Ö REFERENCE

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# STATE OF NORTH CAROLINA

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

### **CONTENTS** SHEET NO. **DESCRIPTION**

TITLE SHEET

SITE PLAN

BORE LOGS STE PHOTOS

PROFILES CROSS SECTIONS

LEGEND (SOIL & ROCK)

# **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY **DUPLIN** 

PROJECT DESCRIPTION BRIDGE NO. 36 ON US HIGHWAY 11 OVER MAXWELL CREEK AT -L- STATION 23+55

BRIDGE NO. 36 DETOUR ON -LDET- OVER MAXWELL CREEK AT -L DET- STATION 18+59.5 STATE PROJECT REFERENCE NO. B-5639

### **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:

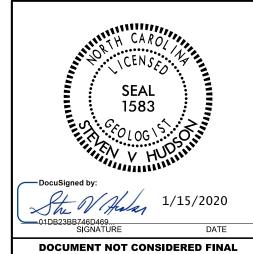
  1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.

  2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES BY 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.

CATLIN PERSONNEL
INVESTIGATED BY S. V. HUDSON, LG
DRAWN BY S. V. HUDSON, LG
CHECKED BY J. L. STONE, LG
SUBMITTED BY S. V. HUDSON, LG



DATE OCTOBER 2019



**UNLESS ALL SIGNATURES COMPLETED** 

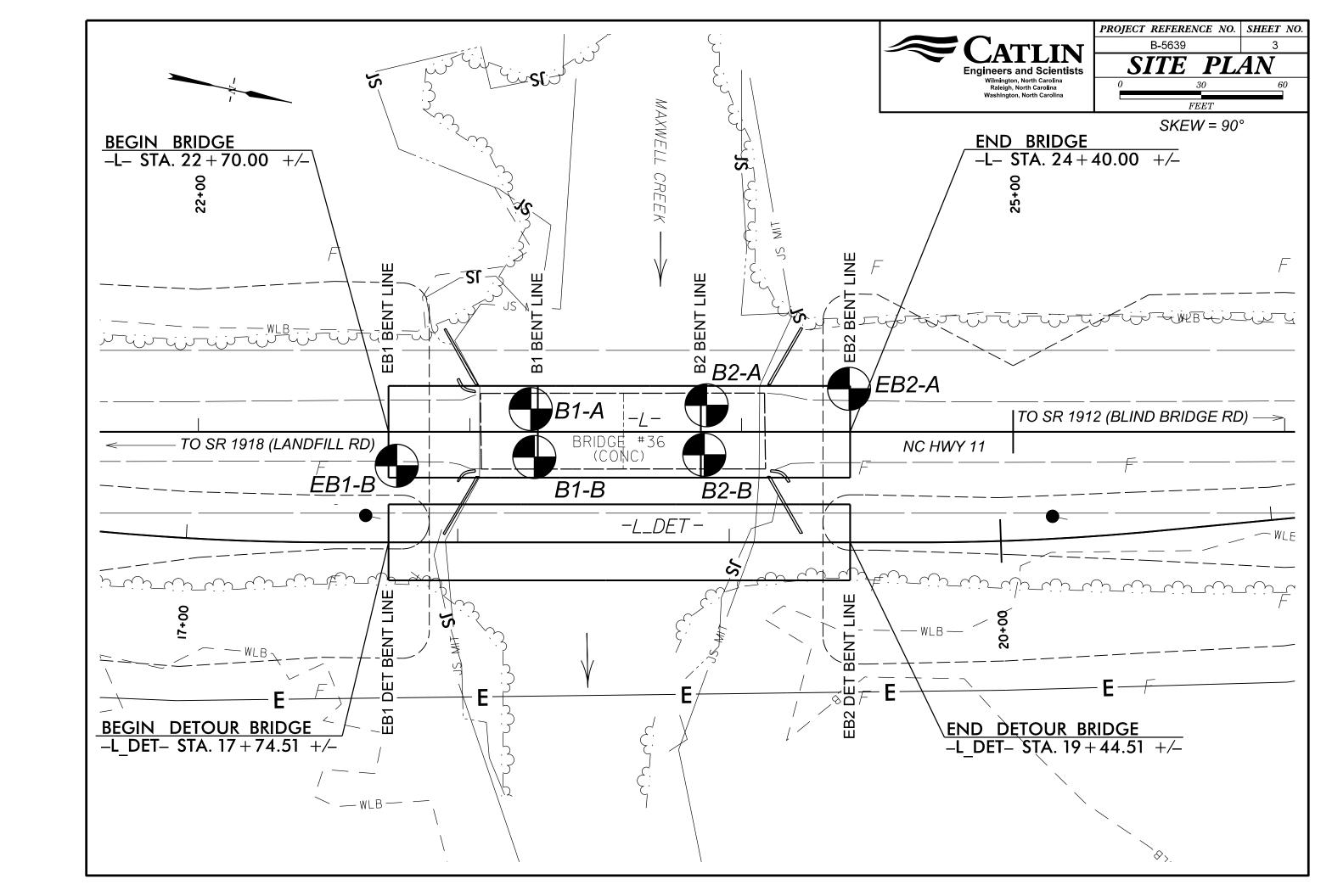
PROJECT REFERENCE NO. SHEET NO. 2

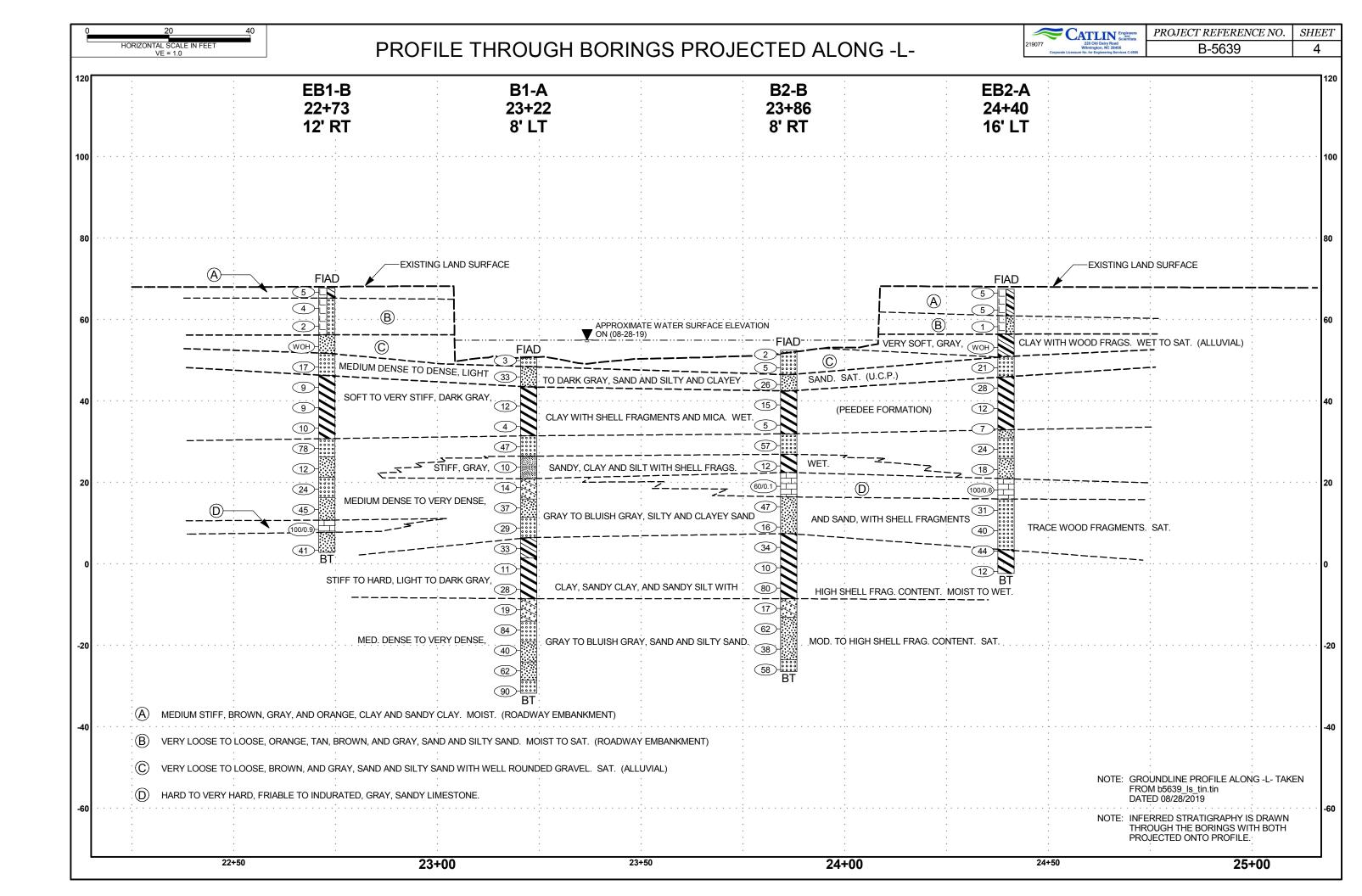
# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

