# REFERENCE

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### STATE OF NORTH CAROLINA

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

# **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY FORSYTH

PROJECT DESCRIPTION WINSTON SALEM NORTHERN **BELTWAY** 

SITE DESCRIPTION BRIDGE NO. 701 ON -Y2- (SR 2381 WILLISTON ROAD) OVER -L- (FUTURE I-74)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U–2579C	1	12

### 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 ENGINEERING UNIT AT 1991 707-6800. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INFERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOL MOISTURE CONDITIONS INDICATED IN THE SUBJURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INVESTIGATION FARE AS RECORDED AND WAY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS NCLUDING 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 GUARANTTEE THE SUFFICIENCY OF ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPHIONO OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONSTRUCTIONS 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 CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDENSION OF FOR AN THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES

- 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 WAVES 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.

PERSONNEL

J. BRADSHAW, E.I.

GEOLOGIC EX.

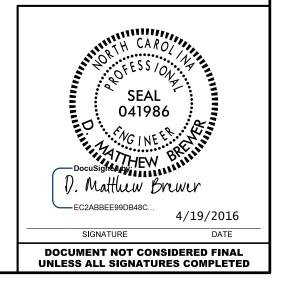
M. BREWER, P.E.

INVESTIGATED BY ECS CAROLINAS, LLF

DRAWN BY \_ M. BREWER, P.E.

CHECKED BY <u>M. WALKO, P.E.</u>

SUBMITTED BY \_\_\_\_\_\_ CAROLINAS, LLP DATE MARCH 2016



## NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

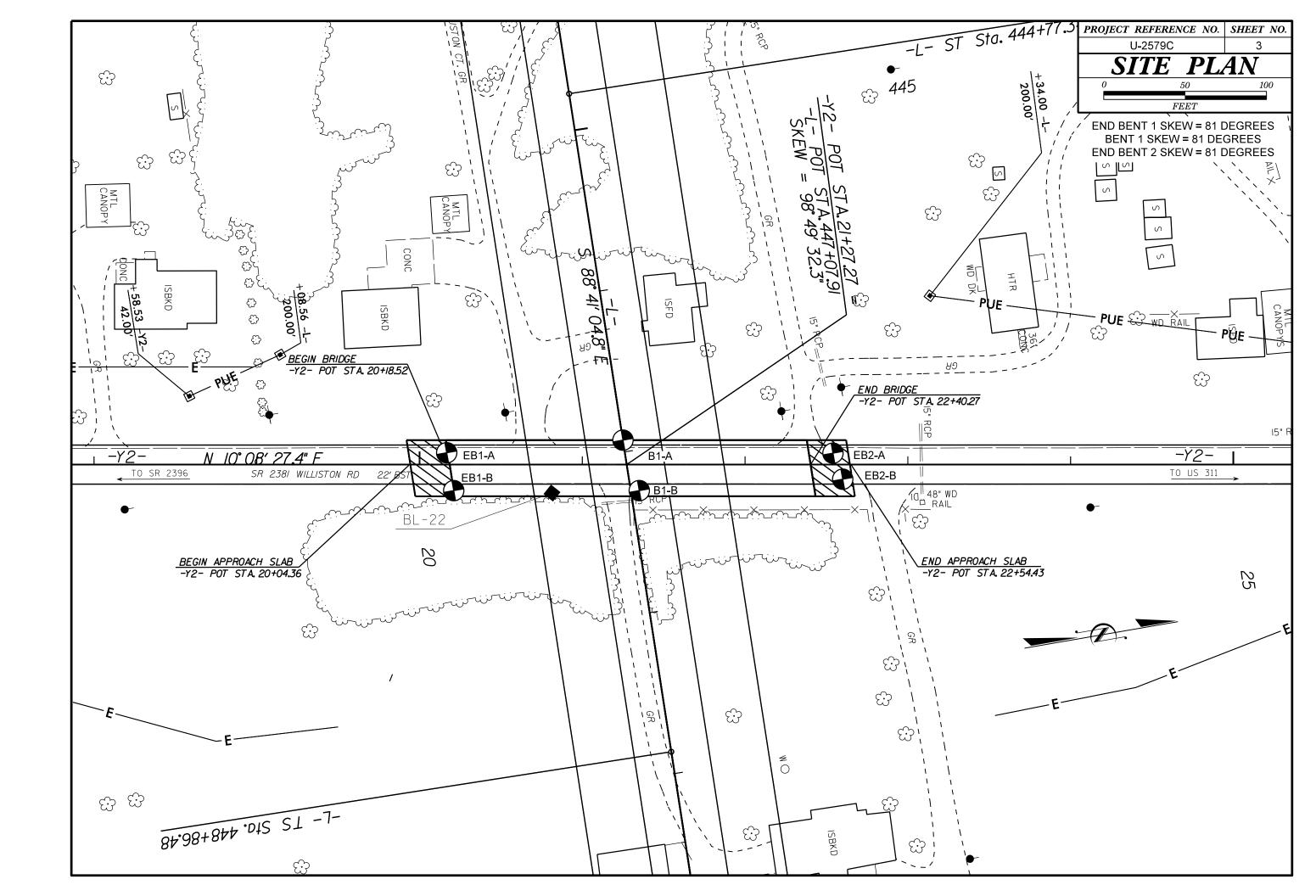
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

