35135 <u>–</u> 07	CONTENTS SHEET NO. 1 2 3-4 5-11	DESCRIPTION TITLE SHEET LEGEND (SOIL & ROCK) SITE PLANS BORELOGS AND DIRECT PUSH LOGS	SL	DEPA GEOTI	RTMENT O DIVISION ECHNICAL ROA	DRTH CARC F TRANSPORTATI OF HIGHWAYS ENGINEERING U DWAY INVEST	ION NIT	ON
4				COUNTY <u>GAST</u> PROJECT DESCI <u>FAILURE</u>	<u>'ON</u> RIPTION <u>NC</u>	HWY 16 PIPE C	ULVERT	
REFERENCE:								
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T: NA								
PROJECT: NA								

STATE	STATE PROJECT REFERENCE NO.	SHEBT NO.	TOTAL SHEETS
N.C.	35135–07	1	11

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOLI TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOLL 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 STIU GUNPLACE) TEST DATA CAN BE RELED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STADARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOL MOSTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOL MOSTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO LUMATIC CANDITIONS 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 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 OPHIONIO OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONSTRUCTIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE WORMATION.

- NOTES: I. 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 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.

PERSONNEL

GEOLOGIC EXPLORATION

M. BREWER

C. BUKOVITZ

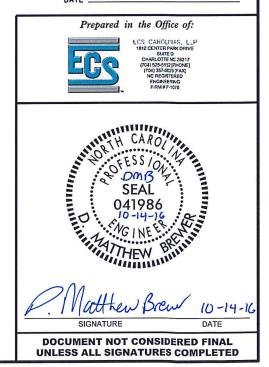
INVESTIGATED BY ECS CAROLINAS, LLP

DRAWN BY <u>M. BREWER</u>, P.E.

CHECKED BY _____M. WALKO, P.E.

SUBMITTED BY ECS CAROLINAS, LLP

DATE OCTOBER 2016



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

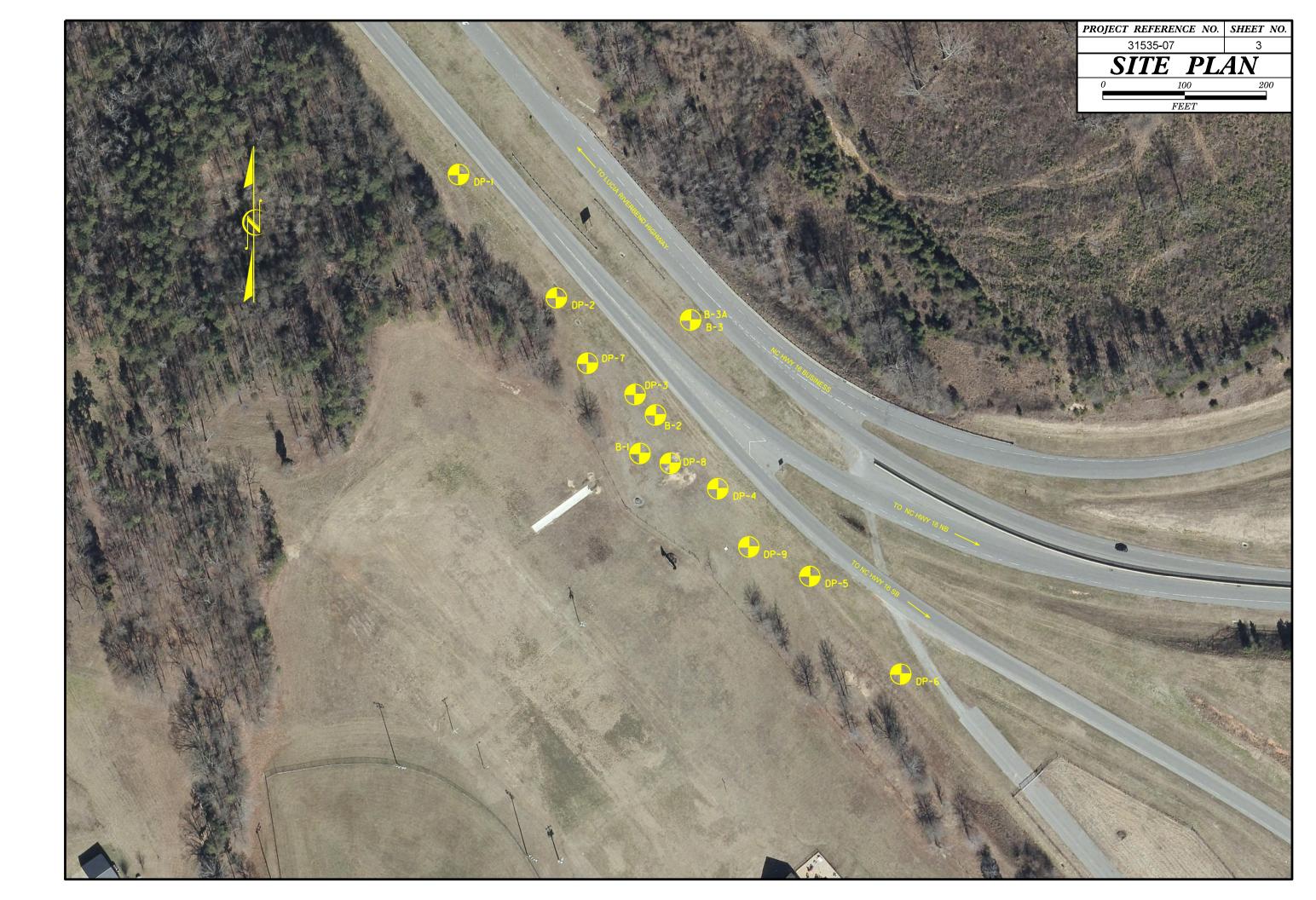
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

