	SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION CONTENTS LINE STATION PLAN	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT
1439	-L- 13+00 TO 21+00 4	ROADWAY SUBSURFACE INVESTIGATION
i: B−4	CROSS SECTIONSLINESTATION-L-I3+00 TO 20+505-I0	COUNTY <u>BRUNSWICK</u> PROJECT DESCRIPTION <u>BRIDGE NO. 100 ON -L- (SR 134</u> 2) <u>OVER MUDDY BRANCH</u>
ENCE		INVENTORY
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38366		
PROJECT:		
PR		

STATE PROJECT REFERENCE NO. SHEET NO. TOTAL SHEETS STATE N.C. **B-4439** 10 1

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 1999 TOT-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAIL

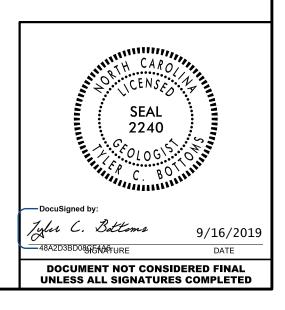
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU UNPLACED TEST DATA CAN BE RELIED ON ONLY TO THE DECREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARANT 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 INVESTIGATION AS HE DEEMS NECESSART TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OF 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:
 THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

S.N. ZIMARINO
R.E. SMITH
INVESTIGATED BY BOTTOMS
DRAWN BY BOTTOMS
CHECKED BY D.N. ARGENBRIGHT
SUBMITTED BY
DATE AUGUST 2019



