5987B REFERENCE

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LEGEND (SOIL & ROCK)

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#### STATE OF NORTH CAROLINA

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

## **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY \_ROBESON

PROJECT DESCRIPTION <u>I-95 IMPROVEMENTS FROM</u> US 301 (EXIT 22) IN ROBESON COUNTY TO NC 59 (EXIT 41) IN CUMBERLAND COUNTY SITE DESCRIPTION BRIDGE ON -L- (I-95) OVER LITTLE MARSH SWAMP AT -L- STA. 803 + 15.00

STATE PROJECT REFERENCE NO. 16 I-5987B

#### **CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (1991) 707-6850. 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 BORCHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST 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 SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS INCLORDED TO CLIMATIC CONDITIONS INCLORDED TO CLIMATIC CONDITIONS INCLORDING TO CLIMATIC CONDITIONS INCLORDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

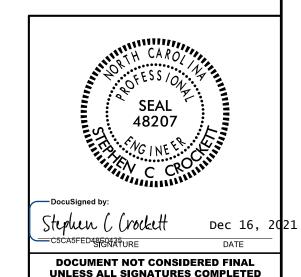
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISTY 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 INFORMATION.

- NOTES:

  1. 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.

  2. 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.

	F&R, INC.
	GOODNIGHT, D.J.
INVESTIGATED	BY F&R /FALCON
	CROCKETT, S.C.
	HAMM, J. R.
SUBMITTED BY	FALCON
DEC	EMRER 2021



PROJECT REFERENCE NO. SHEET NO.

1–5987B

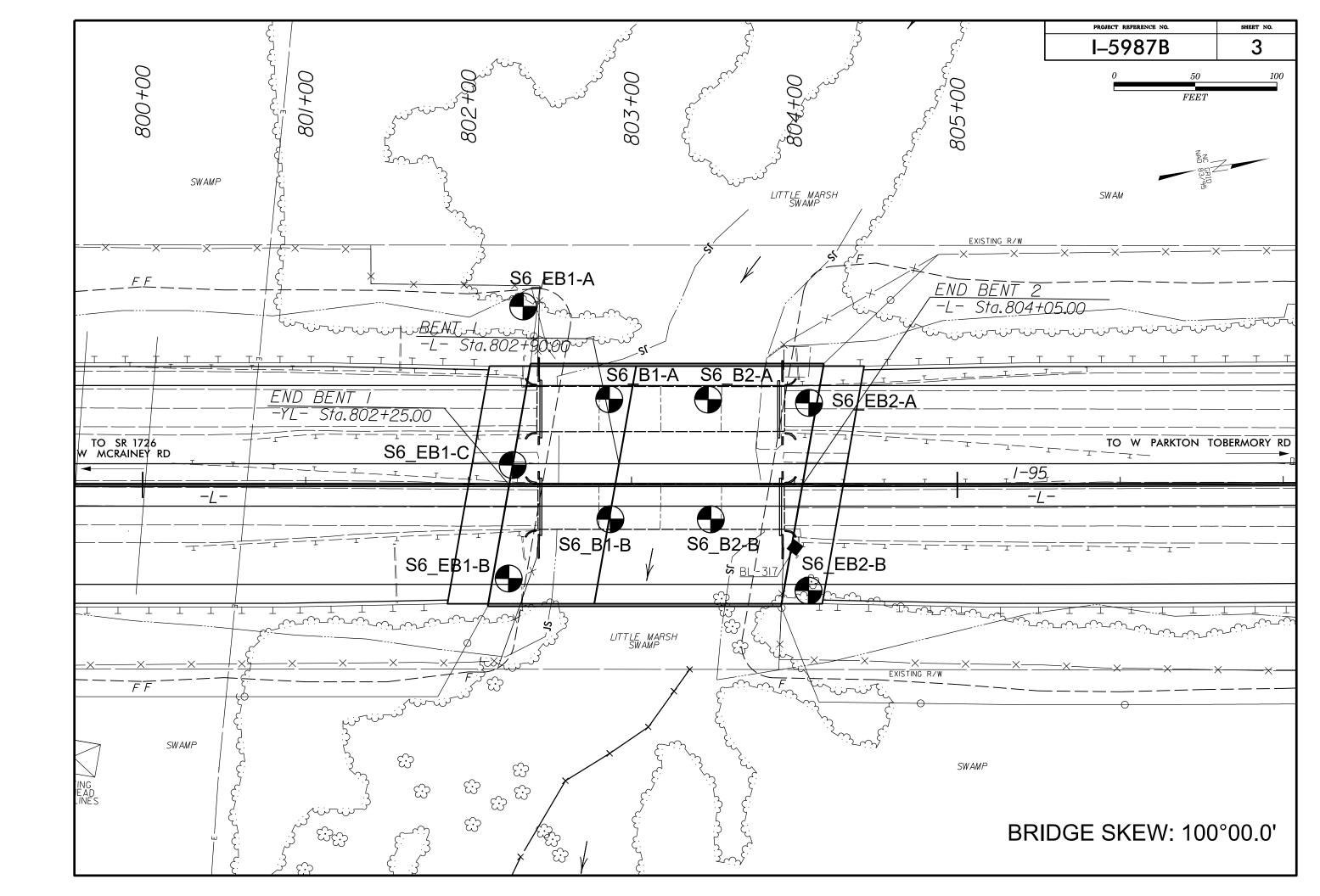
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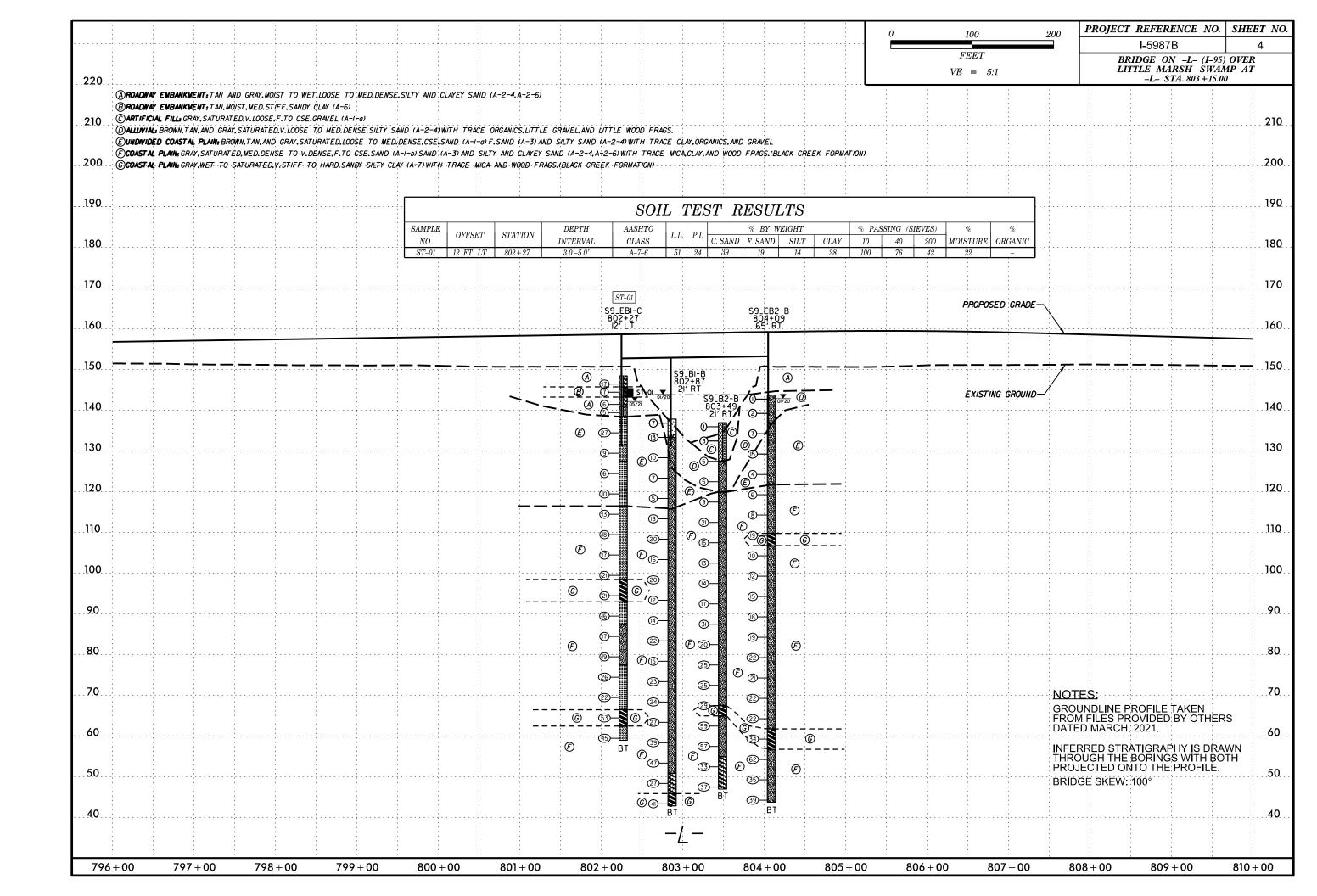
# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