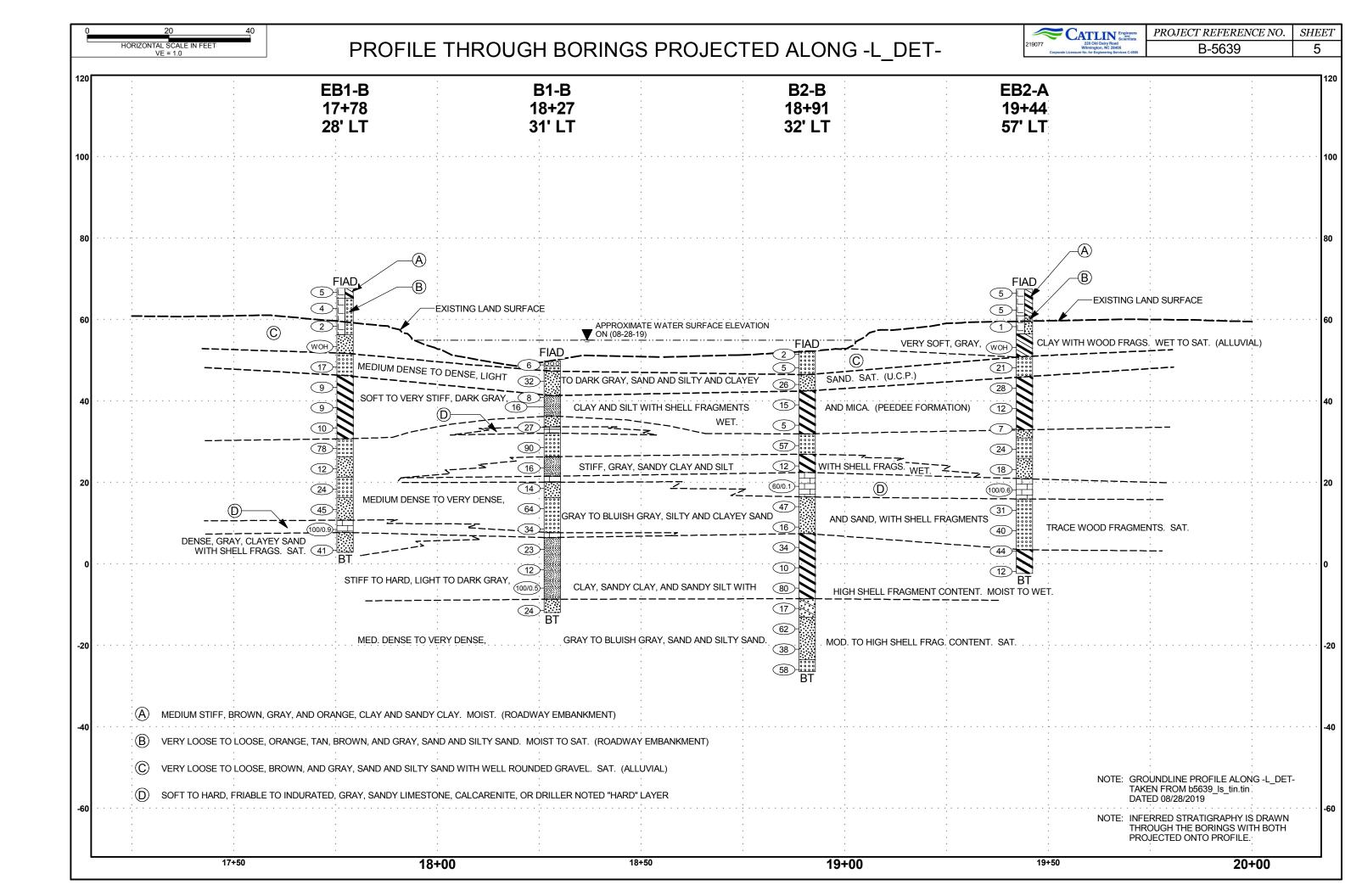
# SUBSURFACE INVESTIGATION

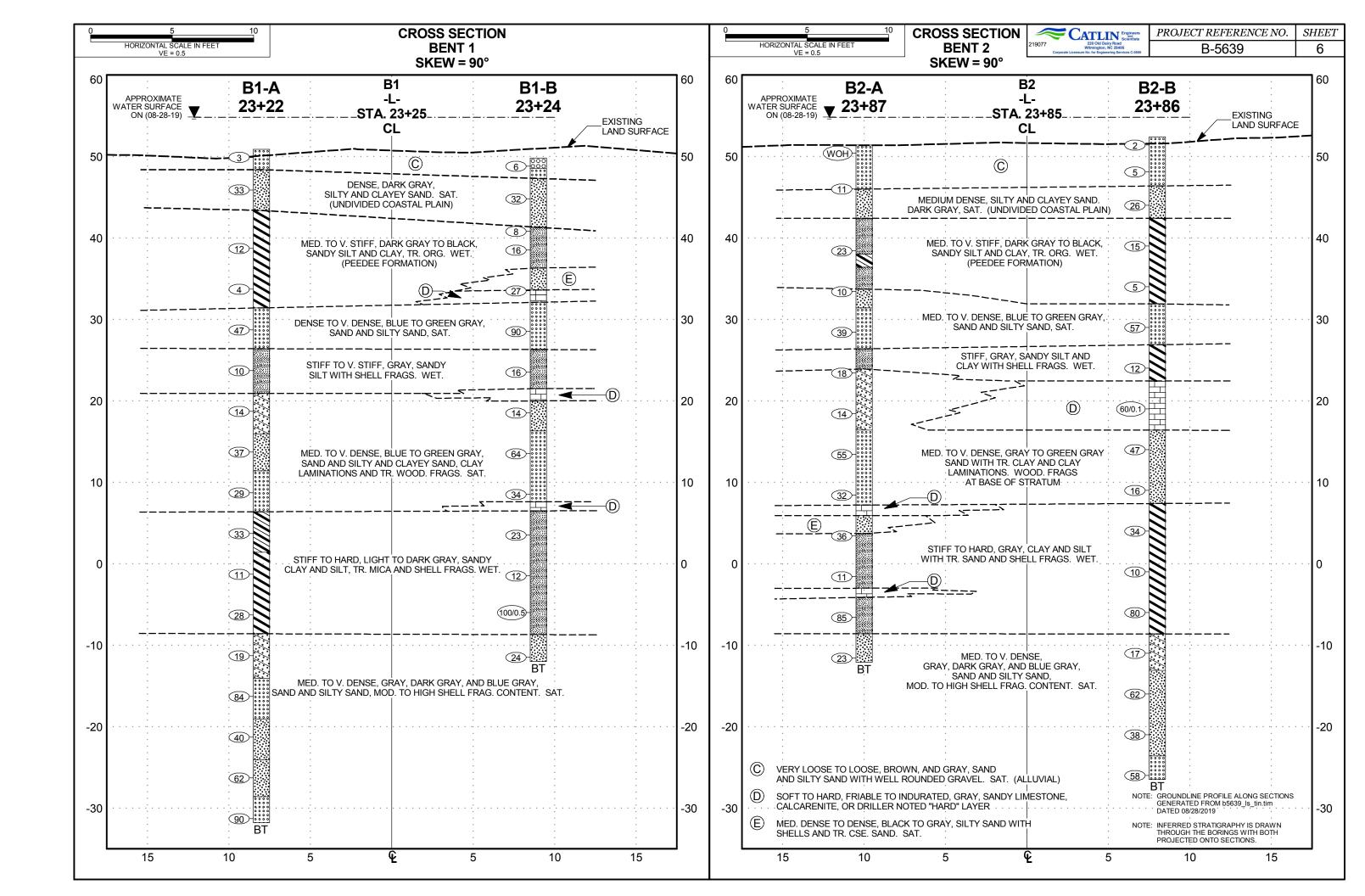
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.	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 DI586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING:	GAP-GRADED - 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 BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN	AQUIFER - A WATER BEARING FORMATION OR STRATA.
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	NI//ANI//A	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.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED VILLY NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS	MINERALOGICAL COMPOSITION	CRYSTALLINE CRYSTA	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
LLASS. (\$\(\sigma\) 50% PASSING *200) (> 30% PASSING *200)	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAQLIN, ETC.  ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-0 A-1-b A-2-4 A-2-5 A-2-6 A-2-7 B-2-6 A-2-7 A-3 A-6, A-7 A-1, A-2 A-4, A-5 A-6 A-7 A-1, A-2 A-6, A-7 A-1, A-1, A-2 A-6, A-7 A-1, A-1, A-1, A-2 A-6, A-7 A-1, A-1, A-1, A-1, A-1, A-1, A-1, A-1,	COMPRESSIBILITY	NON-CRYSTALLINE - FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPT REFUSAL, ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
7. PASSING SILT- GRANULAR SILT- MUCK,	HIGHLY COMPRESSIBLE LL > 50  PERCENTAGE OF MATERIAL	SEDIMENTARY ROCK SPT REFUSAL, ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
*40 30 MX 50 MX 51 MN CLAY PEAT		- WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
-200 15 MX 25 MX BI MX 25 MX 25 MX 25 MX 25 MX 35 MX 36 MX 36 MX 36 MX 36 MX	GRANUL AR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
MATERIAL PASSING *40	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	HAMMER IF CRYSTALLINE.	HORIZONTAL.
LL 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 50115 WITH	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, (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN MODERATE ORGANIC	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE  GROUND WATER	OF A CRYSTALLINE NATURE.	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH,
GROUP INDEX W W 4 MX 8 MX 12 MX 16 MX NU MX AMUUNIS UF SOILS		SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
USUAL TYPES STUNE HARUS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND GRAVEL AND SAND SOILS SOILS	▼ STATIC WATER LEVEL AFTER <u>24</u> HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN, RATING EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	∇PW     PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL.
AS SUBURHUE PUUR	SPRING OR SEEP	WITH FRESH ROCK.	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  CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PANCE OF STANDARD PANCE OF LINCONFINED	MISCELLHINEUUS STIMBULS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH (MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE COMPACINESS UP PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	<u>IF TESTED, WOULD YIELD SPT REFUSAL</u>	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
IN-VALUE) (TUNS/FT-)	WITH SOIL DESCRIPTION → OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4  CONTROL LOOSE	SOIL SYMBOL  OPT ONT TEST BORING  SLOPE INDICATOR 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.
