SHEE TOTAL SHEETS STATE STATE PROJECT REFERENCE NO. NO. SF-890146 J.C 10 1 STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT **STRUCTURE** SUBSURFACE INVESTIGATION COUNTY _UNION SITE DESCRIPTION BRIDGE NO. 146 ON SR 2102 (MEDLIN RD.) OVER LITTLE RICHARDSON CREEK PERSONNEL **CONTENTS** J.K. STICKNEY SHEET NO. **DESCRIPTION** TITLE SHEET C.L. SMITH 2, 2A LEGEND (SOIL & ROCK) 3 SITE PLAN 4-9 BORE LOG(S) SITE PHOTOGRAPH(S) 10 INVESTIGATED BY _______ DRAWN BY _____. WALKER CHECKED BY ______. DATE ______ 2019 **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 SOLI TEST DATA AVAILABLE MAY BE REVEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, CEOTECHNICAL ENCINEERING UNIT AT 1999 1707-6805. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT. CAROLIN CENERAL SOL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEDTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATIORY SAMPLE DATA AND THE IN SITU UNPLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLI MOISTURE CONDITIONS INCLATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLI MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS. ۲H CENSED SEAL 2029 THE BIDDER OF CONTRACTOR IS CAUTOMED THAT DETAILS SHOWNON 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 OPHION 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 SH EDEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED AT THE STETEDIET OF THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FOM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION. BENNET DocuSigned by: t Stat NOTES: NOTES: NOTES: I. OFFETMINGSHOFTIONTIMONIFISINGELIGHEREIN NOR NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OR EDWINSHOFTIONTIME TREEDINGSINGTITMEONEDDEREDURRANTEEDTBE FLENS, SPEEFARFMENTS OR EDWINFAGETOURSTENE THROUGE ORMATIN, THE CONTRACTOR SPECIFICALLY MAVES ANY CLAIMS BORINGFAGETOURSTEDE THROUGE ORMATING, THE CONTRACTOR SPECIFICALLY MAVES ANY CLAIMS BORINGFAGETOURSTEDE THROUGH ORMATING NOTIFIC BORE FOR INFORMET ON SPECIFICATION DE BORINGFAGETOURSTENETING AND ENTERSTING ON THE CONTRACTOR SPECIFICATION SPECIFICATION THE CONDITIONS SADICATED HEREINNABE ENTERSTINATE CONTRACTOR SPECIFICATIONS AT THE PROJECT SITE. 957A7896505942019 SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

17RP_10.K

SF-890146 **REFERENCE:**

									PROJECT REFERENCE NO.	SHEET NO.
									SF-890146	2
						DIVISIO	N OF	F HIGHWAY	RANSPORTATION S RING UNIT	
			AND	ROC	K LE	GEND, T	ERMS		AND ABBREVIATION	
BE PENET	TRATED WITH	A CONTINUC	ATED, SEMI-CONS DUS FLIGHT POW	ER AUGER AN	WEATHERED D YIELD LES	EARTH MATERIALS TH 5 THAN 100 BLOWS P	ER FOOT		GRADATION TES A GOOD REPRESENTATION OF PARTICLE SIZES NDICATES THAT SOIL PARTICLES ARE ALL APPROX	
IS B	BASED ON TH	E AASHTO S	YSTEM. BASIC D	ESCRIPTIONS	GENERALLY I	1586). SOIL CLASSIF NCLUDE THE FOLLOW R PERTINENT FACTO	ING:	GAP-GRADED - INDICATE	S A MIXTURE OF UNIFORM PARTICLE SIZES OF T ANGULARITY OF GRAINS	WO OR MORE SIZES.
