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CONTENTS

DESCRIPTION

LEGEND (SOIL & ROCK)

TITLE SHEET

SITE PLAN

PROFILE BORE LOGS

SHEET NO.

38,

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY HAILFAX

PROJECT DESCRIPTION WIDENING NC 125 FROM I-95 TO OLD FARM ROAD

SITE DESCRIPTION CULVERT ON NC 125 OVER CREEK (-L-STA.84+52)

STATE PROJECT REFERENCE NO. U-5725/R-3822

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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 (199) 707-6850, THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE, INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. THE LABORATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. THE LABORATION OF SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY NIMEBERT 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, DESCRIPTION AND WIND AS WE'! I AS OTHER NON-CLIMATIC FACTORS. 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 PINION 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 SATISTY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT, THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN PEXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- IES:
 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.

P.M. WEAVER C.R. PASTRANA **AMERIDRILL**

INVESTIGATED BY _ESP Associates, P.A.

DRAWN BY __C.R. PASTRANA

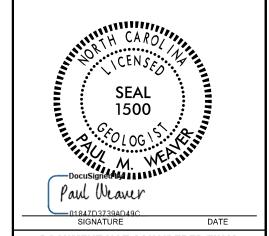
CHECKED BY P.M. WEAVER

SUBMITTED BY <u>ESP</u> Associates, P.A.

DATE **DECEMBER** 2017



ESP ASSOCIATES, PA 7011 ALBERT PICK RD GREENSBORO, NC 27409 FIRM # C-0587 WWW.ESPASSOCIATES.COM



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PROJECT REPERENCE NO.
U-5725/R-3822

2

SHEET NO.

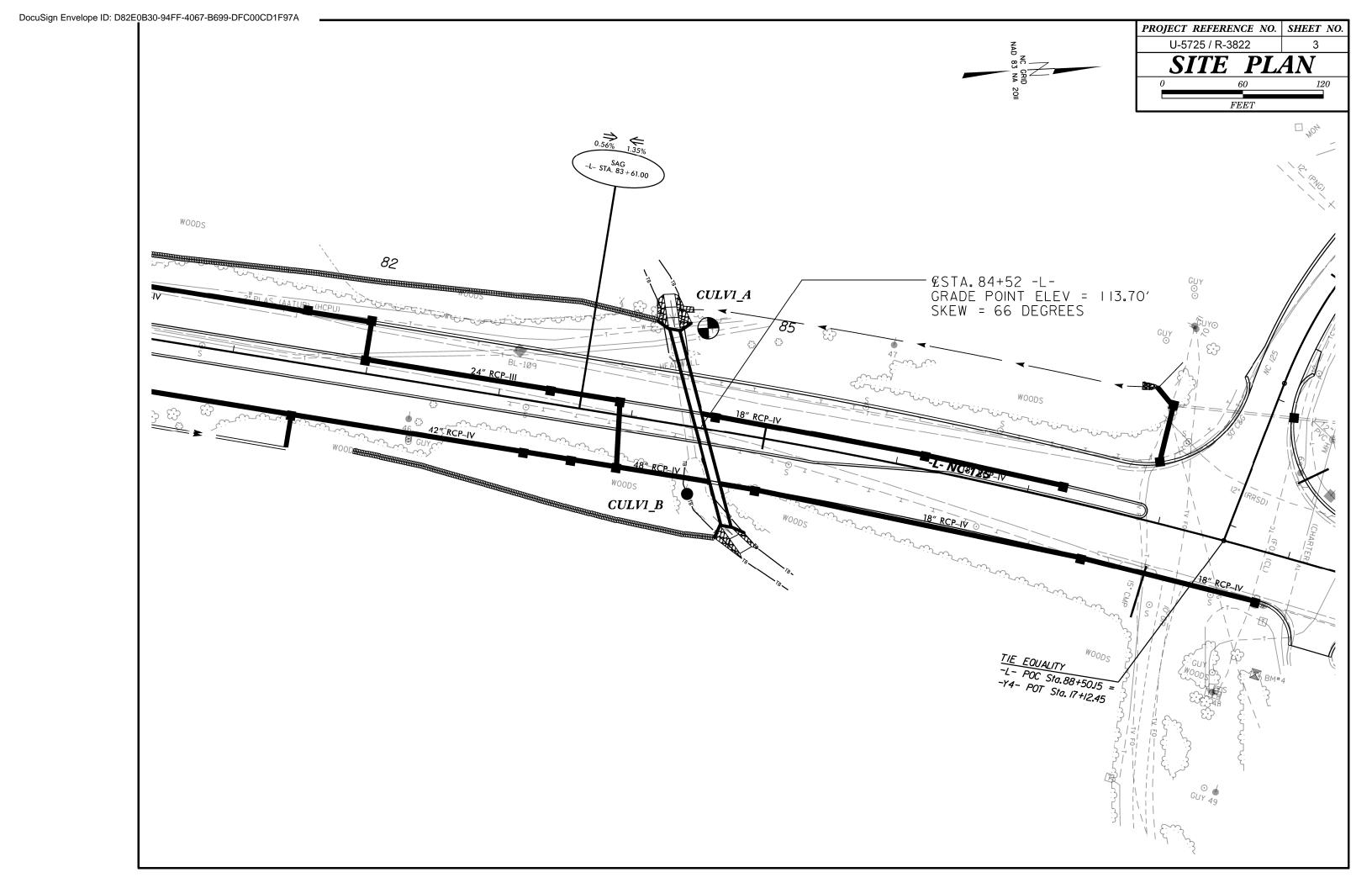
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

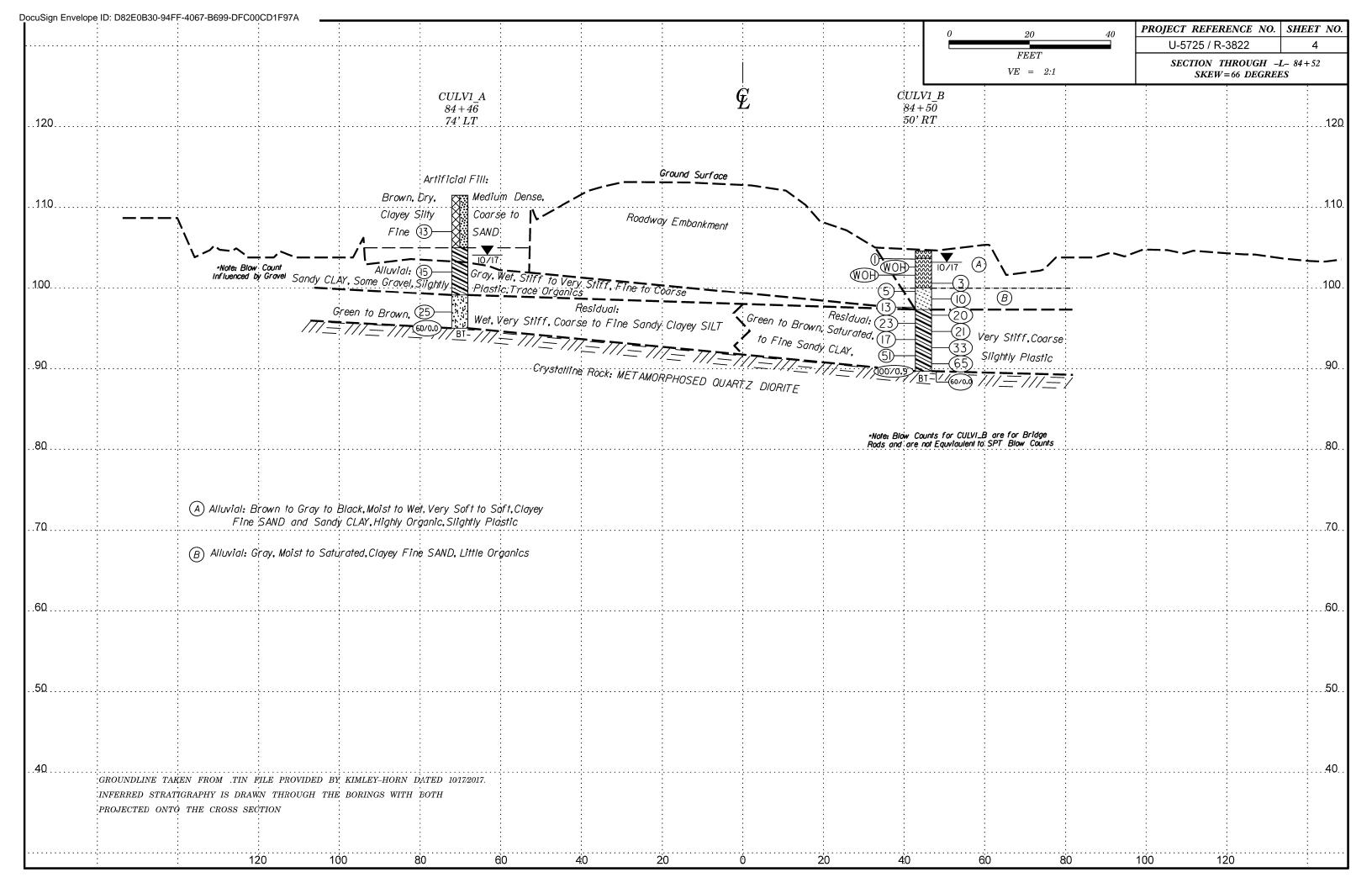
GEOTECHNICAL ENGINEERING UNIT

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	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	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.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM DI586). SOIL CLASSIFICATION	<u>UNIFORMLY GRADED</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	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	AQUIFER - A WATER BEARING FORMATION OR STRATA,
IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, WOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	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.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED,	WEATHERED VIOLENCE NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS	MINERALOGICAL COMPOSITION	CRYSTALLINE FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
ULASS. (\$\(\sigma\) 73% PASSING "2007 (> 35% PASSING "2007)	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-2-6 A-2-7 A-2-6 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY CRAYITY ON SLOPE OR AT BOTTOM
S/MBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	ROCK (NCR) ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	OF SLOPE.
7. PASSING	HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK SPT REFUSAL, ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED CP) SHELL BEDS, ETC.	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.
"18 59 MX GRANULAR SILT MUCK, CLAY PEAT	PERCENTAGE OF MATERIAL	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
MATERIAL PASSING "40	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	HAMMER IF CRYSTALLINE.	HORIZONTAL.
LL 48 MX 41 MN LITTLE OR LITTLE OR LITTLE OR	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (V SLI,) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH,
GROUP INDEX 8 8 8 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF SOILS	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLIJ) 1 INCH, OPEN JOINTS MAY CONTAIN CLAY, IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
USURL TITES STUNK THRUS-	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS	STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN. RATING EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	<u>∨pw</u> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI 0F A-7-5 SUBGROUP IS ≤ LL - 30 ; PI 0F A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP	WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, IN GRANITOID ROCKS, ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/825 DIP & DIP DIRECTION	(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES 'CLUNK' SOUND WHEN STRUCK, IF TESTED, WOULD YIELD SPT REFUSAL	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
CONSISTENCY (N-VALUE) (TONS/FT ²)	₩ITH SOIL DESCRIPTION → OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4 LOOSE 4 TO 10	SOIL SYMBOL SOIL SYMBOL SOIL SYMBOL SLOPE INDICATOR INSTALLATION	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MATERIAL MEDIUM DENSE 10 TO 30 N/A	ARTIFICIAL FILL (AF) OTHER AUSER PORTING CONE PENETROMETER	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE,
DENSE 30 TO 50 VERY DENSE > 50	THAN ROADWAY EMBANKMENT THOUER BURING TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
VERY SOFT < 2 < 0.25	— INFERRED SOIL BOUNDARY — CORE BORING SOUNDING ROD	(V SEV.) 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 < 100 BPF</i>	OF AN INTERVENING IMPERVIOUS STRATUM.
GENERALLY SOFT 2 TO 4 0.25 TO 0.5 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	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
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	ALLINIA COL BOUNDARY A PIEZOMETER	SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE
HARD > 30 > 4		ROCK HARDNESS	RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES	ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK,	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
BOILDER CORRIE CRAVEL COARSE FINE SILT CLAY	SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	MODERATELY 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	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	AR - AUGER REFUSAL NED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED NICA MICACEOUS WEA WEATHERED	BY MODERATE BLOWS.	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
	CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE COURSE TO SEE THE DESCRIPTION OF TERMS	CPT - CONE PENETRATION TEST NP - NON PLASTIC 7/6 - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY
(ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	SOFT CAN BE GROVED 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	TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH	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
(SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE SL SILT, SILTY ST - SHELBY TUBE FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
PLASTIC SEMISOLID: REDUIRES DRYING TO	FRAC FRACTURED, FRACTURES 1CR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS, - FRAGMENTS # - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	TOPSOIL (15.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER,
(PI) PL PLASTIC LIMIT	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS	BENCH MARK: BL:109 N:975009 E:2398675 -BL- STA. 85+08.66
ON CONTINUE MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1,5 - 4 FEET	ELEVATION: II2.80 FEET
OMOPTIMUM MOISTURE = MOIST = MAIN SOLIDEM OF TIMUM MOISTURE SLSHRINKAGE LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO	CME-45C CLAY BITS X AUTOMATIC MANUAL 6° CONTINUOUS FLIGHT AUGER CODE SIZE.	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	FIAD= FILLED IMMEDIATELY AFTER DRILLING
ATTAIN UPTIMUM MUISTURE	CME-55 🖃 CORE SIZE:	THINLY LAMINATED < 0.008 FEET INDURATION	
PLASTICITY		INDUITATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
PLASTICITY INDEX (PI) DRY STRENGTH NON PLASTIC 0-5 VERY LOW	X CME-550 HARD FACED FINGER BITS -N	RUBBING WITH FINGER FREES NUMEROUS GRAINS:	
SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST CASING THE HAND TOOLS:	GENILE BLUW BY HAMMER DISINIEGRATES SAMPLE.	
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH	POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	PORTABLE HOIST INICONE STEEL IEETH X HAND AUGER TRICONE TRICONE X SOUNDING ROD	CRAINS ARE DISCISSED TO SERAPATE WITH STEEL PROPE.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY),	CORE BIT X SUUNDING ROU VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14
		The second secon	1





		BORE LOG							
WBS 50162.1.1 / 37765.1.5	TIP U-5725 / R-3822 COUN		GEOLOGIST Pastrana, C.R.	_		62.1.1 / 37765.1.5	TIP U-5725 / R-3822 COUN		GEOLOGIST Pastrana, C.R.
SITE DESCRIPTION Widening of		1		GROUND WTR (ft)	-	<u>_</u>	g of NC 125 from I-95 to Old Farm F		GROUND WTR (f
BORING NO. CULV1_A	STATION 84+46	OFFSET 74 ft LT	ALIGNMENT -L-	0 HR. 8.6		O. CULV1_B	STATION 84+50	OFFSET 50 ft RT	ALIGNMENT -L- 0 HR. 1.
		1						<u> </u>	
		-							
				N/A	L			 	SURFACE WATER DEPTH N/A
DRILL RIG/HAMMER EFF./DATE AMI DRILLER Meatyard, C.	START DATE 10/23/17	75 100 NO. MOI 0	SURFACE WATER DEPTH	FACE 0.0 FILL ayey Silty Coarse ID 6.5 Fine to Coarse I, Trace Organics nced by gravel 12.4 f, Coarse to Fine SILT th Standard t Elevation 95.0 ft AMORPHOSED	DRILL RIG/H. DRILLER ELEV Cft) 105 100 95	DEPTH (ft) BLOW CC	START DATE 10/20/17 DUNT BLOWS PER FOR 50 0 25 50 50 50 50 50 50 50 50 50 50 50 50 50	75 100 NO. MOI	SURFACE WATER DEPTH N/A L O SOIL AND ROCK DESCRIPTION G - 104.6 GROUND SURFACE
			-						

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REFERENCE

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

CONTENTS

SHEET NO. **DESCRIPTION** TITLE SHEET LEGEND (SOIL & ROCK) 2Α SUPPLEMENTAL LEGEND (GSI) SITE PLAN PROFILE 5-10 CROSS SECTIONS II-38 BORE LOGS, CORE LOGS, & CORE PHOTOGRAPHS

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY HALIFAX

PROJECT DESCRIPTION PREMIER BLVD. EXTENSION (-L1-) FROM NC 125 TO SOUTH OF US 158

SITE DESCRIPTION BRIDGE ON PREMIER BLVD. EXTENSION OVER CHOCKOYOTTE CREEK

STATE PROJECT REFERENCE NO. 39 R - 3822

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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 1999 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE, INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNOS. THE LABBORATORY SAMPLE DATA AND THE IN SITU IN-PLACED 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 INTERRETATIONS 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 HINSELF 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 SUBSURFACE INFORMATION.

- ITES:
 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.

P.M. WEAVER C.R. PASTRANA **AMERIDRILL**

INVESTIGATED BY ESP Associates, P.A.

