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### STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

### **STRUCTURE** SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 39010.1.R2 (U-3440) \_ F.A. PROJ.\_ COUNTY **CABARRUS** 

PROJECT DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP ROAD) IN KANNAPOLIS

SITE DESCRIPTION DUAL BRIDGES ON NC 3 OVER IRISH BUFFALO CREEK REPLACING BRIDGE NO. 36

C

440

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NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR QUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - 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.

STATE	STATE PROJECT REFERENCE NO.	SHBBT NO.	TOTAL SHEETS
N.C.	39010.1.R2 (U-3440)	1	18

#### CAUTION NOTICE

THE SLBSURFACE 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 BORNE LOOS, ROCK CORES, AND SOL TEST DATA AVAILABLE MAY BE REVEWED OR INSPECTED IN RALEGEN BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, CEGTECHNICL ENGINEERAGE UNIT AT 1999 JSG-MOBB. NETHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, ON SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SIXE AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GENERAL SQL AND ROCK STRAID DESCRIPTIONS AND INDICATED BOUNDARES ARE BASED ON A GEOTECHNCAL INTERPRETATION OF ALL AVALABLE SUBSUFFACE DATA AND MAY NOT INCECESSABILY REPLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRAIA WITHIN THE BOREHOLE, THE LABORATORY SAMPLE DATA AND THE IN SITU UN-PLACETEST DATA CAN BE RELIED ON ONLY TO THE DECREE OF RELIABULITY INVERTMENT IN THE STRANAED TEST MOTA CAN BE RELIED ON ONLY TO THE DECREE OF RELIABULITY INVERTMENT IN THE STRANAED TEST MATA CAN BE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOL MOSTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCOMPTION TO CLIMATIC CONTIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS THE BIDDER OR CONTRACTOR IS CAUTONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMMARY ONLY AND IN MAYL CASES THE FINAL DESIGN OFTALLS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PLARPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT MARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MORE, OR OPINION OF THE DEPARTMENT AS TO THE INVESTIGATION MADE, NOR THE MITERPRETATIONS MORE, OR OPINION OF THE DEPARTMENT AS TO THE INVESTIGATION MADE, NOR THE MITERPRETATIONS MORE, OR OPINION OF THE DEPARTMENT AS TO THE INVESTIGATION MADE INDEPRIDENT USBURFACE MYESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HWSELF AS TO CONDITIONS TO BE ENCOUNTERED. THE SUPERCI. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS. RECOUNTERED AT THE SUB-OFFERING FROM THOSE INDICATED IN THE SUBSURFACE MON THE ACTUAL CONDITIONS AND OF THE NET AS TO DEFERING FROM THOSE INDICATED IN THE SUBSURFACE MON THE ACTUAL CONDITIONS TO BE ENCOUNTERED ON THE STRUE OFFERING FROM THE ACTUAL CONDITIONS TO BE ENCOUNTERED AND EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS RECOUNTERED AT THE SIDE OFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION,

> INVESTIGATED BY J.P. ROGERS C.B. LITTLE CHECKED BY SUBMITTED BY C.B. LITTLE JUNE 2014 DATE

PERSONNEL C.C. MURRAY J.E. ESTEP M.R. MOORE



#### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

### SUBSURFACE INVESTIGATION

#### SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

								· · · · · · · · · · · · · · · · · · ·					<u>ов</u> о,							
SOIL IS CON THAT CAN B	ISIDERED TO	BE THE UNCONSOLIDATED, S D WITH A CONTINUOUS FLIG	ESCRIPTION EMI-CONSOLIDATED HT POWER AUGER,	N. OR WEATH	HERED EARTH	MATERIALS		<u>Well Graded</u> - Indicates a G <u>Uniform</u> - Indicates That Soi Podrly Graded)	GRAD	ATION F PARTICLE SIZES F APPROXIMATELY THE	ROM FINE TO COARSE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD VIELD SPT REFUSAL ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD VIELD SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN B.I NOT A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN B.I								
CLASSIFICAT	ION IS BASE	D on the Aashto System,	BASIC DESCRIPTION	DNS GENERA	S, ASIM D-158 LLY SHALL I	NCLUDE:		<u>GAP-GRADED</u> - INDICATES A MIX	ANGULARITY	OF GRAINS	ADRE SIZES.	DF WEATHERED ROCK.								
AS MINERALI	GICAL COMP VER	TURE, MOISTORE, AASHTO LLA OSITION, ANGULARITY, STRUC Y STAFF, GRAY, SULTY CLAY, MOIST WITH M	IURE, PLASTICITY, TURE, PLASTICITY, TERBEDDED FINE SAND L	ETC. EXAMPL	RTINENT FACT LE: LASTAC, A-7-6	ORS SUCH		THE ANGULARITY OR ROUNDNESS SUBANGULAR, SUBROUNDED, OR F	S OF SOIL GRAINS IS D	DESIGNATED BY THE	TERMS: <u>ANGULAR</u> ,	WEATHERED	ERIALS AR	E TYPICALLY	DIVIDED AS FOLL NON-COASTAL PI	.OWS: LAIN MATERIAL THAT WOULD YIE I IF TESTED	LD SPT N VALU			
	SO	IL LEGEND AND A	ASHTO CLA	ASSIFIC	ATION				MINERALOGICAL	_ COMPOSITIO			1.2	FINE TO COARSE	GRAIN IGNEOUS AND METAMORPH	HIC ROCK THAT				
GENERAL CLASS.	GRAI (≤ 35	NULAR MATERIALS 5% PASSING #200)	SILT-CLAY MA	TERIALS ING *200)	ORGAN	IC MATERIA	LS	MINERAL NAMES SUCH AS QUART WHENEVER THEY ARE CONSIDERE	IZ, FELDSPAR, MICA, TALI D DF SIGNIFICANCE.	C, KAOLIN, ETC. ARE U	ROCK (CR)			WOULD YIELD SP GNEISS, GABBRO, FINE TO COABSE	PT REFUSAL IF TESTED. ROCK TY SCHIST, ETC.	THE INCLUDES O				
GROUP CLASS	A-1	A-3 A-2	A-4 A-5	A-6 A-7	A-1, A-2 A-3	A-4, A-5   A-6, A-7					1 CCC THAN 31	ROCK (NCR)	LINE		SEDIMENTARY RO	CK THAT WOULD YEILD SPT REF	USAL IF TESTE			
SYMBOL					11111			MODERATELY COMPRESSIBLE	SSIBLE		EDUAL TO 31-50 GREATER THAN 50	COASTAL PLA	IN BOCK		COASTAL PLAIN	SEDIMENTS CEMENTED INTO ROCH	SANDSTONE CE			
% PASSING	000000000000					A			PERCENTAGE	OF MATERIA	L	- (CP)	NOCK		SHELL BEDS, ETC		SHIDSTORE, CEI			
* 10 * 40	58 MX 38 MX 58 MX	51 MN			GRANULAR	CLAY	MUCK, PEAT	ORGANIC MATERIAL	GRANULAR SILT - CL	AY	OTHER MATERIAL	1			WEA	ATHERING				
<b>*</b> 200	15 MX 25 MX	10 MX 35 MX 35 MX 35 MX 35	MX 36 MN 36 MN 3	36 MN 36 MN	30123	SOILS		TRACE OF DRGANIC MATTER	2 - 3% 3 - 5%	TR	ACE 1 - 10%	FRESH	ROCK FR HAMMER	EGH, CRYSTAL IF CRYSTALL	S BRIGHT, FEW JO INE.	DINTS MAY SHOW SLIGHT STAININ	NG.ROCK RINGS			
liouid limit Plastic index	6 MX	40 MX 41 MN 42 MX 41 NP 18 MX 18 MX 11 MN 11	MN 48 MX 41 MN 4 MN 18 MX 18 MX 11	10 MX 41 MN 1 MN 11 MN	SOILS -	WITH OR	HIGHLY	MODERATELY ORGANIC HIGHLY ORGANIC	3 - 5% 5 - 12% 5 - 10% 12 - 20% >10% >20%	L)1 SOI H)0	TLE 10 - 20% 4E 20 - 35% HLY 35% AND ABOVE	VERY SLIGHT (V SLI.)	ROCK GE CRYSTAL	NERALLY FRE	SH, JOINTS STAIN EN SPECIMEN FAC	ed, some joints may show thi Ce shine brightly, rock rings	N CLAY COATIN UNDER HAMMER			
GROUP INDEX	0	0 8 4 MX	8 MX 12 MX 1	6 MX No MX	MODERA AMOUNT	SOF	ORGANIC		GROUN	D WATER		SLIGHT	ROCK GE	NERALLY FRE	SH, JOINTS STAIN	ED AND DISCOLORATION EXTENDS	S INTO ROCK UP			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SILTY OR CLAYEY SAND GRAVEL AND SAND	SILTY SDILS	CLAYEY SOILS	ORGANI MATTER		3011.5	WATER LEV	VEL IN BORE HOLE IM	MEDIATELY AFTER H	DRILLING	(SL1.)	1 INCH. ( CRYSTAL	open joints .s are dull	MAY CONTAIN CLA AND DISCOLORED.	AY. IN GRANITOID ROCKS SOME O CRYSTALLINE ROCKS RING UNDE	CCASIONAL FEL			
GEN. RATING AS A	EXCI	ELLENT TO GOOD	FAIR TO	POOR	FAIR TO	PDDR I	INSUITABLE	VPW PERCHED W	ATER, SATURATED ZON	E, OR WATER BEAR	NG STRATA	MODERATE (MOD.)	SIGNIFIC GRANITO DULL SO	ANT PORTION ID ROCKS, MOS IUND UNDER H	s of rock show St feldspars ar Iammer blows an	DISCOLORATION AND WEATHERING E DULL AND DISCOLORED, SOME D SHOWS SIGNIFICANT LOSS OF	G EFFECTS. IN SHOW CLAY. RO STRENGTH AS C			
SUBGRADE	ΩE Δ-7-5 '		30 . PI DE 4-7	-6 SUBCE		1 - 30			SEEP				WITH FR	ESH ROCK.						
	ы низ.		Y OR DENS	SENESS	.001 13 > 1				MISCELLANE	OUS SYMBOLS	3	SEVERE	ALL ROC	k except du Colored and	ARTZ DISCOLORED A MAJORITY SHO	) or stained. In granitoid roc IV kaolinization. Rock shows :	CKS, ALL FELDSF SEVERE LOSS O			
PRIMARY	SOIL TYPE	COMPACTNESS OR	RANGE OF ST PENETRATION RE	TANDARD SISTENCE	RANGE D	F UNCONFI	NED NGTH		IENT (RE)	SPT DPT DHT TEST BORI		(MOD, SEV,)	and can <u>if test</u>	BE EXCAVAT ED, WOULD YI	ED WITH A GEOLO ELD SPT REFUSAL	OGIST'S PICK. ROCK GIVES 'CLUN	K'SOUND WHEN			
GENER	ALL Y	VERY LODSE	(N-VALU <4	E)	(T)	DNS/FT2)		WITH SDIL DESCRI		AUGER BORING	- SPT N-VALUE	SEVERE (SEV.)	ALL ROC	K EXCEPT OL NGTH TO STR	JARTZ DISCOLORED	O OR STAINED. ROCK FABRIC CLEI	AR AND EVIDENT ARE KADLINIZED			
GRANU MATER	ilar Nal	MEDIUM DENSE	10 TO 3	30		N/A		ARTIFICIAL FILL (	AF) OTHER -	CORE BORING	REF- SPT REFUSAL		IF TEST	ED, YIELDS S	PT N VALUES > 1	00 BPF				
(NON-	COHESIVE)	VERY DENSE	30 10 3			(0.25		INFERRED SOIL BO		MONITORING WE	LL	VERY SEVERE (V SEV.)	ALL ROC THE MAS REMAININ	K EXCEPT OU S IS EFFECT NG. SAPROLITI	IARTZ DISCOLORED IVELY REDUCED T E IS AN EXAMPLE	O OR STAINED. ROCK FABRIC ELE O SOIL STATUS, WITH ONLY FRAC OF ROCK WEATHERED TO A DEG	MENTS ARE DIS GMENTS OF STR REE SUCH THAT			
GENER		SOFT MEDIUM STIEF	2 TO 4	4	0.2	5 TD 0.50		INFERRED ROCK LI	NE 🛆	PIEZOMETER			VESTIGES	s of the or	IGINAL ROCK FAB	RIC REMAIN. <u>IF TESTED, YIELDS</u>	SPT N VALUES			
MATER (COHE	AIAL SIVE)	STIFF VERY STIFF	8 TO 1 15 TO 3	15 30	Ø	1 TD 2 2 TO 4		ALLUVIAL SOIL BO		SLOPE INDICATI	DR	COMPLETE	ROCK RE	DUCED TO SO ED CONCENTR EXAMPLE.	IL. ROCK FABRIC ATIONS. QUARTZ (	NOT DISCERNIBLE, OR DISCERNIB MAY BE PRESENT AS DIKES OR S	LE ONLY IN SM STRINGERS, SAPI			
						>4		ROCK STRUCTURES	ION OF	CONE PENETRON	ETER TEST				ROCK	HARDNESS				
U.S. STD. SI	EVE SIZE	4 12	40 6	30 200	270				•	SOUNDING ROD		VERY HARD	CANNDT SEVERA	BE SCRATCH	ed by Knife or /S of the geoloi	SHARP PICK. BREAKING OF HAND GIST'S PICK.	SPECIMENS RE			
OPENING (M	(M)	4.76 2.0	0.42 0.	25 0.07	5 0.053				ABBREV	IATIONS		HARD	CAN BE TO DET	SCRATCHED	BY KNIFE OR PIC	K ONLY WITH DIFFICULTY. HARD	HAMMER BLOWS			
BDULDE (BLDR.	ER CO ,) ((	BBLE GRAVEL COB.) (GR.)	SAND (CSE. SD.)	SANE (F SI		ILT SL.)	CLAY (CL.)	AR - AUGER REFUSAL BT - BORING TERMINATED CL CLAY	MED MEDI MICA MICA MOD MODE	UM NCEOUS RATELY	VST - VANE SHEAR TEST WEA WEATHERED ン - UNIT WEIGHT	MODERATEL HARD	Y CAN BE	SCRATCHED	BY KNIFE OR PIC BLOW OF A GEO	K, GOUGES OR GRODVES TO 0.25 LOGIST'S PICK, HAND SPECIMENS	Inches Deep Can be detac			
GRAIN SIZE	MM 305 IN. 12	75 2.0 3	) (	0.25	0.05	0.005		CPT - CONE PENETRATION T	EST NP - NON P		$\dot{\gamma}_{ m d}$ - DRY UNIT WEIGHT	MEDIUM	BY MOD CAN BE	ERATE BLOWS	S. R GDUGED 0.05 IN	CHES DEEP BY FIRM PRESSURE (	OF KNIFF OR PL			
	SC	DIL MOISTURE - (	CORRELATIO	ON OF	TERMS			DMT - DILATOMETER TEST	PMT - PRES	SUREMETER TEST	SAMPLE ABBREVIATIONS	HARD	CAN BE	E EXCAVATED	IN SMALL CHIPS	TO PEICES 1 INCH MAXIMUM SIZE	e by hard blo			
SOIL (ATTE	MOISTURE ( RBERG LIMI	SCALE FIELD M TSI DESCR	IDISTURE (	GUIDE FDR	FIELD MOIS	TURE DESC	RIPTION	<ul> <li>OP1 - DYNAMIC PENETRATIO.</li> <li>OP1 - VOID RATIO</li> <li>F - FINE</li> </ul>	SD SAND, SD SAND, SL SILT, S	ULITIC SANDY STLTY	5 - BULK SS - SPLIT SPDON ST - SHELBY TUBE	SOFT	CAN BE	E GROVED OR CHIPS TO SEV	GOUGED READILY	BY KNIFE OR PICK. CAN BE EXC SIZE BY MODERATE BLOWS OF A	AVATED IN FRA PICK POINT. SI			
		- Satu (Sa	RATED - T.)	USUALLY L FROM BELO	.IQUID: VERY DW THE GRO	WET, USUA	LLY TABLE	FOSS FOSSILIFEROUS FRAC FRACTURED, FRACTUR	SL1 SL1GH RES TCR - TRICO	ITLY DNE REFUSAL	RS - ROCK RT - RECOMPACTED TRIAXIAL	VERY	PIECES CAN BE	CAN BE BRD	KEN BY FINGER P H KNIFE. CAN BE	RESSURE. EXCAVATED READILY WITH POINT	I OF PICK. PIEC			
		LIMIT						HI HIGHLY	W - MOISTON V - VERY	RE CUNIEN!	CBR - CALIFORNIA BEARING RATIO	SOFT	OR MOR FINGER	RE IN THICKNE NAIL.	ESS CAN BE BROK	EN BY FINGER PRESSURE. CAN B	E SCRATCHED F			
RANGE <		- WE	r - (w)	SEMISOLID	REDUIRES	TURE		EOUI	PMENT USED O	N SUBJECT P	PROJECT	F	RACTU	RE SPAC	ING	BEDD	DING			
"" PL	+ PLAST	IC LIMIT						DRILL UNITS:	ADVANCING TOOLS:		HAMMER TYPE:	TER	<u>1</u>	<u>SP</u>	ACING	VERY THICKLY BEDDED	THICKN			
ОМ		M MOISTURE - MOIS	ST - (M)	SOLID; AT	OR NEAR (	OPTIMUM MO	DISTURE		CLAY BITS		X AUTOMATIC MANUAL	VERY WI WIDE	DE	MDRE TI 3 TO 10	HAN 10 FEET I FEET	THICKLY BEDDED	1.5 - 4			
SL		AGE LIMIT	·····	PEOLIDEE					6' CONTINUOUS	FLIGHT AUGER	COBE SIZE:	– MODERAT CLOSE	ELY CLOSE	E 1 TD 3 0.16 TO	FEET 1 FEET	VERY THINLY BEDDED	0.03 - 0			
		- DRI	(D)	ATTAIN OP	TIMUM MOIS	TURE		ВК-51	8' HOLLOW AUG	ERS	П-в	VERY CL	OSE	LESS TH	HAN 0.16 FEET	THICKLY LAMINATED THINLY LAMINATED	0.008 - 0. < 0.008			
		<u>PL</u>	ASTICITY					CME-45C	HARD FACED F	INGER BITS					IND	URATION				
		PLASTIC	ITY INDEX (PI)		DRY STR	ENGTH								FUR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, H						
LOW PLAST	VONPLASTIC 0-5 VERT LOW LOW PLASTICITY 6-15 SLIGHT							CME-550	X CASING X	W/ ADVANCER		-  <sup>F</sup>	RIABLE		GENTLE	BLDW BY HAMMER DISINTEGRATE	S SAMPLE.			
MED. PLAST HIGH PLAS	TICITY TICITY	16 26	-25 OR MORE		MEDIU HIGH	M ł		PORTABLE HOIST		STEEL TEETH	POST HOLE DIGGER	M	DDERATELY	INDURATED	GRAINS BREAKS	CAN BE SEPARATED FROM SAMPL EASILY WHEN HIT WITH HAMMER.	E WITH STEEL			
			COLOR					┨└┘ │		TUNO, UHAD,	SOUNDING ROD	41	DURATED		GRAINS	ARE DIFFICULT TO SEPARATE WI	TH STEEL PROE			
DESCRIPTI MODIFI	IONS MAY IN	NCLUDE COLOR OR COLOR AS LIGHT, DARK, STREAKED	COMBINATIONS ( , ETC, ARE USED	TAN, RED, TO DESCH	YELLOW-BRO RIBE APPEAF	WN, BLUE-GI RANCE	RAY).				VANE SHEAR TEST	E	TREMELY	INDURATED	SHARP 1	HAMMER BLOWS REQUIRED TO BRE	EAK SAMPLE;			
								1			[_]				SAMPLE	BREAKS ACROSS GRAINS.				

