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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.

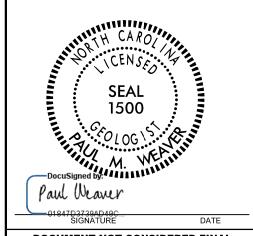
CHECKED BY \_\_P.M. WEAVER

SUBMITTED BY ESP Associates, P.A.

DATE <u>JANUARY</u> 2018



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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 A-6 A-7 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 GADES 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 <sup>2</sup> )	₩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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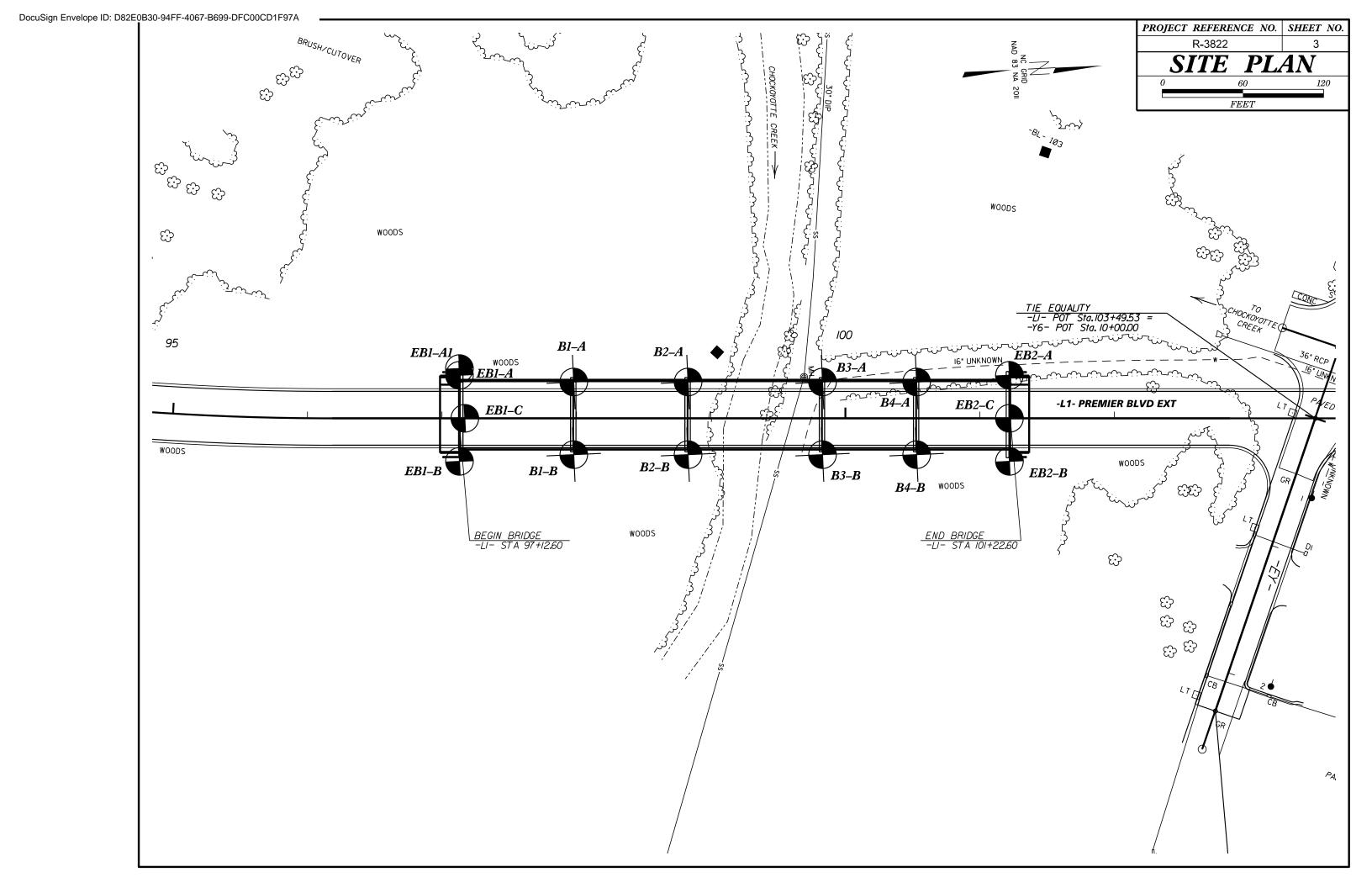
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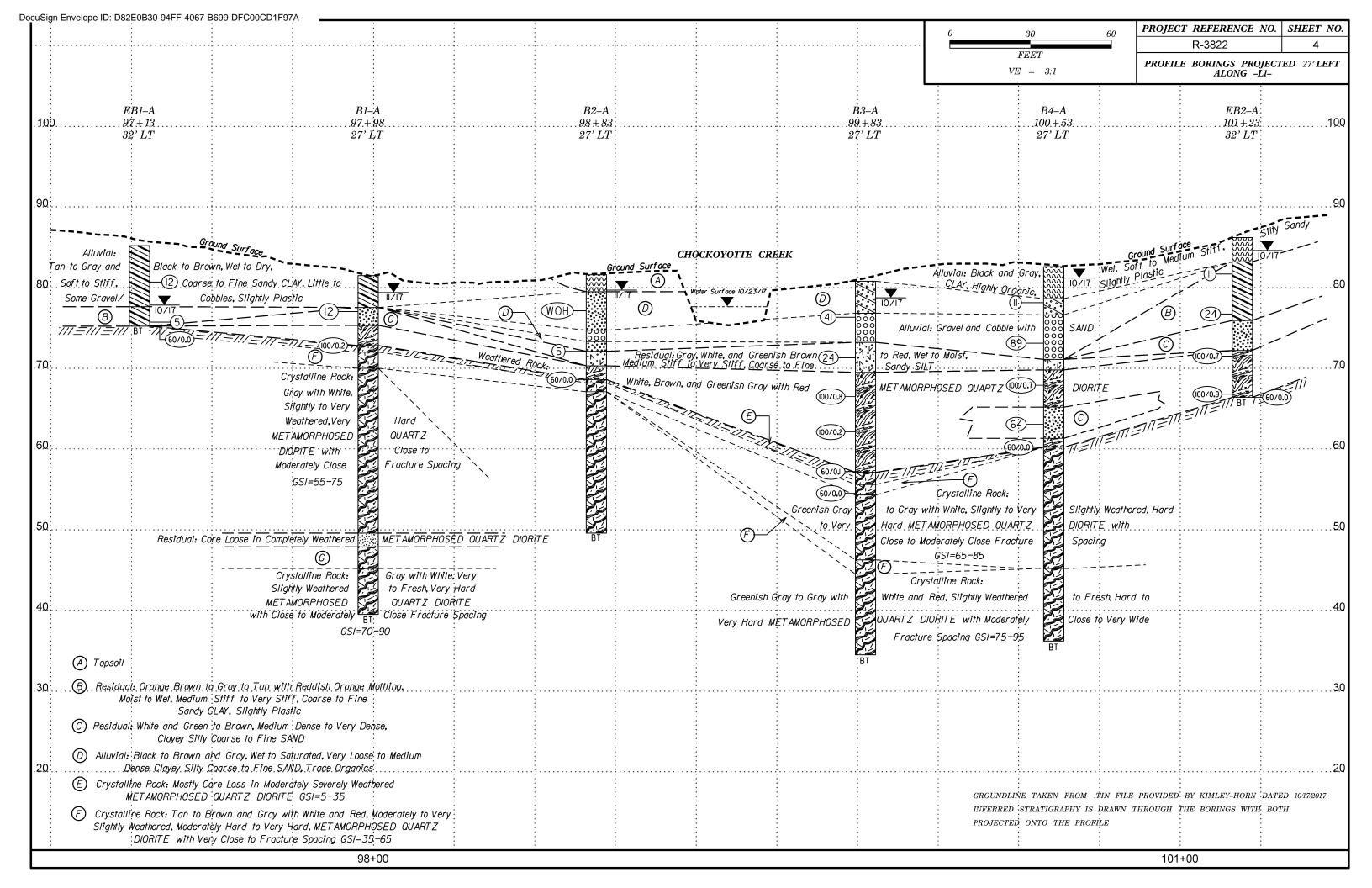
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

