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STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33835.1.1 (B-4682) F.A. PROJ. BRSTP-1628(1)
COUNTY WILSON
PROJECT DESCRIPTION BRIDGE NO. 2 ON -L- (SR 1628) OVER
CONTENTNEA CREEK AT -L- STATION 15+47

N.C. B-4682 1 10

CAUTION NOTICE

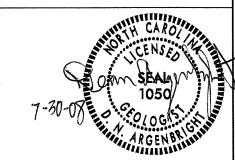
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FELD BORNIG LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C.DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 250-408B. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORNING LOGS, 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 BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN STILL (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DESCREE OF RELIABILITY INNERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTICATIONS ARE AS RECORDED AT THE TIME OF THE INVESTICATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS 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 PFELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DESIGN 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 HUNSELF 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 TO BE CHOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

	T.C. BOTTOMS
	MACTEC PERSONNEL
	J.R. SWARTLEY
	R.E. SMITH
•	J.M. EDMONDSON
INVESTIGATED	BY F.M. WESCOTT III
CHECKED BY	D.N. ARGENBRIGHT
	D.N. ARGENBRIGHT
	JULY 2008

PERSONNEL



DRAWN BY: C.R. SUMNER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE 14. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - 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.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS SOIL DESCRIPTION TERMS AND DEFINITIONS 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 VIELD SPT REFUSAL. SPT REFUSAL IS PREFUSAL IS PREFUSAL IS PREFUSAL IS PREFUSAL. 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 <u>Graded</u> - indicates a good representation of particle sizes from fine to coarse <u>RM</u> - indicates that soil particles are all approximately the same size. (also 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 ALLUVIUM (ALLUV.) - SDILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586), SDIL GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ANGULARITY OF GRAINS CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR. R HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. VERY STIFF, GRAY, SITY CLAY, MOIST WITH INTERRIFDOED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6 SUBANGULAR, SUBROUNDED, OR ROUNDED, NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL MINERALOGICAL COMPOSITION SOIL LEGEND AND AASHTO CLASSIFICATION FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN GENERAL MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KADLIN, ETC. ARE USED IN DESCRIPTIONS GROUND SURFACE. ORGANIC MATERIALS CLASS. WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COMPRESSIBILITY A-1, A-2 A-4, A-5 GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 NON-CRYSTALLINE COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM SEDIMENTARY ROCK THAT WOULD YELLO SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.