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ERRED	
JSAL. 8 60 BLOWS.	ADUIFER - A WATER BEARING FORMATION OR STRATA.
ED BY A ZONE	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
	ARGILLACEQUE - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,
5 > 100	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
	AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE
ANITE,	GROUND SURFACE.
	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
NULK ITPE	OF SLOPE.
YIELD INTED	CORE RECOVERY (RECJ - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
	DIKE - A TABULAR BODY OF IGNEDUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
INDER	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
S IF OPEN, BLOWS IF	<u>DIP DIRECTION (DIP AZIMUTH) -</u> THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
to Spar	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
S.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
MPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
INS DULL STRENGTH TRUCK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
	JDINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS DCCURRED.
BUT REDUCED TO SOME	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
ERNIBLE BUT	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
ONLY MINDR	<u>PERCHED WATER</u> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
L AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
DLITE IS	ROCK DUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEOMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCHARGE.
UIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
REQUIRED	<u>SILL</u> - 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,
an Be Ed	$\frac{\text{SLICKENSIDE}}{\text{SLIP} PLANE.}$ - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
K POINT. 5 OF THE	STANDARD FENETRATION TEST (PENETRATION RESISTANCE)(SPI1) - NUMBER OF BLOVS IN OR BPF)OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FODT 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.
MENTS ALL, THIN	STRATA CORE RECOVERY ISREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH DF STRATUM AND EXPRESSED AS A PERCENTAGE.
S 1 INCH ADILY BY	STRATA ROCK OUALITY DESIGNATION (SROD) - A MEASURE OF ROCK OUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EDUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATE AND EXPRESSED AS A PERCENTARF.
	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
<u>SS</u>	BENCH MARK: BL-14
T	<u>STA 63+24,64</u>
FEET	<u>N 636547.1510 E 1507771.2200</u> ELEVATION: 667.34 FT.
3 FEET	NOTES:
EET	SOIL STRATIGRAPHY IS THROUGH THE BORINGS FOR PROFILE
SUBE, ETC	
ROBE;	
,	





	PROJECT REFERENCE NO.	SHEET				
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	PROJECT REFERENCE NO.	SHEET									
20 40	39010.1.1 (U-3440)	5									
FEET	Section Through End Bent One (LL&RL) Sta. 67+60.60 -L- (W.P. #1)										
	Skew = 110°00'00"										
	· · · · · · · · · · · · · · · · · · ·										
	·										
(FILL)		600									
PLASTIC		020									
		680									
RL) ROADWAY EMBANKME	ENT (FILL)										
T RED-BRN MED. STIFF T MOIST MED. PLASTIC		67_0									
50,7 SILTY SANDY CLAY (A-	-7-6)										
		660									
ALLUVIUM (7) GRAY V. LOOSE MOIST	TO WET	000									
(PIE16) CLAYEY SAND (A-2)											
WEATHERED ROCK	WEATH CRYSTALLINE ROCK	650									
CRYSTALLINE ROCK											
-(607.)		640.									
-@/.)											
		630									
		600									
-1111		bZU									
1 1 1 1 - 1 1 - 1		610									
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	PROJECT REFERENCE NO. S	SHEET				
20 40	39010.1.1 (U-3440)	6				
FEET	Section Through Bent One (LL&) Sta. 67 + 90.60 -L- (W.P. #2)	'RL)				
	Skew = 110°00'00"					
	· · · · · · · · · · · · · · · · · · ·					
		600				
		- 690				
$\begin{array}{c} & & & & \\ & & & & \\ & & & \\ & & & \\$						
)						
		670				
OROADWAY EMBANKMEN	T (FILL)					
RED-BRN' MED. STIFF MOIST LOW PLASTIC		000				
$\frac{\mathcal{CLAYEY}}{\mathcal{C}} = \frac{\mathcal{CLAYEY}}{\mathcal{C}} = \mathcal{CLA$	· · · · · · · · · · · · · · · · · · ·	bbU				
(PI=10) TAN & GRAY V. LOOSE	WET NON PLASTIC					
(PI=5) OLIVE & WHITE LOOS	-2-4) E -WET -SILTY-SAND - (A-1-B)	650				
00/.9 WEATHERED ROCK OLIVE & WHITE WET	SEV. WEATH. CRYSTALLINE ROCK					
CRYSTALLINE ROCK		640				
607.) OLIVE & WHITE						
607.0		630				
		0-2-0				
· - · · · · · · · · · · · · · · · · · ·		620				
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	20		40		39010.1.1	(U-3440)		7
	FEE	T		Se	ction Thro Sta. 68 +	ugh Bent 1 50.60 -L-	[wo (LL (W.P. #	GRL) 3)
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1	ART	FICIAL	FILL			2 2 1 1		670
÷	TAN-GRA MOIST S	Y SOFT T	TO MED. S Y (A-6)	TIFF				
/	W/ORGAN	ncs						
<b>.</b>		+	 			 		660
(3	TAN-G	ALLU	VIUM OSE	0	1			
3	) W/ORG	ANICS	SAND (A	2)		 		650
(18		<u> </u> RESID WHITE M	UAL ED. DENS.	E WET		     		1
0.	<u>SIL</u> T	<u>Y SAND (</u>	<u>A-1-B) W/1</u>	RÁCE MI	CA	 		640
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0		STALLINE	ROCK					
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	PROJECT REFERENCE NO. SH										
20 40	39010.1.1	(U-3440)	8								
FEET	Section Throug Sta. 68	th End Bent Two ( 90.60 -L- (W.P. #	LL&RL) 4)								
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(FILL)			600								
PLASTIC CLAYEY SILTY SAND	$D^{-}(A-2-4)$ $D^{-}(A-1+B)$	,									
2.0											
			680 -								
0.5 ARTIFICIAL FILL		1 1 1 1 1 1 1 1									
GRAY-TAN & GRAY LOOSE I	MOIST TO WET		1								
			660								
S ALLUVIUM	I I I		1								
- <b>1</b> 5	   		650								
LS	1     										
1007.2	k P E		640								
1007.5 WEATHERED ROCK											
CRYSTALLINE ROCK W	TRACE MICA		670								
			1 1 1								
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### NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