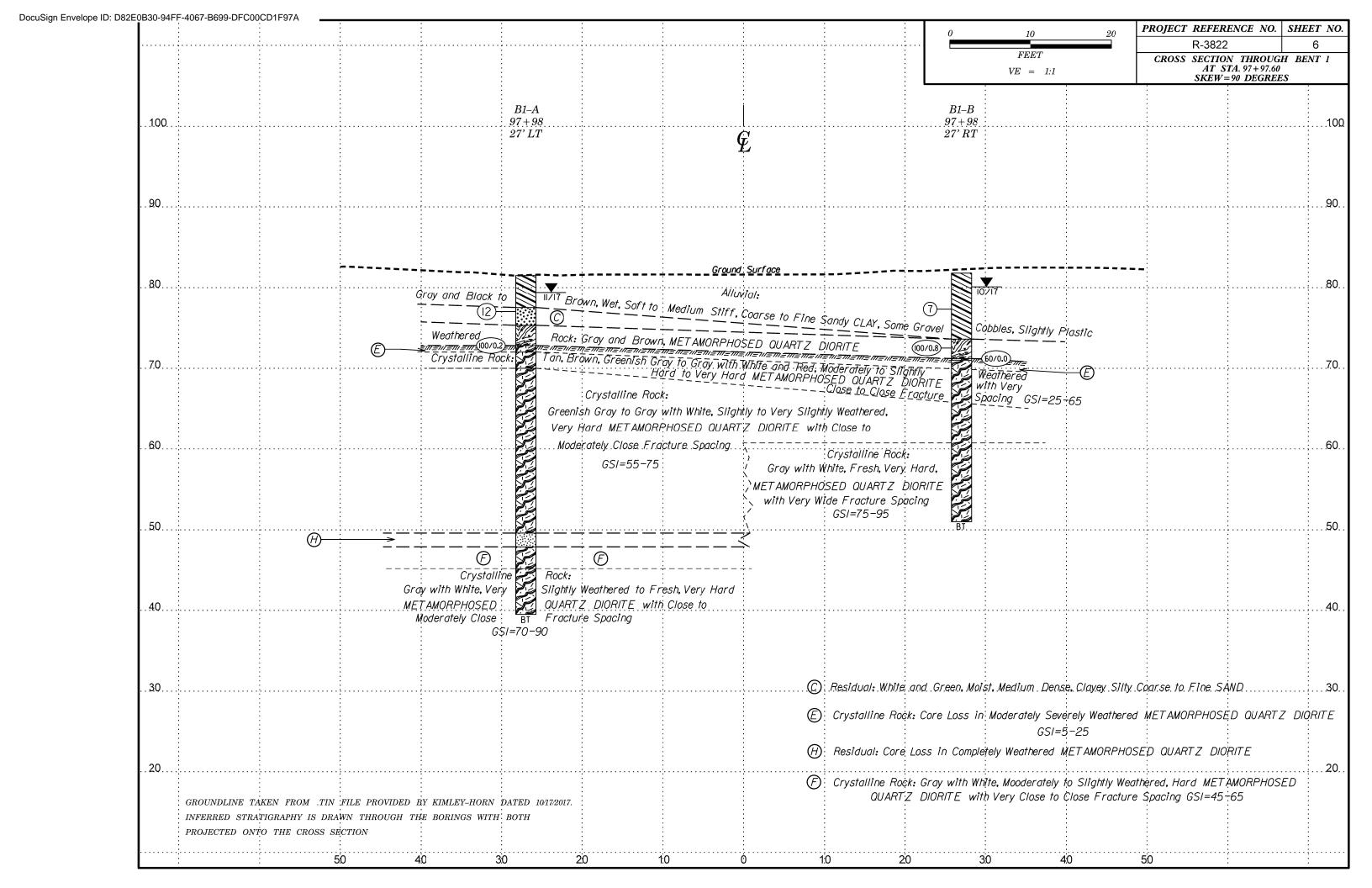
## SUBSURFACE INVESTIGATION

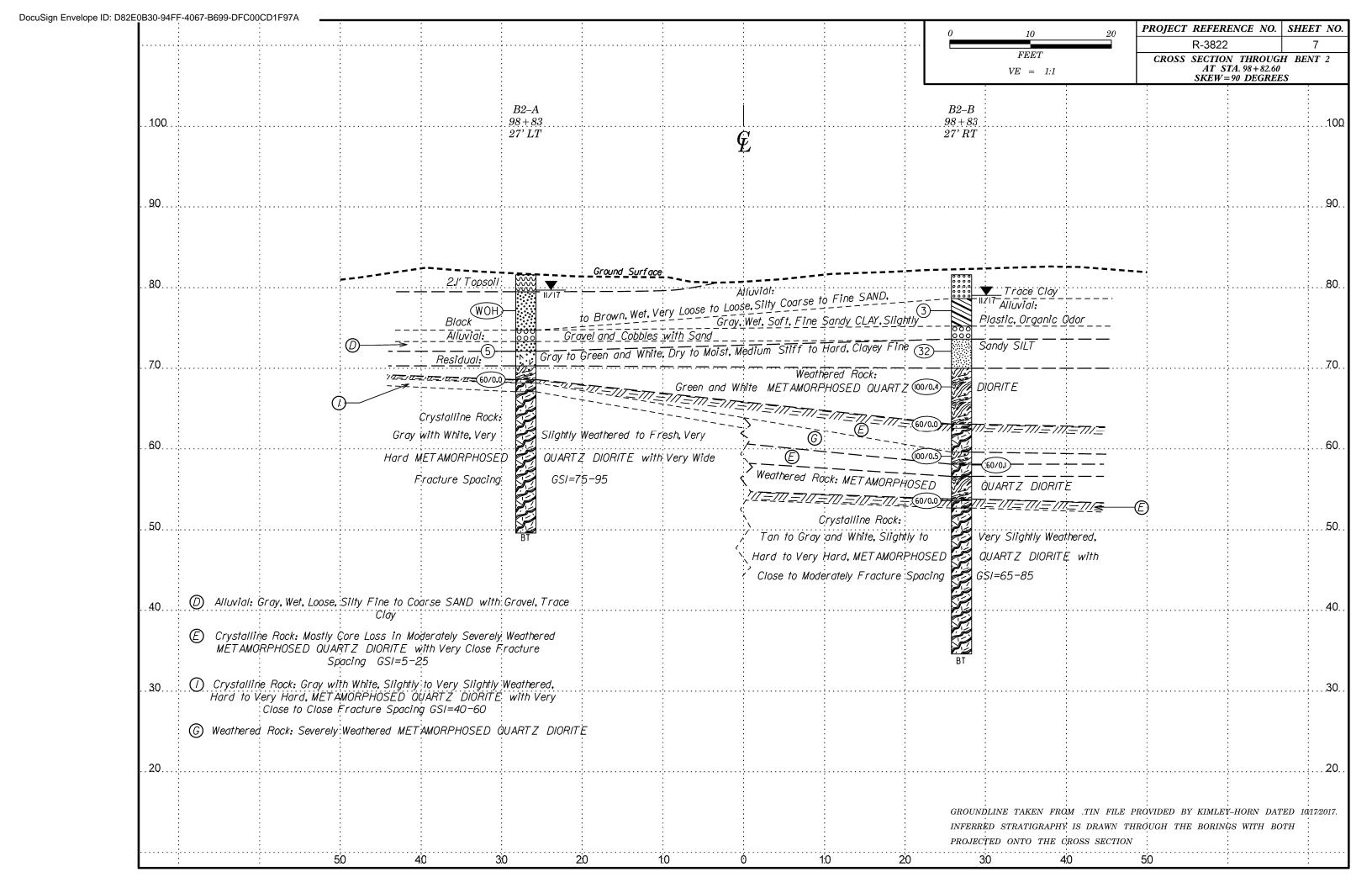
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000) AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed 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 ongs or fents 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