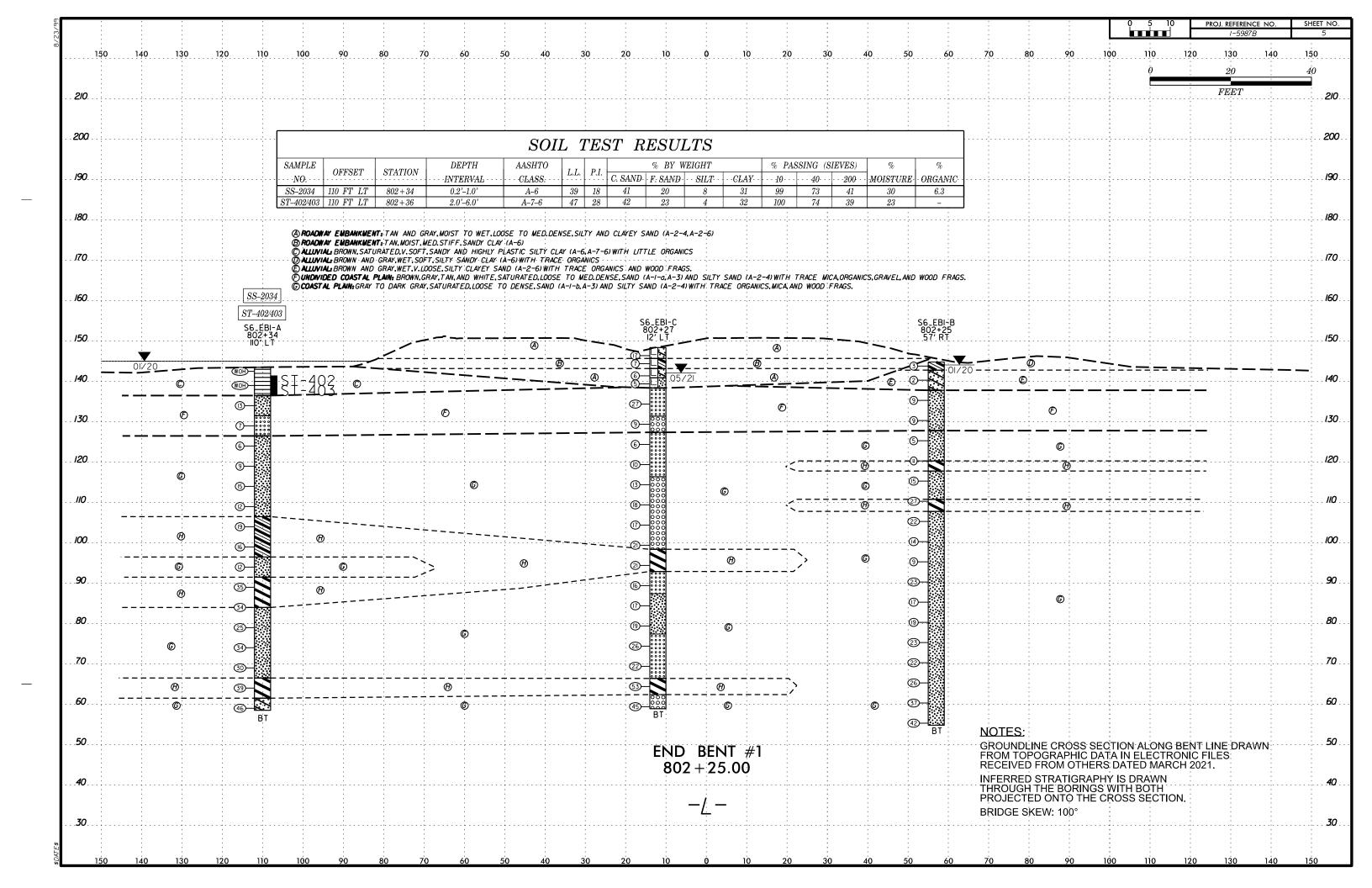
# SUBSURFACE INVESTIGATION

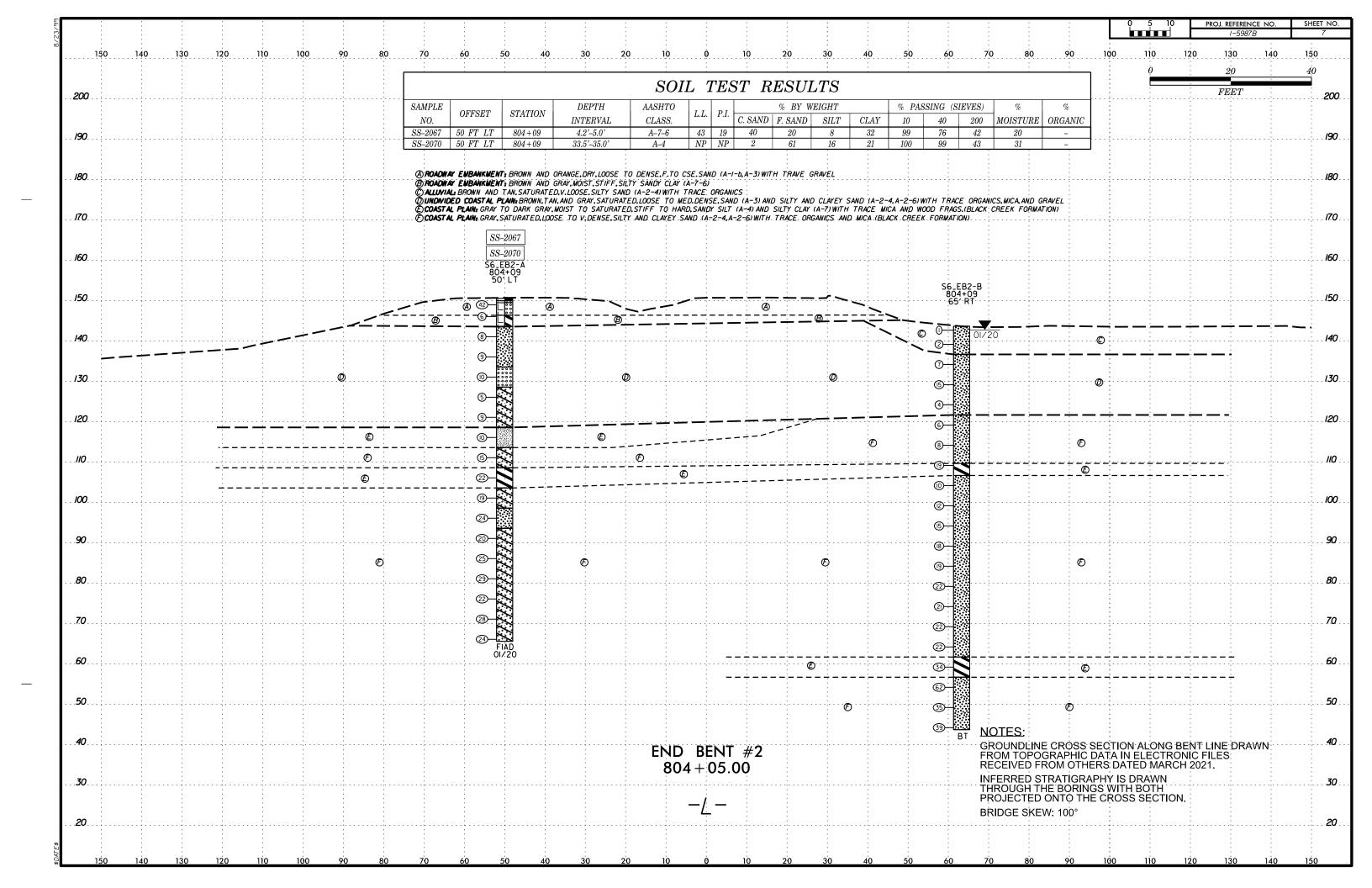
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
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	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	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.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	<u>UNIFORMLY GRADED</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	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
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	UNCLISS, OMBBRU, SURISI, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. A-1-0 A-1-6 A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-7-6 A-3 A-6, A-7	COMPRESSIBILITY	NON-LATSTALLINE SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.  COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	OF SLOPE.
7. PASSING	HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK SPT REFUSAL ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	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.
■10 50 MX GRANULAR SILI- MUCK,	PERCENTAGE OF MATERIAL	CP) SHELL BEDS, ETC. WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
#40 30 MX 50 MX 51 MN SOLS SOLLS SOLUS SOL	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.
MATERIAL	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
PASSING *40 SOILS WITH	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	HORIZONTAL.
LL — — 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN LITTLE OR LITCHEV	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER 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.
CROID INDEX A A A MY A MY 12 MY IS MY NO MY AMOUNTS OF ORGANIC	GROUND WATER	OF A CRYSTALLINE NATURE.  SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
UISIAL TYPES STONE FRACS ORGANIC SUILS	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAVEL, AND SAND GADYS AND SAND SOILS SOILS	▼ STATIC WATER LEVEL AFTER 24 HOURS	CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SANU		MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	<u>FLOAT</u> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
GEN. RATING EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE  AS SUBGRADE  OUT OF THE TO POOR POOR UNSUITABLE	→ PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP	WITH FRESH ROCK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	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	FIELD.
COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED	FT 25.005	(MOD.SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT <sup>2</sup> )	ROADWAY EMBANKMENT (RE)  DIP & DIP DIRECTION  WITH SOIL DESCRIPTION  OF ROCK STRUCTURES	IF TESTED, WOULD YIELD SPT REFUSAL	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
VERY LOOSE < 4	SPT C SLOPE INDICATOR	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	ITS LATERAL EXTENT.
GENERALLY LOOSE 4 TO 10	SOIL SYMBOL SYMBOL TEST BORING INSTALLATION	TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	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
MATERIAL MEDIUM DENSE 10 10 30 N/A	ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF  VERY  ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
(NON-COHESIVE) VERY DENSE > 50	THAN ROADWAY EMBANKMENT THOUGH BURING TEST	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	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
VERY SOFT < 2 < 0.25	──── INFERRED SOIL BOUNDARY ————————————————————————————————————	(V SEV.) REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	OF AN INTERVENING IMPERVIOUS STRATUM.
GENERALLY   SOFT   2 TO 4   0.25 TO 0.5     SILT-CLAY   MEDIUM STIFF   4 TO 8   0.5 TO 1.0	INFERRED ROCK LINE MINITORING WELL TEST BORING	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BFF</u> COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
MATERIAL STIFF 8 TO 15 1 TO 2	A DIEZOMETED	SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS	ROCK QUALITY DESIGNATION (RQD) - 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
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD > 30 > 4	****** ALLUVIAL SOIL BOUNDARY \( \triangle \text{FIEZUMETER} \) SPT N-VALUE	ALSO AN EXAMPLE.	RUN AND EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	UNCLASSIFIED EXCAVATION - TOTAL UNCLASSIFIED EXCAVATION -	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	ROCK.  SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNSUITABLE WASTE  ACCEPTABLE, BUT NOT TO BE	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNCLASSIFIED EXCAVATION - SEED IN THE TOP 3 FEET OF ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	<u>SLICKENSIDE</u> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
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 DETACHED BY MODERATE BLOWS.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE)(SPT) - NUMBER OF BLOWS (N OR BPF) OF
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL
SOIL MOISTURE - CORRELATION OF TERMS	CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOU MOISTURE SCALE FIELD MOISTURE	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_{ m d}$ - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC	POINT OF A GEOLOGIST'S PICK.  SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY
(ATTERBERG LIMITS)  DESCRIPTION  GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u>	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	PIECES CAN BE BROKEN BY FINGER PRESSURE.	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
(SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE SL SILT, SILTY ST - SHELBY 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	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
PLASTIC SEMISOLID; REQUIRES DRYING TO	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRACT - FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	FRAGS FRAGMENTS $w$ - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK: ELEVATIONS TAKEN FROM 15987_LS_TIN3.TIN
(PI) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS  VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	DATED 05/2I
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT  DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: FEET
SL _ SHRINKAGE LIMIT	DRILL UNITS:  ADVANCING TOOLS:  HAMMER TYPE:  X CME-45C  CLAY BITS  X AUTOMATIC  MANUAL	MODERATELY CLOSE	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO		VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	FIAD - FILLED IMMEDIATELY AFTER DRILLING
ATTAIN OPTIMUM MOISTURE	X CME-55 G* CONTINUOUS FLIGHT AUGER CORE SIZE:	THINLY LAMINATED < 0.008 FEET	
PLASTICITY	■ STHULLOW AUGERS   □-B — □-H —	INDURATION	
PLASTICITY INDEX (PI) DRY STRENGTH	L CME-550	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST UNGCARBIDE INSERTS HAND TOOLS:	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MODERATELY PLASTIC 16-25 MEDIUM	X CASING W/ ADVANCER POST HOLE DIGGER	CDAING CAN DE CEDADATES FORM CAMPLE VITA CTEEL SPORE	
HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST X TRICONE 2 15/6 STEEL TEETH HAND AUGER	MODERATELY INDURATED BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TRICONE TUNGCARB. SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;	
		DIFFICULT TO BREAK WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN BED VELLOW-BROWN BLUE-CDAY)	CORE BIT		
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.	CORE BIT VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS,	DATE: 8-15-1-