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				
BE PENET ACCORDIN	RATED WITH A	NCONSOLIDATED, SEMI-C A CONTINUOUS FLIGHT TANDARD PENETRATION AASHTO SYSTEM, BASI	POWER AUGER A TEST (AASHTO	ND YIELD LES T 206,ASTM (S THAN 100 BLOWS P 01586), SOIL CLASSIFI	ER FOOT CATION	UNIFORMLY GRADED - IN	TES A GOOD REPRESENTATION OF PART NDICATES THAT SOIL PARTICLES ARE (ES A MIXTURE OF UNIFORM PARTICLE S	ALL APPROXIMATELY THE SAME SIZE	ROCK LINE IN SPT REFUSAL BLOWS IN NOT	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN				
		EXTURE, MOISTURE, AASH										ONE OF WEATHERE TYPICALLY DIVIDE			
AS MINERALOGICAL COMPOSITION, ANOULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, WOIST WITH INTERBEDDED FINE SMID LAPERS, HIGHLY PLASTIC, A-7-6 SOIL LEGEND AND AASHTO CLASSIFICATION					S.HIGHLY PLASTIC, A-7-6	,	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR <u>ROUNDED</u> .			WEATHERED ROCK (WR)	20 1112	NON-		MATERIAL THAT WOULD YIE	LD SPT N VALUES >
GENERAL	GR	ANULAR MATERIALS	SILT-CLA	y materials	ORGANIC MATER			MINERALOGICAL COMPOS	SITION	CRYSTALLINE				RAIN IGNEOUS AND METAMORP	
CLASS. GROUP		35% PASSING #200) 3 A-2		ASSING =200) A-6 A-7	A-1, A-2 A-4, A-5			MES SUCH AS QUARTZ.FELDSPAR.MICA. N DESCRIPTIONS WHEN THEY ARE CONS		ROCK (CR)	GNEISS, GABBRO, SC		SS. GABBRO. SCH	REFUSAL IF TESTED. ROCK T HIST.ETC. RAIN METAMORPHIC AND NON-	
	A-1-a A-1-b	A-2-4 A-2-5 A-2-6 4	A-2-7	A-7-5 A-7-6	A-3 A-6, A-7			COMPRESSIBILITY	(NON-CRYSTALL ROCK (NCR)	.INE	SEDI	MENTARY ROCK	THAT WOULD YEILD SPT REF	USAL IF TESTED.
SYMBOL								HTLY COMPRESSIBLE ERATELY COMPRESSIBLE	LL < 31 LL = 31 - 50	COASTAL PLAI	N F			S PHYLLITE, SLATE, SANDSTO DIMENTS CEMENTED INTO ROC	
7. PASSING 10 5	<u></u>				GRANULAR SILT-	MUCK	НІСНІ	PERCENTAGE OF MATE	LL > 50	SEDIMENTARY (CP)		SPT		TYPE INCLUDES LIMESTONE,	
-	0 MX 0 MX 50 MX 51	MN				MUCK, PEAT							WEATH	ERING	
•200 1	5 MX 25 MX 10	MX 35 MX 35 MX 35 MX 3	35 MX 36 MN 36 M	N 36 MN 36 MN	SOILS		ORGANIC MATERIAL	<u>SOILS</u> SOILS	OTHER MATERIAL				GHT.FEW JOINTS	5 MAY SHOW SLIGHT STAINING.	ROCK RINGS UNDER
MATERIAL PASSING #40 LL PI	 6 MX N	- 40 MX 41 MN 40 MX 4			SOILS WITH LITTLE OR	HIGHLY	TRACE OF ORGANIC M LITTLE ORGANIC MAT MODERATELY ORGANIC HIGHLY ORGANIC	TER 3 - 5% 5 - 12%	TRACE 1 - 10% LITTLE 10 - 20% SOME 20 - 35% HIGHLY 35% AND ABOVE	VERY SLIGHT (V SLI.)	ROCK GEI	S ON A BROKEN SP	ECIMEN FACE SH	SOME JOINTS MAY SHOW THIN HINE BRIGHTLY. ROCK RINGS U	
				X 16 MX NO MX	MODERATE	ORGANIC		GROUND WATER				YSTALLINE NATURE.			
	TONE FRAGS.	0 0 4 M	X 8 MX 12 M SILTY	CLAYEY	AMOUNTS OF ORGANIC MATTER	SOILS	▽	WATER LEVEL IN BORE HOLE IMMED	DIATELY AFTER DRILLING	(SLI.)	1 INCH. O	OPEN JOINTS MAY (CONTAIN CLAY. I	ND DISCOLORATION EXTENDS I N GRANITOID ROCKS SOME OCC STALLINE ROCKS RING UNDER	ASIONAL FELDSPAR
OF MAJOR (MATERIALS		AND GRAVEL AND SAND		SOILS			▼	STATIC WATER LEVEL AFTER 24	HOURS					COLORATION AND WEATHERING E	
GEN. RATING					FAIR TO BOOD		√PW	PERCHED WATER, SATURATED ZONE, (OR WATER BEARING STRATA	(MOD.)	GRANITOI	ID ROCKS, MOST FEL	DSPARS ARE DU	JLL AND DISCOLORED, SOME SH	OW CLAY. ROCK HAS
AS SUBGRADE	EX	CELLENT TO GOOD	FAIR	TO POOR	POOR	UNSUITABLE						UND UNDER HAMMEF ESH ROCK.	R BLOWS AND SH	IOWS SIGNIFICANT LOSS OF ST	RENGTH AS COMPARED
	PI	OF A-7-5 SUBGROUP IS \leq	LL - 30 ; PI OF A-	7-6 SUBGROUP IS	> LL - 30			SPRING OR SEEP						STAINED. IN GRANITOID ROCKS	ALL FELDSPARS DULL
		CONSISTEN	NCY OR DE	NSENESS				MISCELLANEOUS SYME	BOLS					AOLINIZATION. ROCK SHOWS SE	
		COMPACTNESS OR		F STANDARD	RANGE OF UNC		—	34NKMENT (RE) 25/025 DIP & DIP D				I BE EXCAVATED WI ED.WOULD YIELD SI		'S PICK. ROCK GIVES 'CLUNK'	SOUND WHEN STRUCK.
GENERAL		CONSISTENCY VERY LOOSE	(N-	N RESISTENCE VALUE) < 4	COMPRESSIVE S (TONS/F	²)				SEVERE (SEV.)	ALL ROCK	K EXCEPT QUARTZ	DISCOLORED OR STRONG SOIL. IN	STAINED, ROCK FABRIC CLEAR N GRANITOID ROCKS ALL FELDS	
GRANULA		LOOSE		TO 10 TO 30	N/A		- SOIE STINDOE	VST PMT				EXTENT. SOME FR ED.WOULD YIELD SI		RONG ROCK USUALLY REMAIN.	
MATERIA		MEDIUM DENSE DENSE		TO 50	N/A			TILL (AF) OTHER AUGER BORIN	NG 🛆 CONE PENETROMET	R				STAINED, ROCK FABRIC ELEME	NTS ARE DISCERNIBLE