AS	S MINERALOG	SICAL COMPO	SITION, ANGULAR	ITY, STRUCTUR	RE, PLASTICIT	Y, ETC. FOR EXAMPLE			Y OR ROUNDNESS OF SOIL GRAINS IS DESIGNATE	D BY THE TERMS:
CENEDAL		DIL LEGI Granular mate	END AND 4	1	CLASSIFI MATERIALS	CATION		ANGULAR, SUBAN	NGULAR, SUBROUNDED, OR ROUNDED. MINERALOGICAL COMPOSITION	
GENERAL CLASS.	(:	≤ 35% Passing	= 200)	(> 35% PAS	SSING •200)	ORGANIC MATER	RIALS		MES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOL N DESCRIPTIONS WHEN THEY ARE CONSIDERED OF	
GROUP CLASS.	A-1-a A-1-b	A-3 A-2-4	A-2 A-2-5 A-2-6 A-2-7	A-4 A-5	A-6 A-7 A-7-5, A-7 <u>-</u> 6	A-1, A-2 A-4, A-5 A-3 A-6, A-7			COMPRESSIBILITY	
SYMBOL								MODE		31 - 50
	50 MX					GRANULAR SILT- CLAY	MUCK,	HIGH	LY COMPRESSIBLE LL > PERCENTAGE OF MATERIAL	שכ
	30 MX 50 MX 1 15 MX 25 MX 1		35 MX 35 MX 35 MX	K 36 MN 36 MN	36 MN 36 MN	SOILS SOILS	PEAT	ORGANIC MATERIAL		THER MATERIAL
MATERIAL PASSING #40						SOILS WITH		TRACE OF ORGANIC M LITTLE ORGANIC MAT	TER 3 - 5% 5 - 12% LITT	LE 10 - 20%
LL PI	_ 6 MX		41 MN 40 MX 41 MN 10 MX 11 MN 11 MN			LITTLE OR MODERATE	HIGHLY	MODERATELY ORGANIC HIGHLY ORGANIC	> 10% > 20% HIGH	
GROUP INDEX	0	0 0	4 MX	8 MX 12 MX	16 MX NO MX	AMOUNTS OF ORGANIC	ORGANIC SOILS		GROUND WATER	
OF MAJOR	GRAVEL, AND		.TY OR CLAYEY AVEL AND SAND	SILTY SOILS	CLAYEY SOILS	MATTER			WATER LEVEL IN BORE HOLE IMMEDIATELY AF STATIC WATER LEVEL AFTER 24 HOURS	TER DRILLING
MATERIALS GEN. RATING	SAND	EXCELLENT TO	CUUD	FAIR T	0. 2008	FAIR TO POOR	UNSUITABLE		PERCHED WATER, SATURATED ZONE, OR WATER B	BEARING STRATA
AS SUBGRADE			BGROUP IS ≤ LL -			PUUK	CHOOTHDEE	0-M-	SPRING OR SEEP	
			NSISTENCY	OR DEM	NSENESS				MISCELLANEOUS SYMBOLS	
PRIMARY S	SOIL TYPE		TNESS OR ISTENCY	PENETRATION	STANDARD I RESISTENCE ALUE)	RANGE OF UNC COMPRESSIVE (TONS/F	STRENGTH	L ROADWAY EMB	CANKMENT (RE) 25/025 DIP & DIP DIRECTION	
GENERAL	LLY		LOOSE	<	4			SOIL SYMBOL	OPT DMT TEST BORING	SLOPE INDICATOR
GRANULA MATERIA		MEDIU	DOSE M DENSE ENSE	10 T	010 030 050	N/A		M		CONE PENETROMETER
(NON-CO	HESIVE)	VERY	DENSE	>	50				\leftarrow	TEST SOUNDING ROD
GENERAL SILT-CL		S	(SOFT OFT M STIFF	2 T	2 04 08	< 0.25 0.25 TO 0.5 TO	0.5		MW -	TEST BORING
MATERIA (COHESI)	ΆL.	S	TIFF	8 T	015	1 TO 2	2	INFERRED ROO		WITH CORE
		н		>	30	> 4				J- SFT N-VALUE
U.S. STD. SIE	EVE SIZE		4 10	40	60 200	270				LASSIFIED EXCAVATION -
OPENING (MM	M)		4.76 2.00		0.25 0.075 FINE	5 0.053		SHALLOW	UNCLASSIFIED EXCAVATION - USE	EPTABLE, BUT NOT TO BE D IN THE TOP 3 FEET OF ANKMENT OR BACKFILL
BOULDER (BLDR.)		BLE 0 0B.)	GRAVEL (GR.)	SAND	SAND (F SD	SIL I	CLAY (CL.)			STREET, ON DECKFILL
GRAIN MM SIZE IN.		75	2.0		0.25	0.05 0.00	5	AR - AUGER REFUSAL BT - BORING TERMINATEI	MED MEDIUM VS	ST - VANE SHEAR TEST EA WEATHERED
512E IN.			STURE - C	ORRELAT	ION OF	TERMS		CL CLAY CPT - CONE PENETRATIO	MOD MODERATELY 2	Y - UNIT WEIGHT Y - UNIT WEIGHT Y - DRY UNIT WEIGHT
	MOISTURE S	SCALE	FIELD MO DESCRIP	ISTURE		FIELD MOISTURE DE	SCRIPTION	CSE COARSE DMT - DILATOMETER TES	ORG ORGANIC	SAMPLE ABBREVIATIONS
			- SATURA		USUALLY LI	DUID; VERY WET, USL	JALLY	DPT - DYNAMIC PENETRA e - VOID RATIO	TION TEST SAP SAPROLITIC S	- BULK 5 - SPLIT SPOON
ᄕᇆᆮ		LIMIT	(SAT.)			THE GROUND WATE		F - FINE FOSS FOSSILIFEROUS	SL SILT, SILTY SI	T - SHELBY TUBE 5 - ROCK
PLASTIC RANGE <			- WET - (REQUIRES DRYING TI IMUM MOISTURE	D	FRAC FRACTURED, FRAC FRAGS FRAGMENTS	w - MOISTURE CONTENT CE	T - RECOMPACTED TRIAXIAL 3R - CALIFORNIA BEARING
(PI) PL		LIMIT						HI HIGHLY EQ	V - VERY UIPMENT USED ON SUBJECT PROJ	RATIO
OM SL		4 MOISTURE AGE LIMIT	- MOIST -	- (M)	SOLID; AT O	R NEAR OPTIMUM M	OISTURE	DRILL UNITS:	ADVANCING TOOLS: HAMM	ER TYPE:
			- DRY - (DDITIONAL WATER T	0	CME-45C		
			PLA	STICITY		MON MUISTURE		CME-55	X 8' HOLLOW AUGERS CORE	SIZE: Вн
	B. 4			CITY INDEX (PI)	DRY STREN		CME-550		N
SLIC	PLASTIC			0-5 6-15 16-25		VERY LON SLIGHT		VANE SHEAR TEST	X CASING W/ ADVANCER	TOOLS:
	ERATELY PL HLY PLASTIC			16-25 OR MORE		MEDIUM HIGH		PORTABLE HOIST		POST HOLE DIGGER
<u> </u>			C	OLOR				X <u>CME-550X</u>	TRICONE TUNGCARB.	SOUNDING ROD
						YELLOW-BROWN, BLU ESCRIBE APPEARANC				VANE SHEAR TEST

					PROJECT REFERENCE NO.	SHEET NO.