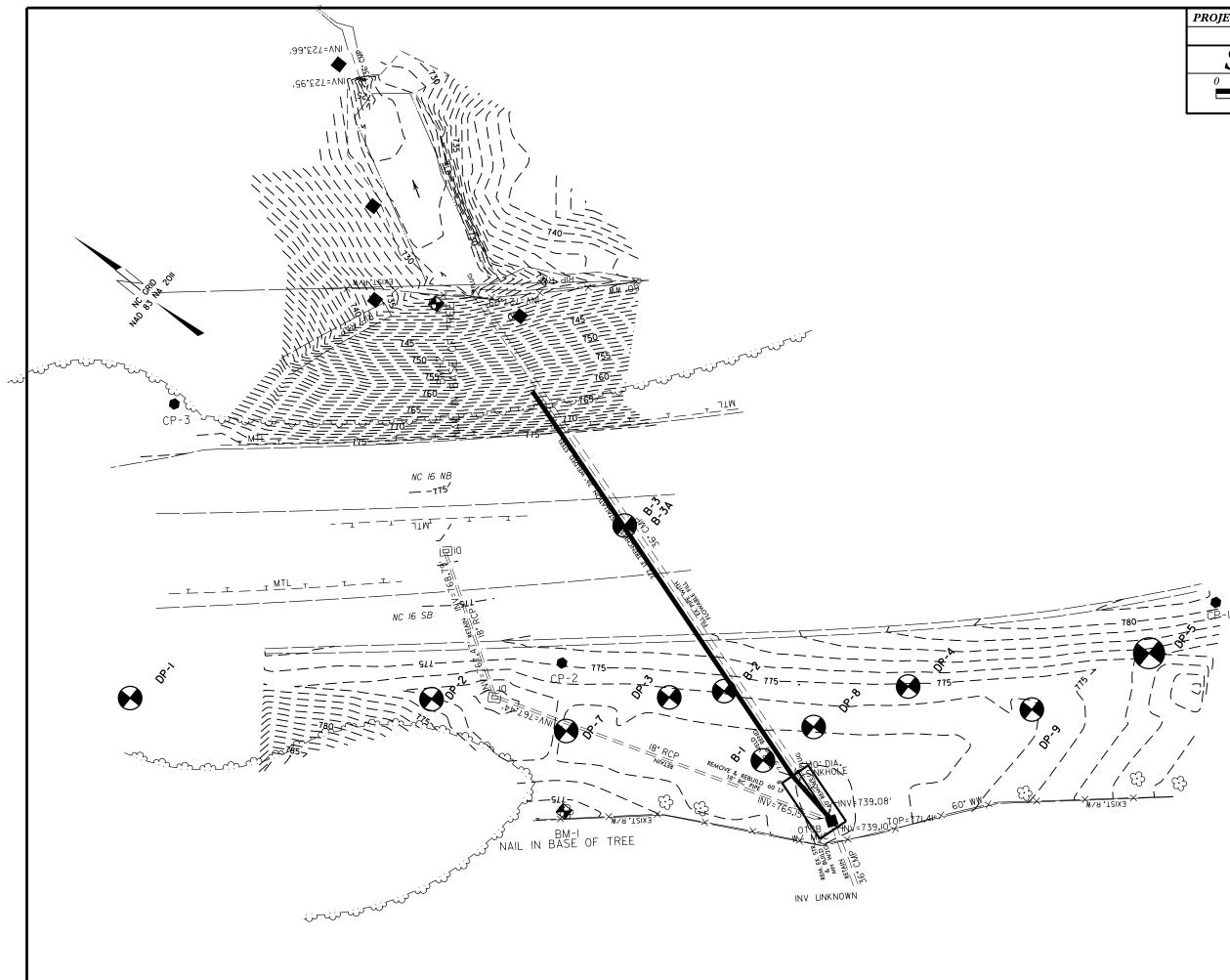
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM DI586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTE ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EGUAL TO OR LESS THAN 0. BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS;
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF.GRAY, SULTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPI
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR) 100 BLOWS PER FOOT IF TESTED.
UCREME UNHINGLIN INTERINES Sill *CLH institution ORGANIC MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS GROUP A-1 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	MINERAL NAMES SUCH AS OUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE IN GNEISS, GABBRO, SCHIST, ETC.
CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTA ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YELD SPT REFUSAL
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT SEDIMENTARY ROCK STAL FLAIN SEDIMENTS CEMENTED INTO ROCK, BUT
10 50 MX GRANULAR SILI- MUCK,	PERCENTAGE OF MATERIAL	
*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 36 MN SOILS	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS <u>SOILS</u> <u>OTHER MATERIAL</u>	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK
MATERIAL PASSING *40 LL 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 50ILS WITH LL 40 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 NN 11 NN PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 NN 11 NN	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 10% 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	HAMMER IF CRYSTALLINE. VERY SLIGHT ROCK GENERALLY FRESH.JOINTS STAINED.SOME JOINTS MAY SHOW THIN CLAY C (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER H OF A CRYSTALLINE NATURE.
GROUP INDEX: 0 0 0 0 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF ORGANIC SOILS USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO RC (SLI.) I INCH. DPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONE CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMEI
GRANECK NEO SAND GRAVEL AND SAND SOILS SOILS GEN.RATING AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR POOR	▼ STATIC WATER LEVEL AFTER <u>24</u> HOURS ► ∑PW ► ○PM ► ○PM ► ○PM ► ○PM ► ○PM	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECT (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLA DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH WITH FRESH ROCK.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 PI OF A-7-6 SUBGROUP IS > LL - 30		MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL F
CONSISTENCY OR DENSENESS		SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE L (MOD.SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND
PRIMARY SUIL TYPE CONSISTENCY PENEIRATION RESISTENCE COMPRESSIVE STRENTH GENERALLY VERY LOOSE < 4	ROADWAY EMBANKMENT (RE) 20000 DIP & DIP & DIP & DIP & DIP & UP DIRECTION WITH SOIL DESCRIPTION FOR ROCK STRUCTURES	IF TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT OUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND E REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS / TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.
GRANULAR MEDIUM DENSE 10 TO 30 N/A MATERIAL MEDIUM DENSE 30 TO 50 N/A (NON-COHESIVE) VERY DENSE > 50	ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY ALL ROCK EXCEPT OUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS AF SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS DI (V SEV) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT
