STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

CONTENTS

SHEET	DESCRIPTION						
1	TITLE SHEET						
2	LEGEND						
3	SITE PLAN						
4	PROFILE						
5	BORE LOGS						
6	SOIL TEST RESULTS						
7	SCOUR REPORT						

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33721.1.1 (B-4473) F.A. PROJ. BRSTP-1006(20)
COUNTY COLUMBUS
PROJECT DESCRIPTION BRIDGE NO. 78 ON SR 1006 OVER GRISSETT
SWAMP AT -L- STA. 12+65

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 LOSS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, CEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOSS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

CENERAL, 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 DETWEEN BORNOS OR BETWEEN SAMPLED STRATA THIRIN THE GORFHOLE. THE LABORATORY SAMPLE DATA AND THE IN STU IN-PLACE! TEST DATA CAN BE RELIED ON ONLY TO THE DESCREE OF RELIABLITY INNERENT IN THE STANDARD TEST METHOD. THE OSSERVED WATER LEVELS OR SOIL MOSTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS AND VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

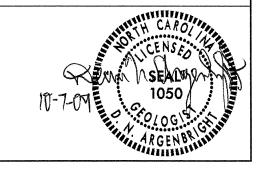
THE PLODER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE FRELMMARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT, FOR BIDDING AND CONSTRUCTION PLANDS. REFER TO THE CONSTRUCTION PLANDS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOT 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 SUBJEFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS 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 THE OCCUPY.

	T.C. BOTTOMS
	J.M. EDMONDSON
	R.E. SMITH

-	
INVESTIGATED BY	T.C. BOTTOMS
CHECKED BY	D.N. ARGENBRIGHT
	D.N. ARGENBRIGHT
JODMITTED 11	

PERSONNEL

SEPTEMBER 2009



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

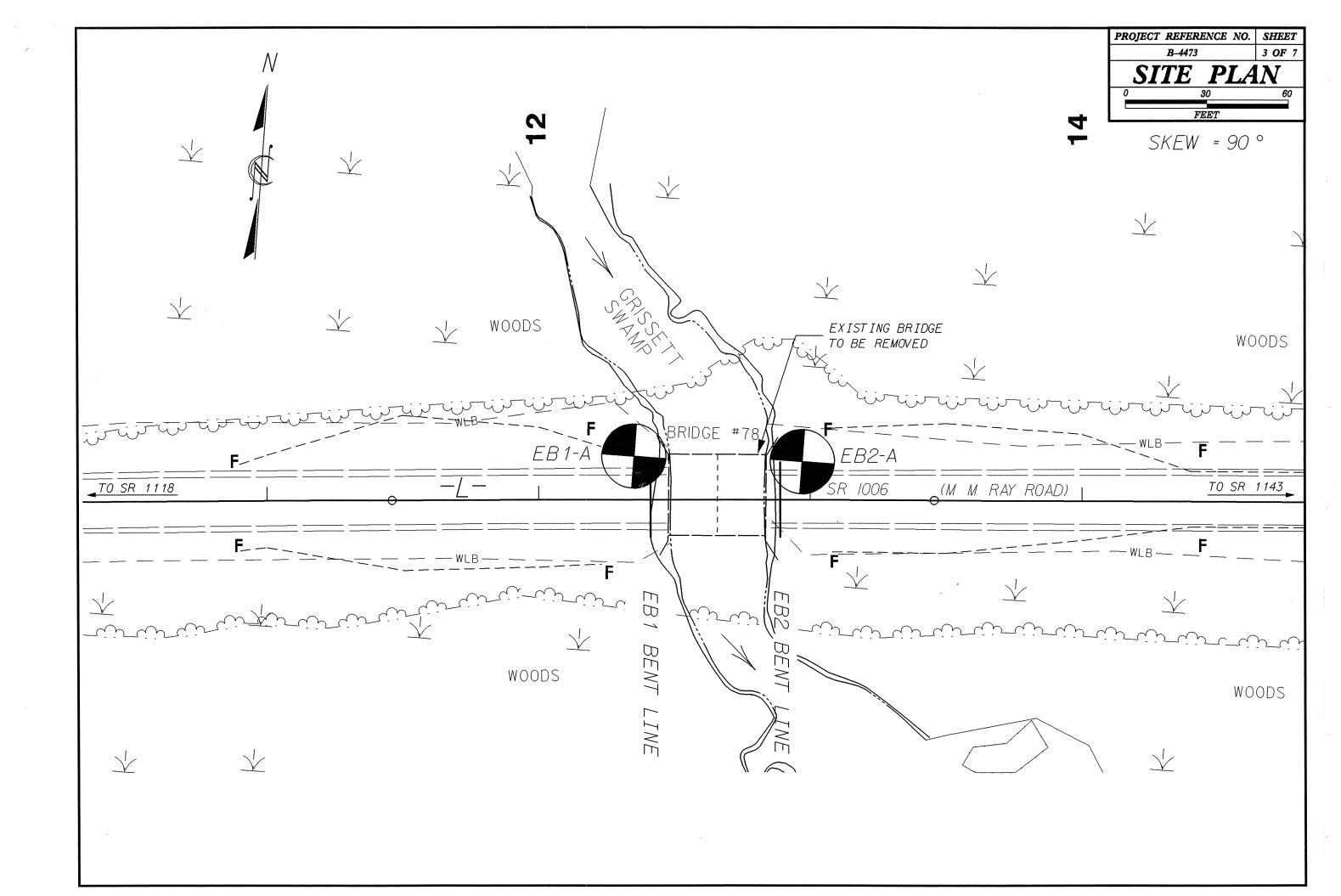
	SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS										
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS								
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 180 BLOWS PER FOOT ACCORDING TO STANDAMP DEVETRATION TEST (AASHTO 1206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE:	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. ANGUL ARTIY OF GRAINS	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL 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 EDUAL TO OR LESS THAN 01 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUJFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.								
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	THE ANGULARITY OR ROUNDNESS OF BOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR,	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEDUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,								
VERY STIFF, GRAY, SATY CLAY, MOIST WITH INTERBEDDED FINE SAND LAVERS, HIGHLY PLASTIC, A-7-6	SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL								
SOIL LEGEND AND AASHTO CLASSIFICATION GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS GRANULAR MATERIALS	MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS	CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.								
CLASS. (≤35% PASSING *200) (>35% PASSING *200) UHGANIC MATERIALS	WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	Seiss, Gabbro, Schist, etc.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.								
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-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-2-4 A-3-5 A-6, A-7	COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31	NON-CRYSTALLINE SEDIMENTARY ROCK THAT WOULD YELLD 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 LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 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 BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.								
X PASSING 10 50 MX GRANULAR SILT-		(CP) SHELL BEDS, ETC. WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT								
# 40 38 MX 56 MX 51 MN SOILS SOILS SOILS SOILS SOILS SOILS	UNCANUL MATERIAL SOILS SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 187	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE								
LIGUID LIMIT PLASTIC INDEX 6 MX NP 10 MX 11 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 50 ILS WITH PLASTIC INDEX 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN LITTLE OR GROUP INDEX 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		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 OF A CRYSTALLINE NATURE.	HORIZONTAL. <u>DIP DIRECTION (DIP AZIMUTH) -</u> THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.								
USUAL TYPES STONE FRAGS. FINE STUTY OR CLAYEY STUTY CLAYEY ORGANIC		SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.								
MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS MATTER	▼ STATIC WATER LEVEL AFTER 24 HOURS	CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS, IN	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.								
GEN.RATING AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITA SUBGRADE		(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	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.								
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP	WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.								
CONSISTENCY OR DENSENESS COMPACTNESS OR RENSE OF STANDARD RANGE OF UNCONFINED COMPACTNESS OR RENSE O	MISCELLANEOUS SYMBOLS FI ROADWAY EMBANKMENT (RF) ST CPT TOOL TOOL SAMPLE SAMPLE	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,	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.								
PRIMARY SOIL TYPE CUMPRESSIVE CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT ²)	WITH SOIL DESCRIPTION VST PHT LEST BURING DESIGNATIONS	IF TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.								
GENERALLY	S - BULK SAMPLE AUGER BORING SS - SPLIT SPOON	(SEV.) IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KADLINIZED TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.								
MATERIAL MEDIUM DENSE 10 TO 30 (N/H (NON-COHESIVE) DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY FMRANKMENT — CORE BORING	IF TESTED, YIELDS SPT N VALUES > 100 BPF VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	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								
VERY DENSE >50 VERY SOFT <2 <0.25	INFERRED SOIL BOUNDARY MONITORING WELL ST - SHELBY TUBE SAMPLE MONITORING WELL SO DOWN AND TO THE ST - SHELBY TUBE SAMPLE	(V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN								
GENERALLY SOFT 2 TO 4 0.25 TO 0.50 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE A PIEZOMETER	VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF	INTERVENING IMPERVIOUS STRATUM.								
MATERIAL STIFF 8 TO 15 1 TO 2	INSTALLATION RT - RECOMPACTED TRIAXIA SAMPLE SLOPE INDICATOR	AL 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 ALSO AN EXAMPLE.	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF								
HARD >30 >4 TEXTURE OR GRAIN SIZE	25/825 DIP & DIP DIRECTION OF INSTALLATION CBR - CALIFORNIA BEARING ROCK STRUCTURES RATIO SAMPLE	ROCK HARDNESS	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AN EXPRESSED AS A PERCENTAGE.								
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	SOUNDING ROD SPT N-VALUE SOUNDING ROD REF─ SPT REFUSAL	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REDUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.								
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	ABBREVIATIONS	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL								
BOULDER	AR - AUGER REFUSAL HI HIGHLY # - MOISTURE CONTENT BT - BORING TERMINATED MED MEDIUM V - VERY	TO DETACH HAND SPECIMEN. MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT REGULTS FROM FRICTION ALONG A FAULT OR								
GRAIN MM 305 75 2.0 0.25 0.05 0.005	CL CLAY MICA MICACEOUS VST - VANE SHEAR TEST CPT - CONE PENETRATION TEST MOD MODERATELY WEA WEATHERED	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	SLIP PLANE.								
SIZE IN. 12 3 SOIL MOISTURE - CORRELATION OF TERMS	CSE COARSE NP - NON PLASTIC 7 - UNIT WEIGHT DMT - DILATOMETER TEST ORG ORGANIC 7 - DRY UNIT WEIGHT	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB, HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH								
SOIL MOISTURE SCALE FIELD MOISTURE (ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST	POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	A 2 INCH DUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.								
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	F - FINE SD SAND, SANDY FOSS FOSSILIFEROUS SL SILT, SILTY	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.								
LL LIQUID LIMIT (SAT.) FROM BELOW THE GROUND WATER TABLE	FRAC FRACTURED, FRACTURES SLI SLIGHTLY FRAGS FRAGMENTS TCR - TRICONE REFUSAL	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	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 TH								
PLASTIC SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	FINGERNAIL. FRACTURE SPACING BEDDING	TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.								
PLASTIC LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	TERM SPACING TERM THICKNESS	BENCH MARK: BM NO.5 RR SPIKE IN 14" OAK AT -BL- STA.17+6189' RT								
OM OPTIMUM MOISTURE - MOIST - (M) SOLID: AT OR NEAR OPTIMUM MOISTUR		VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 2 FEET THINLY BEDDED 0.16 - 1.5 FEET	ELEVATION: 46.50 FT.								
REQUIRES ADDITIONAL WATER TO	6° CONTINUOUS FLIGHT AUGER CORE SIZE:	CLOSE 0.16 TO 1 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET	NOTES:								
- DRY - (D) ATTAIN OPTIMUM MOISTURE	BK-51 S' HOLLOW AUGERSB	THINLY LAMINATED < 0.008 FEET	Thores.								
PLASTICITY DESCRIPTION OF THE PROPERTY OF THE	X CME-46B HARD FACED FINGER BITS	INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	-								
PLASTICITY INDEX (PI) DRY STRENGTH NONPLASTIC 0-5 VERY LOW	CME-550 TUNG,-CARBIDE INSERTS -H-	DUDNING HAVE FREED HAVE BEEN AND ADDRESS.									
LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM	X CASING W/ ADVANCER HAND TOOLS:	GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.									
HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST X TRICONE 2 15/6 STEEL TEETH POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.									
COLOR	TRICONE TUNG,-CARB. HAND AUGER SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;									
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 SOUNDING ROD VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REDUIRED TO BREAK SAMPLE;									
The second of th		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.									