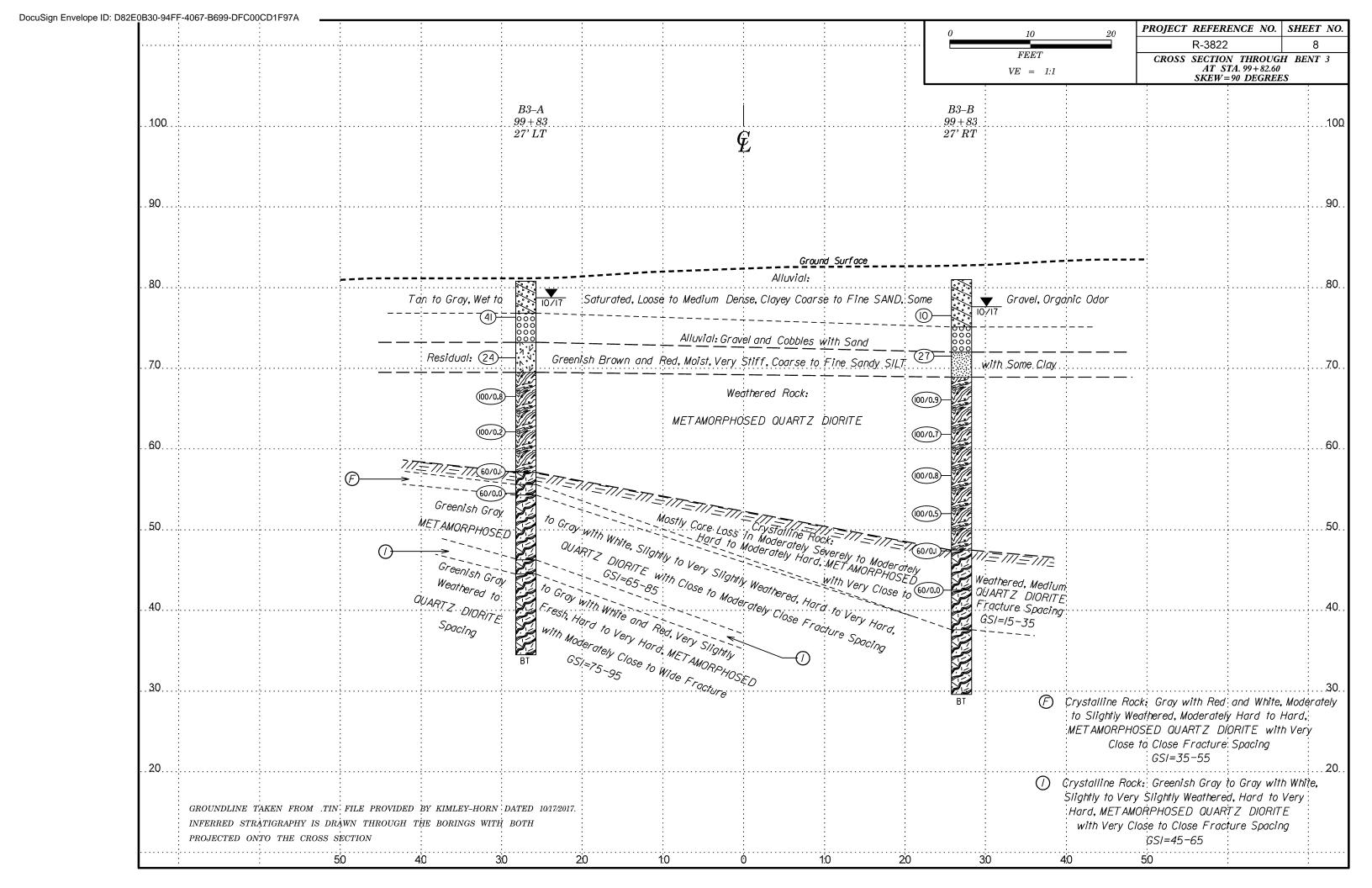


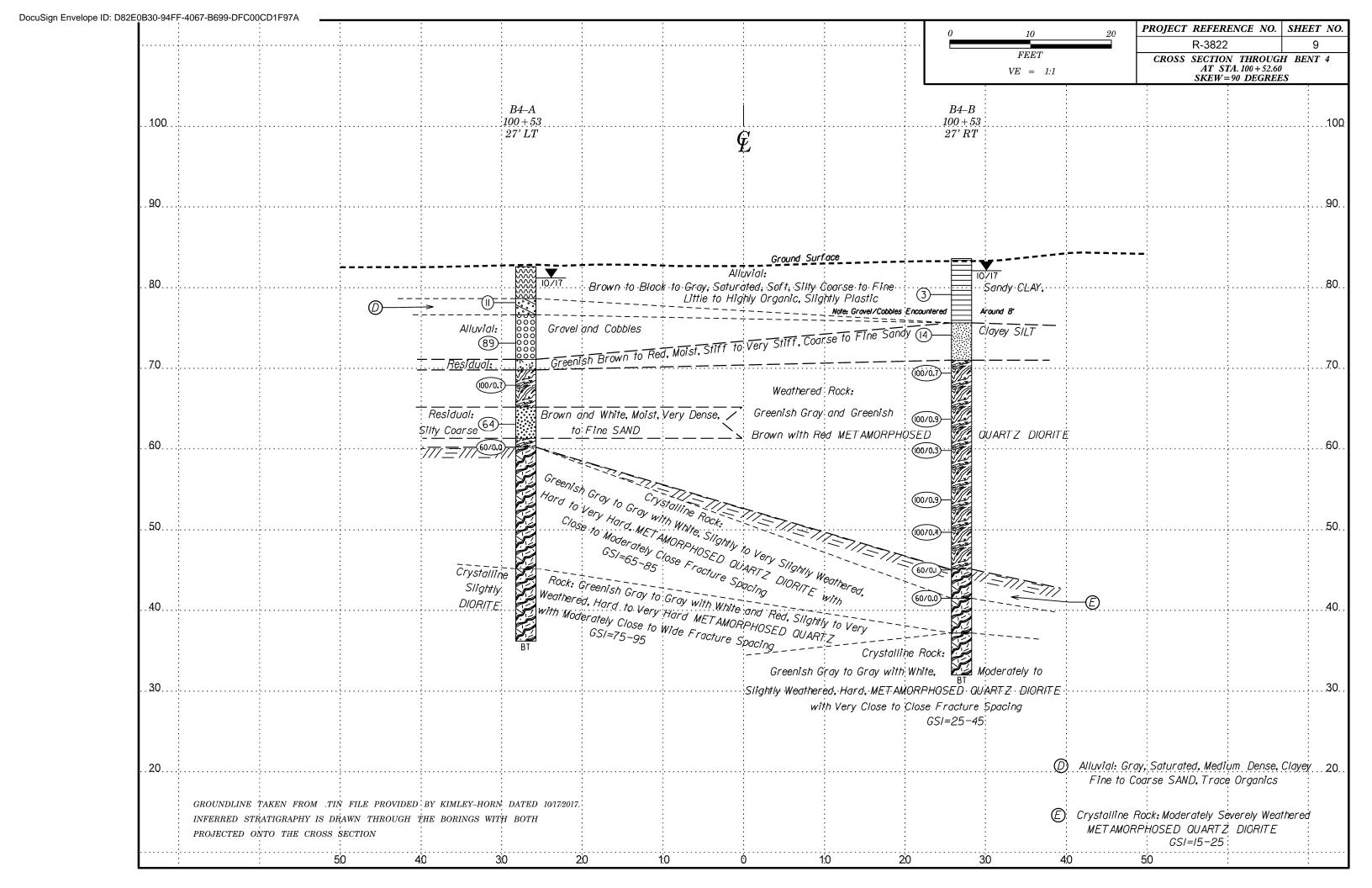


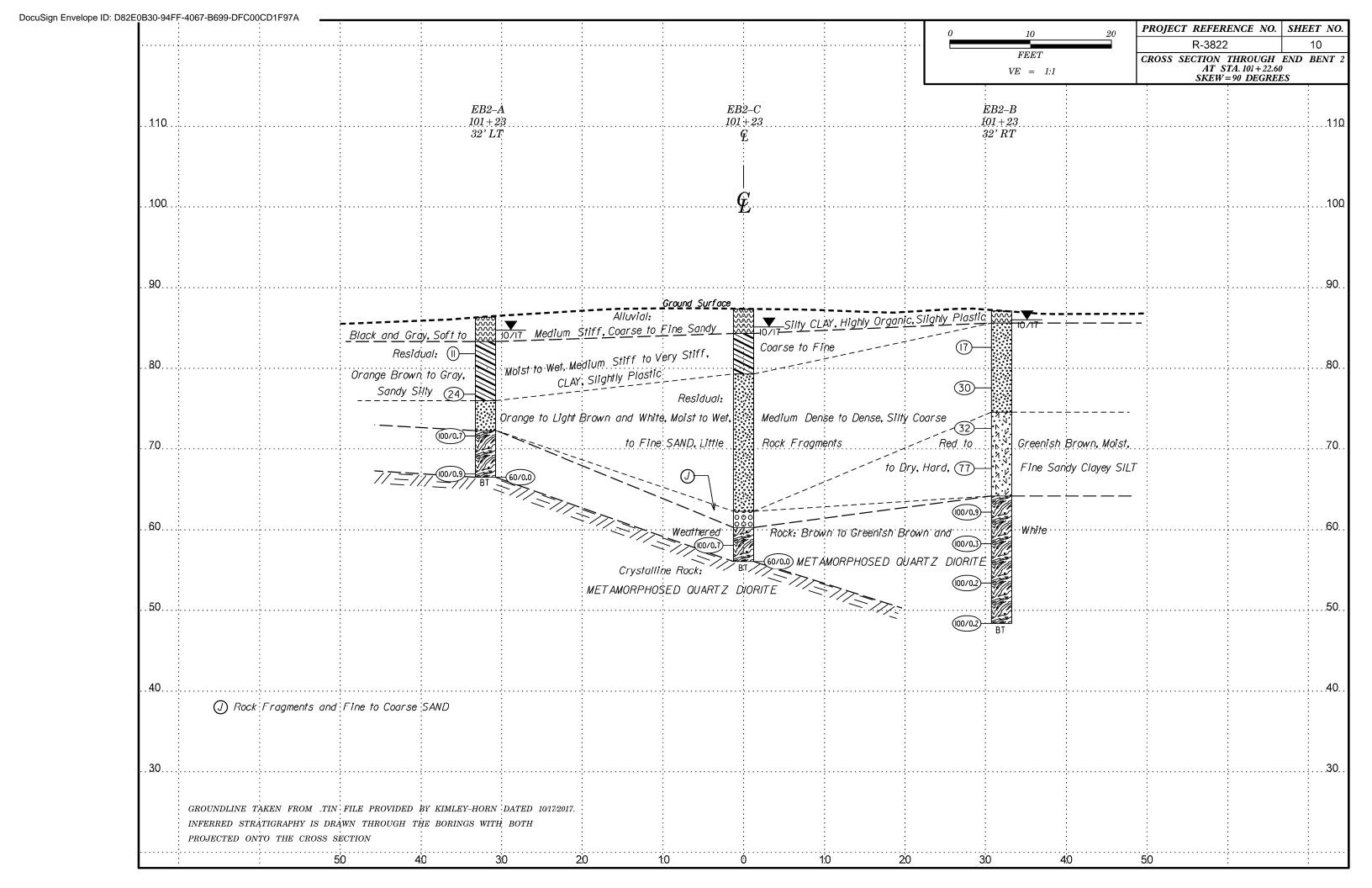
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				<u>:</u>	<u> </u>		<u>.</u>			R-3822	:	5
									FEET  VE = 1:1	CROSS SECTION T AT ST SKEW=	HROUGH END H A. 97 + 12.60 90 DEGREES	BENT
1.10		EB1–A(1) EB1– 97+13 97+		:	: <i>EB</i>	1–C + 17			EB1-B 97+13			11
1. 10		37' LT 32' L	T			Z.			32' RT			 : :
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			: 80
		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	Plastic				70
					White and	MET AMORPA	Hard, Coarse to	Fine Sandy				
60				: : :	Crystallin	Rock:	USED QUARTZ	DIORITE (100/0.8)	S/LT  60/0.1  BT -///			
				: MEIA : :	AMURPHUSED UU : : :	IARTZ DIURITE : :			BT (60/0.1)			
50												5
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				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			©	Weathered Rock: METAMOR	PHOSED QUARTZ I	DIORITE	
		N FILE PROVIDED BY KIMLEY-HORN RAWN THROUGH THE BORINGS WIT SECTION	•									
	<u>;</u>	:	30 2		.: 1:0		:0 2			;		:











		ORE LUG				<del></del>				
<b>WBS</b> 37765.1.5	TIP R-3822 COUNT	ry Halifax	<b>GEOLOGIST</b> Pastrana, C.R.		<b>WBS</b> 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	<b>STATION</b> 97+13	OFFSET 37 ft LT	ALIGNMENT -L1-	<b>0 HR.</b> 5.4	BORING NO. EB1-A		<b>STATION</b> 97+13	OFFSET 32 ft LT	ALIGNMENT -L1- 0 HR.	Dry
COLLAR ELEV. 86.0 ft	TOTAL DEPTH 11.9 ft	NORTHING 974,726	<b>EASTING</b> 2,401,465	<b>24 HR</b> . 6.5	COLLAR ELEV. 85.2	ft	TOTAL DEPTH 10.0 ft	NORTHING 974,726	<b>EASTING</b> 2,401,470 <b>24 HR</b> .	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
	<b>START DATE</b> 10/27/17	COMP. DATE 10/27/17	SURFACE WATER DEPTH N		DRILLER Meatyard, (		<b>START DATE</b> 10/25/17	COMP. DATE 10/25/17	SURFACE WATER DEPTH N/A	
			-					<del>'</del>	. T	
(ft) ELEV (ft) (ft) 0.5ft 0.5ft 0.5ft	<b></b>	75 100 NO. MOI G		CRIPTION  DEPTH (ft)	(ft) ELEV (ft) 0	0.5ft 0.5ft 0.5	<b>─</b> 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
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BORE DOUBLE			<del>.</del>						- - - - -	
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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	<b>↓                                    </b>	LAR ELE			- AA47		CME 550V			NORTHII			OD ''	.S. Augers	<b>NG</b> 2,401,53		24 HR. MER TYPE	7.0
-	LLER M		F./DATE AM			10/25/1		COMP. D				FACE WATER DEP		Automatic	<b>+</b> ├──	LER M			E AIVII		CME-550X ART DAT			COMP. D				<del></del>	CE WATER I			Automatic
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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											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
	-									000	78.1 77.2	Gravel a	obbles and Cobbles	<u> 8.1</u>	1	71.4	13.5					<u> </u>			1 1			- -	,	, 3	•	
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. <del></del> <del></del>	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 <b>-</b>	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	
	-										-					-												- -	in Crystalline F		MORPHOSE	
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WBS	3776	5.1.5			TI	IP F	R-3822	2		СО	UNT	<b>/</b> H/	ALIFAX	(			GEOLO	OGIST Pastra	na, C.R.		
SITE	DESCF	RIPTIO	<b>N</b> 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	<b>EV</b> . 8	1.5 ft		T	ОТА	L DEP	TH	42.0 f	ft		NOF	RTHING	974,	810		EASTIN	<b>IG</b> 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	<b>TE</b> 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		<b>75</b>	100	SAMP NO.	MOI	L O G	ELEV. (ft)	SOIL AND R	OCK DES	SCRIPTION	DEPTH (ft)
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90		┾				₩.		Τ.		1 .		T -			<del> </del>		- 81.5 -		ND SURI LLUVIAL		0.0
80	- 78.0	3.5	4	F	7			<u> </u>		:	 	<del>                                     </del>						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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65	-	t				-	<del></del>	+				+-					t k	Moderately V METAMORPHOSE	eathered D QUAR	d, Very Hard TZ DIORITI	l E with
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60		Ŧ				:		:		:		:					f	Gray with White	, Slightly		
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		‡						:		:		:	: : :				F	Close F	racture S	pacing	
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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	<b>GEOLOGIST</b> Pastrana, C.R.	
SITE	DESCR	IPTION	<b>I</b> 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-	<b>0 HR</b> . N/A
COLL	AR ELI	<b>EV.</b> 81	1.5 ft		тот	AL DE	<b>PTH</b> 42	.0 ft		NC	<b>PRTHING</b> 974,810	<b>EASTING</b> 2,401,479	<b>24 HR.</b> 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 \( \bigcup_{\text{9}}^{\text{8.}} \)
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)					<ul> <li>Very close fracture s</li> </ul>	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%					<del>-</del>	GSI = 55-75	
50		<b>†</b>		14:18/1.0 5:58/1.5							<del>-</del> 		
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 -	+ 42.0 +		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:
		‡									<del>-</del> <del>-</del>		
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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

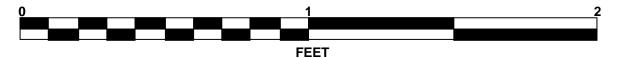
Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

Halifax County, North Carolina

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

Box 4: 28.3 Feet to 37.0 Feet





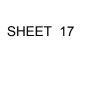
Box 5: 37.0 Feet to 42.0 Feet



														<u>OG</u>								
	3776					<b>P</b> R-382				OUN							GEOLOG	IST Nance	, D.S.			
SITE	DESCF	RIPTION	<b>N</b> 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	<b>EV</b> . 8	1.8 ft		TO	OTAL DE	PTH	<b>i</b> 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	<b>ΓΕ</b> 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
<b>85</b>		  -  - 					•		-		•				<b>V</b>				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 <sup>-</sup> - 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-	<b>0 HR.</b> N/A
COL	LAR ELI	<b>EV</b> . 81	1.8 ft		TOT	AL DEI	<b>PTH</b> 30	.8 ft		NC	<b>RTHING</b> 974,808	<b>EASTING</b> 2,401,533	<b>24 HR.</b> 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	<b>TE</b> 10/2	26/17		CC	MP. DATE 10/26/17	SURFACE WATER DEPTH N	/A
COR	E SIZE	NQ			TOTA	AL RUI	<b>N</b> 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%					<ul><li>Gray with White, Fresh</li></ul>	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

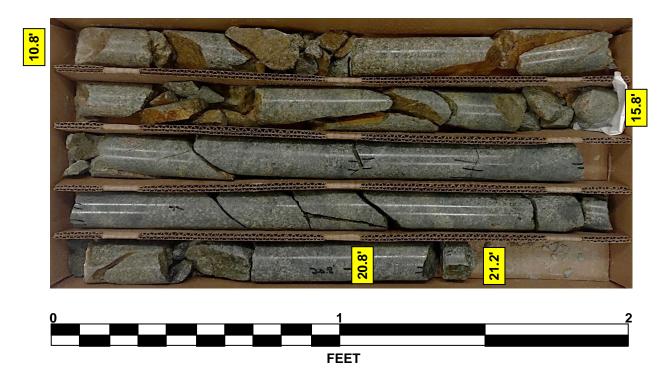
TIP No. R-3822

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

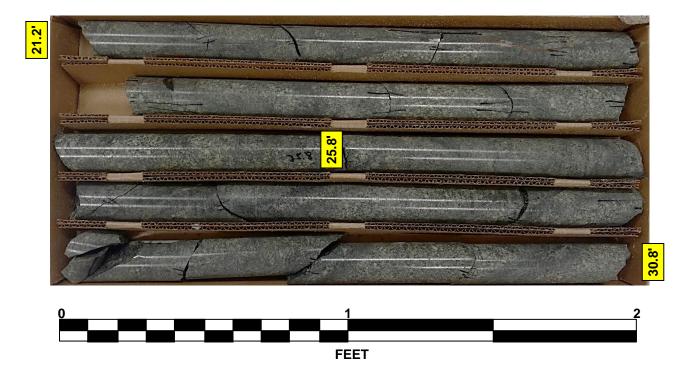
TIP No. R-3822

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



								ORE L				_	
NBS	3776	5.1.5			T	<b>IP</b> R-3822	COUNT	Y HALIFAX	(			GEOLOGIST Pastrana, C.R.	_
SITE D	ESCF	RIPTION	<b>N</b> Brid	dge or	Prem	ier Boulevar	d Extension Over	Chockoyotte	Creek				GROUND WTR
BORIN	IG NO	. B2-A	4		S	TATION 98	+83	OFFSET	27 ft LT			ALIGNMENT -L1-	0 HR.
COLLA	AR EL	<b>EV.</b> 8	1.6 ft		T	OTAL DEPT	<b>H</b> 32.0 ft	NORTHING	974,8	95		<b>EASTING</b> 2,401,483	24 HR.
RILL F	RIG/HA	MMER E	FF./DA	TE A	ME9533	3 CME-550X 8	3% 01/0//2015	•	DRILL N	IETHOD	H.S	S. Augers HAMM	ER TYPE Automat
DRILL	ER N	/leatyar	d, C.		S	TART DATE	10/31/17	COMP. DA	TE 11/0	01/17		SURFACE WATER DEPTH N	/A
LEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	OW CO		0 2	BLOWS PER FOO	Τ 75 100	SAMP. NO.	🏏   1	L O G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION DEPT
85	_	  -  -									-	B1.6 GROUND SURFA	ACE
80	-	‡									$\widetilde{\mathbb{Z}}$	2.1' Topsoil -79.5	
	78.1	3.5		WOL	WOLL							ALLUVIAL Black to Brown, Very Loos	se Silty Fine
		±	1	WOH	WOH	0		.		W	÷Ł	SAND, Trace Clay, Trac	
75	-	Ŧ				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \							with Sand
	73.1	8.5	5	3	2	-     '				٥ ا	<u> </u>	73.3 GRAVEL and COBBLES 72.1 Gray, Loose, Silty Fine to Co	
0		‡			1	<b> </b>				W		Gravel, Trace C	lay
_	- 68.6	13.0			1					<del> </del>		Gray and White, Moist, Med	dium Stiff, Fine
	00.0	13.0	60/0.0	D							<b>1</b>	68.2 Sandy Clayey S 67.1 WEATHERED RO	
5		Ŧ									1	METAMORPHOSED QUA	RTZ DIORITE
	-	‡									2	CRYSTALLINE R	
		‡									1	Core Loss in Moderatel Weathered METAMORPHO	SED QUARTZ
0		t										DIORITE Gray with White, Slightly to	Verv Slightly
	-	Ŧ									F	Weathered, Hard to V	ery Hard
		‡						:   : : : :				METAMORPHOSED QUART  Very Close to Close Fract	
5		t										Gray with White, Very Slightl	y Weathered to
	-	Ŧ									F	Fresh, Very Hard METAM QUARTZ DIORITE with Very	Wide Fracture
		‡						.			7	Spacing	
60	_	±									£	-49.6	
	-	<del>-</del>					,				-	Boring Terminated at Eleva Crystalline Rock: METAM QUARTZ DIORI	ORPHOSED
	-												
	-	<u> </u>									F	<del>-</del>	
	-	<u> </u>									E	- -	
		<u> </u>									E		
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		+	1	1							F		