					SF-890146	2A
		NORTH	CAROLINA DEPARTMI DIVISION OF			
		GEO1	ECHNICAL EN			
	SI	UBS	URFACE IN	NVE	STIGATION	V
	SOIL	AND R	OCK LEGEND, TERMS, (PAGE 2		LS, AND ABBREVIATIO	NS
		ROCK DES			TERMS AND DEFINITIONS	
ROCK LINE 1 SPT REFUSA BLOWS IN N REPRESENTE	INDICATES THE LEVEL AL IS PENETRATION B NON-COASTAL PLAIN D BY A ZONE OF WEA	AT WHICH NON-COAS Y A SPLIT SPOON SA MATERIAL, THE TRAN ATHERED ROCK.	OULD YIELD SPT REFUSAL IF TESTED, AN INFERRED STAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL, MPLER EQUAL TO OR LESS THAN 0,1 FOOT PER 60 MSITION BETWEEN SOIL AND ROCK IS OFTEN	<u>AQUIFER</u> - A <u>ARENACEOUS</u>	<u>LUV.</u>) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. WATER BEARING FORMATION OR STRATA. - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAN	
WEATHERED	RIALS ARE TYPICALLY		N MATERIAL THAT WOULD YIELD SPT N VALUES >		5 - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF ROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHAL	
ROCK (WR) CRYSTALLINE ROCK (CR)	E	100 BLOWS PER FO FINE TO COARSE G WOULD YIELD SPT	OT IF TESTED. RAIN IGNEOUS AND METAMORPHIC ROCK THAT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE.	WHICH IT IS SURFACE.	ROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO F ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO	O OR ABOVE THE GROUND
NON-CRYSTA			RAIN METAMORPHIC AND NON-COASTAL PLAIN THAT WOULD YEILD SPT REFUSAL IF TESTED.		(CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF I ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVIT	
ROCK (NCR)	AIN	ROCK TYPE INCLUD	ES PHYLLITE, SLATE, SANDSTONE, ETC. DIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	OF SLOPE.	RY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED I	
SEDIMENTAR (CP)	Y ROCK	SPT REFUSAL. ROCI SHELL BEDS, ETC. WEATH	C TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	BY TOTAL LE	NGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.	
FRESH	ROCK FRESH, CRYSTA HAMMER IF CRYSTAL	LS BRIGHT, FEW JOINT	S MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER	DIP - THE AN	TS MASSIVE ROCK. IGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS IM	NCLINED FROM THE
VERY SLIGHT (V SLI.)	ROCK GENERALLY FR	ESH, JOINTS STAINED, KEN SPECIMEN FACE S	SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, HINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF		N (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HOP MEASURED CLOCKWISE FROM NORTH.	RIZONTAL TRACE OF THE
SLIGHT (SLI.)	1 INCH. OPEN JOINTS	MAY CONTAIN CLAY.	AND DISCOLORATION EXTENDS INTO ROCK UP TO IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR /STALLINE ROCKS RING UNDER HAMMER BLOWS.	SIDES RELATI	RACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEE VE TO ONE ANOTHER PARALLEL TO THE FRACTURE. PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLE	
MODERATE (MOD.)	SIGNIFICANT PORTIO GRANITOID ROCKS, MO	NS OF ROCK SHOW DIS DST FELDSPARS ARE D	COLORATION AND WEATHERING EFFECTS. IN ULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS HOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	FLOAT - ROCH PARENT MATE	FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION	N AND DISLODGED FROM
MODERATELY SEVERE (MOD. SEV.)	AND DISCOLORED AND	D A MAJORITY SHOW K	STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH T'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK.	FORMATION (F FIELD.	<u>(M)</u> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZE TURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT I	ed and traced in the
SEVERE	<u>IF TESTED, WOULD Y</u> ALL ROCK EXCEPT Q	<u>IELD SPT REFUSAL</u> WARTZ DISCOLORED OF	STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT	LEDGE - A SH ITS LATERAL	ELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNE EXTENT.	ESS IS SMALL COMPARED TO
VERY	<u>IF TESTED, WOULD Y</u>	IELD SPT N VALUES >	RONG ROCK USUALLY REMAIN. <i>100 BPF</i> STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	MOTTLED (MO USUALLY INDI	DY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE D I.J - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COL CATES POOR AERATION AND LACK OF GOOD DRAINAGE.	ORS. MOTTLING IN SOILS
SEVERE (V SEV.)	REMAINING. SAPROLI	TE IS AN EXAMPLE OF	DIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK ROCK WEATHERED TO A DEGREE THAT ONLY MINOR IN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	OF AN INTERV	ER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATE /ENING IMPERVIOUS STRATUM. S.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF	
COMPLETE			DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	ROCK SEGMEN	<u>Y DESIGNATION (ROD)</u> - A MEASURE OF ROCK QUALITY DESC TS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY TH RESSED AS A PERCENTAGE.	