(NON-COH	IESIVE)	VERY DENSE	;	· 50					0	SEVERE	BUT MAS	S IS EFFECTIVELY	REDUCED TO SC	DIL STATUS, WITH ONLY FRAGME	ENTS OF STRONG ROCK
		VERY SOFT		< 2	< 0.25		INFERRED SO	IL BOUNDARY CORE BORING	G • SOUNDING ROD					ROCK WEATHERED TO A DEGRE IN. <u>IF TESTED, WOULD YIELD S</u>	
GENERAL SILT-CL4		SOFT MEDIUM STIFF		TO 4 TO 8	0.25 TO 0.5 TO		INFERRED ROOM		TEST BORING					DISCERNIBLE, OR DISCERNIBLE	
MATERIA		STIFF		TO 15	1 TO 2			•	WITH CORE					BE PRESENT AS DIKES OR STR	
COHESIV	E)	VERY STIFF		TO 30	2 TO -	ł	ALLUVIAL SO	IL BOUNDARY A PIEZOMETER INSTALLATIO	DN OF SPT N-VALUE			EXAMPLE.			
		HARD			> 4			RECOMMENDATION SYM					ROCK HA	RDNESS	
		TEXTURE	E OR GRAI	N SIZE										P PICK. BREAKING OF HAND SP	ECIMENS REQUIRES
U.S. STD. SIE OPENING (MM		4 1 4.76 2.	0 40 00 0.40	60 200 0.25 0.07				UNCLASSIFIED EXCAVATION -	ACCEPTABLE, BUT NOT TO BE			HARD BLOWS OF T			
UPENING (MM		4./6 2.	00 0.42 COARSE	FINE			SHALLOW [UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK	USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL			SCRATCHED BY KNI		Y WITH DIFFICULTY. HARD HAM	MER BLOWS REQUIRED
BOULDER			SAND	SAN		CLAY		ACCEPTABLE DEGRADABLE ROCK	EMPHIKMENT OF BECKFILL					UGES OR GROOVES TO 0.25 INC	HES DEEP CAN BE
(BLDR.)	(COE	3.) (GR.)	(CSE. SD.)	(F SE	(SL.)	(CL.)		ABBREVIATIONS		HARD	EXCAVATE	ED BY HARD BLOW		T'S PICK. HAND SPECIMENS CA	
GRAIN MM		75 2	.0	0.25	0.05 0.005	i	AR - AUGER REFUSAL	MED MEDIUM	VST - VANE SHEAR TEST			RATE BLOWS.			
SIZE IN.	12	3					BT - BORING TERMINATE	D MICA MICACEOUS MOD MODERATELY	WEA WEATHERED γ - UNIT WEIGHT					DEEP BY FIRM PRESSURE OF K TICES 1 INCH MAXIMUM SIZE BY	
	SO	IL MOISTURE	- CORRELA	TION OF	TERMS		CPT - CONE PENETRATIO		√ _d - DRY UNIT WEIGHT			F A GEOLOGIST'S P			
	MOISTURE SC		MOISTURE	GUIDE FOR	FIELD MOISTURE DE	SCRIPTION	CSE COARSE DMT - DILATOMETER TES	ORG ORGANIC	TEST SAMPLE ABBREVIATIONS					NIFE OR PICK. CAN BE EXCAVA	
(HTT	ERBERG LIMI	DESC	CRIPTION				DPT - DYNAMIC PENETRA		S - BULK			iips to several ii Can be broken by		BY MODERATE BLOWS OF A PIC IRF.	K POINT. SMALL, THIN
			JRATED -		QUID: VERY WET. USU		e - VOID RATIO	SD SAND, SANDY	SS - SPLIT SPOON					VATED READILY WITH POINT OF	PICK, PIECES 1 INCH
LL			AT.)	FRUM BELU	W THE GROUND WATE	RIABLE	F - FINE FOSS FOSSILIFEROUS	SL SILT, SILTY SLI SLIGHTLY	ST - SHELBY TUBE RS - ROCK	SOFT	OR MORE	IN THICKNESS CAM		FINGER PRESSURE. CAN BE S	
PLASTIC				SEMISOL ID:	REQUIRES DRYING TO	1	FRAC FRACTURED, FRAC				FINGERNA				
RANGE <		- WET	- (W)		IMUM MOISTURE		FRAGS FRAGMENTS HI HIGHLY	W - MOISTURE CONTENT V - VERY	CBR - CALIFORNIA BEARING RATIO		RACTL	JRE SPACING		BEDD	
PLL.	PLASTIC	LIMII								VERY WIDE		<u>SPACI</u> MORE THAN		TERM VERY THICKLY BEDDED	THICKNESS 4 FEET
ПМ		MOISTURE - MOIS	GT - (M)	SOLID; AT C	R NEAR OPTIMUM MO	ISTURE		UIPMENT USED ON SUBJEC		WIDE		3 TO 10		THICKLY BEDDED	1.5 - 4 FEET
	SHRINKAG						DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:	MODERATEL CLOSE	Y CLOSE	E 1 TO 3 F Ø.16 TO 1		THINLY BEDDED VERY THINLY BEDDED	0.16 - 1.5 FEET 0.03 - 0.16 FEET
		- DRY	- (D)	REQUIRES A	DDITIONAL WATER T	נ	LME-450	CLAY BITS		VERY CLOSE	E	LESS THAN @		THICKLY LAMINATED	0.008 - 0.03 FEET
1		JAT		ATTAIN OPT	IMUM MOISTURE		СМЕ-55	6" CONTINUOUS FLIGHT AUGER	CORE SIZE:					THINLY LAMINATED	< 0.008 FEET
	·	Ρ	LASTICITY				1	8" HOLLOW AUGERS	Вн	-			INDURA		
		PLA	STICITY INDEX	(P])	DRY STRENG	тн	CME-550	HARD FACED FINGER BITS	□-N	FOR SEDIMENT	ARY ROC			NG OF MATERIAL BY CEMENT	
	PLASTIC		0-5	_	VERY LOW			TUNGCARBIDE INSERTS		FRIABL	ē			INGER FREES NUMEROUS GRA	
	HTLY PLASTI ERATELY PLA		6-15 16-25		SLIGHT MEDIUM		VANE SHEAR TEST	CASING W/ ADVANCER	HAND TOOLS:	1					
	LY PLASTIC		26 OR MORE		HIGH		PORTABLE HOIST			MODERA	TELY IN			SEPARATED FROM SAMPLE W WHEN HIT WITH HAMMER,	ITH STEEL PROBE:
			COLOR				1	TRICONE TUNGCARB.	X HAND AUGER	1				FICULT TO SEPARATE WITH	STEEL PROBE.
							1 🗆			INDURA	ſED			REAK WITH HAMMER.	
		CLUDE COLOR OR COL						CORE BIT	X VANE SHEAR TEST	1		9	HARP HAMMER	BLOWS REQUIRED TO BREAK	SAMPLE:
MUL	JULIEUS 2001	1 HO LIGHT, DAKK, STR	CHRED, EIL, AR		ESURIDE APPEARANU			│ 凵	_ LJ	- EXTREM	IELY IND			ACROSS GRAINS.	