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   OLIGI	WBS	3776	5.1.5			TIP	R-382	22	C	OUNT	Υŀ	HALIFAX	(	<b>GEOLOGIST</b> 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	<b>l</b> 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	<b>EV</b> . 81	1.6 ft		тот	AL DE	<b>PTH</b> 32	.0 ft		NC	RTHING	974,895	<b>EASTING</b> 2,401,483	<b>24 HR.</b> 1.9
No.   SAMP   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	<b>TE</b> 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	<b>N</b> 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> </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

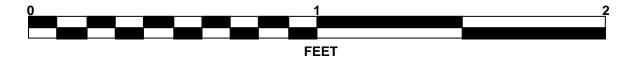
**Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek** 

Halifax County, North Carolina

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

Box 3: 30.4 Feet to 32.0 Feet





							<u>D</u>	ORE L	<u>UG</u>			
WBS	37765	5.1.5			TI	<b>P</b> R-3822	COUNTY	/ HALIFAX			<b>GEOLOGIST</b> Pastrana, C.R.	
SITE	DESCR	IPTION	<b>I</b> Brid	ge on	Premi	ier Boulevard Ex	ktension Over C	hockoyotte	Creek			GROUND WTR (ft)
BOR	ING NO	. B2-E	3		S <sup>-</sup>	<b>TATION</b> 98+83	3	OFFSET 2	7 ft RT		ALIGNMENT -L1-	<b>0 HR</b> . N/A
COL	LAR ELI	<b>EV.</b> 8	1.8 ft		TO	OTAL DEPTH	47.0 ft	NORTHING	974,893		<b>EASTING</b> 2,401,537	<b>24 HR.</b> 2.6
DRILL	RIG/HA	MMER E	FF./DA	TE A	ME9533	CME-550X 83%	01/0//2015		DRILL METHO	D H.	S. Augers HAMI	MER TYPE Automatic
DRIL	LER N	leatyar	d, C.		S	TART DATE 1	1/01/17	COMP. DAT	TE 11/03/17		SURFACE WATER DEPTH N	I/A
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0.5ft	UNT 0.5ft	BL 0 25	OWS PER FOOT	75 100	SAMP. NO. MO	L O I G	SOIL AND ROCK DES	CRIPTION DEPTH (ft)
85	-	- - -									- 81.8 GROUND SURF	ACE 0.0
80		‡—				<u> </u>					ALLUVIAL	
00	70.0	3.5						1			Black to Brown, Loose, C  78.8 SAND, Trace C	
	78.3	3.5	1	1	2	3			w		Gray, Soft, Fine Sandy C Plastic, Organic	CLAY, Slightly
75		ł									75.4	6.4
	73.3	8.5								000 000 000	73.8 GRAVEL and COBBLE	0.0
		Ŧ	7	11	21	: : : :   `•	32		D	F	Green and White with Red	l, Hard, Clayey
70	_	‡					· · ·   · · · · · · · · · · · · · · · ·			477	70.2 Fine Sandy SI WEATHERED R	11.0
	68.3	13.5	100/0.4					100/0.4			Green and White METAN QUARTZ DIOR	MORPHOSED
65		‡									QO/INIZ BIOI	
	63.3	18.5									63.3	18.5
		10.0	60/0.0					60/0.0			62.8 CRYSTALLINE F METAMORPHOSED QUA	ROCK
60	59.8 <b>-</b>	22.0									_59.8 Mostly Core Loss in Mode	rately Severely 22.0
	58.3	23.5	100/0.5					· 100/0.5			Weathered METAMORPHO DIORITE	23.5
		‡	00/0.1								56.8 WEATHERED R Severely Weathered META	
55	53.8	28.0				<del>    .</del>		+ : : : : .			- <sub>54.0</sub> QUARTZ DIOR	ITE 27.8
		1	60/0.0					60/0.0			52.9 METAMORPHOSED QUA	RTZ DIORITE \28.9
50	_	Ł									WEATHERED R METAMORPHOSED QUA	
		ł				:::: :		::::			CRYSTALLINE F METAMORPHOSED QUA	
		ł									Mostly Core Loss in Mode	rately Severely
45	_	ł					<del> </del>	+			Weathered METAMORPHO DIORITE with Very Close F	
		Ŧ									Tan to Gray and White, S Slightly Weathered, Hard	
40		Ŧ									METAMORPHOSED QUAR Close to Moderately Close F	TZ DIORITE with
	-	Ŧ										ractar o opacing
		Ŧ										
35	_	<del>-</del>								22	_34.8  Boring Terminated at Elev	47.0
	-										Boring Terminated at Elev Crystalline Rock: METAN QUARTZ DIOR	MORPHOSED

									<u> </u>	RE LUG			
<b>VBS</b> 377	65.1.5			TIP	R-382	22	C	OUNT	Υ⊢	HALIFAX	<b>GEOLOGIST</b> Pastrana, C.R.		
ITE DESC	CRIPTIO	<b>N</b> Bri	dge on Pr	emier	Boule	ard Exte	nsion	Over (	Choc	koyotte Creek		GROUND WT	R (ft)
ORING N	<b>O</b> . 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	<b>PTH</b> 47	.0 ft		NO	<b>PRTHING</b> 974,893	<b>EASTING</b> 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	<b>TE</b> 11/0	1/17		СО	MP. DATE 11/03/17	SURFACE WATER DEPTH N	/A	
ORE SIZE	E NW			тот	AL RU	<b>N</b> 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   <sub>(ft)</sub>	(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							<ul> <li>Isolate</li> <li>Very close fracture s</li> </ul>	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



								<u>P</u>	<u>ORE L</u>	<u>UG</u>				
WBS	3776	5.1.5			TI	<b>P</b> R-3822		COUNT	Y HALIFAX				GEOLOGIST Pastrana, C.R.	
SITE	DESCF	RIPTION	N Brid	dge on	Premi	er Bouleva	rd Extens	ion Over (	Chockoyotte	Creek			GR	OUND WTR (ft)
BOR	ING NO	. B3-A	4		S	TATION 9	9+83		OFFSET 2	27 ft LT			ALIGNMENT -L1- 0 H	HR. N/A
COLI	LAR EL	<b>EV.</b> 8	0.8 ft		т	OTAL DEP	<b>TH</b> 46.3	ft	NORTHING	974,9	995		<b>EASTING</b> 2,401,488 <b>24</b> F	<b>HR.</b> 2.1
DRILL	RIG/HA	MMER E	EFF./DA	TE A	ME9533	CME-550X	83% 01/0//	2015		DRILL I	METHO	D H.	S. Augers HAMMER T	YPE Automatic
DRIL	LER N	/leatyar	d, C.		S	TART DATI	E 10/18/	17	COMP. DA	TE 10/	19/17		SURFACE WATER DEPTH N/A	
ELEV	DRIVE	DEPTH	BLO	ow co	UNT		BLOWS	PER FOOT		SAMP.	<b>V</b> /		SOIL AND ROCK DESCRIPT	FIONI
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	МОІ		ELEV. (ft)	DEPTH (ft)
85														
		Ŧ											-	
		Ŧ											80.8 GROUND SURFACE	0.0
80	-	Ŧ										<b>\\\</b>	ALLUVIAL Gray, Loose to Medium Dense,	
	77.3	3.5									_	<b>*</b> ***	<ul> <li>Coarse to Fine SAND, Organic Oc</li> </ul>	dor, Some
75		‡	3	30	11						Sat.	000	Note: Blow count influenced by g	
-10	-	‡					<del>,/</del>	1	1			000	Cobbles GRAVEL and COBBLES with	
	72.3	8.5	5	11	13		<u>/</u> ::::				M	1	RESIDUAL	
70	_	‡				'	24				IVI	1,1	Greenish Brown to Red, Very Stiff, Fine Sandy Clayey SILT	
	67.3	† † <sub>13.5</sub>											WEATHERED ROCK White and Green METAMORPH	HOSED
05	07.5	+ 13.3	26	74/0.3					. 100/0.8	•			QUARTZ DIORITE	
65	-	‡					<u> </u>	1	+				<del>_</del> -	
	62.3	18.5	100/.0.	3					100/0.2				- -	
60	_	<u> </u>	1007.0.	1									- _	
		<u> </u>											- 	
	57.3	<u>† 23.5</u> 	60/0.1	Ī					60/0.1				57.1 CRYSTALLINE ROCK	23.7
55	54.5	26.3	60/0.0	1			+	+	. 60/0.0				Mostly Core Loss in Moderately S Moderately Weathered, Medium	everely to
		Ŧ	00/0.0	ή									Moderately Hard METAMORPH QUARTZ DIORITE with Very Close	HOSED
50		Ŧ											Spacing	
	-	Ŧ											<ul> <li>Gray with Red and White, Mode</li> <li>Slightly Weathered, Moderately Ha</li> </ul>	rd to Hard
		Ŧ											METAMORPHOSED QUARTZ DIC 46.3 Very Close to Close Fracture S	
45	-	‡					ļ · · · ·	ļ · · · ·					Greenish Gray to Gray with White, Very Slightly Weathered, Hard to	
		‡											METAMORPHOSED QUARTZ DIC	ORITE with
40		‡											Greenish Gray to Gray with White,	Slightly to
	-	‡					1	1					<ul> <li>Very Slightly Weathered, Hard to \         METAMORPHOSED QUARTZ DIO</li> </ul>	ORITE with
		‡											<ul> <li>Very Close to Close Fracture S</li> <li>Greenish Gray to Gray with White</li> </ul>	
35	-	‡										M	Very Slightly Weathered to Fresh  34.5 Very Hard METAMORHOSED C	, Hard to
		‡											DIORITE with Moderately Close Fracture Spacing	to Wide
		‡											Boring Terminated at Elevation 3	
	-	‡											_ Crystalline Rock: METAMORPI QUARTZ DIORITE	HOSED
		‡											- -	
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#### SHEET 26