DRAWN BY T.T. WALKER, F&R Inc.

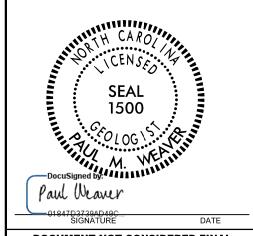
CHECKED BY __P.M. WEAVER

SUBMITTED BY ESP Associates, P.A.

DATE <u>JANUARY</u> 2018



ESP ASSOCIATES, PA 7011 ALBERT PICK RD SUITE E GREENSBORO, NC 27409 FIRM # C-0587 WWW.ESPASSOCIATES.COM



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R-3822

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PROJECT REFERENCE NO.

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	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	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.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586), SOIL CLASSIFICATION	<u>UNIFORMLY GRADED</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
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	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	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.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
CENERAL CRANIII AR MATERIAI S SILT-CLAY MATERIAI S	MINERALOGICAL COMPOSITION	FINE TO COARSE CRAIN ICNEOUS AND METAMORPHIC ROCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) UNGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, CNEISS, GABBRO, SCHIST, ETC.	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-6 A-2-6 A-2-7 A-1-4-3 A-6, A-7	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
00000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR) ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
1/2 PASSING	PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
*40 30 MX 50 MX 51 MN SOILS CLAY PEAT	GRANULAR SILT - CLAY	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
אויים 35 אויים 25 אוי	ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
MATERIAL PASSING *40 SOILS WITH	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	HORIZONTAL.
LL	MODERATELY ORGANIC	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX A A A A MY 9 MY 12 MY 16 MY MO MY MOUNTS OF ORGANIC	GROUND WATER	OF A CRYSTALLINE NATURE. SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
HEIMI TYPES CTOME ERACS ORGANIC	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAVEL, AND SAND GADE GRAVEL AND SAND SOULS SOUS	▼ STATIC WATER LEVEL AFTER 24 HOURS	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MALEMALS SANU	✓ PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
GEN.RATING AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	E	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK,	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	(MOD, SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES 'CLUNK' SOUND WHEN STRUCK, IF TESTED, WOULD YIELD SPT REFUSAL	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
CONSISTENCY (N-VALUE) (TONS/FT ²)	₩ITH SOIL DESCRIPTION → OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE	SOIL SYMBOL SOIL SYMBOL SOIL SYMBOL SEPT DATE TEST BORING INSTALLATION	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MATERIAL MEDIUM DENSE 10 TO 30 N/A	N VSI PRI	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
(NON-COHESIVE) DENSE 30 TO 50 VERY DENSE > 50	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
VERY SOFT < 2 < 0.25	INFERRED SOIL BOUNDARY CORE BORING SOUNDING ROD	(V SEV.) REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	OF AN INTERVENING IMPERVIOUS STRATUM.
GENERALLY SOFT 2 TO 4 0.25 TO 0.5 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	MONITORING WELL TEST BORING WITH CODE	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
MATERIAL STIFF 8 TO 15 1 TO 2	WITH CURE	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	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
(COHESIVE)	TTTTT ALLUVIAL SOIL BOUNDARY A PIEZOMETER INSTALLATION - SPT N-VALUE	ALSO AN EXAMPLE.	RUN AND EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270		VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	HOSE IN THE TOP O SEET OF	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED	OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	BY MODERATE BLOWS.	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
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	MEDIUM 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 I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL
SOIL MOISTURE - CORRELATION OF TERMS	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\dot{\gamma}_{\sf d}$ - DRY UNIT WEIGHT	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	SOFT CAN BE GROVED 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	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL
(SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE SL SILT, SILTY ST - SHELBY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY	TENGTH 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.
PLASTIC SEMISOLID; REQUIRES DRYING TO	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
HANDE - WEI - (W) ATTAIN OPTIMUM MOISTURE	FRAGS FRAGMENTS	FRACTURE SPACING BEDDING	BENCH MARK: BM #6: N: 945061, E: 2401116, -BL- STA. 8+95.97, 133.28' LEFT
""PLL _ PLASTIC LIMIT	HI HIGHLY V - VERY RATIO EQUIPMENT USED ON SUBJECT PROJECT	TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	BENCH TIE IN 8' DOUBLE OAK
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: 90.56 FEET
SL SHRINKAGE LIMIT	CME-45C CLAY BITS X AUTOMATIC MANUAL	MODERATELY CLOSE	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	6' CONTINUOUS FLIGHT AUGER	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	FIAD= FILLED IMMEDIATELY AFTER DRILLING
PLASTICITY	CME-55 X 8*HOLLOW AUGERS CORE SIZE:	INDURATION	
		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
<u>Plasticity index (PI)</u> <u>Dry strength</u> NON Plastic 0-5 Very Low	TUNGCARBIDE INSERTS	RUBBING WITH FINGER FREES NUMEROUS GRAINS;	
SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM	VANE SHEAR TEST Y CASING WY ADVANCER HAND TOOLS:	GENILE BLUW BY HAMMER DISINIEGRATES SAMPLE.	
HIGHLY PLASTIC 26 OR MORE HIGH	POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TRICOUS TRICOCARD HAND AUGER	CRAINC ARE DISEIGNET TO CERARATE WITH CIEFL PROPE.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMPLINATIONS (TAN DED VELLOW-DROWN DIVIS COMP		INDURATED DIFFICULT TO BREAK WITH HAMMER.	
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.	VANCE SHEAR LEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE REPORCE CRAIMS	2
		SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14

PROJECT REFERENCE NO.

R-3822

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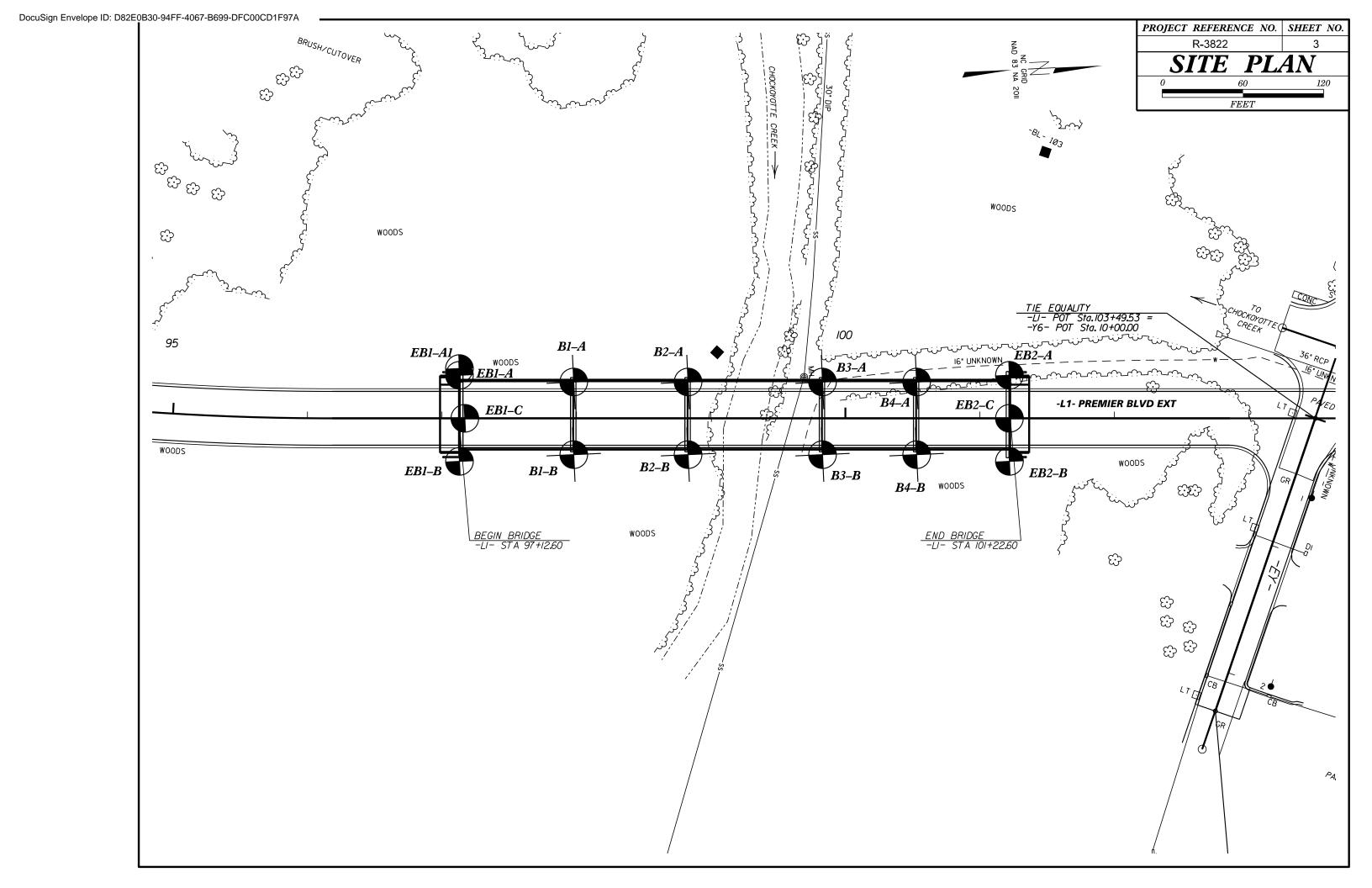
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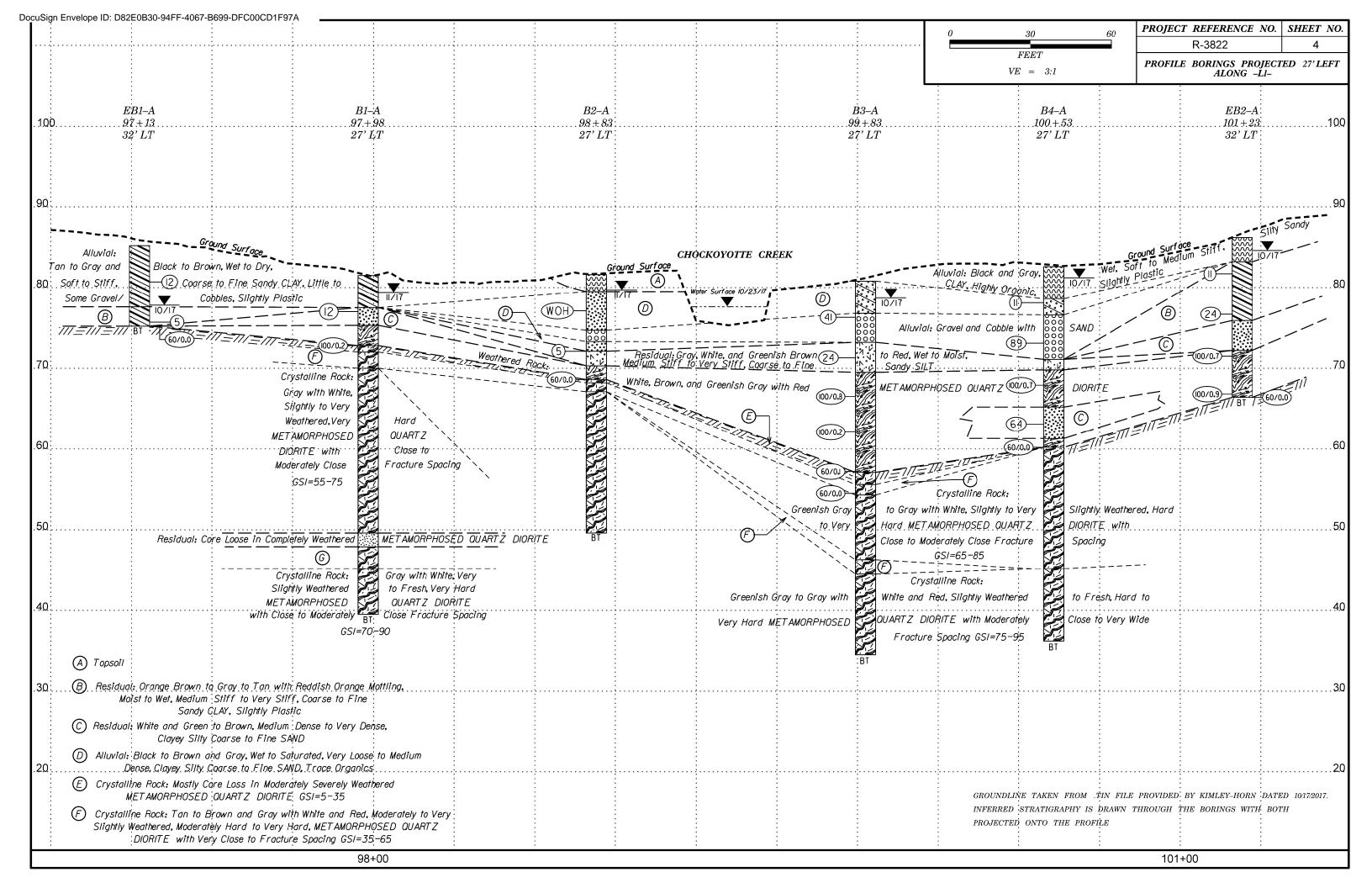
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GEOTECHNICAL ENGINEERING UNIT