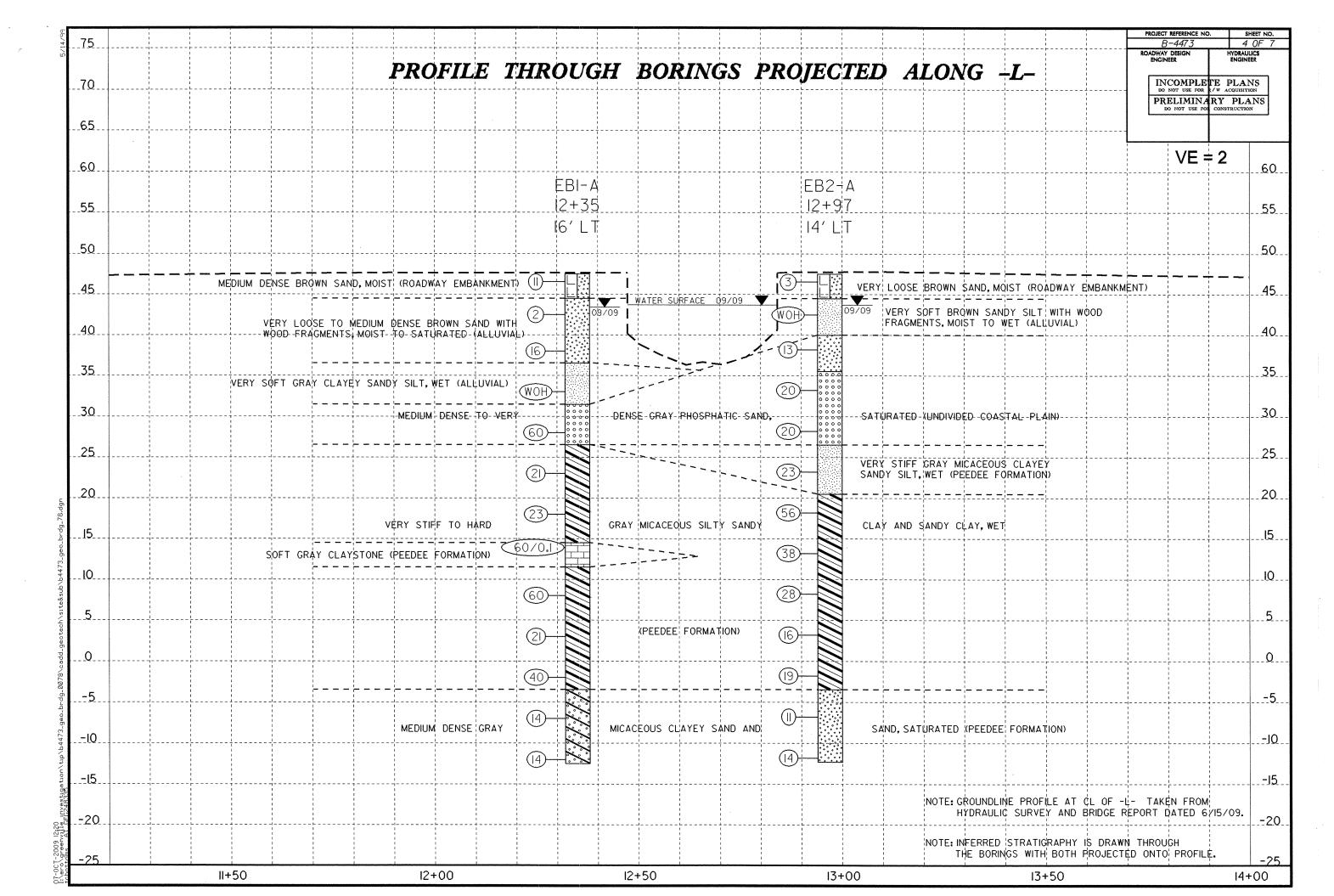
PROJECT REFERENCE NO.