VERY SDFT < 2 < 0.25 GENERALLY SOFT 2 T0 4 0.25 T0 0.5 SILT-CLAY MEDIUM STIFF 4 T0 8 0.5 T0 1.0 MATERIAL STIFF 8 T0 15 1 T0 2 (COHESIVE) VERY STIFF 15 T0 30 2 T0 4	INFERRED SOIL BOUNDARY	 (V SEV.) REMAINING, SAPPOLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N V</u> COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS ALSO AN EXAMPLE.
HARD > 30 > 4	INSTALLATION	ROCK HARDNESS
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMEN
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	ACCEPTABLE, BUT NOT TO BE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER B
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY (BLDR.) (COB.) (GR.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)		TO DETACH HAND SPECIMEN. MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DI
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE D BY MODERATE BLOWS.
SIZE IN. 12 3 SOIL MOISTURE - CORRELATION OF TERMS	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY γ - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC γ_{1} - DRY UNIT WEIGHT	MEDIUM CAN BE GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE O HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD POINT OF A GEOLOGIST'S PICK.
SOIL MOISTURE SCALE FIELD MOISTURE (ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE, - COARSE ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u> DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	SOFT CAN BE GROVED OR GOUEDOIST STREAM FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	e - VOID RATIO SD SAND, SANDY SS SPLIT SPOON F - FINE SL SILT, SILTY ST SHELBY TUBE FOSS FOSSILIFEROUS SL SLIGHTLY RS ROCK	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCH FINGERNAIL.
PLASTIC RANGE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING
(P) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	HI HIGHLY V - VERY RATIO EQUIPMENT USED ON SUBJECT PROJECT	TERM SPACING TERM VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED
DM OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CME-45C CLAY BITS X AUTOMATIC MANUAL	WIDE 3 TO 10 FEET THICKLY BEODED 1 MODERATELY CLOSE 1 TO 3 FEET THINLY BEODED 0. CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.0 VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.00
- DRY - (D) ATTAIN OPTIMUM MOISTURE	CME-55	THINLY LAMINATED <
		INDURATION
PLASTICITY INDEX (PI) DRY_STRENGTH NON PLASTIC Ø-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT		FRIABLE CENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST CASING W/ ADVANCER POST HOLE DIGGER PORTABLE HOIST TRICONE STEEL TEETH HAND AUGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH ST BREAKS EASILY WHEN HIT WITH HAMMER.
COLOR	X DIEDRICH D-50	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL DIFFICULT TO BREAK WITH HAMMER.
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN. RED. YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	Image: A second building CORE BIT Image: A second building Image: A second building Image: A second building Image: A second building Image: A second building Image: A second building Image: A second building Image: A second building Image: A second building Image: A second building Image: A second building Image: A second building Image: A second building	EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS.