<b>WBS</b> 39	010.1	I.R2			TI	P U-3440		COUNTY	CABAR	RUS			GI	EOLOGIST Murray, C. C.	. <b></b>		WB	<b>3</b> 3901	0.1.R2			11T	• U-3	440		COUNTY		
SITE DESCRIPTION BRIDGE 36 (LEFT LANE) ON NC 3 OVE					VER IRIS	SH BUFFAI	O CRE	EK			GROUND WTR (ft)				DESC	RIPTIO	N BR	IDGE	36 (LEF	(LEFT LANE) ON NC 3 OVER IRI								
BORING	NO.	EB1-	A(LL)		S	TATION 6	7+78		OFFSET	58 ft L.T			AL	IGNMENT -L-	_ (	<b>0 HR.</b> 6.0	BOF	RING NO	). EB1	-B(LL)	ŀ	ST	ATION	67+	-63			
COLLAR	ELEV	/. 65	9.5 ft		т	DTAL DEPI	rh 28.0 fi		NORTHING	<b>3</b> 636,6	538		E4	ASTING 1,507,906	24	<b>4 HR.</b> 6.0	COL	LAR EL	. <b>EV</b> . 6	61.8 ft		тс	TOTAL DEPTH 23.5 ft					
DRILL RIG	/HAMN	MER E	FF./DA	TE HF	00066	CME-550 81	% 03/19/20	14		DRILL	NETHO	DD 1	NW Cas	/ Casing w/ SPT HAMMER TYPE Automatic				DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/201										
DRILLER	Est	ep, J.	E.		S	FART DATE	05/02/1	4	COMP. DA	TE 05/	02/14		SURFACE WATER DEPTH N/A					LLER	Estep,	J. E.		ST		ATE	05/06/1	14		
ELEV DRI	EV D	EPTH	BLC	W COL	JNT		BLOWS F	PER FOOT		SAMP.	$\mathbf{V}$			SOIL AND ROCK DES	SCRI	IPTION	ELEV	, DRIVE	DEPT	H BL	ow co				BLOWS	PER FOOT		
(it) (ft	t)		0.5ft	0.5ft	0.5ft		25 5	1	/5 100	NO.	/мо	<u>I</u> G	ELE	V. (ft)		DEPTH (ft)		(ft)	00	0.5ft	0.5ft	0.5ft	0			50		
660	_					- <u>r</u>	1	<del></del>					659.	5 GROUND SURF.	AC	E 0.0	665		+									
0.50	Ţ												-	TAN & GRAY SOFT MOIST	T TC	WETLOW			Ŧ									
655	<u></u>	2.9	2	1	1	•2				SS-19	w		1	(PI≂12) PLASTIC SILTY SAM	NDY	Y CLAY (A-6)	660		Ŧ				1.	•••				
	Ŧ					1					▼		E	c.		7.0		658.7	- 3.1	3	2	3		•••				
.651	1.6 -	7.9	2	3	Λ	'						000	<u>) - 002.</u> ) -			7.0			Ŧ			l I	•5' [					
650	Ŧ		2		7	•7				55-20	W	000		(A-1-B) W/ TRACE	SE V E MI	CA	655	6527	Ŧ .,									
646	Ē	12.0				:'							648.	0 RESIDUAL	-	11.5			Ī	0	1	4	<b>6</b> 5					
645	<u></u>	_12.9	4	11	12		23			SS-21	w	000		WHITE & TAN MED. DENS SAND (A-1-B) W/ TRA	SE \ ACE	WET SILTY	650		Ŧ				!	÷÷-	···· <del>·</del> · <del>·</del>			
	Ŧ							+	+				- 044.	WEATHERED R		K		648.7	13.1	21	69	31/0.1						
64^	1.6	17.9	52	48/0 4							W	1	Ŧ	CRYSTALLINE R		CK			Ŧ									
640	$\pm$			10.0.1			<u> </u>		100/.9			H	1				645	643.7	+ 18 1				<u> </u>		<u> </u>			
636	6 G +	22 Q						· · · ·				II.	1						1	100/0.	4				· · · ·			
635	1	22.5	60	60/0.1					60/.1		W		636.	CRYSTALLINE R	ROC	23.4 K	640		1				· ·			<u>  · · · ·</u>		
	t						· · · ·							WHITE & TAI	N			638.7	- 23.1	100/0.	4		<u> </u>	••				
63	1.6 +	27.9	60/0.1				<u> </u>		60/.1	<b>↓</b>	W	مراجع مسلط	- <u>631</u>	5 Boring Terminated W/TH	IST				ţ		1							
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V	/BS	39010	.1.R2			T	IP U	J-344(	)		со	UNTY	CABARI	งบร				GEC	DLOGI	ST М	lurray, C	C. C.			WBS	3901	0.1.R2			Т	1P U-3	3440		COUNT
SITE DESCRIPTION BRIDGE 36 (LEFT LANE) ON NC 3 OVER										R IRIS	SH BUFFALO CREEK										GROUND	SITE	DESCF	RIPTION	N BR	36 (LE	LEFT LANE) ON NC 3 OVEF							
E	ORIN	IG NO.	B1-A	(LL)		S	TATIO	ON 6	58+0	5			OFFSET	38 ft LT				ALIC	GNMEI	NT -L	-		0 HR.	5.0	BOR	ING NO	. B1-E	3(LL)	s	STATION 67+91				
c	OLL	AR ELE	EV. 66	60.1 ft		<u>т</u>	OTAL	DEP	тн	37.1 f	t		NORTHIN	<b>3</b> 636,6	615			EAS	EASTING 1,507,931 24 HR. 5.0			COL	LAR EL	EV. 6	60.7 ft	Т	OTAL I	DEPT	1 26.2 1	ft				
D	RILL	RIG/HAN	MMER E	FF./DA	TE H	F00066	6 CME	-550 8	1% (	03/19/20	014		DRILL METHOD NW Casing w/ SPT HAMMER TYPE Automatic								DRIL	DRILL RIG/HAMMER EFF./DATE HF00066 CME-550 81% 03/19/2014												
C	RILL	ER E	step, J	Ε.		s	TART	T DAT	E C	)5/05/1	4		COMP. DA	TE 05/	05/	14		SURFACE WATER DEPTH N/A				DRIL	LER E	Estep, J	I. E.	s	TART	DATE	05/05/1	14				
E	EV	DRIVE ELEV	DEPTH	BLC	ow co				В	LOWS	PER	FOOT		SAMP.						SOIL	AND ROO	CK DESC	CRIPTION		ELEV	DRIVE ELEV	DEPTH		ow co	UNT		0	BLOWS	PER FOOT
	.14	(ft)	(1)	0.5ft	0.5ft	0.5ft			25		50		75 100	NO.	<u>/</u> ^	101	G	ELEV.	(ft)					DEPTH (ft)		(ft)	(1)	0.5ft	0.5ft	0.51	++		,	50
e	65		F														ł	_							665		$\pm$							
		-	F															-									ł							
6	60	-	Ē															660.1			GROUN	D SURF	ACE	0.0	660	-	<u> </u>							1
		658.1	2.0		-				•		:							-	C	GRAY-1	<b>ALI</b> FAN TO (	<b>.UVIAL</b> GRAY V.	LOOSE TO			658.3	2.4	6		-				
		-	I	1	2	1	<b>4</b> 3				1:					A 6		-	LC	DOSE N	NOIST T	O WET S	SAND (A-1-B	)			+	0			1	)11 .		
6	55	-	ł		1										$\vdash$			-							655		<u>+</u> _,				$\left  \frac{1}{.1} \right $			<u> </u>
	-	653.1	7.0	1	2	2		4		· · ·		· · ·		SS-22	۰ ا	N		-									+ ··· ′.4	3	2	4	/. ●6.			
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	-	648.1	12.0				i			· · ·		· · ·						- 648.6			RES		<u> </u>	11.5		648.3	12.4	14	70	30/0	_    !÷	· i	· · · ·	· · · ·
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	-	643.1	<u>17.0</u>	25	61	39/0.2	2   :	<u></u> -	÷⊦÷	-:-:-:	+÷		+ · - · - · - · - · - · - · - · - ·	SS-23			000	- 642.6 -			WEATH	ERED RO	оск	17.5			+	100/0.	3				· · · ·	
	640	-	+					•••	• •		1:						977	-		TAN	I & WHIT CRYSTA	E SEV. N	WEATH. OCK		640		+						· · · ·	· · · ·
	ŀ	638.1	22.0	58	60/0 -			••• •••	-   -		:	· · ·					90	- - 637.6						22.5		638.3	22.4	100/0.	3				· · · ·	
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	555	-	+						.   .		+:							-								634.5	<u>+ 26.2</u> +	60/0.0	, ,			<u> </u>	<u> </u>	• • • • •
	ŀ		+27.0 +	60/0.1	ĩ			· · · ·	:   :			· · · · · ·	60/.1	•			S.	-									ŧ							
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	<u>, 20</u>	623.1	+ 37.0								1.			1				623.0						37.1			+							
	ľ	<u></u>	+	60/0.1	1	-	1						60/.1	•				1		Boring 1 PENE1	Terminate	ed WITH	STANDARD				Ŧ							
4		-	+															-	Ele	vation 6	623.0 ft II	V CRYST	TALLINE RO	СК			$\frac{1}{2}$							
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WBS	<b>3</b> 3901	0.1.R2			TI	P U-3440		COUNTY	Y CABARF	ิรบร			GEO	LOGIST Murray, C.	C.		WBS	<b>3</b> 3901	0.1.R2			TIF	• U-34	40	COUNTY
SITE	DESC	RIPTION	BRI	DGE 3	36 (LEI	FT LANE) (	ON NC 3 C	VER IRI	SH BUFFAL		ΞK				G	ROUND WTR (ft)	SITE	E DESCF	RIPTION	BRI	DGE 3	6 (LEF	TLANE	) ON NC	3 OVER IRIS
BOF		. B2-А	(LL)		ST	ATION 68	3+75		OFFSET	46 ft LT			ALIG	SNMENT -L-	0	<b>HR.</b> 7.0	BOF	RING NO	. B2-C	(LL)		ST	ATION	68+67	
COL	LAR EL	. <b>EV.</b> 66	60.5 ft		т	OTAL DEPT	<b>H</b> 57.6 ft		NORTHING	<b>3</b> 636,6	16		EAS	<b>TING</b> 1,508,002	24	HR. FIAD	COL	LAR EL	EV. 66	60.7 ft		ТС	TAL DE	PTH 47.3	3 ft
DRIL	L RIG/HA	MMER E	FF./DA	TE HI	FO0066	CME-550 81	% 03/19/20	14		DRILL N	IETHO	D N	IW Casing	g w/ Advancer H	HAMMER	TYPE Automatic	DRIL	L RIG/HA	MMER E	FF./DA	TE HF	O0066	CME-550	81% 03/19	//2014
DRI	LLER	Estep, J	. E.		S	ART DATE	04/23/14	4	COMP. DA	TE 04/	23/14		SUR	FACE WATER DEPTH	H N/A		DRII	LLER E	Estep, J	. E.		ST	ART DA	.TE 04/24	4/14
ELEV	, DRIVE	DEPTH	BLC	wco	UNT		BLOWS P	ER FOOT		SAMP.	▼∕			SOIL AND ROCK		PTION	ELEV	, DRIVE	DEPTH	BLC	WCOL	JNT		BLOW	/S PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	25 5	0	75 100	NO.	мо	G	ELEV.	(ft)		DEPTH (f	2 (ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50
665	<u> </u>	+											_				665		4						
		+											-						‡						
660		<u>+</u>											- - 660.5	GROUND S	SURFACE	Ξ 0.			<u>†</u>						
000	-	† 											-	ALLU TAN V. LOOSE M	IVIAL OIST SAN	ND (A-2)			‡						
		‡						 					-					_ 657.7	- 3.0 -	1	1	2		· · · ·	· · · · · ·
655	_	‡											- 			6.	655		+				<u> </u>		· · · · · ·
	653.5	<u>+</u> 7.0	1-1	1	1					0.99			-	ALLUY GRAY V. SOFT TO SO	OFT MOU	ST CLAYEY	11	652.7	+ 8.0					· · · ·	· · · · ·
		$ \begin{array}{c c} & & & \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$								33-9			-	SANDY SI	ILT (A-4)				t	1	2	3	<b>6</b> 5	· · · · ·	
650	648.5	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$										000	<u>- 649.5</u>	ΔΙΙΙ	V/1A1	11.	<u>650</u>		ŧ				1.		
		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$								SS-10	w	000	L	WHITE LOOSE W	ET SAND	(A-1-B)		647.7	+ 13.0	2	3	4			
645												000	644 5			16	645		Ŧ				/.···		
	643.5	17.0	0		1							$\mathbf{n}$	- 044.0	ALLU'		(DI=10)		6427	1 18.0				1		
		Ŧ		Ŭ		<b>●</b> 1				SS-11			F	PLASTIC SANDY S	SILTY CLA	(PI=18) (Y (A-7-6)		042.7	<u>+</u> 10.0 .	0	0		•0		
640	-	Ŧ				<del> </del>							639.5			21.	640		Ŧ						
	638.5	<u>† 22.0</u> †	7	7	6	●13				SS-12	w	000	-	ALLU WHITE & ORANGE	MED. DE	NSE WET		637.7	23.0	5	12	10			
635		Ŧ									1		- 636.5	SAND (A-1) W/ RESID	TRACE	MICA24.	635		Ŧ	5		19		• • • 32	
	633.5	+ 27.0											-	WHITE & TAN DENSE	E TO V. D	ENSE WET			Ŧ						
		‡	7	14	17		<b>♦</b> 31			SS-13	w		<u>}</u>	(GRAN	VITIC)			632.7	<u>+ 28.0</u> +	97	60/0.1			·   · · · ·	·÷  -:
630	_	‡					· · · ·						<u>}</u>				630		+						
	628.5	+ 32.0	11	23	35						14/		- -					627.7	- 33.0				· · · ·	· · · · ·	· · · · · ·
		+						•58					-						t	100/0.5					
625	602 5	+ 27.0															625		+				<u> </u>		
	023.5	1 37.0	29	39	52				<b>Q</b> 91		w							622.7	+ 38.0	100/0.4					
620		<u>+</u>							· · · \								620		1						
10/14	618.5	42.0	25	65/0 8								sen.	- 618.5			42.		618.7	- 42.0	100/0 4					
1 6,		Ŧ	35	65/0.5	1				100	•			f	WHITE & TAN WE	ET SEV. V	NEATH.			Ŧ						
<mark>등 615</mark>	_	+					+						F	GRAN	SK W/ TR/ NITIC)	ACE MICA	615	-	Ŧ.,					·   · · ·	
8	613.5	+ 47.0	43	57/0.4	Ŧ				100/0									613.7	<u>+ 47.0</u> +	100/0.3			<u> </u>	<u> </u>	· [ · · · ·
		Ŧ											*- }-						Ŧ						
D	608.5	+ 52.0								1			-						+						
L&RI		‡	55	45/0.3	3				100/.8	<b>•</b>			1						‡						
1) 00 605	_	‡						· · · ·	·   · · · ·				<u>}</u>						‡						
DOOD	603.5	57.0	74	26/0.1	1							<u>I</u>	602.9			57	5		‡						
L BR		ł		1					1007.6	-			-	Boring Terminated at SEV. WEATH. CR	t Elevation YSTALLIN	1 602.9 ft IN NE ROCK			±						
商		$\pm$											F						$\pm$						
Ш Ш		Ŧ											L						ł						
3440		Ŧ											F						Ŧ						
) L		Ŧ								ĺ			F						Ŧ						
OUB		ŧ											F						ŧ						
RED		‡											F						‡	1					
T BO		‡											F						‡						
CDO		+											-						‡						
21	1		1	1		L					1									1	I				



Webs       Solutinization       Initial Control       Contro       Contro       Contro       Contr	
STILE LESSAR         District Microson Miching           BORING MO. BEZAULT         STATION 6907         OPER 48 LLT         ALLONMENT 4         OH R. 60         OH R. 60         District Microson Miching           DRILLER ELEV. 690.01         TOTAL DEPTH 42.3 ft         NORTHING 638.613         EASTINO 1508.2014         DISL MICROSON MI	
DOILING COULD         Direction         Direction <thdirection< th=""></thdirection<>	
DRILL RIGHAMMER EFF, DATE         H-COUDE CME-550         81%         DTALL METHOD         Not Casing with SPT         HAMMER TYPE         Automatic           DRILL RE Estep, J. E.         START DATE         GAME         SAM         SUBFACE WATER DEPTH         NA           LLV DRWL         BLOWG DEPTH         BLOWG DEPTH         SUBFACE WATER DEPTH         NA         DRILLER Estep, J. E.         START DATE         H-COURD COME           LLV         DRU         BLOWG DEPTH         BLOWG DEPTH         SUBFACE WATER DEPTH         NA         DRILLER Estep, J. E.         START DATE         H-COURD COME           650         Sam         0         25         56         75         100         NO         SOL AND ROCK DESCRIPTION         DEPTH M           650         Sam         0         25         56         75         100         NO         SOL AND ROCK DESCRIPTION         DEPTH M           650         Sam         0         22         2         100         25         56         75         100         NO         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100         100	42.1 ft
DRILLER         Estep, J. E.         START DATE         Quick         COMP. DATE         Quick         SUPACE WATER DEPTH         NIA           EEU         DEV/LV         DEPTH         BLOW SOUNT         BLOWS PER FOOT         BLOWS PER FOOT <t< td=""><td>03/19/2014</td></t<>	03/19/2014
ELEV         PIEVE (W)         Depth (W)         BLOW COUNT         BLOWS PER POOT         SAMP         V         C         SOL AND ROCK DESCRIPTION DEPTH 00         Depth 00	)4/22/14
(10)       (10)       0.51       0.55       50       75       100       NO.       MO.       C       LLCV (9)       COCARDINGCICLECOM IGHT       CPPHIND       (10)       C       C       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.51       0.55 </td <td>LOWS PER FOOT</td>	LOWS PER FOOT
660         10         2         2         2         2         3         3         3         4           655         653.2         0.8         2         1         2         2         1 <t< td=""><td>50</td></t<>	50
660         GRCUND SUFFACE         CO           650	
BS-6         W         TAN-GRA SOFT TO MED. STIFF MOIST TO ULOW/PIPASTIC SUTY SANDY CLAY (A9)         50           655         68.2         1         2         2         2         4         1	
655       853.2       6.8       2       1       2       1       2       1       2       1	
6532       6.8       -       -       -       -       -       -       -       662.5       7.0       3       3       3       -       -       -       662.5       7.0       3       3       3       -	
650       642.2       1.2       3       46       1	· · ·   · · · · ·
900       648.2       11.8       1       2       4       6	· · ·   · · · · · · · ·
645       1       2       4       6       1	
645       643       16.8       0<	
643       2       16.8       0 <td></td>	
640       638.2       21.8       3       11       12	· · · · · · · · ·
638.2       21.8       3       11       12       10       633.0       ALLUVIAL       23.0         635       637.5       22.0       3       5       3       1       12       10       637.5       22.0       3       5       3       1       12       637.5       22.0       3       5       3       1       12       10       637.5       22.0       3       5       3       1       10	· · · · · · · · · · · ·
635       636       637       11       12       11       12       11       12       11       12       11       12	· · · · · · · · · · ·
333       26.8       27       32       33	· · · · · · · · ·
630       628.2       31.8       24       41       57         625       623.2       36.8       41       67/0.5       67/0.5       623.2       36.8         618.2       41.8       100/0.5       100/0.5       100/0.5       617.7       80/17.1       617.7	
630	
628.2       31.8       24       41       57	
625       -	
623.2     36.8     41     67/0.5	· · · · · · · · · · · ·
620	· · · · · · · · ·
618.2     41.8     100/0.5	••••
42.3 42.4 60/0.1 42.4 60/0.1 42.4 60/0.1	
	<u> </u>