B-4473

SHEET NO.

2 OF 7





	LOG REPORT	T						T						
PROJECT NO. 33721.1.1	ID . B-4473	COUNTY COLUMBUS	GEOLOGIST Botto			JECT NO.			D . B-4473	COUNTY C		·····	GEOLOGIST Bot	·
	E NO. 78 ON -L- (SR 1006) OVER G			GROUND WTR (ft)				T	. 78 ON -L- (SR 1006) OVER GF					GROUND WTR (f
BORING NO. EB1-A	STATION 12+35		IGNMENT -L-	0 HR. N/A	ļ	NG NO. E			STATION 12+97	OFFSET 14		ALIGNME		0 HR . N//
COLLAR ELEV. 47.5 ft	TOTAL DEPTH 60.0 ft		STING 2,072,041	24 HR. 4.1	ļ	AR ELEV.			TOTAL DEPTH 59.8 ft	NORTHING	138,489	EASTING	2,072,103	24 HR. 3.
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary		HAMMER TYPE			L MACHINE			DRILL METHOD Mud Rotary				HAMMER TYPE	
START DATE 09/14/09	COMP. DATE 09/15/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK	33.0 ft	STAR	RT DATE (L	COMP. DATE 09/15/09	SURFACE W		TH N/A	DEPTH TO ROC	K N/A
ELEV (ft) DRIVE ELEV (ft) DEPTH (ft) D.5ft 0.5ft		OT SAMP. V L O O O O O ELEV.	SOIL AND ROCK DESCR	RIPTION DEPTH (ft)	ELEV (ft)		· · · ·	0.5ft 0.5		T 75 100	NO. MO	O I G	SOIL AND ROCK DES	CRIPTION
50					50	+								
47.5 + 0.0 2 6	5	- 47.5 - · · · · · SS-1	GROUND SURFAC			47.5	0 3	2 1		. , 	SS-8	47.5	GROUND SURF	
45 ‡	, p ₁₁		BROWN SAND, MO		45	<u> </u>		- '	· • · · · · · · · · · · · · · · · · ·				BROWN SAND, M	
43.5 + 4.0 2 1	 	SS-2	ALLUVIAL BROWN SAND WITH \	WOOD		43.5 + 4	.0 WOH	WOH WO	OH		SS-9		ALLUVIAL BROWN SANDY SILT W	
		:: ::::	FRAGMENTS, MOIST TO S.			<u> </u>	Worr			: : : : :	55-9		FRAGMENTS, MOIST	
40 39.0 8.5					40	39.2 + 8	.3	-, -	5			40.0	UNDIVIDED COASTA	
1 3 8	8			11.0		<u> </u>	4	8 5	13	.	SS-10	GF	RAY PHOSPHATIC SAND), SATURATED
35	./	·· ···	ALLUVIAL GRAY CLAYEY SANDY S	1	35	1 1 1			1 1			35.5		12
34.0 13.5 WOH WO	он woн	SS-3 30%	SIMI SENIET SAINDTS	//L1, VVL1		34.2 1		10 10	0 20		SS-11	35.5 35.5		
		31.5	UNDVIDED COASTAL	PLAIN16.0		<u> </u>				.		0000		
29.0 18.5		0000	GRAY PHOSPHATIC SAND,		30	29.2 1		11 -		+		0000		
16 33	3 27	SS-4 SS-4		21.0		İ	11	11 9	9 • 20			26.5		21
25 🖠			COASTAL PLAIN GRAY MICACEOUS SILTY S	N }	25	<u> </u>				.		1900001	COASTAL PLA	
24.0 23.5 6 11	1 10	SS-5	WET (PEEDEE FORM	ATION)		24.2 7 2	3.3 4	11 1:	23		SS-12	I F	AY MICACEOUS CLAYE WET (PEEDEE FOR!	
 						Ŧ		l				I F		0-
20 19.0 28.5		·			20	19.2 + 2	3.3					20.5	COASTAL PLA	NN 27
7 11	1 12					Ŧ	6	10 4	16 56 .			G G	RAY MICACEOUS SAND (PEEDEE FORMA	Y CLAY, WET TION)
15					15	‡								
14.0 33.5 60/0.1		14.5	COASTAL PLAIN		10	14.2 + 3	3.3	18 20	20					
1 1 100/0.1			GRAY CLAYSTONE (P FORMATION)	PEEDEE 36.0		‡	"	10 21	38.					
10 0 1 0 1			COASTAL PLAIN GRAY MICACEOUS SILTY S		10	9.2 + 3			· · · · · / · · · · · ·	-				
9.0 38.5 30 33	3 27	0 . SS-6	WET (PEEDEE FORM/			3.2	17	13 1	5 28		SS-13			
_	:::: :::;;/:::					‡				: : : : :				
5 4.0 43.5	1				5	4.2 ‡ 4	3.3 6	8 8	<u></u>					
6 10	$0 \mid 11 \mid \cdots \mid 21 \cdots \mid \cdots $:: ::::				‡		0 8	1 16	: : : : :				
0 1 1 1					0	1 , 1.	3.3							
-1.0 48.5 40 27	7 13	:: :::: 📑				-0.8 7 4	7	9 1	10	: : : : :				
		· · · · · · - 3.5_	COASTAL PLAIF	<u> 51</u> .0	_	‡			: : /: : : : : : : :			-3.5	COASTAL PLA	
-5 -6.0 53.5			GRAY MICACEOUS CLAY SATURATED (PEEDEE FO	YEY SAND,	-5	-5.8 + 5							RAY MICACEOUS SAND (PEEDEE FORMA	, SATURATED
5 6	8 •14	SS-7	ONTORMIED (PEEDEE FO	A MAINT LIOIN)			6	5 6	6 . •11 .		SS-14	<u></u>	(FEEDEE FORMA	HON)
-10 🛨					-10	1				1 1 1				
-11.0 58.5 6 7	7		5	60.0		-10.8 7 5	5 5	7 7	7			-12.3		59
	—	-12.5	Boring Terminated at Elevati	ion -12.5 ft in									oring Terminated at Eleva Medium Dense S	ation -12.3 ft in
<u>-15</u>		1 1 1 F	Medium Dense Clayey	y Sand	-15	Ŧ		İ				1 F	Medium Dense S	bariu
												F		
-20					-20	‡						F		
						‡						F		
						‡								
-25					-25	‡						-		
						‡								
					-30							 		
-30 T				1	I -3U		1 1	1	ı		1	1 1		