VERY HARD	CANNOT RE SCRATCH	ROCK HA	ARDNESS P PICK. BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (S ROCK.	AP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTUR	E OR FABRIC OF THE PARENT
HARD	SEVERAL HARD BLOW CAN BE SCRATCHED	S OF THE GEOLOGIST" BY KNIFE OR PICK ON		RELATIVELY	TRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIF(THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEE OR SCHISTOSITY OF THE INTRUDED ROCKS.	
MODERATELY HARD	EXCAVATED BY HARD	BY KNIFE OR PICK. GO BLOW OF A GEOLOGIS	UGES OR GROOVES TO 0.25 INCHES DEEP CAN BE T'S PICK. HAND SPECIMENS CAN BE DETACHED	<u>SLICKENSIDE</u> OR SLIP PLAN	- POLISHED AND STRIATED SURFACE THAT RESULTS FROM IE.	
MEDIUM HARD		GOUGED 0.05 INCHES IN SMALL CHIPS TO P	DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. EICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	A 140 LB. HAN WITH A 2 INC	NETRATION TEST (PENETRATION RESISTANCE)(SPT) - NUMBE MMER FALLING 30 INCHES REDUIRED TO PRODUCE A PENET HOUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSA THAN 0.1 FOOT PER 60 BLOWS.	RATION OF 1 FOOT INTO SOIL
SOFT	CAN BE GROVED OR FROM CHIPS TO SEV	GOUGED READILY BY K	NIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	<u>STRATA CORE</u> TOTAL LENGT	RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL H OF STRATUM AND EXPRESSED AS A PERCENTAGE.	
VERY SOFT	CAN BE CARVED WIT OR MORE IN THICKNE FINGERNAIL.	H KNIFE. CAN BE EXCA ESS CAN BE BROKEN B	VATED READILY WITH POINT OF PICK. PIECES 1 INCH Y FINGER PRESSURE. CAN BE SCRATCHED READILY BY	LENGTH OF R THE TOTAL L	<u>QUALITY DESIGNATION (SROD)</u> - A MEASURE OF ROCK OUAL DOCK SECMENTS WITHIN A STRATUM EQUAL TO OR GREATER ENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.	
TERM	FRACTURE SPA	SPACING	BEDDING	BENCH MA	ARK: BM #2: RR SPIKE IN 15" BIRCH, -L- STA	4.17+55.42,43.59'LT
VERY WID	3	THAN 10 FEET TO 10 FEET	VERY THICKLY BEDDED 4 FEET THICKLY BEDDED 1.5 - 4 FEET		ELEVA	TION: 500.95 FEET
CLOSE	0.1	TO 3 FEET 6 TO 1 FOOT	THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET	NOTES:		
VERY CLO	OSE LESS	THAN 0.16 FEET	THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	FIAD= FILL	ED IMMEDIATELY AFTER DRILLING	
		INDUR	ATION NG OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	-		
FRIA		RUBBING WITH	FINGER FREES NUMEROUS GRAINS; Y HAMMER DISINTEGRATES SAMPLE.			
MODE	RATELY INDURATED	GRAINS CAN BE	SEPARATED FROM SAMPLE WITH STEEL PROBE;			
INDUR	RATED	GRAINS ARE DI	WHEN HIT WITH HAMMER. FICULT TO SEPARATE WITH STEEL PROBE;			
			BREAK WITH HAMMER. BLOWS REOUIRED TO BREAK SAMPLE;			
EXIR	EMELY INDURATED		ACROSS GRAINS.			DATE: 8-15-14

													UG					
WBS	17BP.	10.R.1	27		ТІ	P SF	-8901	46	C	OUNT	Y UI	NON				GEOLOGIST Stickney, J. K.		
SITE	DESCR	IPTION	Brid	ge No	o. 146 d	on SR	2102	(Medlir	ו Rd.)	over l	ittle	Richard	dson Cre	eek			GROUN	ID WTR (fi
BORI	NG NO.	EB1-	A		S	ΓΑΤΙΟΙ	N 16	+05			OFF	SET 8	3 ft LT			ALIGNMENT -L-	0 HR.	6.