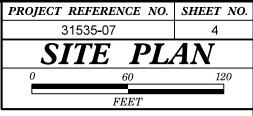
SHEET NO.

PROJECT REPERENCE NO. 35135-07

TERMS AND DEFINITIONS D AN INFERRED ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ED. AN INFERREL) SPT REFUSAL. 1 FOOT PER 60 IS OFTEN ADUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. N VALUES > 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 СК ТНАТ SURFACE. CLUDES GRANITE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. AL PLAIN IF TESTED. MAY NOT YIELD 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. TONE, CEMENTED DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT BOCKS OR CUTS MASSIVE BOCK. RINGS UNDER DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DATINGS IF OPEN. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. AMMER BLOWS IF FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE ICK UP TO SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FELDSPAR FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. BLOWS. $\underline{\mathsf{FLOAT}}$ - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. . IN Y. ROCK HAS AS COMPARED FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. ELDSPARS DULL OSS OF STRENGTH WHEN STRUCK. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO VIDENT BUT ITS LATERAL EXTENT. ARE KAOLINIZED LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. RE DISCERNIBLE PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE AN INTERVENING IMPERVIOUS STRATUM. ONLY MINOR ALUES < 100 BPF RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. IN SMALL AND 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 SAPROLITE IS RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT POCK S 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 LOWS REQUIRED THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT eep can be Detached OR SLIP PLANE. 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 B PICK POINT. WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL BLOWS OF THE TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. FRAGMENTS IT. SMALL, THIN STRATA ROCK QUALITY DESIGNATION (SRQD) - 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. PIECES 1 INCH ED READILY BY TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK: THICKNESS 4 FEET 1.5 - 4 FEET ELEVATION: FEET 16 - 1.5 EEET NOTES: - 0.16 FEET 08 - 0.03 FEET BORING LOCATION INFORMATION PROVIDED BY VAUGHN & MELTON 0.008 FEET AT. PRESSURE. ETC. TEEL PROBE: PROBE; DATE: 8-15-1-









