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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.

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 OPNION OF 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 SITE DIFFERING 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

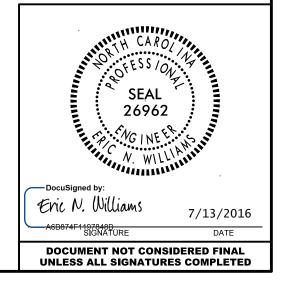
KLEINFELDER

INVESTIGATED BY J.P. ROGERS

CHECKED BY J.E. BEVERLY

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

DATE <u>JULY</u> 2016



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 UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATH-RED EARTH MAI BE PENETATED WITH A CONTINUOUS FLIGHT POWER AUGER AND VIELD LESS THAN 100 ACCONDING TO THE STANDARD PENETRATION TEST (AASHTO T 200, ASTM DI506), SOIL IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE TH CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTING	BLOWS PER FOOT CLASSIFICATION E FOLLOWING:	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATEL' GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR I ANGULARITY OF GRAINS	Y THE SAME SIZE. MORE SIZES.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN Ø.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FO VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLA	EXAMPLE,	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY TH	E TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:
SOIL LEGEND AND AASHTO CLASSIFICATION	5/16,8-7-0	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. MINERALOGICAL COMPOSITION		WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > ROCK (WR) 100 BLOWS PER FOOT IF TESTED.
CLASS. (≤ 357, PASSING 2000) (> 357, PASSING 2000)	ianic materials	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFI		CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-4 A-5 A-6 A-7, A-1, A-2	A-4, A-5 A-6, A-7	COMPRESSIBILITY		NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN
STMBOL DODD DODD DODD DODD DODD DODD DODD D		SLIGHTLY COMPRESSIBLE LL < 31	F	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK
7, PASSING "18 58 MX GRANULAR	SILT- MUCK,	PERCENTAGE OF MATERIAL		(CP) SHELL BOCK THE INCLUDES LIMESTONE, SHAUSTONE, CEMENTED
40 30 MX 50 MX 51 MN 200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN	SOILS PEAT	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MA	TERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER
MATERIAL PASSING *40 LL 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN PI 6 MX NP 18 MX 18 MX 11 MN 11 MN 18 MX 18 MX 11 MN 11 MN	E OR LICULY	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE MODERATELY ORGANIC 5 - 10% 12 - 20% SOME	1 - 10% 10 - 20% 20 - 35% 35% AND ABOVE	HAMMER IF CRYSTALLINE. VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (V SLIJ) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
GROUP INDEX 0 0 0 4 MX 0 MX 12 MX 10 MX 0 MX USUAL TYPES STONE FRAGS FINE SILLTY OF CLAYEY SILLTY CLAYEY MAD	RATE ORGANIC TS OF SOILS WIC	GROUND WATER	LLING	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI.) 1 INCH, OPEN JOINTS MAY CONTAIN CLAY, IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
OF MAJOR GRAVEL, AND SAND GRAVEL, AND SAND GRAVEL AND SAND SOLLS SOLLS CENTER AS SOLLS CENTER AS SOLLS	POOR UNSUITABLE	▼ STATIC WATER LEVEL AFTER 24 HOURS ∑Pw PERCHED WATER, SATURATED ZONE, OR WATER BEARING	STRATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS, IN (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ±PI OF A-7-6 SUBGROUP IS > LL - 30		SPRING OR SEEP		WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL
				SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH MOD, SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL
GENERALLY VERY LOOSE < 4 GENERALLY LOOSE < 4 GENANII AP LOOSE 4 TO 10	RESSIVE STRENGTH (TONS/FT ²)			SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOLL O'VIELD SPT IN VALUES > 100 BPF
ONNOCENT MEDIUM DENSE 10 TO 30 MATERIAL DENSE 30 TO 50 (NON-COHESIVE) VERY DENSE > 50 VERY SOFT < 2	N/A < 0.25			VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK (V SEV.) REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR
GENERALLY SOFT 2 TO 4 SILT-CLAY MEDIUM STIFF 4 TO 8 MATERIAL STIFF 8 TO 15 (COHESIVE) VERY STIFF 15 TO 30	0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4		EST BORING /ITH CORE PT N-VALUE	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u> COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. OUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.
HARD > 30	> 4			ROCK HARDNESS
TEXTURE OR GRAIN SIZE				VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 DPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053			ED EXCAVATION - BUT NOT TO BE TOP 3 FEET OF	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED
(BLOR) (COR) (CR) SAND SAND	SILT CLAY SL.) (CL.)	UNDERCUT ACCEPTABLE DEGRADABLE ROCK EMBANKMENT	OR BACKFILL	to detach hand specimen. Moderately can be scratched by Knife or Pick, gouges or grooves to 0.25 inches deep can be
GRAIN MM 305 75 2.0 0.25 0.05 SIZE IN. 12 3	0.005	ABBREVIATIONS AR - AUGER REFUSAL MED MEDIUM VST - VAI BT - BORING TERMINATED MICA MEACOUS WEA WEA	E SHEAR TEST	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.
SOIL MOISTURE - CORRELATION OF TERMS		CLCLAY MODMODERATELY γ -UNIT CPT - CONE PENETRATION TEST NP - NON PLASTIC γ_{d} -DRY		HARD CAN BE EXCAVATED IN MALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOI GUIDE FOR FIELD MOI	STURE DESCRIPTION	CSECOARSE ORGORGANIC DMT - DILATOMETER TEST PMT - PRESUMEMETER TEST <u>SAMPLE</u> DPT - DYNAMIC PENETRATION TEST SAPSAPROLITIC S - BULK	ABBREVIATIONS	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
- SATURATED - USUALLY LIQUID; VERY (SAT.) FROM BELOW THE GRO		e - VOID RATIO SD SAND, SANDY SS - SPLI F - FINE SL SILT, SILTY ST - SHEL FOSS FOSSILIFEROUS SL SLIGHTLY RS - RQC	BY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY
PLASTIC RANGE - WET - (W) SEMISOLID& REOUIRES			MPACTED TRIAXIAL	FINGERNAIL. FRACTURE SPACING BEDDING
		HI HIGHLY V - VERY RAT	10	TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET
OM _ OPTIMUM MOISTURE - MOIST - (M) SOLIDI AT OR NEAR OF SL _ SHRINKAGE LIMIT	TIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CME-45C CLAY BITS X AUTOMAN		VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.30 - 0.16 FEET
- DRY - (D) REQUIRES ADDITIONAL ATTAIN OPTIMUM MOIS		CME-55		VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET
PLASTICITY		X 8' HOLLOW AUGERS	- □*' -	
PLASTICITY INDEX (PI) DI NON PLASTIC 0-5 SLIGHTLY PLASTIC 6-15	Y STRENGTH VERY LOW SLIGHT	CME-550 HARD FACED FINGER BITS		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ET FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY PLASTIC 16-25 HIGHLY PLASTIC 26 OR MORE	MEDIUM HIGH		ILE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
COLOR			g Rod	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE: DIFFICULT TO BREAK WITH MAMMER.
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-B MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE A			EAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

