57 REFERENCE

7405 3 **PROIECT**

STATE OF NORTH CAROLINA

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

CONTENTS

SHEET NO.

4 - 6

DESCRIPTION

TITLE SHEET LEGEND (SOIL & ROCK) SITE PLAN & WALL PROFILE BORING LOGS

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY **FORSYTH**

PROJECT DESCRIPTION US 158 (REIDSVILLE RD.) FROM NORTH OF US 421/I 40 BUS. TO SR 1965 (BELEWS CREEK RD.)

SITE DESCRIPTION RETAINING WALL NO.1 FROM -L-STA 28+40 (LT) TO -L-STA 32+07 (LT)

INVENTORY

STATE PROJECT REFERENCE NO. R-2577A 6

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENCINEERING UNIT AT (99) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

CENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN SORTINGS ON BETWEEN SAMPLED STRATA WITHIN THE BORCHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS AND WIND 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 SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE MIDICATED IN THE SUBSURFACE INFORMATION. THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

1. 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.

2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

J. MIZE A. BOZORGI S&ME PERSONNEL

S&ME PERSONNEL

INVESTIGATED BY _RK&K, LLP

DRAWN BY <u>J.</u>MIZE

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SUBMITTED BY _RK&K, LLP

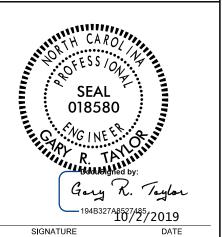
DATE **_JUNE 2019**

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PROJECT REFERENCE NO.