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WBS	47533	3.1.1			Т	<b>I</b> P	<b>I</b> -5987B		COUNT	Y ROE	BESC	N			GEOLOGIST B. Painter	
SITE	DESCR	IPTION	Bridg	ge on -	L- ( <b>I</b> -9	95) c	over Little N	larsh Sw	amp at -L	- Sta. 8	03+1	5				GROUND WTR (ft
BORI	NG NO.	S6 E	B1-A		s	TAT	TION 802	+34		OFFS	ET	110 ft LT			ALIGNMENT -L-	0 HR. N/A
	AR ELI				_		AL DEPTH					403,42			<b>EASTING</b> 2,010,186	24 HR. N/A
										NOKI	HINC				1	
				E F&F			E-55 73% 03					DRILL M		) Mu	<del>, '</del>	ER TYPE Automatic
DRIL	LER D	. Tignor			S	TAF	RT DATE	01/07/20	)	COMF	P. DA	TE 01/0	7/20	<b>a</b>	SURFACE WATER DEPTH 0.3	ift
ELEV	DRIVE ELEV	DEPTH	BLC	w co	UNT	4		BLOWS F	PER FOOT			SAMP.	lacksquare		SOIL AND ROCK DESC	CRIPTION
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	0 25	5	50 	75 	100	NO.	/моі		ELEV. (ft)	DEPTH (
150																
100	-	‡													<del>-</del>	
		‡														
145		t													_	
	143.5	0.0				Ш							V	<u> </u>	143.5 WATER SURFACE (C	1/07/20)
		‡	WOH	WOH	WOF	¹  <b>∳</b> 0	0					SS-2034	30%		ALLUVIAL BROWN, FINE TO COAF	RSE SANDY
140	140.0	3.5				_  [_		· · · ·		<u> </u>					CLAY (A-6) WITH LITTLE	ORGANICS
		+	WOH	WOH	WOF	'  <b>•</b> ¢	0 · · ·						Sat.		(ORGANIC CONTEN	1-0.3%)
		Ī					χ			: :						
135	135.0	8.5			_	4 L	./			1::	• •				UNDIVIDED COASTA BROWN-TAN, SILTY FINE	
	-	t	3	6	7		13-						Sat.		MICACEOUS	
		Ŧ					. 7			: :						1
130	130.0	13.5	3	_	<u> </u>	41	· / · · ·			<u> </u>	• •			0000	TAN-WHITE, FINE TO CC (A-3) WITH TRACE WOOD	
		ţ	3	4	3		<b>∮</b> 7 · ·						Sat.	0000	( , , , , , , , , , , , , , , , , , , ,	
		+					· i · · ·							0000	126.5	1
125	125.0	18.5	3	3	3	4	1:::			<u> </u>					COASTAL PLA GRAY, CLAYEY SILTY FINE	I <b>N</b> E TO COARSE
		ţ	3	3	"		6						Sat.		SAND (A-2-4), MICACEOUS	WITH TRACE
	-	ļ												-	ORGANICS (BLACK FORMATION	
120	120.0	23.5	4	4	-	4  -	-1			ļ::					· <del>-</del>	
		t	4	4	5		: ♦9 : :			: :			Sat.			
		+					. 1									
115	115.0	28.5	4	6	9	4  -		<del></del>		<u> </u>					<del>-</del>	
		‡	-	"	"		· · •15						Sat.			
	•	ł					:::::::									
110	110.0	33.5	5	6	6	4  -	· · · · · ·			<u> </u>			Sat.		<u>-</u>	
		‡			ľ		· •12 ·			: :			Sal.			
		t					:: j:								DARK GRAY, SILTY FINE	TO COARSE — 3
105	105.0_	38.5	4	8	11	┨┝				ļ			Sat.		<ul> <li>SANDY CLAY (A-6), MICAC</li> </ul>	EOUS (BLACK
		Ī					7.		: : : :	: :			Oat.		CREEK FORMAT	ION)
400		‡														
100	100.0	43.5	5	6	10	┨┝							Sat.		_	
		Į					7 .			: :			Out.			
0.5		İ					: : <i>[</i>			: :					96.5 DARK GRAY, SILTY FINE	TO COARSE 4
95	95.0	48.5	4	6	6	┨┝	· •12 ·			+ : :			Sat.		<ul> <li>SAND (A-2-4), MICACEO</li> </ul>	US (BLACK
		ł													CREEK FORMAT	•
90		Ī					:::: <b>`</b> \			: :					91.5 DARK GRAY, FINE TO CO	ARSE SANDY 53
30	90.0	53.5	8	15	20	1 🗆		- 35 -		+ : :			Sat.		SILTY CLAY (A-7), MICACE CREEK FORMAT	
		+						. [							CILLET ORWAT	(ON)
85	85.0 _	58.5						. ;	: : : :	: :						
55	OD.U	38.5	8	16	18	11		- •34 -		1			Sat.		84.0	59
	-	ŧ						<i>f</i> ::::							GRAY, SILTY FINE TO CO (A-2-4), MICACEOUS W	TH TRACE
80	80.0	63.5						<i>I</i>	: : : :						ORGANICS (BLACK FORMATION	CREEK
55	. 00.0	- 55.5	7	12	13	1		25 · · ·		1 : :			Sat.		_ FURIVIATION	•
		t					::::[			: :						
75	75.0	[   68.5						`\								
. ,	13.0 _	- 00.5	14	16	18	1		- 34 -		: :			Sat.		<del>-</del>	
		‡						.¦ .		: :	: :					
70	70.0	[ 														
10	70.0	L /3.5	L		1	$\perp$		1	<del> </del>					l°. • • • • • •		

#### GEOTECHNICAL BORING REPORT BORE LOG

								ORE L	<u> </u>				
WBS	47533	.1.1			TI	<b>P</b> I-5987B	COUNT	Y ROBESO	N			GEOLOGIST B. Painter	
SITE	DESCRI	IPTION	Brid	ge on -	L- ( <b>I</b> -95	5) over Little	Marsh Swamp at -	L- Sta. 803+1	5				GROUND WTR (ft)
BOR	NG NO.	S6_E	B1-A		S	TATION 8	02+34	OFFSET	110 ft LT	-		ALIGNMENT -L-	<b>0 HR.</b> N/A
COLL	AR ELE	<b>EV.</b> 14	13.5 ft		т	OTAL DEPT	<b>FH</b> 85.0 ft	NORTHING	403,42	24		<b>EASTING</b> 2,010,186	<b>24 HR.</b> N/A
DRILL	RIG/HAM	IMER EF	F./DAT	E F&F		ME-55 73%	03/01/2019		DRILL N	IETHOI	<b>D</b> Muc	l Rotary HAMM	ER TYPE Automatic
	LER D.						E 01/07/20	COMP. DA				SURFACE WATER DEPTH 0.3	
ELEV		DEPTH		ow co			BLOWS PER FOO		SAMP.		1-1	1	
(ft)	ELEV (ft)	(ft)	0.5ft			0 :	25 50	75 100	NO.	MOI	O I G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION DEPTH (ft)
70			_ <sub>10</sub> .	15	<u> 15</u> -		Match Line				ļ.,.,		
	1	<u> </u>	10	15	15		30			Sat.			
	\ <u> </u>					: : : :	:\; : :   : : :	.				_66.5 DARK GRAY, FINE TO CO	ADSE SANDY 77.9
65	65.0 J	78.5	10	17	22		39			l w		SILTY CLAY (A-7), MICACE	EOUS (BLACK
	•	-					39	.				CRÈEK FORMAT	,
60	60.0	83.5					: : : \;   : : : :	.				DARK GRAY, SILTY CLAY	
		- 05.5	9	19	27		646			Sat.	N-	COARSE SAND (A-2-6), I 58.5 (BLACK CREEK FOR	
	-	‡										Boring Terminated at Eleva	ation 58.5 ft IN
	-	<u> </u>										CLAYEY SAND (COAST (BLACK CREEK FOR	
	-	<u> </u>									1	Notes:	
	-	t									1 -	1. Shelby Tubes pushed in 802+26, 93' Lt; ST-402: 2.0	Offset Boring '-4.0', ST-403:
	-	ł									F	4.0'-6.0', Both Lab	
	=	F									1 F	Other Samples:	
	-	ļ									F	ST-402 (2.0 - 4.0) ST-403 (4.0 - 6.0)	
	-	<u> </u>									-	-	
	-	<u> </u>									<u> </u>		
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										В	<u>UR</u>		<u>.OG</u>							
WBS	47533	3.1.1			TI	<b>IP I</b> -598	7B		С	OUNT	Y RO	BESC	N			GEOLOGI	ST W. Pesl			
SITE	DESCR	IPTION	Brid	ge on -l	( <b>I</b> -9:	5) over Li	ttle N	/larsh S	Swam	np at -L	- Sta.	803+1	5						GROUN	D WTR (ft
BOR	NG NO.	S6_E	B1-B		S	TATION	802	+25			OFFS	SET	57 ft RT			ALIGNME	NT -L-		0 HR.	N/A
COLI	AR ELI	<b>EV</b> . 14	14.8 ft		T	OTAL DE	PTH	90.0	ft		NOR.	THING	403,3	91		EASTING	2,010,350		24 HR.	0.7
DRILL	RIG/HAN	IMER EF	F./DAT	E F&R	2175 (	CME-55 84	% 03	3/01/2019	9				DRILL I	METHO	D Mu	ıd Rotary		HAMN	IER TYPE	Automatic
DRIL	L <b>ER</b> S	. Davis			S	TART DA	ΤE	01/08/	20		сом	P. DA	<b>TE</b> 01/	08/20		SURFACE	WATER DE	PTH N	/A	
ELEV	DRIVE ELEV	DEPTH	BLC	ow cou	JNT			BLOWS	S PEF	R F001	Ī		SAMP				SOIL AND RO	OCK DES	CRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25		50		75 	100	NO.	МО	1 1	ELEV. (ft)	OOIL AND IN	JON DEC	ONI TION	DEPTH
145	4440															144.8		ND SURF	ACE	(
	144.8	0.0	2	1	2	3	-		-   :							- <u>- 142.8</u> <u> </u>	<b>A</b> DWN-GRAY, S	LUVIAL SILTY FIN	IE TO COA	RSE
	141.3	3.5	1	1 1	1		:		-   :	 				l		- I	SANDY CLAY		TH TRACE	
140	-	†	'	'	'	\\ \\	-		+		<del> </del>			W			OWN-GRAY,	SILTY CL	AYEY FINE	
		<u> </u>				/ · ·	:		:   :								OARSE SAND RGANICS AND	<u>doow</u>	FRAGMEN	
135	136.3	8.5	3	4	5		-		-   -					Sat		- GR/	UNDIVIDED AY-BROWN, S			RSE
	-	Ŧ					-		-   -							_ SA	ND (A-2-4) WI ANI	TH TRAC		ICS
	131.3	13.5					-		.   .							-	,		. <del>-</del>	
130	_	Ŧ	4	4	5	9_	-		-					Sat.		- -				
		‡				:¦: :	:		.   :		: :					127.8			— — -	1
125	126.3	18.5	3	2	3	<u>  j</u>	:							Sat.			ARK GRAY, C		ILTY FINE	
120	-	‡				1 .1	-		-		T : :			Joan			OARSE SAND /IICA (BLACK (			
	121.3	23.5				:/: :	:		-   :	· · · ·		: :				- -				
120			3	5	6	11	:					• •		Sat. W		- 120.3	RK GRAY, FIN	IE TO CC	ADSE SAN	24
		‡				::\:	:		:   :	 				**			LTY CLAY (A-	7) WITH	TRACE MI	
	116.3	28.5	5	7	8	/-	:		-   :	 				1		_ \ _ GF	BLACK CR) RAY, SILTY FI			
115	_	ŧ		'	O	<del>  •</del>	15		$\pm$		+			Sat		( <i>P</i> -	4-2-4) (BLACK	CREEK I	FORMATIO	N)
		ł				:::	7		.   :							-				
110	111.3	33.5	9	10	17		- \	27	-   -					Sat.		_ 110.8	RK GRAY, FIN	IF TO CO	ARSE SAN	NDY 34
	-	Ŧ					- [		-   -					W		- SI	ILTY CLAY (A- AND WOOD F	7) WITH	TRACE MI	CA
	106.3	T 38.5					-		.   .							- \	CREEK	FORMA	TION)	j
105	-	Ŧ	7	10	12		22				ļ: ·			Sat.		_ (A-	RAY, SILTY FI -2-4) WITH TR	ACE MIC	A, CLAY, A	ND
		Ŧ					<i>[.</i>		-   -							- W	OOD FRAGM FOI	ENTS (BI RMATION	LACK CRE √)	EK
100	101.3	43.5	7	7	7				] :					Sat.		-				
	-	Ŧ				<del>  · · ·   ·</del>	-		-							-				
	96.3	48.5				: ;:	-		-   :							<del>-</del> -				
95		‡	2	4	5	9	-				<u> </u>			Sat.		- -				
	•	‡				: :/.	:		-   :	· · · ·		: :				- -				
90	91.3	53.5	8	10	13		//		-   :		: :			Sat.		- -				
90	-	‡					- <b>9</b> 23				<del> </del>			Jai.		- -				
	86.3	+ - 58.5				::::	į 📗		:   :	· · · ·						- -				
85	- UU.U	+ 70.5	6	7	10		17		-   -		<u>  : :</u>			Sat.		- 				
		‡					-		:   :	 						- -				
00	81.3	63.5	9	10	9	:::	ÿ		:   :					0-1		- -				
80	-	‡		'0	9		<b>●</b> 19 <u> </u>		+		: :			Sat.		<u>-</u>				
	70.0	†				: : :	1		:   :							- -				
75	76.3	68.5	9	10	13		.\  23	 3						Sat.		- 				
	-	ł					:[[									-				
	71.3	T 73.5			40		- <u>i</u>		-   :							_				
70	-	Ŧ	10	9	13		<b>+</b> 22				+			Sat.		- 				
		Ŧ					: \		.   :							-				
65	66.3	78.5	7	12	14	:::			]   :					Sat.		- -				
UU			i	i				/D	- 1		1		1	ı oat.	1.00					