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SITE	DESCR	IPTION	NC-1	16 Pipe	e Culve	ert Failure								GROUND WTR (ft)	SITE	DESCR	RIPTION	NC-1	6 Pipe	e Culve	ert Failure			
BOR	ING NO.	B-1			S		√A		OFFSET	N/A			ALIGNMENT N/A	0 HR. 34.5	BOF	ING NO	. B-2			ST	TATION N	/A		O
COL	LAR ELE	EV . 77	2.3 ft		T	OTAL DEP	TH 41.0	ft	NORTHING	600.4	09		EASTING 1,402,341	24 HR. 24.0	COL	LAR EL	. EV . 7	74.1 ft		Т	OTAL DEP	FH 40.9 ft	t	NC
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755		ŧ						· · · · ·				X	-		755	755.6	<u>+ 18.5</u> +	5	8	5				+
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		Ł														750.6	+ 23.5							
750	748.8 -	23.5											-		750		+ 20.0	4	4	7		.	+ • • • •	+
	- 140.0 -	- 23.5	2	2	2	$\left \begin{array}{c} 1 \\ \bullet 4 \end{array} \right $					W		748.2 ROADWAY EMBAN	24.	1		Ŧ							
745	-	‡									vv		Soft, Red-Brown-Gray, Fi 745.3 Sandy, Silty CLAY	ne to Coarse	745	745.6	+ 28.5] ::\::			
745	743.8 -	28.5] i							RESIDUAL	(((()))	- 745		<u>†</u>	7	9	6	• 15			+
	-		1	1	1	4 2 · · ·					W		. Very Loose, Brown-Gray, S (A-2-4), with trace clay and	ilty Fine SAND			ł				: : <u>i</u> : :			
740	-	+											rock fragment		740	740.6	- 33.5	3	· ·					
	738.8 -	33.5	00/0 4			1	_ <u></u>		<u></u>				738.8	33.		1.	Ŧ	3	3	9	• 12			
		ŧ	60/0.1										CRYSTALLINE R Orange-White (GR				‡							
735		Ł											735.3	37.	735	735.6	38.5	12	20	80/0.3	· ·i	<u></u>	+	<u>+</u> .
	733.8 -	- 38.5	100/0.3						100/0 2				- WEATHERED R (GRANITE)			733.2	40.9							
	731.3	41.0											731.3	41.	D		Ŧ	60/0.0						
	-	+	60/0.0						60/0.0				Boring Terminated with Penetration Test Refusal at				ŧ							
	-	ŧ											ft In Crystalline Rock (GRANITE)			‡							
		ŧ											Other Samples:				t							
		╞											ST-1 (10.0 - 12.0) ST-2 (20.0 - 22.0)			-	+							
	-	F															Ŧ							
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GASTON				GEOLOGIST C. Bukovit	z		
				·		GROUN	D WTR (ft)
OFFSET N	/A			ALIGNMENT N/A		0 HR.	31.0
NORTHING	600,45	56		EASTING 1,402,360		24 HR.	26.7
[DRILL M	ETHOD) H.S	S. Augers	HAMME	RTYPE	Automatic
COMP. DAT	E 08/1	2/16		SURFACE WATER DEPT	TH N/A	4	
	SAMP.		L				
75 100	NO.	моі	O G	SOIL AND ROC	K DESC	RIPTION	1
· · · · · · · · · · · · · · · · · · ·				774.1 GROUND 772.9 ARTIFIC	SURFA		0.0 1.2
		М		Medium Dense, Brov (A-2-6), tr	wn, Clay	ey Fine S wel	AND /
		М		 Flyash sampled as 	Medium	Dense, (Gray
		М		Silty Fine to Coarse Intermittent layers	of Browr	(A-2-4), N Silty Fin	e to
			81	765.4	se Sand		8.7
		М		ROADWAY E			rown,
				Clayey Fine to Coars trace gravel size	se SANE ed rock f) (A-2-6), ragments	with
· · · ·		м		-			
		М		_ ·			
		М		_			
							07.0
							<u>27.0</u>
<u> </u>		М		Medium Dense, Br SAND (A-2-4), with	trace cl	ay and gr	ine avel
				sized rock	k fragme	ents	
		м		-			
		IVI					
				- 735.6			38.5
. 100/0.8			M	- WEATHE			
60/0.0			E.	Boring Termina	ted with	Standard	40.9
				Penetration Test Ref ft On Crystalline			
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WBS	3 1535	5-07			TI	P N/A		COUNT	Y GASTON				GEOLOGIST C. Bukovitz		WBS	31535-07	7		Т	IP N/A		COUNTY
SITE	DESCR	RIPTION	NC-	16 Pipe	Culve	ert Failure								GROUND WTR (ft)	SITE	DESCRIPT	ION	NC-16 P	ipe Culv	ert Failure		
BOR	ING NO.	B-3			S		N/A		OFFSET	N/A			ALIGNMENT N/A	0 HR. Dry	BOR	ING NO . B	3-3A		S	TATION N	/A	C
COL	LAR EL	EV . 77	76.0 ft		т	OTAL DEP	TH 16.8	ft	NORTHING	600,5	72		EASTING 1,402,403	24 HR. FIAD	COL	LAR ELEV.	776.	.0 ft	т	OTAL DEP	TH 20.0 ft	N
DRILI	L RIG/HAN	MMER EF	F./DATI	E GEC	0366 Die	edrich D50 87	7% 11/07/20	15	•	DRILL N	IETHOD) H.S	6. Augers HAMME	ER TYPE Automatic	DRILL	RIG/HAMME	R EFF./	DATE	EO366 D	iedrich D50 87	% 11/07/2015	I
DRIL	LER J	. Messio	ck		S	FART DAT	E 08/15/	16	COMP. DA	TE 08/	15/16		SURFACE WATER DEPTH N/A	A	DRIL	LER J. Me	essick		S	TART DATI	E 08/15/16	; c
ELEV		DEPTH	BLC	W COL	JNT		BLOWS	PER FOO	T	SAMP.	$\mathbf{\nabla}$	L	SOIL AND ROCK DESC		ELEV	DRIVE ELEV DE	PTH	BLOW C	COUNT		BLOWS P	ER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	моі	G	ELEV. (ft)	DEPTH (ft)	(ft)	(ft)	(ft) (0.5ft 0.5	ift 0.5ft	0	25 5	0 75
780		L											_		780							
		Ŧ										E				l f						
		Ŧ										F	776.0 GROUND SURFA	ACE 0.0		Ŧ						
775	775.0	1.0	8	11	10	1					м		ROADWAY EMBANH Medium Dense and Loose, F	KMENT	775	775.0	1.0	8 10) 11		<u> </u>	
	772.5	+ + <u>3.5</u>				· · · /.		· · · · · ·	· · · · · ·				Silty Fine to Coarse SAND	(A-2-4), with		772.5 + 3	3.5			<u> </u> ::: /	21 · · · ·	· · · · ·
770	770.0	‡	10	5	7	• 12			· · · · · ·		M		trace clay and some	graver	770	770.0 4	6.0	13 8	8	16		
110	110.0	+ 0.0	4	4	5	• • 9 • •					м		_		110	- //0.0 <u>-</u>	0.0	4 4	5	· • 9 · ·		
	767.5	<u>+ 8.5</u> +	5	4	4	· · · · ·					м					767.5 + 8	8.5	8 5	4			· · · · ·
765		‡											—		765	4 4						
	762 5	+							 			L				762.5 + 1	35					· · · · ·
	760.7	+	4	6	14		20				М	L						4 4	5	∶ ∳ 9		
760		+	11	15	10		25			_	М		759.2	16.8	760	+ +						
		ŧ											Boring Terminated at Eleva Roadway Embankment (B	Boulder Fill)		757.5 1	8.5	54 22	2 18	::::		
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11810 - BORING LOGS.GPJ NC_DOT.GDT 10/13/16		ŧ																				
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SHEET 6