R-2577A

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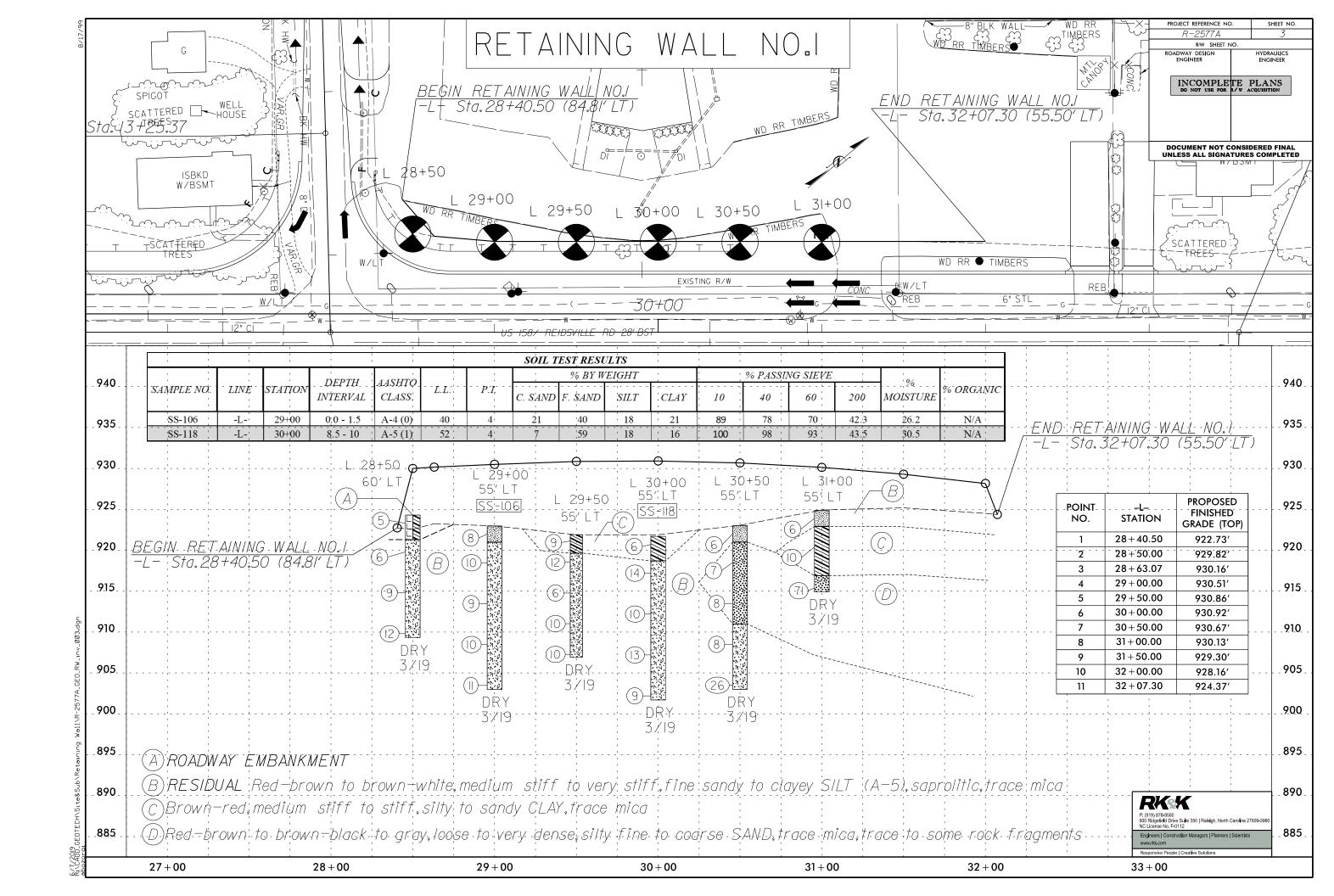
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN	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	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOO ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION		ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING:	GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	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.
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,		ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING
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: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE CRYSTALLINE WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	SURFACE.
	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	GNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
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-2-5 A-2-6 A-2-7 A-4, A-5 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YELD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.
000000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LL = 3! - 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
7. PASSING	05005117.05.05.111.7507.11	(CP) SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
*40 30 MX 50 MX 51 MN SOILS SOILS PER	T GRANULAR SILT - CLAY	- WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
*200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN	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.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
MATERIAL PASSING *40 CONC. MITH	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 48 MX 41 MN 41 MN LITTLE OR LITTLE OR HIGH	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	(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 Ø Ø Ø 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF SOI		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
USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	water level in bore hole immediately after drilling	(SLI.) ! INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
UF MAJUR GRAVEL, AND SAME GRAVEL AND SAME SOLIS SOLIS	▼ 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.
MATERIALS SANU	→ PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN (MOD.) 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 UNSUI	ABLE	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	WITH FRESH RUCK. 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.
RANGE OF STANDARD RANGE OF UNCONFINE		(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.
PRIMARY SOIL TYPE CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENG (N-VALUE) (TONS/FT ²)	TH ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
VERY LOOSE 6.4	SPI CHOOSE MUNICATION	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
GENERALLY LOOSE 4 TO 10 GRANULAR DESCRIPTION OF THE PROPERTY O	SOIL SYMBOL OPT ONT TEST BORING INSTALLATION SCURE INDICATOR	TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS
MATERIAL MEDIUM DENSE 10 TO 30 N/A MATERIAL DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER THAN ROADWAY EMBANKMENT AUGER BORING TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
(NON-COHESIVE) VERY DENSE > 50		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	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	TEST BORING MONITORING WELL TEST BORING	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.
MATERIAL STIFF 8 TO 15 1 TO 2	A PIEZOMETER	SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD > 30 > 4	TTTTT ALLUVIAL SOIL BOUNDARY A 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 PAREN ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE	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		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 UNCLASSIFIED EXCAVATION - UNDERCUT UNCLASSIFIED EXCAVATION - EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.) (GR.) (SE. 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	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 REDUIRED 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. HARD 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 $\dot{\gamma}_{ m d}$ - DRY UNIT WEIGHT	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE (ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPT.	ON 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	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	VERY CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH	LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY
LL LIQUID LIMIT	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; REQUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
(PI) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	FRAGS FRAGMENTS	FRACTURE SPACING BEDDING TERM SPACING TERM THICKNESS	BENCH MARK:
	FOUTPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	ELEVATION: FEET
OM POPTIMUM 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 MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	-
SL SHRINKAGE LIMIT	CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	6' CONTINUOUS FLIGHT AUGER CORE SIZE	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	ABBREVIATIONS: F.I.A.D FILLED IMMEDIATELY AFTER DRILLING
	CME-55 S CONTINUOUS FLIGHT HOUSER CORE SIZE: -B -H	INDURATION (0.000 FEET	- I I I I I I I I I I I I I I I I I I I
PLASTICITY		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	ROADWAY BORING ELEVATIONS DETERMINED FROM PROVIDED .TIN FILES
PLASTICITY INDEX (PI) DRY STRENGTH NON PLASTIC Ø-5 VERY LOW	CME-550	RUBRING WITH FINGER FREES NUMEROUS CRAINS.	
SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST □ □ HAND TOOLS•	FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH	CASING W/ ADVANCER POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;	
	PORTABLE HOIST TRICONE STEEL TEETH X HAND AUGER	BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	X DEIDRICH D-50 TRICONE TUNGCARB. SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY	. CORE BIT VANE SHEAR TEST	CHAND HAMMED BLOWS DECLIDED TO BREAK CAMPLE.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REGULTED TO BREAK SAMPLE;	