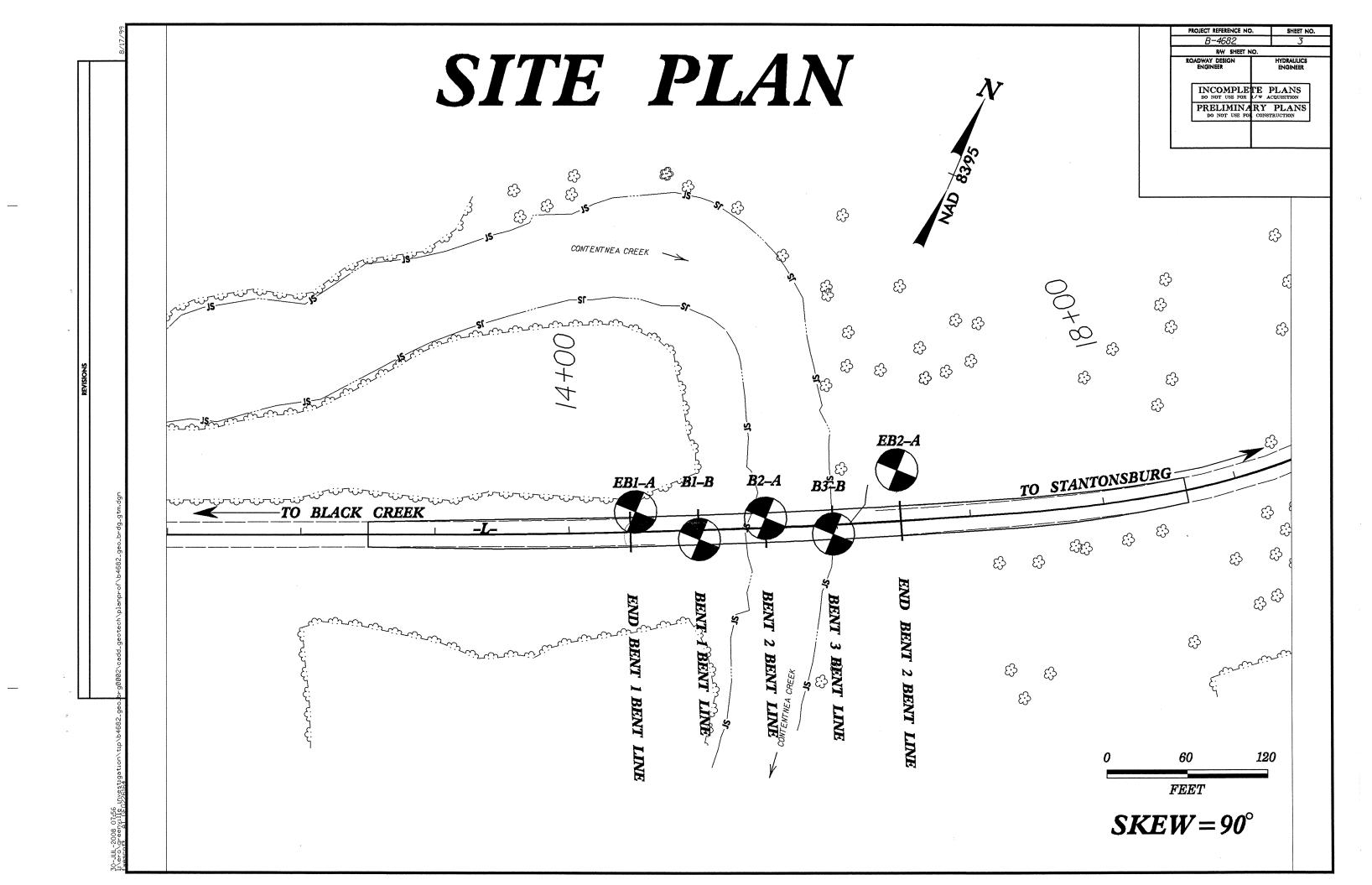
COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD ROCK (NCR) SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 LIQUID LIMIT EQUAL TO 31-50 LIQUID LIMIT GREATER THAN 50 CLASS. 1-a A-1-b A-3 COASTAL PLAIN SEDIMENTARY ROCK SYMBOL CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC PERCENTAGE OF MATERIAL PASSIN DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT STI T WEATHERING ANULA SILT - CLA CLAY ROCKS OR CUTS MASSIVE ROCK. ORGANIC MATERIAL OTHER MATERIAL PEAT SOILS SOTI S SOTIS ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER SOILS DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE * 200 RACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% HAMMER IF CRYSTALLINE. JITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE TOME LABOR ADDERATELY ORGANIC VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF 20 - 35% LASTIC INDEX NP 18 MX 18 MX 11 MN 11 MN 18 MX 18 MX 11 MN CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF V SLIJ HIGHLY ORGANIC LITTLE OR >10% >20% HIGHLY 35% AND AROVE THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH MODERATE OF A CRYSTALLINE NATURE. GROUP INDEX 0 0 4 MX 8 MX 12 MX 16 MX No M DRGAN GROUND WATER FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. AMOUNTS OF ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO SLIGHT SOILS USUAL TYPES STONE FRAGS. WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING SILTY OR CLAYEY ORGANIC (SLT.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY, IN GRANITOID BOCKS SOME OCCASIONAL FELISPAL MATTER CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. SOILS GRAVEL AND SAND SOILS **Y**_ STATIC WATER LEVEL AFTER 24 HOURS MATERIALS. SAND SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN MODERATE FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. GEN. RATINO **▽**PW 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 TAIR TO PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITAB POOR SUBGRAD FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY SPRING OR SEEP WITH FRESH ROCK. PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30 MODERATELY ALL ROCK EXCEPT DUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL CONSISTENCY OR DENSENESS LANEOUS SYMBOLS AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH 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 MOD. SEV.) COMPACTNESS OR ROADWAY EMBANKMENT (RE) SAMPLE PRIMARY SOIL TYPE OPT DAT TEST BORING ENETRATION RESISTENCE COMPRESSIVE STRENGTH IF TESTED, WOULD YIELD SPT REFUSAL JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. DESIGNATIONS (TONS/FT2) WITH SOIL DESCRIPTION ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCE S - BULK SAMPLE LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO VERY LODGE \oplus IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME SOIL SYMBOL AUGER BORING (SEV.) GENERALLY ITS LATERAL EXTENT. 4 TO 10 SS - SPLIT SPOON EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. GRANULAR MEDIUM DENSE ARTIFICIAL FILL (AF) OTHER LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MATERIA SAMPLE IF TESTED, YIELDS SPT N VALUES > 100 BPF DENSE VERY DENSE CORE BORING (NON-COHESIVE 30 TO 50 THAN ROADWAY EMBANKMENT MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT ST - SHELBY TUBE >50 SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK INFERRED SOIL BOUNDARY VERY SOFT PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN **<0.25** \bigcirc MONITORING WELL REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR RS - ROCK SAMPLE GENERALLY SOFT 2 TO 4 0.25 TO 0.50 0.5 TO 1.0 VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF TERVENING IMPERVIOUS STRATUM. INFERRED ROCK LINE 4 TO 8 8 TO 15 SILT-CLAY MEDIUM STIFF PIEZOMETER Δ RT - RECOMPACTED TRIAXIAL OMPLETE 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 1 TO 2 ALLUVIAL SOTE BOUNDARY SAMPLE SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS VERY STIFF 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 RUN AND COHESIVE 15 TO 30 SLOPE INDICATOR \bigcirc CBR - CALIFORNIA BEARING DIP & DIP DIRECTION OF INSTALLATION ROCK HARDNESS EXPRESSED AS A PERCENTAGE. ROCK STRUCTURES TEXTURE OR GRAIN SIZ \bigcirc SPT N-VALUE SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SOUNDING ROD U.S. STD. SIEVE SIZE 200 270 0.053 REF- SPT REFUSAL PARENT ROCK. SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. OPENING (MM 0.25 SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED ABBREVIATIONS HARD COARSE FINE TO DETACH HAND SPECIMEN. BOULDER CORRL F AUGER REFUSAL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. w - MOISTURE CONTENT CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE (BLDR.) (GR.) (SL.) (CL.) BT - BORING TERMINATED MED. - MEDIUM V - VERY SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. MICA. - MICACEDUS VST - VANE SHEAR TEST EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED CL. - CLAY
CPT - CONE PENETRATION TEST GRAIN MM 305 2.0 0.25 0.05 0.005 MODERATE BLOWS. 75 MOD. - MODERATELY WEA. - WEATHERED SIZE <u>STANDARD PENETRATION TEST (PENETRATION RESISTANCE)(SPT)</u> - 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 CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE MEDILIN UNIT WEIGHT - DILATOMETER TEST 7 - DRY UNIT WEIGHT SOIL MOIS - CORRELATION OF TERMS DRG. - DRGANIC A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST POINT OF A GEOLOGIST'S PICK. SOIL MOISTURE SCALE GUIDE FOR FIELD MOISTURE DESCRIPTION e - VOID RATIO SAP. - SAPROLITIC SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS (ATTERBERG LIMITS) DESCRIPTION STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN FOSS. - FOSSILIFEROUS SL. - SILT, SILTY PIECES CAN BE BROKEN BY FINGER PRESSURE. SATURATED STRATA ROCK QUALITY <u>designation (srod) -</u> 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 FRAC. - FRACTURED, FRACTURES (SAT.) FROM BELOW THE GROUND WATER TARLE CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH LIQUID LIMIT FRAGS. - FRAGMENTS TCR - TRICONE REFUSAL OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. LASTIC FINGERNAIL SEMISOLID: REQUIRES DRYING TO RANGE - WET - (W) EQUIPMENT USED ON SUBJECT PROJECT TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. FRACTURE SPACING PLASTIC LIMIT THICKNESS TERM SPACING BENCH MARK: RR. SPIKE IN BASE OF 36' PIN OAK -L- STATION 13+65.12 ADVANCING TOOLS: DRILL UNITS: VERY THICKLY BEDDED > 4 FFFT VERY WIDE MORE THAN 10 FEET - MDIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE X AUTOMATIC MANUAL 61.04' LT OPTIMUM MOISTURE 1.5 - 4 FEET 3 TO 10 FEET 1 TO 3 FEET CLAY BITS ELEVATION: 69.71 MOBILE B-SL _L SHRINKAGE LIMIT THINLY BEDDED 0.16 - 1.5 FEET MODERATELY CLOSE VERY THINLY BEDDED 6 CONTINUOUS FLIGHT AUGER 0 03 - 0 16 FFFT REQUIRES ADDITIONAL WATER TO CORE SIZE: CLOSE NOTES: 0.008 - 0.03 FEET - DRY - (D) THICKLY LAMINATED BK-51 VERY CLOSE LESS THAN Ø.16 FEET ATTAIN OPTIMUM MOISTURE 8º HOLLOW AUGERS THINLY LAMINATED < 0.008 FEET ____-B____ PLASTICIT INDURATION X CME-45C HARD FACED FINGER BITS ______ FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. PLASTICITY INDEX (PI DRY STRENGTH TUNG.-CARBIDE INSERTS ___-H___ NONPLASTIC VERY LOW 0-5 CMF-550 RUBBING WITH FINGER FREES NUMEROUS GRAINS: FRIABLE X CASING W/ ADVANCER LOW PLASTICIT 6-15 SLIGHT GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. HAND TOOLS: MED. PLASTICITY 16-25 26 OR MORE MEDIUM PORTABLE HOIST X TRICONE 2 15/6 STEEL TEETH GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE: POST HOLE DIGGER MODERATELY INDURATED HAND AUGER TRICONE GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE CORE BIT SOUNDING ROD INDURATED DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN. RED. YELLOW-BROWN, BLUF-GRAY). DIFFICULT TO BREAK WITH HAMMER. VANE SHEAR TEST MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE, SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS.

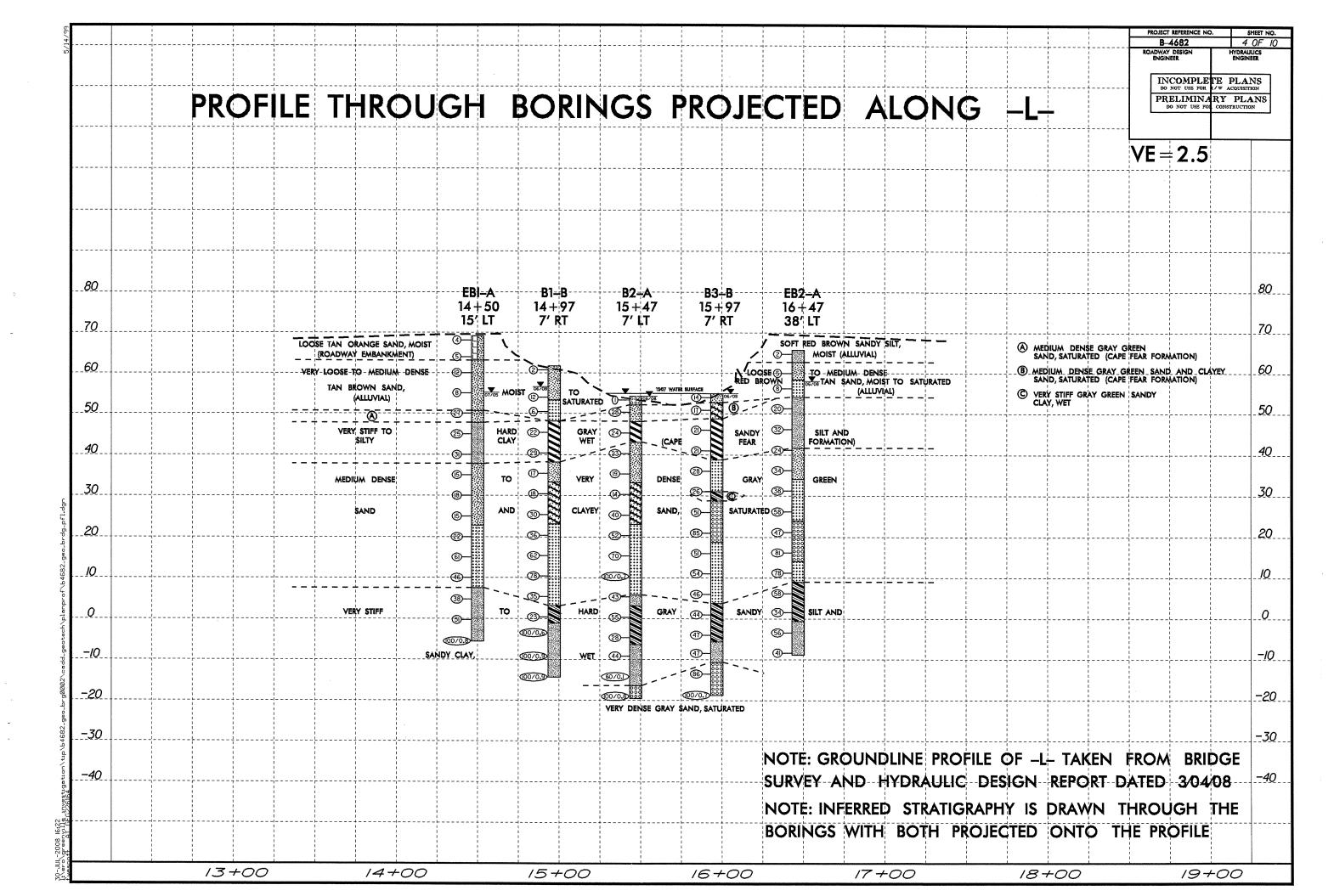
PROJECT REFERENCE NO.