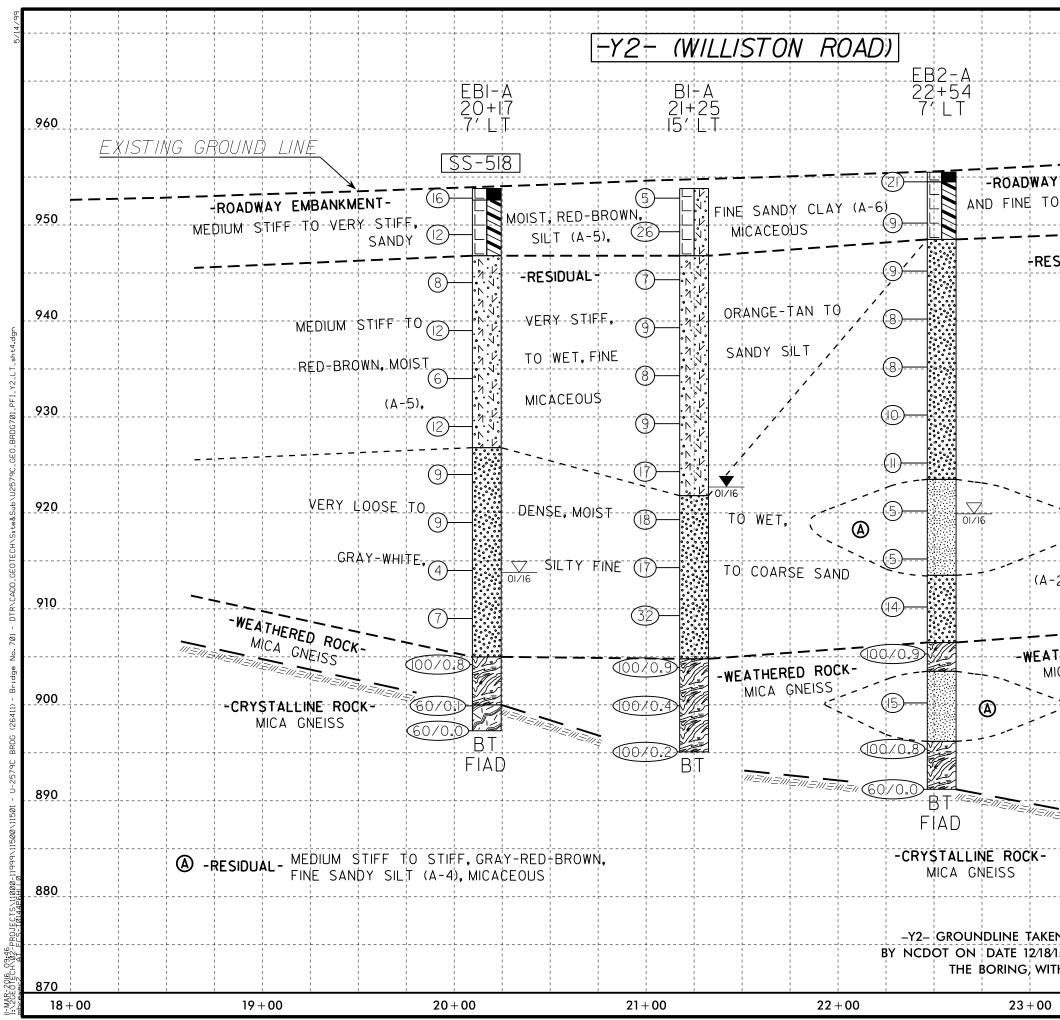
			SOIL	DESCF	RIPTIC	IN				Т		GR	RADATION						ROCK DE	SCRIPTION
BE PENET ACCORDI IS B CONSISTE	RATED WITH NG TO THE BASED ON TH INCY, COLOR,	UNCONSOLIDA A CONTINUO STANDARD PE HE AASHTO SY , TEXTURE, MOI	JS FLIGHT PO NETRATION TH STEM. BASIC STURE, AASHT	DWER AUG EST (AAS DESCRIP O CLASSI	GER AND GHTO T 2 TIONS G IFICATIO	YIELD LES 106.ASTM ( ENERALLY N.AND OTH	S THAN 10 01586). SOI INCLUDE TH ER PERTIN	Ø BLOWS PI L CLASSIFI HE FOLLOWI ENT FACTOF	ER FOOT CATION NG: RS SUCH	WELL GRADED - INDICATI UNIFORMLY GRADED - INI GAP-GRADED - INDICATES	IDICATES S A MIXT	THAT SOIL TURE OF UNI	PARTICLES ARE AL	LL APPROXIM IZES OF TWO	MATELY THE SAME SIZE.	ROCK LINE IND SPT REFUSAL 1 BLOWS IN NON REPRESENTED B	DICATES IS PENET I-COASTA BY A ZO	THE LEVEL TRATION B AL PLAIN D ONE OF WEA	L AT WHICH NON-CO Y A SPLIT SPOON S MATERIAL, THE TR ATHERED ROCK.	WOULD YIELD SPT REFUSAL IF TEST ASTAL PLAIN MATERIAL WOULD YIELD MAMPLER EQUAL TO OR LESS THAN 0. ANSITION BETWEEN SOIL AND ROCK
		GICAL COMPOS							•		Y OR ROL	UNDNESS OF	SOIL GRAINS IS D		BY THE TERMS:	WEATHERED	.s are	TYPICALLY	DIVIDED AS FOLLO	WS: NIN MATERIAL THAT WOULD YIELD SP1
	S	OIL LEGE	ND AND	AASH	TO C	ASSIF	ICATION	١		ANGULAR, SUBAN			OR <u>ROUNDED</u> .			ROCK (WR)			100 BLOWS PER F	
GENERAL CLASS.	(	GRANULAR MATE ≤ 35% PASSING			T-CLAY M 35% PASS		OF	rganic mater	IALS	MINERAL NAM			Z, FELDSPAR, MICA, 1		I, ETC.	CRYSTALLINE	, N			GRAIN IGNEOUS AND METAMORPHIC RO REFUSAL IF TESTED. ROCK TYPE IN
GROUP	A-1	A-3	A-2			A-6 A-7	A-1, A-2	A-4, A-5		ARE USED IN	DESCRIP		N THEY ARE CONSID	JERED OF S	IGNIFICANCE.	ROCK (CR)	Ē	<u>IC.IC.</u>	GNEISS, GABBRO, S	
0	А-1-а А-1-ь	A-2-4 A	-2-5 A-2-6 A-2			A-7-5, A-7-6	A-3	A-6, A-7	******	SUIGH		COMPF IPRESSIBLE	RESSIBILITY	LL < 31		NON-CRYSTALLI ROCK (NCR)	NE  -		SEDIMENTARY ROO	CK THAT WOULD YEILD SPT REFUSAL
SYMBOL 8	000000000000000000000000000000000000000			<u> </u>	1.7.1					MODEF		COMPRESSIBL	_E	LL = 31 LL > 50		COASTAL PLAIN SEDIMENTARY F			COASTAL PLAIN S SPT REFUSAL. RO	EDIMENTS CEMENTED INTO ROCK, BUT CK TYPE INCLUDES LIMESTONE, SANDS
*10 E	50 MX						GRANULAR	SILT- CLAY	MUCK,		PE	RCENTA	GE OF MATEF	RIAL		(CP)	E		SHELL BEDS, ETC.	HERING
*40 3 *200 1	30 MX 50 MX 15 MX 25 MX	10 MX 35 MX 3	5 MX 35 MX 35	MX 36 MN	36 MN 3	6 MN 36 MN	SOILS	SOILS	PEAT	ORGANIC MATERIAL		GRANULAR SOILS	SILT - CLAY SOILS	<u>OTHE</u>	R MATERIAL	FRESH F	ROCK FRE	ESH, CRYSTA		NTS MAY SHOW SLIGHT STAINING. ROCK
MATERIAL PASSING #40 LL PI	_ 6 MX		1 MN 40 MX 41 9 MX 11 MN 11				LITI	S WITH	HIGHLY	TRACE OF ORGANIC MA LITTLE ORGANIC MATT MODERATELY ORGANIC HIGHLY ORGANIC		2 - 3% 3 - 5% 5 - 10% > 10%	3 - 5% 5 - 12% 12 - 20% > 20%	TRACE LITTLE SOME HIGHLY	20 - 35%	VERY SLIGHT R (V SLI.) C	HAMMER I ROCK GEN CRYSTALS	IF CRYSTAL NERALLY FR	LLINE. RESH, JOINTS STAINED DKEN SPECIMEN FACE	), SOME JOINTS MAY SHOW THIN CLAY C SHINE BRIGHTLY. ROCK RINGS UNDER H
GROUP INDEX USUAL TYPES S OF MAJOR	Ø STONE FRAGS. GRAVEL, AND		4 MX	SI	LTY	6 MX NO MX	amou Ori	erate NTS of Ganic Tter	ORGANIC SOILS			LEVEL IN E	UND WATER		R DRILLING	SLIGHT F	ROCK GEN I INCH. OF	NERALLY FR OPEN JOINTS	RESH, JOINTS STAINED 5 MAY CONTAIN CLAY	) AND DISCOLORATION EXTENDS INTO RO . IN GRANITOID ROCKS SOME OCCASIONA RYSTALLINE ROCKS RING UNDER HAMMEF
MATERIALS GEN. RATING AS SUBGRADE	SAND	SAND GRA	Vel and sand		FAIR TO	SOILS POOR	Fair to Poor	POOR	UNSUITABLE	 ₹ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	PERCHE		VEL AFTER <u>24</u> GATURATED ZONE, OF		ARING STRATA	(MOD.) G	GRANITOIC DULL SOU	ID ROCKS, MO	OST FELDSPARS ARE	ISCOLORATION AND WEATHERING EFFECT DULL AND DISCOLORED, SOME SHOW CLA SHOWS SIGNIFICANT LOSS OF STRENGTH
		PIOF A-7-5 SUB						•		- O-M-						MODERATELY A	ALL ROCK	к ехсерт о		OR STAINED. IN GRANITOID ROCKS, ALL F
			NSISTEN			SENESS		GE OF UNC		<u> </u>	<u> </u>	ISCELLA	NEOUS SYMB	JLS						KAOLINIZATION. ROCK SHOWS SEVERE L IST'S PICK. ROCK GIVES "CLUNK" SOUND
PRIMARY S		CONSI VERY	NESS OR STENCY		(N-VAL	RESISTENCE UE)		PRESSIVE S (TONS/F1	STRENGTH	ROADWAY EMBA			25 DIP & DIP DIF ► OF ROCK STRU SPT DAT TEST BOIL VST DAT TEST BOIL VST DAT		SLOPE INDICATOR	SEVERE A	ALL ROCK REDUCED	K EXCEPT O IN STRENG	TH TO STRONG SOIL.	DR STAINED. ROCK FABRIC CLEAR AND E IN GRANITOID ROCKS ALL FELDSPARS (