GRANULAR MEDIUM DENSE 10 TO 30 N/A MATERIAL DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
(NON-COHESIVE) DENSE 30 TO 50  VERY DENSE > 50	THAN ROADWAY EMBANKMENT	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 MINUTORING 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	WITH CORE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD > 30 > 4	TTT ALLUVIAL SOIL BOUNDARY A PIEZOMETER INSTALLATION - 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		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	UNDERCUT UNSUITABLE WASTE  UNSUITABLE WASTE  UNSUITABLE WASTE  USED IN THE TOP 3 FEET OF	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 UNDERCUT UNCLASSIFIED EXCAVATION - EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.) (GR.) (SE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	SLICKENSIDE - 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 $\gamma$ - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_d$ - DRY UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE CHIDE FOR EIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC	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 SAMPLE ABBREVIATIONS  DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	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.  VERY  CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH	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
(SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE SL SILT, SILTY ST - SHELBY TUBE FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	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 CEMICOLIDA DECULIDAD DE CIDADO DE CONTROL DO CEMICOLIDA DE CONTROL	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS,) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
(P) ATTAIN OPTIMUM MOISTURE	FRAGS FRAGMENTS $w$ - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK: ELEVATION & LOCATIONS OBTAINED WITH RTK GPS
"" PL L + PLASTIC LIMIT -	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS  VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	
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	CME-45C CLAY BITS X AUTOMATIC MANUAL	MODERATELY CLOSE	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO	G. CONTINUOUS ELIGHT AUGER	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   □ CURE SIZE:	THINLY LAMINATED < 0.008 FEET  INDURATION	U.C.P. = UNDIVIDED COASTAL PLAIN
PLASTICITY	<b>√</b>		VE = VERTICAL EXAGERATION
PLASTICITY INDEX (PI)  ORY STRENGTH	X CME-550 HARD FACED FINGER BITS -N	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  RUBBING WITH FINGER FREES NUMEROUS GRAINS:	
NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST TUNGCARBIDE INSERTS HAND TOOLS:	FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MODERATELY PLASTIC 16-25 MEDIUM	X CASING W/ ADVANCER POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;	
	PORTABLE HOIST TRICONESTEEL TEETH HAND AUGER	BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TRICONE 2 1/2 TUNGCARB. SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;  OFFICULT TO BREAK WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	CORE BIT VANE SHEAR TEST	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-1-
		1	