GEOTECHNICAL BORING REPORT BORE LOG

BORE LO																																			
WBS 37405.1.1 TIP R-2577A COUNTY FORSYTH									GEOLOG	IST AB	ozorgi			WBS	374	05.1.1			TIP	P R-257	7A	COUN	TY FORS	YTH		GEOLOG	GEOLOGIST A Bozorgi								
SITE DESCRIPTION US 158 From North of US 421/I-40 Bus. To SR 1965 (Belev													GROU	ND WTR (ft)	SITE	DESC	RIPTIO	N US	158 Fro	m Nor	rth of US	421/I-40	Bus. To S	SR 1965 (B	elews Cre	ek Rd.)				GROUND WTR (ft)					
BOF	BORING NO. L 28+50 STATION 28+50			OFFSET	60 ft LT			ALIGNMENT -L- 0 HR. Dry						RING N	O . L 29	9+00		STA	ATION	29+00		OFFSET	55 ft LT	•	ALIGNMENT -L-			0 HR . Dry							
COL	COLLAR ELEV. 924.3 ft TOTAL DEPTH 15.0 ft			NORTHIN	I G 863,8	397		EASTING	1,650,0)23	24 HR.	Dry	COL	LAR E	LEV . 9	23.0 ft		то	TAL DEF	TH 20.	0 ft	NORTHI	NG 863,	932	EASTING	1,650,059		24 HR. Dry							
DRIL	RIG/HA	MMER EF	F./DATE	SME275	DIEDRICH D	-50 90% 11	/08/2018		DRILL	METHOD	H.S.	S. Augers		HAI	MMER TYPE	Automatic	DRIL	L RIG/F	IAMMER	EFF./DA	TE SME	275 D	DIEDRICH I	0-50 90%	11/08/2018		DRILL	METHOD	H.S. Augers		HAMME	R TYPE Automatic			
DRII		William	ıs	S	TART DAT	E 03/20/1	9	COMP. D				SURFACE WATER DEPTH N/A						DRILLER T Williams						E 03/20	0/19	COMP. [DATE 03	/20/19	SURFAC	SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH_ (ft)	0.5ft 0.5		0		PER FOOT 50	75 100		MOI	OΙ	ELEV. (ft)	SOIL AN	D ROCK DE	ESCRIPTION	N DEPTH (f	ELEV (ft)	DRIV ELE	DEPTI (ft)	-	0.5ft 0		0	BLOW 25	/S PER FOO		SAMP 00 NO.	1/10		SOIL AND RO	OCK DESC	RIPTION			
925	924.3	0.0	2 2	3	\$ 5					M		· 924.3	ROAD	ROUND SUF DWAY EMBA medium stiff,	ANKMENT f, silty CLAY (0. (A-6),	1	923.0	0.0	2	4	4		T				6 26%	923.0	RE	ND SURFA				
920	920.8	3.5	2 3	3	6 · · · ·					M		9 <u>21.3</u> — Bro	— — — — own-orange, fine	race mic RESIDUA e, medium sti e sandy SIL	ca AL tiff to stiff, cla _T (A-5)		920	919.	3.5	3	5	5	10			1	·	W	⁸	Red-brown, stiff Brown-red, st	, fine sand iff, clayey S	/ <u>SILT (A-4)</u> 2. SILT (A-5)			
915	915.8 - - - - -		3 4	5	9					M	7 1 7 1 7 1						915	914.	5 + 8.5 +	4	4	5					-	W N							
910	910.8 -	13.5	4 5	7	12					M		909.3 Bo	oring Termi Resid	inated at Ele lual: clayey	evation 909.3 SILT (A-5)	15.0 3 ft in	910	909.	5 <u>13.5</u>	4	4	6	10					W .X							
	- - -										-						905	904.	5 18.5	3	5	6	1 1 • 11					W N		oring Terminate Residual:	d at Elevat	20. on 903.0 ft in			
	- - -										-								‡ ‡										- - -	r tooladai.	sayoy oiz	(1.0)			
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ZDWY.GFJ N	- - -										-								‡										<u>-</u> -						
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GEOTECHNICAL BORING REPORT BORE LOG