33721.1.1 B-4473

BRIDGE NO. 78 ON SR 1006 OVER GRISSETT SWAMP AT -L- STA. 12+65

	EB1-A SOIL TEST RESULTS														
SAMPLE	OFFSET	STATION	DEPTH	AASHTO								SING (S.		%	%
NO.			INTERVAL	CLASS.	CLASS. C.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC	
SS-1	16 LT	12+35	1.0-1.5	A-2-4(0)	20	NP	26. 1	55.3	4.5	14.1	99	86	20	_	
SS-2	16 LT	12+35	4.0-5.5	A-2-4(0)	21	NP	16.7	72.1	6.2	5.0	100	94	14	_	_
SS-3	16 LT	12+35	13.5-15.0	A-4(0)	24	8	4.8	56.7	10.4	28. 1	100	97	43	29.7	_
SS-4	16 LT	12+35	18.5-20.0	A-3(0)	22	NP	22.6	72.9	2.5	2.0	100	94	6	_	_
SS-5	16 LT	12+35	23. 5-25. 0	A-6(6)	32	11	0.4	47.2	22.2	30.2	100	100	68	-	-
SS-6	16 LT	12+35	38.5-40.0	A-6(6)	29	16	7.6	39.2	21.0	32.2	98	97	57	-	-
SS-7	16 LT	12+35	53.5-55.0	A-2-6(1)	33	15	14.1	52.7	9.1	24. 1	100	98	35	_	-

				$\overline{EB2}$ – \overline{A}	SO.	\overline{IL}	TES'	T RE	SUL'	ΓS					
SAMPLE	OFFSET	STATION	DEPTH	AASHTO	I. I.	[] [D]						SING (S	IEVES)		%
NO.	OFF DEL	D12111011	INTERVAL	CLASS.	Д.Д.	1 .7.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-8	14 LT	12+97	1.0-1.5	A-2-4(0)	22	NP	10.9	76.6	6.5	6.0	100	96	15	-	-
SS-9	14 LT	12+97	4.0-5.5	A-4(O)	21	2	0.8	63. 9	19.2	16.1	100	100	41	-	-
SS-10	14 LT	12+97	8.3-9.8	A-2-4(0)	20	NP	3.9	79.4	7.6	9.0	100	100	21	-	
SS-11	14 LT	12+97	13.3-14.8	A-3(0)	23	NP	36.5	60.3	1.2	2.0	100	78	4	_	-
SS-12	14 LT	12+97	23. 3-24. 8	A-4(3)	29	7	1.0	48.2	22.6	28. 1	100	100	64	-	-
SS-13	14 LT	12+97	38. 3-39. 8	A-6(6)	33	19	5.4	47.8	14.6	32.2	99	98	50	-	_
SS-14	14 LT	12+97	53. 3-54. 8	A-2-4(0)	28	7	11.9	61.7	7.3	19.1	93	91	26	_	_



FIELD SCOUR REPORT

٧		33721.1.1	TIP:	B-4473	COUNTY:	COLUMBUS
DESCRIPTIO	N(1): BF	RIDGE NO. 78	ON -L- (SR	1006) OVER GRIS	SETT SWA	MP

	EXISTING BRIDGE
Information from:	Field Inspection X Microfilm (reel pos:) Other (explain)
Bridge No.: Foundation Type:	78 Length: 37 Total Bents: 3 Bents in Channel: 1 Bents in Floodplain: 2 TIMBER PILES
EVIDENCE OF S Abutments or B	SCOUR(2) End Bent Slopes: NONE NOTED
Interior Bents:	NONE NOTED
Channel Bed:	NONE NOTED
Channel Bank:	NONE NOTED
	UR PROTECTION WOODEN WING WALLS
Extent(4):	8' OUTSIDE EDGE OF BRIDGE
Effectiveness(5):	EFFECTIVE
Obstructions(6):	NONE NOTED

INSTRUCTIONS

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoritical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

			DESIGN IN	IEOPM/	N TIO	NI				
	D 184 ('1/7)	04110 41			4110	13				
Channel	Bed Material(7):	SAND A	ND SANDY SIL I							
Channel E	Bank Material(8):	SAND AN	ND SANDY SILT	Γ						
Channa	J. Dank Cavar(0):	TDEEC A	MD CHDHDC							
Channe	el Bank Cover(9):	IKEES F	WD SHKOR2							
Floor	dplain Width(10):	APPROX	(1000'							
Flood	dplain Cover(11):	TREES A	AND SHRUBS							Ball for the Philippin of The State is to the Tourish work to a should be at management of
	Ct	Δ		D	r.		_	M = C =		
	Stream is(12):	Agg	grading	Degra	iaing _		. 3	Static X	nover-	
hannel Migratio	n Tendency(13):	SLIGHT	CHANCE TO M	IGRATE E	EAST	TOWAF	RD EB1			
Observations	and Other Comn	nents:								
DESIGN SCO	UR ELEVATION	NS(14)			Fe	et_X_	M	eters	_	
	<u>BENTS</u> EB1	EB2								
	31.5	39.5		Г				<u> </u>	1	T1
	31.3	33.3								
	e Prijectivija unikajavivi silainas ir Millerinine si sasasa ka aud den eseki.									

0	(505)	r 11 % (1								
•	of DSE to Hydrau				411	:		. . :		
	nical Engineering nd 17' at EB2 fror									
o.o at Eb i ai	id 17 dt EDZ 1101	11 010 0100	relical scour ele	valion pro	розс	<u> </u>	riyaradık	o report d	alca o Te	, 00
	SIS RESULTS F	ROM CH	ANNEL BED AN	ND BANK	MAT	ERIAL				
Bed or Bank										
Sample No.	**************************************									
Retained #4	l									
Passed #10	L	······································				-				
Passed #40 Passed #200	L		-			ŀ				
Coarse Sand			See Sheet 6,			-				
Fine Sand			"Soil Test Re			ŀ				MANUSCON CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CO
Silt			for samples:			ŀ				
Clay Channel Bed: SS-2, SS-9										
LL Channel Bank: SS-2, SS-9										
PI			-			ŀ				
AASHTO			no.			ŀ			<u> </u>	
Station			Т	T	Т					
Offset										sea mandri cara servicina de la resista de l
Depth										

Template Revised 02/07/06

Reported by:

Tyler Bottoms

Date: 10/7/2009

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5	BORE LOGS
6	SOIL TEST RESULTS
7	SCOUR REPORT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33721.1.1 (B-4473) F.A. PROJ. BRSTP-1006(20)
COUNTY COLUMBUS
PROJECT DESCRIPTION BRIDGE NO. 76 ON SR 1006 OVER GRISSETT
SWAMP AT -L- STA. 20+14

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 FELD BORING LOSS, ROCK CORES, AND SOL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, CEOTECHNICAL ENGINEERING UNIT AT 1999, 520-4028, NETHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSUBFACE DATA AND MAY NOT NECESSARILY PEFLECT THE ACTUAL SUBSUBFACE CONDITIONS BETWEEN BORNOS OR BETWEEN SAMPLED STRATA WITHIN THE BOREMOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU ON-PLACEITEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABLITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE RIVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS AND WARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

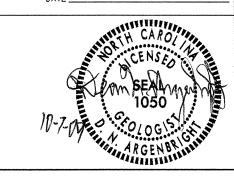
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCLMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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 SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS 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.