INT	/ GA	S	ION	1					GEOLOG	ilS	т	C. Bukov	itz			
														GROUN	ND WTR (ft))
	OFF	SE	т	N	/A				ALIGNME	ΞN	т	N/A		0 HR.	Dry	1
	NOR	T۲	IINC	3	600,57	72		T	EASTING	;	1,4	02,403		24 HR.	FIAD)
					DRILL M	ETHOD	Н.	S. /	Augers				HAMM	R TYPE	Automatic	
	COM	P.	DA	T	E 08/1	5/16			SURFAC	E١	NA	TER DEF	TH N//	٩		
001					SAMP.		L O			ç	SOI	L AND RO	CK DES	RIPTION	J	
	75		100		NO.	ИОІ	G					-				
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								7	776.0		6	GROUN	D SURF		0.	.0
						М		-	Loc	se	to	Dense, Ta Coarse SA	n-Gray-V	/hite-Red	, Silty	
		-	-			м		-		inc	. 10	clay a	and grave		ace	
	+	_	-			М	Ē	_								
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				-		М		7	756.0 Bo	orir	ng T	Ferminated	l at Eleva	tion 756.0	20.) ft In	0
								-		Rc	bād	way Emba	nkment (I	Boulder Fi	ill)	
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WBS 31535-07 TIP N/A COUNTY G/	GASTON	GEOLOGIST C. Bukovitz		WBS 3	31535-07		TI	P N/A COUN	TY GASTO	N		GEOLOGIST C. Bukovitz		
SITE DESCRIPTION NC-16 Pipe Culvert Failure		•	GROUND WTR (ft)	SITE DE	ESCRIPTIC	ON NC-16 Pipe	e Culve	ert Failure					GROUND W	/TR (ft)
BORING NO. DP-1 STATION N/A OFF	FSET N/A	ALIGNMENT N/A	0 HR. N/A	BORING	NO. DF	P-2	SI	TATION N/A	OFFSET	N/A		ALIGNMENT N/A	0 HR.	N/A
COLLAR ELEV. 778.0 ft TOTAL DEPTH 2.0 ft NOF	RTHING 600,750	EASTING 1,402,119	24 HR. N/A	COLLAF	R ELEV.	773.1 ft	т	OTAL DEPTH 3.9 ft	NORTHIN	G 600,599		EASTING 1,402,239	24 HR.	N/A
DRILL RIG/HAMMER EFF./DATE GEO7822 Geoprobe 7822DT 90% 02/05/2016	DRILL METHOD CPT	DPT HAMN	IER TYPE Automatic	DRILL RIC	G/HAMMER	EFF./DATE GEC)7822 G	Geoprobe 7822DT 90% 02/05/2016	-1	DRILL MET	HOD CPT	DPT HAMM	ER TYPE Auto	matic
DRILLER J. Messick START DATE 08/12/16 COM	MP. DATE 08/12/16	SURFACE WATER DEPTH N	//A	DRILLEI	R J. Mes	sick	ST	TART DATE 08/12/16	COMP. D	ATE 08/12/	16	SURFACE WATER DEPTH N/	4	
ELEV DRIVE DEPTH BLOW COUNT BLOWS PER FOOT	SAMP.	SOIL AND ROCK DES				TH BLOW COU	UNT	BLOWS PER FOO	т	SAMP.		SOIL AND ROCK DES		
(ft) ELEV (ft) (ft) 0.5ft 0.5ft 0 25 50 75	100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	(ft)	(ft) (ft	:) 0.5ft 0.5ft	0.5ft	0 25 50	75 100	NO.	NOI G	SOIL AND NOON DES		
780				775										
		778.0 GROUND SURF	ACE 0.0		±			· · · · · · · · · · · · · · · · · ·			10000000	773.1 GROUND SURF	ACE	0.0
	· · · · M	RESIDUAL 776.0 Red-Brown, Fine Sandy	y SILT (A-4). <u>2.0</u>	770	1						M	RESIDUAL Red-brown, Fine Sandy 770.2	SILT (A-4)	2.0
		Boring Terminated at Elev Residual Sandy Sll	ation 776.0 ft In LT (A-4)	770	+					1	м 🔅	769.2 Gray, Silty Fine to Coarse	SAND (A-2-4).	2.9 3.9
		·····,·			1							Boring Terminated at Eleva Residual Silty SAND	tion 769.2 ft In (A-2-4)	
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WBS 31535-07	TIP N/A COUN	FY GASTON	GEOLOGIST C. Bukovitz		WB	IS 3153	35-07		וד	IP N/A	COUNT	Y GASTON			GEOLOGIST C. Bukovitz		
SITE DESCRIPTION NC-16 Pipe C	ulvert Failure			GROUND WTR (ft)	SITI	E DESC	RIPTION	NC-16	Pipe Culve	ert Failure						GROUND W	/TR (ft)
BORING NO. DP-3	STATION N/A	OFFSET N/A	ALIGNMENT N/A	0 HR. N/A	BOF	ring no	0. DP-4		ST	TATION N	/Α	OFFSET	N/A		ALIGNMENT N/A	0 HR.	N/A
COLLAR ELEV. 773.5 ft	TOTAL DEPTH 15.0 ft	NORTHING 600,481	EASTING 1,402,335	24 HR. N/A	COL	LLAR E	LEV. 77	4.5 ft	тс	OTAL DEPT	`H 18.5 ft	NORTHING	600,366		EASTING 1,402,436	24 HR.	N/A
DRILL RIG/HAMMER EFF./DATE GEO782	22 Geoprobe 7822DT 90% 02/05/2016	DRILL METHOD CPT	DPT HAN	MMER TYPE Automatic	DRIL	LL RIG/HA	AMMER EFI	F./DATE	GE07822 G	Geoprobe 7822	2DT 90% 02/05/2016	1	DRILL MET	HOD CP	PT/DPT HAMM	ER TYPE Autor	matic
DRILLER J. Messick	START DATE 08/12/16	COMP. DATE 08/12/16	SURFACE WATER DEPTH	N/A	DRI	ILLER	J. Messic	k	ST	TART DATE	08/12/16	COMP. DA	TE 08/12/	16	SURFACE WATER DEPTH N/	Ą	
ELEV (ft)DRIVE ELEV (ft)DEPTHBLOW COUNT COUNT BLOW COUNT 0.5ft0.5ft0.5ft0.5ft0.5ft			SOIL AND ROCK D	ESCRIPTION DEPTH (ft)	ELE\ (ft)	V DRIVE ELEV (ft)	E / DEPTH (ft)	BLOW 0.5ft 0	COUNT .5ft 0.5ft	0 2	BLOWS PER FOO	T 75 100	SAMP. NO.	L O IOI G	SOIL AND ROCK DES	CRIPTION	
DRILL RIG/HAMMER EFF./DATE GEO78: DRILLER J. Messick ELEV DRIVE DEPTH BLOW COUNT	22 Geoprobe 7822DT 90% 02/05/2016 START DATE 08/12/16 T BLOWS PER FOO	DRILL METHOD CPT COMP. DATE 08/12/16 DT SAMP. 75 100 NO. MOI G M - - - - - - - - - - - - - - - - - - - - - - - M	A DPT HAM SURFACE WATER DEPTH SOIL AND ROCK DE SOIL AND ROCK DE SOIL AND ROCK DE COUND SUI COUND SUI CO	MER TYPE Automatic N/A ESCRIPTION ESCRIPTION FILL SILT (A-4). (A-2-4). 8.8 ANKMENT ELAY (A-7-5). Evation 758.5 ft In	DRIL DRI ELE\ (ft) 775	LL RIG/HA	AMMER EFI J. Messic E DEPTH	F./DATE k BLOW	GE07822 G	Geoprobe 7822	2DT 90% 02/05/2016 08/12/16 BLOWS PER FOO	COMP. DA	DRILL METI TE 08/12/ SAMP. NO.		-774.5 GROUND SURF	A CRIPTION A CRIPTION A CRIPTION A CRIPTION CRIPTION Silty Fine to 2-4) CMENT AY (A-7-5). SAND (A-2-4). tion 756.0 ft In	0.0 0.0 1.0 9.6 16.0 18.5
															- 		
							+								-		