BORE LOG			
WBS 37405.1.1 TIP R-2577A COUNTY FORSYTH	GEOLOGIST A Bozorgi	WBS 37405.1.1 TIP R-2577A COUN	ITY FORSYTH GEOLOGIST A Bozorgi
SITE DESCRIPTION US 158 From North of US 421/I-40 Bus. To SR 1965 (Belews Creek Rd.)	GROUND WTR (ft)	SITE DESCRIPTION US 158 From North of US 421/I-40 Bus. To S	SR 1965 (Belews Creek Rd.) GROUND WTR (ft)
BORING NO. L 29+50 STATION 29+50 OFFSET 55 ft LT	ALIGNMENT -L- 0 HR. Dry	BORING NO. L 30+00 STATION 30+00	OFFSET 55 ft LT ALIGNMENT -L- 0 HR. Dry
COLLAR ELEV. 921.9 ft TOTAL DEPTH 20.0 ft NORTHING 863,970	EASTING 1,650,091 24 HR. Dry	COLLAR ELEV. 921.7 ft TOTAL DEPTH 20.0 ft	NORTHING 864,009 EASTING 1,650,123 24 HR. Dry
DRILL RIG/HAMMER EFF./DATE SME275 DIEDRICH D-50 90% 11/08/2018 DRILL METHOD H	S. Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE SME275 DIEDRICH D-50 90% 11/08/2018	DRILL METHOD H.S. Augers HAMMER TYPE Automatic
DRILLER T WilliamsSTART DATE 03/21/19COMP. DATE 03/21/19	SURFACE WATER DEPTH N/A	DRILLER T Williams START DATE 03/21/19	COMP. DATE 03/21/19 SURFACE WATER DEPTH N/A
DRIVE Company Compan	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)	DRIVE DEPTH BLOW COUNT BLOWS PER FOOT BLOWS PER FOOT	OT SAMP. L O SOIL AND ROCK DESCRIPTION NO. MOI G
925	921.9 GROUND SURFACE 0.0	925	
920 2 3 6 . •9······ W	RESIDUAL	920 2 3 3 4 6	· · · · · · W RESIDUAL
918.4 + 3.5	Brown-red, stiff, silty CLAY (A-6) Brown to brown-white, medium stiff to stiff,	918.2 3.5	Red-brown, medium stiff, fine to coarse sandy CLAY (A-6), trace mica3.0
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	clayey fine sandy SILT (A-5), saprolitic, trace	3 5 9	Red-brown to brown-gray, stiff, fine sandy SILT (A-5), trace mica
915	mica -	915	
913.4 † 8.5		913.2 + 8.5	
910		910	
908.4 + 13.5	-	908.2 13.5	
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905	-	905	· · · · · ·
903.4 † 18.5 4 4 6 1 1 1 1 1 1 1 1 1	901.9 20.0	903.2 18.5 3 4 5	
	Boring Terminated at Elevation 901.9 ft in Residual: clayey SILT (A-5)	+	Boring Terminated at Elevation 901,7 ft in
	Residual. dayey SiLT (A-5)		Residual: sandy SILT (A-5)
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GEOTECHNICAL BORING REPORT BORE LOG