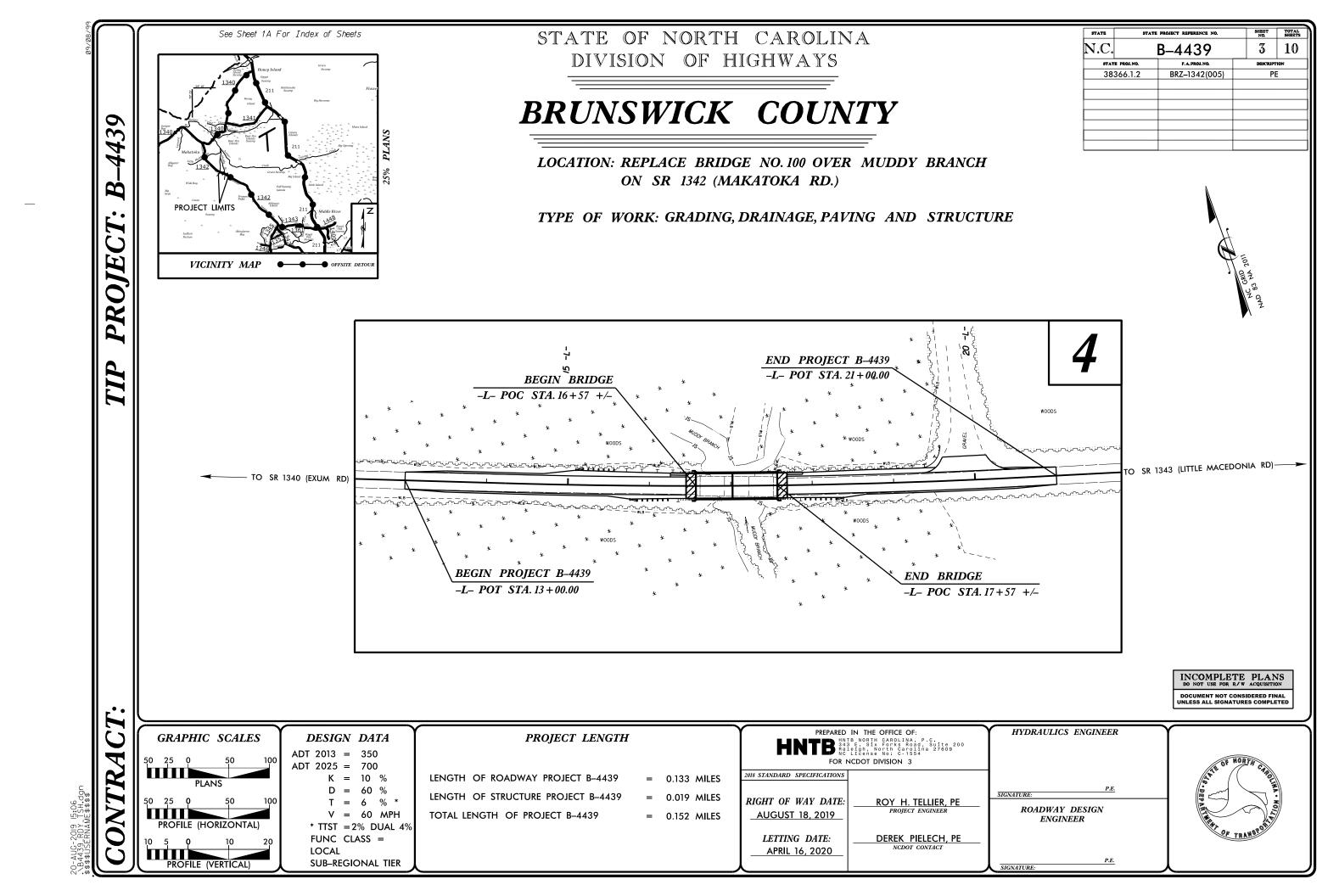




TERMS AND DEFINITIONS ED. AN INFERRED) SPT REFUSAL. 1 FOOT PER 60 IS OFTEN ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. N VALUES > ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND CK THAT SURFACE. CLUDES GRANITE, CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. AL PLAIN IF TESTED. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. MAY NOT YIELD STONE, 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. $\underline{\text{DIKE}}$ - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. RINGS UNDER DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL . NATINGS IF OPEN. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. AMMER BLOWS IF FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE ІСК ИР ТО SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FELDSPAR FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. BLOWS. $\underline{\mathsf{FLOAT}}$ - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. . IN Y. ROCK HAS AS COMPARED FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. ELDSPARS DULL OSS OF STRENGTH WHEN STRUCK. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO VIDENT BUT ITS LATERAL EXTENT. ARE KAOLINIZED LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. RE DISCERNIBLE PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE STRONG ROCK T ONLY MINOR VALUES < 100 BPF OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK OUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SECMENTS EQUAL TO OR CREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE IN SMALL AND SAPROLITE IS RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT S REQUIRES SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO LOWS REQUIRED THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. $\underline{\text{SLICKENSIDE}}$ - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. EEP CAN BE ETACHED STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL R PICK POINT WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL BLOWS OF THE TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. $\underline{STRATA CORE RECOVERY (SREC.)}$ - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. FRAGMENTS IT. SMALL. THIN STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. PIECES 1 INCH ED READILY BY TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK: b4439_ls_tnl_190211.tin THICKNESS 4 FEET ELEVATION: .5 - 4 FEET 16 - 1.5 FEET NOTES: 3 - Ø.16 FEET 08 - 0.03 FEET 0.008 FEET

DATE: 8-15-14

FEET





STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

ROY COOPER GOVERNOR

August 21, 2019

State Project: 38366.1.2 (B-4439) F.A. Project: BRZ-1342(005) County: Brunswick Description: Bridge No. 100 on -L- (SR 1342) over Muddy Branch

Subject: Geotechnical Inventory Report

Project Description

This project begins approximately 350 feet west of Bridge Number 100 over Muddy Branch on Makatoka Road (SR 1342) in Brunswick County, and extends east along Makatoka Road for approximately 0.15 miles. This geotechnical investigation was confined to the areas of proposed construction.

Fieldwork was conducted in August of 2019. Hand auger borings and push probes were completed at various offsets along the project corridor. Representative soil samples were collected for visual classification in the field.

The following alignment was investigated. Selected cross sections of this alignment is included in this report.

Line

 $Station(\pm)$

-L-

13+00 to 21+00

Areas of Special Geotechnical Interest

1) The entire project was found to exhibit seasonal high ground water.

2) The following section contains organic soils which have the potential to cause embankment/subgrade and or slope stability problems during construction.

Line

 $Station(\pm)$

-L-

13+00 to 19+70

Mailing Address: NC DEPARTMENT OF TRANSPORTATION GEOTECHNICAL ENGINEERING UNIT -EASTERN REGIONAL OFFICE 1570 MAIL SERVICE CENTER RALEIGH, NC 27699-1570

Telephone: (919) 662-4710 Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location 3301 JONES SAUSAGE RD. SUITE 100 GARNER, NC 27529 3) The following section contains cohesive soils which have the potential to cause embankment/subgrade and or slope stability problems during construction.

Line

-L-

This project corridor is located within the Coastal Plain Physiographic Province. Topography along the project is nearly flat to gently sloping. Natural ground elevations ranged from $42\pm$ to $49\pm$ feet above sea level.

Surficial soils in this area are generally classified as undivided coastal plain sediments and are underlain by formational soils belonging to the Peedee Formation.

Ground water data was collected in August of 2019. Ground water elevations ranged from $44\pm$ to $45\pm$ feet above sea level.

Soils encountered within this project area have been divided into two categories: Roadway Embankment and alluvial soils.

Roadway embankment soils were found along the existing Makatoka Road corridor. Where encountered it was composed of $1\pm$ to $7\pm$ feet of loose sand (A-2-4, A-1-b).

Soils identified as alluvial were encountered beneath Makatoka Road and within the floodplain of Muddy Branch. These soils are composed of $4\pm$ to $10\pm$ feet of soft muck, 2 or more feet of loose sand (A-2-4), and 4 or more feet of medium stiff silty clay (A-7-6). Vane Shear tests taken within the muck suggest shear strengths ranging from 0 to 1357 PSF. The varying degree of shear strength values is due to the abundance of wood within the muck.