PROJECT REPERENCE NO. 39010.1.1

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.

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

SUBSURFACE INVENTORY DATED MAY 2014

BORING AND ELEVATION DATA DERIVED FROM NCDOT ROADWAY

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

TERMS AND DEFINITIONS

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 BLOWS REQUIRED THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT

OR SLIP PLANE.

BENCH MARK:

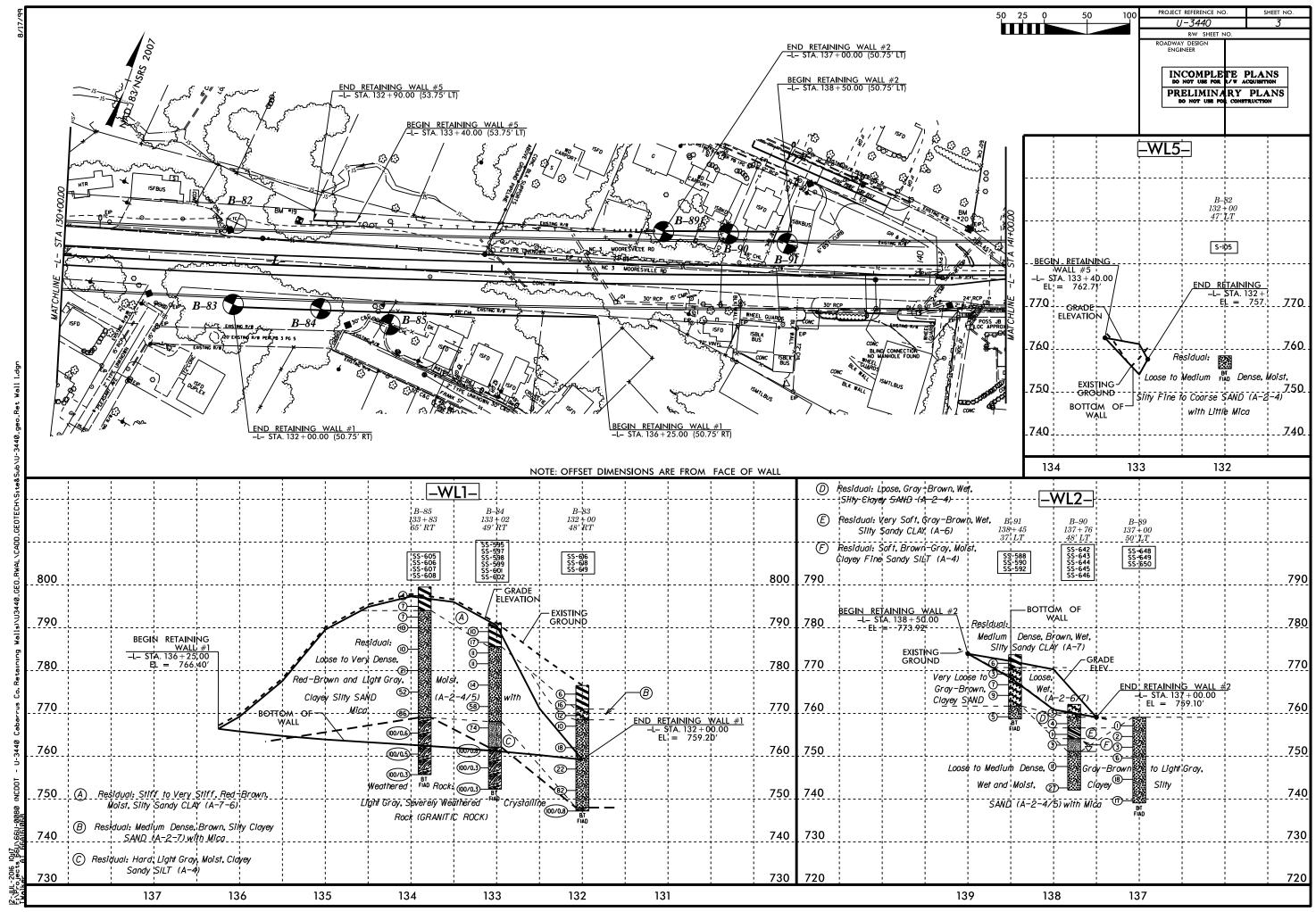
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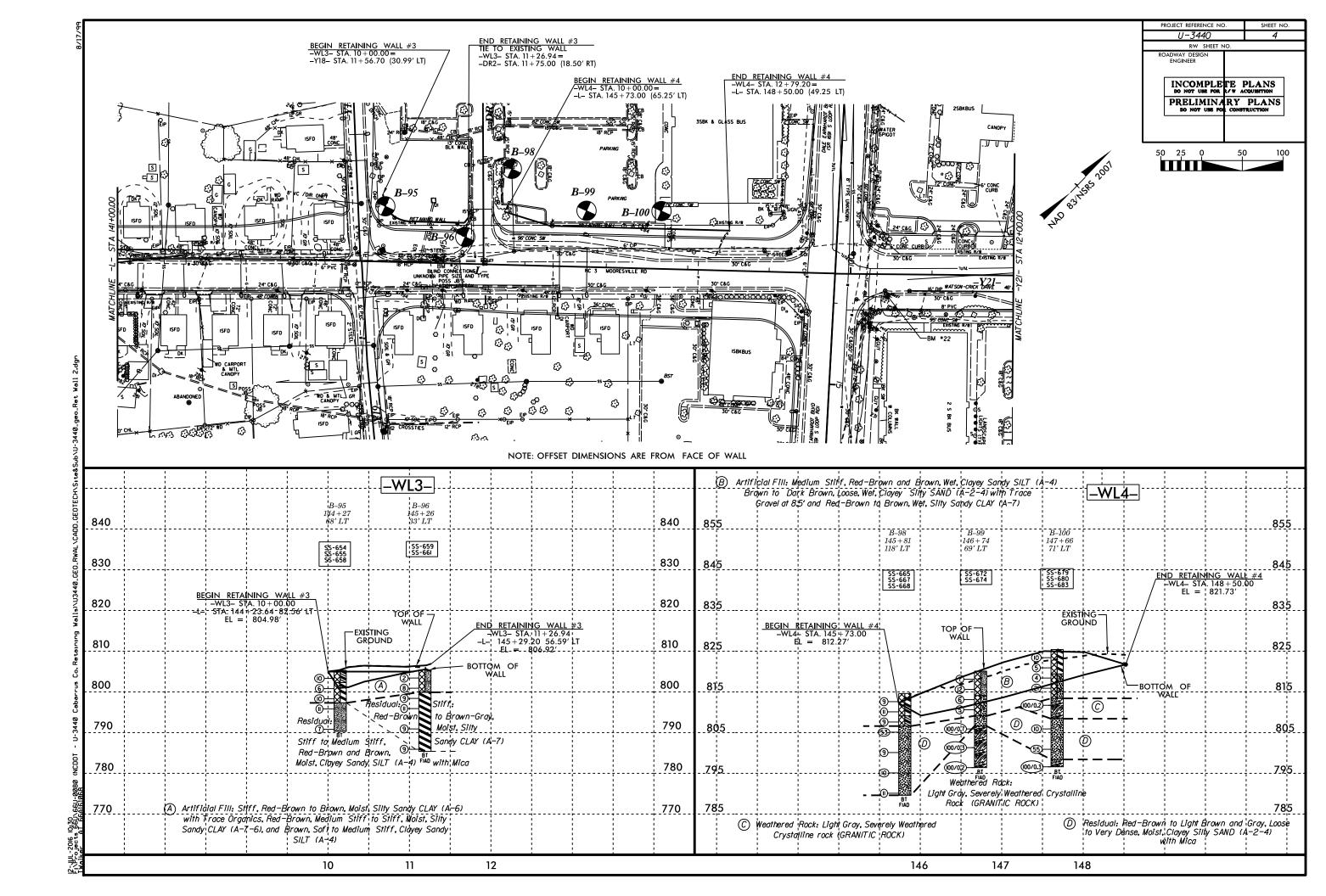
TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