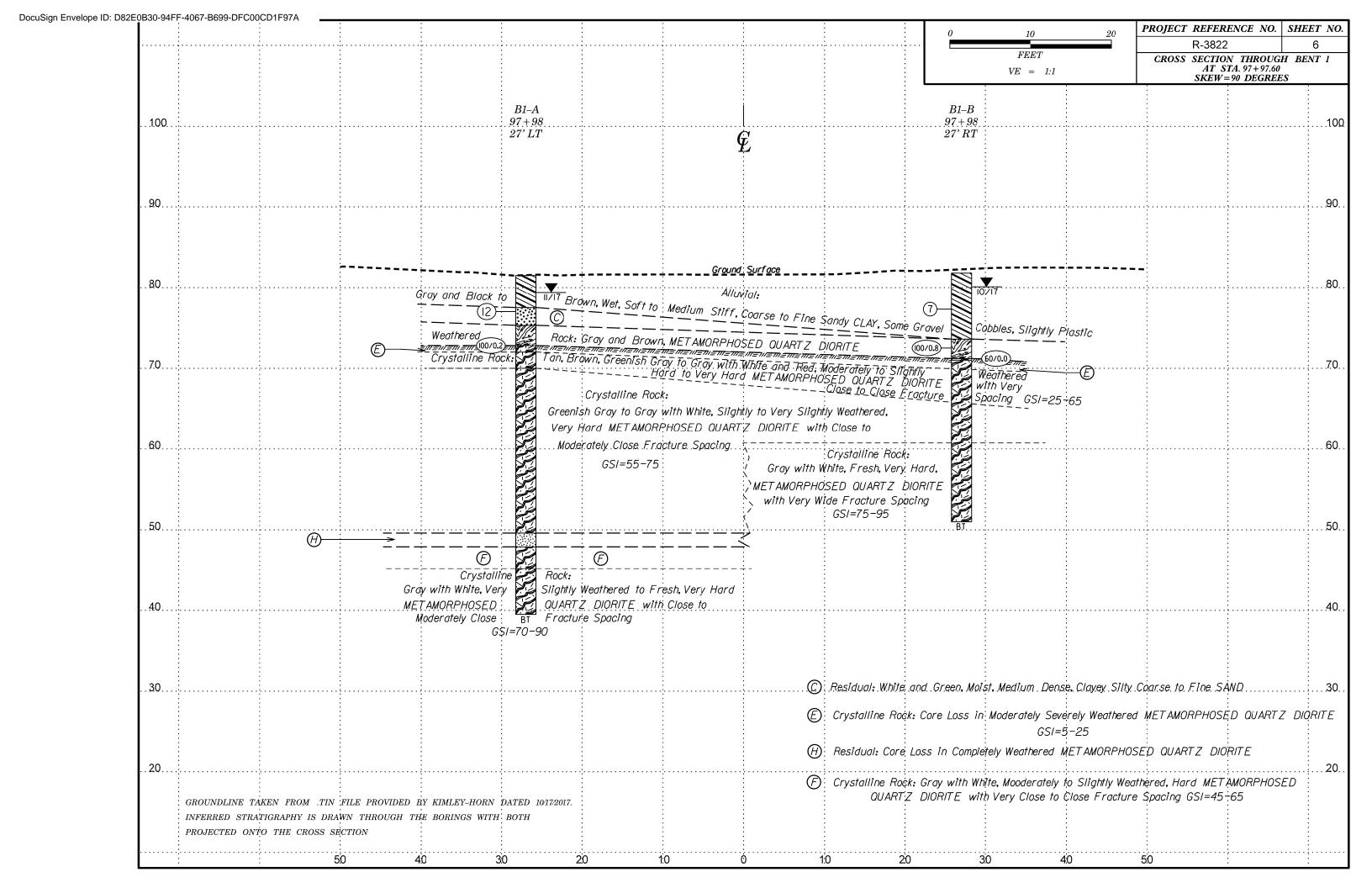
SUBSURFACE INVESTIGATION

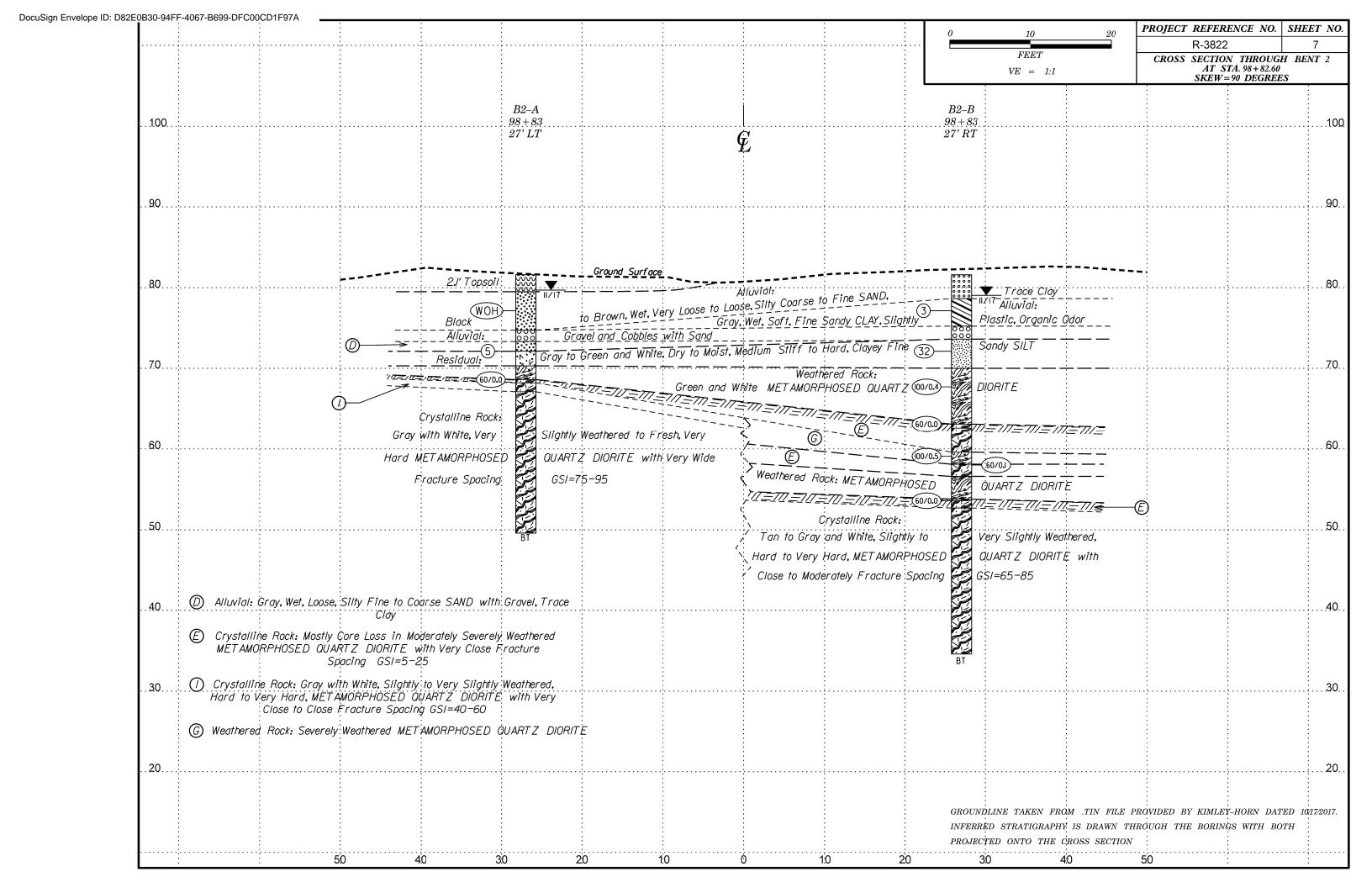
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000) AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000) GEOLOGICAL STRENGTH INDEX (GSI) FOR GSI FOR HETEROGENEOUS ROCK MASSES SUCH JOINTED ROCKS (Hoek and Marinos, 2000) AS FLYSCH (Marinos, P and Hoek E., 2000) From a description of the lithology, structure and ,occasionally es with compact s with angular POOR - Very smooth, slicken-l or highly weathered surfaces soft clay coatings or fillings From the lithology, structure and surface and conditions of the discontinuities, estimate the average value of GSI. Do not try to highly weathered sur coatings or fillings agments surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the planes) be too precise. Quoting a range from 33 to 37 is more realistic than stating that unweathered weather position in the box that corresponds to the condition ФФ Y POOR kensided, highly weathere soft clay coatings or f of the discontinuities and estimate the average value GSI = 35. Note that the table does not of GSI from the contours. Do not attempt to be too apply to structurally controlled failures. Where weak planar structural planes are precise. Quoting a range from 33 to 37 is more ITIONS OF ES realistic than giving GSI = 35. Note that the Rough, slightly s present in an unfavorable orientation smooth, c surfaces fillings Hoek-Brown criterion does not apply to structurally with respect to the excavation face, CONDITIONS these will dominate the rock mass controlled failures. Where unfavourably oriented behaviour. The shear strength of surfaces continuous weak planar discontinuities are present, in rocks that are prone to deterioration slightly es these will dominate the behaviour of the rock mass. POOR Slickensided, h with compact o as a result of changes in moisture content will be reduced if water is - Very sersided or from the contents of the contents or from the contents or from the contents or from the contents or from the contents of the contents of the contents or from the contents of the co 7 The strength of some rock masses is reduced by the **G00D** G00D thered presence of groundwater and this can be allowed for present. When working with rocks in the by a slight shift to the right in the columns for fair, fair to very poor categories, a shift to the right may be made for wet conditions. th, r ed AIR -GOOD Rough, s surface poor and very poor conditions. Water pressure does VERY I VERY | sided with s FAIR Smoot alter VERY Slick With Water pressure is dealt with by effective VERY not change the value of GSI and it is dealt with by stress analysis. using effective stress analysis. 2 <u>G</u> DECREASING SURFACE QUALITY COMPOSITION AND STRUCTURE STRUCTURE INTACT OR MASSIVE - intact A. Thick bedded, very blocky sandstone .90 rock specimens or massive in N/A N/A The effect of pelitic coatings on the bedding planes is minimized by the confinement of situ rock with few widely spaced PIECES discontinuities the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally 80 controlled instability. 60 BLOCKY - well interlocked undisturbed rock mass consisting ROCK of cubical blocks formed by three intersecting discontinuity sets 50 D. Syltstone F. Weak B. Sand-C. Sandor silty shale siltstone stone with stone and Ы or clayey thin inter siltstone with sand-С shale with layers of ın sımılar stone layers VERY BLOCKY - interlocked. INTERLOCKING mounts sands tone 40 partially disturbed mass with 50 multi-faceted angular blocks formed by 4 or more joint sets C. D. E. and G - may be more or . Tectonically deformed, BLOCKY/DISTURBED/SEAMY -30 less folded than illustrated but ntensively folded/faulted, folded with angular blocks this does not change the strength. sheared clayey shale or siltstone formed by many intersecting Tectonic deformation, faulting and with broken and deformed DECREASING discontinuity sets. Persistence of bedding planes or schistosity loss of continuity moves these andstone layers forming an 30 categories to F and H. almost chaotic structure 20 DISINTEGRATED - poorly inter-locked, heavily broken rock mass 20 H. Tectonically deformed silty with mixture of angular and or clayey shale with or clayey shale forming a 10 rounded rock pieces or without a few very chaotic structure with pockets thin sandstone layers of clay. Thin layers of andstone are transformed nto small rock pieces. LAMINATED/SHEARED - Lack of blockiness due to close spacing N/A N/A → Means deformation after tectonic disturbance of weak schistosity or shear planes