# GEOTECHNICAL BORING REPORT BORE LOG

								B	ORE L	.(	JG								
WBS	47533	3.1.1			TI	ΊP	I-5987B	COUNT	Y ROBESC	N	l			GEOLOG	IST W. Pesl				
SITE	DESCR	IPTION	Bridg	ge on -l	L- ( <b>I</b> -9	5)	over Little Marsh Sw	amp at -L	<sub>-</sub> - Sta. 803+1	5							GROUN	ID WT	R (ft)
BOR	ING NO.	S6_E	B1-B		S <sup>-</sup>	TA	ATION 802+25		OFFSET	57	7 ft RT			ALIGNME	ENT -L-		0 HR.		N/A
COL	LAR ELI	E <b>V</b> . 14	4.8 ft		T	ОТ	TAL DEPTH 90.0 ft		NORTHING	;	403,39	)1		EASTING	2,010,350		24 HR.		0.7
DRILI	L RIG/HAN	MER EF	F./DATE	F&R	2175 (	CME	E-55 84% 03/01/2019				DRILL M	ETHOD	) Muc	Rotary		HAMM	ER TYPE	Autom	atic
DRIL	LER S	. Davis	1			TA	ART DATE 01/08/20		COMP. DA	_		8/20		SURFACE	E WATER DE	PTH N/	Α		
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	W COL	JNT 0.5ft		BLOWS F	PER FOOT	Г 75 100	ш	SAMP NO	MOI	O G	ELEV. (ft)	SOIL AND R	OCK DES	CRIPTION		:PTH (ft)
65	<del> </del>						Matcl	Line	.				-		RAY, SILTY FI -2-4) WITH TF	NE TO CO	DARSE SA	ND	
60	61.3	83.5	15	16	21		37					Sat.		- -	VOOD FRAGN	IENTS (BL ION) <i>(con</i>	ACK CRE	EK	
55	56.3	88.5	13	19	23							Sat.		<u>. 54.8</u>	oring Terminat	ed at Eleva	ation 54.8	ft IN	90.0
														SII	LTY SAND (CO	DASTAL P FORMAT	LAIN) (BL	ACK	

					- 1			-		ORE								
	47533					IP I-5987				Y ROBI				GEOLO	OGIST Goodnig	ght, D.	1	
				ge on -		5) over Litt			amp at -l	1							GROUND	WTR (fi
BORIN	NG NO.	S6_E	B1-C		_	TATION				OFFSE					MENT -L-		0 HR.	8.
COLL	AR ELE	<b>EV</b> . 14	18.4 ft		T	OTAL DEF	TH 8	9.5 ft		NORTH	IING	403,40	)3	EASTIN	<b>IG</b> 2,010,281		24 HR.	6.
DRILL	RIG/HAN	IMER EF	F./DAT	E MID	3964 C	ME-45C 91%	6 02/21/2	2019				DRILL M	ETHOD	Mud Rotary		HAMN	MERTYPE AU	utomatic
	ER P	owell, E	3.		S	TART DAT	<b>E</b> 05	/17/21	1	COMP.	DA	<b>TE</b> 05/1	17/21	SURFA	CE WATER DE	PTH N	/A	
	DRIVE ELEV	DEPTH	BLC	OW CO	UNT	]			PER FOO			SAMP.			SOIL AND R	OCK DES	SCRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	5	50 	75 	100	NO.	MOI G					DEPTH
150	_	_												_				
	- 147.4	10									-			- 148.4	ROADWA	Y FMRAN	IKMENT	(
	145.4	t	7	11	6	الخززز ال	i7 : :			.	-		м	145.7	TAN, CLA	YEY SAN	D (A-2-6)	2
145	145.4	3.0	2	3	4	.•7	+			<del></del>	_		м		TAN, SA	NDY CLA	Y (A-6)	
	142.4	6.0	2	3	3	;::::								143.2	TAN AND GRAY	, CLAYE	Y SAND (A-2-6	6)
140	140.4	8.0	4	3		6	.						W	140.9	ΓAN-GRAY, CLA`	YEY SILT	Y SAND (A-2-	·5)
	-	F	4	3	2	<b>Q</b> 5					-		W	138.4				10
		F									:		000		<b>Undivide</b> Light Gra			
135	135.4	13.0	10	13	14		27						Sat.					
	-	ļ									-		000					
130	130.4	18.0				] ::;/:				.	:		00	131.4	TAN, COARSE	SAND (	A-1-a) WITH	1
130	-	-	4	4	5	. 🙌 .	.				-		Sat.	)  -  -		E PEBBÌ		
	-	‡				:j: : :	.				:		00	127.4	COA	STAL PL	AIN	2
125	125.4	23.0	2	3	3					<u> </u>	-		Sat.	(	GRAY, SLIGHTLY (BLACK CR	SILTY F	INE SAND (A-	-3)
	-	_	-			<b>  9</b> 6	.			·   · · · ·	:		Sal.	_	(BLACK CIV	LLICIOI	WATION)	
	400.4					:j: : :	:   : :			·   · · · · ·   · · ·	-		000					
120	120.4	28.0	3	4	6	●10	+			<del>                                     </del>	-		Sat.	00				
	-	F				:i:	.			.			000					
115	115.4	33.0				]   : : ; : :	.   : :			.	-		00	30- 10-	GRAY, SLIGH			3
	-	F	4	6	′	•13					-		Sat.	00-	COARSE S	AND (A-1 LENSES	I-b) WITH S OF CLAYEY	,
		ļ				$   \vdots : i $				.			000	00-		SAND		
110	110.4	38.0	6	9	9	/	10			·   · · · ·			Sat.	-  -  -				
	-	‡				: : : <b>Ț</b>				.	-		0000	-   -   -				
105	- 105.4 <sup>-</sup>	43.0				[]:::;;	.			·   · · · ·	:		0000	00-				
105	-	- 75.0	6	8	9	<del> </del>	7				-		Sat.	0-				
	-	<u> </u>				i:::	.			.	-		000	0-				
100	100.4	48.0	6	9	12	\					•		000	00-				
	-	<u> </u>			'-	[] : : : !	P21			.	:		Sat.	98.4	DARK GRAY, FII	VE CAND	V QII TV CI A	5
	05.1					: : :	i   : :			.					(A-7) WITH INTE	RMITTE	NT LENSES C	
95	95.4	53.0	6	11	10	1	<u>I                                    </u>			+	_		м	<b>\</b>	COARSE SAN	ID AND T	KACE MICA	
	-	É				: : : <i>!</i>							000	92.9	GRAY	, SAND (	A-3)	5
90	90.4	58.0				]]::::/:							000		Sivil	, = +D (	•,	
	-	F	5	8	8	•1	6				-		Sat.	-				
	-	Ŧ				::::				.	:		0 0 0	87.4 •••	GRAY, SILTY	' FINE SA	AND (A-2-4)	6
85	85.4	63.0	5	8	9	• • • •	7	• • •		<u> </u>	•		Sat	<u>::</u> _			. ,	
	-	‡				:::	' ::			.				<b>∷</b> -				
90	80.4	68.0				::::	:   : :			.	:			<u>:-</u>				
80		- 55.0	6	9	10	<del>   </del>	19						Sat.	<u></u>				
	-	ţ				[] : : : }	\  : :			.	:		000	77.4	CDAV CLICIT	IV 0" T	V CAND /A O	7
75	75.4	73.0	0	144	15	<u>                                   </u>			<u> </u>		.		000	0 0	GRAY, SLIGHT	LT. OILI	1 JAND (A-3)	
	-	<u> </u>	8	11	15		26	-			•		Sat.					
	-	F					: :			.	:		000					
70	70.4	78.0	1				:/  · ·			.	-	1	000					