HEAT. PRESSURE. ETC

DATE: 8-15-14

FEET





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	39010					FIP U-34				CABAR						Wells, T.	•	1	WBS	3901	0.1.1			Т	IP U-3440)	COUNT	ſY
SITE	DESCR	IPTION	NC	3, PF	ROPO	SED WES	ST SIDE I	BYPAS	<u> </u>	,			P RD) IN KA	NNAPOL	.IS		GROUND WTR (ft)	SITE	DESCR	RIPTION	NC	3, PR	OPOS	SED WEST	SIDE BYF	PASS (U	-20
BOR	ING NO	. B-83	5			STATION	132+00		0	OFFSET	48 ft RT			ALIC	GNMENT	-L-		0 HR. Dry	BOR	ING NO). B-84			s	TATION 1	33+02		0
COL	LAR ELI	EV. 77	76.5 ft		1	TOTAL DE	PTH 29	9.3 ft	1	NORTHING					TING 1,	513,190		24 HR. Dry	COL	LAR EL	EV. 79	91.1 ft		т	OTAL DEP	TH 38.8 f	ť	N
DRILL	RIG/HA	MMER E	FF./D/	ATE 1	RI8016	6 MOBILE B	+57 93% [~]	12/08/201	11		DRILL	NETHO	DD H	H.S. Auge	rs		HAMM	ER TYPE Automatic	DRIL	l Rig/Ha	MMER E	FF./DA	ТЕ П	RI8016	MOBILE B-5	7 93% 12/0	8/2011	
DRIL	LER G	ower, S	S.			START DA	TE 12/0	06/13	C	COMP. DA	TE 12/	06/13	;	SUR	FACE W	ATER DEP	TH N/	A	DRIL	LER (Gower, S	S.		S	TART DAT	E 12/05/1	13	C
ELEV	DRIVE ELEV	DEPTH	BL	ow co	DUNT		BLO	WS PER	FOOT		SAMP.	▼⁄			sc	IL AND RO	CK DESC	RIPTION	ELEV	DRIVE ELEV	UEFIN	BLC	ow co	UNT		BLOWS	PER FOO	Т
(ft)	(ft)	(ft)	0.5ft	0.5f	0.5f	t 0	25	50	75	5 100	NO.	Имо	I G				0.1.0201	DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
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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.		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	JAL STIFF MOIST MED. TY SANDY CLAY 5) JAL D. DENSE TO V. ILTY SAND & SILTY
74 SS-60		768.1 LT. GRAY HARD MOIS SILT (A 762.1 WEATHEREI LT. GRAY SEV. WEAT ROCK (GRANI	T CLAYEY SANDY +4) D ROCK TH. CRYSTALLINE
100/.3		752.3 Boring Terminated at E SEV. WEATH. CRYS (GRANITIC NOTE: BORING USED WALI	STALLINE ROCK ROCK) 9 FOR RETAINING