									<u> </u>	<u>UI</u>	TE L	<u>UG</u>			
NBS	37765	5.1.5			TIP	R-382	22	С	OUNT	Υŀ	HALIFAX		GEOLOGIST Pastrana, C.R.		
SITE	DESCR	IPTION	<b>I</b> Bric	dge on Pr	emier	Boule	ard Exte	nsion	Over 0	Cho	ckoyotte	Creek		GROUND W	/TR (ff
3ORI	NG NO.	. В3-А	١		STA	ΓΙΟΝ	99+83			OF	FSET 2	7 ft LT	ALIGNMENT -L1-	0 HR.	N/A
OLI	AR ELI	<b>EV</b> . 80	).8 ft		тот	AL DE	<b>PTH</b> 46	.3 ft		NC	RTHING	974,995	<b>EASTING</b> 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	S. Augers HAMN	IER TYPE Auto	omatic
DRIL	LER M	leatyard	d, C.		STAI	RT DA	<b>TE</b> 10/1	8/17		СС	MP. DAT	Γ <b>E</b> 10/19/17	SURFACE WATER DEPTH N	I/A	
CORI	E SIZE	NQ			TOTA	AL RUI	N 22.61	ft							
LEV	RUN ELEV	DEPTH	RUN	DRILL RATE	REC.	JN RQD	SAMP.	STF REC.	RATA	L			ACCOUNTION AND DEMANCE		
(ft)	(ft)	(ft)	(ft)	(Min/ft)	REC. (ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ	ELEV. (ft		ESCRIPTION AND REMARKS		DEPTH
7.1	<del>-74</del>	- 00 7											Begin Coring @ 23.7 ft		
55	57.1 54.5 <b>-</b>	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		CRYSTALLINE ROCK loderately Severely to Moderately Wea		
		20.0	5.0	4:30/1.0 6:46/1.0	(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	
	-	ł		8:27/1.0 6:13/1.0	100%	7470		(8.0) 100%	(6.4) 80%		E	Grav with Red and \	GSI = 15-35 White, Moderately to Slightly Weathere	ed Moderately	4
50	49.5 -	31.3	5.0	8:48/1.0 7:23/1.0	(5.0)	(3.1)		100 /6	00 /6		-		MORPHOSED QUARTZ DIORITE with Close Fracture Spacing		
		ł	3.0	7:39/1.0 7:25/1.0	100%	62%					1 40 2	Joints at 10 d	egrees to 30 degrees with heavy iron GSI = 35-55	staining	
45	44.5 <b>-</b>	36.3		8:34/1.0 9:27/1.0				(1.8)	(0.4)		46.3 - -44.5	Greenish Gray to Gra	y with White, Slightly to Very Slightly V	Veathered, Hard	34
		30.3	5.0	10:17/1.0 10:54/1.0		(4.9) 98%		(10.0)	(9.7)		- 44.3	, N	AMORPHOSED QUARTZ DIORITÉ v loderately Close Fracture Spacing	vith Close to	30
		ł		11:09/1.0 12:04/1.0		90%		100%	97%		ŀ		tures from 45 degrees to 90 degrees near vertical fractures from 28.0' to 29	9.3'	
ŀO	39.5 -	41.3	5.0	11:16/1.0 9:16/1.0	(5.0)	(4.8)					-	Greenish Gray to Gra	GSI = 65-85 y with White, Slightly to Very Slightly V	Veathered Hard	4
		ł	3.0	9:02/1.0 8:46/1.0	100%	96%					ŀ	to Very Hard METAN	MORPHOSED QUARTZ DIORITE with Close Fracture Spacing	Very Close to	
35	34.5 -	46.3		11:38/1.0 9:54/1.0							- 34.5	Joi	ints from 30 degrees to 60 degrees GSI = 45-65		40
	04.0	10.0		9.54/1.0							54.5	Greenish Gray to G	ray with White and Red, Very Slightly	Weathered to	<u> </u>
		ł									_	Mode	y Hard METAMORHOSED QUARTZ I rately Close to Wide Fracture Spacing		
	-	ł									_	J	oints at 10 degrees to 20 degrees GSI = 75-95		
		ł									_		nated at Elevation 34.5 ft in Crystalling AMORPHOSED QUARTZ DIORITE	e Rock:	•
	_	Ł									L				
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	-	ł													
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WBS No. 37765.1.5

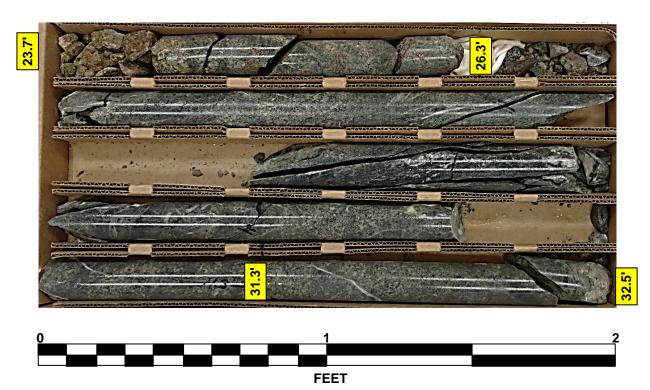
TIP No. R-3822

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

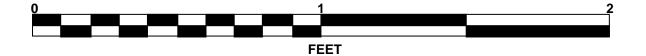
Project Description: Bridge on Premier Blvd. Ext. Over Chockoyotte Creek

**Halifax County, North Carolina** 

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

Box 3: 41.3 Feet to 46.3 Feet





									1	UKI					1		
WBS	37765	5.1.5			TI	<b>P</b> R-3	822		COUNT	<b>Y</b> HAI	LIFAX				<b>GEOLOGIST</b> Pastrana, C.R.	_	
SITE	DESCR	IPTION	<b>I</b> Bric	lge on	Premi	er Bou	levaro	d Extens	ion Over	Chocko	yotte (	Creek				GROUN	D WTR (ft)
BOR	ING NO.	В3-В	;		S	TATION	<b>l</b> 99	+83		OFFS	<b>ET</b> 2	7 ft RT			ALIGNMENT -L1-	0 HR.	N/A
COLI	LAR ELE	<b>EV</b> . 81	.0 ft		TO	OTAL D	EPTI	<b>H</b> 51.41	ft	NORT	HING	974,9	92		<b>EASTING</b> 2,401,542	24 HR.	3.4
DRILL	RIG/HAI	MMER E	FF./DA	TE Al	<u> </u>	CME-5	50X 83	3% 01/0//	2015					<b>D</b> H.S	<u> </u>	J IER TYPE	Automatic
	LER M							10/19/		COME	 Σ <b>D</b> ΔΤ	E 10/			SURFACE WATER DEPTH N		
	DDI\/E			DW CO			/AIL		PER FOOT	l	· DAI	SAMP.	20/1/	1 L T	SORI ACE WATER DEFITE N		
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				_	<u> </u>	Tan to Gray, Loose to Me		
	77.5	3.5	4	5	5					.			W	$\sim$	Clayey Coarse to Fine SANI	D, Some Gr	avel
75	-	Ŀ				. 🥄	ió .						**	///	75.1		5.9
	-	F					7.			.	]				GRAVEL and COBBLES	with SAND	)
	72.5	8.5	6	12	15			27					М		72.0 RESIDUAL		9.0
70	_	<u> </u>					• •	T <sup>÷</sup> ' · · ·	: : :	·   · ·					Greenish Brown with Red, V		
	67.5 <sup>-</sup>	13.5				: :	::	'	+					977	68.9 Coarse to Fine San		12.1
	- 07.3	13.5	16	42	58/0.4	• •					1				Greenish Gray METAMO	ORPHOSE D	)
65	_	F							+	10	00/0.9				QUARTZ DIOR -	116	
	62.5 <sup>-</sup>	18.5					: :			.							
00	•		54	46/0.2			: :			10	00/0.7						
60	_	-				<del> </del>			+	+ -					-		
	57.5	23.5	- 00	40/0.0						.							
55	-	F	60	40/0.3			: :			.   . 10	00/0.8						
	-	-							1						-		
	52.5	28.5	100/0.5	1			: :										
50	-	_		1		• •				.  "	00/0.5						
	-	F													•		
	47.5	33.5	60/0.1	-			: :				 60/0.1				47.5 CRYSTALLINE R	OCK	33.5
45	-	_								<u> </u>					METAMORPHOSED QUA	RTZ DIORI	ΤE
	42.5 <sup>-</sup>	20 5				: :	::			.	::				42.5		38.5
	42.5	36.5	60/0.0							6	60/0.0 <b>°</b>				Brown wtih Gray, Moderate		to
40	_	F							+						Moderately Weathered, Moderately Hard METAM		
	-	<u> </u>					: :								QUARTZ DIORITE with Very Fracture Spaci		lose43.4
25	-	ţ					: :			.   : :					Greenish Gray to Gray with	White, Sligh	tly to
35	_	_				<del> </del>			+	+					Very Slightly Weather METAMORPHOSED QUAR	Z DIORITE	
	-	E				: :	: :			.	::				Close to Moderately Close F	racture Spa	cing
30	-	_							: : :	.				F	20.6		F4 .
	-	-										1			-29.6  Boring Terminated at Elev	ation 29.6 ft	51.4 in
	-	<u> </u>													Crystalline Rock: METAN QUARTZ DIOR	IORPHOSE ITE	D
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									<u></u>	<u>UI</u>	KE L	UG						
WBS	3776	5.1.5			TIP	R-382	22	C	TNUC	ΥΗ	HALIFAX	(		GEOLOG	IST Pastra	na, C.R.		
SITE	DESCF	RIPTION	<b>I</b> Brid	lge on Pr	emier	Boule	ard Exte	nsion	Over (	Choo	koyotte	Creek					GROUND V	WTR (ft)
BOR	ING NO	. B3-B	3		STA	ΓΙΟΝ	99+83			OF	FSET 2	27 ft RT		ALIGNME	NT -L1-		0 HR.	N/A
COLI	LAR EL	<b>EV</b> . 81	1.0 ft		тот	AL DE	<b>PTH</b> 51	.4 ft		NC	RTHING	974,992		EASTING	2,401,542	2	24 HR.	3.4
DRILL	RIG/HA	MMER E	FF./DA	TE AMES	9533 CN	ΛΕ-550)	K 83% 01/	0//2015				DRILL METH	IOD H.S.	. Augers		HAMM	ER TYPE AL	ıtomatic
DRIL	LER N	/leatyard	d, C.		STAI	RT DA	<b>TE</b> 10/1	9/17		СС	MP. DA	TE 10/20/1	7	SURFACI	E WATER D	EPTH N/	A	
	E SIZE						<b>N</b> 12.9 f											
ELEV	RUN	DEPTH	RUN	DRILL	RI	JN RQD	SAMP.	STR REC.	ATA	Ļ								
(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	(ft) %	NO.	(ft) %	RQD (ft) %	O G	ELEV. (1	ft)	Di	ESCRIPTIO	N AND REMAI	RKS		DEPTH (ft)
42.5					,,,	70		70	70		(			Begin Co	ring @ 38.5	ft		
	42.5	38.5	2.9	9:52/0.9	(2.0) 69%	(0.6) 21%		(4.0) 82%	(0.6) 12%		42.5	Brown wtih	Gray, Mod	derately Sev	erely to Moder	rately Weath	ered, Medium	38.5
40	39.6 -	41.4	5.0	11:22/1.0 7:34/1.0 13:09/1.0	(5.0)	(2.1)		02 /0	12 /0				, (	Close to Clos	se Fracture Sp	acing		у
		1	3.0	12:55/1.0 15:36/1.0	100%			(8.0)	(6.3)		37.6	Numeroi 7		ore loss scatt	grees to 90 de ered througou		on staining	43.4
35	34.6 -	46.4		10:12/1.0 13:49/1.0				100%	79%		-	Greenish Gr	av to Grav		SI = 15-35 Slightly to Ver	rv Sliahtlv W	eathered. Har	 rd
	34.0	70.7	5.0	4:55/1.0	(5.0)	(4.2)					F	METAMOF	RPHOSEÉ	QUARTZ D	NOŘITÉ with ( ure Spacing	Close to Mod	lerately Close	
		Ŧ		5:54/1.0 6:04/1.0	100%	84%					F			m 0 degrees	to 90 degrees			
30	29.6 -	51.4		7:21/1.0 8:31/1.0							29.6		-	GS	g 47.9' to 48.1 SI = 65-85			51.4
		‡									-	Bor			ation 29.6 ft in SED QUARTZ		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