WBS	3153	5-07			ТІ	P N/A		COUNT	Y GASTO	١			GEOLO	GIST C. Bukovitz			WBS	31535	5-07		TI	IP N	I/A	COUNTY	GASTON	1		Ģ	EOLOGIST C. Bukovitz		
SITE	DESC	RIPTION	NC-	16 Pip	e Culve	ert Failure									GROUND V	VTR (ft)	SITE	DESCR	RIPTION	NC-16 Pip	be Culve	ert Fai	ilure					•		GROUND V	VTR (ft)
BOR	ING NC). DP-5			S	TATION N	/A		OFFSET	N/A			ALIGNN	IENT N/A	0 HR.	N/A	BORI	ING NO.	. DP-6		SI	TATIC	ON N/A	(OFFSET	N/A		A	LIGNMENT N/A	0 HR.	N/A
COL	LAR EI	.EV . 77	76.5 ft		т	OTAL DEPI	TH 5.0 ft		NORTHIN	G 600,2	259		EASTIN	G 1,402,549	24 HR.	N/A	COLI		EV. 77	8.2 ft	т	OTAL	DEPTH 5.0 ft	1	NORTHING	G 600,139	9	E	ASTING 1,402,660	24 HR.	N/A
DRILL	. RIG/HA	MMER EF	F./DAT	E GE	07822 G	eoprobe 7822	2DT 90% 02	2/05/2016	•	DRILL	METHOD	CPT /	/ DPT	HAM	MER TYPE Aut	omatic	DRILL	. RIG/HAN	MMER EF	F./DATE GE	EO7822 G	Geopro	be 7822DT 90% 02/0	05/2016		DRILL ME	THOD	CPT/D	PT H.	AMMER TYPE Auto	omatic
		J. Messio					08/12/1	16	COMP. DA	TE 08/	/12/16		SURFAC	CE WATER DEPTH	N/A				. Messic			TART	DATE 08/12/16	6 (COMP. DA	TE 08/12	2/16	s	URFACE WATER DEPTH	N/A	
ELEV	DRIVE	DEPTH (ft)	BLC	w co	UNT			PER FOO				L		SOIL AND ROCK DE	SCRIPTION		ELEV	DRIVE ELEV	DEPTH	BLOW CC 0.5ft 0.5ft	DUNT			PER FOOT		SAMP.		L O	SOIL AND ROCK	DESCRIPTION	
(π)	(ft)	(π)	0.5ft	0.5ft	0.5ft	0 2	25	50	75 100	NO.	ИОІ	GE	ELEV. (ft)			DEPTH (ft)	(π)	(ft)	(π)	0.5ft 0.5ft	t 0.5ft	0	25 5	50 7	5 100	NO.	моі	G			
780		+															780		+									F			
		Ŧ										F.							†			<u> .</u>					1		3.2 GROUND S ROADWAY EM	JRFACE BANKMENT	0.0
775		†	+					· · · ·	• • • • • •				776.5	GROUND SUR ROADWAY EMBA	NKMENT	0.0	775		Ŧ			:		· · · · ·	· · · · ·		M		ROADWAY EM Gray-Brown-Red, Fine	Sandy SILT (A-4)	
		Ŧ								1	м			Gray, Silty Fine SAN	ND (A-2-4).				ŧ								l		3.2		5.0
		Ŧ											771.5			5.0			Ŧ									F	Boring Terminated at I Roadway Embankmer	Elevation 773.2 ft In t Sandy SILT (A-4)	
		Ŧ										F	F	Boring Terminated at Ele Roadway Embankment Si	lty SAND (A-2-4)		-	Ŧ									F	-		
		Ŧ										F							Ŧ									F			
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١	VBS	31535	-07				TIP	N/A			СС	DUNT	ΥG	ASTO	N				0	GEOL	OGIS	ST C	. Bul	kovit	z						WB	IS 3	81535	5-07				٦	ΓΙΡ	N/A				cou	NTY	GA	STON	I				GE	OLC	JGIS	тс	. Buk	ovitz					
;	SITE D	ESCR	IPTION	NC-	16 Pi	pe Cu	lvert I	ailure																		G	ROU	ND W	/TR (ft)	SITI	e de	SCR	IPTIO	N N	IC-16	8 Pipe	e Culv	/ert F	ailure	;																		GROU	ND W	TR (f	ft)
I	BORIN	g no.	DP-7				STA	ION	N/A				OFI	FSET	N/A	۱ <u> </u>			4	ALIGI	NMEN	N TI	I/A			0) HR.		Ν	/A	BOF	RING	NO.	DP-	-8			5	STAT	TION	N/A	۱ <u> </u>				OFFS	SET	N/A				AL	IGN	MEN	ΤN	/A			0 HR.		N/.	/A
(OLLA		EV . 77	72.9 ft			тот	AL DEF	PTH	13.0	ft		NO	RTHI	IG 6	600,5	19		E	EAST	ING	1,402	2,27	7		24	4 HR.		N	/A	COL	LLAF	R ELE	EV.	773.2	2 ft		1	гот/	AL DE	PTH	I 15	.0 ft			NOR	THING	600),397			EA	STIN	١G	1,40	2,378			24 HR.		N/.	/A
I	RILL R	ig/han	IMER EF	F./DAT	E G	E0782	2 Geop	robe 78	22DT	90% 0	2/05/2	016			D	RILL N	ETHO) DC	CPT / E	OPT					HAM	MER	TYPE	Auto	omatic	:	DRIL	ll Rig	g/han	IMER	EFF./D	DATE	GEC)7822	Geop	probe 7	822D	T 90%	6 02/0	5/201	6			DRIL	L ME	THOD	, CP	T/DP	Т				Н	AMME	R TYPE	Auto	matic	
			Messio				STA		TE ()8/12/	16		со	MP. C	ATE	08/	12/16	6	5	SURF		WAT	ER D	DEPT	TH N	J/A					DRI			Mess					STAF	rt da	TE	08/1	2/16			сом	P. DA	TE ()8/12	/16		SU	RFA	CE	WAT	er di	EPTH	I N/A				
E	LEV (ft)	DRIVE	DEPTH (ft)	BLC	-					LOWS		F00 ⁻		1(amp.	/	0				SOIL A	AND	ROC	K DE	SCRI	IPTIO				ELE\ (ft)	V DF E	RIVE LEV	DEP1 (ft)	ТН) о	BLOV	V COL	UNT)		BLOV				' 5	100	SAN			L O			ę	SOIL	AND F	ROCK	DESC	RIPTIO	N		
	RILLI	ER J.		k BLC	ow c		STAI	RT DA	FE (BI 25)8/12/ LOWS	16 3 PER 50 		 75 	MP. [1(ATE	08/ AMP.	12/16			EV. (ft 2.9	t) Fly	SOIL # () yash s () Rec ray-Bri ng Ter	AND GRO AR sampl Coars d, Fin own, rmina	UND TIFIC Ied a se S/	CIAL FINE SUR SUR CIAL F S Gra S G S G S G S G S G S G S G S G S G S G	FACE FACE FILL y, Silt A-2-4	E ty Find +) ENT A-4) O (A-2 1 759.	N [DRI	DFE	RJ.		sick TH	BLOW		UNT			17E 25 	08/1 BLOV	2/16 VS P 50 	ER F0	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	75 	P. DA	TE ()8/12 /IP.	/16 MOI	L O G	-	2 2	۶ Fly	SOIL /	GROU ART Coarse	JND S IFICL ed as e SAN	URFA GURFA GURFA Gray, ; ID (A-:	RIPTIO	N e to	1	0.0
NCDOT BORE DOUBLE 11810 - BORING LOGS.GPJ NC_DOT.GDT 10/13/16																																																														