B-4682

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PRO	JECT NO). 3383	5.1.1	ID	. В-4682			COUNTY	WILSO	N		GEOLOGIST	Bottoms, T. C.		PRO	JECT NO). 33835.1	1.1	ID.	B-4682	COUNTY	WILSO	N		GEOLOGIST B	ottoms, T. C.
SITE	DESCR	IPTION	BRIDGE	NO. 2	2 ON -L- (SR 1628)	OVER CO	NTENTNEA	CREEK				GROUND W	VTR (ft)	SITE	DESCRI	PTION B	RIDGE	NO. 2 C	ON -L- (SR 1628) OVER CO	NTENTNEA C	REEK				GROUND WTR (ft
BOR	NG NO.	B1-B			STATION	14+97		OFFSET	7ft RT		ALIGI	NMENT -L-	0 HR.	N/A	BOR	RING NO.	B1-B		ST	ATION 14+97	OFFSET	7ft RT		ALIGNMEN	NT -L-	0 HR. N/A
COLI	AR ELE	V. 61.7	ft		TOTAL D	EPTH 76.	0 ft	NORTHII	NG 678,8	826	EAST	TING 2,337,354	24 HR.	5.2	COL	LAR ELE	V. 61.7 ft		то	TAL DEPTH 76.0 ft	NORTHING	678,8	326	EASTING	2,337,354	24 HR . 5.2
DRIL	L MACH	INE CM	E-45C		DRILL ME	THOD M	ud Rotary					HAMMER TY	PE Automatic		DRIL	L MACH	INE CME	-45C	DR	RILL METHOD Mud Rotary					HAMMER TYP	E Automatic
STAF	RT DATE	06/04/	08	(COMP. DA	TE 06/2	6/08	SURFAC	E WATER	R DEPTH	ł N/A	DEPTH TO R	ROCK N/A		STA	RT DATE	06/04/08		СО	MP. DATE 06/26/08	SURFACE	WATER	DEPTH	N/A	DEPTH TO RO	OCK N/A
ELEV	DRIVE		BLOW C		\Box	BLOV	VS PER FOO	OT	SAMP	. 🗸	L O	SOIL AND ROCK [DESCRIPTION		ELEV	DRIVE	DEPTH BI	ow co	DUNT	BLOWS PER FOO	DT T	SAMP.			OOU AND DOOK DO	CODIDTION
(ft)	(ft)	(ft) (.5ft 0.5f	t 0.5f	t 0	25	50	75 10	00 NO.	MOI				DEPTH (ft)	(ft)	(ft)	(ft) 0.5i	ft 0.5ft	0.5ft	0 25 50	75 100	NO.	MOI) 	SOIL AND ROCK DE	ESCRIPTION
65		_									L				15_			_L		Match Line		Ī				
	-			ļ							E					1			1 T				T-1-	Boi	ring Terminated at Ele hard silt	evation -14.3 ft in
	61.7	- 0.0 V	OH 1	+-		.			SS-23		61.7	GROUND SU BROWN SAND, S		0.0		 								F	Tidia one	
60	_	-		'	\ 2				33-23		_	(ALLUV	IAL)		-20	∤ ∓	-							F		
	_	-			\ \				.	lacksquare						1 7								F		
55	54.9	6.8			11:7:										-25	1 7		†						-		
			4 6	6	1	2			SS-24		53.2			8.5		1 ‡	.							F		
	51.4 ⁻	10.3			_] :/:						000					‡	:							ļ.		
50	_	-	4 3	3	6				SS-25		53.2				-30		.							F		
	-								:		48.2	GRAY SILTY C	CLAY, WET	13.5		‡								ţ.		
45	46.4		7 10	12	- $:::$	22			SS-26		3	(CAPE FEAR FO	ORMATION)		-35									 	8	
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	41.4 ⁻	20.3				: \: : :					\$					‡	.							<u> </u>		
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05	26.4	35.3	5 11	19	- :::	: \;;;;			:							1 ±								E		
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E B4682_GEO_BRDG.GPJ_NC_DOT.GDT_07/30/08	- 11.4		26 36	42	1		.	78	SS-30		000			1	-70]]	.							E		
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o SRDG	1.4	- 60.3	5 9	14	$\exists \mid : : :$	23			SS-31	┤ [\$				-80	‡								F		
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	-7.9	60.6									#			l		‡	:							ļ.		
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일 -15			13 44	30/0.	71	<u> </u>	<u> </u>	100/0	SS-47	1	※第二 -14.3			76.0	-95	1 +	.							+		

NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

														GEOLOGIST Bot				JECT NO								COUNTY				GEOLOGIS	J	
SITE	DESC	RIPTION	BRID	GE NO	O. 2 O	N -L- (SR	1628) C	OVER C	ONTE	ENTNEA	CREEK				GROUND W	TR (ft)	SITE	DESCRI	PTION	BRID	GE NO). 2 OI	N -L- (SR	1628) O\	ER CON	TENTNEA	CREEK					GROUND W
BORII	NG NO) . B2-A			ST	ATION 15	5+47		C	OFFSET	7ft LT		ALIGN	MENT -L-	0 HR.	N/A	BOR	ING NO.	В3-В			STA	ATION 15	5+97		OFFSET	7ft RT		ALIGNME	NT -L-		0 HR.
OLL	AR EL	. EV. 54.2	2 ft		то	TAL DEPT	H 73.7	7 ft	N	NORTHIN	3 678,8	60	EASTI	NG 2,337,394	24 HR.	0.0	COLI	LAR ELE	V. 54.	9 ft		тот	TAL DEPT	H 73.61	t	NORTHIN	G 678,	868	EASTING	2,337,445		24 HR.
RILL	L MAC	HINE C	√E-45C		DR	ILL METH	OD Mu	ıd Rotai	ry					HAMMER TYPE	Automatic		DRIL	L MACHI	NE C	ME-450	С	DRI	LL METH	OD Mud	Rotary					HAMMER	R TYPE	Automatic
TAR	RT DAT	E 06/04	/08		СО	MP. DATE	06/25/	/08	s	SURFACE	WATER	DEPT	TH N/A	DEPTH TO ROO	K N/A		STAF	RT DATE	06/03	3/08		CON	MP. DATE	06/24/0	8	SURFACE	WATE	R DEPT	H N/A	DEPTH T	го коск	N/A
EV t)	DRIVE ELEV (ft)	DELIU	BLOW 0.5ft 0			0 2	BLOWS	S PER F	OOT 75	5 100	SAMP. NO.	\ \ \	L O ELEV. (ft)	SOIL AND ROCK DES		EPTH (ft)	ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)		V COUN' 0.5ft 0		0 2		PER FOOT	75 100	SAMP NO.	У МОІ	L O G	SOIL AND RO	OCK DESC	RIPTION
55	54.2	100								······································		V		GROUND SURF		0.0	55	54.9	0.0	WOH	5	9	1		T		SS-15	₩	54.9	GROUN GRAY SAN	ND SURFAC	
		T I	WOH W	vон	1	1					SS-32	1	000 000 52.0	BROWN SAND, SAT (ALLUVIAL)		2.2		51.8	31				14		::::		33-10	Ή [52.6	(AL	LUVIAL)	
۰ŀ	51.3	7 29	7	12	16	: : * ` .	28	: : :			SS-33	1	<u></u>	GRAY GREEN SAN (CAPE FEAR FORM	ID, WET		50	· · · · ·	-3-1	3	7	10	- 17			: : : :	SS-16		N.	GRAY GREE SAT	TURATED	
		ŦI		l			¦					1	48.1			6.1		1 7		1			-				11		48.8	(CAPE FEA		
	46.3	I 7.9					: : :							GRAY SILTY CLAY	Y, WET			47.0	7.9	8	9 /	12	$i \dots i$				SS-17		3	GRAT GREEN	SILITUL	AT, WEI
4		‡	8	11	13		24			• • • •	SS-34	1					45	‡	.		Ĭ	' [*]		!1 · · · · ·	<u> </u>	1	35-17	-	3	-		
		‡				: : : !	: : :						43.1	GRAY SAND, SATU	IRATED	11.1		42.0	12.9				:::1						3			
4	41.3	12.9	7	10	13	::::	: : :				SS-35	1		CIVIT CAND, CATC	r. 4 11 tmle*		40	42.U	12.9	5	10	11		1	::::	::::			3			
1	•	‡				;		:			1 35,33	1						‡	.						†	 	11		38.8			
	36.3	† ₁₇₉				:::j	: : :	: : :										37.0	17.9						::::	::::		_	_ 38.8	GRAY GREEN	SAND, SA	TURATED
1		# 1	7	9	10	19		<u>. </u>			SS-36	1	33.1				35			'	13	15		28			SS-18	4	0000			
		‡				:::/:	: : :	: : :						ODAY OLAVES CALLE	3ATI ID ATE:	21.1				-					::::	::::			000			
L	31.3	22.9	5	6		:: <i>j</i> :	: : :	: : :				1		GRAY CLAYEY SAND, S	SATURATED		_	32.0	22.9	14	14	12		26	::::			_ [31.0			
	•	†	o	١	°	14_	 				SS-37	-					30	1	.						 	1	SS-19		20.0	GRAY GREEN	SANDY CI	AY, WET
		±			1	: : : · ·	\:::	: : :										27.0	27.9						: : : :				000	GRAY SAN	ID, SATUR	ATED
r	26.3_	‡ 27.9 ‡	14	17	23		4		• •								25	1		16	21 3	30			51		SS-20		000			
		± 1					\	$\cdot \mid \cdot \cdot$	$\cdot \cdot \top$				23.1			31.1		7		1]		500			
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	11.3	‡ 42.9			1	: : : :	: : :						-					12.0	42.9		47				1	: : : :			-			
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	•	‡			-		•	43			SS-39	-		BROWN SANDY SII	LT, WET		5		.					 [11		3.8			
	4.0	‡				: : : :	: : :	:\::					3.1	GRAY SANDY CLA	Y, WET	51.1		2.0	52.9							1				GRAY SAN	NDY CLAY,	WET
H	1.3	52.9	8	18	37			. 55			SS-40	1					_0			11	12 3	32		_ · · · •	4		SS-22	길				
		± 1						;/··				1						7						!)			
L	-3.7	<u> </u>					/	$\cdot \mid \cdot \cdot$										-3.0	57.9	17	23 2	24		: : : 1)			
		+	10	12	16		4 28	+								22.2	-5	‡	.		.		• • • •		+	+	41		-5.7			
	-8.2	1624				: : : :		: ::					-0.4	GRAY SANDY SIL	T, WET	60.6		-7.5	62.4											GRAY SAI	NDY SILT,	WET
r	0.∠_	7 024	9	17	27		: : \	• 44 • • •			SS-41]	EF.				-10	‡	: [13	19 2	28			47		SS-48	븨				
1	•	†						. 7.					EF				1,0		.						1.75	1	11		-10.7	GRAY SAN	ND. SATUR	ATED
-	-13.2	67.4	00	7/0.4		::::	: : :	: : :	: : : †	``								-12.5	67.4	24	36 5	50	: : : :	: : : :	::::	\ \	SS-49	-	000 <u>-</u>	Sivil Only	, 5, 1, 011	- ·· · · · · ·
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		‡						: : :					16.4 000 -	GRAY SAND, SATU	JRATED	70.6		-17.5	724						: : : :	1:::			000- 000- 000- 000- 000- 000-			
+	-18.2		15	56 3	4/0.3		: : :	.			SS-42		000 000- 000- -19.5	2.01. 5.01b, 5A10		73.7		-17.5	12.4	21	60 40	0/0.2		<u> </u>	1	100/0.7				Idea Tare Control	d = 4 ml = -11	on 10.75°
十		‡		1			· · · · · · · · · · · · · · · · · · ·			100/0.8			TOOL -10.0	Boring Terminated at Elevi		13.1	-20	+	.							100/0.7			<u> </u>	oring Terminated very o	d at Elevati dense sand	
		± 1											1 -	very dense sa	uid				.										F			
- 1											1	I	ı F			1	1	. +		1								1 1	-			

PROJECT NO. 3	33835.1.	1	ID.	B-4682			COUNTY	WILSON	1		GEOLOGIST We	scott, F. M.		PRC	JECT NO). 3383	35.1.1	ID	D. B-4682	COUNTY	WILSO	N		GEOLOGIST W	escott, F. M.
SITE DESCRIPTION			10.20	ON -L- (SR	1628) OV	ER CON	1					GROUND W	TR (ft)						2 ON -L- (SR 1628) OVER CO			······			GROUND WTR
BORING NO. EE				ATION 16			OFFSET			ALIGNME	NT - -	0 HR.	N/A		RING NO.				STATION 16+47	OFFSET			ALIGNM	=NT _! -	0 HR. N
						+	 		20			-	l						······································					·····	
COLLAR ELEV.				TAL DEPT			NORTHING	0/8,9	DU	CASTING	2,337,471	24 HR.	7.8		LAR ELE				TOTAL DEPTH 74.7 ft	NORTHIN	6/8,	930	EASTING	2,337,471	24 HR. 7
DRILL MACHINE		5C		RILL METHO							HAMMER TYPE				LL MACH				DRILL METHOD Mud Rotary		·····			HAMMER TYPI	E Automatic
START DATE 06				MP. DATE			SURFACE			N/A	DEPTH TO ROC	K N/A		STA	RT DATE				COMP. DATE 06/23/08	SURFACE	WATE	R DEPTH	l N/A	DEPTH TO RO	CK N/A
ELEV DRIVE DEP	TH BLC	W COU	INT			PER FOOT		SAMP.	'/ In		SOIL AND ROCK DES	CRIPTION		ELEV (ft)	, DRIVE ELEV	DEPTH	BLOW C	TNUO	BLOWS PER FOO		SAMP	1 / 1	L	SOIL AND ROCK DE	SCRIPTION
(ft) ELEV (ft)	0.5ft	0.5ft	0.5ft	0 2	5 !	50	75 100	NO.	MOI G	ELEV. (ft)			PTH (ft)	(π)	(ft)	(ft)	0.5ft 0.5f	ft 0.5f	6ft 0 25 50	75 100	NO.	МОІ	Ğ		
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65 65.8 + 0.0		WOH	2	2		T		SS-6			RED BROWN SANDY S			-15	1 1	-							Ę.		
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<u> </u>					. 77.	 • • • •	<u> </u>			-0.6			66.4	-80									L		
-2.4 + 68.	2			1::::	: : : ` >	1:::	-			t "	GRAY SANDY SIL	T, WET	00.4	1		t l							E		
1 100	8	27	29	: : : :		> 56		SS-51		E				1		- 1							F		
_5				<u> </u>		1	- • • • •	4		F				-85	⊣	- 1							F		
-7.4 73.	2				1:::/	1 : : :				F													F		
10 +	17	11	30	<u> </u>	41	1	<u>. </u>	Ц		-8.9			74.7										ţ		
u i i									1	· Bor	ring Terminated at Elevati	on -x aff in hard		i _an	. 1			1	i						