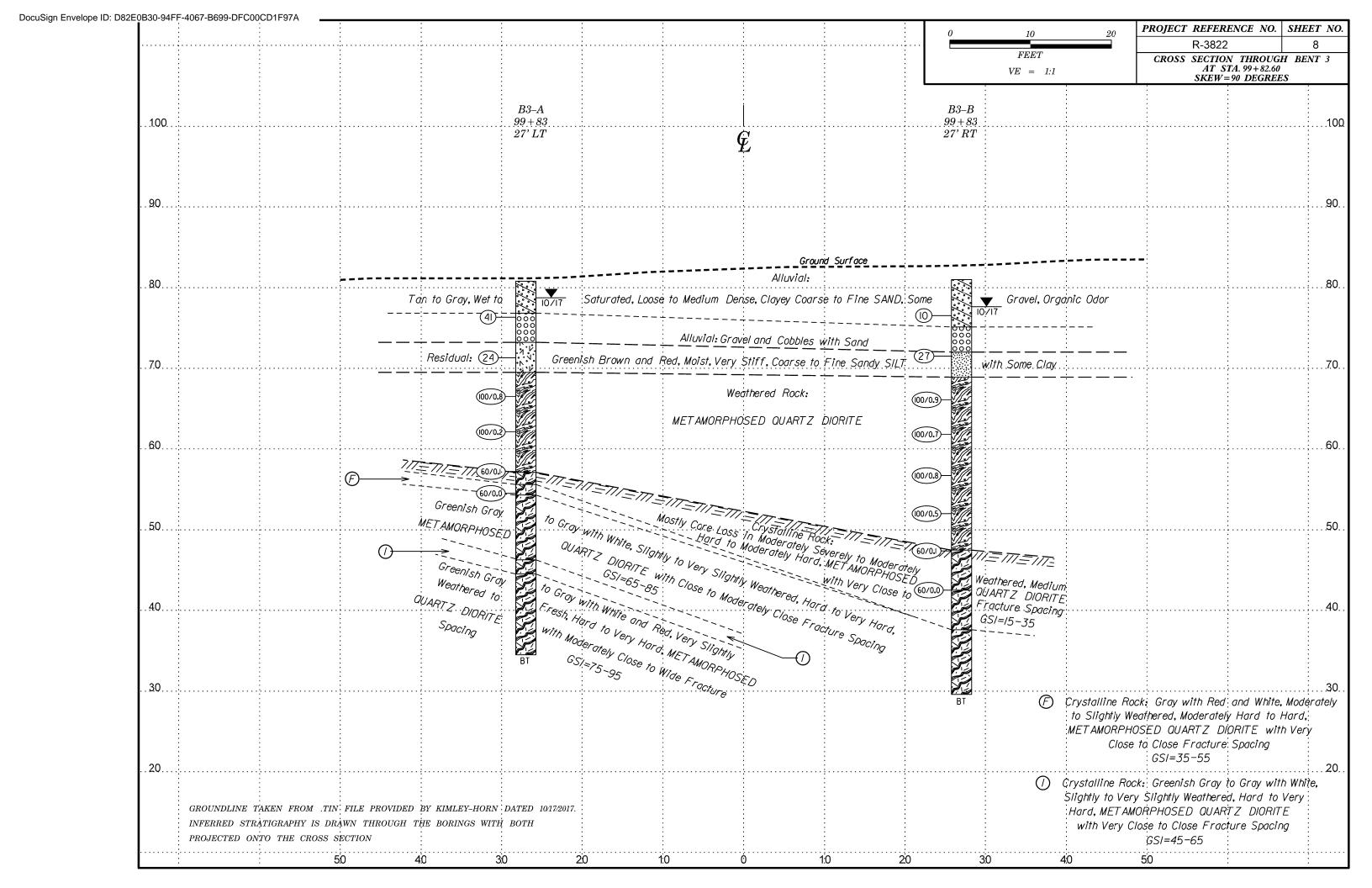


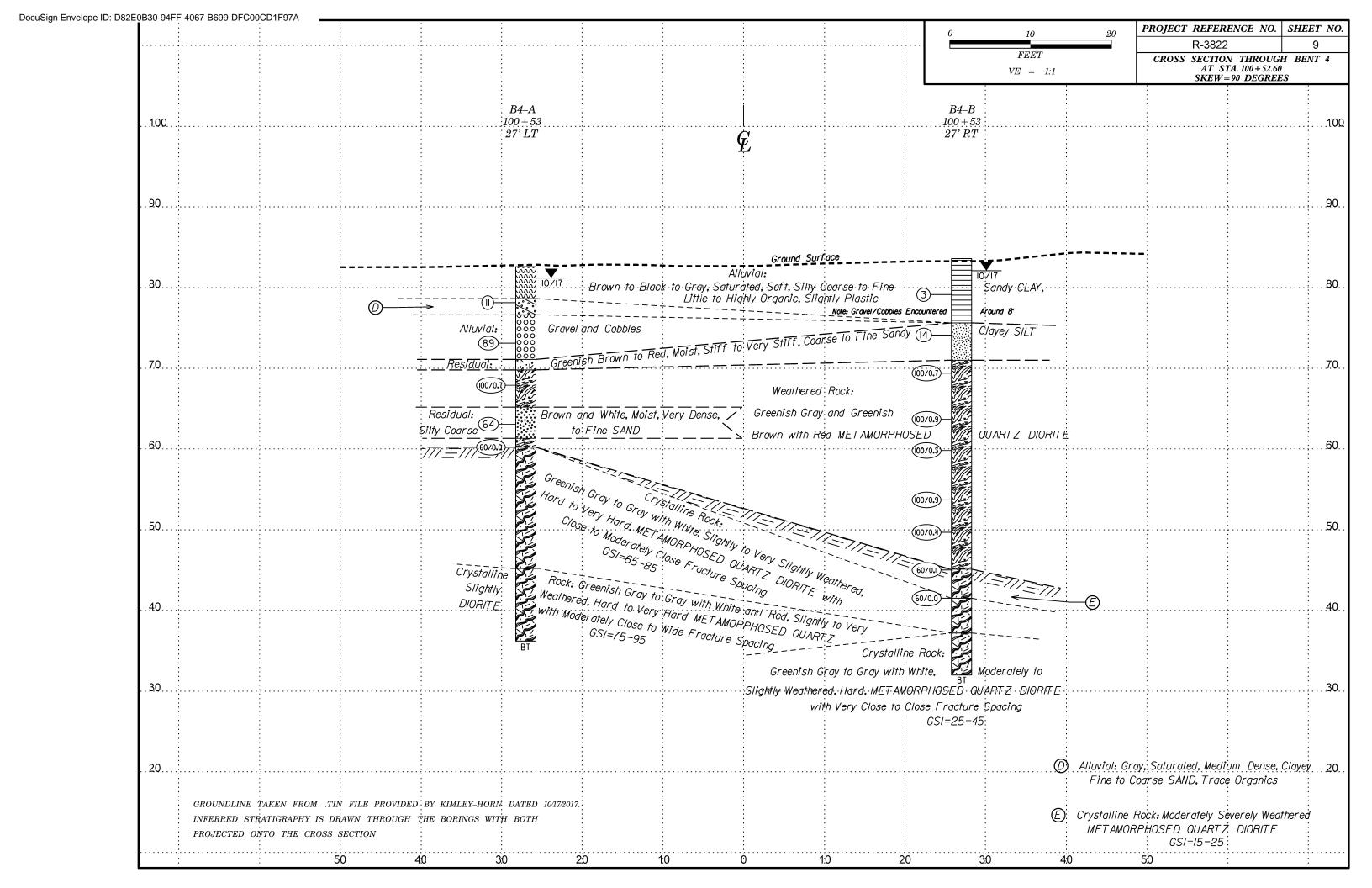


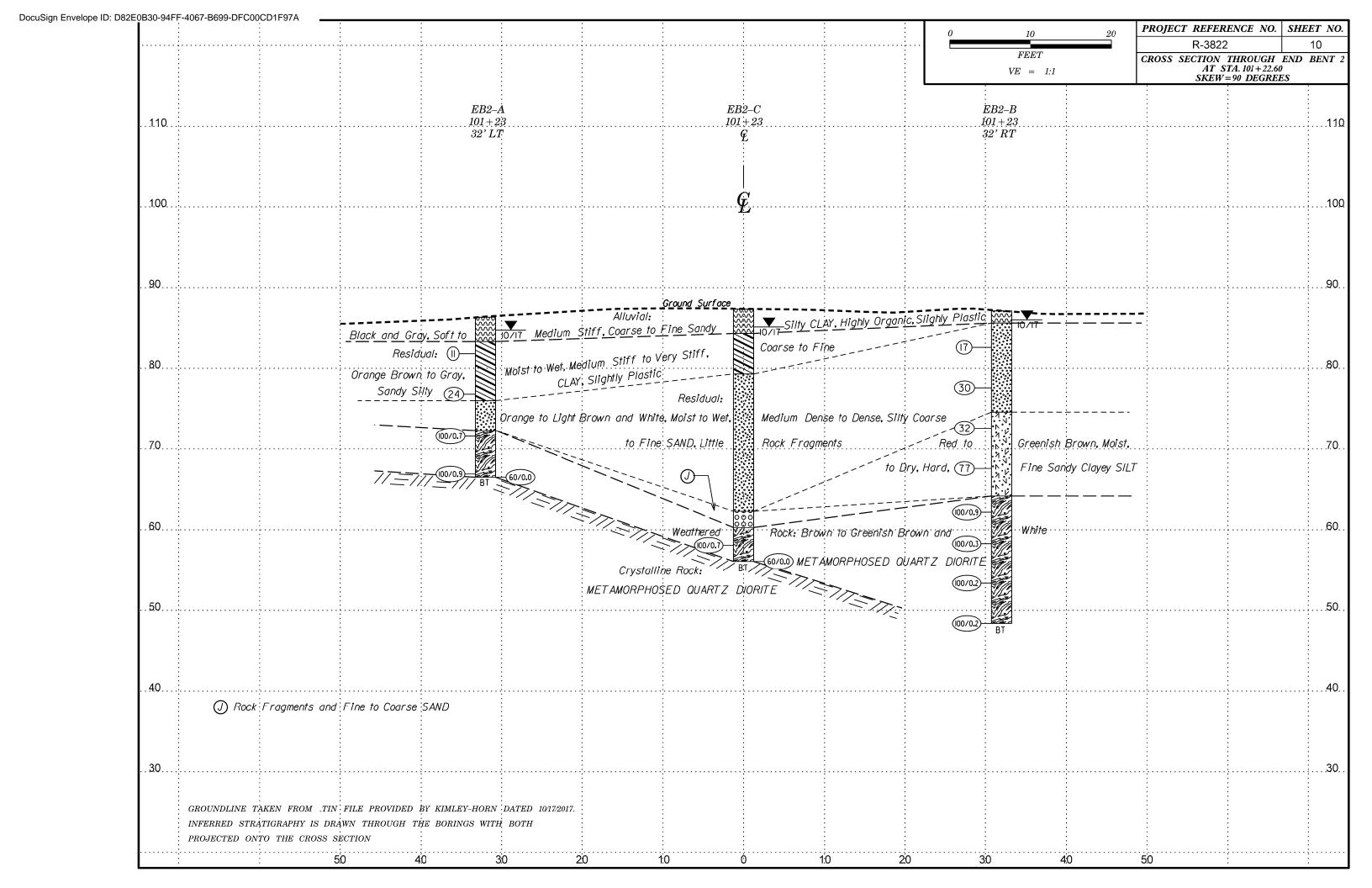
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				<u>:</u>	<u> </u>		<u>.</u>			R-3822	:	5
									FEET VE = 1:1	CROSS SECTION T AT ST SKEW=	HROUGH END H A. 97 + 12.60 90 DEGREES	BENT
1.10		EB1–A(1) EB1– 97+13 97+		:	: <i>EB</i>	1–C + 17			EB1-B 97+13			11
1. 10		37' LT 32' L	T			Z.			32' RT			 : :
1.00					9	E						10
												:
90				: : : :	: : :	Ground Suface						90 :
			: :	Alluvial:	Fine Sandy		Gravel, Slightly	Plastic - Alluvial:	Very Dense, Silty Coars			
80		Tan to Gray, Dry	to Moist,	Stiff, Coarse to	:	🏭 · · · · · · · · †o∙ F-	ine SAND with G te: Blow Count Influence	ravel and (54)	Cobbles			
		- G // 60/0.0 / / BT	10/17 5 G0/0.0)	iy to Tan to Orc	inge to Brown Stiff, Coarse		Residual: sh Orange Mottlii	26	Medium Stiff to Very	5		:
7.0				Weather	White and	to Fine Sal	ndy CLAY, Slightly	Plastic26)				70
					White and	MET AMORPA	Hard, Coarse to	Fine Sandy				
60				: : :	Crystallin	e Rock:	USED QUARTZ	DIORITE (100/0.8)	S/LT 60/0.1 BT -///			
				: MEIA : :	AMURPHUSED UU : : :	IARTZ DIURITE : :			BT (60/0.1)			
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40												4
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		N FILE PROVIDED BY KIMLEY-HORN RAWN THROUGH THE BORINGS WIT SECTION	•									
	<u>;</u>	:	30 2		.: 1:0		:0 2			;		:











		ORE LUG								
WBS 37765.1.5	TIP R-3822 COUNT	ry Halifax	GEOLOGIST Pastrana, C.R.		WBS 37765.1.5		TIP R-3822 COUN	TY HALIFAX	GEOLOGIST Pastrana, C.R.	
SITE DESCRIPTION Bridge on Pres	mier Boulevard Extension Over	Chockoyotte Creek		GROUND WTR (ft)	SITE DESCRIPTION	Bridge on Pre	emier Boulevard Extension Over	Chockoyotte Creek	GROU	IND WTR (ft)
BORING NO. EB1-A1	STATION 97+13	OFFSET 37 ft LT	ALIGNMENT -L1-	0 HR. 5.4	BORING NO. EB1-A		STATION 97+13	OFFSET 32 ft LT	ALIGNMENT -L1- 0 HR.	Dry
COLLAR ELEV. 86.0 ft	TOTAL DEPTH 11.9 ft	NORTHING 974,726	EASTING 2,401,465	24 HR . 6.5	COLLAR ELEV. 85.2	ft	TOTAL DEPTH 10.0 ft	NORTHING 974,726	EASTING 2,401,470 24 HR .	7.4
DRILL RIG/HAMMER EFF./DATE AME95	33 CME-550X 83% 01/0//2015	DRILL METHOD H.	S. Augers HAMN	IER TYPE Automatic	DRILL RIG/HAMMER EFF.	./DATE AME95	533 CME-550X 83% 01/0//2015	DRILL METHOD	H.S. Augers HAMMER TYPE	Automatic
	START DATE 10/27/17	COMP. DATE 10/27/17	SURFACE WATER DEPTH N		DRILLER Meatyard, (START DATE 10/25/17	COMP. DATE 10/25/17	SURFACE WATER DEPTH N/A	
			-					'	. T	
(ft) ELEV (ft) (ft) 0.5ft 0.5ft 0.5ft		75 100 NO. MOI G		CRIPTION DEPTH (ft)	(ft) ELEV (ft) 0	0.5ft 0.5ft 0.5	─ I	75 100 NO. MOI 0		1
ELEV DRIVE DEPTH BLOW COUNT	BLOWS PER FOO	75 100 SAMP. V L O NO. MOI G	SOIL AND ROCK DES	ACE 0.0 to Fine Sandy ghtly Plastic Orange Mottling, 9.5 e Sandy CLAY, C 11.9 OCK RTZ DIORITE n Standard Elevation 74.1 ft MORPHOSED	BLEV CHI	BLOW COUNT	BLOWS PER FOO	75 100 SAMP. NO. MOI C	SOIL AND ROCK DESCRIPTION	0.0 andy ic
R3822_GEO_BR			_						- - - -	
BORE DOUBLE			.						- - - - -	
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-			Bridge on F				on Over				1			D WTR (ft)	l				ge on F				nsion Ove	er Chockoyot							-	D WTR (ft
	RING NO.			STATIO				OFFSET			_	NMENT -L1-	0 HR.	Dry	l —	ING NO.					ATION 9			OFFSET					MENT -L1-		0 HR.	19.0
	LAR ELE					H 22.4 ft		NORTHIN		728 Method I		TING 2,401,502	24 HR.	8.2	↓ 	LAR ELE			- AA47		CME 550V			NORTHII			OD ''	.S. Augers	NG 2,401,53		24 HR. MER TYPE	7.0
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ELE\	, DRIVE		BLOW COU		DATE	BLOWS F		<u> </u>		. V L	SURF				ELEV	DD1) /F	DEPTH		w cour		ARIDAI		VS PER FC		SAMP		, 7 L	SURFA				
(ft)	ELEV (ft)	⊃ =	0.5ft 0.5ft		2		50	75 10		/ 0	ELEV. (fi		CK DESCRIPTION	DEPTH (ft	(ft)	ELEV (ft)		0.5ft			0	25	50	75 10		1 /	O G		SOIL AND	ROCK DES	CRIPTION	
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85	-				• • • •		· · · ·				86.2		SURFACE .UVIAL	0.0	80	81.4	3.5	14	25	29			· · · ·		.	l w		- -	Coarse to Fi	Cobbles		
	-	-		11							-	Tan to Gray, Moist,		ndy		-	†					1			1 1	_	,		Note: Blow cou	cobbles		and - <u> </u>
											81.2 81.2			5.0		76.4	8.5	9	13	13		r — —	<u> </u>		.	▼		76.9		vel and Cob RESIDUAL		8
80	-								-{			Tan, Wet, Medium Silty, Coarse to Fine	SAND with Gravel	se, and	75	_		9	13	13		26				M		_	Orange to Brow Sandy (n, Very Stiff	, Coarse to F y Plastic	Fine
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75									4		<u> </u>	RES Gray to Tan to Oran	SIDUAL age Brown with Red	dish	70		13.3	10	13	13		26				М		- -				
	-										<u>}</u>	Orange Mottling, Moi Stiff, Coarse to Fine	e Sandy CLAY, Slig	htly		-									.			67.8			5. 	17
70	-							.	1		<u>- 71.4</u> -	Pl White and Brown, N	lastic Moist, Hard, Coarse	to 14.8	65	66.4	18.5	15	36	37				73		М		-	White and Br	Sandy SILT		ie
		-										Fine Sa	andy SILT	17.9		-							I					-				
											[WEATHE METAMORPHOSE	RED ROCK D QUARTZ DIORI	TE		61.4	23.5	66 4	44/0.3					4			T/Z	62.1		ATHERED R		22
65	63.8	22.4									63.8			22.4	60	58.7 -	26.2		44/0.3			1		100/0.	- 11			- 58.7	METAMORPH			ΓΕ 26. <u>Γ\26</u> .
	-	6	0/0.0					60/0.0			_	Penetration Test Ref	ated with Standard fusal at Elevation 63	3.8 ft		-		60/0.1				'	'	60/0.	1			58.6	CRY: METAMORPH	STALLINE I		
	-										_	on Crystalline Rock:	: METAMORPHOS Z DIORITE	ED		-												- '		rminated wit	n Standard	
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WBS	3776	5.1.5			TI	IP F	R-3822	2		СО	UNT	/ H/	ALIFAX	(GEOLO	OGIST Pastra	na, C.R.		
SITE	DESCF	RIPTIO	N Bric	lge on	Prem	ier B	Bouleva	ard E	Extensi	ion O	ver C	hock	oyotte	Creek						GROUN	ND WTR (ft)
BOR	ING NO	. B1-/	4		S	TAT	ION 9	7+9	98			OFF	SET :	27 ft LT	•		ALIGN	MENT -L1-		0 HR.	N/A
COLI	LAR EL	EV . 8	1.5 ft		T	ОТА	L DEP	TH	42.0 f	ft		NOF	RTHING	974,	810		EASTIN	IG 2,401,479		24 HR.	2.1
DRILL	RIG/HA	MMER I	EFF./DA	TE AI	ME9533	3 CM	E-550X	83%	01/0//2	2015				DRILL	METHO	D H	I.S. Augers		HAM	MER TYPE	Automatic
DRIL	LER N	/leatyaı	d, C.		S	TAR	T DAT	E ´	10/27/1	17		CON	/IP. DA	TE 10	/31/17		SURFA	CE WATER DE	PTH N	N/A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft	UNT 0.5ft	0		25 	BLOWS	PER F		75	100	SAMP NO.	MOI	L O G	ELEV. (ft)	SOIL AND R	OCK DES	SCRIPTION	DEPTH (ft)
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80	- 78.0	3.5	4	E	7			<u> </u>		:	 	 						Black to Brown, So o Fine Sandy CLA	oft to Med	lium Stiff, Co	
75		‡	4	5	7	:	•12 ·	:			 	:			M		75.3	R	ESIDUAL		6.2
75	-	‡				-	_==	+		†=	==:	†=				W	<u> </u>	White and Green Silty Coa	se to Fin	e SAND	lycy _
	73.0 72.8	8.5 8.7	100/0.2			:		:				:	100/0.2	•			72.8 72.0	WEAT METAMORPHO	HERED F SED QUA		8.7 ITE - 9.5
70	_	‡	60/0.0			lĿ		Ŀ		<u> :</u>		<u> :</u>	60/0.0				70.0		ALLINE	ROCK	11.5
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45		1						-				.					45.2	CRYST	ALLINE	ROCK	36.3
		Ŧ						-		-		-					F\	Gray with White Weathered, Ha			
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40	-	‡				Ŀ		<u> </u>	· · ·	<u> </u>		<u> </u>				S	39.5	Gray with White, \	/ery Sligh	itly Weather	
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WBS	37765	5.1.5			TIP	R-382	22	С	OUNT	ΥΙ	HALIFAX	GEOLOGIST Pastrana, C.R.	
SITE	DESCR	IPTION	I Brid	dge on Pr	emier	Boule	ard Exte	ension	Over	Cho	ckoyotte Creek		GROUND WTR (ft)
BORI	NG NO	. B1-A	١		STA	TION	97+98			OF	FSET 27 ft LT	ALIGNMENT -L1-	0 HR . N/A
COLL	AR ELI	EV. 81	1.5 ft		тот	AL DE	PTH 42	.0 ft		NC	PRTHING 974,810	EASTING 2,401,479	24 HR. 2.1
DRILL	RIG/HA	MMER E	FF./DA	TE AMES	533 CI	ME-550	X 83% 01	/0//2015	5		DRILL METHOD H.S	. Augers HAMM	ER TYPE Automatic
DRIL	LER N	leatyard	d, C.		STA	RT DA	TE 10/2	27/17		CC	OMP. DATE 10/31/17	SURFACE WATER DEPTH N/	A
CORI	E SIZE	NQ			тот	AL RU	N 33.3	ft					
ELEV	RUN ELEV	DEPTH	RUN	DRILL RATE	REC.	UN RQD	SAMP.	STF REC.	RATA	L	_	ESCRIPTION AND REMARKS	
(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ	ELEV. (ft)	ESCRIPTION AND REWARKS	DEPTH (f
72.8	70.0	0.7										Begin Coring @ 8.7 ft	
70	72.8 70.0	8.7 11.5	2.8	4:58/1.0 8:21/1.0	(1.8) 64%	(0.0) 0%		(0.0)	(0.0)		72.8 72.0 Core Loss in Mod	CRYSTALLINE ROCK erately Severely Weathered METAMO	RPHOSED \(\bigcup_{\text{9}}^{\text{8.}} \end{array}
70	70.0	11.5	5.0	10:27/0.8 7:19/1.0	(4.9)	(4.7)		(1.8)	(0.0)		70.0 Tan to Brown and Gr	QUARTZ DIORITE ay with White and Red, Moderately We	eathered. Very
		‡		13:04/1.0 15:41/1.0	98%	94%		(18.4) 90%	-		Hard METAMORPH	IOSED QUARTZ DIORITE with Very C Fracture Spacing, Very Quartzitic	
65	65.0	16.5	F.0	17:40/1.0 20:21/1.0		(2.1)		90%	70%		Majorit	y of joints at 10 degrees to 20 degrees 1 vertical fracture 0.8' long	
	•	‡	5.0	6:06/1.0 6:34/1.0	(4.0) 80%	(3.1) 62%					All	fracture faces heavily iron stained GSI = 45-65	
60	60.0	21.5		8:05/1.0 10:53/1.0							Gray with White	e, Slightly to Very Slightly Weathered, V	/ery Hard
00		21.5	5.0	13:07/1.0 6:03/1.0	(4.6)	(3.9)					_	O QUARTZ DIORITE with Close to Mod Fracture Spacing	•
		‡		7:30/1.0 9:55/1.0	92%	78%					L 4	y of joints at 10 degrees to 20 degrees joints at 70 degrees to 80 degrees	
55	55.0	26.5	5.5	8:18/1.0 15:52/1.0 23:38/1.0	(4.0)	(4.2)					 Very close fracture s 	pacing 15.6 to 15.9', 18.2' to 18.4', 21. 25.6' to 26.4'	1' to 22.0', and
		‡	5.5	13:38/1.0 14:21/1.0		(4.3) 78%					-	GSI = 55-75	
50		†		14:18/1.0 5:58/1.5							- 		
50	49.5 -	32.0	5.0	:48/0.5	(3.4)	(1.9)		(0.0)	(0.0)		47.9 Core Less in Com	RESIDUAL	31. D OLIABETZ 33.
		‡		4:16/1.0 4:40/1.0	68%	38%		(2.7)	(1.2)		Core Loss in Com	pletely Weathered METAMORPHOSE DIORITE	D QUARTZ
45	44.5 -	37.0		5:47/1.0 10:15/1.0				100%			45.2 Grav with W	CRYSTALLINE ROCK hite, Moderately to Slightly Weathered,	Hard 36.
	•	‡	5.0	5:39/1.0 5:30/1.0	(4.9) 98%	(4.6) 92%		98%	93%		METAMORPHOSED	QUARTZ DIORITE with Very Close to Spacing	Close Fracture
40		‡		5:27/1.0 7:44/1.0							Γ Ι ,	ees to 80 degrees with light to heavy in GSI = 45-65	ŭ
	39.5 -	<u>+ 42.0</u>		13:29/1.0							Gray with Whit	e, Very Slightly Weathered to Fresh, Ve	ery Hard
	•	‡									- \	QUARTZ DIORITE with Close to Mod Fracture Spacing	derately Close
	_	‡									- -	oints at 10 degrees to 20 degrees GSI = 70-90	
	-	‡										nated at Elevation 39.5 ft in Crystalline AMORPHOSED QUARTZ DIORITE	Rock:
		‡									- -		
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WBS No. 37765.1.5

TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B1-A (-L1-, STA. 97+98, 27' LT)

Box 1: 8.7 Feet to 11.5 Feet



Box 2: 11.5 Feet to 20.4 Feet





Box 3: 20.4 Feet to 28.3 Feet



CORE PHOTOGRAPHS

WBS No. 37765.1.5

TIP No. R-3822

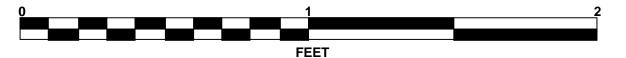
Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B1-A (-L1-, STA. 97+98, 27' LT)

Box 4: 28.3 Feet to 37.0 Feet





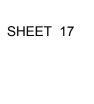
Box 5: 37.0 Feet to 42.0 Feet



														<u>OG</u>								
	3776					P R-382				OUN							GEOLOG	IST Nance	, D.S.			
SITE	DESC	RIPTION	N Bric	dge on	Premi	er Boule	vard	Exten	sion	Over	Cho	ckoy	otte	Creek						GROU	ND WT	R (ft)
BORI	NG NO). B1-E	3		S	TATION	97+	-98			О	FFSE	T 2	27 ft RT			ALIGNME	NT -L1-		0 HR.		N/A
COLL	AR EL	EV . 8	1.8 ft		TO	OTAL DE	PTH	i 30.8	ß ft		N	ORTH	IING	974,8	80		EASTING	2,401,533	}	24 HR.		1.7
DRILL	RIG/HA	MMER E	FF./DA	TE AN	ЛE9533	CME-550	X 83	3% 01/0	//201	5				DRILL N	IETHO	D H.	.S. Augers		HAMI	MER TYPE	Autom	natic
DRILL	ER N	Леаtyar	d, C.		S	TART DA	TE	10/26	/17		C	OMP.	DA	ΓΕ 10/2	26/17		SURFACE	WATER D	EPTH N	I/A		
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft	JNT 0.5ft	0	25	BLOWS	S PEI	R FOC	75		100	SAMP. NO.	MOI	L O G	ELEV. (ft)	SOIL AND F	ROCK DES	SCRIPTION		PTH (fi
85		 - - 					•		-		•				V				JND SURF		se to	0.
75	78.3 - 73.3	3.5	3	3	4	• • • • • • • • • • • • • • • • • • •									W		-	Fine Sandy				8.
70		10.6	60/0.0	60/0.3			:		: -			. 100	/0.8 /0.0				71.0 70.0	Gray and Brov QUA	RTZ DIOF FALLINE I DSED QUA	NORPHOSE RITE ROCK ARTZ DIOR	RITE	10 10 11
65	-	† † †					· .		-	· · · · · · · · · · · · · · · · · · ·							- Gre	eathered MET	AMORPH DIORITE Gray with Slightly We	OSED QUA White and eathered, H	RTZ Red, ard	16
60	-	<u>+</u> + + + +					-		-				•				Gre - ME	Very Close to enish Gray to Very Slightly TAMORPHOS ase to Moderat	Close Frac Gray with Weathered ED QUAR	cture Spaci White, Slig d, Very Har TZ DIORIT	ng htly to d E with	
55	-	<u> </u>							+								- ME ⁻ - 51.0	Gray with W TAMORPHOS Very Wid	hite, Fresh ED QUAR e Fracture	n, Very Hard TZ DIORIT Spacing	d E with	3
	-																- (Crystalline Roc	k: METAI	MORPHOS	ED	
	-	+ + + + + + + + + + + + + + + + + + +															- - - - - - - - - - - - - - - - - - -					

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										<u> </u>	KE LUG		
	37765					R-382					ALIFAX	GEOLOGIST Nance, D.S.	
				dge on Pr				nsion	Over (koyotte Creek		GROUND WTR (ft)
BOR	ING NO	. B1-B	3		STA	ΓΙΟΝ	97+98			OF	FSET 27 ft RT	ALIGNMENT -L1-	0 HR. N/A
COL	LAR ELI	EV . 81	1.8 ft		TOT	AL DEI	PTH 30	.8 ft		NC	RTHING 974,808	EASTING 2,401,533	24 HR. 1.7
DRILL	RIG/HA	MMER E	FF./DA	TE AMES	9533 CN	/IE-550	K 83% 01	/0//2015			DRILL METHOD H.S	Augers HAMN	MER TYPE Automatic
DRIL	LER M	1eatyard	d, C.		STAI	RT DA	TE 10/2	26/17		CC	MP. DATE 10/26/17	SURFACE WATER DEPTH N	/A
COR	E SIZE	NQ			TOTA	AL RUI	N 20.01	ft					
ELEV	RUN	DEPTH	RUN	DRILL	REC.	JN RQD	SAMP.	STR REC.	ATA RQD	Ļ	D	ECODIDITION AND DEMARKS	
(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	O G	ELEV. (ft)	ESCRIPTION AND REMARKS	DEPTH (ft)
71												Begin Coring @ 10.8 ft	
70	71.0	10.8	5.0	4:03/1.0 14:25/1.0		(0.5) 10%		(0.0)	(0.0)		71.0	erately Severely Weathered METAMO QUARTZ DIORITE	ORPHOSED 10.8
		Ŧ		4:08/1.0 5:29/1.0	, ,	1070		(3.5)	(0.5) 12%		Constraint Constraint	GSI = 5-25 Gray with White and Red, Moderatel	. to Olimbah
65	66.0	15.8	5.0	8:55/1.0 6:30/1.0	(4.8)	(2.8)		(4.4)	(2.4)		- Greenish Gray to - 65.8 Weathered, Hard ME	FAMORPHOSED QUARTZ DIORITE	with Very Close 16.0
	-	Ŧ	0.0	4:28/1.0 5:54/1.0	96%			100%	55%		- Abundant low t	to Close Fracture Spacing o high angle fractures with heavy iron	ı staining
	61.0	20.8		7:08/1.0 12:42/1.0							- 61.4 Greenish Gray to Gra	GSI = 25-45 with White, Slightly to Very Slightly V	Weathered, Very20.4
60	- 01.0	- 20.0	5.0	5:12/1.0	(5.0)	(5.0)		(10.4) 100%	(10.4) 100%		Hard METAMORPH	OSED QUARTZ DIORITE with Close Close Fracture Spacing	to Moderately
		‡		7:08/1.0 7:12/1.0	100%	100%						joints at 0 degrees to 10 degrees	atainin a
	56.0	25.8		7:19/1.0 10:56/1.0	(5.0)	(5.0)					- 4 Joints at 35 t	legrees to 45 degrees with some iron 2 joints at 80 degrees	staining
55	-	‡	5.0	6:45/1.0 7:26/1.0		(5.0) 100%					Gray with White, Fresh	GSI = 55-75 n, Very Hard METAMORPHOSED QU	JARTZ DIORITE
		1		7:28/1.0 7:27/1.0							_	ith Very Wide Fracture Spacing No natural fractures	
	51.0	30.8		7:48/1.0							51.0	GSI = 75-95 nated at Elevation 51.0 ft in Crystalline	30.8
		Ŧ									MET	AMORPHOSED QUARTZ DIORITE	
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WBS No. 37765.1.5

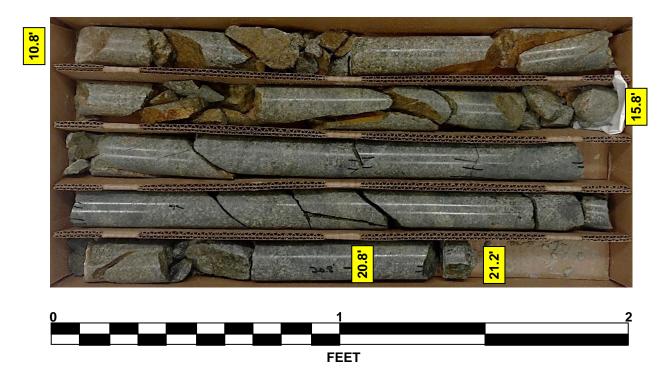
TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B1-B (-L1-, STA. 97+98, 27' RT)

Box 1: 10.8 Feet to 21.2 Feet



CORE PHOTOGRAPHS

WBS No. 37765.1.5

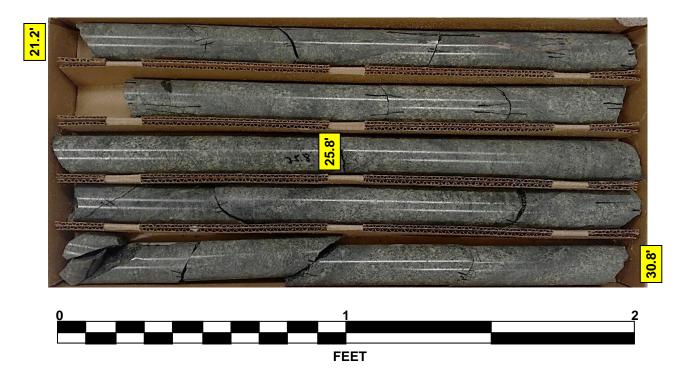
TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B1-B (-L1-, STA. 97+98, 27' RT)

Box 2: 21.2 Feet to 30.8 Feet



			BURE LUG		
/BS 37765.1.5		TIP R-3822 COL	NTY HALIFAX	GEOLOGIST Pastrana, C.R.	
ITE DESCRIPTION	Bridge on Pre	emier Boulevard Extension Ov	er Chockoyotte Creek		GROUND WTR (ft
ORING NO. B2-A		STATION 98+83	OFFSET 27 ft LT	ALIGNMENT -L1-	0 HR. N/A
OLLAR ELEV. 81.	ft	TOTAL DEPTH 32.0 ft	NORTHING 974,895	EASTING 2,401,483	24 HR. 1.9
RILL RIG/HAMMER EF	./DATE AME9	9533 CME-550X 83% 01/0//2015	DRILL METHOD H.S	5. Augers HAMMI	ER TYPE Automatic
RILLER Meatyard,	C.	START DATE 10/31/17	COMP. DATE 11/01/17	SURFACE WATER DEPTH N/	Α
EV DRIVE DEPTH	BLOW COUNT		OOT SAMP. V L	SOIL AND ROCK DESC	
5			· · · · · · · · · · · · · · · · · · ·	81.6 GROUND SURFA 2.1' Topsoil	CE (
<u> </u>				79.5 ALLUVIAL	2
78.1 <u>3.5</u>	1 WOH WO	OH 0	w	Black to Brown, Very Loos SAND, Trace Clay, Trace	
73.1 8.5	5 3 2	2		73.3 GRAVEL and COBBLES 72.1 Gray, Loose, Silty Fine to Coa Gravel, Trace Cl	with Sandsarse SAND withsay
68.6 + 13.0	0/0.0	<u> </u>		70.3 RESIDUAL 68.6 Gray and White, Moist, Med Sandy Clayey SII WEATHERED RO	LT 1
5 1				METAMORPHOSED QUAF CRYSTALLINE RO Core Loss in Moderately	RTZ DIORITE DCK Severely
				Weathered METAMORPHO DIORITE Gray with White, Slightly to Weathered, Hard to Ve	Very Slightly
<u> </u>				METAMORPHOSÉD QUART. Very Close to Close Fractu Gray with White, Very Slightly Fresh, Very Hard METAMO	Z DIORITE with ure Spacing Weathered to
				QUARTZ DIORITE with Very Spacing	Wide Fracture
0			1 1 2 2	49.6 Boring Terminated at Eleva Crystalline Rock: METAMO	ORPHOSED
				QUARTZ DIORIT	

DRING NO. B2-A STATION 98+83 OFFSET 27 ft LT ALIGNMENT -L1- 0 HR. No.										<u></u>	<u>UI</u>	KE L	UG		
CRING NO. B2-A STATION 98+83 OFFSET 27 ft LT ALIGNMENT -L1- O HR. Northing 974,895 EASTING 2,401,483 24 HR. OLIGINATION OLIGINATION OLIGI	WBS	3776	5.1.5			TIP	R-382	22	C	OUNT	Υŀ	HALIFAX	(GEOLOGIST Pastrana, C.R.	
DILLAR ELEV. 81.6 ft TOTAL DEPTH 32.0 ft NORTHING 974,895 EASTING 2,401,483 24 HR.	SITE	DESCF	RIPTION	l Bri	dge on Pr	remier	Boule	ard Exte	nsion	Over (Choo	ckoyotte	Creek		GROUND WTR (fi
RILLER Meatyard, C. START DATE 10/31/17 COMP. DATE 11/01/17 SURFACE WATER DEPTH N/A Company	BOR	ING NO	. B2-A	١		STA	TION	98+83			OF	FSET	27 ft LT	ALIGNMENT -L1-	0 HR. N//
RILLER Meatyard, C. START DATE 10/31/17 COMP. DATE 11/01/17 SURFACE WATER DEPTH N/A DRE SIZE NQ TOTAL RUN 19.0 ft RUN (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft)	COLI	LAR EL	EV . 81	1.6 ft		тот	AL DE	PTH 32	.0 ft		NC	RTHING	974,895	EASTING 2,401,483	24 HR. 1.9
No. SAMP RELEV RUN RATE RELEV RUN RATE RELEV RUN RATE RELEV RUN RATE RELEV RUN RATE RELEV RUN RATE RUN R	DRILL	RIG/HA	MMER E	FF./D	ATE AME	9533 CI	ME-5502	X 83% 01/	0//2015	i			DRILL METHOD H.S	S. Augers HAMN	MER TYPE Automatic
RUN Check	DRIL	LER N	/leatyar	d, C.		STAI	RT DA	TE 10/3	1/17		СС	MP. DA	TE 11/01/17	SURFACE WATER DEPTH N	I/A
Company Comp	COR	E SIZE	NQ			тоти	AL RU	N 19.0 f	t						
Company Comp	ELEV	RUN	DEPTH	I RUN			UN I ROD	SAMP.	STR	ATA			_	DECODIDATION AND DEMARKS	
68.6 13.0 4.0 8:01/1.0 (3.6) (2.9) (0.0)	(ft)				KAIL	(ft) %	(ft) %		(ft)	(ft) %		ELEV. (1		DESCRIPTION AND REMARKS	DEPTH (
6:09/1.0	68.6														
5.6 64.6 - 17.0		68.6	13.0	4.0	6:09/1.0	90%			(0.0) 0%			68.2	Core Loss in Mod		ORPHOSED 13
4:39/1.0 100% 100% 100% 5:04/1.0 5:04/1	65	64.6 -	17.0		7:12/1.0 5:59/1.0				(1.1)	(0.4)		1_67.1_ <i>/</i>		QUARTZ DIORITE	14
5:04/1.0 5:37/1.0 6:06/1.0 7:07/1.0 7:07/1.0 7:07/1.0 7:07/1.0 7:07/1.0 7:07/1.0 7:22/1.0 5:57/1.0 7:22/1.0 5:57/1.0 7:22/1.0 5:57/1.0 7:12/1.0 5:57/1.0 7:12/1.0 5:57/1.0 5:57/1.0 5:57/1.0 5:57/1.0 5:57/1.0 5:57/1.0 5:57/1.0 5:57/1.0 5:57/1.0 5:57/1.0 6:06/1.0 7:12/1.0			‡	5.0	8:03/1.0 4:39/1.0	(5.0)	(5.0) 100%		(17.5)	(17.5)		t	Gray with White, SI	ightly to Very Slightly Weathered, Hard	d to Very Hard
59.6 + 22.0 5:17/1.0 (5.0) (5.0) (5.0) (5.0) (5.0) (6:06/1.0 (5.0) (5.0) (6:06/1.0 (5.0) (5.0) (6:06/1.0 (5.0) (5.0) (6:06/1.0 (5.0)	00		‡		5:04/1.0				100%	100%		}		Spacing	Close Fracture
4:50/1.0 100% 100% 6:06/1.0 7:07/1.0 100% 100% Fracture Spacing METAMORPHOSED QUARTZ DIORITE with Very Wide Fracture Spacing No natural fractures GSI = 75-95	60	59.6 -	22.0	5.0	5:17/1.0		(5.0)					-		GSI = 40-60	
7:07/1.0 7:40/1.0 SSI = 75-95 5.0 4:25/1.0 100% 100% 7:22/1.0 100% 7:22/1.0 100% 7:22/1.0 100% 7:22/1.0 100% 7:22/1.0 100% 7:12			‡		4:50/1.0	100%						<u>t</u>	Gray with Whit METAMORPHOSED	te, Very Slightly Weathered to Fresh, \ QUARTZ DIORITE with Very Wide Fi	/ery Hard racture Spacing
5.0 4.25/1.0 (5.0) (5.0) 5:21/1.0 100% 100% 7:22/1.0 5:57/1.0 5:57/1.0 7:12/1.0 5:57/1.0	55	54.6 -	27.0		7:07/1.0							L		No natural fractures	3
7:22/1.0 5:57/1.0 7:12/1.0 49.6 32.0 7:12/1.0 Boring Terminated at Elevation 49.6 ft in Crystalline Rock:			1	5.0	4:25/1.0	(5.0)						<u> </u>		33. 10 00	
9 49.6 + 32.0 7:12/1.0			±		7:22/1.0		10070					ŧ			
	50	49.6 -	32.0		7:12/1.0							<u>49.6</u>	Boring Term	inated at Elevation 49.6 ft in Crystallin	a Pock:
			+									-			o record
			Ŧ									F			
		-	‡									_			
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WBS No. 37765.1.5

TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B2-A (-L1-, STA. 98+83, 27' LT)

Box 1: 13.0 Feet to 22.4 Feet





Box 2: 22.4 Feet to 30.4 Feet



CORE PHOTOGRAPHS

WBS No. 37765.1.5

TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B2-A (-L1-, STA. 98+83, 27' LT)

Box 3: 30.4 Feet to 32.0 Feet





						BC	ORE LO	JG		
WBS	37765	5.1.5			TI	P R-3822 COUNTY	HALIFAX		GEOLOGIST Pastrana, C.R.	
SITE	DESCR	IPTION	I Bric	lge on	Prem	ier Boulevard Extension Over Ch	nockoyotte C	Creek		GROUND WTR (ft)
BORI	NG NO	. B2-E	3		S ⁻	TATION 98+83	OFFSET 27	7 ft RT	ALIGNMENT -L1-	0 HR . N/A
COLL	AR ELI	EV . 8′	1.8 ft		T	OTAL DEPTH 47.0 ft	NORTHING	974,893	EASTING 2,401,537	24 HR. 2.6
DRILL	. RIG/HA	MMER E	FF./DA	TE A	ME9533	CME-550X 83% 01/0//2015	0	DRILL METHOD	.S. Augers HAMM	ER TYPE Automatic
DRIL	LER N	1eatyar	d, C.		S ^r	TART DATE 11/01/17	COMP. DATE	E 11/03/17	SURFACE WATER DEPTH N/	/A
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	O.5ft	0.5ft		BLOWS PER FOOT 0 25 50 79		SAMP. U L O MOI G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION DEPTH (fi
85		-							81.8 GROUND SURFA	ACE 0.
80	_	‡							ALLUVIAL Black to Brown, Loose, Co	
	78.3	3.5	1	1	2			w		LAY, Slightly
75		‡							Plastic, Organic C	6.4
70	73.3	8.5						000	73.8 GRAVEL and COBBLES	S with Sand8.
	70.0	1	7	11	21	· · · · · · · · · · · · · · ·		D	RESIDUAL Green and White with Red,	Hard, Clayey
70	-	‡				· · · · · · · · · · · · ·			- 70.2 Fine Sandy SIL WEATHERED RO	
	68.3	13.5	100/0.4	1					Green and White METAM	ORPHOSED
		‡	100/0				100/0.4		QUARTZ DIORI	IE
65		<u> </u>								40
	63.3	18.5	60/0.0				60/0.0		63.3 62.8 CRYSTALLINE R	
60	59.8 -	22.0							METAMORPHOSED QUAI 59.8 Mostly Core Loss in Modera	
	58.3	23.5	100/0.5	1			100/0.5		Weathered METAMORPHO DIORITE	
		‡	60/0.1				· · 60/0.1¶		56.8 WEATHERED RO	
55	_	‡							Severely Weathered METAI QUARTZ DIORI	TC
	53.8	28.0	60/0.0	1			60/0.0		53.8 CRYSTALLINE R	OCK 28
		ł							METAMORPHOSED QUAI WEATHERED RO	
50	_	Ŧ							METAMORPHOSED QUAI	
		Ŧ							 METAMORPHOSED QUAR 	RTZ DIORITE
45		‡							Mostly Core Loss in Modera Weathered METAMORPHO	
45	-	‡							DIORITE with Very Close Fr	acture Spacing
		‡							_ Tan to Gray and White, SI _ Slightly Weathered, Hard	to Very Hard
40		ŧ							_ METAMORPHOSED QUART Close to Moderately Close Fr	
		+							_	, ,
		Ŧ								
35		-							34.8	47
									Boring Terminated at Eleva Crystalline Rock: METAM QUARTZ DIORI	ORPHOSED

									<u> </u>	RE LUG			
VBS 377	65.1.5			TIP	R-382	22	C	OUNT	Υ⊢	HALIFAX	GEOLOGIST Pastrana, C.R.		
ITE DESC	CRIPTIO	N Bri	dge on Pr	emier	Boule	ard Exte	nsion	Over (Choc	koyotte Creek		GROUND WT	R (ft)
ORING N	O . B2-I	В		STA	TION	98+83			OF	FSET 27 ft RT	ALIGNMENT -L1-	0 HR.	N/A
OLLAR E	LEV. 8	1.8 ft		тот	AL DE	PTH 47	.0 ft		NO	PRTHING 974,893	EASTING 2,401,537	24 HR.	2.6
RILL RIG/H	IAMMER	EFF./D/	ATE AMES	9533 CI	ME-550	X 83% 01	/0//2015	i		DRILL METHOD H.S	S. Augers HAMN	IER TYPE Auton	natic
RILLER	Meatya	rd, C.		STA	RT DA	TE 11/0	1/17		СО	MP. DATE 11/03/17	SURFACE WATER DEPTH N	/A	
ORE SIZE	E NW			тот	AL RU	N 22.0 f	ft						
EV RUN		H RUN	DRILL	REC.	UN RQD (ft)	SAMP.	STR REC.	ATA RQD	L	Г	ACCOUNTION AND DEMARKS		
ft) ELEV	۷ _(ft)	(ft)	RATE (Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ	ELEV. (ft)	DESCRIPTION AND REMARKS	DE	PTH (ft
2.8											Begin Coring @ 19.0 ft		
62.8	I	3.0	9:32/1.0 7:53/1.0	20%	(0.0) 0%		(0.6) 20%	(0.0) 0%		_	Moderately Severely Weathered META QUARTZ DIORITE	MORPHOSED	19.0
59.8	22.0		13:43/1.0 N=100/0.3	5						59.8 - 58.3	GSI = 5-25 WEATHERED ROCK		22.0
	‡		N=60/0.0	1							hered METAMORPHOSED QUARTZ CRYSTALLINE ROCK	DIORITE	25.0
55	‡										TAMORPHOSED QUARTZ DIORITE		07.
53.8	28.0	4.0			(2.5)		(0.5)	(0.0)		54.0 53.8 52.9 ME	WEATHERED ROCK FAMORPHOSED QUARTZ DIORITE	ſ.	27.8 \ 28.0 \ 28.9
=0	‡		4:34/1.0 4:54/1.0	90%	63%		(18.1)	0% (13.9)			CRYSTALLINE ROCK FAMORPHOSED QUARTZ DIORITE		
50 49.8	32.0	5.0			(3.4)			77%		Mostly Core Loss in I	Moderately Severely Weathered META DIORITE with Very Close Fracture Spa		
	‡		6:19/1.0 7:23/1.0	100%	68%						GSI = 5-25	ŭ	
44.8	37.0		9:45/1.0 9:30/1.0							L Tan to Gray and Wh ── Hard METAMORPH	nite, Slightly to Very Slightly Weathered HOSED QUARTZ DIORITE with Close	l, Hard to Very to Moderately	
	‡	5.0	12:02/1.0	100%	(3.6) 72%						Close Fracture Spacing ty of joints at 10 degrees to 20 degrees		
40 39.8	‡		10:34/1.0 23:02/1.0							 Isolate Very close fracture s 	d fractures at 35 degrees to 45 degree pacing 31.3' to 31.6', 35.9' to 36.3', 36.	s 6' to 36.8', and	
39.8	42.0	5.0		(5.0)	(4.4)					-	41.5' to 41.7' GSI = 65-85		
	‡		19:01/1.0 18:22/1.0		88%					<u>-</u> -			
34.8	47.0		8:41/1.0 5:57/1.0							34.8	inated at Elevation 34.8 ft in Crystalline		47.
	+++++++++++++++++++++++++++++++++++++++												

WBS No. 37765.1.5

TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B2-B (-L1-, STA. 98+83, 27' RT)

Box 1: 13.0 Feet to 22.0 Feet





Box 2: 28.0 Feet to 37.0 Feet



CORE PHOTOGRAPHS

WBS No. 37765.1.5

TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B2-A (-L1-, STA. 98+83, 27' RT)

Box 3: 37.0 Feet to 45.2 Feet





Box 4: 45.2 Feet to 47.0 Feet



								D	<u>ORE L</u>	<u>UG</u>				
WBS	3776	5.1.5			TI	P R-3822		COUNT	Y HALIFAX				GEOLOGIST Pastrana, C.R.	
SITE	DESCF	RIPTIO	N Brid	dge on	Premi	er Bouleva	rd Extensi	on Over C	Chockoyotte	Creek			GROUND WTR	(ft)
BOR	ING NO	. B3- <i>A</i>	4		S	TATION 9	9+83		OFFSET 2	27 ft LT			ALIGNMENT -L1- 0 HR. N	√A
COLI	LAR EL	EV . 8	0.8 ft		т	OTAL DEP	FH 46.3 f	t	NORTHING	974,9	995		EASTING 2,401,488 24 HR .	2.1
DRILL	RIG/HA	MMER E	EFF./DA	TE A	ME9533	CME-550X	83% 01/0//2	015		DRILL I	METHO	D H	I.S. Augers HAMMER TYPE Automat	ic
DRIL	LER N	/leatyar	d, C.		S	TART DATE	= 10/18/1	7	COMP. DA	TE 10/	19/17		SURFACE WATER DEPTH N/A	
ELEV	DRIVE	DEPTH	BLO	ow co	UNT		BLOWS	PER FOOT		SAMP.	V /		SOIL AND ROCK DESCRIPTION	
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0 :	25	50	75 100	NO.	МОІ		SOIL AIND ROCK DESCRIPTION ELEV. (ft) DEPT	H (ft)
85		1												
		Ŧ												
		Ŧ											80.8 GROUND SURFACE	0.0
80	-	$\overline{\Gamma}$							1			/ //	ALLUVIAL Gray, Loose to Medium Dense, Clayey	
	77.3	3.5					: : : :	: : : :			_	/ //	Coarse to Fine SAND, Organic Odor, Some	4.0
75		Ŧ	3	30	11			: : : :			Sat.	000	Note: Blow count influenced by gravel and	
	-	Ŧ					<i>;/</i>					000	cobbles	7.6
	72.3	8.5	5	11	13		/				l M	V V	RESIDUAL Greenish Brown to Red, Very Stiff, Coarse to	
70	_	‡					24				"	,	Fine Condy Clayov CILT	11.3
	67.3	† † _{13.5}											WEATHERED ROCK White and Green METAMORPHOSED	
65	07.5	1 10.0	26	74/0.3					. 100/0.8				QUARTZ DIORITE	
_ 65	-	‡						1	+					
	62.3	18.5	100/.0.	<u></u>					100/0.2					
60	_	<u> </u>	1007.0.	1									_	
		<u> </u>												
	57.3	<u>† 23.5</u>	60/0.1						60/0.1				55.6 CRYSTALLINE ROCK	23.7 25.2
55	54.5	26.3	60/0.0						. 60/0.0				NIOSTIV Core Loss in Moderately Severely to	26.5
		Ŧ	00/0.0	Ί				: : : :					Moderately Hard METAMORPHOSED QUARTZ DIORITE with Very Close Fracture	
50		Ŧ					: : : :	: : : :					Spacing	
	-	Ŧ											Gray with Red and White, Moderately to Slightly Weathered, Moderately Hard to Hard	
		Ŧ											METAMORPHOSED QUARTZ DIORITE with Very Close to Close Fracture Spacing	34.5
45	-	‡											Greenish Gray to Gray with White, Slightly to Very Slightly Weathered, Hard to Very Hard	36.3
		‡											METAMORPHOSED QUARTZ DIORITE with Close to Moderately Close Fracture Spacing	
40		‡											Greenish Gray to Gray with White, Slightly to	
-10	-	‡							1				 Very Slightly Weathered, Hard to Very Hard METAMORPHOSED QUARTZ DIORITE with 	
		‡											Very Close to Close Fracture Spacing Greenish Gray to Gray with White and Red,	
35	_	‡											Very Slightly Weathered to Fresh, Hard to	46.3
		‡											DIORITE with Moderately Close to Wide Fracture Spacing	
		‡											Boring Terminated at Elevation 34.5 ft in	
	-	‡											Crystalline Rock: METAMORPHOSED QUARTZ DIORITE	
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SHEET 26

									<u> </u>	<u>UI</u>	KE L	UG			
NBS	37765	5.1.5			TIP	R-382	22	С	OUNT	Υŀ	HALIFAX		GEOLOGIST Pastrana, C.R.		
SITE	DESCR	IPTION	I Bric	dge on Pr	emier	Boule	ard Exte	nsion	Over (Choo	ckoyotte (Creek		GROUND W	VTR (ff
OR	NG NO	. В3-А	١.		STA	ΓΙΟΝ	99+83			OF	FSET 2	7 ft LT	ALIGNMENT -L1-	0 HR.	N/A
OLI	AR ELI	EV. 80).8 ft		тот	AL DE	PTH 46	.3 ft		NC	RTHING	974,995	EASTING 2,401,488	24 HR.	2.
RILL	RIG/HA	MMER E	FF./DA	TE AMES	9533 CN	ΛΕ-550)	X 83% 01	/0//2015	;			DRILL METHOD H.S	5. Augers HAMN	MER TYPE Auto	omatic
RIL	LER M	leatyard	d, C.		STAI	RT DA	TE 10/1	8/17		СС	MP. DAT	E 10/19/17	SURFACE WATER DEPTH N	I/A	
OR	E SIZE	NQ			TOTA	AL RU	N 22.61	ft							
LEV	RUN	DEPTH	RUN	DRILL	REC.	JN RQD	SAMP.	STR REC.	RATA	L		D	ACCOUNTION AND DEMANCE		
(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ	ELEV. (ft		ESCRIPTION AND REMARKS	[DEPTH
57.1													Begin Coring @ 23.7 ft		
55	57.1 54.5 -	23.7	2.6	2:13/0.6 9:38/1.0 10:16/1.0	(1.4) 54%	(0.3) 12%		(0.3)	(0.0)		57.1 55.6	Mostly Core Loss in M	CRYSTALLINE ROCK loderately Severely to Moderately Wea	athered, Medium	23 1 <u>7 - 2</u> 5
	04.0	20.5	5.0	4:30/1.0	(5.0) 100%	(3.7) 74%		(1.3)	(0.3)		54.3	Hard to Moderately Ha	ard METAMORPHOSED QUARTZ DIG Close Fracture Spacing	ORITE with Very	, 26
		Ŧ		6:46/1.0 8:27/1.0	100%	74%		(8.0) 100%	(6.4) 80%		-	Grav with Red and V	GSI = 15-35 White, Moderately to Slightly Weathere	ed Moderately	4
50	49.5 -	31.3	5.0	6:13/1.0 8:48/1.0 7:23/1.0	(5.0)	(2.1)		100%	80%		t		MORPHOSED QUARTZ DIORITE with Close Fracture Spacing		
		ł	3.0	7:39/1.0	100%	(3.1) 62%					£	Joints at 10 d	egrees to 30 degrees with heavy iron	staining	
1 5	44.5 -	36.3		7:25/1.0 8:34/1.0 9:27/1.0				(1.8)	(0.4)		46.3	Greenish Gray to Gra	GSI = 35-55 y with White, Slightly to Very Slightly V	Veathered, Hard	34
	44.5	30.3	5.0	10:17/1.0		(4.9)		(10.0)	(9.7)		- 44.5		AMORPHOSED QUARTZ DIORITÉ v loderately Close Fracture Spacing	vith Close to	30
		Ŧ		10:54/1.0		98%		100%	97%		-		tures from 45 degrees to 90 degrees near vertical fractures from 28.0' to 29	9.3'	
10	39.5 -	41.3	5.0	12:04/1.0 11:16/1.0		(4.0)					E	Greenish Gray to Gray	GSI = 65-85 y with White, Slightly to Very Slightly V	Neathered Hard	4
		Ŧ	5.0	9:16/1.0 9:02/1.0	(5.0) 100%	(4.8) 96%					E	to Very Hard METAN	MORPHOSED QUARTZ DIORITE with Close Fracture Spacing	1 Very Close to	
35	34.5 -	46.3		8:46/1.0 11:38/1.0 9:54/1.0							34.5	Joi	ints from 30 degrees to 60 degrees		40
	34.5	40.3		9.54/1.0							- 34.5	Greenish Gray to G	GSI = 45-65 Fray with White and Red, Very Slightly	Weathered to	
		Ŧ									E	Mode	y Hard METAMORHOSED QUARTZ I rately Close to Wide Fracture Spacing		
	-	[E	Jo	oints at 10 degrees to 20 degrees GSI = 75-95		
		Ŧ									E		nated at Elevation 34.5 ft in Crystalling AMORPHOSED QUARTZ DIORITE	e Rock:	_
	_	Ł									L		7 41101 4110025 407 4 112 5101 412		
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WBS No. 37765.1.5