#### GEOTECHNICAL BORING REPORT BORE LOG

WBS	47533	3.1.1			TI	P I-6	5987B	,			ROBESC					GEOLOGIST Goodnight, D.	
			Brido	ge on -	L- (I-9	5) ove	r Little	Marsh S	Swamp at -	-L- St	a. 803+	15				<u> </u>	GROUND WTR (ft)
BOR	ING NO.	S6_E	B1-C		s	ΓΑΤΙΟ	<b>ON</b> 80	02+27		OF	FSET	12 ft	LT			ALIGNMENT -L-	<b>0 HR</b> . 8.7
COL	LAR ELI	E <b>V</b> . 14	8.4 ft		TO	OTAL	DEPT	<b>FH</b> 89.5	ft	NC	ORTHING	<b>3</b> 40	3,40	03		<b>EASTING</b> 2,010,281	<b>24 HR.</b> 6.3
DRILI	L RIG/HAN	MER EF	F./DAT	E MID	3964 CI	ME-45	C 91% (	02/21/2019		-		DRI	LL M	ETHO	) Mı	ud Rotary HAMME	R TYPE Automatic
DRIL	LER P	owell, B			S	ΓART	DATE	E 05/17/2	21	CC	OMP. DA	TE	05/	17/21		SURFACE WATER DEPTH N/A	4
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)		0.5ft		0	2	BLOWS	S PER FOC	75	100		MP.	MOI	L O G	SOIL AND ROCK DESC	CRIPTION DEPTH (ft)
70	65.4	83.0	8	10	- <sub>12</sub> -		· · ·	Mat	tch Line			-	. <b>–</b> .	-Sat	000000000000000000000000000000000000000	GRAY, SLIGHTLY. SILTY (continued) 66.4 GRAY, SANDY SILTY CLA	82.0
65	- 0.5.4	83.0	10	23	30				• 53 • • • •	· ·				W	000	INTERMITTENT LENSES SAND AND A LITTLE 62.4 GRAY, SLIGHTLY SILT	OF COARSE E MICA 86.0
60	60.4	88.0	15	20	25	ŀ÷			45	4				Sat.	0000	COARSE SAND (A	·
NOUCH BURE SINGLE BUO_13390_GEO_BURELUGS_BRUG_LGGS 13.GF3 NC_DOIGDT 12.10/21									<b>2</b> 45					- Gat.		Boring Terminated at Eleva SAND (COASTAL PLAIN) (E FORMATION)  Other Samples: ST-01 (3.0 - 5.0)	BLACK CREEK

											В	UR		<u>OG</u>							
WBS	47533	3.1.1			Т	IP  -	-5987I	3		C	TNUC	Y RO	BESO	N			GEOLOGI	IST W. Pesl			
SITE	DESCR	IPTION	Brid	ge on -	L- ( <b>I</b> -9	5) ov	er Littl	е Ма	arsh S	wam	p at -L	- Sta. 8	303+1	5			_			GROU	ND WTR (
BORI	NG NO.	S6_E	31-A		s	TATI	ON 8	302+	86			OFFS	ET :	53 ft LT			ALIGNME	NT -L-		0 HR.	N
COLI	AR ELI	<b>EV</b> . 13	39.2 ft		Т	OTA	L DEP	тн	90.0	ft		NORT	THING	403,4	168		EASTING	2,010,250		24 HR.	FIA
DRILL	RIG/HAN	MER EF	F./DAT	E F&F	R2175 (	CME-5	55 84%	03/0	)1/2019	)				DRILL	METHO	D M	ud Rotary		HAM	MER TYPE	Automatic
DRIL	LER S	. Davis			s	TAR	T DAT	Έ	01/15/2	20		сом	P. DA	TE 01	/16/20		SURFACE	WATER DE	PTH 4	.5ft	
ELEV	DRIVE	DEPTH	BLC	ow co	UNT			В	LOWS	PER	1 FOO	-		SAMF		<u> </u>		COIL AND D	OCK DE	ecpiptio!	NI.
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0		25		50		75 	100	NO.		O )  G	ELEV. (ft)	SOIL AND RO WATER SU			N DEPTH
																<b> </b> -	. – – –				
140	_																- 100 0	CDOU	ND CLID	E40E	
	139.2	0.0	WOR	WOR	WOR	0.	<del></del>	Т:	<del></del>	Π:					Sat		139.2	Α	ND SUR LLUVIAL		
	135.7 ·	3.5						-		.   .							137 <u>.2</u> ¬ BR	OWN-GRAY, : COARSI			IE TO
135	135.7	<del>- 3.5</del>	4	6	5	1 H	<b>♦</b> 11	+:		4		+::			Sat.			RAY-TAN, SIL WITH TRACE	TY FINE	SAND (A-	
		Ŧ					)::	:		.   .							- '	WIIII IIVACL	WOOD	INAGIVILIN	13
130	130.7	8.5	5	5	6	:	1	:	: : :	.   .	: : :		::		1		-				
	-	‡	3	3	0		<b>1</b> 11	:		.   .					Sat		-				
		‡				:	ļ::	:		:   :			: :				127.2	- UNDIVIDED	COAST	ΔΙ ΡΙΔΙΝ	1
125	125.7 ·	13.5	3	3	5	tli,	I ▲8	ֈ։		<u> </u>		ļ · ·			Sat.		- GI	RAY, SILTY FI (A-2-4) WI	NE TO C	COARSE S	AND
		‡				;	<b>7</b>	:		:   :							- <u>122.2</u>	(A-2-4) VVI	IIII IIVA	CE MICA	
100	120.7 ·	18.5				]		:		:   :							= 122.2 — GR	AY, SILTY CL			ARSE
120	-	‡	1	1	2	3	· · · ·	+:		+:					Sat.	//	<del>-</del>	SAND (A-2-6)	WIIHI	RACE MIC	-A
		‡				'		:		:   :							117.2	5755			
115	115.7	23.5	3	3	4	1 1		<u>.</u>		<u>.</u>		<u> </u>			Sat.		_ 	RAY, SILTY FI (A-2-4) W			AND
		İ				•	·	:		·   :			::		Oat						
	110.7 ·	28.5				:	. `\.	:		:   :		: :	: :				<u> 112.2</u>		STAL PL		
110	- 110.7	20.5	7	10	14	11		24		+		-			Sat.			ARK GRAY, SI AND (A-2-4) W			
		+				.		-		.   .								CLAY (BLACK	CREEK	FORMATIC	ON)
105	105.7	33.5	7	10	13			:		.   :	: : :	: :	::				=				
	-	Ŧ	′	'0	'	-		•23 		.   .					Sat.		-				
		Ī						:		.   :							-				
100	100.7	+ 38.5 +	7	11	14	┧┟╴	· · ·	•25		<u> </u>		<u> </u>			Sat		_				
		‡								:   :							- - 97.2				
95	95.7	43.5			14	] :		:		:   :							D/	ARK GRAY, FII 7) WITH TRAC			CLAY
00	-	‡	6	9	14			23		.   .		1			М		- '`\	MICA (BLACK	CREEK	FORMATIC	ON)
		‡						i :		:   :			::				<del>-</del> -				
90	90.7	48.5	6	8	12	łĿ	• • •	120 <del>-</del>		<u>:   :</u>	- : :	<u> </u>			Sat.		- 89.7				
		‡				:	:: <u>]</u>	Ĭ:		:   : :   :								RAY, SILTY FII ACE CLAY AN			
0.5	85.7 ·	- - 53.5				] :	!	:		:   :							F\	FOI ARK GRAY, FII	RMATIO		
85	-	‡	6	8	13	<u>                                     </u>		521 <del>-</del>	<del></del>	+:	<del></del>				W		(A-	7) WITH TRAC	CE COA	RSE SAND	AND
		‡				:		:		:   :							82.2	MICA (BLACK			•
80	80.7	58.5	8	10	11	łĿ		<u>.</u>				<u> </u>			Sat.		(A	RAY, SILTY FI A-2-4) WITH TI	RACE C	LAY, GRA\	/EL,
		ŧ				:		21		·   ·					Oat.		L ANI	D MICA (BLAC	K CREE	K FORMA	TION)
	75.7 ·	63.5				:	:: ;	:		·   :							_				
75	- 1.0.1	1 33.5	7	9	11	1⊢	<del>-  </del>	20		+		+			Sat		_				
		ł				$\ \cdot\ $		-		:   :			:				E				
70	70.7	68.5	9	10	11	<b>  </b>   :	1	:		.   :		: :			.		_				
	-	Ŧ		'	''	-		21		.   .		1			Sat.		-				
		Ī =				:		1		:   :							-				
65	65.7 -	73.5	8	14	14	1⊨		1		4:		1:-			Sat		<del>-</del>				
		‡				[]:		-	`\.								<del>-</del> -				
60	60.7	78.5				] :		:		`   ` :	 		::				- -				
60		1	1	1	1	1.1		- 1		- 1	<b>\</b>	1	- 1	1	1	F					

#### GEOTECHNICAL BORING REPORT BORE LOG

WBS	47533	.1.1			TI	P I	-5987	7B						BESO	N N			GEOLOGIST W. Pesl		
SITE	DESCR	IPTION	Bridg	ge on -	L- ( <b>I-</b> 9	5) ov	er Lit	tle N	Marsh	Swa	amp a	t -L-	Sta. 8	303+1	5				GROUI	ND WTR (ft)
BOR	NG NO.	S6_B	1-A		S <sup>-</sup>	ΤΑΤΙ	ON	802	2+86			-			53 ft LT			ALIGNMENT -L-	0 HR.	N/A
COL	LAR ELE	<b>EV</b> . 13	9.2 ft		T	ATC	L DE	PTH	<b>I</b> 90.	O ft			NOR	ΓHING	403,4	68		<b>EASTING</b> 2,010,250	24 HR.	FIAD
_	. RIG/HAM		F./DATI	E F&F													D Mu	ud Rotary HAMME	R TYPE	Automatic
DRIL	LER S.	Davis				TAR	T DA		01/1				СОМ	P. DA	<b>TE</b> 01/		<del>/                                    </del>	SURFACE WATER DEPTH 4.5	ift	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)		0.5ft		0		25	BLOV	VS PI 50			75 L	100	SAMP NO.	MOI	0 I G	SOIL AND ROCK DESC	CRIPTION	N DEPTH (f
60			 	31	<u>-39</u> -				N	latch	Line	7	·0 <del>·</del>		<u> </u>	Sat.				MD
55	55.7 -	- - - 83.5 -	14	25	42			-				• [ • ] • ] • 67				Sat.		GRAY, SILTY FINE TO CC (A-2-4) WITH TRACE CLA AND MICA (BLACK CREEK (continued)	Y. GRAV	EL.
_ 50	50.7	- - 88.5 -	16	26	36					-	: : : : /	62 <u>-</u>				W		52.2 LIGHT GRAY, FINE SANDY (A-7) WITH TRACE MICA (E 49.2 FORMATION	BLACK CI	REEK 90.
NCDO I BORE SINGLE BUG ISSBY_GEO_BORELOGS_BRDG_L80315.GPJ NC_DO1.GD1 12/10/21																		Boring Terminated at Eleva SILTY CLAY (COASTAL PI CREEK FORMAT	.AIN) (BL	ACK