COLL	AR ELE	V. 50)3.1 ft		т	OTAL I	DEPTH	H 20.5	5 ft		NOF	RTHING	436,7	22		EASTING 1,546,032	24 HR.	FIA
ORILL	RIG/HAN	VIMER E	FF./DA	TE H	FO0070	CME-5	50X 81	1% 06/0	4/2018	3			DRILL N	NETHO	D N	V Casing w/ SPT HAMM	ER TYPE	Automatic
DRILL	ER SI	mith C			S		DATE	03/28	3/19		CON	IP. DA	TE 03/:	28/19		SURFACE WATER DEPTH N/	Δ	
	DRIVE	DEPTH	1	W CO						RFOOT			SAMP.	-	1 L T	1		
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	-	0	25	5	50		75	100	NO.	мо	O G	SOIL AND ROCK DESC ELEV. (ft)	RIPTION	DEPTH
							1							[
505																		
	-	-														- 503.1 GROUND SURFA	CE	(
	-	-													ES	ROADWAY EMBANI Red-Orange, Silty (
500	_	-				í:			· ·		·					-		
_	497.9	5.2	1	3	3			· · · ·	: :							497.9 ALLUVIAL		5
495	-	-			Ŭ	● ⁶		· · · · · ·	: :					<u>—м</u> —	N	Gray, Silty CLA	Y	
	492.9	- 10.2									1.				N	RESIDUAL		
-	492.9 -	- 10.2	22	26	74/0.3	· ·	· · ·	 _ <u></u> _	· ·			100/0.8				491.9 Blue-Gray, Sandy Silt WEATHERED RC		11
490	-	-							· ·		<u> </u>					Gray (META-ARGI		
_	487.9	_ 15.2	100/0.4				•••	· · · · · ·					,					
485	-	-	100/0.4					· · · · · ·	: :			100/0.4						
	482.9	20.2									1.					-		
F	402.9 -	- 20.2	100/0.3			<u> </u>	• •		• •	•••	·	100/0.3	Ч			482.6 Boring Terminated at Eleval Weathered Rock (META-	ion 482.6	20 ft in

													00					
WBS	17BP.	.10.R.1	27		Т	IP	SF-8901	46	C	OUNTY	UN V	NON				GEOLOGIST Stickney, J. K.	-	
SITE	DESCR	IPTION	Brid	lge No	o. 146	on S	SR 2102	(Medlir	n Rd.)	over L	ittle F	Richard	dson Cre	eek			GROUN	ID WTR (ff
BORI	NG NO.	EB1	-B		S	TAT	FION 15	5+94			OFF	SET 8	3 ft RT			ALIGNMENT -L-	0 HR.	5.
COLL	AR ELE	EV. 50	03.4 ft		Т	ΟΤΑ	AL DEPT	H 20.6	6 ft		NOR	THING	4 36,7	23		EASTING 1,546,012	24 HR.	FIA
SITE DESCRIPTION Bridge No. 146 on SR 2102 (Medlin Rd.) over Little Richardson Creek GROUND WTR (ft) BORING NO. EB1-B STATION 15+94 OFFSET 8 ft RT ALIGNMENT -L- 0 HR. 5.8																		
DRILL	.ER S	mith, C). L.		S	TAF		03/28	3/19		CON	IP. DA	TE 03/	28/19		SURFACE WATER DEPTH N	/A	
LEV	DRIVE	DEPTH	BLC	ow co	UNT			BLOW	'S PER	FOOT			SAMP.	▼/				
	ELEV			0.5ft	0.5ft	0	2	5	50		75	100	NO.	мо			CRIPTION	DEPTH
505																		
	-	[Ц.									F	503.4 GROUND SURF	ACE	(
	-	F				¦												
500	-	F														<u>.</u>		
ŀ	498.0	5.4	2	1	2	Ηİ	· · · ·			· · · · · ·					LN:	497 በ		f
195	-	F					3 · · ·			· · · · · ·					N	ALLUVIAL	~	
	403.0										· ·				N	RESIDUAL		
ľ	493.0	- 10.4 -	100/0.5			'		- 	-+-							Diue-Gray, Sanuy Si	TY CLAY	
90	-	+					· · · ·		· ·		··					- Gray (META-ARG	LLITE)	
-	488.0	15.4	100/0 /				· · · ·	· · · · · ·		· · · · · ·								
185	-	ŧ	100/0.4	•			· · · · ·	· · · · · ·	: :	· · · · · ·								
105	-	- -									1.					-		
F	483.0	20.4	100/0.2						. .		<u> </u>	100/0.2	Н	<u> </u>	-	Boring Terminated at Eleva	tion 482.8	ft in
	-	ŧ.														- Weathered Rock (META	ARGILLITI	=)
	-	ŧ.																