B-4682 Bridge No. 2 on SR 1628 over Contentnea Creek

HOLE #	SAMPLE#	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST.	ORG.
EB1-A	SS-1	100	100	26	5.2	75.6	6.8	12.4	18	NP	A-2-4(0)	13.1-14.6		
	SS-2	97	54	21	61.6	18.4	7.6	12.4	30	6	A-2-4(0)	18.5-19.6		
	SS-3	100	99	67	1.6	44.8	33.2	20.4	37	8	A-4(5)	23.1-24.6		
	SS-4	100	97	18	24.8	59.2	7.6	8.4	25	NP	A-2-4(0)	33.1-34.6		
	SS-5	100	80	11	78.6	11.6	1.4	8.4	20	NP	A-2-4(0)	43.1-44.6		
	SS-43	99	85	53	27.5	30.1	34.3	8.1	18	1	A-4(0)	63.4-64.9		
	SS-44	100	100	86	0.6	38.8	46.4	14.2	22	1	A-4(0)	68.4-69.9		
											` ,			
EB2-A	SS-6	100	99	70	6.6	27.8	27.2	38.4	33	4	A-4(2)	1.0-1.5		
	SS-7	100	99	27	9.8	68.0	7.8				A-2-4(0)	4.8-6.3		
	SS-8	100	57	6	81.4	13.4	2.8				A-3(0)	8.6-10.1		
	SS-9	100	83	44	32.6	28.4	22.6				A-4(1)	13.6-15.1	11.7	
	SS-10	100	97	27	7.2	75.8	8.6				A-2-4(0)	24.1-25.1		
	SS-11	91	54	10	66.2	25.0	4.4				A-3(0)	33.6-35.1		
	SS-12	93	46	9	74.6	17.4	3.6				A-1-b(0)	43.6-45.1		
	SS-13	98	62	9	65.8	27.2	4.6				A-3(0)	53.6-55.1		
	SS-14	100	99	95	1.8	8.6	49.2				A-6(9)	58.6-60.1		
	SS-50	100	99	95	2.2	6.5	36.7				A-6(20)	63.2-64.7	20.0	
	SS-51	100	99	92	1.0	21.6	57.1				A-4(3)	68.2-69.7		
											, ,			
B3-B	SS-15	100	80	27	41.1	35.2	12.5	11.2	28	9	A-2-4(0)	1.0-1.5		
	SS-16	100	69	26	48.4	26.6	13.9	11.2	32	12	A-2-6(0)	3.1-4.6		
	SS-17	100	98	89	2.8	17.8	59.0	20.3	47	19	A-7-6(19)	7.9-9.4		
	SS-18	99	80	8	48.9	43.9	3.1	4.1	18	NP	A-3(0)	17.9-19.4		
	SS-19	100	97	81	8.1	14.8	32.5				A-6(17)	23.9-24.4		
	SS-20	100	49	9	79.4	12.6	1.9	6.1	15	NP	A-1-b(0)	27.9-29.4		
	SS-21	100	62	9	56.4	36.2	3.3	4.1	16	NP	A-3(0)	37.9-39.4		
	SS-22	100	100	96	8.0	12.2	44.4	42.6	31	14	A-6(13)	52.9-54.4		
	SS-48	99	92	52	12.5	50.2	29.2	8.1	21	2	A-4(0)	62.4-63.9		
	SS-49	99	45	16	66.7	21.4	7.8	4.0	18	NP	A-1-b(0)	67.4-68.9		
B1-B	SS-23	89	81	21	28.2	51.5	10.1	10 1	18	NP	A-2-4(0)	1 0-1 5		
	SS-24	100	95	22	18.3	63.3	10.3				A-2-4(0)			
	SS-25	100	86	6	57.8	37.3	2.8				A-3(0)	10.3-11.8		
	SS-26	100	99	92	2.2	12.4	55.0					15.3-16.8		
	SS-27	100	83	17	43.4	40.2	7.3				, ,	25.3-26.8		
	SS-28	98	25	13	81.3	5.7	3.9					30.3-31.8		
	SS-29	98	52	7	80.2	13.1	1.6				A-3(0)	40.3-41.8		
	SS-30	100	65	6	67.7	27.5	2.7				A-3(0)	50.3-51.8		
	SS-31	100	99	97	1.4	5.7	46.2				A-6(14)	60.3-61.8		
	SS-45	100	100	76	1.0	50.4	40.5				A-4(0)	64.6-65.2		
	SS-46	100	97	45	11.9	56.0	24.0				A-4(0)	69.6-71.0		
	SS-47	78	24	5	84.7	9.5	1.7					74.6-76.0		
B2-A	SS-32	92	39	11	74.0	14.6	7.3	<i>1</i> 1	27	ND	A-1-b(0)	10-15		
	SS-33	98	59	17	64.9	20.4	9.6				A-1-b(0) A-2-4(0)			
	SS-34	100	98	87	3.7	14.4	61.7				A-7-5(19)			
	SS-35	100	99	24	11.3	69.2	13.5					12.9-14.4		
	SS-36	100	99	12	20.3	68.3	6.4					17.9-19.4		
	SS-37	97	49	27	60.5	13.4	9.8					22.9-24.4		
	SS-38	100	68	7	77.2	17.1	2.6				A-3(0)	32.9-34.4		
	SS-39	100	99	84	2.2	23.5	60.0				A-4(0)	48.4-49.4		
	SS-40	100	99	90	1.0	21.3					A-6(8)	52.9-54.4		
	SS-41	99	95	65	7.1	45.5					A-4(0)	62.4-63.9		
	SS-42	49	24	9	65.5	20.6	9.8					72.4-73.7		
											()			



FIELD SCOUR REPORT

WBS: _	33835.1.1	_ TIP:	B-4682		COUNTY: Wilson	า			
DESCRIPTION(1): E	Bridge No. 2 on	SR 1628	over Contentr	nea Creek			·····	· · · · · · · · · · · · · · · · · · ·	
			EXISTIN	IG BRID	GE				
Information from:	Field Ir Other	nspection _ (explain) _	X N	/licrofilm	(reel	pos	::)	
Bridge No.:; Foundation Type: _]	P				ents in Channel:	5	Bents in	Floodplain: _	5
EVIDENCE OF SO Abutments or E	` '	: None no	ted						
Interior Bents: N	None noted								
Channel Bed: N	None noted	•							
Channel Bank: <u>N</u>	None noted								
EXISTING SCOU Type(3): <u>(</u>	R PROTECTIO								
Extent(4): <u>4</u>	l' from outside e	edge of bri	dge						
Effectiveness(5):	Appears satisfa	ctory							
Obstructions(6): _	Fress and const	truction de	bris						

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.

				DES	IGN IN	IFORM	ATIC	N					
Channel	Bed Material(7	'): <u>Sand (</u>	SS-	15, SS	5-32)	Sulfah							
								····					
Channel E	Bank Material(8	3): <u>Sand (</u>	SS-	1) and	sandy s	ilt (SS-6))	*****					
Channe	l Bank Cover(9): Trees	and	shrub	S								
Flood	dplain Width(10)): <u>250+/-</u>	feet	•									 Anti-
Flood	lplain Cover(11): Trees	and	shrub	<u>S</u>				***				
	Stream is(12	2):	Aggr	ading	X	Degr	ading			S	tatic		
Channel Migratio	n Tendency(13	3): Slight	tend	ency t	o migrat	e east to	ward I	End	Bent 2	W-1			
Observations	and Other Con	nments:											
					· · · · · · · · · · · · · · · · · · ·								
DESIGN SCO	UR ELEVATIO	NS(14)					Fe	eet_	X	Me	ters		
	BENT	s											
	B1	B2		В3									
10 yr. Over	rtopping 56	46.5	-	48				_				4	
• •			+					\dashv	····			+	
			+					+				+	
			T									1	
0	(DOE (- 1 bt		· 41										
Comparison of Design Scour							verton	ninc	scour				
Design Scoul	Lievation agre	CS WILL UT	City	, ui auii	CS Office	5 10 yı. 0	vertop	pirig	scour.				
		.,,,,,,			***************************************								
SOIL ANALYS Bed or Bank	SIS RESULTS	FROM C	HAN	INEL	BED AN	D BANK	MAT	ERI	<u>AL</u>				
Sample No.				<u> </u>							· · · · · · · · · · · · · · · · · · ·	+	
Retained #4				<u> </u>								-	
Passed #10				<u> </u>				<u> </u>	7			十	
Passed #40													
Passed #200													
Coarse Sand				e She								\perp	
Fine Sand					t Result	s",						_	
Silt				samp								_	
Clay						S-1,SS-6						+	
LL Pl			Cn	iannel	Ded 55	-15, SS-:	5 <u>Z</u>					+	
AASHTO												+	
Station					*************	.,			J			-	
Offset												+	
Depth													