BORING NO. S6_B1-B         STATION 802+87         OFFSET 21 ft RT         ALIGNMENT -L-         0 H           COLLAR ELEV. 137.8 ft         TOTAL DEPTH 95.0 ft         NORTHING 403,458         EASTING 2,010,323         24 H	
BORING NO. S6_B1-B	
COLLAR ELEV.   137.8 ft   TOTAL DEPTH   95.0 ft   NORTHING   403.458   EASTING   2,010,323   24 H	OUND WTR (f
DRILL RIGHAMMER EFF_JDATE	HR. N/
DRILLER S. Davis   START DATE   01/21/20   COMP. DATE   01/22/20   SURFACE WATER DEPTH   4.6ft	<b>HR.</b> FIA
ELEV	YPE Automatic
140	
140	TION
137.8 0.0 2 3 4 7	DEPTH
137.8	<u>/20)</u>
135	
134   134   34   35   7   6   7   134	
134.3   3.5   7   6   7   13   13   3   WOOD   TAN-BROWN, SLTY FINE TO COARSE (A.2-4) WITH TRACE CLY AND FRAGMEN   TRACE WOOD FRAGMEN	
130	MENTS
120	
125	AVEL AND NTS
124.3	
124	1:
120	AIN
110	D WOOD
119.3 18.5 2 2 3 3	
115   114.3   23.5   6   8   10   10   109.3   28.5   6   8   12   105   104.3   33.5   6   7   9   16   100	
115	_
110	
110	SE SAND LE CLAY,
109.3 28.5 6 8 12 20 Sat.  105 104.3 33.5 6 7 9 11	ND MICA ON)
105	,
100 99.3 38.5 5 9 11 520 Sat.  95 94.3 43.5 6 6 6 6 6 12. Sat.	
95 94.3 43.5 6 6 6 6 6 6 6 6 90 89.3 48.5 Sat. Sat.	
99.3 38.5 5 9 11	
99.3 38.5 5 9 11	
95 94.3 43.5 6 6 6 6  Sat. Sat.	
90 89.3 48.5 6 6 6 6 C Sat. Sat.	
90 89.3 48.5 6 6 6 6 C Sat. Sat.	
90 89.3 48.5	
89.3 7 48.5	
85   1	
84.3 + 53.5	
80 79.3 58.5	
79.3	
75 74.3 63.5 7 10 13 · · · · · · · · · · · · · · · · · ·	
7 10 13 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
70 + 1	
69.3 7 68.5 Sat. Sat.	
65 64.3 73.5	
10 11 16 :	

#### GEOTECHNICAL BORING REPORT BORE LOG

									URE L	UG				
WBS	47533	.1.1			TI	<b>P</b> I-5987B		COUNTY	' ROBESO	N			GEOLOGIST W. Pesl	
SITE	DESCR	IPTION	Bridg	ge on -	L- ( <b>I</b> -9	5) over Little	Marsh Sw	amp at -L-	Sta. 803+1	5				GROUND WTR (ft)
BOR	NG NO.	S6_B	1-B		S	TATION 80	2+87		OFFSET :	21 ft RT			ALIGNMENT -L-	<b>0 HR</b> . N/A
COLI	AR ELE	<b>EV</b> . 13	7.8 ft		т	OTAL DEPT	<b>H</b> 95.0 ft		NORTHING	403,4	58		<b>EASTING</b> 2,010,323	<b>24 HR.</b> FIAD
				E F&R		ME-55 84%		I		DRILL N	IETHOL	O Muc	1	ER TYPE Automatic
	LER S.					TART DATE		n	COMP. DA				SURFACE WATER DEPTH 4.6	
ELEV	DDI /E	DEPTH	BLC	W CO				PER FOOT		SAMP.		1 L T	GOIT AGE WATER DEI III 4.0	JIL
(ft)	ELEV (ft)	(ft)		0.5ft		0 2			75 100	NO.	моі	O G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION DEPTH (ft)
_60_	59.3	78.5	 6	16	 23		\	h Line	T		 Sat.		COASTAL PLA	
55	54.3	02.5					• 39 \ .				Sal.	-	GRAY, SILTY FINE TO CO (A-2-4) WITH TRACE TO I TRACE WOOD FRAGMEN - (BLACK CREEK FORMATIO	LITTLE CLAY, TS AND MICA
	- 54.3 - -	- 63.5	23	22	25		: : ; <b>)</b>	 47 			Sat.	-	50.8	87.0
50	49.3	88.5	9	12	15		<b>Q</b> 27				Sat.	/////	LIGHT GRAY, SILTY CLA COARSE SAND (A-2-6) W MICA (BLACK CREEK FO	YEY FINE TO VITH TRACE DRMATION)
45	44.3	93.5	11	18	23		41				W		45.8 GRAY, FINE TO COARSE CLAY (A-7) WITH TRACE 42.8 CREEK FORMAT	MICA (BLACK
	-												Boring Terminated at Eleva SILTY CLAY (COASTAL PI CREEK FORMAT	LAIN) (BLACK
	-	-												
	-	-											-	
	-												-	
	- -	<del>-</del>											-	
	_	-											_	
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	-	<del>-</del> -										-		
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	- - -	<del> </del>  -  -											-	
	-	- - -										-		

									ORE I					
	47533				_	<b>IP I</b> -5987B			Y ROBESO				GEOLOGIST W. Pesl	1
				ge on -L	<del>-i-</del>	•		wamp at -L	- Sta. 803+					GROUND WTR (f
BOR	NG NO.	S6_B	2-A		S	TATION 8	03+47		OFFSET	52 ft L	T		ALIGNMENT -L-	0 HR. N/
COLL	AR ELI	<b>EV.</b> 13	34.4 ft		T	OTAL DEP	<b>FH</b> 85.0	ft	NORTHIN	<b>3</b> 403	,528		<b>EASTING</b> 2,010,259	<b>24 HR.</b> FIA
DRILL	RIG/HAN	MER EF	F./DATI	E F&R	2175 (	CME-55 84%	03/01/2019			DRILI	_ METHOD	) Mu	ud Rotary HAMM	ER TYPE Automatic
DRILI	L <b>ER</b> S	. Davis	1		S	TART DATE	E 01/16/2	20	COMP. DA				SURFACE WATER DEPTH 9.0	5ft
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	·	0.5ft	JNT 0.5ft	0 :	BLOWS 25	PER FOOT	75 100	SAM	'/	L O G	SOIL AND ROCK DES	CRIPTION DEPTH
155		<u> </u>											<del>-</del>	
150	- - -	† † †											- - - - -	
145	-	+ - - - -									•	_	- - - - - - - -	01/16/20)
140	-												- - - - -	
135	134.4												- -  	ACE
	1.54.4	1 00	WOR	WOR	WOR	•0::::					Sat.	X	- ARTIFICIAL FI - GRAY, FINE TO COARS	LL
	130.9	3.5				] [ : : : :						$\bigotimes$	- (A-1-a)	SE GRAVEL
130	-	‡	2	1	1	2	: : : :	+		11	Sat.	$\bigotimes$	<u>-</u> -	
		‡				<u> </u>  :::::						Xi	- <u>127.4</u> ALLUVIAL	
125	125.9	8.5	3	1	2	3					Sat.		GRAY-TAN, SILTY FINE	
		‡											WITH LITTLE GR	AVEL
100	120.9 .	13.5											- - 120.4	
120	-	‡	4	2	2	4	<del> </del>	<del> </del>	1	11	Sat.		COASTAL PLA  DARK GRAY, SILTY FINE	JN
		‡											WITH TRACE CLAY AND CREEK FORMAT	MICA (BLACK
115	115.9	18.5	3	3	2	5					Sat.		- CREEK FORWAT	ION)
		‡											- -	
110	110.9	23.5				. /							- -	
110	-	‡	3	5	8	13-	<del> </del>	<del> </del>	1	1	Sat.		<del>-</del> -	
		‡				::ţ::							- -	
105	_ 105.9 -	28.5	3	6	9	15-	: : : :			1	Sat.		- <del>-</del> -	
		‡											- -	
100	100.9	33.5			0	::;:							- -	
100	-	‡	5	6	9	15		1		11	Sat.		<del>-</del> -	
		‡ <u>-</u>				:::';							<del>-</del> -	
95	95.9 . -	38.5	10	10	13		23			41	Sat.		- -	
		‡				:::::	i  : : : :						<del>-</del> -	
90	90.9	43.5	6	10	12	:::::							<del>-</del> -	
30	-	‡	"	10	12		22 <del></del>		1	11	Sat.		<del>-</del> -	
		1,05					Ĭ : : : :						- -	
85	85.9 . -	48.5	9	12	14		26	<u> </u>		41	Sat.		<del>-</del>	
		Ŧ						: : : :	: : : :				<del>-</del> -	
80	80.9	53.5	11	12	17	::::	\frac{1}{1} \dots				Sat		- -	
-	-	Ŧ	''		••		29	1		11	Sat.		<del>-</del> - -	
	75.9	58.5											- -	
75	13.5	1 50.5	12	15	14	11 : : : :			1::::			:::::	<del>-</del>	

#### GEOTECHNICAL BORING REPORT BORE LOG

WBS	47533	.1.1			TI	IP	<b>I</b> -5987B		COUNT	Y RC	BESO	N			GEOLOGIST W. Pesl		
SITE	DESCR	PTION	Bridg	ge on -	L- ( <b>I</b> -9	5)	over Little	Marsh Sv	vamp at -	L- Sta.	803+1	5				GROUI	ND WTR (ft)
BOR	ING NO.	S6_B	2-A		S <sup>-</sup>	T/	ATION 80	3+47		OFF	SET 5	52 ft LT			ALIGNMENT -L-	0 HR.	N/A
COL	LAR ELE	<b>EV</b> . 13	4.4 ft		TO	01	TAL DEPTI	H 85.0 f	t	NOR	THING	403,5	28		<b>EASTING</b> 2,010,259	24 HR.	FIAD
DRILI	RIG/HAM	MER EF	F./DATE	E F&F	R2175 C	CM	ИЕ-55 84% 0	3/01/2019				DRILL N	IETHOD	Mι	id Rotary HAMM	ER TYPE	Automatic
DRIL	LER S.	Davis			S	TA	ART DATE	01/16/2	20	COM	IP. DA	TE 01/			SURFACE WATER DEPTH 9.	6ft	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0.5ft	UNT 0.5ft	-	0 2		PER FOO 50	T 75	100	SAMP.	MOI	LOG	SOIL AND ROCK DES	CRIPTION	N DEPTH (ft)
75 70 65 50		(ft) - 63.5 - 68.5 - 73.5 - 78.5 - 83.5	9 10 13	0.5ft 14 17 23 16	0.5ft 16 20 28 27				50  ch Line	75	100	NO.	Sat.  Sat.  M Sat.			SAND (A MICA (BL (continued Y SILTY C BLACK CI )) DARSE S, ICA (BLAC ION) DARSE S, AY AND M MATION) ation 49.4 LIAIN) (BL	DEPTH (ft)  -2-4) ACK  2)  CLAY REEK  AND CK  -72.0 CK  AND AND AND ACK  -77.0 AND AND AND AND AND AND AND AND AND AND