	-	ŧ																
	-	F														-		
	-	<u> </u>																
	-	L														_		
	-	Ł													ΙĿ			
	-	Ł													ΙĿ			
	_	F													F	-		
	-	F													F			
	-	F													I F			
	-	F													F	-		
	-	ŧ													ļĘ			
	-	ŧ.														-		
	-	ł																
	-	ł																
	-	F														-		
	-	L													ΙĿ			
	-	L																
	-	Ł													ΙĿ			
	-	F																
	_	F													F	-		
	-	F													F			
	-	ŧ																
	-	ŧ														-		
	-	ŧ																
	-	ŧ													E	-		
	-	Ł											1		[
	-	ł											1		F			
	-	Γ				1							1					

			URE LOG		
VBS 17BP.10.R.127	TI	IP SF-890146 COUNT	UNION	GEOLOGIST Stickney, J. K.	
ITE DESCRIPTION	Bridge No. 146 o	on SR 2102 (Medlin Rd.) over I	ittle Richardson Creek		GROUND WTR (ft)
ORING NO. B1-A	ST	TATION 16+41	OFFSET 18 ft LT	ALIGNMENT -L-	0 HR. 0.6
OLLAR ELEV. 495.8	3 ft TC	OTAL DEPTH 28.7 ft	NORTHING 436,695	EASTING 1,546,058	24 HR. 0.6
RILL RIG/HAMMER EFF.	DATE HFOO070	0 CME-550X 81% 06/04/2018	DRILL METHOD NM	Casing w/SPT HAMM	ER TYPE Automatic
RILLER Smith, C. L.	ST	TART DATE 03/28/19	COMP. DATE 03/28/19	SURFACE WATER DEPTH N/	A
LEV DRIVE DEPTH	BLOW COUNT 5ft 0.5ft 0.5ft	BLOWS PER FOOT 0 25 50	75 100 NO	SOIL AND ROCK DESC ELEV. (ft)	
00				495.8 GROUND SURFA	CE 0
				ALLUVIAL Silty SAND with Gr	
90 491.7 - 4.1	7 13 24	■		491.7 RESIDUAL Blue-Gray, Silty CLAY with R	4. ock Fragments
				488.2 WEATHERED RC Gray (META-ARGIL	
85 484.7 11.1 5	0 10/0.0		· 100/0.5		
180 479.7 16.1 + 100	/0.4		· · · · · · · · · · · · · · · · · · ·		
75 474.7 21.1					
	/0.2		· 100/0.2		
469.7 <u>26.1</u> 469.7 100	/0.2	· · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · · ·	. 100/0.2 •	467.1	28
				Boring Terminated with Cas Refusal at Elevation 467.1 ft Rock (META-ARGIL	on Crystalline

												<u> 7</u>		<u>.OG</u>					
VBS	17BP	.10.R.1	27		TI	P S	F-890	146		COL	JNTY	UN	ION				GEOLOGIST Stickney, J. K.	_	
SITE	DESCR		l Brid	ge No	. 146 c	on SI	R 2102	2 (Me	edlin F	(d.) o	ver L	ittle F	Richar	dson Cr	eek			GROUN	ID WTR (ft
ORI	NG NO.	. B1-B			S	ΓΑΤΙΟ	DN 1	6+25	5			OFF	SET	19 ft RT			ALIGNMENT -L-	0 HR.	0.4
OLL	AR ELI	EV. 49	6.1 ft		т	DTAL	DEP	ТН 2	25.5 fl			NOR	THING	3 436,6	691		EASTING 1,546,018	24 HR.	0.4
		MMER E		TE HF												D NV			Automatic
		mith, C					DAT					CON		TE 03/			SURFACE WATER DEPTH N	/Δ	
	DRIVE	1		W COL					OWS F				IF . DA	SAMP	-	1 L T	JURFACE WATER DEFTH IN	A	
_EV (ft)	ELEV (ft)	DEPTH (ft)	0.5ft		0.5ft	0		ар 25		50		75	100	NO.	мо	0	SOIL AND ROCK DES	CRIPTION	DEPTH (
												1			[
500																			
	-	ŧ															-		
	-	‡															496.1 GROUND SURF.	ACE	C
195	-	<u> </u>				+r											ALLUVIAL		
	-	ł						.								-	Silty SAND with G	ravel	
	490.9	5.2					· _ · _ · .	↓÷.	<u> </u>		•••						491.9 490.9 RESIDUAL		4
90	490.9	- 0.2	100/0.5			·		·		<u> </u>			100/0.5				_ Blue-Gray, Silty C	LAY	
	-	ŧ					· · · · · ·		· · · · · ·		· · · ·						WEATHERED R Gray (META-ARG		
	485.9	10.2					· · ·	:	· · ·		•••							,	
85	-	ł	100/0.4									<u> </u> '	100/0.4				-		
	-	Ŧ						:			•••								
30	480.9	15.2	100/0.4				· · · · · ·		· · · · · ·		· · · ·								
50	-	ŧ	100/0.4					+:		<u> </u>		<u> </u>	100/0.4				-		
	-	t					· · ·		 		· · · ·								
75	475.9	20.2	100/0.2			.					• •	· ;	100/0.2			Ø			
	-	Ŧ						·		· ·		· ·]				-		
	-	†					· · ·		· · ·		· · · ·								
ŧ	470.9	25.2	100/0.3			.		· ·			• •		100/0.3			CH.S.	470.6 - Boring Terminated at Eleva	tion 470.6	
	- - - - - - - - - - - - - - - - - - -	+ + + + + + + + + + + + + + + + + + +															-		
	- - -																-		
	• - -																-		
	- - -																-		
	-	+ + +															-		
	-																-		
	-	t														-			
	-	Ľ														I F			

									<u>URE L</u>	<u> </u>					
WBS	17BP.	10.R.1	27		ד	Р	SF-890146	COUNT	Y UNION				GEOLOGIST Stickney, J. K.		