GRANULA	٩R		ose I dense		4 TO 10 TO			N/A					101 111		INSTALLATION CONE PENETROMETER				VIELD SPT N VALUES	STRONG ROCK USUALLY REMAIN. <u>&gt; 100 BPF</u>
GENERAL	HESIVE)	VERY VERY	NSE DENSE SOFT DFT	<u> </u>	30 TO > 5 < 2 2 TO	2		< 0.25 0.25 TO			Y EMBANK	KMENT 🕁	-) AUGER BORING	•	SOUNDING ROD	SEVERE E	BUT MASS REMAINING	S IS EFFEC	TIVELY REDUCED TO TE IS AN EXAMPLE C	OR STAINED. ROCK FABRIC ELEMENTS AN SOIL STATUS, WITH ONLY FRAGMENTS OU FROCK WEATHERED TO A DEGREE THAT MAIN. <i>IF TESTED, WOULD YIELD SPT N</i>
SILT-CL MATERIA (COHESI)	AY NL	MEDIUN ST VERY	1 STIFF IFF STIFF		4 TO 8 TO 15 TO	8 15 30		0.5 TO 1 1 TO 2 2 TO 4	1.0	THEM INFERRED ROCH		<sup>Mw</sup> C Ary △	) MONITORING W PIEZOMETER INSTALLATION	¥	⊢ TEST BORING WITH CORE )— SPT N-VALUE	s	SCATTERE			DT DISCERNIBLE, OR DISCERNIBLE ONLY AY BE PRESENT AS DIKES OR STRINGERS
					> 3 RAIN			> 4			RE		DATION SYME						ROCK H	IARDNESS
U.S. STD. SIE	EVE SIZE		4 10			0 200	270							עא_ ערבר:	SSIFIED EXCAVATION -				HED BY KNIFE OR SHA	ARP PICK. BREAKING OF HAND SPECIMEN: T'S PICK.
OPENING (MM			4.76 2.00	0.4 COAR		25 0.07						ASSIFIED E> JITABLE WAS		USED	TABLE,BUT NOT TO BE IN THE TOP 3 FEET OF KMENT OR BACKFILL			SCRATCHED CH HAND SP		NLY WITH DIFFICULTY. HARD HAMMER B
BOULDEF (BLDR.) GRAIN MM	(0	BBLE ( COB.) 75	RAVEL (GR.) 2.0	SAN (CSE.	SD.)	SAN (F SI 25	5	SILT (SL.) 0.005	CLAY (CL.)	AR - AUGER REFUSAL		ABBF			- VANE SHEAR TEST	HARD E	EXCAVATE		BLOW OF A GEOLOG	GOUGES OR GROOVES TO 0.25 INCHES DE IST'S PICK. HAND SPECIMENS CAN BE D
SIZE IN.	12	3	STURE -						,	BT - BORING TERMINATED - CL CLAY CPT - CONE PENETRATION		MICA MOD	MICACEOUS MODERATELY	wea. 2 -	- WEATHERED UNIT WEIGHT DRY UNIT WEIGHT	HARD C	CAN BE E		IN SMALL CHIPS TO	S DEEP BY FIRM PRESSURE OF KNIFE C PEICES 1 INCH MAXIMUM SIZE BY HARD
	MOISTURE ERBERG LI			IPTION				ISTURE DES		CSE COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRAT		PMT - ST SAP	ORGANIC PRESSUREMETER T SAPROLITIC	-	AMPLE ABBREVIATIONS	F	ROM CHI	IPS TO SEV		KNIFE OR PICK. CAN BE EXCAVATED IN E BY MODERATE BLOWS OF A PICK POIN SURE.
		LIMIT	- SATUR (SAT		F	ROM BELO	W THE GR	Y WET,USU OUND WATE	R TABLE	e - VOID RATIO F - FINE FOSS FOSSILIFEROUS		SL S SLI S	SAND, SANDY SILT, SILTY SLIGHTLY	ST - RS -	SPLIT SPOON SHELBY TUBE ROCK	SOFT C		IN THICKNE		CAVATED READILY WITH POINT OF PICK. BY FINGER PRESSURE. CAN BE SCRATCH
RANGE <			- WET -	(W)			REQUIRES	DRYING TO STURE	)	FRAC FRACTURED, FRACT FRAGS FRAGMENTS	TURES		TRICONE REFUSAL DISTURE CONTENT		- RECOMPACTED TRIAXIAL - CALIFORNIA BEARING	FF	RACTU	JRE SPA	ACING	BEDDING
(PI) PL	+ PLASTI	C LIMIT								HI HIGHLY				T. DDO 15	RATIO	TERM VERY WIDE		MORE	SPACING THAN 10 FEET	TERM VERY THICKLY BEDDED
		M MOISTURE AGE LIMIT	- MOIST	- (M)				РТІМИМ МС		DRILL UNITS:		NI USED CING TOOLS: CLAY BITS	ON SUBJEC	HAMMER		WIDE MODERATELY CLOSE	( CLOSE	3 E 1	TO 10 FEET TO 3 FEET 16 TO 1 FOOT	THICKLY BEDDED 1 THINLY BEDDED 0.1 VERY THINLY BEDDED 0.0
			- DRY -	(D)			DDITIONAL	. WATER TO STURE	כ	СМЕ-55		5" CONTINUOUS	S FLIGHT AUGER	CORE SI		VERY CLOSE	:	LESS	THAN 0.16 FEET	THICKLY LAMINATED 0.00 THINLY LAMINATED <
	1		PL	ASTIC	ITY							3 HOLLOW AU		В _	н					RATION
	D. 46777		PLAST			0	<u>D</u>	RY STRENG		CME-550		HARD FACED F		N				.KS, INDURA		NING OF MATERIAL BY CEMENTING, HE
SLIC	PLASTIC GHTLY PLAS			0-5 6-15				VERY LOW SLIGHT	I	VANE SHEAR TEST			E INSERTS	HAND TO	DOLS:	FRIABLE				BY HAMMER DISINTEGRATES SAMPLE.
	ERATELY P ILY PLASTI			16-25 26 ОК М				MEDIUM HIGH		PORTABLE HOIST			W/ ADVANCER STEEL TEETH		IST HOLE DIGGER	MODERAT	ELY IN	IDURATED		BE SEPARATED FROM SAMPLE WITH ST Y WHEN HIT WITH HAMMER.
				COLOF	R					X DIEDRICH D-50	י 🗖 ן		TUNGCARB.		UNDING ROD	INDURAT	ED			DIFFICULT TO SEPARATE WITH STEEL BREAK WITH HAMMER.
		INCLUDE COL JCH AS LIGH1								X <u>DIEDRICH D-12</u> 0		CORE BIT 2.25" I.D. H	I.S. AUGERS		NE SHEAR TEST	EXTREME	ELY INDU	URATED	SHARP HAMME	BREAK WITH HAMMER. R BLOWS REQUIRED TO BREAK SAMPLE KS ACROSS GRAINS.