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





							BORE LOG			
WBS	37765	5.1.5			TII	R-3822 <b>COUN</b>	TY HALIFAX		<b>GEOLOGIST</b> Pastrana, C.R.	
SITE	DESCR	IPTION	Brid	ge on	Premi	Boulevard Extension Over	Chockoyotte Creek			GROUND WTR (ft)
BOR	ING NO.	. B4-A			ST	ION 100+53	OFFSET 27 ft LT		ALIGNMENT -L1-	<b>0 HR.</b> N/A
COLI	LAR ELE	<b>EV</b> . 82	.6 ft		тс	<b>L DEPTH</b> 46.4 ft	<b>NORTHING</b> 975,06	5	<b>EASTING</b> 2,401,491	<b>24 HR.</b> 1.4
DRILL	RIG/HAI	MMER E	FF./DA	TE A	ME9533	E-550X 83% 01/0//2015	DRILL ME	THOD H.S.	. Augers HAMME	R TYPE Automatic
DRIL	LER M	leatyard	l, C.		ST	T DATE 10/17/17	COMP. DATE 10/18	3/17	SURFACE WATER DEPTH N/A	A
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0.5ft	UNT 0.5ft	BLOWS PER FOO 25 50	75 400	MOI G E	SOIL AND ROCK DESC	CRIPTION  DEPTH (ft)
85	-	<u></u>							82.6 GROUND SURFA	CE 0.0
80	79.1	3.5	3	6	5		-	<b>▼</b> ******	ALLUVIAL Black, Fine Sandy CLAY, Hi Slightly Plastic	ghly Organic,
75	- - - 74.1	8.5				11	· · · · · · · · · · · · · · · · · · ·	Sat	Gray, Medium Dense, Clayey 76.6 SAND, Trace Orga GRAVEL and COBE	inics
70	- - - 69.1	13.5	25	40	49	· · · ·   · · · ·   · · · · · · · · · ·	• • • • • • • • • • • • • • • • • • •	-71-0	71.1	
65	-		26	63	37/0.2		100/0.7		Fine Sandy Clayey  WEATHERED RO  Greenish Gray with  METAMORPHOSED QUAR	SILT OCK Red 17.4
60	64.1 - - 60.2	18.5 22.4	21	38	26	 			RESIDUAL Brown and White, Very Dens to Fine SAND 60.2  WEATHERED RO	e, Silty Coarse
55 50	-	- - - - - - - - - - - - - - - - - - -	60/0.0				60/0.0		White and Green METAMC QUARZ DIORIT CRYSTALLINE RC Greenish Gray to Gray with W Very Slightly Weathered, Har METAMORPHOSED QUART. Close to Moderately Close Fra	E  DCK  /hite, Slightly to d to Very Hard Z DIORITE with
45	-								Greenish Gray to Gray with V Slightly to Very Slightly Weat Very Hard METAMORPHOS DIORITE with Moderately C Fracture Spacin	hered, Hard to SED QUARTZ close to Wide g
									Boring Terminated at Eleva Crystalline Rock: METAMG QUARTZ DIORIT	ORPHOSED

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#### SHEET 32

										<u> </u>	KE LUG		
WBS	3776	5.1.5			TIP	R-382	22	C	OUNT	Υŀ	ALIFAX	<b>GEOLOGIST</b> Pastrana, C.R.	
SITE	DESC	RIPTION	<b>I</b> Brid	dge on Pr	emier I	Boulev	ard Exte	nsion	Over (	Choc	koyotte Creek		GROUND WTR (fi
BOR	ING NO	<b>)</b> . B4-A	١		STAT	ΓΙΟΝ	100+53			OF	FSET 27 ft LT	ALIGNMENT -L1-	0 HR. N/A
COLI	LAR EI	<b>.EV</b> . 82	2.6 ft		TOT	AL DEI	<b>PTH</b> 46	.4 ft		NO	<b>RTHING</b> 975,065	<b>EASTING</b> 2,401,491	<b>24 HR.</b> 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
DRIL	LER	Meatyard	d, C.		STAF	RT DA	<b>TE</b> 10/1	7/17		СО	MP. DATE 10/18/17	SURFACE WATER DEPTH N	/A
OR	E SIZE	NQ			TOTA	AL RUI	<b>N</b> 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)	PEOCINI FION AND NEWANIO	DEPTH (
<b>6</b> 02	60.2	22.4	10	0.50/4.0	(4.0)	(0.0)		(44.0)	(44.4)			Begin Coring @ 22.4 ft	-
	00.2	1 22.4	4.0	2:53/1.0 7:55/1.0	(4.0) 100%	(3.0) 75%		(14.9) 99%	(11.1) 74%		60.2 Greenish Gray to Gra	CRYSTALLINE ROCK y with White, Slightly to Very Slightly V	Veathered, Hard
	56.2	26.4	5.0	5:18/1.0 6:55/1.0	(4.0)	(2.5)						FAMORPHOSED QUARTZ DIORITÉ v loderately Close Fracture Spacing	
55		‡	5.0	9:26/1.0 8:44/1.0	(4.9) 98%	(3.5) 70%					2 ioints	ts at 0 degrees to 10 degrees with iron at 70 degrees with heavy iron staining	n
	51.2	31.4		6:43/1.0 8:26/1.0							-	pacing 23.9' to 24.4', 27.7' to 27.9', 28. 31.5' to 31.8'	
50	31.2	1 31.4	5.0	10:07/1.0 6:42/1.0	(5.0)	(3.7)					- Sever	ral partially healed high angle fractures GSI = 65-85	
		‡		6:10/1.0 7:42/1.0	100%	74%					- -		
	46.2	36.4	50	7:45/1.0 8:10/1.0	(5.0)	(4.0)					. 45.0		27
15		‡	5.0	5:41/1.0 7:57/1.0		(4.9) 98%		(9.0)	(9.0)			Gray with White and Red, Slightly to	
	41.2	41.4		10:05/1.0				100%	100%		Mode	ery Hard METAMORPHOSED QUART rately Close to Wide Fracture Spacing	
0	41.2	+ 41.4	5.0	11:07/1.0 8:26/1.0 10:08/1.0	(5.0)	(5.0)					. 1 jo _ Sever	oint at 30 degrees with iron staining ral partially healed high angle fractures	
		‡		9:46/1.0	100%	100%					- -	GSI = 75-95	
	36.2	46.4		9:22/1.0 9:37/1.0							36.2	inated at Elevation 36.2 ft in Crystalline	46
		+++++++++++++++++++++++++++++++++++++++											