	J.M. EDMONDSON
	R.E. SMITH
•	

INVESTIGATED BY	T.C. BOTTOMS
CHECKED BY	D.N. ARGENBRIGHT
SUBMITTED BY	D.N. ARGENBRIGHT

SEPTEMBER 2009

PERSONNEL T.C. BOTTOMS



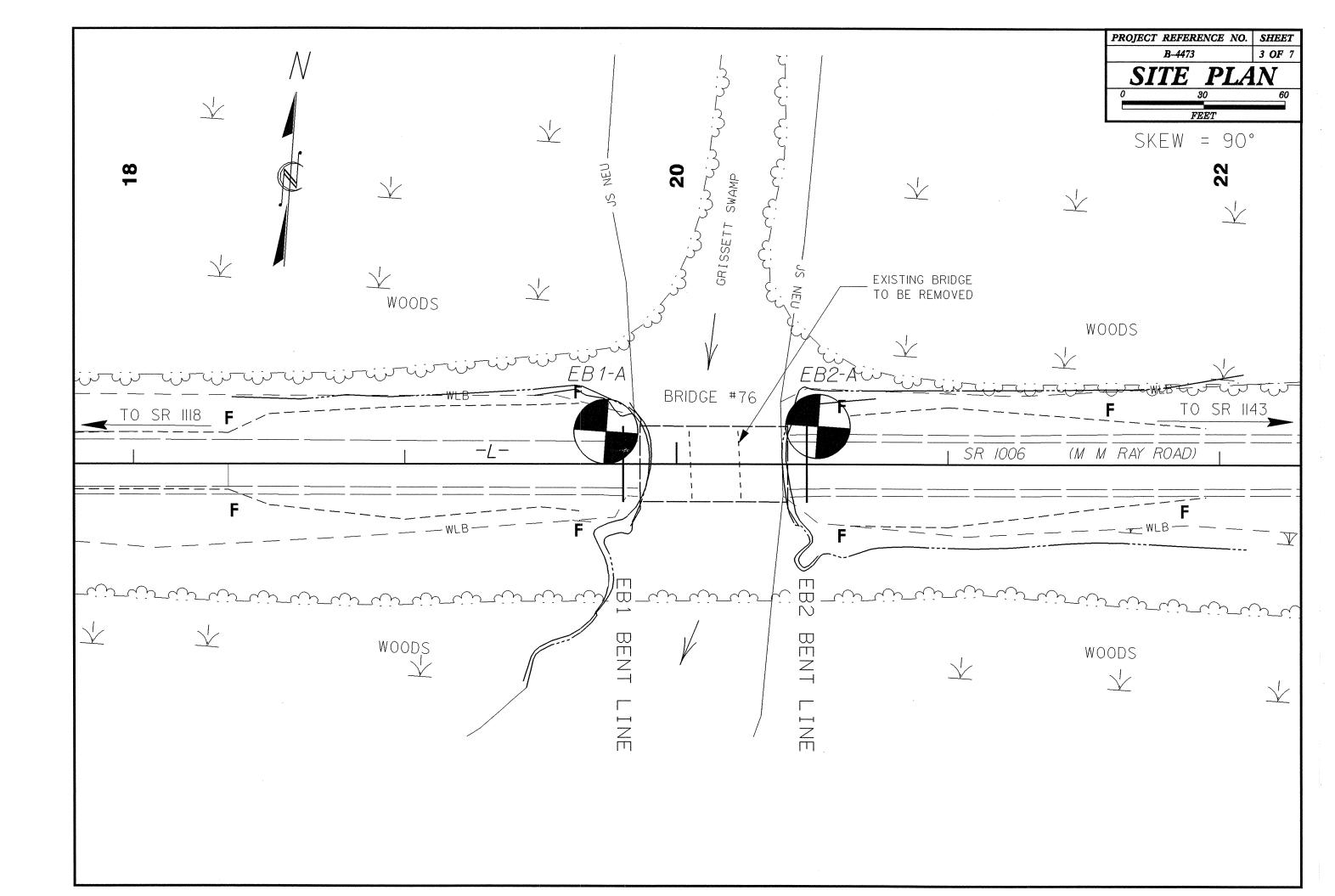
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

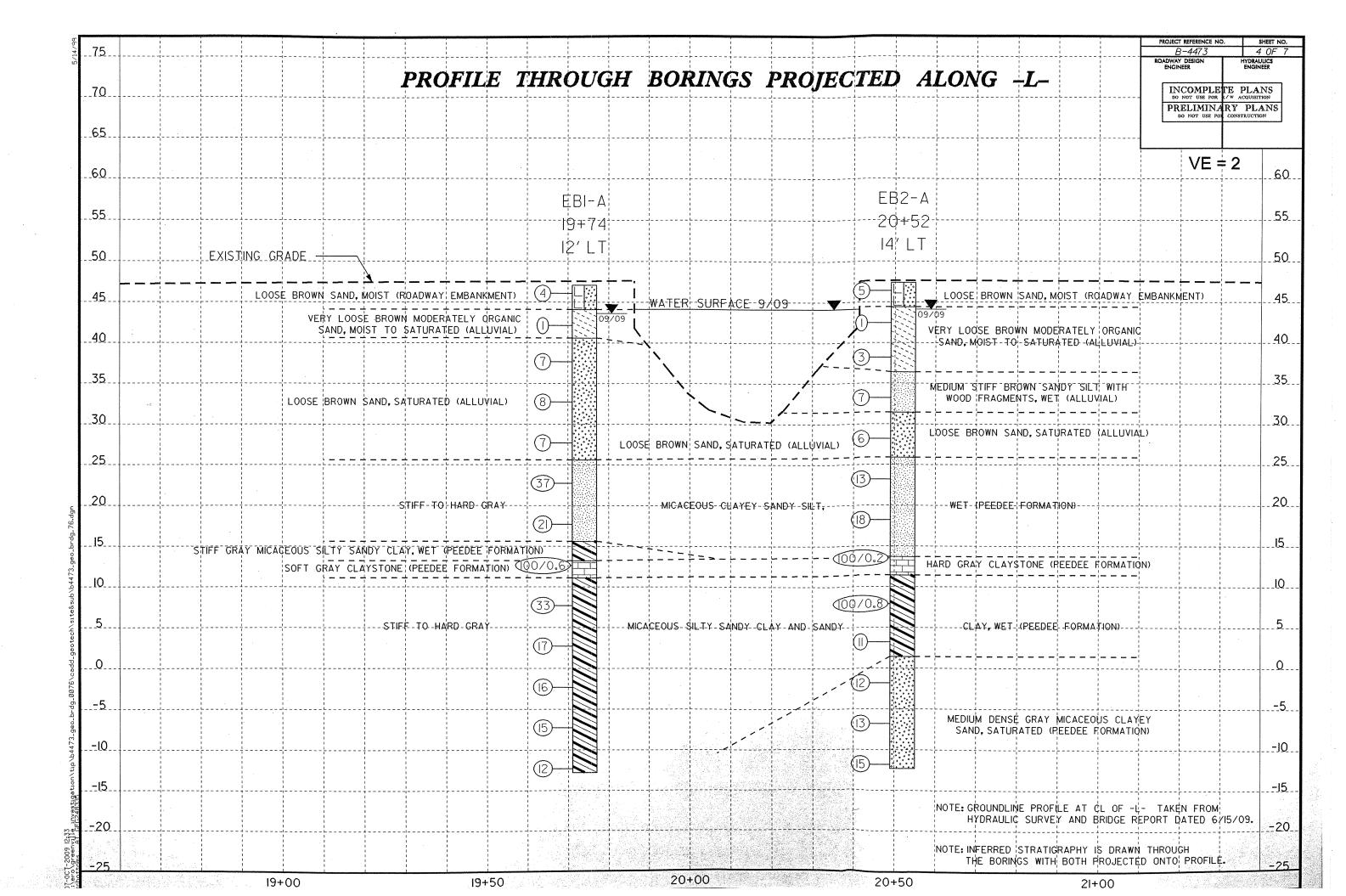
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