											DL	T		OG							
WBS	39010	.1.1			T	IP U-	3440			COU	NTY	CA	BARR	US			GEOLOGI	ST Wells,]	Г.		
SITE	DESCR	IPTION	NC	3, PRC	POS	SED W	EST	SIDE	BYPA	ASS (U-20	009) -	TO SF	R 1691 (I	OOP	P RD.)	In Kannap	OLIS		GROUN	OWTR (ft)
	NG NO.				-	ΤΑΤΙΟ								65 ft RT			ALIGNMEN			0 HR.	Dry
COLL	AR ELE	V . 79	9.5 ft		Т	OTAL	DEPT	FH 43	3.8 ft		- I	NOR	THING	639,8	09		EASTING	1,513,366		24 HR.	FIAD
DRILL	. RIG/HAI	MMER E	FF./DA	TE TR	18016	MOBIL	E B-57	93%	12/08/2	2011				DRILL	IETHC	D H.S	I. S. Augers		HAMIM	ER TYPE	Automatic
וופח	LER G	ower 9			6	TART		12/	05/13		6	°OM	אם פ	TE 12/0			-	WATER DE		Δ	
				W COL					WS PE					SAMP.	V	1 - 1	JUNFACE	WATER DE		~	
ELEV (ft)	ELEV (ft)	DEPTH (ft)	0.5ft		0.5ft	0	2	25 	50		7	5	100	NO.	мо	0	ELEV. (ft)	SOIL AND RO	OCK DES	CRIPTION	DEPTH (ft)
800		_															799.5	GROUI	ND SURF	ACE	0.0
	798.5 -	1.0	2	2	2		•••			•••	•••	•••				N		RE	SIDUAL		
795	796.0	3.5	2	3	4	- • • • • • • • • • • • • • • • • • •					 			SS-605 SS-606	M M		(PI=	RED-BRN MEE =24) TO LOW SILTY SANDY	(PI=11) P	LASTIC MIC	A.
	793.5 -	6.0	3	3	4		· ·		::	· · · ·	::	· · · ·	::	00.007			794.0				5.5
	791.0	8.5	-			.¶?	•••			•••	· ·	•••	: :	SS-607	М	Ŀ		-BRN TO BRN DENSE MOIS			
790	-	-	5	5	5		10							SS-608	М			SA	ND (A-2-4))	
	-	-				:										-					
705	786.0	13.5	3	4	6		· · · ·			· · · ·		· · · ·				-					
785	-	-	3	4	0		10								М						
	-	-					<u>`\</u>]		::	•••	· ·	•••	· ·								
780	781.0	18.5	6	9	12	$ \cdot \cdot$.\ ا			• •					М	ŀ					
	-	-						21 <u></u> [<u>``</u> `							IVI	F					
	-									::	::	· · · ·	::								
775	776.0	23.5	16	24	28	1			· `\	••••	•••	•••	•••		м						
	-	-					•••		::			•••	::			Ľ					
	771.0	28.5								• •	.`.\					-					
770		-	26	36	50	1		· ·		· ·			86		М	F	769.0				30.5
	-	-					· · · ·		::	· · · ·	::	· · · ·	: :]								
705	766.0	33.5	74	00/0.4			· · · ·		::	· · · ·	::	· · · ·	::				LI.	GRAY SEV. V ROCK (G			NE I
765	-	_	71	29/0.1				+					100/.6								
	-	-					• •			• •	· ·										
760	761.0	38.5	100/0.5											,							
	-	-		1									100/.5								
		-				::						· · · ·	::								
	756.0	43.5	100/0.3										100/.3			7//2	755.7 Bor	ing Terminate	d at Elevai	tion 755.7 ft	43.8 IN
	-	F														E	S	EV. WEATH.	CRYSTAL	LINE ROCK	
	-	L														F					
	-	F				1										F	. NO	TE: BORING	USED FO	REIAININ	U
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NCDOT BORE DOUBLE U3440_GEO_BH_WALL_CABARRUS.GPJ NC_DOT.GDT 7/12/