В										BORE LOG																					_						T						
WBS 37405.1.1 TIP R-2577A SITE DESCRIPTION US 158 From North of US 421/I-40					Ÿ.										ji	Ι.			-	S 374						R-2577		NTY F			_		GEOLOGIST A Bozorgi										
					58 F				0 Bus. 7		•			₹d.)	1.	GROUND WTR (fi							-						om North of US 421/I-40 Bus. To SR STATION 31+00					•			.)				GROUND		
		0. L				-	TATION 3			-	OFFSET				ALIGNMENT -L- EASTING 1,650,155			0 HR.		Dry	-	RING N				_				<u>. </u>			55 ft LT			ALIGNM				0 HR.	Dry		
COLLAR ELEV. 923.0 ft TOTAL DEPTH 20.0 ft					NORTHING 864,047						1,650			24 HR.		Dry				924.9 ft			TOTAL DEPTH 10.0 ft E275 DIEDRICH D-50 90% 11/08/2018				NORTHING 86			20 11	EASTING	1,650 و		24 HR. HAMMER TYPE Auto		Dry							
	DRILL RIG/HAMMER EFF./DATE SME275 DIEDRICH DRILLER T Williams START DA							OMD F		DRILL METHOD H.S				NE 14/4 TE			ER TYPE	= Auton	natic					DAIE :							MD D				.S. Augers	- \A/A				Jtomatic			
					N CO		TART DATI		VS PER		JOIVIP. L		MP. T			JRFAC	E WATE							LLER DRIVI			BLOW CO		SIARI	IDAIE	03/21	PER FC		INIP. DA	SAMP		, 7 L T	SURFAC	EWAIE	K DEP	IH N/A		
(ft)	/ ELE (ft)	E DEP	t) 0			0.5ft	0 :	25	50	7:	5 10	11	. 17	MOI ()	V. (ft)	SOIL A	ND ROC	CK DES	CRIPTIO		PTH (ft)	ELE\ (ft)	ELEV (ft)	E DEPT	0.5	6ft 0.5f	_	t 0	2		50	75	100		/	O OI G		SOIL A	ND ROC	K DESCF	RIPTION	
925		_																	o cupe	AOF			925) 0.0) 2	3	3	$\frac{\parallel}{\parallel}$	1 6:		.	.			w		924.9		RES	SURFAC		0.0
920	923.	-		1	3	3	6						,	W	923 921	<u>0</u>	Red-browr	, mediun	SIDUAL n stiff, fi A-4)	ne sandy	i	0.0 2.0	920		1 3.5	3	4	6	∐ ∙	\ \ 10						w		_		(/ stiff, fine	4-4)to coarse	sandy SILT sandy CLA	i
	919.	5 + 3.	5	3	3	4	7						\	W		Re	ed-brown t	o brown- (A-2-4),	black, lo	ose, silty ica	SAND				1 8.5	5					````							 - <u>916.9</u>		,	A-6)	CANI	<u> </u>
915	914.	5 + 8.	5	4	5	3					· · · ·			w									915		1	5	14	57				. . ` `	<u>`</u> 71_			W		914.9	(A-2-4), t Borina Ter	race to s minated a	ome rock	coarse SANi fragments in 914.9 ft ir	10.0
910	909.	+ 5 <u>+</u> 13.	.5	2	3	5								**************************************	9 <u>1</u> 1	0Re	ed-brown, (A-	stiff to ve	ery stiff,	fine sand	ly SILT	12.0			†													- - -	. 100		, 0, 11, 12 (,	. = .,	
905		Ī		2	3	5							'	۷ .۸ ۸ .۸	; ; ; ;		,	77 1	,						Ī													- - -					
	904.	5 + 18	.5	2	5	21		26						W N	903	0 E	Boring Ter	minated a	at Eleva	tion 903.0	0 ft in	20.0																					
		‡															Kes	sidual: sa	andy Sil	I (A-5)					‡													- - - -					
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