# GEOTECHNICAL BORING REPORT BORE LOG

BORE LOG							
<b>WBS</b> : 45594.1.1	<b>TIP:</b> B-5639	COUNTY: DUPLIN	1	GEOLOGIST: C. FUTF			
SITE DESCRIPTION: BRIDGE N	NO. 36 ON -L- (US HWY 11)	OVER MAXWELL CF	REEK AT -L- STATIO	N 23+55	GROUND WTR (ft		
BORING NO.: EB1-B	<b>STATION</b> : 22+73	OFFSET:	12 ft RT	ALIGNMENT: -L-	<b>0 HR.</b> 10.		
COLLAR ELEV.: 67.7 ft	TOTAL DEPTH: 64.9 ft	t NORTHING	<b>G</b> : 408,391	<b>EASTING:</b> 2,309,945	24 HR. FIA		
DRILL RIG/HAMMER EFF./DATE: CA	T1303 CME-550 94% 09/26/2018		DRILL METHOD: Mu	d Rotary	HAMMER TYPE: AUTOMATI		
DRILLER: D.T. Chalmers, Jr.	START DATE: 08/23/1	9 COMP. DA	<b>ATE</b> : 08/23/19	SURFACE WATER DEF	PTH: N/A		
ELEV DRIVE DEPTH BLOW CO	UNT BLOWS F	PER FOOT	SAMP. #	SOIL AND RO	CK DESCRIPTION		
(ft) (ft) (ft) 0.5ft 0.5ft	0.5ft 0 25 5	50 75 100	RESULT MOI G	ELEV. (ft)	DEPTH		
70				_			
67.7 + 0.0					D SURFACE		
2 3	2 5			DDOWN TO	EMBANKMENT ORANGE, CLAY		
65					ND BROWN, F. SAND		
2 2	2						
60 +	<u> </u>			_			
59.3 7 8.4 1 1	1 2		M L				
				56.2	1		
55					LUVIAL BILTY, F. SAND		
WOH WOH	MOH 6:		Sat.				
50   †			0000		COASTAL PLAIN — — — 1		
49.3 18.4 3 9	8		Sat.	- LIGHT G	RAY, F. SAND		
	::,7": :::::		0000	46.2	2		
45 44.3 + 23.4	· · · j· · ·   · · · · ·			COAS	TAL PLAIN NDY CLAY AND CLAY,		
5 5	4 . •9		w	MICA AND WOOD	FRAGS. AT BASE OF		
	.				RATUM FORMATION)		
39.3 28.4 5 5	4		1	_			
	<sup>4</sup>     . •9						
35 +	.			_			
34.3 7 33.4 2 4	6		Sat.				
<del> </del>				30.7	3		
30 29.3 + 38.4		+ +	0000	GRAY AND OLIVE	GREEN, F. AND CSE.		
24 33	45	•78	Sat.		SAND		
25	:::::::::::::::::::::::::::::::::::	::::	0000		4 F. SAND WITH HIGH		
24.3 + 43.4 4 5	7		Sat.		AG. CONTENT		
				21.2	4		
20 19.3 48.4			00000	GRAY, F. AND CS	SE. SAND WITH HIGH NTENT AND TR. CLAY		
5 9	15		Sat.	SHELL TIME. CO	INTENT AND TIL CLAT		
45	:::: `\::		0000	_16.2CDAY_CLAVEY	, F. AND CSE. SAND 5		
15 14.3 53.4 11 16	29				HELL FRAGS.		
1 1 1 10	29	5	Sat.				
10 +					DY LIMESTONE5		
9.3 58.4 7 93/0.4		100/0.9 <sup>6</sup>	Sat.	_7.7	6		
	:::: :::!:			GRAY, CLAYEY	, F. AND CSE. SAND HELL FRAGS.		
5 4.3 63.4				-	ILLET NAGO.		
9 17	24		Sat.	2.8 BORING TERMIN	6- ATED AT ELEVATION		
				2.8 ft IN DENSE CL	AYEY SAND (PEEDEE		
				- FOR	MATION)		
				-			
‡							