SITE D	ESCR	IPTION	Brid	lge No	. 146 0	on S	SR 2102 (Medlir	Rd.) over	ittle Richard	lson Cre	ek	-		GROUN	D WTR (f
BORIN	IG NO.	EB2-	A	-	S	ТАТ	TION 17+06		OFFSET 8	B ft LT			ALIGNMENT -L-	0 HR.	4.
	AR ELE						AL DEPTH 20.4	1 ft	NORTHING		33			24 HR.	FIAD
				TE 11			/E-550X 81% 06/0								Automatic
													-		AULOTTALIC
DRILLE		mith, C				TAR	RT DATE 03/28		COMP. DAT		28/19		SURFACE WATER DEPTH N/	A	
ELEV E	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0W CO	UNT 0.5ft	0		S PER FOOT 50	75 100	SAMP. NO.	моі	L O G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION	DEPTH
505							<u></u>	· · · · · ·					502.2 GROUND SURFA	KMENT	(
500	-	-							· · · · ·		\bigtriangledown		Asphalt and Select N	laterial	
495	496.9 -	5.3 	1	3	4		• • • • • • • • • • • • • • • • • • •				м	N	496.9 ALLUVIAL 194.2 Tan-Brown-Gray, Sandy	Silty CLAY	. 5
	491.9	 10.3					· · · · · · · · ·	· · · · ·	· - · · ·				494.2 RESIDUAL 492.9 RESIDUAL Blue-Gray, Sandy Silt		§
190	491.9 - - -	- 10.3 - -	100/0.2				· · · · · · · · · · · · · · ·	· · · · · ·	100/0.2				WEATHERED RO Gray (META-ARGII	OCK	/
4	- 486.9 -	- - 15.3					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·						
185	-	-	100/0.2	1			· · · · · · · · · · · · · · · · · · ·	· · · · ·	100/0.2						
4	- 481.9 -	20.3	60/0.1				· · · · · · · · · · · ·	· · · · ·	<u> </u>				481.8 Boring Terminated at Elevat	ion 481 8 f	20 t on
]]]]														

												<u> </u>	00								
WBS	17BP	. 10.R .1	127		Т	P SI	-8901	46	C	OUNT	YUN	IION				GEOL	.OGIST	Stickne	ey, J. K.		
SITE	DESCR	IPTIO	N Brid	lge No	o. 146 d	on SR	2102	(Medli	n Rd.)	over l	_ittle F	Richard	dson Cre	eek						GROUN	ID WTR (ft
ORI	NG NO.	. EB2	-В		S	ΓΑΤΙΟ	DN 16	6+95			OFF	SET 8	8 ft RT			ALIG	MENT	-L-		0 HR.	4.0
OLL	AR ELI	EV. 5	02.5 ft		т	DTAL	DEPT	H 19.	3 ft		NOR	THING	4 36,6	35		EAST	ING 1,	546,061		24 HR.	FIAD
RILL	rig/ha	MMER E	EFF./DA	ТЕ Н	FO0070	CME-	550X 8	1% 06/0	04/2018	3			DRILL	NETHC	D N	V Casing	w/ SPT		HAM	VER TYPE	Automatic
RILL	.ER S	mith. C	C. L.		S	TART	DATE	03/28	3/19		CON	IP. DA	TE 03/	28/19		SURF	ACE W	ATER DE	PTH N	I/A	
LEV	DRIVE ELEV	DEPTH	1	ow co						FOOT			SAMP.		1 - 1						
ft)	ELEV (ft)	(ft)	0.5ft	1	-	0	2	5	50		75	100	NO.	мо	O I G	ELEV. (ft		DIL AND R	OCK DES	CRIPTION	DEPTH (
																	/				
505																					
<u>/////////////////////////////////////</u>	-	ŧ														-					
	-	<u> </u>				· ·	• • •		• •		· ·					502.5		GROU ROADWA	ND SURF		0
600	-	t					· į· ·		• •							-		Asphalt ar			
	498.2	4.3					:							$ert \nabla$	Ļ E	497.7					4
	-	Ŧ	3	6	8		• •14_			• • •		•••		м	N	495.6	Ton	A Brown Cu		y Silty CLAY	
95	-	Ŧ													N	493.9		R	ESIDUAL		8
ŀ	493.2	9.3	100/0.2	2								100/0.2						Blue-Gray, WEAT	Sandy Si HERED R		
90	-	ŧ				:	· · ·	· · · · · ·	: :	· · · ·								Gray (M			
30	488.2	+ 112									1.					-					
F	400.2	+ 14.3 +	100/0.4	1			· · ·	· · ·	· · ·	· · ·		100/0.4									
85	-	t							• •							-					
Ļ	483.2	19.3				.						60/0.0				483.2					19
	-	ł	60/0.0									00/0.0 -			-					ation 483.2 f FA-ARGILLI	
	-	ł														-					
	-	Ŧ													I F						
	-	ŧ																			
	-	ŧ														-					
	-	ŧ																			
	-	Ł													ΙĿ	_					
	-	Ŧ													I F	-					
	-	ŧ													I F						
	-	‡														-					
	-	ţ																			
	-	ŧ													ΙĿ						
	-	ŧ													ΙĿ	-					
	-	Ŧ													-						
	-	Ŧ													F						
	-	ŧ														-					
	-	‡																			
	-	Ł													ΙĿ	_					
	-	ł													-						
	-	Ŧ													F						
	-	‡														-					
	-	ŧ																			
	-	ŧ													ΙĿ						
	-	ŧ													ΙĿ	-					
	-	f													F						
	-	Ŧ																			
	-	ŧ														-					
	-	t																			
	-	ł													F						
	-	Ŧ														-					
	-	‡																			
		<u>t</u>													╘						

												<u> </u>	00								
WBS	17BP	. 10.R .1	127		Т	P SI	-8901	46	C	OUNT	YUN	IION				GEOL	.OGIST	Stickne	ey, J. K.		