# project reference no.

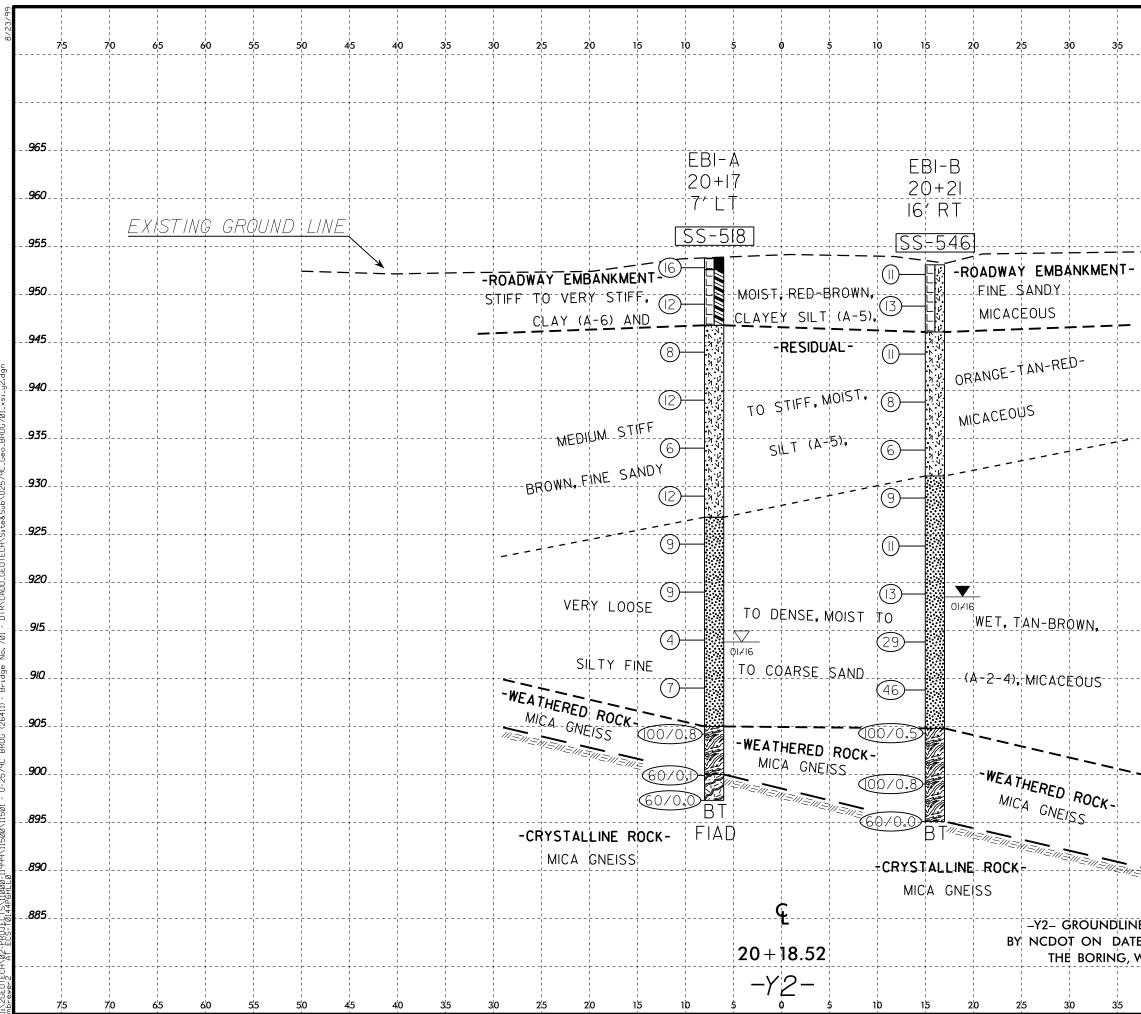
DATE: 8-15-14

	TERMS AND DEFINITIONS
D. AN INFERRED	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
SPT REFUSAL. FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS OFTEN	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING
N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. <u>ARTESIAN</u> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
CK THAT CLUDES GRANITE,	WHICH IT IS ENCOUNTERED,BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
L PLAIN F TESTED.	<u>CALCAREOUS (CALC.)</u> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <u>COLLUVIUM</u> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
MAY NOT YIELD TONE, CEMENTED	OF SLOPE. <u>CORE RECOVERY (REC.)</u> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK. <u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
ATINGS IF OPEN. MMER BLOWS IF	HORIZONTAL. <u>DIP DIRECTION (DIP AZIMUTH)</u> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
K UP TO	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. F <u>AULT</u> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
FELDSPAR BLOWS.	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
. ROCK HAS	PARENT MATERIAL.
AS COMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
ELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
ISS OF STRENGTH	
HEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
DENT BUT	<u>LEDGE</u> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
RE KAOLINIZED	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS
DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
ONLY MINOR ALUES < 100 BPF	OF AN INTERVENING IMPERVIOUS STRATUM.
N SMALL AND SAPROLITE IS	<u>RESIDUAL (RES.)SOIL</u> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <u>ROCK QUALITY DESIGNATION (ROD</u> ) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
OWS REQUIRES	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
EP CAN BE	<u>SLICKENSIDE</u> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
TACHED	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
R PICK POINT. BLOWS OF THE	A 140 LB.HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL
	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
FRAGMENTS . SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
	<u>STRATA ROCK QUALITY DESIGNATION (SROD)</u> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY
PIECES 1 INCH ED READILY BY	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	BENCH MARK: BL-22
A FEET	N = 875236.2960, E = 1655339.7950
4 FEET 5 - 4 FEET	ELEVATION: 953.42 FEET
6 - 1.5 FEET 3 - 0.16 FEET	NOTES:
B - 0.03 FEET	NORTHINGS AND EASTINGS OBTAINED WITH A TRIMBLE GEO 7X WITH
0.008 FEET	SUB-FOOT ACCURACY.
	FIAD = FILLED IMMEDIATELY AFTER DRILLING
AT, PRESSURE, ETC.	
EL PROBE:	
PROBE:	
;	DATE: 8-15-14

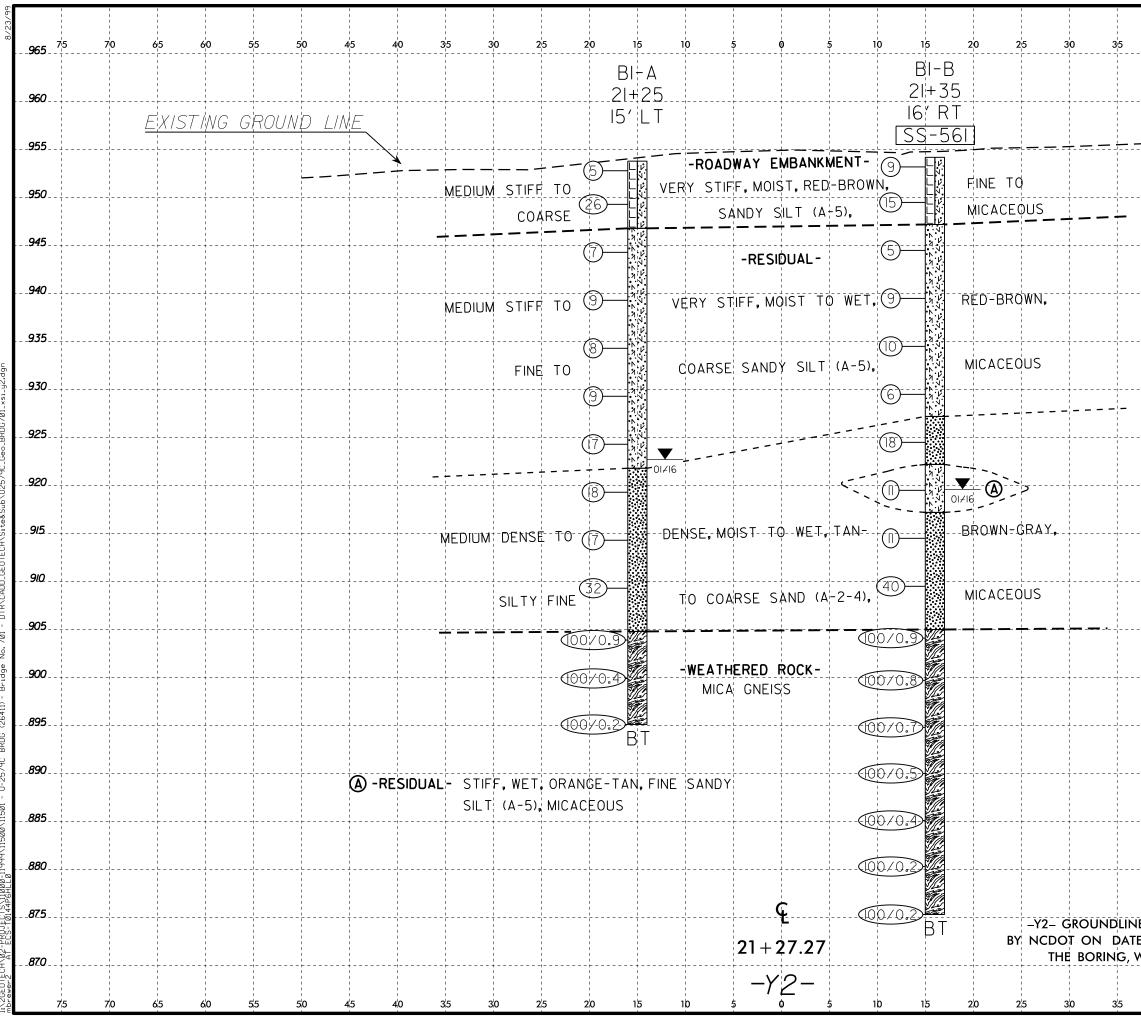




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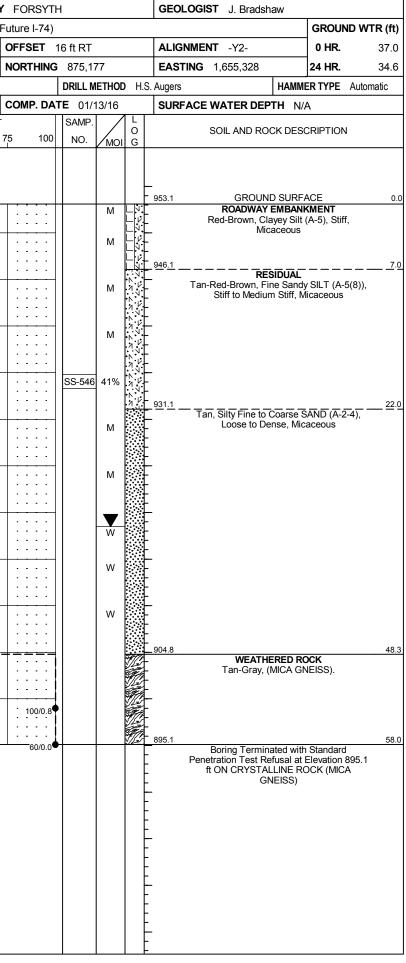
			PROJECT REFERENCE NO	D. SHEET NO.
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IE TAKENI ED			N PLANS PROV	875
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		5,5 0		. //

oro 75 70 65	60 55 50 45 40	35 30 25 20 15 10	5 0 5	10 15 20	25 30 35 40	0 5 10 FEET	PROJECT REFERENCE NO. SHEE U-2579C SECTION THROUGH END BE STA. 22 + 40.27 -Y2-
970 						VE = 1:1	SKEW = 81 DEGREES
			2-A EE	32-B	I         I         I         I           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I	4 <sup>,</sup> 5 50 55 60	0 6 <sup>,</sup> 5 7 <sup>,</sup> 0 7 <sup>,</sup> 5
965				2+60			
		· · · · · · · · · · · · · · · · · · ·	1 1 9	′ RT			
960					MBANKMENT-	· · · · · · · · · · · · · · · · · · ·	
		-ROADWAY EMBANKMENT		-530 -ROADWAY E			
955 <u>E.X</u> ;/	<u>ST-ING-GROUND:-LINE</u>						
950		STIFF TO VERY	TIFF, MOIST	K RED-BROWN, FINE	MICACEOUS		
		(A-6) AND FINE (9)+	<u> </u>			· +	
945			~ . МЕ DIUM	-RESIDUAL-			
			SANDY	STIFF, MOIST, TAN- SILT (A-5), MICAC	BROWN		
940			Č6	SILT (A-5), MICAC	EOUS		
		LOOSE TO MEDIUM DENSE.		1 y V			
935		MOIST-TO-WET	TAN- 7)	BROWN-WHITE	*		
930		SAND	(A-2-4)				
				MICACEOUS			
925			(I)—	017I6			
					$\frac{1}{1}$ $\frac{1}{1}$ $\frac{1}{1}$		
.920		MEDIUM STIFF TO 5	STIFF, 6)	WET, GRAY-RED-BR	OWN TO		
		TAN-ORANGE, FINE	ÓI≠I6 SANDY SILT	(A-4), MICACEOUS			
.915			3				
					+ +		
910		MEDIUM DENSE, WET, 4	TAN- (8)	BROWN TO BLACK			
		ORANGE, SILTY FINE	TO COARSE SAND	(A-2-4), MICACEOU	5		
.905		STIFF TO VERY STIFF, WET,				· · · · · · · · · · · · · · · · · · ·	
		SANDY	BROWN+GRAY TO	ORANGE-BLACK, FIN	тарана IĘ		
900		WEATHERED ROCK	\$1LT-(A-4), 29	MICACEOUS	· · · · · · · · · · · · · · · · · · ·		
		MICA GNEISS					
895				A			
890			$3 - \frac{100}{10.8}$	-WEAT			
205		MICA GNEISS F	IAD 60/0.0	WEATHERED ROC	<b>-</b> _		
885				B Construction Construction	<b>K-</b>		
890		Y DENSE, WET, GREEN-GRAY, SILTY FINE					
.880		RSE SAND (A-2-4), MICACEOUS		STALLINE ROCK		N FROM ROADWAY DESIGN	
875	B -WEATHERED RO	CK- MICA GNEISS	22+40.27	MICA GNEISS B		5. INFERRED STRATIGRAPHY OTH PROJECTED ON THE C	
<i>u</i>			-72-	·			