WBS	S     39010.1.R2     TIP     U-3440       E     DESCRIPTION     BRIDGE 36 (RIGHT LANE) ON N       RING NO.     EB1-A(RL)     STATION     67+46							COUNT	Y CABAR	ิรบร			GEOL	OGIST Murray	y, C. C.			WBS	39010	).1.R2			TIF	• U-344	0	COUNT
SITE	E DESCRIPTION     BRIDGE 36 (RIGHT LANE) ON NC       RING NO.     EB1-A(RL)       STATION     67+46							OVER IF		ALO CRI	EEK					GROUND V	VTR (ft)	SITE	DESCR	IPTION	BRI	DGE 3	36 (RIC	HT LAN	E) ON NC	3 OVER IF
BORIN	IG NO.	EB1-	A(RL)		S	TATION 6	37+46		OFFSET	20 ft RT			ALIGN	MENT -L-		0 HR.	4.0	BOR	ING NO	EB1	-B(RL)	ł	ST	ATION	67+37	
COLL	AR ELE	E <b>V.</b> 66	68.0 ft		т	OTAL DEP	TH 28.1 f	t	NORTHING	<b>3</b> 636,5	64		EAST	NG 1,507,867	7	24 HR.	FIAD	COL	LAR EL	EV. 66	50.7 ft		то	TAL DE	יTH 23.3	ft
DRILL	RIG/HAI	MMER E	FF./DA	TE H	00066	CME-550 8	1% 03/19/20	)14		DRILL	NETHO	D N	W Casing	/ SPT	HAMM	ER TYPE Au	tomatic	DRIL	L RIG/HA	MMER E	FF./DA	TE HF	-00066	CME-550 8	31% 03/19/	2014
DRILL	ER E	step, J	. É.		S-	TART DAT	E 05/08/1	4	COMP. DA	TE 05/	08/14		SURF	CE WATER D	EPTH N/	Ά		DRIL	LER E	step, J	. E.		ST	ART DA	Г <b>Е</b> 05/06/	/14
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0.5ft	JNT 0.5ft	0	BLOWS	PER FOOT 50	75 100	SAMP. NO.	мо	C C C	ELEV. (ft	SOIL AND F	ROCK DESC	CRIPTION	DEPTH (ft)	ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW COL	JNT 0.5ft	0	BLOWS	50
670		_										ţ						665		-						
665	665.0	3.0	1	1	1									ROADW/ BLAC ROADW/	AY EMBANI	KMENT ASE KMENT	2.0	660		+ + + 				  !		
660						<b>●</b> 2 · · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · ·		55-38			661.0	BRN-TAN SOI PLASTIC SAN	FT MOIST L	LOW (PI=10) Y SILT (A-4)	7.0	655	657.8	+ 2.9 -	4	3	4	• • • • • • • • • • •		· · · · · ·
		- 0.0 - -	0	1	1		· · · · ·	· · · ·	· · · · · ·		м			GRAY V. LOO SAND (A-2-4)	SE WET CL W/ LAYERS CLAY	AYEY SILTY S OF SANDY			652.8	- - - 7.9	2	9	16		· · · · · · · · · · · · · · · · · · ·	· · · · · ·
655	655.0	13.0_ -	1	0	1	■ 1· · · · ·			· · · · · · · ·	SS-39	w						40.5	650	647.8	- - - 12.9.	53	47/0.3			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
650	650.0	18.0	39	61/0.5					100	•	w		- 651.5 - -	WEA PINK-OLIVE & V CRYS	THERED RO WHITE WET TALLINE R	DCK SEV. WEATH. OCK		645	-							
645	645.0	23.0	60/0.1	T					60/.1	<b> </b>   <b> </b>			645.0	CRYS	TALLINE R	оск	23.0	640	642.5	- 18.2 - - -	60/0.1				· · · · · · · · · · · · · · · · · · ·	· · · · · ·
640	640.0	28.0						· · · ·	· · · · · ·				639.9	PINK-	WHITE & O	LIVE	28.1		637.5	<u>- 23.2</u>	60/0.1			<u> </u>		<u>.  </u>
		+ + +	60/0.1						60/.1					Boring Termir PENETRATI Elevation 639.9 t	nated WITH ON TEST R ft IN CRYST	STANDARD EFUSAL at FALLINE ROCK	<			+ + +						
	-	+ + +																	-	+ + + +						
	-	+ + +																	-	+ + +						
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ſ	WBS	39010	).1.R2			ТІ	P U-344	0	COUNT	Y CABARI	ิรบร				GEOLOGIST Murray, C. C.			WBS	39010	0.1.R2			TIF	U-34	40		COUNTY
	SITE D	ESCR	IPTION	I BRI	DGE :	36 (RI	GHT LAN	E) ON NC 3	OVER I	RISH BUFF	ALO CR	EEK				GROUI	ND WTR (ft)	SITE	DESCR		BRI	DGE 36	6 (RIG	HT LAI	NE) O	N NC 3	OVER IR
	BORIN	DESCRIPTION       BRIDGE 36 (RIGHT LANE) ON NC 3 OVER IRISH BUFFALO CREEK         NG NO.       B1-B(RL)       STATION 67+69       OFFSET 59 ft RT         AR ELEV.       662.0 ft       TOTAL DEPTH 30.6 ft       NORTHING 636,522													ALIGNMENT -L-	0 HR.	4.0	BOR	ING NO	. B2-E	B(RL)		ST	ATION	68+3	36	
	COLLA	LLAR ELEV.         662.0 ft         TOTAL DEPTH         30.6 ft         NORTHING         636,522           LL RIG/HAMMER EFF./DATE         HF00066 CME-550         81%         03/19/2014         DRILL METH													EASTING 1,507,886	24 HR.	FIAD	COLI	LAR EL	<b>EV</b> . 66	60.1 ft		то	TAL DI	EPTH	38.0 ft	:
	DRILL F	RIG/HAI	MMER E	FF./DA	TE HI	-00066	CME-550	81% 03/19/2	014		DRILL	METHO	DD N	VW C	Casing w/ Tri-Cone & SPT HAM	MER TYPE	Automatic	DRILL	RIG/HA	MMER E	FF./DA	TE HFO	00066 (	CME-550	81%	03/19/20	14
	DRILL	ER E	step, J	. E.		S	TART DA	TE 05/07/	14	COMP. DA	TE 05/	/07/14			SURFACE WATER DEPTH	I/A		DRIL	LER E	step, J	. E.		ST	ART D	ATE	04/25/1	4
1		DRIVE ELEV	DEPTH	BLC	ow co			BLOWS	PER FOOT	Г 	SAMP.				SOIL AND ROCK DES	CRIPTION	1	ELEV	DRIVE	DEPTH	BLC		NT		E	3LOWS F	'ER FOOT
+		(ft)	(14	0.5ft	0.5ft	0.5ft		25	50	75 100	NO.	/мо	<u>I G</u>	EI	LEV. (ft)		DEPTH (ft)		(ft)	(1)	0.5ft	0.5ft	0.5ft	0	25		1
-	665		ł											$\vdash$				665		+							
		-	Ţ											F 66	GROUND SURF	ACE	0.0			Ŧ							
	660		$\frac{1}{1}$											ŀ	ROADWAY EMBAN RED-BRN MED, STIFF MOI	NKMENT	P =10)	660		Ŧ							
	-	658.7	3.3	3	2	3						$-\nabla$		E	PLASTIC CLAYEY SANI	DY SILT (À	-4)			Ī			1				
			Ŧ				•5 				55-28	-		E 6!	56.0		6.0		657.5	<u> </u>	0	1	2	<b>4</b> 3			
╞	655	662.7	<b>–</b> ",								-			-	ALLUVIAL TAN & GRAY V. LOOSE W	VET NON (I	PI=5)	655	-	Ŧ				1			<u> </u>
			T0.3 T	1	1	2	<b>4</b> 3 · ·				SS-29	w		E	PLASTIC CLAYEY SILTY	SAND (A-	2-4)		652.5	7.6	1	2					
	650		Ē										000	- 6	50.7 RESIDUAL		11.3	650		+	'	2	'	<b>•</b> 3		· · · ·	
	-	648.7	13.3	5	18	82/0.4								6	48.2 OLIVE & WHITE LOOSE W	ET SILTY	SAND		647.5	1 40 6					<u>ר:</u>		
1			Ŧ			}				• • 100/.9	00-00				WEATHERED R	ROCK	/			- 12.0. -	3	6	12		•18		
-	645	6437	- 18 3						<u> </u>					1 6	43.7 CRYSTALLINE F	ROCK	H. 18.3	645	-	+					<u>+</u>		· · · · ·
	F		1.0.0	60/0.1	1						•		5	Ŧ	CRYSTALLINE I OLIVE & WHI	ROCK			642.5	<u>+ 17.6</u>	100/0.5				┆╘╴┝╴		+
	640	-	ŧ.											+				640		+							
	-	638.4	23.6	60/0 1								w							637.5	+ 22.6							
			ł	00/0.1			· · · ·											0.05			100/0.4					· · · ·	
ŀ	635	-	+															635		+				<b>.</b>			
		533.4	- 28.6	60/0.1	T					60/.1	•	W		- 6	31 4		30.6		632.5	27.6	100/0.3				, .   . 	· · · ·	
	-		+					I						Ē	Boring Terminated BY TRI-	CONE REF	USAL	630	-	+					· · · · ·	· · · ·	· · · ·
			+											F	ROCK				627.5	+ 32.6					.		
			+											Ę				625		‡	100/0.3			· · ·		· · · ·	
		-	+											-				025		+							
			+											F					622.2	<u>+ 37.9</u>	160/0 1			<u> </u>		· · · ·	
4		-	+											F						‡							
11011			ŧ											F						+							
DT 6			‡											F						‡							
OT.G		-	+											-					-	+ +							
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A Ld			‡											F					-	‡							
RL).G			+											Ę						‡							
9(LL&			‡											F						+							
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BRDC			+											F						+							
BH			+											F						+							
GEO			+											F						ŧ							
440			‡											-						‡							
С Ш			+											F						+							
<b>JUBLI</b>			+											F						+							
RE DC			1											F						‡							
BOR			ţ											F						‡							
CDOT			+											F						‡							



WBS	<b>3</b> 3901	0.1.R2			ТІ	P U-3440		COUNT	Y CABARF	RUS			GE	OLOGIST Murray, C. C.			WBS	39010	0.1.R2			TIF	• U-3440		COUNTY
SITE	DESC	RIPTION	BRI	DGE 3	6 (RIC	GHT LANE	) ON NC 3	OVER IF	RISH BUFFA	ALO CR	EEK				GROUN	D WTR (ft)	SITE	DESCR		I BRI	IDGE 3	36 (RIG	HT LANE)	ON NC 3	OVER IR
BOF	ING NC	. EB2	-A(RL)		ST	ATION 6	8+85		OFFSET	20 ft RT			AL	IGNMENT -L-	0 HR.	5.0	BOR	ING NO	. EB2	-B(RL)	)	ST	ATION 68	;+70	
COL	LAR EL	<b>EV.</b> 66	58.2 ft		тс	DTAL DEP	TH 42.51	ť	NORTHING	<b>6</b> 36,5	650		EA	STING 1,508,005	24 HR.	FIAD	COLI	LAR ELI	<b>EV</b> . 66	60.5 ft		то	TAL DEPT	H 28.1 f	t
DRIL	L RIG/HA	MMER E	FF./DA	TE HF	00066	CME-550 81	03/19/2	014	-	DRILL I	METHO	OD	NW Cas	ing w/ SPT HAM	MER TYPE	Automatic	DRILL	RIG/HA	MMER E	FF./DA	TE HF	-00066 (	CME-550 819	% 03/19/20	)14
DRI	LER	Estep, J	. E.		ST	ART DAT	E 05/08/	4	COMP. DA	TE 05/	08/14	1	su	RFACE WATER DEPTH	I/A		DRIL	LER E	step, J	. E.		ST	ART DATE	05/02/1	4
ELEV	DRIVE	DEPTH	BLC	w cou	JNT		BLOWS	PER FOOT		SAMP.	▼∕	1 L 0		SOIL AND ROCK DES	CRIPTION		ELEV	DRIVE ELEV	DEPTH	BLC	JW COL	JNT		BLOWS	PER FOOT
(11)	(ft)	(11)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	Имс	<u>л</u> G	ELE	/. (ft)		DEPTH (ft)	(11)	(ft)	(11)	0.5ft	0.5ft	0.5ft	0 2	5 !	50
670		+											$\vdash$				665		+						
		<b>†</b>											- 668.2	2 GROUND SUR		0.0			ŧ						
665	665.3	+ + 2.9										Ľ.	666.:	BLACK TOP & BLACK	BASE	2.0	660		<u>†                                    </u>						·
	-	+	2	1	2	<b>∮</b> 3				SS-31	] <u>™</u>	, []		RED-BRN V. LOOSE MOI	ST LOW (PI	=9)		-	ŧ						+
		‡							·   · · · · ·				- 661.:		SAND (A-2	-4) 7.0			+ <u>2.9</u> +	1	2	3	<b>1</b> • • • • •		
660	660.3	7.9	2	2	3	1		· · · ·		55-32	M			ROADWAY EMBA		ST	655	-	+						
		‡								00-02			0- 0-	CLAYEY SILTY SAM	ID (A-1-B)	01		652.6	+ - 7.9						
655	655.3	+ 129							·   · · · · ·				<u>0</u> - 656.		NKMENT	12.0	650		ŧ		2		<b>∳</b> 5 <sup>*</sup> · · ·		
000		+	Ó	0	0 WOI	↓ ↓ ●0				SS-33	w		%  }-	GRAY V. SOFT WET LOW	(PI=9) PLA	STIC		-	+						
		‡											651	ORGANIC	3	17 0		647.6	+ 12.9 +	2	3	2	5		
650	650.3	+ 17.9	3	5	4	<u>-</u>	<u> </u>			00 24	1			ROADWAY EMBA			645	-	‡				<b>I.</b>	· · · ·	
		‡							·   · · · · ·	00-04								642.6	+ + 17.9					<u> </u>	<u> </u>
GAE	645 3	+ 229															640		‡	60	40/0.2				
045		+	2	3	1	4	<u> </u>			SS-35	w							-	+						
		‡											0 641	2		27.0		637.6	+ 22.9 +	100/0.	5				
640	640.3	+ 27.9	0	0	0	<u>  </u>				66.36	-						635	-	+						
		‡			wo	H <b>e</b> o 	<u> </u>		· · · · · ·		"		637.	6 PLASTIC SILTY SAND	Y CLAY (A-6	) 30.6		632.6	+ + 27.9						
635	635.3	+ 329							· · · · · ·					WEATHERED I SEV. WEATH. CRYSTA	<b>ROCK</b> ALLINE ROC	к			+	100/0.:	4				
033		+	100/0.5	đ					. 100/.5	•	W	<i>11</i>						-	+						
		‡																	+						
630	630.3	<u>+ 37.9</u>	60/0.1	-			· · · ·		60/.1	•	w		630.	3 CRYSTALLINE	ROCK	37.9		-	+						
		‡																	‡						
	625.8	42.4				· · · ·	· · · ·		· · · · · ·				- 625.	7		42.5			‡						
/14		+	60/0.1	4					607.1	-			-	Boring Terminated WIT PENETRATION TEST	H STANDAR REFUSAL a	D t		-	+						
6/10		‡											-	Elevation 625.7 ft IN CRYS	STALLINE R	оск			‡						
GDT		‡											F					-	+						
DOT		+											È						‡						
S		ŧ											F						‡						
GPJ		+											-					-	‡						
&RL)		ł											Ł						Ŧ	1					
36(LL		+											Ł					-	+						
COO		Ŧ								ļ			E						Ŧ						
BRD		Ŧ											E						Ŧ				1		
BH		+											<u> </u>					-	Ŧ						
GEO		Ŧ											F						Ŧ				1		
3440		Ŧ											F						Ŧ				1		
⊃ u		Ŧ											F					-	Ŧ				1		
OUB		‡											F						Ŧ						
RE D		‡											F						‡				1		
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kcbo		ŧ											F						Ŧ						



TEST RESULTS

PROJECT: 39010.1.R2 (U-3440)