PROJECT REFERENCE NO. SHEET
B-5639 7

### PROJECT REFERENCE NO. SHEET GEOTECHNICAL BORING REPORT CATLIN Engineers and Scientists B-5639 8 **BORE LOG TIP**: B-5639 COUNTY: DUPLIN GEOLOGIST: C. FUTRAL COUNTY: DUPLIN GEOLOGIST: C. FUTRAL WBS: 45594.1.1 WBS: 45594.1.1 **TIP:** B-5639 SITE DESCRIPTION: BRIDGE NO. 36 ON -L- (US HWY 11) OVER MAXWELL CREEK AT -L- STATION 23+55 SITE DESCRIPTION: BRIDGE NO. 36 ON -L- (US HWY 11) OVER MAXWELL CREEK AT -L- STATION 23+55 **GROUND WTR (ft) GROUND WTR (ft) STATION**: 23+22 OFFSET: 8 ft LT ALIGNMENT: -L-OFFSET: 8 ft LT BORING NO.: B1-A 0 HR. -4.0 BORING NO.: B1-A **STATION**: 23+22 ALIGNMENT: -L-0 HR. -4.0 **EASTING**: 2,309,914 COLLAR ELEV.: 50.9 ft TOTAL DEPTH: 82.7 ft **NORTHING:** 408,435 **EASTING**: 2,309,914 COLLAR ELEV.: 50.9 ft TOTAL DEPTH: 82.7 ft **NORTHING**: 408,435 24 HR. FIAD 24 HR. FIAD DRILL RIG/HAMMER EFF./DATE: CAT1303 CME-550 94% 09/26/2018 **DRILL METHOD:** Mud Rotary HAMMER TYPE: AUTOMATIC HAMMER TYPE: AUTOMATIC DRILL RIG/HAMMER EFF./DATE: CAT1303 CME-550 94% 09/26/2018 **DRILL METHOD:** Mud Rotary DRILLER: D.T. Chalmers, Jr. **START DATE:** 08/28/19 COMP. DATE: 08/28/19 **SURFACE WATER DEPTH: 5.0ft** DRILLER: D.T. Chalmers, Jr. **START DATE:** 08/28/19 COMP. DATE: 08/28/19 SURFACE WATER DEPTH: 5.0ft ELEV DRIVE DEPTH BLOW COUNT ELEV DRIVE DEPTH BLOW COUNT **BLOWS PER FOOT BLOWS PER FOOT** SAMP # SAMP SOIL AND ROCK DESCRIPTION SOIL AND ROCK DESCRIPTION RESULT (ft) RESUL (ft) (ft) 0.5ft 0.5ft 0.5ft 0.5ft 0.5ft 0.5ft 75 100 (ft) 75 100 MOI G ELEV. (ft) WATER SURFACE (08/28/19) Match Line -25 BLUISH-GRAY, SILTY, F. SAND 33 Sat. (continued) **GROUND SURFACE** BLUISH-GRAY, F. AND CSE. SAND -30 -30.3 + 81.2 36 45 GRAY, F. SAND WITH WELL ROUNDED 45 Sat. | -31.8 GRAVEL UNDIVIDED COASTAL PLAIN BORING TERMINATED AT ELEVATION 46.9 -31.8 ft IN V. DENSE F. AND CSE. SAND 11 22 W DARK GRAY, SILTY AND CLAYEY, F. (PEEDEE FORMATION) SAND COASTAL PLAIN DARK GRAY, CLAY WITH TR. MICA AND HIGH SHELL FRAG. CONTENT AT BASE 39.7 -6 W (PEEDEE FORMATION) 34.7 + 16.2 2 W . . . . BLUISH-GRAY, F. SAND 30 29.7 + 21.2 22 25 Sat. GRAY, SANDY SILT WITH HIGH SHELL 24.7 + 26.2FRAG. CONTENT Sat. GRAY, CLAYEY AND SILTY, F. SAND 19.7 + 31.2 WITH SHELL FRAGS. W . . . . BLUISH GRAY, SILTY, F. SAND WITH 14 23 W GRAY, F. AND CSE. SAND WITH HIGH SHELL FRAG. CONTENT 14 . . . . Sat. LIGHT GRAY, SANDY CLAY WITH HIGH SHELL FRAG. CONTENT AND TR. 13 20 Sat WEATHERED LIMESTONE AT BASE OF STRATUM DARK GRAY, SANDY CLAY WITH SOME SHELL FRAG. AND TR. MICA AT BASE 5 W OF STRATUM -5.3 15 . . . . Sat DARK GRAY, CLAYEY SAND WITH HIGH -10.3 + 61.2SHELL FRAG. CONTENT GRAY, F. SAND WITH TR. SHELL FRAG. 33 Sat. GRAY, SILTY SAND WITH SOME SHELL -20.3 10 18 22 Sat.