### GEOTECHNICAL BORING REPORT BORE LOG

								-																	
WBS	34839	9.1.1			٦	<b>IP</b> U-2579	C	COUNT	Y FORSYT	H			GEOL	OGIST J. Bradshaw			34839					P U-2579		COUNT	
SITE	DESCR		Brid	ge No.	701 c	on -Y2- (Will	iston Road	) over -L- (	Future I-74)						GROUND WTR (ft)				-	je No. 7	701 on	-Y2- (Will	iston Road)	) over -L-	(Fut
BOR	ing no.	EB1-	A		S	STATION 2	20+17		OFFSET	7 ft LT			ALIG	NMENT -Y2-	<b>0 HR.</b> 40.0	BOR	ing no.	. EB1-	В		ST	TATION 2	20+21		0
COLI	LAR EL	<b>EV.</b> 95	53.8 ft		ר	OTAL DEP	<b>TH</b> 56.5 1	ť	NORTHING	875,1	77		EAST	<b>ING</b> 1,655,304	24 HR. FIAD	COL	LAR EL	<b>EV.</b> 98	53.1 ft		т	OTAL DEP	<b>TH</b> 58.0 ft	ť	N
DRILL	. RIG/HAN	/MER EF	F./DAT	E GE	O105 E	edrich D120	92% 11/07/20	)15	,	DRILL	IETHO	D H.:	S. Augers	НАММЕ	ER TYPE Automatic	DRILI	. RIG/HAI	MMER EF	F./DATE	GEO	366 Die	edrich D50 8	7% 11/07/201	5	-
DRIL	LER M	1. Irelan	d		5	START DAT	E 01/12/	16	COMP. DA	TE 01/	12/16		SURF	ACE WATER DEPTH N/A	A	DRIL	.LER J	. Messi	ck		ST	ART DAT	E 01/13/1	16	C
ELEV	DRIVE	DEPTH	BLC	ow co	UNT		BLOWS	PER FOOT	Г	SAMP.			-			ELEV	DRIVE		BLO	W COL	JNT		BLOWS	PER FOO	T
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	Имо	I G	ELEV. (f	SOIL AND ROCK DESC	DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
955																955									
1	953.8	0.0	14	11	5			1			м		953.8 952.6	GROUND SURFA Asphalt (0.5') and ABC S			953.1	<u> </u>							
		ŧ				<b>P</b> <sup>16</sup>							-	ROADWAY EMBANK	KMENT			ŧ	3	4	7	• • 11 •			:
950	950.0	3.8	7	5	7	- <b>1</b> 2.					М		-	Red-Brown, Fine Sandy CLA Stiff to Stiff, Micace		950	949.8-	3.3	3	5	8	· · •	+	+	+
		ŧ											946.8		7.0			ŧ				• • • • • • • • • • • • • • • • • • •			:
945	945.0	8.8										Т 7 Ч 1		Orange-Tan, Fine Sandy SIL		945	944.8-	8.3				· 1 <sup>1</sup> · ·			•
		ŧ	3	3	5	-•8					м	7 V V V	-	to Medium Stiff, Mica	aceous			1	3	4	7	11			:
		ŧ										7 V V V	-					ŧ							:
940	940.0	13.8	3	5	7					SS-518	3 30%	N N N N				940	939.8-	13.3	3	3	5	1	+	+ · · ·	<u> </u>
		ŧ									1	N N	-					Ŧ				· • 8 · · ·			
935	935.0	18.8			-	<u>.</u>	· · · ·	· · · ·				N N N	-			935	934.8-	+ + 18.3				<u> </u>			
		ŧ	3	3	3	●6·					м		-					1	2	3	3	<b>6</b>			:
		ŧ				<u>: </u> : : :							-					ŧ				1			
930	930.0	23.8	3	5	7	· • 12·					м	N N N	-			930	929.8-	23.3	3	3	6		<u> </u>	· · · ·	<u>-</u>
		ŧ										N V	926.8		27.0			ŧ							
925	925.0	28.8					· · · ·							Tan-Brown, Silty Fine to C (A-2-4), Very Loose to Loos		925	924.8-	28.3				· i · ·			•
		ŧ	3	4	5	- • 9					м		-	(, , , , , , , , , , , , , , , , , , ,				1	2	4	7	11			:
		Ŧ				-							_					Ŧ							
920	920.0	33.8	4	4	5						w		_			920	919.8-	33.3	6	7	6		<u> </u>		+
		Ŧ											-					Ŧ							
915	915.0	38.8				<u> </u>							-			915	914.8-	38.3					• • • • •		•
		Ŧ	3	1	3	4					$ \nabla$	-	-				011.0-	Ī	8	6	23				
		Ŧ											_					Ŧ							-
910	910.0	43.8	1	2	5			+			w		-			910	909.8-	43.3	14	17	29				-
		ŧ											-					ŧ							:
905	905.0	48.8											905.0		48.8	905	904.8-	48.3					· · · · ·		·
		ŧ	55	45/0.3	3				100/0.8				-	WEATHERED RC Tan-Gray, (MICA GN				+	100					T : : :	: ]
000		ŧ											-			000		ŧ							:
900	900.0	53.8	60/0.1	1				<u> </u>	60/0.1				900.0	CRYSTALLINE RO	53.8 OCK	900	899.8-	<u> </u>	49	51/0.3			<u> </u>	· · · ·	:+
	897.3	56.5	60/0.0						60/0.0				897.3	Tan-Gray, (MICA GN Boring Terminated with				t							
	-	ŧ											-	Penetration Test Refusal at E	Elevation 897.3		895.1	58.0	60/0.0						•
		ŧ											-	ft IN CRYSTALLINE ROCK (I	MICA GNEISS)			ŧ	60/0.0						
900		t											-					ŧ							
	-	ŧ											-				-	ŧ							
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### SHEET 8