SITE DESCRIPTION: BRIDGE NO. 036 (LEFT LANE & RIGHT LANE) ON NC 3 OVER IRISH BUFFALO CREEK

SOIL S	AMPLE RE	SULTS																	ROC	K SAMPLE R
SAMPLE NO.	OFFSET	STATION	DEPTH	AASHTO	Ν	L.L.	<i>P.I</i> .		% BY WEIC	ΉT		% PA	SSING S	SIEVES	%	%	UNIT	VOID	SAMPLE NO.	OFFSET
			INTERVAL	CLASS				C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC	WT. (d)	RATIO		
		EB1-A(LL)																		
SS-19	58 LT.	67+78	2.9-4.4	A-6(6)	2	36	12	16.3	21.1	28.4	34.2	97	89	64						
SS-20	58 LT.	67+78	7.9-9.4	A-1-b(0)	7	23	NP	82.7	13.3	4.0	0.0	87	30	5						
SS-21	58 LT.	67+78	12.9-14.4	A-1-b(0)	23	33	NP	55.7	27.0	13.3	4.0	77	46	16						
		EB1-B(LL)																		
SS-26	9 LT.	67+63	8.1-9.6	A-2-4(0)	5	28	NP	22.9	46.5	20.5	10.1	93	82	34						
		B1-A(LL)																		
SS-22	38 LT.	68+05	7.0-8.5	A-1-b(0)	4	29	NP	71.2	22.5	2.2	4.0	83	41	6						
SS-23	38 LT.	68+05	17.0-18.5	A-1-b(0)	100+	30	NP	59.2	25.4	9.5	6.0	67	37	13						
		B1-B(LL)																		
SS-24	9 LT.	67+91	2.4-3.9	A-2-6(1)	11	37	14	40.6	18.5	18.7	22.1	79	54	35						
SS-25	9 LT.	67+91	7.4-8.9	A-1-b(0)	6	26	NP	67.6	22.9	5.4	4.0	77	37	9						
		B2-A(LL)																		
SS-9	46 LT.	68+75	7.0-8.5	A-4(0)	2	21	NP	11.3	44.8	25.8	18.1	100	98	51						
SS-10	46 LT.	68+75	12.0-13.5	A-1-b(0)	5	20	NP	78.6	15.1	4.3	2.0	66	21	5						
SS-11	46 LT.	68+75	17.0-18.5	A-7-6(19)	1	43	18	1.2	9.0	32.9	57.0	100	99	94						
SS-12	46 LT.	68+75	22.0-23.5	* * * *	13															
SS-13	46 LT.	68+75	27.0-28.5	A-2-4(0)	31	33	NP	45.2	32.3	16.4	6.1	74	51	20						
		B2-C(LL)																		
SS-14	25 LT.	68+67	18.0-19.5	****	0															
		EB2-A(LL)																		
SS-6	46 LT.	69+07	1.0-2.5	A-6(5)	4	37	12	21.9	20.5	33.5	24.1	96	83	59						
SS-7	46 LT.	69+07	6.8-8.3	A-2-4(0)	3	27	9	34.0	31.2	16.8	18.1	88	69	34						
SS-8	46 LT.	69+07	16.8-18.3	A-7-6(20)	0	44	19	1.6	8.2	39.9	50.3	100	99	93						
		EB2-C(LL)			,				<u> </u>		•									
SS-1	26 LT.	69+00	7.0-8.5	A-1-b(0)	6	22	NP	85.2	9.4	3.3	2.0	/5	21	4						
SS-2	26 LT.	69+00	13.0-14.5	A-2-4(0)	2	26	NP	44.0	34.2	11.8	10.1	100	55	20						
SS-3	26 LT.	69+00	17.0-18.5	A/-6(16)	0	41	17	1.4	13.9	36.5	48.2	100	99	89						
SS-4	26 LT.	69+00	22.0-23.5	***	8	-	-	88.6	7.2	4.1	0.0	52	10	3						
\$\$-5	26 L I.	69+00	27.0-28.5	A-1-b(0)	100+	28	NP	56.9	26.3	12.8	4.0	/1	41	15						
00.20	00 DT	EBI-A(RL)	0005	4 (7)	2	25	10	10.0	16 7	41.2	22.2	0(	0.0	75						
SS-38	20 RT.	67+46	8.0-9.5	A-4(7)	2	35		10.9	15.7	41.2	32.2	96	88	75						
58-39	20 RT.	6/+46	13.0-14.5	A-2-4(0)	I	23	NP	32.2	37.6	20.1	10.1	76	59	28						
80.07	(0.DT	EBI-B(RL)	2044	A 7 ((D)	7	41	16	20.5	14.5	20.0	26.2	06	82	(5						
88-27	60 R I.	6/+3/	2.9-4.4	A-7-6(9)	/	41	10	20.5	14.5	28.8	30.2	90	82	05						
66.00	50 DT	B1-B(KL)	2240	A 4(1)	5	24	10	41.2	14.0	217	22.1	05	57	40						
55-28	59 KT.	67+69	3.3-4.8	A-4(1)	2	20	5	41.2	14.9 11 7	10.5	12.1	00	62	20						
55-29	59 KI.	67+69	8.3-9.8	A - 2 - 4(0)	1001	24	J ND	43.7	22.7	19.5	2.0	90 71	45	52						
55-30	59 KT.	0/+09	13.3-14.8	A-1-0(0)	100+	34	INP	32.1	51.0	15.7	2.0	/1	45	14						
66.17	(0.DT	B2-B(KL)	12 ( 12 1	A 1 b(0)	10	21	ND	575	25.6	10.0	6.0	71	40	15						
55-10	60 KT.	08+30 EB2 4(BL)	12.0-13.1	A-1-0(0)	10	51	INF	57.5	25.0	10.9	0.0	/1	40	15						
66.21	<b>10</b> DT	ED2-A(KL)	2045	A 2 4(0)	2	20	0	41.0	22.5	18.2	18.1	70	56	22						
55-31	20 KI.	60+05	2.9-4.5	A = 2 - 4(0)	5	13	ND	41.0	22.5	16.3	10.1	60	17	23						
55-52 55-22	20 K L.	60,05	1.7-7.4	A. 4(6)	5 0	45 21	0 NP	44.5	21.2	30.3	30.2	100	47	25 76						
55-55	20 KT. 20 PT	60±05	12.9-14.4	Δ_1_h(0)	a	24 24	7 ND	5.0 87 0	20.0	29.4	2.0	76	20	5						
00-04 CC 25	20 KT. 20 DT	60-00	12.7-14.4 22 0_24 A	Δ_1_b(0)	у Л	24	ND	80 2.7	163	ے.د 1 ۸	2.0	78	24	Δ						
33-33 SS 26	20 KI. 20 PT	0070J	22.7-24.4	Δ_6(6)	-1	22	12	7 /	27.8	1.4 77 K	2.0	00	05							
53-50	20 11.	00-00	LI.7-L7.4	11-0(0)	v	22	12	1.4	52.0	Z1.U	2.2.2	//	,,,	05						

#### ROCK SAMPLE RESULTS

STATION	DEPTH	RQD	UNIT WT	Q(ksf)	E(MPsi)
	INTERVAL		(pcf)		

#### TEST RESULTS

#### PROJECT: 39010.1.R2 (U-3440) COUNTY: CABARRUS SITE DESCRIPTION: BRIDGE NO. 036 (LEFT LANE & RIGHT LANE) ON NC 3 OVER IRISH BUFFALO CREEK

#### SOIL SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH	AASHTO	N	<i>L</i> . <i>L</i> .	<i>P.I</i> .		% BY WEIG	GHT		% PAS	SSING S	IEVES	%	%	UNIT	VOID	SAMPLE NO.	OFFSET	STATION	DEPTH	RQD	UNIT WT	Q(ksf)	E(MPsi)
			INTERVAL	CLASS				C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC	WT. (d)	RATIO				INTERVAL		(pcf)		
		EB2-B(RL)																								
SS-17	60 RT.	68+70	2.9-4.4	A-1-b(0)	5	27	5	60.4	14.1	11.5	14.1	89	48	25												

\*\*\* Insufficient Material to Test Sample

\*\*\*\* Missing Sample or Not Sent to Lab for Testing

#### ROCK SAMPLE RESULTS



#### **CONTENTS**

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
I	TITLE SHEET
2	LEGEND
3-4	SITE PLAN & PROFILE(S)
5-12	BORE LOG(S)
13	SOIL TEST RESULTS

### STATE OF NORTH CAROLINA

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

### **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY CABARRUS

PROJECT DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP ROAD) IN

KANNAPOLIS

SITE DESCRIPTION **RETAINING WALLS 1-5** 

STATE STATE PROJECT REPERENCE NO. NO. SHEETS N.C 13 39010.1.1 1

#### **CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNIKG 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, GEOTECHNICAL ENGINEERING UNIT AT 1999 707-6805. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL 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 BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN STUI UN-PLACE JEST 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 SUBJURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLUMATIC CONDITIONS MUCLIDIANT FURDERATIVES BECRETATION AND WING AS WELL AS OVER DWOLD HATCH CANDITIONS NCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DE TAILS SNOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT, FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSART TO SATISFY HINSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS FONCOUNTERED AT THE SUFFICIENCY FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES

- TES: 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 STERNSINO OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

KLEINFELDER

INVESTIGATED BY J.P. ROGERS

CHECKED BY J.E. BEVERLY

SUBMITTED BY <u>E.N. WILLIAMS</u>



### 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
SOIL IS CONSIDERED UNCONSOLIDATE BE PENETRATED WITH A CONTINUOUS ACCORDING TO THE STANDARD PENE IS BASED ON THE AASHTO SYST CONSISTENCY, COLOR, TEXTURE, MOIST	D, SEMI-CONSOLIDATED, OR WEATHERED FLIGHT POWER AUGER AND YIELD LE RATION TEST (AASHTO T 206, ASTM M. BASIC DESCRIPTIONS GENERALLY RE, AASHTO CLASSIFICATION, AND OTI	) EARTH MATERIALS THAT CO SS THAN 100 BLOWS PER FO D1586J, SOIL CLASSIFICATIO INCLUDE THE FOLLOWING: HER PERTINENT FACTORS SU	an Dot Dn Jch	<u>WELL GRADED</u> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <u>UNIFORMLY GRADED</u> - INDICATES THAT SOLL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS	HARD ROCK IS NO ROCK LINE INDIC SPT REFUSAL IS BLOWS IN NON-C REPRESENTED BY	DN-COASTAL PLAIN MATERIAL THAT WOULD YELD SPT REFUSAL IF TESTED. AN INFERRED ATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 GASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN A ZONE OF WEATHERED ROCK.
AS MINERALOGICAL COMPOSIT	DN, ANGULARITY, STRUCTURE, PLASTICI	TY, ETC. FOR EXAMPLE,		THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS	ARE TYPICALLY DIVIDED AS FOLLOWS:
SOIL LEGEN	D AND AASHTO CLASSIF	ICATION		ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. MINERAL OGICAL COMPOSITION	WEATHERED ROCK (WR)	100 BLOWS PER FOOT IF TESTED.
General Granular Materia Class. (≤ 35% Passing =20	S SILT-CLAY MATERIALS () (> 35% PASSING =200)	ORGANIC MATERIALS		MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE ROCK (CR)	GNEISS, GABRED, SCHIST, ETC.
GROUP         A-1         A-3           CLASS.         A-1-a         A-1-b         A-2-4         A-2-4	1-2 A-4 A-5 A-6 A-7 A-2-6 A-2-7 A-2-6 A-7-6 A-7-6	A-1, A-2 A-4, A-5 A-3 A-6, A-7		COMPRESSIBILITY	NON-CRYSTALLINE	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED.
SYMBOL 0000000000				SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.      COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK MAY NOT YIELD  CK      SPT REFINAL     NOCK TYPE INCLUDES UMESTIONE SANDSTONE CEMENTED
2 PASSING •10 50 MX		GRANULAR SILT- M	AUCK,	PERCENTAGE OF MATERIAL	(CP)	SHELL BEDS, ETC.
"40" 30" MX 50" MX 51" MN "2000" 15" MX 25" MX 10" MX 35" MX 35" N	35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN	SOILS SOILS P	PEAT	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS OTHER MATERIAL		
MATERIAL				TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	нам	MMER IF CRYSTALLINE.
PASSING #40 LL – – 40 MX 41 M DI 6 MY MD 10 MX 11 M	40 MX 41 MN 40 MX 41 MN 40 MX 41 MN	SOILS WITH		LITTLE ORGANIC MATTER 3 - 5%, 5 - 12%, LITTLE 10 - 20%, MODERATELY ORGANIC 5 - 10%, 12 - 20%, SOME 20 - 35%, HIGHLY ORGANIC > 10%, 20%, HIGHLY 35%, AND ABOVE	VERY SLIGHT ROC (V SLI.) CRY	IX GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (STALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF
		MODERATE OR	RGANIC	GROUND WATER	-	A CRYSIALLINE NATURE.
USUAL TYPES STONE FRAGS. FINE SILTY		ORGANIC SI	SOILS	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) I IN	IN GENERALLY FRESH, JUINIS STAINED AND DISCULARATION EXTENDS INTO MOCK OF TO NCH, OPEN JOINTS MAY CONTAIN CLAY, IN GRANITOID ROCKS SOME OCCASIONAL FELOSPAR VETALS ADE DUIL AND DISCOUDED OPENELLING ROCKS DING UNDER MANMER DI DUIS
OF MAJOR GRAVEL, AND SAND GRAVEL	AND SAND SOILS SOILS			STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIG	INFIGANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING FEFECTS. IN
GEN. RATING AS SUBGRADE EXCELLENT TO GOO	FAIR TO POOR	FAIR TO POOR UNSU	UITABLE	□         □         PERCHED         WATER, SATURATED         ZONE, OR         WATER         BEARING         STRATA	(MOD.) GRA	ANITOID ROCKS, MOST FELOSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS LL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED
PLOF A-7-5 SUBGRO	IP IS ≤ LL - 38/ ±P1 OF A-7-6 SUBGROUP I	S > LL - 30		()→U))(I— SPRING OR SEEP	WIT	H FRESH ROCK.
CONS	ISTENCY OR DENSENESS	3		MISCELLANEOUS SYMBOLS		. ROCK EXCEPT QUARTZ DISCULURED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL ) DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH
	SS OR RANGE OF STANDARD	RANGE OF UNCONFIN	NED	· · · · · · · · · · · · · · · · · · ·	(MOD. SEV.) AND	CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.
PRIMARY SOIL TYPE CONSIST	NCY PENETRATION RESISTENC (N-VALUE)	E COMPRESSIVE STREN (TONS/FT <sup>2</sup> )	NGTH	WITH SOIL DESCRIPTION OF ROCK STRUCTURES	SEVERE ALL	ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT
	DSE < 4				(SEV.) RED	DUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED
GRANULAR MEDIUM (	4 TO 10	N/A			IU JF	SUME EXTENT. SUME FRAGMENTS OF STRUNG ROLK USUALLY REMAIN. TESTED, WOULD YIELD SPT N VALUES > 100 BPF
MATERIAL DENS	30 TO 50	17.1		ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER	VERY ALL	ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE
VERY DE	NSE > 50				SEVERE BUT	MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK
GENERALLY SOFT	FT < 2 2 TO 4	< 0.25 0.25 TO 0.5			VES	STIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</u>
SILT-CLAY MEDIUM	TIFF 4 TO 8	0.5 TO 1.0		TEST BORING WELL TEST BORING WELL	COMPLETE ROC	K REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND
(COHESIVE) VERY S	IFF 15 TO 30	2 TO 4		TRANSFER SPT N-VALUE	ALS	ATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS 50 AN EXAMPLE.
HAR	> 30	> 4			1	ROCK HARDNESS
	KTURE UR GRAIN SIZE				VERY HARD CAN	NOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES
U.S. STD. SIEVE SIZE	10 40 60 20 6 2 00 0 42 0 25 0 0	0 270 75 0.053		UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE ACCEPTABLE, BUT NOT TO BE	SEV	VERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
BOULDER COBBLE GRA	VEL COARSE FIN		AY	SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	HARD CAN TO	N BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULIY. HARD HAMMER BLOWS REQUIRED DETACH HAND SPECIMEN.
(BLDR.) (COB.) (G	(CSE. SD.) (F S	(D) (SL.) (CL	L)	ABBREVIATIONS	HARD EXC	N BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE CAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED
GRAIN MM 305 75 SIZE IN. 12 3	2.0 0.25	0.05 0.005		AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	MEDIUM CAN	MODERATE BLOWS. N RE GROOVED OR COUGED 0.05 INCHES DEEP BY EIRM PRESSURE DE KNIEF OR PICK POINT.
SOIL MOIST	URE - CORRELATION OF	TERMS		CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	HARD CAN	N BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE
SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION GUIDE FOR	FIELD MOISTURE DESCRIP	TION	CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	SOFT CAN	N BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS
				DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	PIE	CES CAN BE BROKEN BY FINGER PRESSURE.
	(SAT.) FROM BEL	DW THE GROUND WATER TA	BLE	e-VOID RATIO SDSAND, SANDY SS-SPLIT SPOON F-FINE SLSILT, SILTY ST-SHELBY TUBE	VERY CAN	N BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH
				FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	FIN	MURE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY IGERNAIL.
RANGE <	- WET - (W) SEMISOLID	REQUIRES DRYING TO		FRACS FRACTORED, FRACTORES TER - TRICONE REFUSAL RT - RECOMPACIED TRIAXIAL FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRA	ACTURE SPACING BEDDING
(PI) PL PLASTIC LIMIT _				HIHIGHLY V-VERY RATIO	TERM	SPACING TERM THICKNESS
	- MOIST - (M) SOLID; AT	OR NEAR OPTIMUM MOISTU	IRE	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE WIDE	MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET
SL SHRINKAGE LIMIT				DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	MODERATELY (	CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET
	REQUIRES	ADDITIONAL WATER TO			VERY CLOSE	LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET
	ATTAIN OP	TIMUM MOISTURE		CME-55		THINLY LAMINATED < 0.008 FEET
	PLASTICITY					
	PLASTICITY INDEX (PI)	DRY STRENGTH		CME-550 HARD FACED FINGER BITS C-N	FOR SEDIMENTARY	Y ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ET
NON PLASTIC SLIGHTLY PLASTIC	0-5 6-15	VERY LOW SLIGHT		VANE SHEAR TEST	FRIABLE	GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY PLASTIC HIGHLY PLASTIC	16-25 26 OR MORE	MEDIUM HIGH			MODERATEL	LY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE:
	COLOR					GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE:
DESCRIPTIONS MAY INCLUDE COLOR			AY).		INDUKATED	DIFFICULT TO BREAK WITH HAMMER.
MODIFIERS SUCH AS LIGHT.	ARK, STREAKED, ETC. ARE USED TO	DESCRIBE APPEARANCE.			EXTREMELY	Y INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE: SAMPLE BREAKS ACROSS GRAINS.