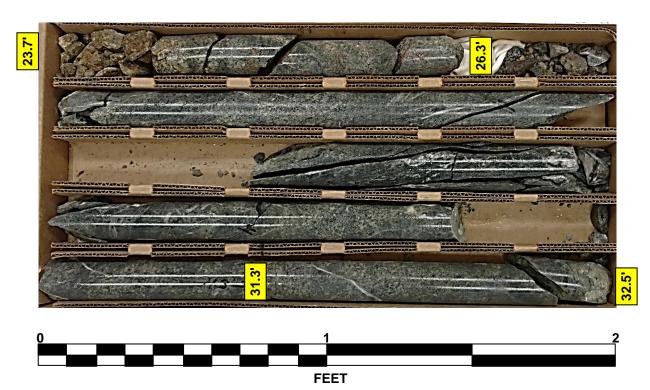
TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B3-A (-L1-, STA. 99+83, 27' LT)

Box 1: 23.7 Feet to 32.5 Feet



Box 2: 32.5 Feet to 41.3 Feet



CORE PHOTOGRAPHS

WBS No. 37765.1.5

TIP No. R-3822

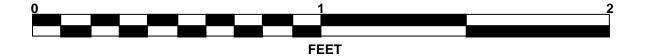
Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B3-A (-L1-, STA. 99+83, 27' LT)

Box 3: 41.3 Feet to 46.3 Feet





										UKI					1		
WBS	37765	5.1.5			TI	P R-3	822		COUNT	Y HAI	LIFAX				GEOLOGIST Pastrana, C.R.		
SITE	DESCR	IPTION	I Bric	lge on	Premi	er Bou	levard	d Extensi	on Over (Chocko	yotte (Creek				GROUN	D WTR (ft)
BOR	ING NO.	. B3-B	3		S	TATION	l 99	+83		OFFS	ET 2	7 ft RT			ALIGNMENT -L1-	0 HR.	N/A
COLI	LAR ELE	EV . 81	1.0 ft		TO	OTAL D	EPTH	- 51.4 f	t	NORT	THING	974,9	92		EASTING 2,401,542	24 HR.	3.4
DRILL	RIG/HAI	MMER E	FF./DA	TE AI	<u> </u>	CME-5	50X 83	3% 01/0//2	2015					D H.S	<u> </u>	J MER TYPE	Automatic
	LER M							10/19/1		COME		E 10/			SURFACE WATER DEPTH N		
	DDI\/E		T	DW CO			/AIL		PER FOOT	L	· DAI	SAMP.	20/1/	1 L T	SORI ACE WATER DEFITE		
ELEV (ft)	ELEV (ft)	DEPTH (ft)	0.5ft		0.5ft	0	25		50	75 	100	NO.	MOI	O G	SOIL AND ROCK DES	CRIPTION	DEPTH (ft)
85	_																
80	- -													-	81.0 GROUND SURF	ACE	0.0
	-	‡							1				_	**	Tan to Gray, Loose to Me		
	77.5	3.5	4	5	5								W	\sim	Clayey Coarse to Fine SAN	D, Some Gr	avel
75	- -	t				. 🤻	iō .				• •		**		75.1		5.9
		<u> </u>					`\.			.				000	GRAVEL and COBBLES	S with SANE)
	72.5	8.5	6	12	15		::`\	27					M		72.0 RESIDUAL		9.0
70	_	‡					• • •	Γ [÷] ′···		<u> </u>					Greenish Brown with Red, V	ery Stiff, Cl	
	67.5 ⁻	13.5					::	' <u></u>	+					777	68.9 Coarse to Fine San WEATHERED R		12.1
	- 07.5	13.3	16	42	58/0.4		: :				1				Greenish Gray METAMO QUARTZ DIOR	ORPHOSE	
65	_	F							ļ	10	00/0.9				QUARTZ DIOR	111 =	
	62.5	18.5					: :										
00	-	<u> </u>	54	46/0.2			: :			10	00/0.7						
60	_	t				 			 	$+ \cdots$					-		
	57.5	23.5	- 00	40/0.0						.							
55	_	Ī	60	40/0.3						. 10	00/0.8						
- 00	_	‡							1						-		
	52.5	28.5	100/0.5	1			: :										
50	-	+		1							00/0.5						
] -	F							1						•		
	47.5	33.5	60/0.1	-			: :				 60/0.1				47.5 CRYSTALLINE F	ROCK	33.5
45	-	‡								· · · ·	\vdots				METAMORPHOSED QUA	RTZ DIORI	TE
	40.5	20.5					: :			.	::				42.5		38.5
	42.5	30.5	60/0.0								50/0.0 °				Brown wtih Gray, Moderate		to to
40	_	F							ļ						Moderately Weathered, M Moderately Hard METAM		
	-	‡					: :								QUARTZ DIORITE with Ver Fracture Spaci		close43.4
25	-	‡					: :				::				Greenish Gray to Gray with	White, Sligh	tly to
35	-	t				 			· · · · ·	+					Very Slightly Weather METAMORPHOSED QUAR	red, Hard TZ DIORITE	with
	-	ł				• •					::				Close to Moderately Close F	racture Spa	cing
30	_	F					: :								00.0		54.4
- 55	-	-							1			1		<i>F.</i> 2	-29.6 Boring Terminated at Elev	ation 29.6 fl	51.4 i in
	_	‡													Crystalline Rock: METAN QUARTZ DIOR	IORPHOSE	:D
	_	Ł												Ŀ	_		
	_	F												F			
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WBS	3776	5.1.5			TIP	R-382	22	C	OUNT	Υŀ	IALIFAX	GEOLOGIST Pastran	a, C.R.	
SITE	DESC	RIPTION	Brid	ge on Pr	emier	Boule	ard Exte	nsion	Over (Choo	koyotte Creek			GROUND WTR (ft)
BOR	ING NO). B3-B	3		STA	TION	99+83			OF	FSET 27 ft RT	ALIGNMENT -L1-		0 HR. N/A
COL	LAR EL	. EV . 81	1.0 ft		тот	AL DE	PTH 51.	.4 ft		NC	RTHING 974,992	EASTING 2,401,542		24 HR. 3.4
DRILL	L RIG/HA	MMER E	FF./DA	TE AMES	533 CI	ME-550	X 83% 01/	0//2015			DRILL METHOD H.S	. Augers	HAMM	ER TYPE Automatic
DRIL	LER N	Meatyard	d, C.		STAI	RT DA	TE 10/1	9/17		СС	MP. DATE 10/20/17	SURFACE WATER DE	PTH N/	A
	E SIZE		•				N 12.9 f							
ELEV	RUN	DEPTH	RUN	DRILL	RI	UN	SAMP.	STR	ATA	L				
(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft)	RQD (ft) %	NO.	REC. (ft)	RQD (ft) %	O G	D ELEV. (ft)	ESCRIPTION AND REMARK	K S	DEPTH (ft)
42.5	(-7			· · · · · ·	/0	70		/0	70		LLL V. (II)	Begin Coring @ 38.5 ft		DEI TIT(II)
	42.5	38.5	2.9	9:52/0.9	(2.0)	(0.6)		(4.0)	(0.6)			derately Severely to Moderat	ely Weath	
40	39.6 -	41.4	F 0	11:22/1.0 7:34/1.0	69%	21%		82%	12%			ord METAMORPHOSED QU Close to Close Fracture Space	cing	•
		Ŧ	5.0	13:09/1.0 12:55/1.0	100%	(2.1) 42%		(0.0)	(0.0)			es from 0 degrees to 90 degrees loss scattered througouts		on staining
35	04.0	‡		15:36/1.0 10:12/1.0				(8.0) 100%	(6.3) 79%		Greenish Gray to Gray	GSI = 15-35 with White, Slightly to Very	Slightly W	eathered Hard
	34.6 -	+ 46.4 +	5.0	13:49/1.0 4:55/1.0		(4.2)					METAMORPHOSED	QUARTZ DIORITE with Clo	ose to Mod	lerately Close
		‡		5:54/1.0 6:04/1.0	100%	84%						Fracture Spacing m 0 degrees to 90 degrees v		
30	29.6 -	51.4		7:21/1.0 8:31/1.0							Very close fra −29.6	cture spacing 47.9' to 48.1' a GSI = 65-85	and 50.3' t	o 50.7' 51.4
		‡										nated at Elevation 29.6 ft in (AMORPHOSED QUARTZ D		Rock:
		<u> </u>									-	, anota rioceb go, atteb	TOTATE	
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WBS No. 37765.1.5

TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B3-B (-L1-, STA. 99+83, 27' RT)

Box 1: 38.5 Feet to 46.4 Feet



FEET



CORE PHOTOGRAPHS

WBS No. 37765.1.5

TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B3-B (-L1-, STA. 99+83, 27' RT)

Box 2: 46.4 Feet to 51.4 Feet





						BUF	RE LOG		
WBS	37765	5.1.5			TII	R-3822 COUNTY H	ALIFAX	GEOLOGIST Pastrana, C.R.	
SITE	DESCR	IPTION	Brid	ge on	Premi	oulevard Extension Over Choo	koyotte Creek		GROUND WTR (ft)
BOR	NG NO.	. B4-A			ST	ON 100+53 OF	FSET 27 ft LT	ALIGNMENT -L1-	0 HR. N/A
COLI	AR ELE	EV . 82	.6 ft		тс	L DEPTH 46.4 ft NO	RTHING 975,065	EASTING 2,401,491	24 HR. 1.4
DRILL	RIG/HAI	MMER E	FF./DA	TE A	ME9533	E-550X 83% 01/0//2015	DRILL METHOD H.S.	. Augers HAMME	R TYPE Automatic
DRIL	LER M	leatyard	l, C.		ST	T DATE 10/17/17 CO	MP. DATE 10/18/17	SURFACE WATER DEPTH N//	A
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0.5ft	UNT 0.5ft	BLOWS PER FOOT 25 50 75	100 SAMP. V L O MOI G I	SOIL AND ROCK DESC	RIPTION DEPTH (ft)
85	-	<u></u>						82.6 GROUND SURFA	.CE 0.0
80	79.1	3.5	3	6	5	1	· · · · · · · · · · · · · · · · · · ·	ALLUVIAL Black, Fine Sandy CLAY, Hi Slightly Plastic	ghly Organic,
75	74.1	8.5				• 11 · · · · · · · · · · · · · · · · · ·	Sat. Sat.	Gray, Medium Dense, Clayey 76.6 SAND, Trace Orga GRAVEL and COBE	nics
70	- - - 69.1	13.5	25	40	49			71.1 RESIDUAL Greenish Brown to Red, Very	
65	-		26	63	37/0.2		100/0.7	Fine Sandy Clayey WEATHERED RO Greenish Gray with METAMORPHOSED QUAR	SILT ICK Red 17.4
60	64.1 - - 60.2	18.5	21	38	26			RESIDUAL Brown and White, Very Dens to Fine SAND 60.2 WEATHERED RO	e, Silty Coarse
55	- - - - - - - - - - -	-	60/0.0					White and Green METAMC QUARZ DIORIT CRYSTALLINE RC Greenish Gray to Gray with W Very Slightly Weathered, Har METAMORPHOSED QUARTZ Close to Moderately Close Fra	DRPHOSED E DCK // hite, Slightly to d to Very Hard Z DIORITE with
45								Greenish Gray to Gray with V Slightly to Very Slightly Weatl Very Hard METAMORPHOS DIORITE with Moderately C Fracture Spacin	hered, Hard to SED QUARTZ close to Wide g
								Boring Terminated at Elevar Crystalline Rock: METAMO QUARTZ DIORIT	DRPHOSED

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SHEET 32

										<u> </u>	KE LUG		
WBS	3776	5.1.5			TIP	R-382	22	C	OUNT	Υŀ	ALIFAX	GEOLOGIST Pastrana, C.R.	
SITE	DESC	RIPTION	l Brid	lge on Pr	emier I	Boulev	ard Exte	nsion	Over (Choc	koyotte Creek		GROUND WTR (fi
BOR	ING NO) . B4-A			STAT	ΓΙΟΝ	100+53			OF	FSET 27 ft LT	ALIGNMENT -L1-	0 HR. N/A
OLI	LAR EI	. EV . 82	2.6 ft		TOT	AL DEI	PTH 46	.4 ft		NO	RTHING 975,065	EASTING 2,401,491	24 HR. 1.4
RILL	RIG/H	AMMER E	FF./DA	TE AMES	533 CN	ΛΕ-550)	K 83% 01.	/0//2015		•	DRILL METHOD H.S	S. Augers HAMN	IER TYPE Automatic
RIL	LER	Meatyard	d, C.		STAF	RT DA	TE 10/1	7/17		СО	MP. DATE 10/18/17	SURFACE WATER DEPTH N	/A
OR	E SIZE	NQ			TOTA	AL RUI	N 24.01	ft					
LEV	RUN ELEV	DEPTH	RUN	DRILL RATE	REC.	JN RQD	SAMP.	STR REC.	ATA RQD	L	Г	DESCRIPTION AND REMARKS	
(ft)	(ft)	(ft)	(ft)	(Min/ft)	REC. (ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ	ELEV. (ft)	PEOORII FIOIA / WAD INCIM/ WINCO	DEPTH (
<u>902</u>	60.2	22.4	4.0	0.50/4.0	(4.0)	(2.0)		(14.0)	(44.4)		60.2	Begin Coring @ 22.4 ft CRYSTALLINE ROCK	22
	00.2	‡	4.0	2:53/1.0 7:55/1.0 5:18/1.0	(4.0) 100%	(3.0) 75%		(14.9) 99%	(11.1) 74%		Greenish Gray to Gra	y with White, Slightly to Very Slightly V	Veathered, Hard
	56.2	26.4	5.0	6:55/1.0 9:26/1.0	(4.0)	(3.5)						TAMORPHOSED QUARTZ DIORITÉ v Moderately Close Fracture Spacing	
55		‡	3.0	8:44/1.0 6:43/1.0	(4.9) 98%	(3.5) 70%					2 ioints	ts at 0 degrees to 10 degrees with irons at 70 degrees with heavy iron staining	n
	51.2	31.4		8:26/1.0 10:07/1.0							-	pacing 23.9' to 24.4', 27.7' to 27.9', 28 31.5' to 31.8'	
50	01.2	+ "	5.0	6:42/1.0 6:10/1.0	(5.0) 100%	(3.7) 74%					- Sever	ral partially healed high angle fractures GSI = 65-85	
		‡		7:42/1.0 7:45/1.0	100%	7470					• •		
1 5	46.2	36.4	5.0	8:10/1.0 5:41/1.0	(5.0)	(4.9)					- 45.2		37
.5		‡	3.0	7:57/1.0 10:05/1.0	100%	98%		(9.0) 100%	(9.0) 100%		Greenish Gray to	Gray with White and Red, Slightly to Very Hard METAMORPHOSED QUART	/ery Slightly
	41.2	† + 41.4		11:01/1.0 11:07/1.0				100 %	100 /6		Mode	rately Close to Wide Fracture Spacing oint at 30 degrees with iron staining	
0		‡	5.0	8:26/1.0 10:08/1.0	(5.0)	(5.0) 100%					Sever	ral partially healed high angle fractures GSI = 75-95	
		‡		9:46/1.0 9:22/1.0	10070	10070					- -	GGI = 70-90	
	36.2	<u> </u>		9:37/1.0							36.2 Boring Term	inated at Elevation 36.2 ft in Crystalline	e Rock

WBS No. 37765.1.5

TIP No. R-3822

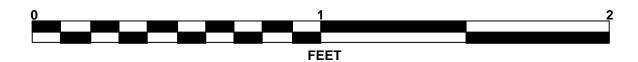
Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