Reported by: SIAMA. Myndydd

Template Revised 02/07/

Date: 7-30-02

CONTENTS

I TITLE SHEET
LEGEND
SITE PLAN
PROFILE
BORE LOG REPORT
SOIL TEST RESULTS
SCOUR REPORT

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 41537.1.1 (B-4992) F.A. PROJ. BRSTP-1628(2)
COUNTY WILSON
PROJECT DESCRIPTION BRIDGE NO.1 ON SR 1628 OVER RUN OF
BEAVERDAM SWAMP AT -L- STATION 13+15

CAUTION NOTICE

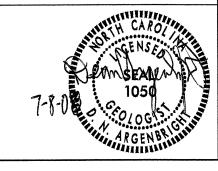
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FELD BORING LOGS, ROCK COPES, AND SOUL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHMICAL ENDRESHING DISTRIBUTION OF THE PLAN 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 NECESSABILY REFLECT THE ACTUAL SUBSUBFACE CONDITIONS BETWEEN BORNIOS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE, THE LABORATORY SAMPLE DATA AND THE IN STIU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIBBLITY INNERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOSTUBE CONDITIONS NIDICATED IN THE SUBSUBFRACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTUBE CONDITIONS AND VARY CONSIDERABLE WITH TIME ACCORDING TO CLIMATIC CONDITIONS MOY LARY CONSIDERABLE WITH TIME ACCORDING TO CLIMATIC CONDITIONS MOY LARY CONSIDERABLE WITH TIME ACCORDING TO CLIMATIC CONDITIONS MOY LARY CONSIDERABLE WITH TIME ACCORDING TO CLIMATIC CONDITIONS MOY LARY CONSIDERABLE WITH TIME ACCORDING TO CLIMATIC CONDITIONS MOY LARY CONSIDERABLE WITH TIME ACCORDING TO CLIMATIC CONDITIONS MOY LARY CONSIDERABLE 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 DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR CUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR PHINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSUPFACE 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 ACTUAL CONDITIONS.

	LEUSONNET
<u>T.</u>	C. BOTTOMS
<u>R</u> .	E. SMITH
<u>J.</u>	EDMONDSON
<u>c.</u>	M.WRIKE
INVESTIGATED BY	F.M. WESCOTT III
CHECKED BY	D.N. ARGENBRIGHT
SUBMITTED BY	D.N. ARGENBRIGHT

DEDCOMME



JULY 2008

DRAWN BY: C.R. SUMNER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCUPATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - 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.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