#### PROJECT REPERENCE NO. 39010.1.1

AQUIFER - A WATER BEARING FORMATION OR STRATA.
APENACEOUS - APPLIED TO DOCKE THAT HAVE BEEN DEDIVED EDOM SAND OD THAT CONTAIN SAND
HRENALEUUS - AFFLIED TO ROCKS THAT HAVE BEEN DERIVED FRUM SHAD UR THAT CONTAIN SHAD.
ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
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 SUFFACE.
CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
$\underline{\text{Colluvium}}$ - Rock fragments mixed with soil deposited by gravity on slope or at bottom of slope.
CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
$\underline{\text{Dike}}$ - A tabular body of igneous rock that cuts across the structure of adjacent rocks or cuts massive rock.
<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
<u>DIP DIRECTION (DIP AZIMUTH)</u> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH,
FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
$\underline{\textit{Formation (FM.)}}$ - a mappable geologic unit that can be recognized and traced in the Field.
JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
$\underline{LEDGE}$ - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
LENS - & RODY OF SOLL OF ROCK THAT THINS OUT IN ONE OF MORE DIRECTIONS

THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

SUBSURFACE INVENTORY DATED MAY 2014

BORING AND ELEVATION DATA DERIVED FROM NCDOT ROADWAY

TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL

STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

ELEVATION:

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

TERMS AND DEFINITIONS

WHEN STRUCK. <u>Joint</u> LEDGE EVIDENT BUT ARE KAOLINIZED LENS MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. ARE DISCERNIBLE OF STRONG ROCK PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. AT ONLY MINOR VALUES < 100 BPF RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. Y IN SMALL AND RS. 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 RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. NS REQUIRES <u>SILL</u> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO

OR SLIP PLANE.

BENCH MARK:

NOTES:

HEAT. PRESSURE. ETC

DATE: 8-15-14

FEET





								1																	
WBS	39010	).1.1			Т	<b>IP</b> U-344	0	COUNT	Y CABAR	RUS			G	EOLOGIST Wells, T.		1	WBS	<b>3</b> 39010	0.1.1				<b>•</b> U-3440		COUNTY
SITE	DESCR	IPTION	I NC	3, PR		SED WEST	SIDE BYF	PASS (U-	2009) TO SI T	R 1691	(LOOF	P RD	) IN	KANNAPOLIS		GROUND WTR (ft)	SITE	DESCR	RIPTION	NC :	3, PR(		ED WEST S	IDE BYP	ASS (U-2
BOR	ING NO	. B-83			S	TATION	132+00		OFFSET	48 ft RT	_		A	LIGNMENT -L-		0 HR. Dry	BOR	RING NO	. B-84			ST	ATION 13	3+02	
COL	LAR ELI	EV. 77	'6.5 ft		T	OTAL DEF	<b>TH</b> 29.3 f	t	NORTHIN	<b>G</b> 639,	753		E	<b>ASTING</b> 1,513,190		24 HR. Dry	COL	LAR EL	EV. 79	91.1 ft		ТС	TAL DEPTH	1 38.8 ft	t
DRIL	_ RIG/HA	MMER E	FF./DA	TE TH	२।८०१६	MOBILE B-5	57 93% 12/08	3/2011		DRILL	METHO	D	H.S. A	ugers	HAMIN	IER TYPE Automatic	DRIL	l Rig/Ha	MMER E	:FF./DA	IE TH	RI8016 M	/OBILE B-57	33% 12/08	<i>}</i> ∕2011
DRIL	LER G	ower, S	S.		S	TART DAT	<b>E</b> 12/06/1	3	COMP. DA	<b>TE</b> 12	/06/13	3	<u> </u> s	URFACE WATER DEP	TH N	/A	DRI	LER G	Gower, S	S.		ST	ART DATE	12/05/1	3
ELEV	DRIVE	DEPTH	BLC				BLOWS	PER FOOT	Г	SAMP	· 🔨			SOIL AND ROO	CK DES	CRIPTION	ELEV	DRIVE	DEPTH	BLO	W COL	JNT		BLOWS F	PER FOOT
(11)	(ft)	(11)	0.5ft	0.5ft	0.5ft	0	25	50	/5 100	NO.	Имо	) G	ELE	EV. (ft)		DEPTH (ft)	(11)	(ft)	(11)	0.5ft	0.5ft	0.5ft	0 25		50 
780		ł											$\vdash$				795		ł						
	-	ŧ											F						ŧ						
775	775.5 ·	+ + 1.0				<u> </u>							- 776	6.5 GROUNE RES	D SURF.	ACE 0.0	700	700.1	$\frac{1}{10}$						
110	-	+	2	3	3	• <u></u> • <u>•</u> •••••••••••••••••••••••••••••••				SS-616	§ W		]	BRN MED. STIFF MOIST MICA. MED.	to V. s <sup>.</sup> (PI=23)	TIFF WET TO PLASTIC SILTY	100	190.1	+ '	3	4	6	. 10 .		
		- 3.5	4	6	10		$\left \begin{array}{cccc} \cdot \cdot \cdot \cdot \\ \cdot \\ 0 \end{array}\right $		·   · · · · ·		м		771	SANDY C	ČLAY (Á	-7-6)		787.6	+ 3.5 +	6	8	9		· · · · ·	
770	770.5	+ 6.0 +	5	6	6			· · · ·	· · · · ·	SS-618	зм	<i>::</i> ?	┇				785	785.1	<u> </u>	5	6	5		· · · ·	· · · ·
	768.0	8.5		5	5	: Ț!²:			·   · · · · ·			/	<u>}-</u> 768	(PI=12) PLASTIC	SILTY C	LAYEY SAND $r = \frac{8.0}{2}$		782.6	+ + 8.5	Ŭ	0	Ű	· ●11 ·     · •   · ·	· · · · ·	
765		ŧ	4						·   · · · · ·	SS-619	М			<i>ل</i> (4 RES	-2-7) SIDUAL	J	790		‡	4	5	6	11	· · · ·	· · · · ·
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	763.0	13.5	6	9	9	:::\	18		.   .		м			SANE	D (A-2-5	)		777.6	+ 13.5 +	5	7	7	· · <b>·</b>	· · · · ·	
760		ŧ				<u>  · · · ¦</u>											775		ŧ					· · · · ·	· · · ·
	758.0	18.5				<b>!</b> 												772 6	+ 18.5				· · · · ·		
755		ŧ	4	8	14				.   .		M						770		1	21	30	28		· · · · ·	<b>•</b> 58
/55	-	ŧ					+	+ <u>,</u> ,,,									770	1 -	ŧ						
	753.0	23.5	28	31	51						м							767.6	23.5	28	39	35		· · · ·	
750		t							· · · · · ·								765		ŧ						
	748.0	28.5							·   · · · · · ·				748	.0		28.5		762.6	- 28 5				· · · ·	· · · ·	
		<u> </u>	57	43/0.3					100/.8	•	+		<u>7 /4/</u>	LT. GRAY SEV. W	ered Ro Eath. (	CRYSTALLINE		102.0	1	32	52	48/0.3		· · · ·	
	-	ŧ											F	ROCK (GR/ Boring Terminated	ANITIC I at Eleva	ROCK) tion 747.2 ft IN	760		ŧ					<u> </u>	<u> </u>
		ŧ											Ł	SEV. WEATH. CI		LINE ROCK		757.6	33.5	100/0.3				· · · ·	
		Ł											F				755		ŧ						
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CABARRUS		GEOLOGIST Wells, T.	
009) TO SR 1691	(LOOP RD.	) IN KANNAPOLIS	GROUND WTR (ft)
OFFSET 49 ft R	Г	ALIGNMENT -L-	0 HR. Dry
NORTHING 639	792	EASTING 1,513,284	24 HR. Dry
DRILL	METHOD +	.S. Augers H/	AMMER TYPE Automatic
COMP. DATE 12	2/05/13	SURFACE WATER DEPTH	N/A
SAME			
75 100 NO.	MOLG	SOIL AND ROCK [	DESCRIPTION
/5 100 NO. NO.	MOI G 5 M 7 M 8 M	791.1 GROUND SU RED-BRN STIFF TO V. 3 (PI=16) PLASTIC SIL (A-7-5 785.6 BRN & LT. BRN MEL DENSE MOIST MICA. SI CLAYEY SAN	JRFACE 0.0 JAL STIFF MOIST MED. TY SANDY CLAY 5) JAL 5.5 JAL 5.5 JAL 5.5 JAL 5.5 JAL 5.5 JAL 1.5 JAL 1
74 SS-60	M	768.1 LT. GRAY HARD MOIS SILT (A 762.1 WEATHEREI LT. GRAY SEV. WEAT ROCK (GRANI	JAL 23.0 JAL 23.0 T CLAYEY SANDY (4) 29.0 D ROCK TH. CRYSTALLINE TIC ROCK)
100/.3		752.3 Boring Terminated at E SEV. WEATH. CRYS (GRANITIC NOTE: BORING USED WALI	38.8 levation 752.3 ft IN STALLINE ROCK ROCK) D FOR RETAINING L

WBS	39010	.1.1			1	ΓΙΡ	U-34	40			cou		CA	BARF	RUS	-			GEOLOGIST Wells, T.		
SITE	DESCR	IPTION	NC	3, PR0	)PO	SEL	D WES	ST S	IDE E	3YP/	ASS	(U-20	009)	FO SF	R 169	1 (L	OOP	RD.)	) IN KANNAPOLIS	GROUND	WTR (ft)
BOR	NG NO.	B-85			5	STA		13	3+83				OFFS	ET (	65 ft F	۲۲			ALIGNMENT -L-	0 HR.	Dry
COLI	AR ELE	<b>V</b> . 79	9.5 ft		1	гот	AL DE	EPTł	<b>H</b> 43	.8 ft			NOR	THING	639	9,80	)9		EASTING 1,513,366	24 HR.	FIAD
DRILL	. RIG/HAN	/IMER E	FF./DA	TE TR	18016	6 MC	OBILE E	3-57	93% 1	12/08/	2011				DRIL	LM	etho	ЮH	.S. Augers HAMME	R TYPE A	utomatic
DRIL	LER G	ower, S	S.		S	STA	RT DA	ΥE	12/0	)5/13	8		СОМ	P. DA	<b>TE</b> 1	2/0	5/13	<b>.</b>	SURFACE WATER DEPTH N/A	۱.	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0.5ft	JNT 0.5ft		0	25	BLO\ 5	NS PI 5(	ER FC	DOT 7	75 I	100	SAN NC	P.	моі	L O G	SOIL AND ROCK DESCR	RIPTION	DEPTH (ft)
800	700 5	-					<u> </u>	. 1											-799.5 GROUND SURFAC	)E	0.0
	798.5	3.5	2	2	2		4	•	· · · ·	 	· · · ·	· · ·	· ·   · ·	· · ·	SS-6	05	М		- RED-BRN MED. STIFF MC - (PI=24) TO LOW (PI=11) PLA	DIST MED.	Α.
795	793 5	- 60	2	3	4		_ <b>→</b> 7								SS-6	06	М			-0, A-7-5) 	5.5
		-	3	3	4	11		:	•••	::	: :			•••	SS-6	07	М		RESIDUAL RED-BRN TO BRN & LT. GRA	Y LOOSE 1	го
790		- 8.5	5	5	5	┨┟	- ( •10	·	•••			•••	· ·	•••	SS-6	08	М		V. DENSE MOIST MICA. CL/ SAND (A-2-4)	AYEY SILT	Y
	+	-					:1:	:	· · · ·	::	: :		· ·   · ·	•••					- -		
785	786.0	13.5	3	4	6	41	·   ·	:	•••		· · · ·	· ·	· ·   · ·	•••					-		
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	781.0	-					:: `		• •										-		
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775	776.0	23.5	16	24	28	+			•••	. \	52	•••					м		-		
	-	-						:	•••	::[				•••					-		
	771.0	28.5					· · ·	:	•••		· ·			· · ·					-		
770	-	-	26	36	50								- <b>`</b> •	86			М		769.0		30.5
		-					· · ·	:	· · · ·	::	::	: :							LT. GRAY SEV. WEATH. CR	CK YSTALLINI	E
765		_ 33.5 -	71	29/0.1				·	•••		•••	•••	· ·	 100/.6-					– ROCK (GRANITIC RO	DCK)	
	4	-					· · · ·	:	· · · ·	::	· · · ·	· · · ·		· · ·					-		
760	761.0	38.5	100/0 5				· · · · · ·	:	· · · ·		· · · ·		· ·   · ·						- -		
100	-	-	100/0.0									•••		100/.5-					-		
	756.0	43.5						:	• •	::									- 766 7		12.9
		-	100/0.3					•	••	•••		••	<u> </u>	100/.3	<b>\</b>	1			Boring Terminated at Elevatic     SEV WEATH OPVETAIL	on 755.7 ft ll	43.8 N
	]	-																	- GRANITIC ROCK		
	+	-																	NOTE: BORING USED FOR WALL	RETAINING	3
	]	_																	-		
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NCDOT BORE DOUBLE U3440\_GEO\_BH\_WALL\_CABARRUS.GPJ NC\_DOT.GDT 7/12/