### GEOTECHNICAL BORING REPORT BORE LOG

WBS	34839	).1.1			TI	P U-257	9C	CC	DUNTY	FORSYT	Н			GEOL	OGIST J. Brads	haw		WBS	34839	.1.1			TIF	P U-2579	<u> </u>	COUNT	Υ
SITE	DESCR	IPTION	Bridg	je No.	701 or	า -Y2- (Wil	liston Ro	ad) ove	er -L- (F	uture I-74)							GROUND WTR (ft)	SITE	DESCR	IPTION	Bridg	e No. 7	701 on	-Y2- (Wil	liston Road)	) over -L-	(Fut
BORI	NG NO.	B1-A			S	TATION	21+25			OFFSET	15 ft LT			ALIGN	IMENT -Y2-		0 HR. 35.7	BOR	BORING NO. B1-B				ST	ATION 2	21+35		0
COLL	AR ELE	<b>EV</b> . 95	53.8 ft		Т	OTAL DE	<b>PTH</b> 58	9 ft		NORTHING	875,2	85		EAST	<b>NG</b> 1,655,316		24 HR. 31.1	COL	COLLAR ELEV. 954.2 ft				тс	DTAL DEF	<b>PTH</b> 78.9 f	ft	N
DRILL	RIG/HAN	IMER EF	F./DATE	E GEO	) 366 Di	edrich D50 8	37% 11/07/	2015			DRILL	<b>IETHO</b>	D H.	S. Augers	ers HAMMER TYPE Automatic DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D50 87% 11/07/2015			15	-								
DRIL	LER J.	Messic	ж		S		<b>FE</b> 01/1	3/16		COMP. DA					ACE WATER DE				LER J.						<b>FE</b> 01/13/1		C
ELEV	DRIVE		1	W CO				VS PER			SAMP.		/ L	1.00000				ELEV	DRIVE ELEV			N COU				PER FOO	
(ft)	ELEV (ft)	(ft)		0.5ft		0	25	50		75 100	NO.		O I G	ELEV. (ft)	SOIL AND RO	DCK DESC	CRIPTION DEPTH (ft)	(ft)	ELEV (ft)	(ft)	0.5ft		0.5ft	0		50	75
	( )																										
955	953.8 -													953.8	GROUI	ND SURFA	ACE 0.0	955	954.2	0.0			_		<del></del>		<del></del>
	-	-	2	3	2	•5 <sup>•••</sup>						М	L V	_	ROADWAY Red-Brown, Fine				-	Ł	3	4	5	. •9 .			•
950	950.3	3.5											ĽΝ	-	(A-5), Medium Stil			950	950.5 ·	3.7		_					
	-	Ŧ	3	7	19							M		-					-	F	5	·	8	· • • • 18	5		
	-	ŧ				     . <b>.</b>	. <b>.</b>			· · · · ·				946.8		ESIDUAL	7.0		-	ŧ							-
945	945.3	8.5	3	3	4	.     - <u>  -</u>	• • • •					М	r V V	-	Red-Brown, Fi	ne Sandy	SILT (A-5),	945	945.5	8.7	2	2	3				
	-	t		-					· · · · · ·	· · · · ·			NV	-	Medium Stiff to	Very Stiff,	, Micaceous			ţ				<b>9</b> 5	·   · · · · ·		:
	-					:h: :			· · ·				N N V	-					940.5 ·	- 13 7							:
940	940.3	13.5 [	4	4	5							м	N N	_				940		 	2	4	5	•9	<u> </u>		+
	-	Ŧ											NN	-						F							.
935	935.3	T 18.5											NN	-				935	935.5	18.7							
	-	ŧ	3	3	5	.•8 .						М	лV V	-					-	F	2	3	1	•10			
	-	ŧ					•   • • •		· · · ·				л V И V	-						ŧ					·   · · · · ·		
930	930.3	23.5	3	4	5		· · · ·					м	N N N N	-				930	930.5	23.7	2	2	4	.1	· · · · · ·		<u>·</u>
	-	t				. <b>Q</b> 9 .			· · ·				N N V	_						ŧ				●6 · · · ·			:
	-	±							· · ·				N V V	-										$\begin{vmatrix} \cdot & \lambda \\ \cdot & \lambda \end{vmatrix}$			
925	925.3	28.5	8	6	11							w	r V	-				925	925.5	28.7	5	7	11		18	+ • • •	+
	-	Ŧ				· · · ·							- ^ V	921.8			32.0			F							
920	920.3	33.5								· · · · ·			./1	-	Tan-Gray, Silty	Fine to Co	barse SAND	920	920.5 ·	33.7				::/:			:
	-	-	6	8	10	] <b>.</b>	18					w		-	(A-2-4), Medi M	um Dense icaceous	to Dense,	020	-	F	4	4	7	. •11			
	-	ŧ					·   · · ·		· · · · · ·					-					-	ŧ							:
915	915.3	38.5	6	9	8		· · · ·					w		-				915	915.5	38.7	4	5	6		· · · · · ·		÷
	-	t		Ű		<b>.</b>	17		· · ·					-					-	t i			-		 		
	-	<u>+</u>					.\		· · ·					_					910.5 ·								•
910	910.3	43.5	10	15	17							w						910	910.5	43.7	8	13	27				-
	-	Ŧ					•   • <b> </b> •							-						F					.   ¦ .		•
905	905.3	T 48.5															49.0	905	905.5 ·	48.7	0.5		04/0-4		1 1		
	-	ŧ	28	21	79/0.4	• • •			· · ·	100/0.9			M	- 304.0		HERED RO	DCK		-	F	25	39 6	61/0.4		· · · · · ·		
	-	ŧ							· · · ·					-	Tan-Gray,	(MICA GN	NEISS).			ŧ							
900	900.3	53.5	100/0.4							100/0.4				-				900	900.5	53.7	30	70/0.3					·
	-	t	100/0.4						· · ·	100/0.4				-						t					.		:
900	-								· · ·					-					895.5	<b>507</b>					:   : : : :		
895	895.3	58.5 L	100/0.2							100/0.2			<u> </u>	895.1	Boring Terminate	d at Elevat	58.7 tion 894.9 ft IN	895		50.7	48	62/0.2					
	-	Ŧ												-	WEATHERED	ROCK (MIC	CA GNEISS)		-	F							•
	-	Ŧ												-				890	890.5	63.7	100/0						
	-	ŧ												-					-	F	100/0.5						
	-	ŧ												-						ŧ					·   · · · · ·		
	-	‡												-				885	885.5	68.7	100/0.4				· · · · ·		·
	-	‡												-					-	ŧ					.   .		
	-	t												_					880.5 ·	727							:
	-	ŧ																880	- 000.0		100/0.2				+		
	-	£												_						ł							.
	-	Ŧ												-					875.5	78.7							
	-	Ŧ												-						F	100/0.2						
	-	+										1		-						ł							

### SHEET 9

FORSYTH	1			GEOLOGIST J. Bradshav	N					
uture I-74)			_			GROUND WTR (ft)				
OFFSET 1	6 ft RT			ALIGNMENT -Y2-		0 HR.	37.0			
NORTHING	875,28	39		EASTING 1,655,348		24 HR.	34.6			
[	DRILL M		Н.5	S. Augers	HAMME	R TYPE	Automatic			
COMP. DAT		13/16		SURFACE WATER DEPTI						
	SAMP.		L							
75 100	NO.	моі	O G	SOIL AND ROCK	VESC					
			1							
					0110-	05				
<u>.</u>		М		954.2 GROUND	MBANK	MENT	0.0			
				Red-Brown, Fine to (A-5), Stiff,	Coarse	e Sandy S	ILT			
+		м	∟¦v] ∟¦v]							
			Ľ	- <u>947.2</u>			7.0			
			 ∧		DUAL Sandy 9	SILT (A-5)				
<b> </b>		М	'''' ^ _	Red-Brown, Fine Medium Stiff to	Stiff, Mi	caceous				
			^' v	-						
<u> </u>		м	^ \ \	-						
				-						
			N V N V	-						
<u> </u>		м	N 4	-						
			1 V V	• •						
<u>  · · · ·</u>		м	7 4	-						
::::		171	14	- - 927.2			07.0			
::::				Tan, Silty Fine to Co	arse S	AND (A-2	-4), <u>27</u> .0			
<u>+</u>		м		Médium Dens	se, Mica	ICEOUS				
				- <u>- 922.2</u>		<u> </u>	32.0			
<u>  · · ·  </u>	00 50		г v И V	Orange-Tan, Fine Sa		_1 (A-5), \$	5011,			
	SS-561	53%	х х V	-						
			 	Tan-Brown, Silty Fir	ne to C	parse SAN	ND <u>37.0</u>			
+		w		(A-2-4), Medium Micao	Dense	to Dense,				
		<u></u>		-						
		W		-						
				-						
+ <u> </u>			Here a			СК	49.2			
100/0.9				Tan-Brown-Gray,			.			
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100/0.2				- - 875.3 - Poring Torminated at	· F1 -	07.075	78.9			
100/0.2			F	Boring Terminated at WEATHERED ROO	t Elevat CK (MIC	ion 875.3 CA GNEIS	π IN S)			
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### GEOTECHNICAL BORING REPORT BORE LOG