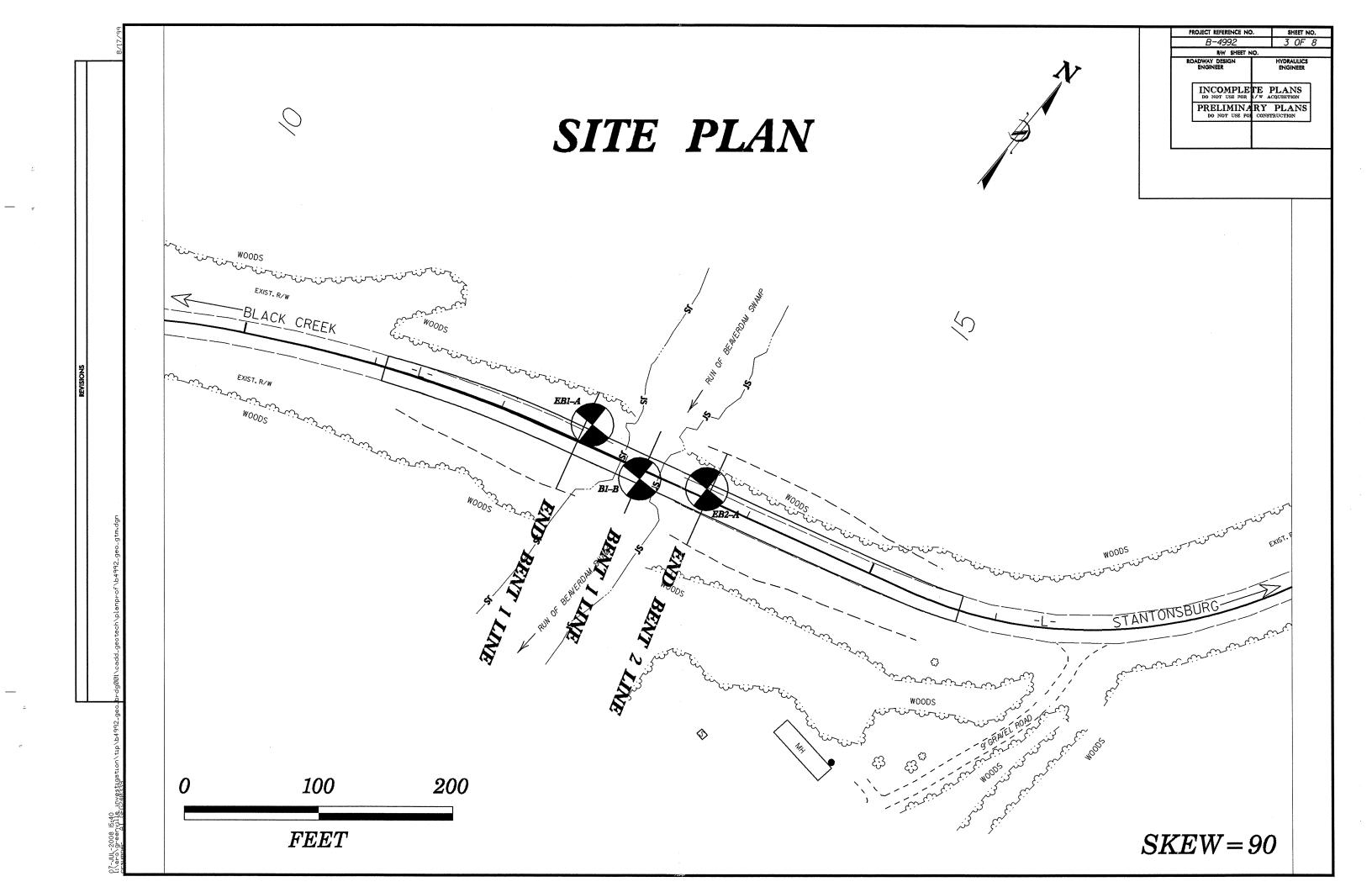
				SOIL AND ROO	CK LEGEND, TERM	is, symbo	LS, AND ABBREV	IATIONS	
	SOIL DESCRIPTION			GRADATION				DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCOM	SOLIDATED. SEMI-CONSOLIDATED, OR WEAT	THERED EARTH MATERIALS	UNIFORM - INDICATES THAT SOI	OOD REPRESENTATION OF PARTICLE SIZES F IL PARTICLES ARE ALL APPROXIMATELY THE		ROCK LINE IN	DICATES THE LEVEL AT WHICH NON-	AT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
100 BLOWS PER FOOT ACCORDING TO ST	TANDARD PENETRATION TEST (AASHTO T2)	206, ASTM D-1586). SOIL	POORLY GRADED) GAP-GRADED - INDICATES A MIX	TURE OF UNIFORM PARTICLES OF TWO OR N	MORE SIZES.	IN NON-COAS	TAL PLAIN MATERIAL. THE TRANSITI	N SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOW ON BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A 2	ONE ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
CONSISTENCY, COLOR, TEXTURE, MOISTURE	HTO SYSTEM. BASIC DESCRIPTIONS GENER E, AASHTO CLASSIFICATION, AND OTHER PE	ERTINENT FACTORS SUCH		ANGULARITY OF GRAINS		OF WEATHERE ROCK MATERI	D ROCK. ALS ARE TYPICALLY DIVIDED AS FOL	.LDWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,
	.AR]TY, STRUCTURE, PLASTICITY, ETC. EXAM CLAY, MONST WITH INTERBEDDED FINE SAMD LAYERS, HIGHLY		THE ANGULARITY OR ROUNDNESS SUBANGULAR, SUBROUNDED, OR F	S OF SOIL GRAINS IS DESIGNATED BY THE ROUNDED.	TERMS: ANGULAR.	WEATHERED	NON-COASTAL F	PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
	ID AND AASHTO CLASSIFI			MINERALOGICAL COMPOSITIO)N	ROCK (WR)	BLOWS PER FO		ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO DR ABOVE THE
GENERAL GRANULAR MATERI	IALS SILT-CLAY MATERIALS	ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUART	Z, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE L		CRYSTALLINE ROCK (CR)	WOULD YIELD S	E GRAIN IGNEOUS AND METAMORPHIC ROCK THAT PT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE.	GROUND SURFACE.
CLASS. (≤35% PASSING *3			WHENEVER THEY ARE CONSIDERE			NON-CRYSTALLIN	GNEISS, GABBRO	, SCHIST, ETC. E GRAIN METAMORPHIC AND NON-CDASTAL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
	A-2 A-4 A-5 A-6 A-7 -2-5 A-2-6 A-2-7 A-7-6 A-7-6		SLIGHTLY COMPRESSIE	COMPRESSIBILITY BLE LIQUID LIMIT	LESS THAN 31	RDCK (NCR)	SEDIMENTANT N	OCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYP LITE, SLATE, SANDSTONE, ETC.	E COLLUYIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 000000000000000000000000000000000000			MODERATELY COMPRES HIGHLY COMPRESSIBLE	SSIBLE LIQUID LIMIT	EQUAL TO 31-50 GREATER THAN 50	COASTAL PLAIN SEDIMENTARY RO	COASTAL PLAIN	SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL
% PASSING		7	THORE TO THE COLOR	PERCENTAGE OF MATERIAL		(CP)	SHELL BEDS, ET	·C.	LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
* 10 50 MX * 40 30 MX 50 MX 51 MN		GRANULAR SILT- CLAY PEAT	ORGANIC MATERIAL	GRANULAR SILT - CLAY SOILS SOILS	OTHER MATERIAL	Ţ		ATHERING	ROCKS OR CUTS MASSIVE ROCK.
	5 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 M			2 - 3% 3 - 5% TRA			OCK FRESH, CRYSTALS BRIGHT, FEW J AMMER IF CRYSTALLINE.	JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
LIQUID LIMIT 40 MX 41	I MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 M	N SOILS WITH		3 - 5% 5 - 12% LIT 5 - 10% 12 - 20% SON	TLE 10 - 20% 1E 20 - 35%	VERY SLIGHT R	OCK GENERALLY FRESH, JOINTS STAIL	NED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF
 	3 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN	N LITTLE OR HIGHLY	HIGHLY ORGANIC	>10% >20% HIG	HLY 35% AND ABOVE		RYSTALS ON A BROKEN SPECIMEN FA F A CRYSTALLINE NATURE.	CE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 8 8 8	4 MX 8 MX 12 MX 16 MX No M	AMOUNTS OF SOILS	~	GROUND WATER		SLIGHT R	OCK GENERALLY FRESH, JOINTS STAI	NED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
	Y OR CLAYEY SILTY CLAYEY EL AND SAND SOILS SOILS	ORGANIC MATTER		EL IN BORE HOLE IMMEDIATELY AFTER D	DRILLING			AY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND SHIND CHAVE	EL AND SAND SULO SULO		1	TER LEVEL AFTER 24 HOURS		MODERATE S	IGNIFICANT PORTIONS OF ROCK SHOW	DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
AS A EXCELLENT TO GO	00D FAIR TO POOR	FAIR TO POOR UNSUITABLE	<u> </u>	ATER. SATURATED ZONE, OR WATER BEARI	NG STRATA			RE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS ND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL.
SUBGRADE PT OF A-7-5 SUBGROUP IS	 6 ≤ LL - 30 :PI OF A-7-6 SUBG		OM- SPRING OR	SEEP		h	ITH FRESH ROCK.		FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
	ISISTENCY OR DENSENESS			MISCELLANEOUS SYMBOLS)			D OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL OW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
PRIMARY SOIL TYPE COMPACTN	NESS OR RANGE OF STANDARD	RANGE OF UNCONFINED COMPRESSIVE STRENGTH	ROADWAY EMBANKM	ENT (RE) SPT CPT DPT DMT TEST BORIN	SAMPLE	(MOD. SEV.) A		OGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	THE FIELD.
CONSIS	STENCY (N-VALUE)	(TONS/FT ²)	WITH SOIL DESCRIF	PTION VST PMT		1		E D OR STAINED.ROCK FABRIC CLEAR AND EVIDENT BUT REDU	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOSS			SOIL SYMBOL	AUGER BORING	S - BULK SAMPLE	(SEV.) I	N STRENGTH TO STRONG SOIL. IN GR	ANITOID ROCKS ALL FELDSPARS ARE KADLINIZED TO SOME	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/A	ARTIFICIAL FILL (4	AF) OTHER 🙏	SS - SPLIT SPCON SAMPLE		XTENT. SOME FRAGMENTS OF STRONG F <i>TESTED, YIELDS SPT N VALUES ></i>	B RUCK USUALLY REMAIN. 1000 BPF	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