JAMES H. TROGDON, III SECRETARY

Sheet 3A

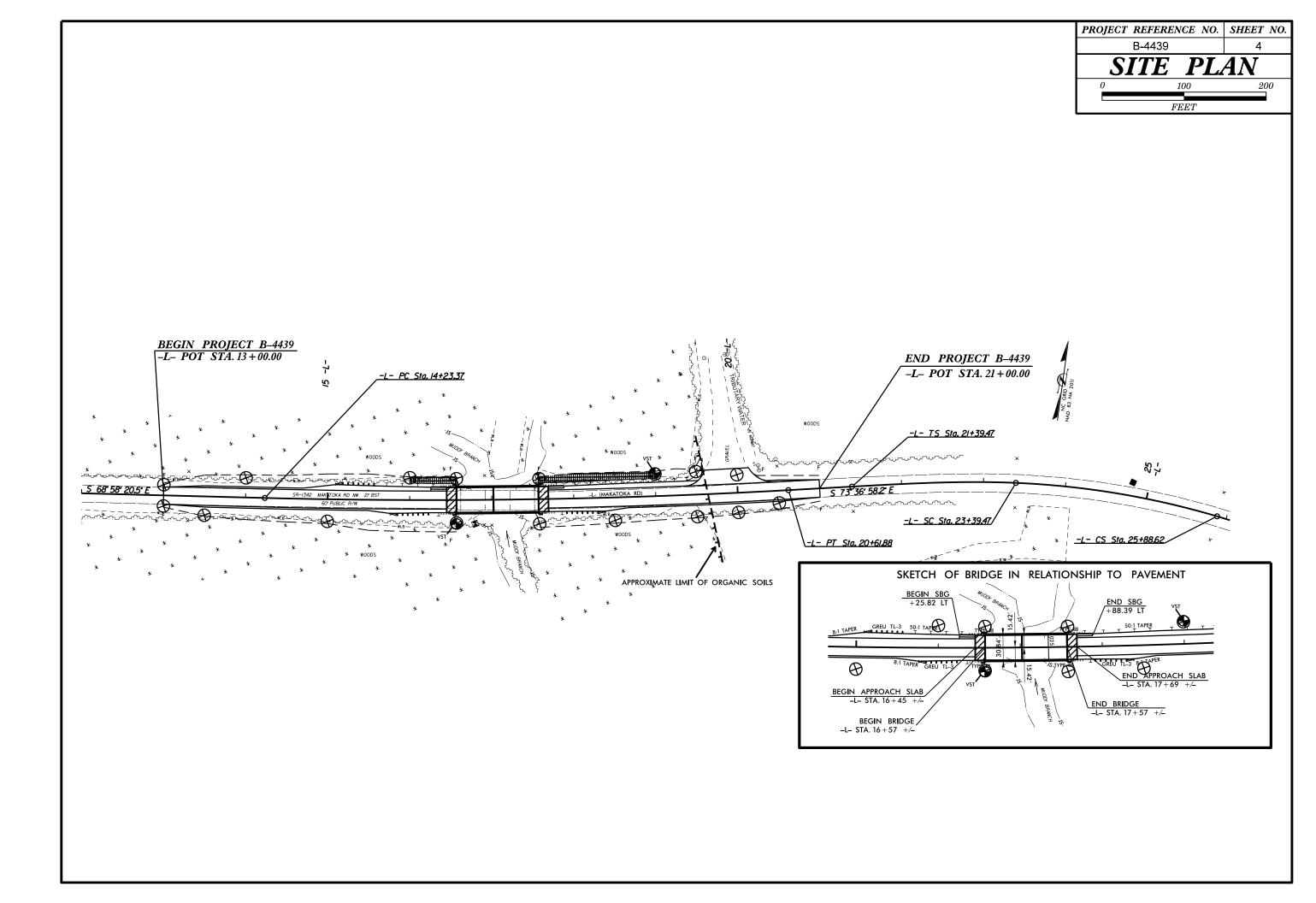
Station(\pm)