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WBS	34839	9.1.1			T	IP U-	25790	C		COUN	NTY	FORS	/TH				GEC	DLOG	IST J.	Bradshav					34839					P U-2			COUN	
SITE	DESCR		Brid	ge No.	701 c	n -Y2-	(Willis	ston R	oad) o	over -L	(Fu	uture I-7	4)									GROUNE	OWTR (ft)	SITE	DESCR		Bridg	ge No.	701 on	I -Y2- (\	Willist	on Road	) over -L	- (Futu
BORI	NG NO.	EB2-	A		s	STATIO	<b>N</b> 22	2+54			0	OFFSET	7 ft LT	-			ALIC	GNME	NT -Y	2-		0 HR.	35.6	BOR	NG NO.	EB2-	В		ST	TATION	22-	+60		OF
COLL	AR ELI	<b>EV</b> . 95	55.5 ft		T	OTAL	DEPT	<b>FH</b> 64	4.3 ft		N	IORTHI	NG 875	5,411	1		EAS	STING	1,655	,346	2	24 HR.	FIAD	COLI	LAR ELI	<b>EV</b> . 95	55.6 ft		т	DTAL D	)EPTI	<b>H</b> 69.0 f	ft	NO
DRILL	RIG/HAN	/MER EF	F./DAT	E GEO	D105 D	iedrich [	)120 9	2% 11/0	07/201	5			DRIL	L ME	THOD	) Н.	S. Augers	S		ŀ	HAMME	R TYPE	Automatic	DRILL	RIG/HAN	/MER EF	F./DATI	E GEO	)105 Di€	edrich D1	120 92	% 11/07/20	015	
DRIL	LER M		d		S	TART	DATE	E 01/	12/16	6	C	COMP. D	DATE (	1/12	2/16		SUR	RFACE	E WATE		H N/A			DRIL	LER M		d		ST		)ATE	01/12/1	16	cc
ELEV	DRIVE ELEV		·	ow co				BLO	WSP	PER FO	DOT		SAN	1P.	▼∕	LO			SOIL A	ND ROCK	DESC	RIPTION		ELEV	DRIVE ELEV	DEPTH	·	w co	-			BLOWS	PER FO	ОТ
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0		25	5	0	7	5 1	00 NC	).	моі		ELEV.	(ft)					DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	;	50	75
960		Ļ															_							960		Ļ								
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955	955.5	+ 0.0															- 955.5		G	ROUND	SURFA	CE	0.0	955	955.6 -	+ 0.0								
900		‡	13	9	12			21							М		-954.5 -			(0.3') and			1.0	955	-	ŧ	7	9	10					
	051.0	+ + 4.3					· /· ·		· · · ·		· ·	· · · · · ·	·				- -	Re	d-Brown	, Fine San tiff to Stiff,	dv CLA	Y (A-6). V	ery		951.6 -	+ 4.0					<i>!</i> :	· · · · ·		.
950	951.2	+ 4.3	7	4	5	┨└┙	9		•••	• •	•••		·		М		-		51	un to Sun,	wicace	ous		950		‡	7	5	6	<u> </u>		· · · ·	· · · ·	· · · · ·
		‡					·	· · ·	· · · ·		· · · ·	· · · · · ·					- <u>948.5</u>	— —		RESID			7.0		-	‡				   .[.	::	· · · · ·	· · · ·	.
945	946.2	9.3	7	4	5	•      •			::	· · ·	· · · ·	· · · ·			м		-			n-White, S 2-4), Loose				945	946.6 -	+ 9.0 +	3	3	4	·   ·	::	· · · · ·		•••
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	0/1 2 ·	+ - 14.3						· ·		· · ·	· · · ·	· · · ·					-								941.6 -	+ 14.0				.  .   .	::	· · · · ·		
940		+ ''''	6	4	4	┨ <u>┝</u> ┊∳	8		•••		•••	<u> </u>			М		-							940	-	‡	3	3	3	•6		· · · ·	· · ·	
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935	936.2	19.3	4	3	5				· · · ·						м		-							935	936.6 -	+ 19.0 +	2	3	4		::			
000	-	ŧ		-	-		· · ·						-		141		-							000	-	ŧ				Ţ.				
	931.2	+ + 24.3				. į			 				.				-								931.6 ·	24.0		_		· \	::	· · · · ·		.
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925	926.2	29.3	4	4	7		1.								м		-							925	926.6 -	+ 29.0 T	4	4	7		11			
	-	Ŧ															- 923.5						32.0		-	Ŧ				$\overline{\cdot}$				
	921.2	T 34.3										· · · ·	.					Gr	ay-Red-E Me	Brown, Fin dium Stiff,	, Micace	eous	4),		921.6 ·	34.0	3	3	3					.
920	-	Ŧ	3	2	3	-•5									$\bigvee_{\mathbf{w}}$									920	_	Ŧ			J	<b>0</b> 6				
		Ŧ							• •						••										916 6 -	- - 39.0								
915	916.2	39.3	1	3	2				•••		•••		-		W		-							915		1 39.0	3	5	8	· · ·	13			.
		ŧ					 				· ·		.				<u>- 913.5</u>		an-Brow	n Silty Fin		arse SAN	<u>42.0</u>		-	ŧ				· ·   · ·	1:1	· · · ·		.
	911.2	44.3	4	6	8		\			· · · ·	· ·	· · ·	-				_	•	(A-2-4),	n, Silty Fin Medium D	ense, N	Vicaceous		010	911.6 -	44.0	5	8	10	· ·   · ·	.\. . <b>\</b> .	· · · ·		, .   .   .
910		ŧ	1		0		_¶14_								W		-							910	-	ŧ					-			
		+ - 49.3					·   •	 	 		· · ·	 	.				- - 906.5						49.0		- 906.6 -	+ 49.0				· ·   · ·	:	· · · ·	· · ·	
905	900.2	+ 49.3	12	88/0.4									.9				-		V Tan-	<b>VEATHER</b> Brown, (M	ED ROO	ck Ieiss).		905	-	ŧ	5	12	14	· ·		26	· · ·	
		‡					÷ † ÷	+=:-	<u>-</u>	÷÷	:-:-	÷÷÷÷	: <b>-</b>				- <u>903.5</u>	Bro		y, Fine Sa		,	tiff. <u>52.0</u>		-	‡				· ·   · ·		····	· · · ·	
900	901.2	54.3	2	5	10				· · · ·		· ·	· · · · · ·	.		w		-			Micac	eous	( )/	- ,	900	901.6 -	+ 54.0 +	7	12	17	· ·   · ·	::	20		.
500	-	ŧ	-				¶15 								vv		<u>-</u>							900	-	ŧ								
	896.2	+ - 59.3					·   -				· · · ·	· · · · · ·	.				896.2						59.3		- 896.6 -	+ 59.0				· · ·				•••
895		+	33	67/0.3				+								10	_			<b>NEATHER</b> Brown, (M				895	-	ŧ	14	24	43	· ·	• • •	· · · ·	···)	67
		ŧ					· · ·		· · · ·			· · · ·	-				-		ran	Diowii, (ivi		12100).			-	ŧ				· · ·	· ·	· · · · ·		<b>. </b> . :
-	891.2	64.3	60/0.0	)		<u>   · ·</u>						60/0	<b>T</b>	$\vdash$		H	891.2		Borina	Terminate	ed with S	Standard	64.3	890	891.6 -	+ 64.0 +	11	42	58/0.3	· ·   · ·				+-
	-	Ŧ															-	Per	netration	Test Refus	sal at El	levation 89	91.2		-	Ŧ							· · ·	
	-	ŧ															-			RYSTALLI GNE	ISS)				886.6 -	69.0	60/0.0			· · · ·				· · ·
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### SHEET 10