	SOIL AND ROO	CK LEGEND, TERMS	s, symbols,	AND ABBREVI	IATIONS		
SOIL DESCRIPTION	GRADATION	•	1	POCK	DESCRIPTION		TEDMC AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 180 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO 1286, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOSTICULES, ASHOTTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES F UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE POORLY GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MADDED - INDICATES OF UNIFORM PARTICLES OF TWO	: SAME SIZE.(ALSO HORE SIZES.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERD ROCK. ROCK MHERED ROCK.				TERMS AND DEFINITIONS (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. A WATER BEARING FORMATION OR STRATA. S - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: VERY STIFF, BRAY, SATY CLAY, MOST WITH INTERBEDGED FINE SAND LIVERS, HIGHLY PLASTS, A-7-6	THE ANGULARITY OR ROUNDNESS OF GOIL GRAINS IS DESIGNATED BY THE SUBANGULAR, SUBROUNDED, OR ROUNDED.	TERMS: ANGULAR,	WEATHERED	NU/AU/A	LLUWS: PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES	00 1101/7410 4	OUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITIO	DN	ROCK (WR)	BLUWS FER FUU		ARTESIAN -	- GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE
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. ARE UNHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	USED IN DESCRIPTIONS	CRYSTALLINE ROCK (CR)		PT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRAN	ITE, GROUND SURF	RFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	COMPRESSIBILITY		NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE	E GRAIN METAMORPHIC AND NON-COASTAL PLAIN OCK THAT WOULD YEILD SPT REFUSAL IF TESTED, F	OCK TYPE COLLUVIUM -	S (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
CLRSSA (R-16) R-15 (R-2-5) R-2-5) R-2-5 (R-2-5) R-2-5 (R-2	MODERATELY COMPRESSIBLE LIQUID LIMIT HIGHLY COMPRESSIBLE LIQUID LIMIT	LESS THAN 31 EQUAL TO 31-50 GREATER THAN 50	COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN	LITE, SLATE, SANDSTONE, ETC. SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIE ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMEN	CORE RECOVE	/ERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL CORE RUN AND EXPRESSED AS A PERCENTAGE.
7. PASSING SILT- MUCK	PERCENTAGE OF MATERIAL ORGANIC MATERIAL GRANULAR SILT - CLAY				ATHERING		TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT CUTS MASSIVE ROCK.
* 40 38 MX 58 MX 51 MN S0ILS SOILS SOILS PEAT	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE	OTHER MATERIAL ACE 1 - 10%		ESH, CRYSTALS BRIGHT, FEW J	IDINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNI	ER <u>DIP</u> - THE AI	ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
LIDUID LIMIT PLASTIC INDEX 6 MX NP 18 MX 11 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 50 ILS WITH PLASTIC INDEX 6 MX NP 18 MX 18 MX 11 MN 11	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME HIGHLY ORGANIC 310% 320% HIGH	TLE 10 - 20% 1E 20 - 35% HLY 35% AND ABOVE	VERY SLIGHT ROCK GE (V SLI.) CRYSTAL	NERALLY FRESH, JOINTS STAIN	NED, SOME JDINTS MAY SHOW THIN CLAY COATINGS CE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BL	OWS IF THE LINE OF	<u>(100 (0)P AZIMUTH) -</u> THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF OF OPP, MEASURED CLOCKWISE FROM NORTH.
USUAL TYPES STONE FRACS. FINE SILTY OR CLAYEY SILTY CLAYEY ORGANIC ORGANIC ORGANIC ORGANIC SOLLS SOLLS SOLLS MATTER	GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER D STATIC WATER LEVEL AFTER 24 HOURS	DRILLING	(SLI.) 1 INCH. CRYSTAL	OPEN JOINTS MAY CONTAIN CL S ARE DULL AND DISCOLORED.	NED AND DISCOLORATION EXTENDS INTO ROCK UP TO LAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSP . CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	SIDES RELAT	FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE ATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
GEN. RATING	ALEMAIS SAND STATIC WATER LEVEL 4FTER 27 HOURS AS A EXCELLENT TO GOOD FAIR TO POOR POOR POOR UNSUITABLE STATIC WATER LEVEL 4FTER 27 HOURS YEAR RATING AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE			ID ROCKS, MOST FELDSPARS AF	DISCOLORATION AND WEATHERING EFFECTS. IN RE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK IN ND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COME	PARENT MATE	DCK FRAGMENTS ON SURFACE NEAR THEIR ORIG:NAL POSITION AND DISLODGED FROM ITERIAL. IN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY
PI OF A-7-5 SUBGROUP IS ≤ LL - 3Ø; PI OF A-7-6 SUBGROUP IS > LL - 3Ø CONSISTENCY OR DENSENESS	SPRING OR SEEP MISCELLANEOUS SYMBOLS	,	MODERATELY ALL ROC	K EXCEPT QUARTZ DISCOLORED	D OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS	DULL THE STREAM.	M. (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
COMPACTAGES OF RANGE OF STANDARD RANGE OF UNCONFINED			(MOD. SEV.) AND CAN	BE EXCAVATED WITH A GEOLG	DW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF S OGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STR		
CONSISTENCY (N-VALUE) (TONS/FT2)	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION POPT ONT TEST BORIN	DESIGNATIONS S - BULK SAMPLE	1	<i>ED. WOULD YIELD SPT REFUSAL</i> :K EXCEPT QUARTZ DISCOLORED	L D OR STAINED.ROCK FABRIC CLEAR AND EVIDENT BU	T PEDUCED	ACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE (4 LOOSE 4 TO 10	SOIL SYMBOL AUGER BORING	SS - SPLIT SPOON	(SEV.) IN STRE EXTENT.	NGTH TO STRONG SOIL. IN GRA SOME FRAGMENTS OF STRONG	ANITOID ROCKS ALL FELDSPARS ARE KADLINIZED TO FROCK USUALLY REMAIN.		SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO AL EXTENT.
MATERIAL MEDIUM DENSE 10 TO 30 N/A (NON-COHESIVE) DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT CORE BORING	\$AMPLE	IF TEST	ED, YIELDS SPT N VALUES > 18	1 <i>00 BPF</i> D OR STAINED. ROCK FABRIC ELEMENTS ARE DISCER	T	BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN
VERY DENSE >50 VERY SOFT <2	INFERRED SOIL BOUNDARY MONITORING WEI	ST - SHELBY TUBE \$AMPLE LL RS - ROCK SAMPLE	(V SEV.) THE MAS REMAINI	S IS EFFECTIVELY REDUCED T NG. SAPROLITE IS AN EXAMPLE	D ON STAINED, ROCK FABRIC ELEMENTS ARE DISCEN TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG E OF ROCK WEATHERED TO A DEGREE SUCH THAT ON BRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES</i> <	ROCK SOILS USUAL Y MINOR PERCHED WAT	ALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. ATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN G IMPERVIOUS STRATUM.
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0 MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	PIEZOMETER ALLUVIAL SOIL BOUNDARY PIEZOMETER INSTALLATION SLOPE INDICATO	RT - RECOMPACTED TRIAXIAL SAMPLE	COMPLETE ROCK RE SCATTER	DUCED TO SOIL. ROCK FABRIC	NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLI	AND RESIDUAL (RETE IS ROCK QUALIT	IRES.) <u>SOIL</u> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK, <u>ITY DESIGNATION (ROD)</u> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
HARD >30 >4 TEXTURE OR GRAIN SIZE	25/025 DIP & DIP DIRECTION OF INSTALLATION ROCK STRUCTURES	CBR - CALIFORNIA BEARING RATIO SAMPLE			HARDNESS		MENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND AS A PERCENTAGE.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	SOUNDING ROD REF SPT REFUSAL			BE SCRATCHED BY KNIFE OR IL HARD BLOWS OF THE GEOLO	SHARP PICK, BREAKING OF HAND SPECIMENS REQUIR	ES SAPROLITE (S	(SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE CK.
OPENING (MM) 4.76 2.00 6.42 0.25 0.075 0.053 BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	ABBREVIATIONS AR - AUGER REFUSAL HI HIGHLY	₩ - MOISTURE CONTENT	HARD CAN BE		CK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS RE	RELATIVELY	INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND Y THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL DOING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.) GRAIN MM 305 75 2.0 0.25 0.05 0.005	CL CLAY CPT - CONE PENETRATION TEST MOD MODERATELY	V - VERY VST - VANE SHEAR TEST WEA WEATHERED	HARD EXCAVA		CK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN DLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED		DE - POLISHED AND STRIATED SURFACE THAT REGULTS FROM FRICTION ALONG A FAULT OR
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE CURP FOR THE ADMINISTRATION OF TERMS	CSE COARSE NP - NON PLASTIC DMT - DILATOMETER TEST ORG ORGANIC DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST	γ - UNIT WEIGHT γ_d - DRY UNIT WEIGHT	MEDIUM CAN BE HARD CAN BE POINT	GROOVED OR GOUGED 0.05 IN EXCAVATED IN SMALL CHIPS OF A GEOLOGIST'S PICK.	NCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS	F THE A 2 INCH OUTHAN ALL FOR	PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS DOT PER 60 BLOWS.
(ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTIO - SATURATED - USUALLY LIQUID: VERY WET, USUALLY	0 - VOID RATIO		FROM (GROVED OR GOUGED READILY CHIPS TO SEVERAL INCHES IN CAN BE BROKEN BY FINGER P	BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGME SIZE BY MODERATE BLOWS OF A PICK POINT. SMALI PRESSURE.	THIN STRATA CORE	RE <u>RECOVERY (SREC.)</u> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH M AND EXPRESSED AS A PERCENTAGE.
LL LIQUID LIMIT (SAT.) FROM BELOW THE GROUND WATER TABL	FRAGS FRAGMENTS TCR - TRICONE REFUSAL		SOFT OR MOR FINGERI	E IN THICKNESS CAN BE BROK NAIL.	EXCAVATED READILY WITH POINT OF PICK, PIECES KEN BY FINGER PRESSURE, CAN BE SCRATCHED READ	LY BY TOTAL LENGT	CK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY 5TH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE 5TH OF STRATA AND EXPRESSED AS A PERCENTAGE.
RANGE - WET - (W) SCHUSCHIS BYTHOU TO ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT P		T	RE SPACING	BEDDING TERM THICKNES		(S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
MOIST (M) SOLIDAT OR NEAR OPTIMIM MOISTING	DRILL UNITS: ADVANCING TOOLS:	HAMMER TYPE: X AUTOMATIC MANUAL	TERM VERY WIDE	<u>SPACING</u> MORE THAN 10 FEET	VERY THICKLY BEDDED > 4 FEET	DEINCH MI	MARK: BM NO. 6 RR SPIKE IN 14" OAK AT -BL- STA. 25+50 74' RT
OM OPTIMUM MOISTURE - MOIST - (M) SULID; AT UK NEAR UPTIMUM MUISTUR SL SHRINKAGE LIMIT	MOBILE B- CLAY BITS	Notoratic Timore	WIDE MODERATELY CLOSE	3 TO 10 FEET 1 TO 3 FEET	THICKLY BEDDED 1.5 - 4 FEE THINLY BEDDED 0.16 - 1.5 FE	ET	ELEVATION: 45.41 FT.
REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	6 CONTINUOUS FLIGHT AUGER BK-51 8 HOLLOW AUGERS	CORE SIZE:	CLOSE VERY CLOSE	0.16 TO 1 FEET LESS THAN 0.16 FEET	VERY THINLY BEDDED 0.03 - 0.16 THICKLY LAMINATED 0.008 - 0.03 THINLY LAMINATED < 0.008 FE	EET NOTES:	
PLASTICITY	X CME-45B				DURATION		
PLASTICITY INDEX (PI) DRY STRENGTH	TUNG,-CARBIDE INSERTS		FOR SEDIMENTARY ROCK		NING OF THE MATERIAL BY CEMENTING, HEAT, PRESSU	RE, ETC.	
NONPLASTIC 0-5 VERY LOW LOW PLASTICITY 6-15 SLIGHT	CME-550 X CASING W/ ADVANCER	HAND TOOLS:	FRIABLE		WITH FINGER FREES NUMEROUS GRAINS; BLOW BY HAMMER DISINTEGRATES SAMPLE.		
MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST X TRICONE 2 15/6 STEEL TEETH	POST HOLE DIGGER	MODERATELY		CAN BE SEPARATED FROM SAMPLE WITH STEEL PRO EASILY WHEN HIT WITH HAMMER.	BE:	
COLOR	TRICONE TUNGCARB.	HAND AUGER SOUNDING ROD	INDURATED	GRAINS	ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;		
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.	1 VANE SHEAR TEST			DIFFICU	ULT TO BREAK WITH HAMMER. HAMMER BLOWS REQUIRED TO BREAK SAMPLE:		
THE OSE TO BE LOTT, DING STEERING, ETC. THE OSE TO BESUIDE RIFERRANCE.			EXTREMELY		BREAKS ACROSS GRAINS.		





NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

BURELUG REPURI			7 [
PROJECT NO. 33721.1.1 ID. B-4473	COUNTY COLUMBUS GEOLOGIST Botto		PROJECT NO. 33721.1.1 ID. B-4473 COUNTY COLUMBUS GEOLOGIST Bottoms, T. C.
SITE DESCRIPTION BRIDGE NO. 76 -L- (SR 1006) OVER GRISS		1 1	
BORING NO. EB1-A STATION 19+74	OFFSET 12ft LT ALIGNMENT -L-	1 1-	
COLLAR ELEV. 47.1 ft TOTAL DEPTH 59.9 ft	NORTHING 138,535 EASTING 2,072,778		
DRILL MACHINE CME-45B DRILL METHOD Mud Rotary			DRILL MACHINE CME-45B DRILL METHOD Mud Rotary HAMMER TYPE Automatic
START DATE 09/15/09 COMP. DATE 09/15/09	SURFACE WATER DEPTH N/A DEPTH TO ROCK		START DATE 09/15/09 COMP. DATE 09/15/09 SURFACE WATER DEPTH N/A DEPTH TO ROCK 33.7 ft
ELEV DRIVE ELEV (ft) O.5ft O.5ft O.5ft O 25 50	75 100 NO. MOI G ELEV. (ft)		ELEV DRIVE DEPTH BLOW COUNT BLOWS PER FOOT SAMP. Color
50			
47.1 0.0 2 2 2 2	47.1 GROUND SURFA		T 1 2 3 1 · · · · · · · · · · · · · SS_15 L ₩ ROADWAY EMBANKMENT
45	BROWN SAND, MC		0 45
43.1 4.0 1 0 1	SS-22 BROWN MODERATELY ORG	GANIC SAND,	ALLUVIAL BROWN MODERATELY ORGANIC SAND,
40 +	MOIST TO SATURA ALLUVIAL	ATED6.5	5 4 40 +
38.7 + 8.4 2 2 5 2 5	BROWN SAND, SATU	RATED	39.2 7 8.2 2 1 2 3 3
	:: :::: 		
35 33.7 - 13.4	 		34.2 † 13.2 BROWN SANDY SILT WITH WOOD
4 4 4			
30 +	·· ···		30 29.2 18.2 BROWN SAND, SATURATED
28.7 + 18.4	SS-24 SS-24		4 3 3 •6
25	25.6	21.5	.5 25 25 COASTAL PLAIN 21
23.7 + 23.4	COASTAL PLAII GRAY MICACEOUS CLAYEY	SANDY SILT,	GRAY MICACEOUS CLAYEY SANDY SILT,
9 20 17 1	- · · · · · SS-25 - WET (PEEDEE FORM.	ATION)	
20 107	·· ····	11	
18.7 + 28.4 6 9 12	:: ::::		
15		31.5	.5 15
13.7 - 33.4	1 137 0101 11100000000000000000000000000	SANDY CLAY, 33.9	14.2 33.2 1 13.7
12 72 28/0.1	SS-26 SS-26 WET (PEEDEE FORM	ATION)	COASTAL PLAIN OUT OF THE PLAIN COASTAL PLAIN 1.0 1.1.4 GRAY CLAYSTONE (PEEDEE 36
10 07 07 07 07 07 07 07 07 07 07 07 07 07	GRAY CLAYSTONE (P FORMATION)	PEEDEE	10 92 + 382 COASTAL PLAIN
8.7 + 38.4 0 12 21 0 0 0 0 0 0 0 0 0	COASTAL PLAII	N	45 52 48/0.3
5 1	AND SANDY CLAY, WET	(PEEDEE	
37 + 43.4			42 432 4 4 7
			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
			0 + COASTAL PLAIN GRAY MICACEOUS CLAYEY SAND,
7 8 8			6 5 7 SS-20 SATURATED (PEEDEE FORMATION)
6 8 7 · · • 15 · · · · · · · · · · · · · · · · · ·			-5.8 + 53.2 7 7 6
5 -10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	<u> </u>		-10
8 6 6 6	-12.8	59.9	1.9 -10.8 58.2 6 7 8 -12.3 59 -12.3 Boring Terminated at Elevation -12.3 ft in
90 01 -15	Boring Terminated at Elevati Stiff Silty Sandy C		-15 -15 -15 -15 -16 -17
	$ \cdot \cdot \cdot $		
1 -20	[-		
	[
9 -30 T			