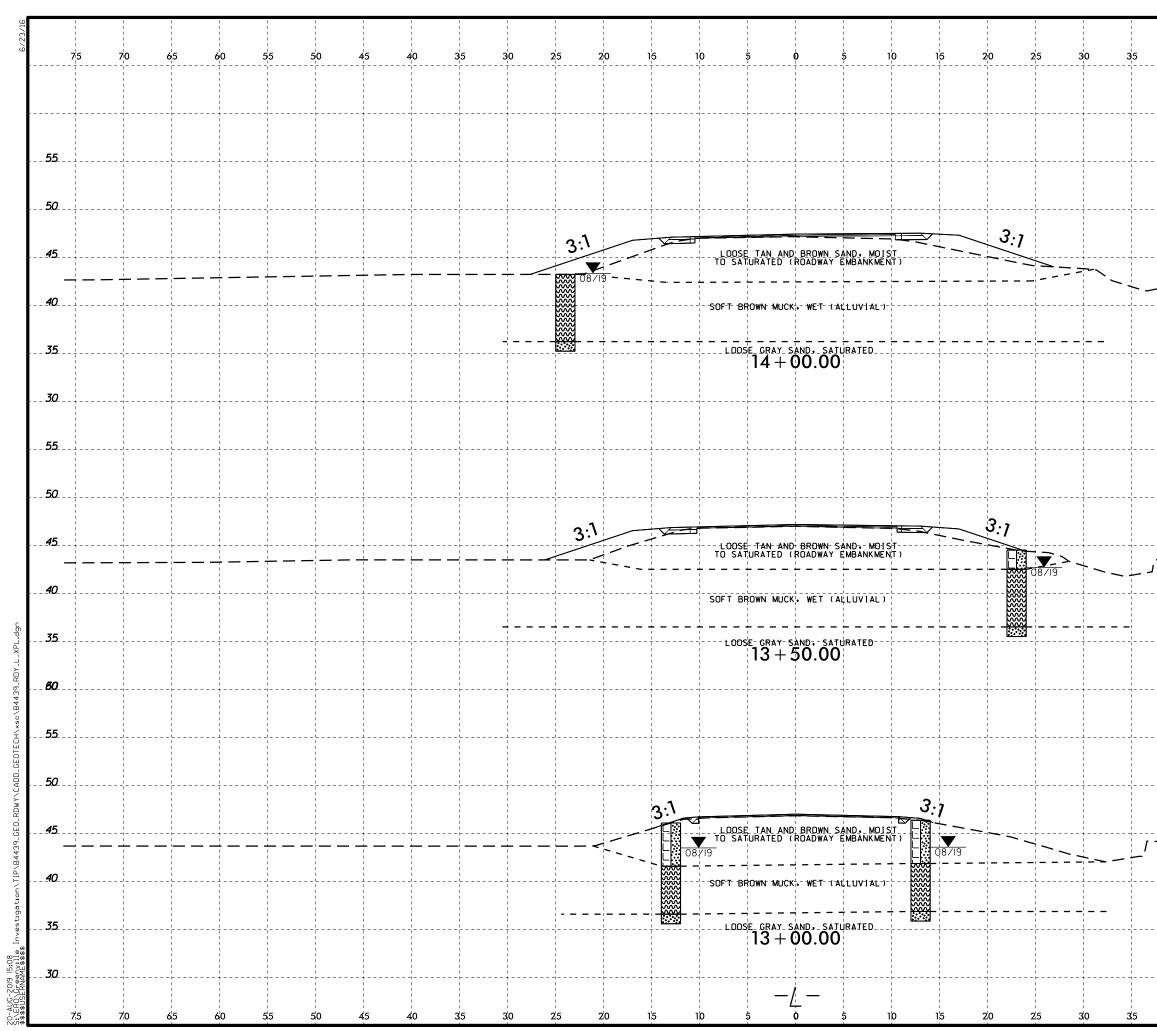
19+60 to 21+00

Physiography and Geology

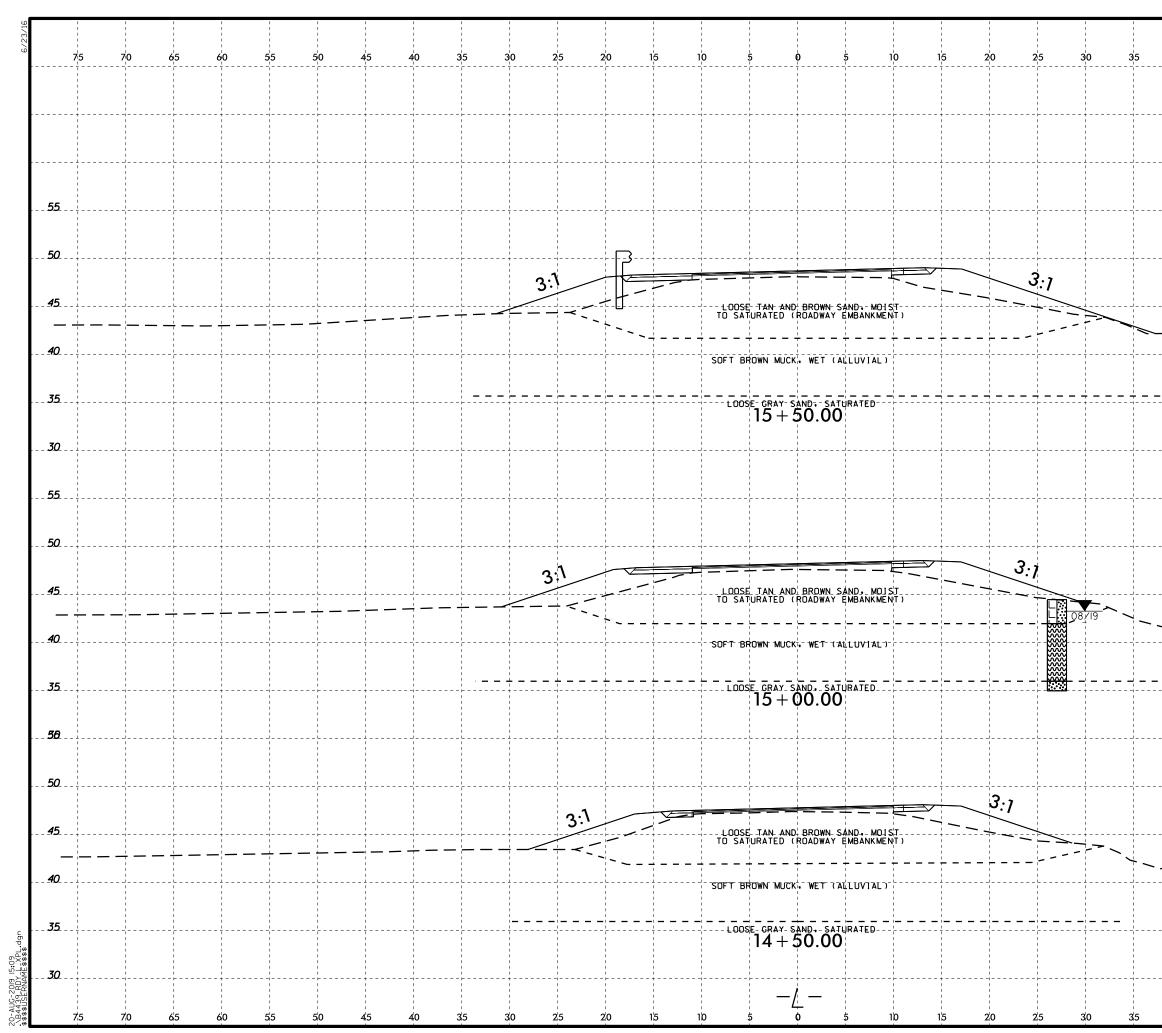
Ground Water

Soils