								D	UKE L	UG				
WBS	47533	3.1.1			TI	<b>P</b> I-5987B		COUNT	ROBESC	N			GEOLOGIST W. Pesl	
SITE	DESCR	IPTION	Brid	ge on -L	- ( <b>I</b> -95	5) over Little Ma	arsh Swa	amp at -L	- Sta. 803+1	5				GROUND WTR (ft)
BORI	NG NO.	S6_E	2-B		S	<b>FATION</b> 803+	49		OFFSET	21 ft RT			ALIGNMENT -L-	0 HR. N/A
COLL	AR ELI	<b>EV</b> . 13	36.9 ft		TO	OTAL DEPTH	90.0 ft		NORTHING	403,5	19		<b>EASTING</b> 2,010,332	24 HR. FIAD
DRILL	RIG/HAN	MER EF	F./DAT	E F&R2	175 C	ME-55 84% 03/0	1/2019			DRILL N	NETHO	) Mu	d Rotary HAMME	R TYPE Automatic
DRILI	L <b>ER</b> S	. Davis			Sī	TART DATE	)1/20/20		COMP. DA	<b>TE</b> 01/	21/20		SURFACE WATER DEPTH 6.9	ft
ELEV	DRIVE ELEV	DEPTH	BLC	W COU	NT	В	LOWSP	ER FOOT		SAMP.	<b>V</b> /	LO	SOIL AND ROCK DESC	PIPTION
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25	50	)	75 100	NO.	моі		ELEV. (ft)	DEPTH (ft
155		_											_	
		‡												
		‡												
150	-	±											<b>-</b>	
		<del>-</del>										-		
145		Ŧ												
	-	Ŧ										_F	WATER SURFACE (0	1/20/20)
		Ŧ												
140	_	Ŧ											· =	
	136.9	Ι.,,											136.9 GROUND SURFA	.CE 0.0
135	130.5	+ ~~	WOR	WOH	1	1					Sat.	X	ARTIFICIAL FIL GRAY, FINE TO COARSI	L
	133.4	3.5				<u> </u>							(A-1-a)	LOIWILL
		‡	1	2	1	3					Sat.			
130	_	‡				<u>                                   </u>		· · · ·					<del>-</del>	
}	128.4	† 8.5 †	7	4	1						070/		127.4	9.5
125		‡								SS-158	27%		<b>ALLUVIAL</b> DARK GRAY, CLAYEY SIL	TY FINE TO
120	123.4	† † <sub>13.5</sub>				1							COARSE SAND (A-2-4) W MICA AND WOOD FRA	ITH TRACE
Ī		‡	1	1	4	5				SS-159	30%			S.II V. S
120	_	‡				1			1					
	118.4	† 18.5 †	2	3	6	: \frac{1}{2} : :   :					Sat.		COASTAL PLAI DARK GRAY, SILTY FINE T	ΓO COARSE
115	•	‡				.					Juli		SAND (A-2-4) WITH TRACE AND WOOD FRAGMENT	S (BLACK
113	113.4	23.5				<del>  \ .   .</del>			1				- CREEK FORMATI	ON)
Ī		‡	5	8	13	21					Sat.			
110	_	‡				! .							<del>-</del>	
-	108.4	28.5	4	5	10	· · · / ·   ·   · · · 1.:   ·					Sat.			
105		‡				🕶 15					Jai.			
105	103.4	33.5				1							<b>-</b>	
Ī	100	‡	6	6	7	13.					Sat.			
100	_	‡				· · j· ·   ·							<del>-</del>	
-	98.4	38.5	5	6	8						Sat			
		‡			Ĭ	<b>\</b> 14   .					Sat.	-		
95	93.4	125				<del>    .</del>			1			_	<b>-</b>	
ŀ	93.4	† 43.5 	6	7	10						Sat.			
90	-	‡				\							<del>-</del>	
-	88.4	48.5	7	11	20	: : : :  \:					Cat			
		‡	'	''	-0	· · · ·   <b>/</b>	31				Sat.			
85	00.4	‡				<del>  / .</del>							_	
	83.4	53.5	12	9	11						Sat.			
80		<u> </u>											_	
	78.4	58.5	10	12	13	\ .								
		İ	10	12	13	25					Sat.	::::F		
75		Τ	1						1	1	1	:::::T		

#### GEOTECHNICAL BORING REPORT BORE LOG

									OIL		<del></del>						
	47533					<b>P</b> I-5987B		COUNTY						GEOLOGIST W. Pesl			
				ge on -		5) over Little		amp at -L						1 .		SROUND V	
	NG NO.				_	TATION 80					21 ft RT			ALIGNMENT -L-		0 HR.	N/A
	AR ELI					OTAL DEPT			NORT	HING	403,5			<b>EASTING</b> 2,010,332		4 HR.	FIAD
			F./DAT	E F&F		CME-55 84% (		. 1					) Mu	<del>, '                                   </del>		TYPE Auto	omatic
	LER S. DRIVE		I BLC	NA/ CO		TART DATE		DER FOOT		DA	SAMP.		1 1 1	SURFACE WATER DEPTH	1 6.9ft		
ELEV (ft)	ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft					75	100	NO	MOI	ō	SOIL AND ROCK	DESCR		
	(11)		0.010	0.010	0.011		I .	<u> </u>	<u> </u>		110.	/ MOI	G	ELEV. (ft)			DEPTH (ft)
75							Matc	h Line									
_/3_	73.4	63.5		<u> </u>					T			<u> </u>		COASTAI DARK GRAY, SILTY	L PLAIN		
	-	‡	11	11	14	:::::	25		: :	- :		Sat.		SAND (A-2-4) WITH T AND WOOD FRAC	TRACE C	CLAY, MICA	,
70	-	-					1		<del>  : :</del>					CREEK FORMAT	ION) (co	ntinued)	
	68.4	68.5	9	11	18		1		: :	: :		Sat.		- - 67.4			69.5
65	-	Ŧ							: :					GRAY, FINE TO COA CLAY (A-7) WITH TR			
	63.4	73.5						<u></u>						CREEK FOR  GRAY, SILTY FINE 1			J— :=" <u>"</u>
		Ŧ	21	28	31			59	: :			Sat.		(A-2-4) WITH TRAC (BLACK CREEK	E CLAY	AND MICA	
60		Ī						1 - 1	+					_		,	
	58.4	78.5	16	25	32			.] •57				Sat.		- -			
55	-	Ł						<u>/</u>						- 54.9			82.0
	53.4	83.5	10	12	21		· · //:						///	GRAY, SILTY CLAYE' SAND (A-2-6) WITH T	Y FINE T	O COARSE IICA (BLACI	 {
	-	ł	10	12	21		.♥33					Sat.	///	- CŔEEK FOI -			
50	- 48.4	88.5				<del> </del>	. 1		+ : :					<u>-</u>			
	40.4	00.5	12	16	21		37		: :			Sat.	///	- _ 46.9			90.0
	- - -													Boring Terminated at CLAYEY SAND (C (BLACK CREEK -	COASTAL	L PLAIN)	
	-																
	-													_			
	-	<u> </u>												- - -			
	-	<u> </u>												 - -			
	-	<u> </u>												- - -			
	-	Ī												- - -			
	-	<u> </u>												 - -			
	-	<u> </u>												- - -			
	-	Ī												- - -			
	-	<u> </u>												<del>_</del> - -			
	-	‡												- - <del>-</del>			
	- - -	† †												- - -			
	- -	<u> </u>												- - -			
	-	‡												<u>.</u>			
		L				L					1			-			

										<u> </u>	JKE	<u> </u>	<u>OG</u>							
WBS	47533	3.1.1			TI	IP I-59	37B		COUN	ITY	ROB	ESO	N			GEOLOGI	ST B. Painte	r		
SITE	DESCR	IPTION	Bridg	ge on -L	( <b>I</b> -9	5) over L	_ittle_N	Marsh S	wamp at	-L- S	Sta. 80	)3+1	5						GROUN	ID WTR
BORI	NG NO.	S6_E	B2-A		S <sup>-</sup>	TATION	804	+09		T0	OFFSE	ET 5	50 ft LT			ALIGNME	NT -L-		0 HR.	N
COLL	AR ELI	<b>EV.</b> 15	0.6 ft		TO	OTAL D	EPTH	85.0	ft	N	NORTH	HING	403,58	39		EASTING	2,010,270		24 HR.	FIA
DRILL	RIG/HAN	IMER EF	F./DATE	F&R3		CME-55 8	2% 03	/01/2019					DRILL M	ETHO	<b>)</b> Mu	d Rotary		HAMM	ER TYPE	Automatic
DRIL	LER D	. Tignor			S	TART D	ATE	01/15/2	20	$\Box$	COMP	. DA	Γ <b>E</b> 01/	17/20		SURFACE	WATER DEP	TH N/.	Α	
ELEV	DRIVE	DEPTH	BLO	w cou	INT			BLOWS	PER FO	ОТ			SAMP.	▼/	1 L		COUL AND DO			
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	1	50	7	5	100	NO.	МОІ	O G	ELEV. (ft)	SOIL AND RO	CK DES	SKIPTION	DEPTI
155																_				
	-	-														•				
	-	Ŧ														. 1 <u>5</u> 0.6	GROUNI	D SURE	∆CE	
150	150.0	0.6	20	18	24	<del> </del>								D	10	150.0	ROADWAY	EMBANI		F
	147.1	3.5					∵.}.	· · · · · · · · ·	-2			: :					BROWN, FINE	<b>PHALT</b> TO COA	RSE SAN	
145	-	F	3	2	4					-			SS-2067	20%		146.4 BF	(A-1-B) WITH ROWN-ORANG			SF
	-	Ŧ				1									LN	143.6		ID (A-3)		
	142.1	8.5	3	4	4	: :								Sat.			NDY CLAY (A-7	'-6), HIG	HLY PLAS	
140	_	F												out.		- BRO	UNDIVIDED O			AND
	137.1	13.5														•	(A-2-4) WITH FRAC	I TRACE SMENTS		
135	-	-	1	3	6	9						: :		Sat.		•				
	-	Ŧ														- <u>133.6</u>			.=.=	
	132.1	18.5	5	4	6									Sat.	0000	· I,	AN-GRAY, FINE (	A-3)	ARSE SAI	ND
130	_	ļ.				• 🔻	0 -		+					Oat.	0000	· -				
	127.1	23.5				: <i>į</i> :						: :				<u>128.6</u> GR.	AY, SILTY CLAY	EY FINE	TO COA	RSE
125	- 127.1	- 20.0	1	2	3	<b>∮</b> 5.						: :		Sat.		- SA -	ND (A-2-6) WIT ANI	H TRAC D MICA	E ORGAN	IICS
120	-	‡									• • •					<del>-</del> ·				
	122.1	28.5	2	3	6							: :		Sat.		•				
120	_	‡				- ●9								Sal.		<del>-</del>				
	- - 117.1	33.5				:     :	: :					: :				<u>118.6</u>		TAL PLA		
115	- 11/-1 -	- 33.3	3	4	6	: • 1	0 -					: :	SS-2070	31%			RAY, CLAYEY FI VITH TRACE M			
	-	‡				,										<u> </u>		MATION		
	112.1	38.5	5	6	9	::\						: :		Sat.			AY, SILTY CLAY SAND (A-2-6), M	ICACEC	US (BLAC	
110	_	‡				• • •	15							Jai.		-	CREEK F	ORMAT	ION)	
	107.1	43.5					: /;			-		: :					RK GRAY, FINE			
105	-107.1	1 -5.5	6	8	14		- <b>\</b>   - <b>♥</b> 22	2				: :		W		· SI ·	LTY CLAY (A-7 (BLACK CRE			CA
	-	Ŧ					- ;				• • •					<u> </u>		,=,=		
	102.1	48.5	6	9	10	::	i j					::		Sat.	//	· SA	AY, SILTY CLAY ND (A-2-6) WIT	H TRAC	E ORGAN	IICS
100	_	-					- <b>→</b> 19			-				Out.		_	O MIČA (BĹACK	CREEK	FORMAT	ION)
	97.1	53.5					: 1					: :					AY, CLAYEY SIL			
95		Ī	9	11	13			24				: :		Sat.			ND (A-2-4) WIT D MICA (BLACK			
	-	Ŧ					-i									93.6		/E/ E		
	92.1	58.5	7	9	11	: :						: :		Sat.		· SA	AY, SILTY CLAY ND (A-2-6) WIT	H TRAC	E ORGAN	IICS
90	-	F					- \\		+					Jul.	<b>\\\</b>	- ANI	O MICA (BLACK	CREEK	FURMAT	IUN)
	87.1	63.5					- '\			• •		: :			<b>/</b> //	•				
85		F	6	12	13		V <b>V</b> 2	25				: :		Sat.	<b>/</b> //	•				
	-	F													<b>/</b> //	-				
	82.1	68.5	10	13	16	::		 		• •		: :		Sat.	<b>/</b> //	•				
80	-	F						<b>→</b> ∠9 · ·	+					Jul.	<b>\\\\</b>	<del>-</del>				
	77.1 73.5					::/					: :			<b>/</b> /	•					
75		I	7	9	13	] :::	· •   •	· · · · 2 · · ·				: :		Sat.		•				