33721.1.1 B-4473

BRIDGE NO. 76 ON SR 1006 OVER GRISSETT SWAMP AT -L- STA. 20+14

EB1-A SOIL TEST RESULTS															
SAMPLE	OFFSET	STATION	DEPTH	AASHTO	$oxed{L.L.} egin{array}{ c c c c c c c c c c c c c c c c c c c$							SING (S.	r	% MO19711DF	% ODG/377G
NO.			INTERVAL	ULADO.	CLASS.			F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-21	12 LT	19+74	1.0-1.5	A-2-4(0)	20	NP	16.9	70.9	5.2	7.0	99	92	14	-	-
SS-22	12 LT	19+74	4.0-5.5	-	-	-	-	-	_	_		-	-	-	5.5
SS-23	12 LT	19+74	8.4-9.9	A-2-4(0)	23	NP	2.9	83.5	8.5	5.0	100	99	17	_	-
SS-24	12 LT	19+74	18.4-19.9	A-2-4(0)	21	NP	10.6	75.9	6.5	7.0	97	94	17	_	-
SS-25	12 LT	19+74	23.4-24.9	A-4(4)	30	8	0.8	50.1	23.0	26.1	100	99	68	-	-
SS-26	12 LT	19+74	33.4-33.9	A-6(6)	28	11	2.0	41.8	24.0	32.2	100	99	71	-	-
SS-27	12 LT	19+74	43.4-44.9	A-6(9)	32	18	7.0	39.4	19.4	34.2	100	98	64		-
SS-28	12 LT	19+74	53. 4-54. 9	A-6(9)	32	16	3.4	39.4	23.0	34.2	100	99	71	-	_

EB2-A $SOIL$ $TEST$ $RESULTS$									TS						
SAMPLE	OFFSET	STATION	DEPTH	AASHTO	L.L.	P.I.		% BY WEIGHT				% PASSING (SIEVES)			%
NO.	OFFSEI	DIATION	INTERVAL	CLASS.	L.D.	2 .1.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-15	14 LT	20+52	1.0-1.5	A-2-4(0)	19	NP	18.1	65.3	5.5	11.1	98	91	19	-	_
SS-16	14 LT	20+52	13.2-14.7	A-4(0)	20	1	2.0	67.8	18.1	12.1	100	100	36	-	
SS-17	14 LT	20+52	18.2-19.7	A-2-4(0)	19	NP	11.5	75.8	5.7	7.0	100	98	16	-	
SS-18	14 LT	20+52	23.2-24.7	A-4(3)	30	6	0.2	51.5	20.2	28. 1	100	100	66	-	-
SS-19	14 LT	20+52	38.2-39.5	A-6(9)	33	19	6.4	38.2	19.2	36.2	99	98	64	-	_
SS-20	14 LT	20+52	48.2-49.7	A-2-4(0)	28	7	10.8	61.0	6.1	22.1	100	98	29	-	-



FIELD SCOUR REPORT

WBS:	33721.1.1	TIP:	B-4473	C	OUNTY: COLUMB	US
DESCRIPTION(1):	BRIDGE NO. 76	6 ON -L- (S	R 1006) OVE	R GRISSE	ETT SWAMP	
			EXISTING	BRIDG	<u>iE</u>	
Information from:		nspection _ (explain) _	X Mi	crofilm	(reel	oos:)
Bridge No.: Foundation Type:	76 Length TIMBER PILES	55	Total Bents:	4 Ben	its in Channel:2	Bents in Floodplain: 2
EVIDENCE OF S Abutments or E	SCOUR(2) End Bent Slopes	: NONE NO	OTED			
Interior Bents:	NONE NOTED					
Channel Bed:	NONE NOTED					
Channel Bank:	NONE NOTED					
			and the second s			
EXISTING SCO Type(3):	UR PROTECTION WOODEN WIN					
Extent(4):	8' OUTSIDE ED	GE OF BF	RIDGE			
Effectiveness(5):	EFFECTIVE					
Obstructions(6):	NONE NOTED				~~~~	

INSTRUCTIONS

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- **9** Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoritical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

DESIGN INFORMATION												
Channel Bed Material(7	: SAND AN	SAND AND SANDY SILT										
								***		Nación de destruir som compresso describ (en escado		
	And William States of the Annual of the Annu											
Channel Bank Material(8	: MODERA	MODERATLEY ORGANIC SAND										
		. 704-741										
Channel Bank Cover(9	: TREES A	TREES AND SHRUBS										
	And the second s									interioris de anguli primajulgi in di e qui assenti a de andi andi di e de andi di e de andi di e de andi di e	****	
Floodplain Width(10): APPROX. 1000'												
Floodplain Cover(11	: TREES A	ND SHRUE	BS									
Stream is(12	: Agg	rading		Degra	ading				Sta	tic X		
Channel Migration Tendency(13	. <u>SLIGHT C</u>	DANCE I	O MIC	JKAIE	EASI	10	WARL	י בם	1			
Observations and Other Com	ments:											

DESIGN SCOUR ELEVATION	NS(14)				Fe	et	Х		Mete	ers		
	_					www	material de la constitución de l			Personal in the Section of	-	
<u>BENTS</u>												
CHANNEL BED 25.5			T			Т		T		·····	T	T
								1				
								ļ				
<u> </u>				1		L		<u>.l</u>			<u> </u>	L
Comparison of DSE to Hydra												
The Geotechnical Engineerin	g Unit and th	ne Hydrauli	ics Ur	nit agree	that t	the	design	scol	ır ele	vations	should b	е
raised 28 feet from the theore	tical scour e	elevation pr	ropos	ed in the	e Hydi	raul	ics rep	ort d	ated	6-15-09		
SOIL ANALYSIS RESULTS	FROM CHA	NNEL BEI	D ANI	D BANK	MAT	ER	IAL					
Bed or Bank					T			Т				
Sample No.												
Retained #4									***************************************			
Passed #10												
Passed #40												
Passed #200		0 01										The state of the s
Coarse Sand		See Shee										
Fine Sand		"Soil Tes		ults",								
Silt		for samp										TO THE OWNER OF THE OWNER
Clay		Channel			SS-23							
LL		Channel	Bank	: SS-22								The Trade of The State of the Control of the Contro
PI												
AASHTO												
Station		T	T		T				**************************************			
Offset												
Depth												

Template Revised 02/07/06

Reported by:

vler Bottoms

Date: 10/7/2009