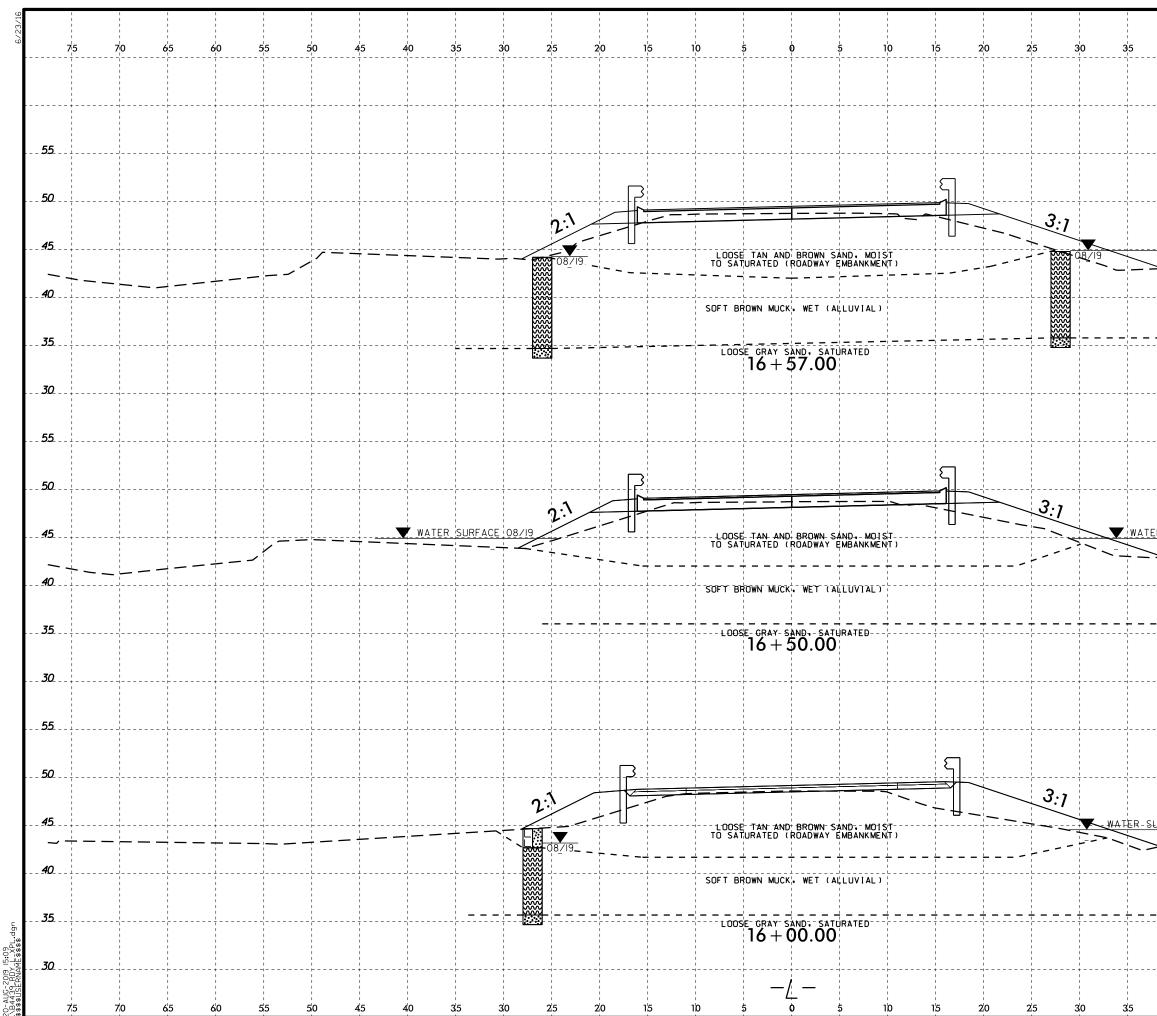




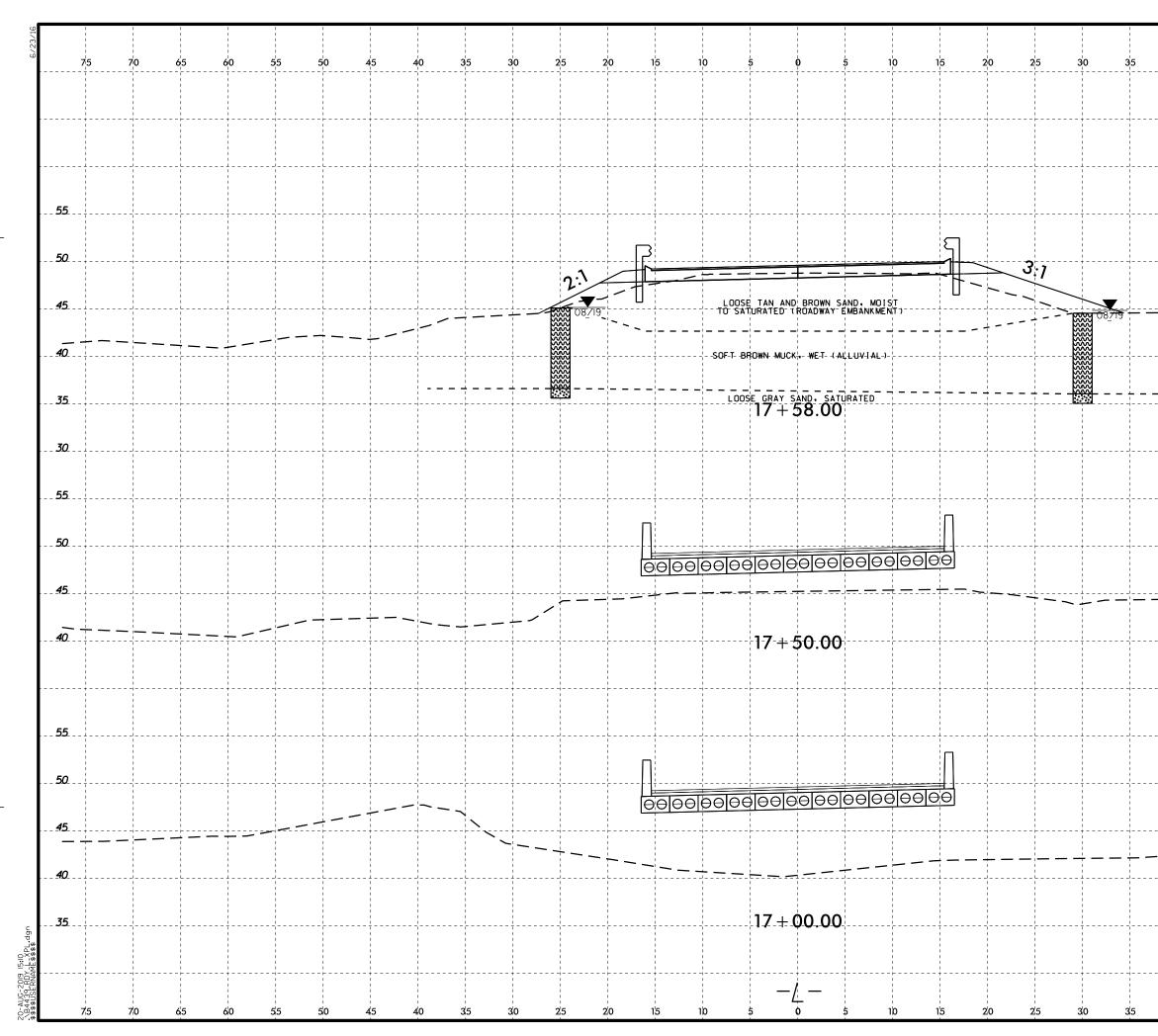
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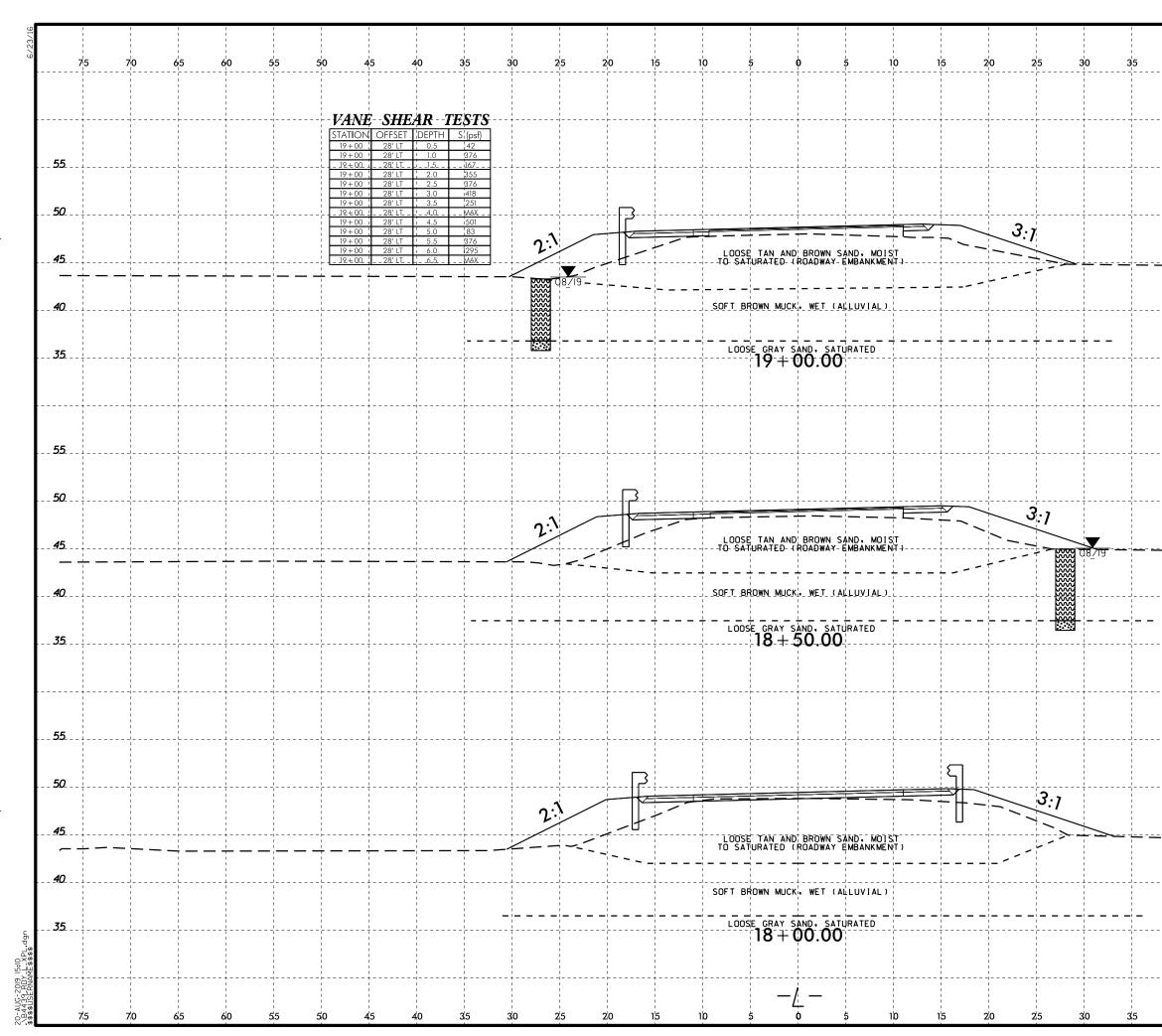