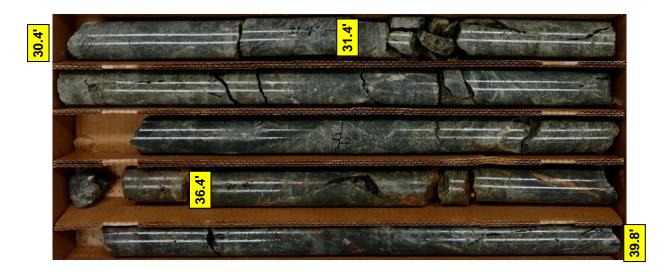
B4-A (-L1-, STA. 100+53, 27' LT)

Box 1: 22.4 Feet to 30.44 Feet





Box 2: 30.4 Feet to 39.8 Feet



CORE PHOTOGRAPHS

WBS No. 37765.1.5

TIP No. R-3822

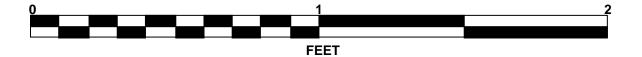
Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B4-A (-L1-, STA. 100+53, 27' LT)

Box 3: 39.8 Feet to 46.4 Feet





											KE L				1	
WBS	37765	5.1.5			TI	P R-38	22		COUNT	Y H	ALIFAX	(GEOLOGIST Pastrana, C.R.	
SITE	DESCR	IPTION	Bric	dge on	Prem	ier Boule	vard	Extensi	on Over	Chock	coyotte	Creek				GROUND WTR (f
BORI	NG NO.	B4-B	3		S.	TATION	100	+53		OFF	SET 2	27 ft RT			ALIGNMENT -L1-	0 HR. N//
	AR ELE				_	OTAL DE				_		975,0	62			24 HR. 1.
										NOF	THING					
DRILL	RIG/HAI	MMER E	FF./DA	TE A	ME9533	CME-550	X 83°	% 01/0//2	015			DRILL N	METHO	D H.S	5. Augers HAMME	R TYPE Automatic
DRIL	LER M	leatyard	d, C.		S	TART DA	ATE	10/23/1	7	CON	MP. DA	TE 10/2	23/17		SURFACE WATER DEPTH N/	A
ELEV	DRIVE	DEPTH	BLC	ow co	UNT			BLOWS F	PER FOOT	Γ		SAMP.	V /	1 L		DIDTION
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	o	25	Ę	50	75	100	NO.	МОІ	O G	SOIL AND ROCK DESC ELEV. (ft)	RIPTION DEPTH
	(1-7)									_		1	<u> </u>			DEI III
85		-												-	83.6 GROUND SURFA	OF .
	_	<u> </u>				 	.			. .				==	83.6 GROUND SURFA ALLUVIAL	CE (
	-	t				: : :				: :			┢┻		Brown to Black to Gray, Soft,	Silty Coarse to
80	80.1	3.5	2	2	1		-+			4			Cat	=	Fine Sandy CLAY, Little to Organic, Slightly Pla	astic
	_	ţ	-	-		 				: :	: : :		Sat.	〓	Note: Gravel/Cobbles encoun	tered around 8'
	-	}				• • •				. .				\blacksquare	75.6	ć
75	75.1	8.5	5	5	9	'=:-;				<u>. </u>			١.,		75.6 RESIDUAL	
	-	ţ	"		"	::•	14		: : : :	: :	: : :		M	# t	Greenish Brown to Red, Stiff, Coarse Sandy SII	Clayey Fine to
	-	+								. .				III F	71.0	∟ı 12
70	70.1	13.5	34	66/0.2		l									WEATHERED RO	СК
	-	}	34	66/0.2			-			. .	100/0.7	1			Greenish Gray METAMOR QUARTZ DIORIT	
	-	Ī				:::				: :	: : :				QUAINIZ DIONII	_
65	65.1	18.5		<u> </u>	05.5					<u>: :</u>	· · · ·					
	-	+	26	31	69/0.4		. [. .	100/0.9					
	_	‡								. .						
60	60.1	23.5					.			. .						
	_		100/0.3	3			-			. .	100/0.3	<u>'</u>				
	_	t				:::				: :	: : :					
55	55.1 ⁻	28.5					.			. .						
			31	34	66/0.4	1						,				
	_	t				::::					100/0.9					
50	50.1	33.5					.			. .	111					
- 50	30.1	_ 55.5	100/0.4	4						. .	100/0.4	•				
	-	+					.			. .	: : : [
45	45.1	38.5								. :	: : :				45.1	38
45	45.1	30.5	60/0.1			l 			<u> </u>	+:	60/0.1) 			CRYSTALLINE RO	OCK
	-	-								. .					METAMORPHOSED QUAR	
40	41.5	42.1	60/0.0								.60/0.0	•			41.5 Greenish Gray to Gray with W	hite Slightly to
40	_	-				 	-+		<u> </u>	+					Very Slightly Weathere	d, Hard
	-	-				::::	.		: : : :	. :					METAMORPHÖSED QUARTZ 37.2 Close Fracture Spa	
	-	ţ .				:::				: :	: : :				Greenish Gray to Gray w	ith White,
35	-	+				 	+			+					Moderately to Slightly Weat METAMORPHOSED QUARTZ	nered, Hard Z DIORITE with
	-	F				:::	:		: : : :	. :					Very Close to Close Fractu	ire Spacing
,						 			L			1			Boring Terminated at Elevat	
	-	-												F	Crystalline Rock: METAMO QUARTZ DIORIT	ORPHOSED
	-	ļ .													QUARTE DIOIRI	_
	-	+												 		
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WBS	3776	5.1.5			TIP	R-382	22	C	OUNT	ΥΙ	HALIFAX			GEOLOGI	ST Pastran	a, C.R.		
SITE	DESCF	RIPTION	I Brid	lge on Pr	emier	Boule	ard Exte	nsion	Over (Cho	ckoyotte (Creek					GROUN	ID WTR (ft)
BOR	ING NO	. B4-B	3		STA	TION	100+53			OF	FFSET 2	7 ft RT		ALIGNME	NT -L1-		0 HR.	N/A
COLI	LAR EL	EV . 83	3.6 ft		тот	AL DE	PTH 51	.6 ft		NC	ORTHING	975,062		EASTING	2,401,545		24 HR.	1.5
DRILL	RIG/HA	MMER E	FF./DA	TE AMES	533 CI	ME-550	X 83% 01/	0//2015				DRILL METHO	D H.S.	Augers		HAMM	ER TYPE	Automatic
DRIL	LER N	/leatyar	d, C.		STA	RT DA	TE 10/2	3/17		CC	OMP. DAT	E 10/23/17		SURFACE	WATER DE	PTH N/	A	
COR	E SIZE	NQ			тот	AL RU	N 9.5 ft											
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	UN RQD (ft) %	SAMP. NO.	STR REC. (ft)	ATA RQD (ft) %	L O G	ELEV. (ft)		DI	ESCRIPTION	I AND REMAR	K S		DEPTH (ft
41.5 40		+ 42.1	5.0	7:07/1.0	(4.2)	(2.5)		(3.5)	(2.5)		41.5		∕ to Grav	Begin Cori	ing @ 42.1 ft Slightly to Very	Sliahtly W	eathered.	
40	20.5	† † 		8:45/1.0 11:30/1.0 12:10/1.0	84%	50%		81%	58%		37.2	METAMOR	RPHOSE Ja	D QUARTZ I bints at 30 de core loss occ	DIORITE with C grees to 45 deg ured at the star	lose Fract grees	ure Spacir	
35	36.5	+ 47.1 - -	4.5	9:59/1.0 6:14/1.0 7:59/1.0	(3.3) 73%	(0.0)		(4.0) 77%	(0.0) 0%			Greenish Gra METAMORPH	y to Gra	y with White,	Moderately to S ORITE with Very	Slightly We	eathered, I	
	32.0	T 51.6		10:57/1.0 5:58/1.0							32.0			S	pacing gh angle fractur			51.6
	-	-		<u>5:17/0.5</u>							_			Ver re loss scatte	y broken red throughout = 25-45			
		£									E	Borin		nated at Eleva	ation 32.0 ft in (ED QUARTZ D		Rock:	
	-	+ + + + + + + + + + + + + + + + + + +																
	-										-							
	-										-							
	-	‡ ‡									- - - - - - -							

WBS No. 37765.1.5

TIP No. R-3822

Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

B4-B (-L1-, STA. 100+53, 27' RT)

Box 1: 41.5 Feet to 51.6 Feet



FEET

COLLAR ELEV. 86.2 ft			ORE LUG						-	1						
BORNING NO. EBZ-A STATION 101+22 OFFSET 2E LT ALIGNMENT 1-1-1 DR. 4.8													GEOLOGIS	T Pastrana, C		
COLLAR ELEV. 85.2 TOTAL DEPTH \$5.2 SOLTAN DEPTH \$5.2 DRILL ROMANIES EFFORT ALEXS DIFFERENCES OF \$5.5 SOLTAN DEPTH \$5.2 DRILL ROMANIES EFFORT ALEXS DIFFERENCES OF \$5.5 SOLTAN DEPTH \$5.2 DRILL ROMANIES EFFORT ALEXS DIFFERENCES OF \$5.5 SOLTAN DEPTH \$5.2 DRILL ROMANIES EFFORT ALEXS DIFFERENCES OF \$5.5 SOLTAN DEPTH \$5.2 DRILL ROMANIES EFFORT ALEXS DIFFERENCES OF \$5.5 DRILL ROMANIES EFFORT ALEXS DIFFERENCES DIFFERENCES DIFFERENCES DIFFERENCES DIFFERENCES DIFFERENCES DIFFE				1	` '											•
DRILLER Modifyand, C. START DATE 01/71/7 COMP, DATE 60/71/77 SURFACE WATER DEPTH NA.																
DRULER Methyert, C. START DATE 101/17/7 COMP. DATE 101/17/7 SUPFACE WATER DEPTH. N/A ELD) SPACE DEPTH SON COUNT SUPFACE WATER DEPTH N/A ELD) SPACE DEPTH SON COUNT SUPFACE WATER DEPTH N/A ELD) SPACE DEPTH SON COUNT SUPFACE WATER DEPTH N/A ELD) SPACE DEPTH SON COUNT SUPFACE WATER DEPTH N/A ELD) SPACE DEPTH SON COUNT SUPFACE WATER DEPTH N/A ELD) SPACE DEPTH SON COUNT SUPFACE WATER DEPTH N/A ELD) SPACE DEPTH SON COUNT SUPFACE WATER DEPTH N/A ELD) SPACE DEPTH SON COUNT SUPFACE WATER DEPTH N/A ELD) SPACE WATER DEPTH N/A ELD)			 													2
Companies Comp	DRILL RIG/HAMMER EFF./DATE AME9533	33 CME-550X 83% 01/0//2015	DRILL METH	IOD H.S. Augers HAMMER TYP	PE Automatic	DRILL RIG/	HAMMER EI	F./DATE AN	ME9533 C	ME-550X 83% 01/0//201	5	DRILL METHOD	H.S. Augers	Н	AMMER TYPE	Automatio
SOLIAND ROCK DESCRIPTION 100 1		START DATE 10/17/17						, C.	STA	RT DATE 10/17/17	COMP.	DATE 10/17/17	SURFACE	WATER DEPTH	I N/A	
	BORING NO. EB2-A COLLAR ELEV. 86.2 ft DRILL RIG/HAMMER EFF./DATE AME9533 DRILLER Meatyard, C. S ELEV (ft) DEPTH (ft) 0.5ft 0.5ft 0.5ft 0.5ft 7.7.7 = 8.5 72.7 = 13.5 70 67.7 = 18.5 66.4 = 19.8 46 54/0.4	STATION 101+23 FOTAL DEPTH 19.8 ft 33 CME-550X 83% 01/0//2015 START DATE 10/17/17 BLOWS PER FOO 25 50	OFFSET 32 ft LT NORTHING 975,135 DRILL METH COMP. DATE 10/17/17 T 75 100 NO. M NO. M VA 100/0.9	ALIGNMENT -L1- EASTING 2,401,489 10D H.S. Augers TO SURFACE WATER DEPTH N/A SOIL AND ROCK DESCRIPTION Balack and Gray, Soft to Medium Stift CLAY with Gravel, Highly Organic, Solution Plastic, Trace Sand RESIDUAL Orange Brown to Gray, Stiff to Very, Coarse to Fine Sandy Sity CLAY, Solution Plastic, Trace Sand Torange Brown to Gray, Stiff to Very, Coarse to Fine Sandy Sity CLAY, Solution Plastic Tolanda Boring Terminated with Standar Penetration Test Refusal at Elevation on Crystalline Rook: METAMORPHG	R. 4.8 R. 1.6 PE Automatic ON DEPTH (ft) O.0 ff, Silty Slightly 3.0 y Stiff, Slightly 14.0 Quartz 19.8 ard n 66.4 ft	BORING I COLLAR I DRILL RIG/ DRILLER ELEV (ft) 90 85 80 75 70 65 60 58.	MO. EB2-I ELEV. 87 //HAMMER EI Meatyard VE EV I DEPTH (ft)	3 ft F./DATE AM , C. BLOW COU 0.5ft 0.5ft 56 44/0.2	STA TOT ME9533 C STA UNT 0.5ft	TION 101+23 AL DEPTH 31.2 ft ME-550X 83% 01/0//201: RT DATE 10/17/17 BLOWS PEI 25 50	OFFSET	DRILL METHOD DATE 10/17/17 SAMP. NO. MOI	EASTING H.S. Augers SURFACE 87.3 88.4.3 Foral Foral Galaxia Black To Fi Coran To Fi Coran Foral	GROUND S GROUND S ALLUV A to Gray, Soft to M ine Sandy Silty CL Slightly F RESID ange Brown, Medium Coarse to Fi Fragments and F WEATHERE TAMORPHOSED Boring Terminated tration Test Refuse Crystalline Rock: M Costant Service Boring Terminated Test Refuse Crystalline Rock: M	O HR. 24 HR. AMMER TYPE I N/A DESCRIPTION URFACE //AL dedium Stiff, Ct AY, Highly Orga Plastic UAL m Stiff, Silty CL Plastic I Dense, Clayey ne SAND ine to Coarse S ED ROCK QUARTZ DIOR d with Standard at Elevation 5 HETAMORPHO	Automatic Automatic Automatic AAY, y Silty SAND 2 RITE 3 66.1 ft

									ORE L								
	3776					P R-3822			/ HALIFAX				GEOLOGI	ST Pastran	a, C.R.		
SITE	DESCF	RIPTION	I Brid	dge on	Premi	ier Boulevard	l Extensio	n Over C	Chockoyotte	Creek						GROUN	ND WTR (ft)
BOR	ING NO	. EB2-	-B		S	TATION 10	1+23		OFFSET	32 ft RT			ALIGNME	NT -L1-		0 HR.	4.0
COL	LAR EL	EV . 87	7.1 ft		TO	OTAL DEPTH	4 38.7 ft		NORTHING	975,1	32		EASTING	2,401,553		24 HR.	1.1
DRILI	RIG/HA	MMER E	FF./DA	TE A	ME9533	CME-550X 83	3% 01/0//20	15		DRILL N	NETHO) H.S	S. Augers		HAMM	ER TYPE	Automatic
DRIL	LER N	1eatyar	d, C.		S	TART DATE	10/16/17	,	COMP. DA	TE 10/	16/17		SURFACE	WATER DE	PTH N	'A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	O.5ft	0.5ft		0 25	BLOWS PI		75 100	SAMP. NO.	MOI	L O G	ELEV. (ft)	SOIL AND RO	OCK DESC	CRIPTION	DEPTH (ft
90		<u></u>										-	-	CDOUN		NOT.	۰
		\vdash										****	87.1 85.6		ND SURFA 5' Topsoil	ACE	0.0
85	-	+ , ,											-		SIDUAL	www. Madie	
	83.6	+ 3.5 +	3	7	10		: : : :				М	:::. <u>F</u>	Den	orange Brown to se to Dense, Si	ilty Coarse	e to Fine S	AND,
80		Ŧ												Little Ro	ock Fragm	ents	
	78.6	8.5			ļ.,.								-				
		‡	10	16	14		30				W						
75	_	‡					1:::						-74.6				12.
	73.6	13.5	10	13	19		1				М		Re	d to Greenish E	Brown, Har	rd, Fine Sa	andy
		ŧ									IVI			O.C.	iyoy ole i		
70	68.6	18.5				l 			 			<u> </u>	-				
	00.0	10.5	13	27	50				● 77 · · ·		D	 					
65		Ŧ										<u>.</u>					
	63.6	23.5			50/0.4				<u></u>			7//	64.2	WEATH	IERED RO	ОСК	22
		‡	26	50	50/0.4				100/0.9	•			C	Greenish Brown		ORPHOSE	D
60	_	‡											_	QUAN	IZ DIONI	16	
	58.6	28.5	100/0.3	3					100/0.3	,							
		ŧ				: : : :											
55	-	+											-				
	53.6	33.5	100/0.2	2					- 100/0.2	'							
50		Ŧ															
	48.6	38.5	100/0						<u>.</u>				48.4				38.
			100/0.2						100/0.2					oring Terminate feathered Rock QUAR		IORPHOS	
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