14/5	20 0	0010	1 1					0	0			0116									20040	111					40		
SIT	FDF	SCRI		NC	3 PR		FD WES		YPAS	S (U-20		R 1691 (		P RD				GROUND W	/TR (ff)	SITE	DESCE			3 PR(		ED WE		BYPA:	SS (U-20
BC		NO.	B-89			s. ee	TATION	137+00			OFFSET	50 ft LT				ALIGNMENT -L-		0 HR.	Dry	BOR	ING NO	. B-90			51 51	ATION	137+76		
СС	LLAF	RELE	<b>V.</b> 75	9.1 ft		т	OTAL DEI	<b>PTH</b> 20	0 ft		NORTHING	<b>6</b> 40,0	)42			EASTING 1,513,610		24 HR.	FIAD	COL	LAR EL	EV. 76	62.1 ft		т	DTAL DE	PTH 2	).0 ft	
DR	ILL RI	g/Haiv	MER E	FF./DA	TE TR	8016	MOBILE B-	57 93% 1	2/08/201	11		DRILL	VIETHO	DD ⊦	-I.S. /	Augers	HAMM	ER TYPE Auto	omatic	DRIL	L RIG/HA	MMER E	FF./DA	TE TR	8016	MOBILE E	\$-57 93%	12/08/20	J11
DR	ILLE	<b>R</b> Go	ower, S	S.		S	TART DA	<b>FE</b> 12/1	0/13		COMP. DA	TE 12/	10/13		;	SURFACE WATER DEP	TH N/	A		DRIL	LER G	Sower, S	S.		SI	ART D	<b>TE</b> 12/	10/13	(
ELE	VDF		DEPTH	BLO	W COL	JNT		BLOV	/S PER	FOOT		SAMP.	▼⁄			SOIL AND ROC	K DESC	RIPTION		ELEV	DRIVE FL FV	DEPTH	BLC	W COL	JNT		BLC	WS PEF	R FOOT
(ft		(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	7	75 100 	NO.	Имо	I G	E	LEV. (ft)		[	DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	7
76	)						<b>.</b>	<del></del>	<u> </u>						- 7	59.1 GROUND	SURFA	\CE	0.0	765		+							
75	; 57;	55.6 -	3.5	1	0	1			· · ·	· · · · · · · ·	· · · · ·	SS-648 SS-649	w w		بازار المرامين المرام مرامين المرامين المرام	GRAY-BRN TO LT. MED. DENSE WET & PLASTIC CLAYE NON-PLASTIC SII	GRAY \ MOIST EY SILT' LTY CLA	/. LOOSE TO LOW (PI=5, 4) Y SAND & YEY SAND	)	760	761.1	1.0	1	1	2	•3			· · · · ·
	7	53.1 T	6.0	1	1	2						SS-650	w			(A-2-4) MI	CA. 9.5-	20.0			750.0		2	2	2	<b>4</b>	· · · ·		
75	<u>7</u>	50.6 <del> </del>	8.5	1	2	4			• •				] м							755		<u> </u>	0	0	1	<b>∮</b> 1	• • • •	•••	· · · ·
		ŧ						•   • • •		· · · · · ·	· · · · ·				÷						753.6	+ 8.5 T	1	1	2			.	· · · · · · · ·
74	5 74	45.6	13.5	3	7	11														750		ŧ				$\begin{pmatrix} \lambda \\ \lambda \\ -\lambda \end{pmatrix}$			· · · ·
		Ī		0	'			18	· ·				M								748.6	13.5	4	4	7				
7/1	74	40.6 +	18.5					.   .	· · ·	· · · · · ·	· · · · ·									745		ŧ					.	•••	· · · · ·
		-+		9	7	10	<b>│                                    </b>	17					W		7:	39.1 Boring Terminated a	at Elevati	ion 739.1 ft IN	20.0	140	743.6	- 18.5	11	12	14		<u>.</u>		
		I													E	MED. DENSE WET (A-	SILTY C -2-4)	LAYEY SAND				<u> </u>		10			• <b>Q</b> 27	<u> </u>	
NCDOT BORE DOUBLE U3440_GEO_BH_WALL_CABARRUS.GPJ_NC_DOT.GDT_7/12/16																													

#### SHEET 7 OF 13

T١	Y CAE	BARR	RUS			GE	OLOGIST Wells, T	-		
1-2	2009) T	O SF	R 1691	(LOOP	RD.	) IN K/	ANNAPOLIS		GROUN	ID WTR (ft)
	OFFSE	ET 4	48 ft L1	-		ALI	GNMENT -L-		0 HR.	11.0
	NORT	HING	<b>6</b> 40,	071		EA	<b>STING</b> 1,513,679		24 HR.	FIAD
_			DRILL	METHO	D⊢	I.S. Aug	ers	HAMM	ER TYPE	Automatic
	COMP	. DA	<b>TE</b> 12	/10/13		SU	RFACE WATER DEF	PTH N/	A	
т	75	100	SAMF	<sup>.</sup> /	L O		SOIL AND RO	CK DESC	RIPTION	
	15	100	NO.		G					
					N	762.1	GROUN	D SURFA	CE	0.0
•			SS-64	2 W	///	-	RE GRAY-BRN V. LOO	<b>SIDUAL</b> DSE WET	LOW (PI:	=12)
:	· ·   · ·		SS-64	3 W		<u>/ 59.1</u>	PLASTIC_CLA RE	SIDUAL	D (A-2-6)	
•	· · ·					- <u>756.6</u> -	GRAY-BRN LOC	SE WET	Low (PI= Sand (A-2	2) <u>5.5</u> -4) /
	1		55-64	4 VV		754.1	GRAY-BRN V. SC	SIDUAL	LOW (PI=	12) 1 8.0
:	· · ·	· ·	SS-64	5 M		- 751 1		SANDY	CLAY (A-6	<u>)</u>
•		• •					BRN-GRAY SOFT N	AOIST MI	CA. CLAY	EY F./
:			SS-64	6 М		-				'
•		•••				-	SILTY S	SAND (A-2	2-5)	,A.
•						_				
						742.1	Boring Terminated	at Elevat	ion 742.1 1	20.0 ft IN
						-	MED. DENSE MOI	ST SILTY	SAND (A-	-2-5)
						-				
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WBS	39010	.1.1			Т	ΡU	-3440			COUNT	ΓΥ (	САВА		JS			GEOLOGIST Wells, T.		
SITE	DESCR	IPTION	I NC	3, PR	OPOS	ED V	/EST	SIDE E	BYP/	ASS (U-	-2009	9) TO	SR	1691 (l	LOOP	RD.	) IN KANNAPOLIS	GROU	ND WTR (ft)
BOR	ING NO.	B-91			S	ΤΑΤΙΟ	<b>DN</b> 13	38+45			OF	FSE	Г 3	7 ft LT			ALIGNMENT -L-	0 HR.	Dry
COL	LAR ELE	<b>V</b> . 77	'3.7 ft		Т	OTAL	DEPT	<b>TH</b> 15.	.0 ft		NC	ORTH	ING	640,0	90		<b>EASTING</b> 1,513,746	24 HR.	Dry
DRILL	RIG/HAN	VIMER E	FF./DA	ТЕ П	318016	MOBIL	EB-57	' 93% 1	2/08/	2011				DRILL N	/IETHO	DD H	.S. Augers HAI	MER TYPE	Automatic
DRIL	LER G	ower, S	S.		S	TART	DATE	12/0	5/13	3	cc	OMP.	DAT	<b>E</b> 12/0	05/13		SURFACE WATER DEPTH	N/A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW CO 0.5ft	UNT 0.5ft	0	2	BLOV 25	VS P 51	ER FOO	T 75	1	00	SAMP. NO.	моі	L O I G	Soil and rock de Elev. (ft)	SCRIPTION	l DEPTH (fi
775	- 772.7 -	- 1.0											•				773.7 GROUND SUF	FACE	0.1
770	770.2	- 3.5 -	2	2	4	∲   <b>∮</b> 3	5  		· ·	· · · ·	· · ·	· · ·	· · ·	SS-588	w		BROWN MED. STIFF W <u>770.7</u> PLASTIC SILTY SAND <b>RESIDUA</b> GRAY & BROWN V. LO	et med. (PI ( <u>CLAY (A-7</u> L DSE to lo(	( <u>=24)</u> <u>-6)3.(</u> DSE
765	765.2	- 0.0 - - 8.5 -	2	3	4 5		9			· · · · · · ·	· · ·	· · · ·		SS-590	w w		WET MED. (PI=22) PL SAND (A-2	STIC CLAY -6)	ΈY
760	760.2	- - - 13.5	2	2	3		· · · ·		-	· · · · · · · ·	· · ·	· · · ·		SS-592	м			L T CLAYEY	<u>12.0</u> SILTY
																	Boring Terminated at Ele LOOSE MOIST CLAYE (A-2-4)	/ation 758.7 Υ SILTY SA	ft IN ND

# GEOTECHNICAL BORING REPORT BORE LOG

v	/BS	39010	).1.1			ТІ	<b>P</b> U-344	0		COUNTY	CABAR	RUS			G	EOLOGIST Wells, T.			WBS	<b>3</b> 9010	0.1.1			ТІ	P U-3440		COUNT	Y
S	ITE C	DESCR	IPTION	NC	3, PR	OPOS	ED WES		BYPA	SS (U-2	009) TO S	R 1691 (	LOO	P RD	.) IN	KANNAPOLIS		GROUND WTR (ft)	SITE			NC	3, PR(	OPOS	ED WEST	SIDE BYP	ASS (U-	20
В	ORIN	IG NO.	B-95			S	TATION	144+2	27		OFFSET	68 ft LT			A	LIGNMENT -L-		0 HR. Dry	BOR	ING NO.	. B-96	3		ST	TATION 1	45+26		C
С	OLL	AR ELE	<b>EV.</b> 80	5.3 ft		Т	OTAL DE	PTH	15.0 ft		NORTHIN	<b>G</b> 640,3	361		E	<b>ASTING</b> 1,514,264		24 HR. Dry	COL	LAR ELI	EV. 80	05.4 ft		т	DTAL DEP	<b>FH</b> 20.0 ft		N
D	RILL	rig/hai	VIMER E	FF./DA1	TE TR	8016	MOBILE B-	57 93%	6 12/08/2	2011		DRILL	METH	OD H	-I.S. A	ugers	Hamm	ER TYPE Automatic	DRIL	l Rig/Ha	MMER E	EFF./DA	TE TR	RI8016	MOBILE B-5	7 93% 12/08	/2011	-
D	RILL	ER G	ower, S	S.		S		<b>TE</b> 12	2/10/13		COMP. DA	<b>TE</b> 12/	/10/13	3	s	URFACE WATER DEP	TH N/	A	DRIL	LER G	Sower, S	S.		ST		E 12/11/1	3	0
EL	.EV	DRIVE ELEV		BLO	W COL	JNT		BL 25	OWS PE	ER FOOT	75 400	SAMP.	▼∕			SOIL AND ROO	CK DESC	CRIPTION	ELEV	DRIVE ELEV	DEPTH	BLC		JNT	0	BLOWS F	PER FOOT	
_	,	(ft)	(11)	U.5ft	U.5ft	U.5ft	U	20	50	1	100	NO.	/мс	) G	ELE	EV. (ft)		DEPTH (ft)	(11)	(ft)	(1)	0.5ft	U.5ft	U.5ft	0	20 5		
8	10														F				810		ŧ							
		-													F					-	ŧ							
8	05	801 2					╞╴┲╾			<del></del>	+		<u> </u>		- 805	GROUNI		ACE 0.0	805	- 804 4 -	+				 	<b> ····</b>	<b> </b>	=
	F	-004.3		4	6	4	. •10	-		$ \begin{array}{cccc} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \end{array} $		SS-654	м		802							1	1	1				.
۹ ۵		801.8 -	- 3.5	3	3	3			· · ·	· · · · ·		SS-655	і м		<b>F</b> ‴		ORGANI		800	801.9 .	<u>+ 3.5</u> +	3	3	5				.
		799.3	6.0	2	3	7		.					М		<b>F</b>	RED-BRN MED. S	TIFF TO		000	799.4	<u>+ 6.0</u>	4	4	5	· .		· · · ·	. †
	-	- 796.8 -	8.5	4	5	6			•••	· · · · · · · ·					797	. <u>3</u> IVIED. (PI=22) PLAST	4-7-6)	T SAINDT CLAY 8.0		796.9	8.5	3	5	6	· • • •			,
7	95	-	F	4	J	U	• • • 11 • • • 1	·   · ·			· · · ·	-	M		F	RED-BRN & BRN S	SIDUAL	MED. STIFF	795		Ŧ		Ĵ			· · · ·	· · · ·	+
		701 0	13.5												F	MOIST NON-MICA SANDY	A. TO MI SILT (A-	CA. CLAYEY -4)		791 9	13.5							
	þ	- 0.10	- 13.5	2	3	4	• • • • • • • • •			· · · ·		SS-658	м		E 790	0.3		15.0	790		E 10.0	4	4	5	· •9 · ·			
		]													F	Boring Terminated MED. STIFF MOIST	at Elevat MICA. C	Con 790.3 ft IN CLAYEY SANDY		-	ŧ							Ī
		-													F	SIL	ı (A-4)			786.9	18.5	3	4	5	. <b> </b> . <b>≜</b> g			.
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#### SHEET 9 OF 13

NT	Y CABARR	RUS			GEOLOGI	ST Wells, T.			
(U-2	2009) TO SF	R 1691 (I	OOP	RD.)	IN KANNAF	POLIS		GROUN	D WTR (ft)
	OFFSET 3	33 ft LT			ALIGNME	NT -L-		0 HR.	Dry
	NORTHING	640,3	68		EASTING	1,514,369		24 HR.	FIAD
		DRILL	IETHO	DHS	S. Augers		HAMM	ER TYPE	Automatic
	COMP. DA	TE 12/	11/13		SURFACE	WATER DEP	TH N/	Ą	
DOT	75 100	SAMP.		0		SOIL AND ROC	K DESC	RIPTION	
	100	NO.	/ MOI	G					
					-				
					805.4		SURFA	CE	0.0
· ·		SS-659	W		BI (PI=	RN SOFT TO ME	D. STIF	F WET LO	W (A-4)
· · · ·			w		700.0			ID I OILI	
		SS-661	м	N					0.0 OT
· ·					RE I	OW (PI=11) PL	ASTIC M	ICA. SILT	61 (
· ·			M		-	SANDYC	LAY (A-	7-5)	
				N					
•••			М	N	_				
				N	-				
· ·			м	N	785 /				20.0
					- Boi		at Elevati	on 785.4 f	t IN
					51	(A	. SILTY -7-5)	SANDY CL	_AT
					_				
					-				
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				F					
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۷	VBS	39010	).1.1			Т	<b>IP</b> U-34	40		COUNT	Y CABAR	RUS			0	GEOLOGIST Wells, T			WBS	39010	).1.1			TIF	<b>D</b> -344	5	COUNT
s	ITE D	ESCR	IPTION	I NC	3, PR	OPOS	SED WES	ST SIE	DE BYP	ASS (U-	2009) TO SI	R 1691 (	LOO	P RD	).) IN	KANNAPOLIS		GROUND WTR (ft)	SITE	DESCR		I NC	3, PRC	OPOSE	ED WEST	SIDE B	YPASS (U-2
E	ORIN	g no.	B-98			S	TATION	145+	+81		OFFSET	118 ft L	Т		4	ALIGNMENT -L-		0 HR. Dry	BOR	ING NO.	B-99			ST	ATION	146+74	
C	OLLA		<b>EV.</b> 81	14.6 ft		<b>T</b>	OTAL DE	EPTH	25.0 ft		NORTHING	<b>G</b> 640,4	468		E	<b>ASTING</b> 1,514,386	1	24 HR. FIAD	COL	LAR ELI	<b>EV.</b> 82	20.1 ft		ТС	TAL DEF	<b>TH</b> 23.	7 ft
D	RILL F	rig/hai	MIMER E	FF./DA	TE TI	RI8016	MOBILE E	3-57 93	3% 12/08	/2011		DRILL	METH	OD	H.S. A	Nugers	HAMIN	IER TYPE Automatic	DRIL	l Rig/Ha	MMER E	FF./DA	TE TR	N8016 N	NOBILE B-5	7 93% 12	/08/2011
C	RILLI	ER G	ower, S	S.		S		ATE	12/11/1	3	COMP. DA	<b>TE</b> 12/	/11/13	3	_ \$	SURFACE WATER DEP	TH N	/A	DRIL	LER G	iower, S	S.		ST	ART DAT	E 12/11	/13
E	_EV	ELEV	DEPTH	BLC				25	BLOWS F	PER FOOT	Γ 75 100	SAMP.				SOIL AND RO	CK DES	CRIPTION	ELEV	ELEV	DEPTH	BLC		JNT	0	BLOW	S PER FOOT
-	,	(ft)	(14)	0.5π	0.511	0.511		25			15 100	NO.	И	DI G	EL	EV. (ft)		DEPTH (ft)	(14)	(ft)	(14)	0.51	0.51	0.5π			50
<u> </u>	815	813.6 -	- 10				<u> </u>								81	4.6 GROUN	D SURF	ACE 0.0	825		F						
		-	- 1.0	3	4	5	<b>│</b> :∳9∶	·   ·		· · ·		SS-665	w		Ł	BRN STIFF WET T		T LOW (PI=14)		-	ł						
ε	10	811.1	3.5	8	6	5		· ·					м		Ł.				820								
		808.6 -	6.0	3	4	5				· · ·		88.667				9.1 ARTIF	ICIAL FI	LL		819.1	1.0	3	3	4			· · · · · ·
		806.1	8.5			05		÷+÷				33-007		X	80	6.6 RED-BRN STIFF	MOIST I SANDY	MED. (PI=17) <u>8.0</u> CLAY (A-6)		816.6	3.5	5	6	6			· · · · · ·
2	805	-	F	15	28	25				•53		SS-668	B M			RED-BRN TO LT. E	SIDUAL BRN & GI	RAY V. DENSE	815	814.1	6.0			-	<u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	+	
		-	L .						<b>, /</b>	 						TO LOOSE & MED CLAYEY SIL	. DENSE	E MOIST MICA. D (A-2-4)		811.6	85	2	3	3	•6 •		· · · · · ·
8	800	801.1 <u>-</u>	13.5	3	4	5							м		L	022. 0.2		- (= .)	810			6	3	2	¢5 <sup></sup>	· · ·	
		-	L.					:   :		 										-	ł				<u>L</u>		· · · · · ·
_		796.1	18.5					:   :		 										806.6	13.5	20	80/0.2				÷ – :- :- :- :- :- :- :- :- :- :- :- :- :-
_7	95	-	F	4	5	5							M						805	-	ł					+	
		-						:   :		 										801.6	18.5						· · · · · ·
7	'90	791.1	23.5	3	5	6		· · ·					м		- - 78	9.6		25.0	800		- 10.0	100/0.3				<u> </u>	
		-	-												E	Boring Terminated MED. DENSE MOIS	at Eleva T MICA.	tion 789.6 ft IN CLAYEY SILTY		-	ł				· · · ·	· · ·	
		-	ł												F	SAN	D (A-2-4	)		796.6	23.5	100/0.2				<u> </u>	• • • • •
		-	+												F					-	+						
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SHEET 10 OF 13