										URE L	-00																
WBS	39010).1.1			Т	IP U-34	40		COUNT	Y CABAR	RUS			GEO	_OGIST Wells, T.			WBS	39010	.1.1			Т	P U-344	0	COUNT	Y (
SITE	DESCR		NC	3, PR	OPOS	SED WES	ST SIDE	E BYP	ASS (U-	2009) TO S	R 1691 (LOO	P RD	.) IN KAN	INAPOLIS		rr (ft)	SITE	DESCR	IPTION	I NC	3, PR	OPOS	ED WES	SIDE BY	PASS (U	2009
BOR	ING NO	. B-89)		S	TATION	137+0	00		OFFSET	50 ft LT			ALIG	NMENT -L-	0 HR.	Dry	BOR	ING NO.	B-90			S	TATION	137+76		OF
COLI	LAR ELI	EV. 7	59.1 ft		Т	OTAL DE	EPTH 2	20.0 ft		NORTHIN	G 640,0)42		EAST	ING 1,513,610	24 HR.	FIAD	COL	LAR ELE	V. 76	62.1 ft		Т	OTAL DEF	TH 20.01	ft	NC
DRILL	RIG/HA	MMER E	FF./D/	TE TI	र18016	MOBILE E	3-57 93%	6 12/08/	/2011	•	DRILLI	METH	OD	H.S. Augers	s HAM	MER TYPE Auto	matic	DRIL	L RIG/HAN	/IMER E	FF./DA	TE T	RI8016	MOBILE B-	57 93% 12/0	8/2011	•
DRIL	LER G	ower, S	S.		S	TART DA	TE 12	2/10/13	3	COMP. DA	TE 12/	10/13	3	SURF		I/A		DRIL	LER G	ower, S	S.		S		E 12/10/	13	cc
ELEV	DRIVE	DEPTH	BL	ow co	JNT		BL	OWS P	ER FOOT	T	SAMP.			Γ'	SOIL AND ROCK DES			ELEV	DRIVE ELEV	DEPTH	BLC	ow co	UNT		BLOWS	PER FOO	Г
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	5	0	75 100	NO.	Имс	DI G	ELEV. (f			EPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
1																											
760																		765									
	758.1	1.0				┟╽╴・・				· · · · · ·				759.1	GROUND SURI RESIDUAL		0.0		-	-							
	-	Ŧ	1	0	1	 ¹		· · ·			SS-648	w			GRAY-BRN TO LT. GRAY MED. DENSE WET & MOIS	V. LOOSE TO			761.1	1.0				H			
755	755.6	- <u>3.5</u>	1	1	1		· ·	•••			SS-649	w			PLASTIC CLAYEY SIL NON-PLASTIC SILTY C	TY SAND &		760	_	_	1	1	2	• 3			· ·
1	753.1	6.0		1	2	$ \begin{bmatrix} T \\ T \\ T \end{bmatrix} $		· · · · · ·		.		1			(A-2-4) MICA. 9.				758.6	- 3.5	2	2	2				. .
750	750.6 ·	- 8.5				$\left \begin{array}{c} \P^3 \cdot \cdot \\ \cdot & \cdot \end{array} \right $	· · ·	· · ·		· · · · · ·	SS-650	W						755	756.1	6.0	0	0	1	$\left \begin{array}{c} T^{r} \cdot \cdot \cdot \\ T^{r} \cdot \cdot \cdot \end{array} \right $	· · · · · ·		· ·
_730	-	ŧ	1	2	4	6					1	M						755	753.6	- - 8.5		Ŭ				1	. .
		ŧ					· · ·	· · ·		. .										-	1	1	2	♦ .3 : :	. .		
745	745.6	13.5	3	7	11	$\left \begin{array}{c} \cdot \cdot \end{array} \right\rangle$	· ·					м						750		-							
	-	ł						· · ·											748.6	- 13.5	4	4	7	: ` . ·			
1	740.6 ·	10 5																		-							
740		- 10.5	9	7	10		17					w		739.1			20.0	745	740.0	-							+
		Ŧ												F	Boring Terminated at Eleve MED. DENSE WET SILTY	ation 739.1 ft IN CLAYEY SAND			743.6	- 10.5	11	13	14		27		
	-	ŧ												F	(A-2-4)					-							
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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	6 40,	071			STING 1,513,679		24 HR.	FIAD
_			DRILL	METHO	D⊢	I.S. Aug	ers	HAMM	ER TYPE	Automatic
	COMP	. DA	TE 12	/10/13		SU	RFACE WATER DEF	PTH N/	A	
т	75	100	SAMF		L O		SOIL AND RO	CK DESC	RIPTION	
	75	100	NO.		G					
					N	762.1		D SURFA	CE	0.0
•			SS-64	2 W	///	-	GRAY-BRN V. LOO			=12)
:	· · · ·		SS-64	3 W		759.1		SIDUAL		- <u> </u>
•	· · ·					- <u>756.6</u> -	GRAY-BRN LOC PLASTIC SILTY (
	1		SS-64	4 W		754.1	GRAY-BRN V. SC	SIDUAL	LOW (PI=	12) 1 8.0
:	· · ·	· ·	SS-64	5 M		- <u>751.1</u>	PLASTIC SILTY			
•							BRN-GRAY SOFT N	NOIST MI	CA. CLAY	EY F./
:			SS-64	6 М		-	RE	SIDUAL		'
•		•••				-	LT. GRAY MED. SILTY S	SAND (A-2		,A.
•				М		_				
						742.1	Boring Terminated			
						-	MED. DENSE MOI	ST SILTY	SAND (A-	-2-5)
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WBS 3						TIP U-:				OUNT							ST Wells, T.		1	
			NC	3, PR					YPAS	S (U-2	-			_00P	? RD.)) IN KANNAF			GROUN	
BORING					_	STATIO							7 ft LT			ALIGNME			0 HR.	Dr
COLLA						OTAL					NOR	THING	640,0				1,513,746	1	24 HR.	Dr
DRILL RI	rig/han	VIMER E	FF./DA	TE T	RI8016	6 MOBILE	EB-57	93% 12	/08/20	11			DRILL N	1ETHO	DDH.	.S. Augers		HAMIN	IER TYPE	Automatic
DRILLE		ower, S	· · · · ·			START	DATE					P. DA	E 12/0	_	X	SURFACE	WATER DEP	TH N	/A	
- <u>LL</u> V E	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW CC 0.5ft		0	25		S PEF 50	FOOT	75	100	SAMP. NO.	моі	C O I G	ELEV. (ft)	SOIL AND RO	CK DES	CRIPTION	DEPTH
775	772.7	- 1.0					• •									773.7		SIDUAL		
	770.2	- <u>3.5</u> - 6.0	2	2	4		· · ·	· · · ·	· · ·	· · · ·	· · · · · · · · · · · · · · · · · · ·	· · ·	SS-588	w w		7 <u>70.7</u> P GF	RAY & BROWN	Sandy (Sidual V. Loos	<u>CLAY (À-7-6</u> SE TO LOOS	》 <u>_</u> SE
	765.2	- - 8.5	2	3 4	4		 9	· · · ·	· · ·	· · · ·	· · ·	· · ·	SS-590	w w	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	 	/et med. (PI=2 Sani	2) PLAS D (A-2-6		Y
760 7	760.2	- - - 13.5	2	2	3	· /· ./. ./. 	· · · · · · · · · · · · · · · · · · ·	· · · · · · · ·	· · ·	· · · ·	· · · · ·	· · · · · ·	SS-592	М	<u>/////////////////////////////////////</u>	- <u>761.7</u> - LT. E - 758.7	BROWN LOOSE	SIDUAL MOIST D (A-2-4		<u>1</u> LTY1
																- Bor	ing Terminated	at Eleva	tion 758.7 ft	IN