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	<b>I</b> Bric	dge on	Prem	ier Boule	evard	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-	<b>0 HR</b> . N//
	AR ELE					OTAL DE				_		975,0	62			<b>24 HR.</b> 1.
										NOF	THING					
DRILL	RIG/HAI	MMER E	FF./DA	TE A	ME9533	CME-550	X 83°	% 01/0//2	015			DRILL N	METHO	<b>D</b> 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	<b>TE</b> 10/2	23/17		SURFACE WATER DEPTH N//	A
ELEV	DRIVE	DEPTH	BLC	ow co	UNT			BLOWS F	PER FOOT	Γ		SAMP.	lacksquare		COIL AND DOOK DECO	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)	DEPTH
	. ,						-			-						
85		-												<u> </u>	83.6 GROUND SURFA	OF .
	_	<u> </u>				<del>                                     </del>	.			.   .				==	83.6 GROUND SURFA ALLUVIAL	CE (
	-	-				!: : :				.   :			┻		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	-	-	'	<del>                                  </del>				:   :	: : :		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	<b>#</b>	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	1		-			.   .	100/0.7	1			Greenish Gray METAMOR QUARTZ DIORIT	
	-	Į.		[		::::			: : : :	.   :	: : :				QUALIZ DIONII	_
65	65.1	18.5		<u> </u>	00.00					<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 <sup>-</sup>	28.5					.			.   .						
			31	34	66/0.4	1						,				
	_	t				::::					100/0.9					
50	50.1	33.5					.			.   .	111					
	30.1	_ 55.5	100/0.4	4						.   .	100/0.4	•				
	-	<del> </del>					.			.   .	: : : [					
45	45.1	38.5								.   :	: : :				45.1	38
45	45.1	30.5	60/0.1			l <del></del>			<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	_	-				<del> </del>	-+		<u> </u>	+					Very Slightly Weathere	d, Hard
	-	-				::::	.		: : : :	.   :					METAMORPHÖSED QUARTZ 37.2 Close Fracture Spa	
	-	ţ .				:::				:   :	: : :				Greenish Gray to Gray w	ith White,
35	-	+				<del> </del>	+			+					Moderately to Slightly Weat METAMORPHOSED QUARTZ	nered, Hard Z DIORITE with
	-	F				:::	:			.   :					Very Close to Close Fractu	ire Spacing
						<del>                                     </del>			<u> </u>			1			Boring Terminated at Elevat	
	-	<b>-</b>												F	Crystalline Rock: METAMO QUARTZ DIORIT	ORPHOSED
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	-	+												<b> </b>		
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WBS	3776	5.1.5			TIP	R-382	22	C	OUNT	Υ	HALIFAX			GEOLOGI	ST Pastran	a, C.R.		
SITE	DESCF	RIPTION	<b>I</b> 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
COL	LAR EL	<b>EV</b> . 83	3.6 ft		тот	AL DE	<b>PTH</b> 51	.6 ft		NC	ORTHING	975,062		EASTING	2,401,545		24 HR.	1.5
DRILI	RIG/HA	MMER E	FF./DA	TE AMES	9533 CI	ME-550	X 83% 01/	0//2015	i			DRILL METHO	DD H.S.	. Augers		HAMM	ER TYPE	Automatic
DRIL	LER N	1eatyar	d, C.		STAI	RT DA	<b>TE</b> 10/2	3/17		CC	OMP. DAT	E 10/23/17	,	SURFACE	WATER DE	PTH N/	A	
COR	E SIZE	NQ			TOTA	AL RU	<b>N</b> 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) %	RQD (ft) %	L O G			DI	ESCRIPTION	I AND REMAR	KS		DEPTH (ft)
41.5 40	41.5	42.1	5.0	7:07/1.0 8:45/1.0 11:30/1.0	(4.2) 84%	(2.5) 50%		(3.5) 81%	(2.5) 58%		41.5		y to Gray RPHOSE	with White, D QUARTZ [	ing @ 42.1 ft Slightly to Very DIORITE with C grees to 45 deg	Slightly W lose Fract		
35	36.5	47.1	4.5	12:10/1.0 9:59/1.0 6:14/1.0	(3.3)	(0.0)		(4.0) 77%	(0.0)		37.2	Greenish Gra	Most of	core loss occ GS	ured at the star I = 65-85 Moderately to	t of the ru		46.4 Hard
	32.0	51.6		7:59/1.0 10:57/1.0 5:58/1.0 5:17/0.5	73%	0%					32.0	METAMORP	HOSED	QUARTZ DIC S	ORITE with Veng pacing gh angle fractur	y Close to	Close Frac	ture51.6
	_	‡		0.1770.0							- -			re loss scatte GS	y broken red throughout I = 25-45			
		<u> </u>									_	Borii			ation 32.0 ft in ( ED QUARTZ D		Rock:	
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	-	‡									-							
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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

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

Box 1: 41.5 Feet to 51.6 Feet



FEET

		BURE LUG					
<b>WBS</b> 37765.1.5		TY HALIFAX	GEOLOGIST Pastrana, C.R.	<b>WBS</b> 37765.1.5		ITY HALIFAX	GEOLOGIST Pastrana, C.R.
	Premier Boulevard Extension Over		GROUND WTR (ft)		n Premier Boulevard Extension Ove		GROUND WTR (1
BORING NO. EB2-A	<b>STATION</b> 101+23	OFFSET 32 ft LT	ALIGNMENT -L1- 0 HR. 4.8	BORING NO. EB2-C	<b>STATION</b> 101+23	OFFSET CL	ALIGNMENT -L1- 0 HR. 11.
COLLAR ELEV. 86.2 ft	TOTAL DEPTH 19.8 ft	<b>NORTHING</b> 975,135	<b>EASTING</b> 2,401,489 <b>24 HR.</b> 1.6	COLLAR ELEV. 87.3 ft	TOTAL DEPTH 31.2 ft	NORTHING 975,134	<b>EASTING</b> 2,401,521 <b>24 HR.</b> 2.
DRILL RIG/HAMMER EFF./DATE AN		DRILL METHO	DD H.S. Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE		DRILL METHOD	H.S. Augers HAMMER TYPE Automatic
DRILLER Meatyard, C.	<b>START DATE</b> 10/17/17	COMP. DATE 10/17/17	SURFACE WATER DEPTH N/A	<b>DRILLER</b> Meatyard, C.	<b>START DATE</b> 10/17/17	COMP. DATE 10/17/17	SURFACE WATER DEPTH N/A
BLEV COLUMN (ft) DEPTH (ft) 0.5ft 0.	0.5ft 0 25 50	75 100 NO. MO	Black and Gray, Soft to Medium Stiff, Slity  CLAY with Gravel, Highly Organic, Slightly  Plastic, Trace Sand	DRIVE   DEPTH   BLOW CO	t 0.5ft 0 25 50	75 100 NO. MOI G	87.3 GROUND SURFACE  ALLUVIAL  Black to Gray, Soft to Medium Stiff, Coarse to Fine Sandy Silty CLAY, Highly Organic, Slightly Plastic  RESIDUAL
77.7 = 8.5	85/0.2	W	RESIDUAL Orange Brown to Gray, Stiff to Very Stiff, Coarse to Fine Sandy Silty CLAY, Slightly Plastic  75.9 Brown and White, Medium Dense, Silty Coarse to Fine SAND  72.2 14.0 WEATHERED ROCK Brown and White Metamorphosed Quartz Diorite  86.4 Boring Terminated with Standard Penetration Test Refusal at Elevation 66.4 ft on Crystalline Rock: METAMORPHOSED QUARTZ DIORITE	75 70 65 60 58.8 28.5 56 44/0 56.1 31.2 60/0.0			Orange Brown, Medium Stiff, Silty CLAY, Slightly Plastic  Orange Brown, Medium Dense, Clayey Silty Coarse to Fine SAND  62.3  Rock Fragments and Fine to Coarse SAND  WEATHERED ROCK  METAMORPHOSED QUARTZ DIORITE

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	3776					<b>P</b> R-3822			HALIFAX				GEOLOGIS	T Pastran	a, C.R.		
SITE	DESCF	RIPTION	<b>I</b> Bric	dge on	Premi	ier Boulevard	Extension O	ver CI	hockoyotte	Creek						GROUN	ND WTR (ft)
BORI	NG NO	. EB2	-B		S.	TATION 10°	1+23		OFFSET 3	32 ft RT			ALIGNMEN	IT -L1-		0 HR.	4.0
COLL	AR EL	<b>EV</b> . 87	7.1 ft		To	OTAL DEPTH	<b>1</b> 38.7 ft		NORTHING	975,1	32		EASTING	2,401,553		24 HR.	1.1
DRILL	RIG/HA	MMER E	FF./DA	TE A	ME9533	CME-550X 83	% 01/0//2015	•		DRILL N	IETHO	<b>D</b> H.:	S. Augers		HAMM	ER TYPE	Automatic
DRILL	ER N	1eatyar	d, C.		S.	TART DATE	10/16/17		COMP. DA	<b>TE</b> 10/	16/17		SURFACE	WATER DEI	PTH N	'A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	O.5ft	0.5ft		0 25	BLOWS PER F 50		75 100	SAMP. NO.	MOI	L O G	ELEV. (ft)	SOIL AND RO	OCK DES	CRIPTION	DEPTH (ft
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-	63.6	23.5			50/0.4							7//	64.2	WEATH	ERED RO	OCK	22.9
		‡	26	50	50/0.4				100/0.9				G	reenish Brown		DRPHOSE	:D
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t	53.6	33.5	100/0.2						100/0.2								
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	48.6	+ - 38.5							100/0.2				48.4				38.7
	- - - - - -	+ + + + + + + + + + +	100/0.2											ing Terminate vathered Rock QUAR		<b>IORPHOS</b>	
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