11	Y CABARF	RUS			GEOLOGIST Wells, T.		
J-2	2009) TO SF	R 1691 (I	LOOP	RD.)	IN KANNAPOLIS	GROUND	WTR (ft)
	OFFSET	69 ft LT			ALIGNMENT -L-	0 HR.	Dry
	NORTHING	<b>6</b> 40,4	60		EASTING 1,514,491	24 HR.	FIAD
		DRILL N	/IETHO	DH.S	S. Augers HAMM	ER TYPE A	utomatic
	COMP. DA	TE 12/*	11/13		SURFACE WATER DEPTH N/	A	
от		SAMP.		L			
	75 100	NO.	моі	G	SUIL AND ROCK DESC	RIPTION	
	100/.2	SS-672	W W W		820.1 GROUND SURFA ARTIFICIAL FIL RED-BRN & BRN MED. STI WET LOW (PI=9) PLAST SANDY SILT (A- 814.1	CE FF TO STIFF IC CLAYEY 4) E WET LOW SILTY SAND OIST MICA. 2) CK RYSTALLINE COCK) TON 796.4 ft If INE ROCK K)	6.0 /11.0 13.5 = 23.7

WBS	39010	.1.1			ТІ	P	U-3440		COUNT	CABARI	RUS			GEOLOGIST Wells, T.		
SITE	DESCR	PTION	NC :	3, PR0	OPOSI	ΞD	WEST S	SIDE BYF	PASS (U-2	2009) TO S	R 1691 (	LOOP	RD.)	IN KANNAPOLIS	GROUND	WTR (ft)
BOR	ing no.	B-10	D		SI	AT	<b>ION</b> 14	7+66		OFFSET	71 ft LT			ALIGNMENT -L-	0 HR.	Dry
COLI	AR ELE	<b>V</b> . 82	5.4 ft		тс	DTA	AL DEPT	H 28.8 f	t	NORTHIN	<b>G</b> 640,4	98		EASTING 1,514,574	24 HR.	FIAD
DRILL	RIG/HAN	/IMER E	FF./DA1	<b>חד בו</b>	R18016 I	VIOE	BILE B-57	93% 12/08	3/2011		DRILL	/IETHO	<b>D</b> H.S	S. Augers HAMM	ER TYPE A	utomatic
DRIL	LER G	ower, S	S.		ST	AR	RT DATE	12/11/1	3	COMP. DA	<b>TE</b> 12/	11/13		SURFACE WATER DEPTH N/	A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLO 0.5ft	W COL 0.5ft	JNT 0.5ft	0	2	BLOWS I	PER FOOT	75 100 I	SAMP. NO.	моі	L O G	SOIL AND ROCK DESC ELEV. (ft)	RIPTION	DEPTH (ft)
830		-												-		
825	-	-					-		1	1				825.4 GROUND SURFA	ACE	0.0
	824.4	- 1.0	3	4	6						SS-679	w	×5	- ARTIFICIAL FIL RED-BRN & BRN STIFF TO	<b>.L</b> ) MED. STIFI	-
820	821.9 819.4	<u>3.5</u> 6.0	3	3	2		5	· · · · ·				w		WET MED. (PI=24) PLASTIC CLAY (A-7-5) -819.4	SILTY SAND	DY 6.0
	816.0	85	1	2	2		4	· · · · ·			SS-680	w	87	ARTIFICIAL FIL GRAY & BRN LOOSE TO N	<b>.L</b> MED. DENSE	
815		- 0.5	4	14	7		· · · • •2	1 • • • •	· · · · ·	· · · · ·		м		WET TO MOIST CLAYEY (A-2-4) W/ TRACE GRA	SILTY SAND VEL @ 8.5	12.0
810	811.9	- - 13.5 -	100/0.2				  			100/.2				WEATHERED RC LT. GRAY SEV. WEATH. C ROCK (GRANITIC F	<b>ick</b> Rystalline Rock)	=
010		-					· · · · ·		<u></u>					808.4		17.0
805	806.9	- <u>18.5</u> -	3	4	6		· • 10 ·	· · · · ·		· · · · ·	SS-683	м		GRAY-BRN TO LT. GRAY MI V. DENSE MOIST MICA. CI	ED. DENSE LAYEY SILTY	го ′
	801.9	- 23.5					· · · · ·							SAND (A-2-4)		
800	-	-	8	30	25	_			•55	· · · · ·		м	-	-		
	796.0	28.5					 	· · · · ·						798.4 WEATHERED RC	ск	27.0
		- 20.0	100/0.3						1	100/.3				LT. GRAY SEV. WEATH. C ROCK (GRANITIC F Boring Terminated at Elevat	RYSTALLINE ROCK) ion 796.6 ft II	<u>28.8</u> N
	+	- - -												SEV. WEATH. CRYSTAL (GRANITIC ROC	LINE ROCK (K)	
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NCDOT BORE DOUBLE U3440\_GEO\_BH\_WALL\_CABARRUS.GPJ NC\_DOT.GDT 7/12/16

	WBS	39010	).1.1			-	TIF	>	υ	-34	140	)					СС	D	N
	SITE	DESCR	IPTION	NC	3, PR(	OPO	SE	Đ	۷	٧E	ST	S	ID	EE	ЗY	PA	S	S (	U
	BOR	ing no.	B-82			:	ST	A٦	Π	ΟN	1	32	2+(	00					
	COLI	LAR ELE	<b>EV.</b> 75	8.5 ft		-	то	T/	٩L	. D	EP	ТΗ	I	3.(	0 ft				
	DRILL	RIG/HAI	MMER E	FF./DA	TE N	A													
	DRIL	LER G	oodnigl	ht, D.			ST	AF	۲	D	AT	E	1	1/2	20/	13			
	ELEV	DRIVE ELEV	DEPTH	BLC	W COL	JNT							BL	-0\	NS	P	ER	FC	00
	(11)	(ft)	(11)	0.5ft	0.5ft	0.5f	ť	0				25				50	)		
	760		-																
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# GEOTECHNICAL BORING REPORT

B	URE L	UG			1			
COUNT	Y CABARR	US			GEOLOGIST Goodnigh	nt, D.		
SS (U-2	2009) TO SR	8 1691 (	LOOP	RD.	) IN KANNAPOLIS		GROUN	ID WTR (ft)
	OFFSET 4	17 ft LT			ALIGNMENT -L-		0 HR.	Dry
	NORTHING	639,8	841	<u> </u>	<b>EASTING</b> 1,513,153		24 HR.	FIAD
		DRILL	viethö	UН	and Auger	HAMM	=r iype	Automatic
	COMP. DA	<b>FE</b> 11/2	20/13	1	SURFACE WATER DEP	TH N/	A	
ER FOOT	75 100	SAMP.		0	SOIL AND ROO	CK DESC	RIPTION	
·		NO.		G	ELEV. (ft)			DEPTH (ft)
						) SURFA	CF	0.0
								0.0 2T
		S-105	_14%_		- 755.5 SILTY F. TO CSE. S	AND (A-2	2-4) W/ LI	TLE <u>3.0</u>
					Boring Terminated	at Elevat	on 755.5 f	t IN
					LOOSE TO MED. D	ENSE M SAND (A	OIST SILT -2-4)	YF.
				[	Other Samples:			
				[	M-105 (2.7 - 3.0)			
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### *PROJ. NO. -39010.1.1 ID NO. - B-5390 COUNTY - CABARRUS*

WALL NO. 1

SOIL TEST RESULTS															
SAMPLE			DEPTH	AASHTO			% BY WEIGHT				% PASSING (SIEVES)			%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-605	65' RT	133+83	1.0-2.5	A-7-6(12)	51	24	15.3	28.4	12.1	44.3	98	93	58	-	-
SS-606	65' RT	133+83	3.5-5.0	A-7-5(3)	42	11	18.3	39.0	14.5	28.2	98	93	46	-	-
SS-607	65' RT	133+83	6.0-7.5	A-2-4(0)	36	NP	22.5	48.1	15.3	14.1	97	92	35	-	-
SS-608	65' RT	133+83	0.0-0.0	A-2-4(0)	32	NP	25.6	49.1	15.3	10.1	96	89	30	-	-
SS-595	49' RT	133+02	1.0-2.5	A-7-5(4)	48	16	27.4	31.9	14.5	26.2	98	88	44	-	-
SS-597	49' RT	133+02	6.0-7.5	A-2-4(0)	28	NP	29.6	46.7	15.6	8.1	97	87	29	-	-
SS-598	49' RT	133+02	8.5-10.0	A-2-4(0)	38	NP	34.3	40.5	11.1	14.1	97	85	28	-	-
SS-599	49' RT	133+02	13.5-15.0	A-2-4(0)	36	NP	50.9	27.9	12.1	9.1	93	60	24	-	-
SS-601	49' RT	133+02	23.5-25.0	A-4(0)	35	NP	30.6	36.9	12.3	20.2	98	87	36	-	-
SS-602	49' RT	133+02	0.0-0.0	A-2-4(0)	29	NP	29.3	47.2	15.4	8.1	98	87	29	-	-
SS-616	49' RT	132+00	1.0-2.5	A-7-6(5)	49	23	35.0	19.3	13.5	32.2	85	63	41	-	-
SS-618	49' RT	132+00	6.0-7.5	A-2-7(0)	44	12	41.9	18.1	19.9	20.1	81	55	35	-	-
SS-619	49' RT	132+00	8.5-10.0	A-2-5(0)	43	8	40.8	22.3	22.7	14.1	79	53	33	-	-

WALL NO. 4

	SOIL TEST RESULTS														
SAMPLE			DEPTH	AASHTO				% BY W		% PAS	SING (S	IEVES)	%	%	
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-665	118' LT	145+81	0.0-0.0	A-7-6(3)	42	14	34.4	21.1	20.3	24.1	89	67	44	-	-
SS-667	118' LT	145+81	6.0-7.5	A-6(5)	37	17	31.0	21.3	17.5	30.2	96	78	49	-	-
SS-668	118' LT	145+81	8.5-10.0	A-2-4(0)	31	NP	50.7	25.2	12.1	12.1	83	52	24	-	-
SS-672	69' LT	146+94	1.0-2.5	A-4(2)	40	9	33.4	20.3	22.1	24.1	87	65	44	-	-
SS-674	61' LT	146+94	6.0-7.5	A-2-5(0)	46	8	45.5	21.3	21.1	12.1	85	56	31	-	-
SS-679	71' LT	147+65	1.0-2.5	A-7-5(15)	57	24	17.7	23.7	22.3	36.2	98	86	63	-	-
SS-680	71' LT	147+65	6.0-7.5	A-2-4(0)	38	NP	41.9	24.1	23.9	10.1	80	55	31	-	-
SS-683	71' LT	147+65	18.5-20.0	A-2-4(0)	40	NP	44.5	23.9	17.5	14.1	86	60	31	-	-

### WALL NO. 5

			SC	DIL T	ES.	T F	RES	UL	TS						
SAMPLE			DEPTH	AASHTO		% BY WEIGHT					% PASSING (SIEVES)			%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S-105	47' LT	132+00	2.7-3.0	A-2-4(0)	30	NP	29.4	49.9	14.6	6.0	99	90	27	-	-

### WALL NO. 2

	SOIL TEST RESULTS														
SAMPLE			DEPTH	AASHTO			% BY WEIGHT				% PASSING (SIEVES)			%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-588	49' LT	138+50	1.0-1.5	A-7-6(9)	45	24	29.1	19.5	13.3	38.1	92	74	51	-	-
SS-590	49' LT	138+50	6.0-7.5	A-2-6(2)	37	22	38.7	24.5	6.7	30.1	86	64	34	-	-
SS-592	49' LT	138+50	13.5-15.0	A-2-4(0)	39	NP	33.1	38.7	14.1	14.0	91	75	31	-	-
SS-642	48' LT	137+75	1.0-2.5	A-2-6(0)	32	12	45.9	22.9	7.0	24.1	76	52	25	-	-
SS-643	48' LT	137+75	3.5-5.0	A-2-4(0)	28	2	31.0	38.2	12.7	18.1	80	66	28	-	-
SS-644	48' LT	137+75	6.0-7.5	A-6(1)	32	12	31.6	27.0	11.3	30.2	90	74	41	-	-
SS-645	48' LT	137+75	8.5-10.0	A-4(0)	38	NP	3.0	65.0	21.9	10.1	100	99	44	-	-
SS-646	48' LT	137+75	13.5-15.0	A-2-5(0)	41	NP	24.3	50.9	16.7	8.0	90	81	28	-	-
SS-648	50' LT	137+00	1.0-2.5	A-2-4(0)	28	5	44.8	26.3	16.8	12.1	85	58	28	-	-
SS-649	50' LT	137+00	3.5-5.0	A-2-4(0)	31	4	40.6	30.7	14.5	14.1	86	63	29	-	-
SS-650	50' LT	137+00	6.0-7.5	A-2-4(0)	26	NP	45.1	33.7	9.1	12.1	88	62	22	-	-

### WALL NO. 3

SOIL TEST RESULTS															
SAMPLE			DEPTH	AASHTO				% BY V		% PAS	SING (S	IEVES)	%	%	
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-654	68' LT	144+27	1.0-2.5	A-6(2)	35	14	33.8	21.1	16.9	28.2	84	63	41	-	-
SS-655	68' LT	144+27	3.5-5.0	A-7-6(10)	46	22	27.2	16.7	13.9	42.3	94	76	56	-	-
SS-658	68' LT	144+27	13.5-15.0	A-4(0)	37	NP	23.9	39.0	22.9	14.1	97	88	40	-	-
SS-659	33' LT	145+26	1.0-2.5	A-4(0)	25	7	40.0	19.3	16.5	24.1	91	66	40	-	-
SS-661	56' LT	145+26	6.0-7.5	A-7-5(5)	44	11	20.1	31.4	20.3	28.2	100	92	54	-	-