GEOTECHNICAL BORING REPORT BORE LOG

								1																		_	
	39010					P U-3440			Y CABARF					LOGIST W	ells, T.				3 39010					I P U-344			INTY (
				3, PR				PASS (U-	2009) TO SF			P RD.	<u></u>			_	OUND WTR (ft)					3, PR			T SIDE B	/PASS	<u> </u>
BOR	NG NO	. B-95			S	TATION 1	44+27		OFFSET	68 ft LT			ALIC	SNMENT -L-		_ 0 H	IR. Dry	BOR	RING NO	. B-96	6		S	TATION	145+26		OF
		EV. 80				OTAL DEP			NORTHING	6 40,3	861		EAS	TING 1,514	264	24 H	IR. Dry		LAR EL						PTH 20.0		NO
DRILL	. RIG/HA	MMER E	FF./D/	TE TI	RI8016	MOBILE B-5	7 93% 12/0	8/2011		DRILLI	METHO	DD ⊦	I.S. Auge	s	HAM	MER TY	/PE Automatic	DRIL	l Rig/Ha	MMER E	EFF./D/	TE T	RI8016	MOBILE B-	57 93% 12	/08/2011	
DRIL	LER G	Gower, S	S.		S	TART DAT	E 12/10/	13	COMP. DA	TE 12/	10/13	;	SUR	FACE WATE		N/A		DRIL	LER G	Gower,	S.		S	TART DA	FE 12/11	/13	со
ELEV	DRIVE ELEV	DEPTH	BL	on wc	UNT		BLOWS	PER FOOT	Г	SAMP.	▼/	L			ND ROCK DE	SCDIDT		ELEV	DRIVE	DEPTH	H BL	ow co	UNT		BLOW	S PER FO	тос
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	мо	I G	ELEV.				DEPTH (ft)	(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
810																		810									
		Ŧ											F							Ŧ							
		Ŧ											F	_						Ŧ							
805	804.3	† † 1.0											- 805.3		ROUND SUR		0.0	805	804.4	1.0							
		Ţ	4	6	4					SS-654	м		802.3	RED-BRN PLASTIC S	STIFF MOIST	LOW (I	(PI=14) A-6) W/ <u>3.0</u>		001.0	‡	1	1	1				
800	801.8	<u> </u>	3	3	3				· · · · · · · · · · · ·	SS-655	м		[]	V 1	RACE ORGA	NICS		800	801.9	<u> </u>	3	3	5		· · · · ·		· · · · · ·
000	799.3	<u>+ 6.0</u>	2	3	7] м		F	RED-BRN N	AED. STIFF TO	O STIFF		000	799.4	+ 6.0 +	4	4	5				
	796.8	+ - 8.5							· · · · · · · · · · ·				797.3	MED. (PI=22)	(A-7-6)	IY SAN	IDY CLAY 8.0		796.9	8.5		5					· · · · · ·
795	-	‡	4	5	6	• • 11 •					M		-	RED-BRN &	RESIDUAL) STIFF	795		‡	3	5	6	• • 11			
		ŧ				. L . J			1 1				F	MOIST NO	N-MICA. TO N SANDY SILT (MICA. CI				ŧ				: :		· · · ·	· · ·
	791.8	<u> </u>	2	3	4	. ∳7				SS-658	м		- 790.3		SANDI SILI ((~~+)	15.0		791.9	13.5	4	4	5				· · ·
	-	1										<u>- 84848</u>	- 190.3		ninated at Elev		90.3 ft IN	790	-	ŧ					<u> </u>		
		ŧ											F	MED. ŠTIFF	SILT (A-4)		Y SANDY		786.9	18.5							· · ·
		ł											Ł							<u>+</u>	3	4	5	· ∳ 9 ·			
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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			0 HR.	Dry
	NORTHING					1,514,369		24 HR.	FIAD
		DRILL	IETHO	DHS	S. Augers		HAMM	ER TYPE	Automatic
	COMP. DA	1	11/13		SURFACE	WATER DEP	TH N/	Ą	
DOT	75 100	SAMP.		L O		SOIL AND ROC	K DESC	RIPTION	
	100	NO.	/моі	G					
					-				
					805.4		SURFA		0.0
· ·		SS-659	W		BI (PI=	RN SOFT TO ME	D. STIF	F WET LO	W (A-4)
· · · ·			w					ID I OILI	
		SS-661	М	N	_799.9				5.5
· ·						D-BRN TO BRN OW (PI=11) PLA	ASTIC M	ICA. SILTY	
· ·			М		-	SANDY C	LAY (A-	7-5)	
				N					
•••			М	N	_				
				N	-				
· ·			М	N	785.4				20.0
					- Bo	ring Terminated a	at Elevati	on 785.4 f	t IN
					51		. SILTY -7-5)	SANDY CL	_AT
					_				
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	39010					I P U-344	-		1	Y CABA						LOGIST Wells, T.	T		3 3901					I P U-344		COUNTY