SITE	DESCR	IPTIO	N Brid	lge No	o. 146 d	on SR	2102	(Medli	n Rd.)	over l	_ittle F	Richard	dson Cre	eek						GROUN	ID WTR (ft
ORI	NG NO.	. EB2	-В		S	ΓΑΤΙΟ	DN 16	6+95			OFF	SET 8	8 ft RT			ALIG	MENT	-L-		0 HR.	4.0
OLL	AR ELI	EV. 5	02.5 ft		т	DTAL	DEPT	H 19.	3 ft		NOR	THING	4 36,6	35		EAST	ING 1,	546,061		24 HR.	FIAD
RILL	rig/ha	MMER B	EFF./DA	ТЕ Н	FO0070	CME-	550X 8	1% 06/0	04/2018	3			DRILL	NETHC	D N	V Casing	w/ SPT		HAM	VER TYPE	Automatic
RILL	.ER S	mith. C	C. L.		S	TART	DATE	03/28	3/19		CON	IP. DA	TE 03/	28/19		SURF	ACE W	ATER DE	PTH N	I/A	
LEV	DRIVE ELEV	DEPTH	1	ow co						FOOT			SAMP.		1 - 1						
ft)	ELEV (ft)	(ft)	0.5ft	1	-	0	2	5	50		75	100	NO.	мо	O I G	ELEV. (ft		DIL AND R	OCK DES	CRIPTION	DEPTH (
	()																/				
505																					
<u>/////////////////////////////////////</u>	-	ŧ														-					
	-	<u> </u>				· ·	• • •		• •		· ·					502.5		GROU ROADWA	ND SURF		0
600	-	t					· į· ·		• •							-		Asphalt ar			
	498.2	4.3					:							$ert \nabla$	Ļ E	497.7					4
	-	Ŧ	3	6	8		• •14_			• • •		•••		м	N	495.6	Ton	A Brown Cu		y Silty CLAY	
95	-	Ŧ													N	493.9		R	ESIDUAL		8
ŀ	493.2	9.3	100/0.2	2								100/0.2						Blue-Gray, WEAT	Sandy Si HERED R		
90	-	ŧ				:	· · ·	· · · · · ·	: :	· · · ·								Gray (M			
30	488.2	+ 112									1.					-					
F	400.2	+ 14.3 +	100/0.4	1			· · ·	· · ·	· · ·	· · ·		100/0.4									
85	-	t							• •							-					
Ļ	483.2	19.3				·						60/0.0				483.2					19
	-	ł	60/0.0									00/0.0 -			-					ation 483.2 f FA-ARGILLI	
	-	ł														-					
	-	Ŧ													I F						
	-	ŧ																			
	-	ŧ														-					
	-	ŧ																			
	-	Ł													ΙĿ	_					
	-	Ŧ													I F	-					
	-	ŧ													I F						
	-	‡														-					
	-	ţ																			
	-	ŧ													ΙĿ						
	-	ŧ													ΙĿ	-					
	-	Ŧ													-						
	-	Ŧ													F						
	-	ŧ														-					
	-	‡																			
	-	Ł													ΙĿ	_					
	-	ł													-						
	-	Ŧ													F						
	-	‡														-					
	-	ŧ																			
	-	ŧ													ΙĿ						
	-	ŧ													ΙĿ	-					
	-	f													F						
	-	Ŧ																			
	-	ŧ														-					
	-	t																			
	-	ł													F						
	-	Ŧ														-					
	-	‡																			
		<u>t</u>													╘						

Bridge No. 146 on SR 2102 (Medlin Rd.) over Little Richardson Creek SITE PHOTOGRAPHS



Photograph No. 1: View looking towards EB1 to EB2



Photograph No. 2: View facing downstream.