### PROJECT REFERENCE NO. SHEET GEOTECHNICAL BORING REPORT CATLIN Engineers and Scientists B-5639 9 **BORE LOG** COUNTY: DUPLIN GEOLOGIST: K. SWAIN WBS: 45594.1.1 TIP: B-5639 WBS: 45594.1.1 **TIP:** B-5639 COUNTY: DUPLIN GEOLOGIST: K. SWAIN SITE DESCRIPTION: BRIDGE NO. 36 ON -L- (US HWY 11) OVER MAXWELL CREEK AT -L- STATION 23+55 **GROUND WTR (ft)** SITE DESCRIPTION: BRIDGE NO. 36 ON -L- (US HWY 11) OVER MAXWELL CREEK AT -L- STATION 23+55 **GROUND WTR (ft)** ALIGNMENT: -L-OFFSET: 9 ft RT OFFSET: 10 ft LT BORING NO.: B1-B **STATION**: 23+24 0 HR. FIAD BORING NO.: B2-A **STATION**: 23+87 ALIGNMENT: -L-0 HR. FIAD **EASTING**: 2,309,931 COLLAR ELEV.: 49.8 ft TOTAL DEPTH: 61.8 ft **NORTHING:** 408,440 TOTAL DEPTH: 63.5 ft 24 HR. FIAD COLLAR ELEV.: 51.4 ft **NORTHING:** 408,498 **EASTING**: 2,309,899 24 HR. FIAD **DRILL RIG/HAMMER EFF./DATE:** CAT4425 CME-55 87% 01/16/2019 HAMMER TYPE: AUTOMATIC **DRILL METHOD:** Mud Rotary **DRILL RIG/HAMMER EFF./DATE:** CAT4425 CME-55 87% 01/16/2019 **DRILL METHOD:** Mud Rotary HAMMER TYPE: AUTOMATIC **DRILLER:** J. EDMONDSON **START DATE:** 10/03/19 COMP. DATE: 10/03/19 SURFACE WATER DEPTH: 5.7ft **DRILLER:** J. EDMONDSON **START DATE:** 10/02/19 COMP. DATE: 10/02/19 SURFACE WATER DEPTH: 4.1ft ELEV DRIVE DEPTH BLOW COUNT ELEV DRIVE DEPTH **BLOWS PER FOOT BLOWS PER FOOT BLOW COUNT** SAMP # SAMP SOIL AND ROCK DESCRIPTION SOIL AND ROCK DESCRIPTION RESULT RESUL (ft) (ft) 0.5ft 0.5ft 0.5ft (ft) 0.5ft 0.5ft 0.5ft 75 100 75 100 MOI G (ft) (ft) ELEV. (ft) DEPTH (ft WATER SURFACE (10/03/19)\_ WATER SURFACE (10/02/19) 55 **GROUND SURFACE** WOR WOR WOH ALLUVIAL **GROUND SURFACE** TAN, F. SAND ALLUVIAL Sat. 48.5 (NO RETURN FROM SURFACE DRIVE) GRAVEL FRAGMENTS <u>47.3</u> 47.0 BLACK, F. SAND WITH TR. ORG. UNDIVIDED COASTAL PLAIN UNDIVIDED COASTAL PLAIN 45 W DARK GRAY, SILTY, F. SAND DARK GRAY, SILTY, F. SAND WITH TR. CLAY AND ORG. COASTAL PLAIN W BLACK, F. SANDY SILT AND F. SANDY COASTAL PLAIN 40 39.5 BLACK, F. SANDY SILT WITH TR. WHITE 39.4 + 12.0 CLAY WITH TR. ORG. 10 12 М SAND GRAINS M (PEEDEE FORMATION) (PEEDEE FORMATION) BLACK, SILTY, F. SAND WITH SHELLS 344 + 170AND TR. CSE. SAND 10 . . . . . . W W GRAY, WHITE, AND BLACK GREENISH GRAY, SILTY, F. SAND GREENISH BLACK AND WHITE, F. SAND DRILLER NOTE "HARD DRILLING" . . 30 30 29.5 GREENISH GRAY, BLACK, AND WHITE 19 20 W Sat. F. SAND. GLAUCONITIC GRAY, F. SANDY SILT WITH LITTLE GRAY, F. SANDY SILT WITH SOME 25 24.5 + 25.3SHELL FRAGS. 24.4 + 27.0 SHELLS 6 W Sat. GRAY, SILTY F. SAND WITH SILT LAMINATIONS AND LITTLE SHELL CONTENT 20.0 DRILLER NOTE TIGHTS STATES GRAY, SILTY, F. SAND WITH SOME 20 20 19.5 + 32 0 . . . . . . W Sat. SHELL FRAGS. GREENISH GRAY, F. SAND WITH CLAY GREENISH GRAY WITH BLACK AND . . . . - -14.5 WHITE SPECKLES. F. SAND WITH CLAY LAMINATIONS AND TR. SHELLS 29 22 35 26 29 W LAMINATIONS AND TR. WOOD. Sat. **GLAUCONITIC** + 420 15 . . . . . . W Sat. DRILLER NOTE "HARD DRILLING" DRILLER NOTE "HARD" DRILLING DARK GRAY, F. SANDY SILT WITH HIGH GRAY, SILTY, F. SAND WITH LITTLE SHELL FRAGMENT CONTENT GRADING SHELL FRAGS 16 20 W TO TR. SHELL FRAGS. GRAY, SILT WITH TR. F. SAND AND LITTLE SHELLS **+** 52.0 W M GRAY, SILT WITH TR. F. SAND AND -5.5 W LITTLE SHELLS 00/0 54 100/0.5 31 М DARK GRAY, SILTY, F. SAND WITH GRAY, SILTY, F. SAND WITH LITTLE -10 -10 -10.5 -10.6 + 62.0 SHELL FRAGS. LITTLE SHELL CONTENT 8 16 W BORING TERMINATED AT ELEVATION BORING TERMINATED AT ELEVATION -12.0 ft IN MED. DENSE SILTY SAND -12.1 ft IN MED. DENSE SILTY SAND