				3, PR					PASS (U					PRD.		NNAPOLIS	GROUND WTR (ft)					3, PR				PASS (U-20
BOR	ING NO.	B-98	5		S	TATION	145+	-81		OFFSE	F 118	3 ft LT	•		ALIO	SNMENT -L-	0 HR. Dry	BOF	RING NO). B-9	9		S	TATION	146+74	
	LAR ELI					OTAL DE				NORTH						TING 1,514,386	24 HR. FIAD		LAR EL						PTH 23.7	
DRIL	RIG/HA	MMER E	FF./DA	TE TI	RI8016	MOBILE B-	-57 93	8% 12/08	8/2011		DF	RILLN	IETHO	DD H	.S. Auge	rs HAMM	IER TYPE Automatic	DRIL	L RIG/H/	AMMER	EFF./DA	TE TF	RI8016	MOBILE B-	57 93% 12/	08/2011
DRIL	LER G	iower, S	S.		S	TART DA	TE 1	12/11/1	3	COMP.	DATE	12/	11/13		SUF	FACE WATER DEPTH N	/A	DRI	LER	Gower,	S.		S	TART DA	FE 12/11	/13
ELEV	DRIVE ELEV	DEPTH	' 						PER FOO			AMP.	▼⁄			SOIL AND ROCK DES	CRIPTION	ELEV	DRIVE	IDEFT	'' 					S PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25		50	75 '	00	NO.	/мо	I G	ELEV.	ft)	DEPTH (ft	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50 7
815		-													_ 814.6	GROUND SURF		825		+						
	813.6 -	+ 1.0 +	3	4	5	. . 	: :	· · · · · ·			· 59	S-665	w		-	ARTIFICIAL FI BRN STIFF WET TO MOIS	T LOW (PI=14)			‡						
810	811.1	3.5	8	6	5		· · ·	· · · · · ·		· · · · ·	· -				-	PLASTIC SILTY SANDY (CLAY (A-7-6)	820		‡						
010	808.6 -	6.0									. L		М		809.1		5.		819.1	1.0	3	3	4			
ł	-	8.5	3	4	5	. • <u>•</u> •	· · ·	 	· · · ·	· · · · ·	1 100	S-667	М		- 806.6	RED-BRN STIFF MOIST N	MED. (PI=17) 8 (816.6	+ 3.5						· · · · · ·
805	806.1	8.5	15	28	25		• •		•53	· · · ·		S-668	М		-	PLASTIC SILTY SANDY RESIDUAL		815		t	5	6	6	12	· · · ·	· · · · ·
	-	ŧ					· · ·	, , , , , , , ,		· · · · ·					-	RED-BRN TO LT. BRN & GI TO LOOSE & MED. DENSE	E MOIST MICA.		814.1	Ŧ	2	3	3	• • • • • • • • • • • • • • • • • • •	· · · ·	· · · · · ·
800	801.1	13.5	3	4	5		?†?	· · · · · ·		 					-	CLAYEY SILTY SAND	D (A-2-4)	810	811.6	+ 8.5	6	3	2		· · · · · · · ·	. .
800		ŧ		1		- 9 ⁹	· ·		1				М		-			010	1	‡				<u> </u>		
	-	+					· · ·	· · · · · ·	· · · ·	· · · · ·					-				806.6	+ 13.5						
795	796.1	18.5	4	5	5		• •				·		М		-			805		+	20	80/0.2		· · ·		
	-	ŧ					: :	· · · · · ·	· · · · · ·						-					ŧ						
700	791.1	23.5		E	6	::::	· ·	· · · · · ·	· · ·						-				801.6	+ 18.5	100/0.3	3				. .
790		<u> </u>	3	5	6	<u> </u>							М		- 789.6	Boring Terminated at Eleva	25.0 tion 789.6 ft IN	800	-	+						
	-	ŧ													-	MED. DENSE MOIST MICA. SAND (A-2-4)	CLAYEY SILTY		796.6	+ 23.5						
	-	ŧ													-	, , , , , , , , , , , , , , , , , , ,	,			‡	100/0.2	2			•	
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SHEET 10 OF 13

1T	Y CABARF	RUS			GEOLOGIST Wells, T.		
J-2	2009) TO SF	R 1691 (I	OOP	RD.)	IN KANNAPOLIS	GROUND	WTR (ft)
	OFFSET	69 ft LT			ALIGNMENT -L-	0 HR.	Dry
	NORTHING	6 40,4	60		EASTING 1,514,491	24 HR.	FIAD
		DRILL	IETHO	D H.S		ERTYPE A	utomatic
	COMP. DA	TE 12/*	11/13		SURFACE WATER DEPTH N/	Ą	
ОТ		SAMP.		L			
	75 100	NO.	мо	O G	SOIL AND ROCK DESC	RIPTION	
	100/.2	SS-672	W W W M		820.1 GROUND SURFA ARTIFICIAL FIL RED-BRN & BRN MED. STI WET LOW (PI=9) PLAST SANDY SILT (A- 814.1	L FF TO STIFF C CLAYEY 4) E WET LOW SILTY SAND OIST MICA. 2) CK RYSTALLINE COCK)	6.0 / 11.0 13.5