#### GEOTECHNICAL BORING REPORT BORE LOG

WBS	47533	.1.1			TI	Р	<b>I</b> -59	37B			COL			BESC	_				GEOLOGIST B. Painter		
SITE	DESCR	IPTION	Bridg	je on -l	L- ( <b>I</b> -95	5) c	over L	ittle	Mars	sh Sw	amp a	at -L-	Sta	803+1	15					GROUN	ID WTR (ft)
BOR	NG NO.	S6_E	B2-A		ST	ΓA.	TION	80	4+09	9			OFF	SET	50	ft LT			ALIGNMENT -L-	0 HR.	N/A
	AR ELE									5.0 ft			NOR'	THING	_	403,58			<b>EASTING</b> 2,010,270	24 HR.	FIAD
	RIG/HAM			F&R											_	DRILL M		Mu	, ·		Automatic
	LER D.					ΓAI	RT D	ATE		/15/2				IP. DA		E 01/1	17/20	1 1	SURFACE WATER DEPTH N//	4	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)		W CO		C	)	2	BLC 5		PER F		75 	100	11	SAMP.	MOI	O G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION	DEPTH (ft)
75										Matc	h Line	<u>e</u>									505
70	72.1 - - - - 67.1	- - - - - - - - - - - - 83.5	7	12	16	_		· · \	28-								Sat.		GRAY, SILTY CLAYEY FINE SAND (A-2-6) WITH TRAC AND MICA (BLACK CREEK (continued)	E ORGAN	IICS
	67.1	_ 83.5 -	9	12	12				24 -			: :	: :				Sat.	///	65.6		85.0
																			Boring Terminated at Eleva CLAYEY SAND (COAST (BLACK CREEK FOR!	AL PLAIN	

								1	ORE					_				
WBS	47533	3.1.1			T	<b>IP I</b> -5987B		COUNTY	<b>Y</b> ROBI	ESO	N			GEOLOGI	ST W. Pesl			
				ge on -L	<del>-</del> i	5) over Little		wamp at -L									1	D WTR (f
	NG NO.				_	TATION 8			OFFSE					ALIGNME			0 HR	N/
	AR ELI					OTAL DEP			NORTH	IING	403,5				2,010,384		24 HR.	0.
			FF./DAT	E F&R2	2175 (	CME-55 84%	03/01/2019				DRILL M		) Mu	d Rotary			ER TYPE	Automatic
	LER S	. Davis	1			TART DATE				DA	TE 01/0	08/20	1	SURFACE	WATER DE	PTH N/	A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	<b>'</b> —	0.5ft		0 :	BLOWS 25	PER FOOT		100	SAMP.	MOI	O G	ELEV. (ft)	SOIL AND RO	OCK DES	CRIPTION	DEPTH
445																		
145	143.7	0.0										_		_ . 143.7		ID SURF	ACE	
		‡	WOH	1	0	1: : :							<u> </u>	BR	<b>AL</b> OWN-TAN, SI	. <b>LUVIAL</b> LTY FINE	TO COAF	RSE
140	140.2	3.5	1	1 1	1	<u>                                   </u>				-			<u> </u>		ND (A-2-4) WI			
		‡	'	'	'	2						Sat.						
		<u> </u>				\ : : :				-				136.7	UNDIVIDED	COASTA	L PLAIN	
135	135.2	8.5	3	3	4	7	<del> </del>	<del>                                     </del>	<del> </del>			Sat.			AY-BROWN, S ND (A-2-4) WI	ILTY FIN	E TO COA	
		<u> </u>				:: : : :				.			_			L, AND C		100,
130	130.2	13.5				\				-			_	_				
		ł	6	7	8	•15				-		Sat.	_					
		Ŧ				:/::	: : : :						 					
125	125.2	18.5	1	1	3	4		+	+			Sat.		- -				
		Ŧ					: : : :		: : :	-			_	101.7				,
120	120.2	23.5							: : :				-	121.7		TAL PLA		<sup>;</sup>
120		+	2	3	3	6	<u> </u>		1			Sat.	-		ARK GRAY, CL OARSE SAND			
		‡				<u>                                  </u>				-			-	GR	RAVEL (BLACK	CREEK	FORMATIO	ON)
115	115.2	28.5	2	4	4					-				<del>-</del>				
		‡		"	4							Sat.						
		ł				::\::	: : : :	1::::										
110	110.2	<u> </u>	3	8	11	1	9	+	<del> </del>			Sat. W		_ 109.7	RK GRAY, FIN	F TO CO	ARSE SAN	JDY :
		+				/.						''		SI	LTY CLAY (A-	7) WITH <sup>-</sup>	TRACE MI	CA
105	105.2	38.5				]   <i>j.</i> .								<u>¬</u>	CREEK	FORMAT	ION)	í
	-	Ŧ	2	4	6	· <b>•</b> 10 -			ļ	-		Sat.	<u> </u>	(A-	RAY, SILTY FIN 2-4) WITH TR	ACE MIC	A. CLAY, A	ND
		Ŧ				: }::	: : : :			-			-	W	OOD FRAGMI FOF	ENTS (BL RMATION	.ACK CREI )	EK
100	100.2	43.5	6	6	6	1			ļ · · ·			Sat.	-	-			,	
		Ŧ				. • 12 -			: : :	-		Jan						
95 _	95.2	48.5				[] : : '; :	: : : :			-			<b> </b> ::::					
-		†	6	7	8	•15		1				Sat.		<del>-</del> ·				
		‡				::::			: : :	-								
90	90.2	53.5	7	7	11	1	: : : :	: : : :	ļ:::	-		804		<del>-</del>				
		‡	'			· · · • • • • • • • • • • • • • • •	3					Sat.						
ا م	050	‡				: : :¦:	: : : :		: : :	-								
85	85.2	58.5	7	9	10	1 <del>•</del> 1	9	<del> </del>	<del> </del>			Sat.		_				
		‡				[[:::]			: : :									
80	80.2	63.5	10		4.4	1 1								<del>-</del>				
		‡	10	11	11	: : : <del> </del>	)22 			: ]		Sat.						
		ŧ				:::::				· -			[[					
75	75.2	68.5 1	10	10	11	1			+	$\exists$		Sat.	ļF	_				
		Ŧ				::::{							li ii F					
70	70.2	73.5				]]::::}	: : : :		: : :	-								
		+	9	11	11	]	122	1	: : :			Sat.		<del>=</del> ·				
		‡				::::;	: : : :		: : :									
65	65.2	78.5				]   · · · · i				-	1		:::: -					

### GEOTECHNICAL BORING REPORT BORE LOG

					-			-		UKI					T			
	47533						I-5987B		COUNTY						GEOLOGIST W. Pesl			
SITE	DESCR	IPTION	Brid	ge on -	L- ( <b>I</b> -9	5) ov	ver Little	Marsh Swa	amp at -L	Sta. 8	03+15	5				(	GROUNI	D WTR (ft)
BORI	NG NO.	S6_E	B2-B		s <sup>-</sup>	ΤΑΤ	<b>ION</b> 80	4+09		OFFS	<b>ET</b> 6	5 ft RT			ALIGNMENT -L-		0 HR.	N/A
COLL	AR ELE	<b>EV</b> . 14	13.7 ft		Т	ATC	L DEPTI	<b>H</b> 100.0 f	t	NORT	HING	403,57	72		<b>EASTING</b> 2,010,384	2	4 HR.	0.9
DRILL	RIG/HAM	IMER EF	F./DAT	E F&F	R2175 C	ME-	55 84% 0	3/01/2019				DRILL M	ETHOD	) Mud	Rotary HA	MMER	TYPE	Automatic
DRIL	LER S.	Davis			s	TAR	T DATE	01/08/20		COMI	P. DAT	Γ <b>E</b> 01/0			SURFACE WATER DEPTH	N/A		
ELEV	DRIVE	DEPTH	BLC	ow co		П		BLOWS F				SAMP	<b>V</b> /	1 - 1				
(ft)	ELEV (ft)	(ft)	`——	0.5ft		0	2	5 5	0	75	100	NO.	MOI	0 G	SOIL AND ROCK [ ELEV. (ft)	DESCR	RIPTION	DEPTH (ft)
	( )												<u> </u>					DEI III (II)
65								Match	n Line									
-65			9	<del> </del> 10 <sup>-</sup>	12	<del>                                     </del>		2		T		<u> </u>	Sat.					
	-	<u> </u>				:	: : : : }	۱::::		: :	: :			<u> </u>	61.7			82.0
60	60.2	83.5		10		lĿ		\							DARK GRAY, SILTY O	CLAY (	A-7) WIT	H
	-	F	8	12	22	-		- •34					М		MICA (BLACK CREE			
	-	F				:				: :	: :				56.7 — CDAY OF TYPING T		DOF 0 A	87.0
55	55.2	88.5	24	37	25	۱Ľ		· · · · ·	\	ļ::			Sat.		GRAY, SILTY FINE TO (A-2-4) WITH TRAC	E MICA	A (BLAC	( J
	-	‡	-	"		:	· · · ·		62.		: :		Sat.	-	CREEK FOR	MATIO	N)	
		<u> </u>				:	 	/		: :	: :			-				
50	50.2	93.5	10	15	20	<u> </u>		- <b>Ø</b> 35 -	<del></del>	+			Sat.	::: <u> </u>				
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