### SHEET GEOTECHNICAL BORING REPORT CATLIN Engineers and Scientists PROJECT REFERENCE NO. B-5639 10 **BORE LOG** GEOLOGIST: C. FUTRAL **TIP**: B-5639 COUNTY: DUPLIN COUNTY: DUPLIN GEOLOGIST: C. FUTRAL WBS: 45594.1.1 **WBS:** 45594.1.1 **TIP:** B-5639 SITE DESCRIPTION: BRIDGE NO. 36 ON -L- (US HWY 11) OVER MAXWELL CREEK AT -L- STATION 23+55 **GROUND WTR (ft)** SITE DESCRIPTION: BRIDGE NO. 36 ON -L- (US HWY 11) OVER MAXWELL CREEK AT -L- STATION 23+55 **GROUND WTR (ft)** OFFSET: 8 ft RT ALIGNMENT: -L-OFFSET: 8 ft RT BORING NO.: B2-B **STATION**: 23+86 0 HR. -2.2 BORING NO.: B2-B **STATION**: 23+86 ALIGNMENT: -L-0 HR. -2.2 **EASTING**: 2,309,917 COLLAR ELEV.: 52.4 ft TOTAL DEPTH: 78.9 ft **NORTHING:** 408,501 **EASTING**: 2,309,917 TOTAL DEPTH: 78.9 ft 24 HR. FIAD COLLAR ELEV.: 52.4 ft **NORTHING**: 408,501 24 HR. FIAD DRILL RIG/HAMMER EFF./DATE: CAT1303 CME-550 94% 09/26/2018 HAMMER TYPE: AUTOMATIC **DRILL METHOD:** Mud Rotary DRILL RIG/HAMMER EFF./DATE: CAT1303 CME-550 94% 09/26/2018 DRILL METHOD: Mud Rotary **HAMMER TYPE: AUTOMATIC** DRILLER: D.T. Chalmers, Jr. **START DATE:** 08/29/19 COMP. DATE: 08/29/19 **SURFACE WATER DEPTH: 3.5ft** DRILLER: D.T. Chalmers, Jr. **START DATE:** 08/29/19 COMP. DATE: 08/29/19 SURFACE WATER DEPTH: 3.5ft ELEV DRIVE DEPTH BLOW COUNT ELEV DRIVE DEPTH BLOW COUNT **BLOWS PER FOOT BLOWS PER FOOT** SAMP # SAMP SOIL AND ROCK DESCRIPTION SOIL AND ROCK DESCRIPTION RESULT (ft) RESUL (ft) 0.5ft 0.5ft 0.5ft MOI G 0.5ft 0.5ft 0.5ft 75 100 (ft) 75 100 ELEV. (ft) WATER SURFACE (08/29/19) Match Line -25 BLUISH-GRAY, F. AND CSE. SAND (continued) **GROUND SURFACE** BORING TERMINATED AT ELEVATION ALLUVIAL LIGHT GRAY, F. SAND WITH WELL ROUNDED GRAVEL Sat. -26.5 ft IN V. DENSE F. AND CSE. SAND (PEEDEE FORMATION) 49 1 Sat. UNDIVIDED COASTAL PLAIN 45.0 DARK GRAY, SILTY, F. SAND Sat. COASTAL PLAIN DARK GRAY, CLAY WITH TR. SHELL 40.0 I 12.4 FRAGS. AT BASE OF STRATUM W (PEEDEE FORMATION) 35.0 17.4 2 W . . . . BLUISH-GRAY, F. AND CSE. SAND 30 30.0 1 22.4 28 29 Sat. GRAY, SANDY CLAY WITH HIGH SHELL FRAG. CONTENT 25.0 27.4 W GRAY, LIMESTONE 20.0 32.4 Sat. 60/0.1 GRAY, F. AND CSE. SAND WITH TR. 15.0 CLAY AND WOOD FRAGS. AT BASE OF 22 25 Sat. 10.0 T 42.4 Sat. . . . . GRAY, CLAY WITH MOD. TO HIGH SHELL FRAG. CONTENT AND TR. F. 5.0 W 4 W 48 34 W GRAY, CLAYEY, F. SAND -10.0 62 W GRAY, SILTY AND CLAYEY F. SAND -15.0 I 67.4 26 30 32 W -20.0 72.4 15 23 Sat. . . . . BLUISH-GRAY, F. AND CSE. SAND

## GEOTECHNICAL BORING REPORT BORE LOG

COUNTY: DUPLIN **WBS**: 45594.1.1 **TIP**: B-5639 **GEOLOGIST:** C. FUTRAL SITE DESCRIPTION: BRIDGE NO. 36 ON -L- (US HWY 11) OVER MAXWELL CREEK AT -L- STATION 23+55 **GROUND WTR (ft)** BORING NO.: EB2-A OFFSET: 16 ft LT **STATION**: 24+40 ALIGNMENT: -L-10.0 COLLAR ELEV.: 67.4 ft TOTAL DEPTH: 69.8 ft **NORTHING**: 408,548 **EASTING**: 2,309,882 FIAD 24 HR. DRILL RIG/HAMMER EFF./DATE: CAT1303 CME-550 94% 09/26/2018 **DRILL METHOD:** Mud Rotary HAMMER TYPE: AUTOMATIC DRILLER: D.T. Chalmers, Jr. **START DATE:** 08/27/19 **COMP. DATE:** 08/27/19 SURFACE WATER DEPTH: N/A ELEV DRIVE DEPTH BLOW COUNT **BLOWS PER FOOT** SAMP # SOIL AND ROCK DESCRIPTION (ft) (ft) 0.5ft 0.5ft 0.5ft RESULT MOI G 75 100 ELEV. (ft) **GROUND SURFACE** 67.4 ROADWAY EMBANKMENT D BROWN GRADING TO GRAY WITH ORANGE MOTTLING, SANDY CLAY 65 М 60 DARK GRAY, SILTY, F. SAND 59.2 Μ ALLUVIAL 11.0 GRAY, CLAY WITH TRACE WOOD FRAGMENTS. 54.1 📘 13.3 WOH WOH WOH W UNDIVIDED COASTAL PLAIN 50 49.1 GRAY, F. SAND . . . . 12 W 45 COASTAL PLAIN DARK GRAY, SANDY CLAY WITH HIGH 14 14 W SHELL FRAG. CONTENT AT BASE OF (PEEDEE FORMATION) 40 39 1 T 28 3 W . . . . 3 Sat. DARK GRAY, CLAYEY, F. AND CSE. SAND WITH SHELL FRAGMENTS . . . . GRAY, F. AND CSE. SAND 29.1 38.3 W 25.9 GRAY, F. SAND WITH SILT AND HIGH 25 24 1 SHELL FRAG. CONTENT . . . . Sat. GRAY, LIMESTONE CONSISTING OF CALCITE CEMENTED SILTY AND 19.1 10 90/0.1 Sat. CLAYEY, F. SAND WITH HIGH SHELL 100/0.6 FRAG. CONTENT GRAY, F. AND CSE. SAND WITH HIGH SHELL FRAG. CONTENT Sat. . . . . 17 23 Sat. 22 22 W GRAY, SANDY CLAY WITH HIGH SHELL FRAG. CONTENT . . . . W BORING TERMINATED AT ELEVATION -2.4 ft IN STIFF SANDY CLAY (PEEDEE



PROJECT REFERENCE NO. SHEET
B-5639 11



PROJECT REFERENCE NO. SHEET
B-5639 12



BRIDGE NO. 36 ON US 11 OVER MAXWELL CREEK



BRIDGE NO. 36 DETOUR OVER MAXWELL CREEK