								B	<u>ORE L</u>	ÜĠ							
WBS	3 9010	0.1.1			ТІ	P U-3440		COUNTY	CABARR	US			GEOLOGI	ST Wells, T			
SITE	DESCR	RIPTION	NC	3, PR	OPOS	ED WEST	SIDE BYP	PASS (U-2	2009) TO SF	R 1691 (LOOP	RD.) IN KANNAF	POLIS		GROUN	ID WTR (ft)
BOR	ING NO	. B-10	0		S	TATION 1	47+66		OFFSET	71 ft LT			ALIGNME	NT -L-		0 HR.	Dry
COL	LAR EL	EV . 82	25.4 ft		т	TAL DEP	FH 28.8 ft	t	NORTHING	640,4	98		EASTING	1,514,574	2	24 HR.	FIAD
DRIL	l rig/ha	MMER E	FF./DA	TE TH	318016	MOBILE B-57	7 93% 12/08	3/2011		DRILL	/IETHC	ЮH	.S. Augers		HAMME	R TYPE	Automatic
DRIL	LER G	Gower, S	S.		S		12/11/1	3	COMP. DA	TE 12/	11/13		SURFACE	WATER DEF	PTH N/A		
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW CO		0 :		PER FOOT 50	75 100	SAMP. NO.	мо	L O G	ELEV. (ft)	SOIL AND RC	OCK DESCR	RIPTION	DEPTH (ft)
830		+															
825	824.4						+ • • • •	.	+				- 825.4		ID SURFAC		0.0
		‡	3	4	6	<u>;</u>	· · · · ·	· · · ·		SS-679	w			D-BRN & BRN MED. (PI=24)	STIFF TO	MED. ST	
020	821.9	<u>3.5</u>	3	3	2	↓ · · · · · ·	· · · · ·				w		- ***		Y (A-7-5)		
820	819.4 -	6.0	1	2	2	$1 \\ 1 \\ \cdot \cdot \cdot$				SS-680	w		819.4				6.0
	816.9	8.5				•				33-000				RAY & BRN LO	OSE TO M	ED. DEN	
815	. -	‡	4	14	7	· · · `	2'1 · · · · · · · · ·		· · · ·		м		-	(A-2-4) W/ TR4			5
	011.0	+				1.1.1	<u> </u>	- <u></u>	-┝╧╧÷┼				813.4	WEATH	ERED ROO	ж	12.0
810	811.9	<u> </u>	100/0.2	2					100/.2	'			- LT.	. GRAY SEV. W ROCK (GF	VEATH. CR RANITIC RO		INE
010	-	ŧ				· : <u></u>	<u> </u>	<u> </u>	<u></u>				- 808.4	·		,	17.0
	806.9	18.5	3	4	6								- GRA	RE Y-BRN TO LT.	SIDUAL GRAY ME	D. DENS	E TO
805		ŧ				• •10 •				SS-683	м		- V.	DENSE MOIST SAN	⁻ MICA. CL/ ID (A-2-4)	AYEY SIL	_TY
	801.9	T 23.5											-				
800			8	30	25			•55			М		-				
		Ŧ										am	798.4				27.0
	796.9	28.5	100/0.3						100/.3				- 796.6 LT	GRAY SEV. W		YSTALL	INE
	-	ŧ											Bor	ROCK (GF	l at Elevatio	n 796.6	ft IN
		ŧ											_ §	SEV. WEATH. C (GRAN	CRYSTALL	NE ROC	К
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NCDOT BORE DOUBLE U3440_GEO_BH_WALL_CABARRUS.GPJ NC_DOT.GDT 7/12/16

								D
WBS	39010).1.1			TI	P	• U-3440	COUNT
SITE	DESCR	IPTION	NC	3, PR	OPOS	E	D WEST SIDE BYF	ASS (U-
BOR	ING NO.	B-82			S	Г/	ATION 132+00	
COLI	LAR ELE	EV. 75	8.5 ft		т	О.	TAL DEPTH 3.0 ft	
DRILL	RIG/HAI	MMER E	FF./DA	TE N	A			
DRIL	LER G	oodnig	ht, D.		S	T/	ART DATE 11/20/1	3
ELEV	DRIVE ELEV	DEPTH	BLC	w co	JNT		BLOWS	PER FOO
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft		0 25 5	50
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7/12/16 BORE NCDOT

GEOTECHNICAL BORING REPORT

	ORE L							
	Y CABARR				GEOLOGIST Goodnig	nt, D.		
NSS (U-2			LOOP	RD.)				ID WTR (ft)
	OFFSET 4				ALIGNMENT -L-		0 HR.	Dry
	NORTHING			<u> </u>	EASTING 1,513,153		24 HR.	FIAD
				ע Ha	and Auger			Automatic
	COMP. DA				SURFACE WATER DEP	TH N/	Α	
ER FOOT	75 100	SAMP. NO.		0	SOIL AND ROO	CK DESC	RIPTION	
		110.	/моі	G	ELEV. (ft)			DEPTH (ft)
					- • 758.5 GROUNI) SURFA	CE	0.0
						SIDUAL		
		S-105	14%		<u>· 755.5</u> SILTY F. TO CSE. S	AND (A-2 IICA.	2-4) W/ LI	TLE <u>3.0</u>
					Boring Terminated	at Elevat	on 755.5 f	t IN
					LOOSĚ TO MED. D TO CSE. 3			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

			SC	DIL TI	ES	T F	RES	UL	ГЅ						
SAMPLE			DEPTH	AASHTO				% BY W	EIGHT		% 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

			SO	DIL TI	ES.	T F	RES	UL	ГS						
SAMPLE			DEPTH	AASHTO				% BY W	EIGHT		% PAS	SING (S	IEVES)	%	%
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

			S	OIL T	ES	5 T .	RES	SUL	TS						
SAMPLE			DEPTH				% 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	VEIGHT		% 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	-	-