															_00						
WBS	31535	-07			ТІ	P N	N/A				со	UNT	Y G	ASTO	N				GEOLOGIST C. Bukovitz		
SITE	DESCRI	PTION	NC-1	16 Pipe	e Culve	ert Fa	ailure	е												GROUND WTR	(ft)
BORI	NG NO.	DP-9			S	ΓΑΤ	ION	N/A	<u>۱</u>				OFF	SET	N/A				ALIGNMENT N/A	0 HR. N	N/A
	AR ELE								1 20	0 ft			<u> </u>		G 600,	295			EASTING 1,402,474		N/A
	RIG/HAM											16					00	ОРТ		MMER TYPE Automatic	
												10	00								<u> </u>
	LER J.		1				I DA		08/1					VIP. D	ATE 08		。 / L		SURFACE WATER DEPTH	N/A	
LEV (ft)		DEPTH (ft)	0.5ft	0.5ft	1	0		25	BLOV		50 50	FUUI	75	100		17	′ c		SOIL AND ROCK D		
	(ft)	. ,	0.51	0.51	0.51						<u> </u>			100		<u>/M</u>	OI G	; 	ELEV. (ft)	DEPT	<u>H (f</u>
775		-																\vdash	GROUND SU	REACE	0
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770	-	-				:	: :	-	•••		-	· · ·	:	· · ·					Brown, Silty Fine to Coa with trace or	ganics.	
10	-	-											-					-	Flyash sampled as G Coarse SAND	ay, Silty Fine to	
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765	-	-				-		-			-		-			M		Ł			
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760	-	-						-			-				_			Ŀ	759.3		14.
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	-	-				:		-	· ·		-	· · ·		· · ·				F	RESIDU	AL	
755	-	-									-		+-			M		┣	Gray-Orange, Fine Sa 753.8 A-7-5)		20.
	-	-																F	Boring Terminated at El	evation 753.8 ft In	
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