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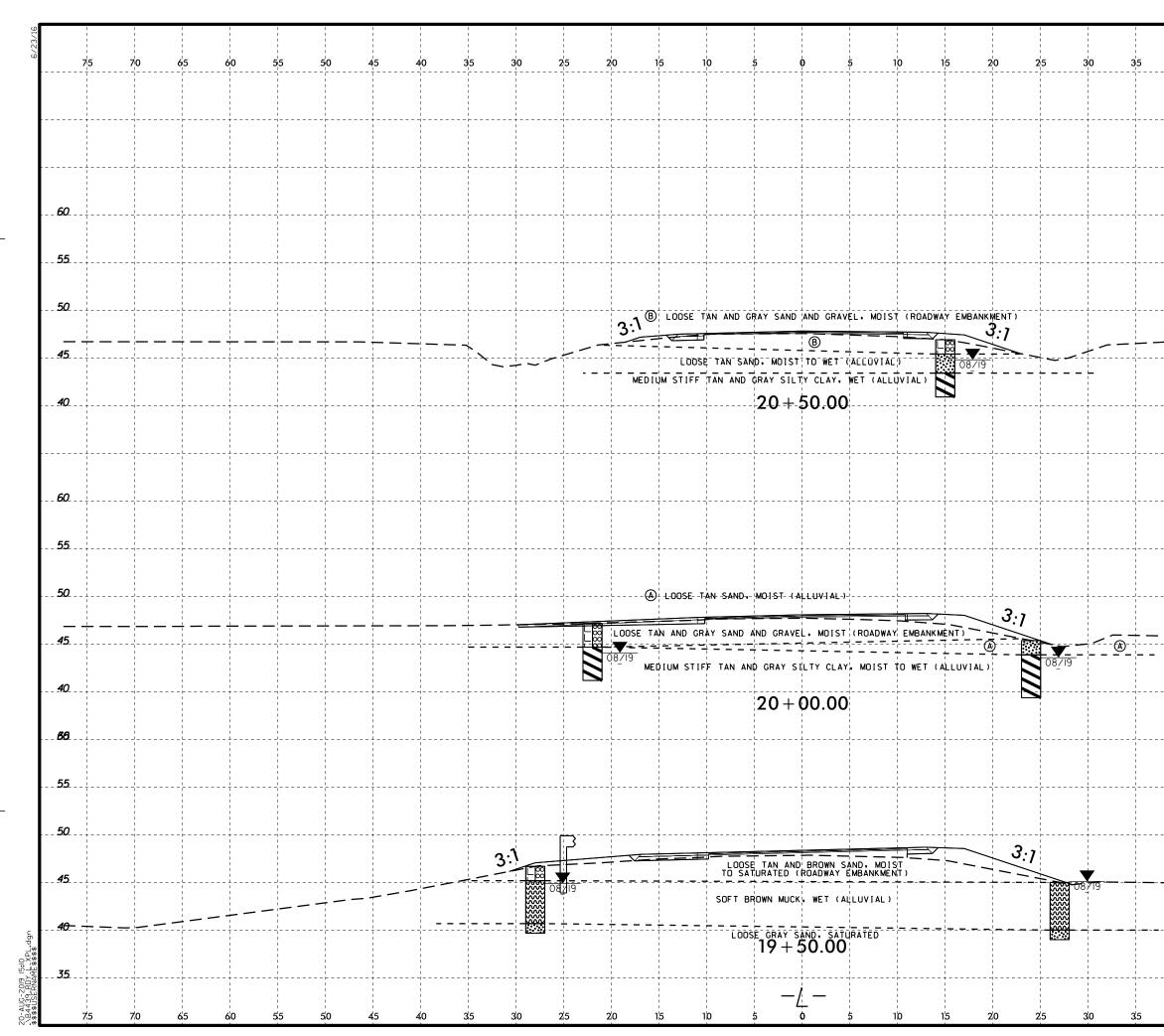
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