OFFSET         9 ft RT         ALIGNMENT         -Y2-         0 HR.         30           NORTHING         875,414         EASTING         1,855,363         24 HR.         FIA           DRILL METHOD         H.S. Augers         HAMMER TYPE         Automatic           COMP. DATE         0 /1/12/16         SURFACE WATER DEPTH         N/A           75         100         NO.         G         SOIL AND ROCK DESCRIPTION           76         NO.         G         SOIL AND ROCK DESCRIPTION           77         100         NO.         G         SOIL AND ROCK DESCRIPTION           78         ROBUNAY EMBANKENT         Red-Brown, Fine to Coarse Sandy SILT         G           79         100         NO.         G         SOIL AND ROCK DESCRIPTION           79         100         NO.         G         Tan-Brown, Silly Fine to Coarse SAND         1           70         100000         100000         G         Tan-Brown, Silly Fine to Coarse SAND	FORSYTH	GEOLOGIST J. Bradshaw	
NORTHING         875,414         EASTING         1,655,363         24 HR         FIA           DRILL METHOD         HS. Augers         HAMMER TYPE         Automatic           COMP. DATE         01/12/16         SURFACE WATER DEPTH         N/A           75         100         SAMP.         0         G         SOIL AND ROCK DESCRIPTION           75         100         NO.         M         -956.6         GROUND SURFACE           956.6         GROUND SURFACE         -956.6         GROUND SURFACE           956.7         ROADWAY EMBANKMENT         Red-Brown, Fine to Coarse Sandy SILT (A-5), Very Stiff to Stiff           955.6         -         Red-Brown, Fine to Coarse Sandy SILT (A-5), Very Stiff Micaceous           M         -         929.6         -           100         NO.         -         929.6         -           1112/16         SS-530         42%         -         -           1112/16         -         Red-Brown, Fine to Coarse SaND         -           1112/16         -         -         -         -           1112/16         -         -         -         -           1112/16         -         -         -         -           111	Future I-74)		GROUND WTR (ft)
NORTHING         875.414         EASTING         1,655.363         24 HR.         FIA           DRILL METHOD         H.S. Augers         HAMMER TYPE         Automatic           COMP. DATE         01/12/16         SURFACE WATER DEPTH         N/A           75         100         SAMP.         0         G         SOIL AND ROCK DESCRIPTION           75         100         NO.         M         G         SOIL AND ROCK DESCRIPTION           955.6         GROUND SURFACE         GROUND SURFACE         GROUND SURFACE         GROUND SURFACE           955.6         GROUND WERAKNENT         Red-Brown, Fine to Coarse Sandy SILT (A-5), Very Stiff to Stiff         GROUND SURFACE         GROUND SURFACE           949.6         -         -         Red-Brown, Fine to Coarse Sandy SILT (A-5, ISIN)         M           1         -         949.6         -         -         Residual (D-1)           1         -         -         Tan-Brown, Sithy Fine to Coarse SAND         -         1           1         -         -         -         -         -         -         -           1         -         -         -         -         -         -         -         -         -         -         -	OFFSET 9 ft RT	ALIGNMENT -Y2-	0 HR. 30.2
DRILL METHOD         H.S. Augers         HAMMER TYPE         Automatic           COMP. DATE         01/12/16         SURFACE WATER DEPTH         N/A           75         100         NO.         MO         G         SOIL AND ROCK DESCRIPTION           75         100         NO.         MO         G         SOIL AND ROCK DESCRIPTION           75         100         NO.         MO         G         SOIL AND ROCK DESCRIPTION           75         100         NO.         MO         G         SOIL AND ROCK DESCRIPTION           76         NO.         MO         G         SOIL AND ROCK DESCRIPTION           76         M         GES6.         GROUND SURFACE           77         ROADWAY EMBANKMENT         Red-Brown, Fine to Coarse Sandy SILT           78         GES6.         Tan-Brown, Sity Fine to Coarse SAND           79         GES6.         Tan-Brown, Sity Fine to Coarse SAND           70         M         GES6.         Tan-Brown, Sity Fine to Coarse SAND           70         M         G         Grange-Black, Sity Fine to Coarse SAND           70         M         Grange-Black, Sity Fine to Coarse SAND         Grange-Grange-Fine Sandy SILT (A-4), Very           71         Grange-Black, Fine Sandy SILT (A			4
COMP. DATE         01/12/16         SURFACE WATER DEPTH         N/A           75         100         NO.         MOI         G         SOIL AND ROCK DESCRIPTION           75         100         NO.         MOI         G         SOIL AND ROCK DESCRIPTION           75         100         NO.         MOI         G         SOIL AND ROCK DESCRIPTION           75         100         NO.         MOI         G         SOIL AND ROCK DESCRIPTION           75         100         NO.         MOI         G         SOIL AND ROCK DESCRIPTION           75         100         M         254.6         Asphalt (0.3') and ABC Stone (0.7')           76         RODWAY EMBANKMENT         Red-Brown, Fine to Coarse SAND         Tan-Brown, Fine Sandy SILT (A-5(13)), Medium Stiff Micaceous           76         939.6         Tan-Brown, Silty Fine to Coarse SAND         1           77         Tan-Brown, Silty Fine to Coarse SAND         1         1           78         939.6         Tan-Orange, Fine Sandy SILT (A-4),	,	, , , ,	
SAMP.         NO.         MOI         G         SOIL AND ROCK DESCRIPTION           75         100         NO.         MOI         955.6         GROUND SURFACE           955.6         GROUND SURFACE         955.6         GROUND SURFACE           955.6         GROUND SURFACE         955.6         GROUND SURFACE           955.6         GROUND SURFACE         955.6         GROUND SURFACE           95.6         GROUNAY EMBANKMENT         Red-Brown, Fine to Coarse Sandy SILT         948.6           95.530         42%         Tan-Brown, Fine Sandy SILT (A-5(13)), Medium Stiff, Micaceous         938.6         Tan-Brown, Sitty Fine to Coarse SAND         1           95.530         42%         1         938.6         Tan-Brown, Sitty Fine to Coarse SAND         1           95.530         42%         1         938.6         Tan-Brown, Sitty Fine to Coarse SAND         1           95.530         42%         1         938.6         Tan-Orange, Fine Sandy SiLT (A-4),			
John         O         SOIL AND ROCK DESCRIPTION           NO.         MOI         G         SOIL AND ROCK DESCRIPTION           955.6         GROUND SURFACE         955.6         GROUND SURFACE           955.6         GROUND SURFACE         955.6         GROUND SURFACE           100         M         955.6         Asphalt (0.3) and ABC Store (0.7)           100         M         955.6         GROUND SURFACE           101         M         1         Robust Hits           101         M         1         1           101			A
M         Session         Sess		SOIL AND ROCK DES	CRIPTION
Image: Second State State State       Red-Brown, Fine to Coarse Sandy State         Image: Second State State       Red-Brown, Fine State         Image: Second State       Red-Brown, Fine State <td> M -</td> <td></td> <td></td>	M -		
M       948.6       RESIDUAL         Tan-Brown, Fine Sandy SILT (A-5(13)),       Medium Stiff, Micaceous         M       938.6       Tan-Brown, Silty Fine to Coarse SAND         M       938.6       Tan-Brown, Silty Fine to Coarse SAND         M       938.6       Micaceous         W       923.6       Micaceous         W       923.6       Micaceous         W       938.6       Green-Gray, Silty Fine to Coarse SAND         W       99		Red-Brown, Fine to Coars	e Sandy SILT
Residual       Residual <th< td=""><td><u>····</u> M L</td><td></td><td> 7.0</td></th<>	<u>····</u> M L		7.0
Image: Second State Sta	M	マークローク RESIDUAL アローク RESIDUAL	LT (A-5(13)),
Image: Second	SS-530 42%		
</td <td>· · · · · · · · · · · · · · · · · · ·</td> <td>Tan-Brown, Silty Fine to C (A-2-4), Loose to Mediu</td> <td>Coarse SAND Jum Dense,</td>	· · · · · · · · · · · · · · · · · · ·	Tan-Brown, Silty Fine to C (A-2-4), Loose to Mediu	Coarse SAND Jum Dense,
923.6       Tan-Orange, Fine Sandy SILT (A-4), Medium Stiff to Stiff, Micaceous         W       913.6         Orange-Black, Silty Fine to Coarse SAND         (A-2-4), Medium Dense, Micaceous         W         903.6         Orange-Black, Fine Sandy SILT (A-4), Very         Stiff, Micaceous         W         903.6         Orange-Black, Fine Sandy SILT (A-4), Very         Stiff, Micaceous         W         903.6         Orange-Black, Fine Sandy SILT (A-4), Very         Stiff, Micaceous         W         93.6         Orange-Black, Fine Sandy SILT (A-4), Very         Stiff, Micaceous         W         93.6         Orange-Black, Fine Sandy SILT (A-4), Very         Stiff, Micaceous         W         93.6         Green-Gray, Silty Fine to Coarse SAND         (A-2-4), Very Dense, Micaceous         W         891.1         886.6         6         600.0         886.6         6         600.0	M		
····       W       ····       Medium Stiff to Stiff, Micaceous         ····       W       ····       ····         ····       ····       ····       ····       ····         ····       ····       ····       ····       ····         ····       ····       ····       ····       ····         ····       ····       ····       ····			; <u>SII ∓ (A-4)</u> — <u>32.0</u>
913.6       Orange-Black, Silty Fine to Coarse SAND         (A-2-4), Medium Dense, Micaceous         W         903.6         Orange-Black, Fine Sandy SiLT (A-4), Very         Stiff, Micaceous         W         898.6         Green-Gray, Silty Fine to Coarse SAND         (A-2-4), Very Dense, Micaceous         W         898.6         Green-Gray, Silty Fine to Coarse SAND         (A-2-4), Very Dense, Micaceous         W         891.1         60/0.0         886.6         60/0.0	w		
W 903.6 0range-Black, Fine Sandy SILT (A-4), Very Stiff, Micaceous W 988.6 Green-Gray, Silty Fine to Coarse SAND (A-2-4), Very Dense, Micaceous W 993.6 Green-Gray, Silty Fine to Coarse SAND (A-2-4), Very Dense, Micaceous W 993.6 60/0.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 886.6 ft ON CRYSTALLINE ROCK (MICA	w	Orange-Black, Silty Fine to	
903.6       Orange-Black, Fine Sandy SILT (A-4), Very         903.6       Orange-Black, Fine Sandy SILT (A-4), Very         Stiff, Micaceous       Stiff, Micaceous         903.6       Green-Gray, Silty Fine to Coarse SAND         900.0       891.1         886.6       Gray, (MICA GNEISS).         900.0       886.6         900.0       886.6         900.0       Boring Terminated with Standard         900.0       Penetration Test Refusal at Elevation 886.6         900.0       Fine to Coarse SAND	w		WILCALEOUS
W Byg8.6 Green-Gray, Silty Fine to Coarse SAND (A-2-4), Very Dense, Micaceous W Byg1.1 Byg		Orange-Black, Fine Sandy S	SILT (A-4), Very Is
891.1       6          891.1       6           Gray, (MICA GNEISS).           886.6         60/0.0       Boring Terminated with Standard         Penetration Test Refusal at Elevation 886.6       6         ft ON CRYSTALLINE ROCK (MICA		Green-Gray, Silty Fine to C	
Gray, (MICA GNEISS).			64.5
Penetration Test Refusal at Elevation 886.6     ft ON CRYSTALLINE ROCK (MICA		Gray, (MICA GNE 886.6	ISS). 69.0
	60/0.0	Penetration Test Refusal at     ft ON CRYSTALLINE R	Elevation 886.6

	SOIL TEST RESULTS															
SAMPLE NO.	NO. BORING OFFSET STATION DEPTH			AASHTO	L.L.	P.I.		% BY	WEIGHT		% PASS	%	%			
			-Y2-	INTERVAL	CLASS.			C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGAINIC
SS-518	EB1-A	7' LT	20+17	13.8-15.3'	A-5(1)	44	3	17.6	43.4	25.4	13.6	99.0	89.0	50.0	30.1	-
SS-546	EB1-B	16' RT	20+21	18.3-19.8	A-5(8)	50	10	11.3	23.6	33.0	32.0	99.0	94.0	69.0	40.8	-
SS-561	B1-B	16' RT	21+35	33.7-35.2'	A-5(0)	42	2	15.1	42.6	33.6	8.7	95.0	88.0	50.0	53.0	-
SS-530	EB2-B	9' RT	22+60	14.0-15.5'	A-5(13)	55	10	4.6	19.9	49.7	25.8	99.0	97.0	81.0	41.9	-

SS = Split-Barrel Sample (ASTM D-1586)

 Lab Technician:
 Amanda R. Roth
 NCDOT Certification No.: 112-09-1003

 Signature:
 Image: Amage: Am

PROJECT REFERENCE NO.	SHEET NO.
U-2579C	11



Site Photo No. 1: End Bent 1 – Y2– (Willison Road) Looking Upstation (North)



Site Photo No. 2: Bent 1 – Y2– (Williston Road) Looking Upstation (North)



Site Photo No. 3: Bent 1 -L- (Future I-74) Looking Downstation (West)