(NON-COHESIVE) DENSE VERY DE			THAN ROADWAY EME	BANKMENT - CORE BORING	ST - SHELBY TUBE			D OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE B	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AFRATION AND LACK OF GOOD DRAINAGE.
VERY SC	OFT <2	<0.25	INFERRED SOIL BOI	UNDARY MONITORING WE	SAMPLE	R	EMAINING. SAPROLITE IS AN EXAMPLI	TD SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK E OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINC	R PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF A
GENERALLY SOFT SILT-CLAY MEDIUM		0.25 TO 0.50 0.5 TO 1.0	INFERRED ROCK LIN	NE PIEZOMETER	RS - HUCK SAMPLE	I.	*	BRIC REMAIN. IF TESTED. YIELDS SPT N VALUES < 100 BPF	INTERVENING IMPERVIOUS STRATUM.
MATERIAL STIFF	F 8 TO 15	1 TO 2	***** ALLUVIAL SOIL BOI	A INCTALLATION	RT - RECOMPACTED TRIAXIAL SAMPLE			NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	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
(COHESIVE) VERY ST		2 TO 4	25/825 DIP & DIP DIRECTI	ION OF SLOPE INDICATO	CBR - CALIFORNIA BEARING		SO AN EXAMPLE.		ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN A
TE TE	EXTURE OR GRAIN SIZE		ROCK STRUCTURES		RATIO SAMPLE		ROCk	HARDNESS	EXPRESSED AS A PERCENTAGE.
U.S. STD. SIEVE SIZE	4 10 40 60 20	90 270	SOUNDING ROD	REF SPT REFUSAL			CANNOT BE SCRATCHED BY KNIFE OR SEVERAL HARD BLOWS OF THE GEOL(SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
	4.76 2.00 0.42 0.25 0.0			ABBREVIATIONS		1		CK 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
	RAVEL COARSE FIN		AR - AUGER REFUSAL	HI HIGHLY	₩ - MOISTURE CONTENT	-	TO DETACH HAND SPECIMEN.		TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.)	(GR.) (CSE. SD.) (F S	SD.) (SL.) (CL.)	BT - BORING TERMINATED CL CLAY	MED MEDIUM MICA MICACEOUS	V - VERY VST - VANE SHEAR TEST			CK. GDUGES OR GRODVES TO 0.25 INCHES DEEP CAN BE DLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT DR
GRAIN MM 305 75 SIZE IN 12 3	2.0 0.25	0.05 0.005	CPT - CONE PENETRATION TO	EST MOD MODERATELY	WEA WEATHERED		BY MODERATE BLOWS.		SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (BPT) - NUMBER OF BLOWS (N OR BPF) OF
	TURE - CORRELATION OF	TEDMC	CSE COARSE DMT - DILATOMETER TEST	NP - NON PLASTIC ORG ORGANIC	7 - UNIT WEIGHT 2 - DRY UNIT WEIGHT			NCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH
SOIL MOISTURE SCALE	ETEL D. MOTETUDE		DPT - DYNAMIC PENETRATION	N TEST PMT - PRESSUREMETER TEST	/d 5/4/ "E25///		POINT OF A GEOLOGIST'S PICK.		A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
(ATTERBERG LIMITS)	DESCRIPTION GUIDE FOR	R FIELD MOISTURE DESCRIPTION	e - VOID RATID F - FINE	SAP SAPROLITIC SD SAND, SANDY			FROM CHIPS TO SEVERAL INCHES IN	BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH
	- SATURATED - USUALLY	LIQUID; VERY WET, USUALLY	FOSS FOSSILIFEROUS FRAC FRACTURED, FRACTUR	SL SILT, SILTY			PIECES CAN BE BROKEN BY FINGER	PRESSURE.	OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY
LL LIQUID LIMIT	(SAT.) FROM BEL	LOW THE GROUND WATER TABLE	FRAGS FRAGMENTS	TCR - TRICONE REFUSAL				EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH KEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY 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.
PLASTIC RANGE		D; REQUIRES DRYING TO	FOUR	PMENT USED ON SUBJECT F	DO IECT		FINGERNAIL.	2500110	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
(PI) PL PLASTIC LIMIT	ATTAIN 0	OPTIMUM MOISTURE			T The state of the	TERM	CTURE SPACING	BEDDING TERM THICKNESS	
	A	AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:	VERY WIDE	<u>SPACING</u> MORE THAN 10 FEET	VERY THICKLY BEDDED > 4 FEET	BENCH MARK: BL-105 -L- STATION 13+52,92,16,92RT
OM OPTIMUM MOISTURE SL SHRINKAGE LIMIT	- MOIST - (M) SOLID; A	TI ON NEAR OFTENOM MOISTONE	MOBILE B	CLAY BITS	X AUTOMATIC MANUAL	WIDE MODERATELY	3 TO 10 FEET	THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET	ELEVATION: 65.61 FT
T		ADDITIONAL WATER TO		6° CONTINUOUS FLIGHT AUGER	CORE SIZE:	CLOSE	0.16 TO 1 FEET	VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	NOTES:
	- DRY - (D) ATTAIN O	PTIMUM MOISTURE	Вк-51	8* HOLLOW AUGERS		VERY CLOSE		THINLY LAMINATED < 0.008 FEET	
	PLASTICITY		CME-45C	HARD FACED FINGER BITS				DURATION	
	PLASTICITY INDEX (PI)	DRY STRENGTH		TUNGCARBIDE INSERTS		FOR SEDIMENTAR		NING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NONPLASTIC LOW PLASTICITY	0-5 6~15	VERY LOW SLIGHT	CME-550	X CASING W/ ADVANCER		FRIA		G WITH FINGER FREES NUMEROUS GRAINS: BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MED. PLASTICITY HIGH PLASTICITY	16-25	MEDIUM HIGH	PORTABLE HOIST	X TRICONE 215/6 STEEL TEETH	HAND TOOLS: POST HOLE DIGGER	MUDE	RATELY INDURATED GRAINS	CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;	
THORITICALLY	26 OR MORE COLOR	112011		TRICONE * TUNGCARB.	HAND AUGER	HODE		EASILY WHEN HIT WITH HAMMER.	
DECCRIPTIONS AND THE CO. CO.		VELLOU DROUB PLUE COLU	X CME-45B	CORE BIT	SDUNDING ROD	INDUF		ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; JLT TO BREAK WITH HAMMER.	
1	R OR COLOR COMBINATIONS (TAN, RED, K, STREAKED, ETC. ARE USED TO DESC				VANE SHEAR TEST	EVID		HAMMER BLOWS REQUIRED TO BREAK SAMPLE:	
				Land	LU	EAIR		BREAKS ACROSS GRAINS.	
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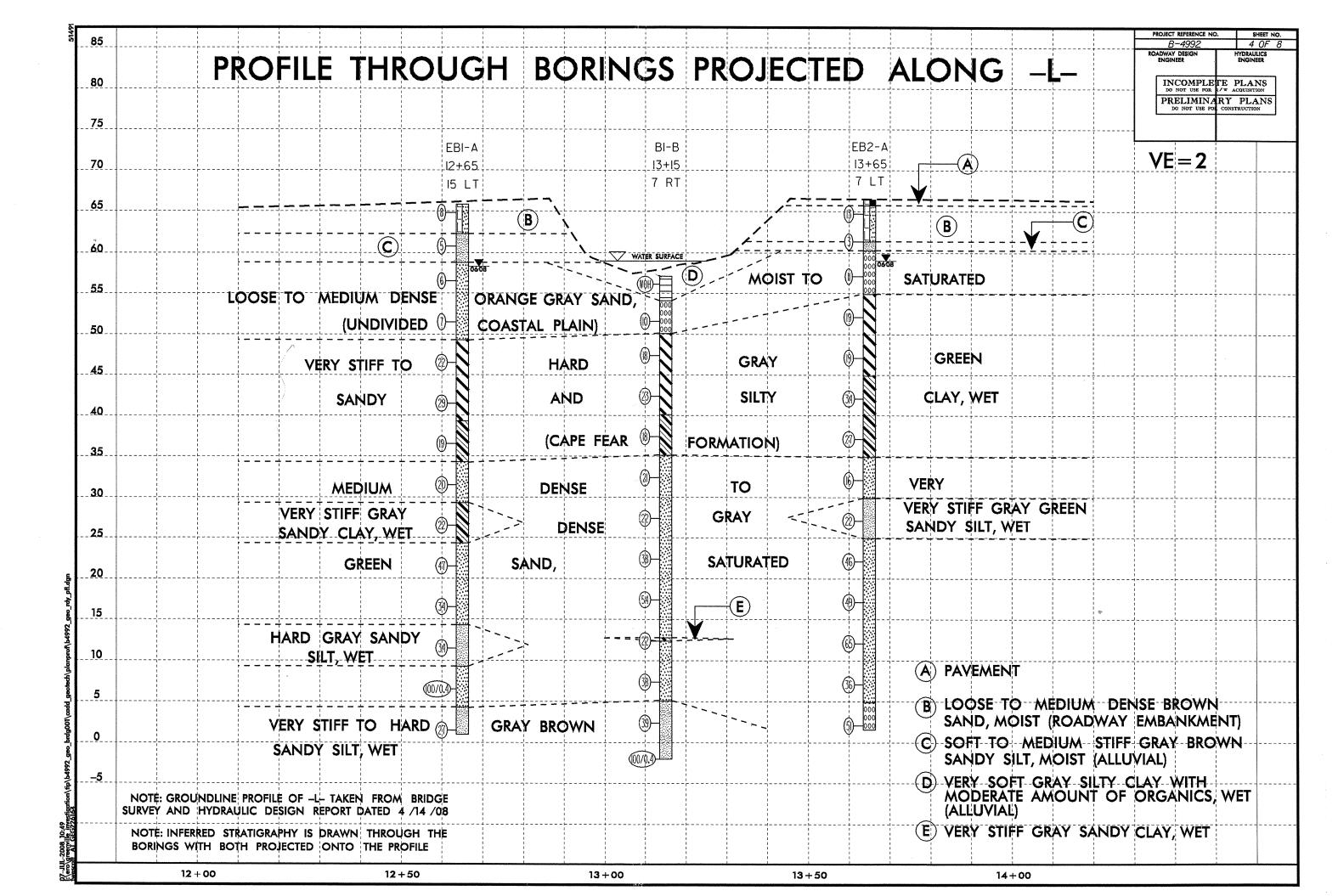
PROJECT REFERENCE NO.

B-4992

SHEET NO.

2 OF 8





			537.). B								ILSON			GEOLOGIST	·····			JECT NO.				. B-4992				COUNTY				l	GEOLOGI	SI BOTT	oms, I.C.
				RIDGE						UN OF		AVERD			Р			GROUND	VTR (ft)	SITE	DESCRIPT	ON	BRIDG	E NO.	1 ON SR	1628 C	VER R	UN OF	BEAVERD	AM SWA	MP					GROUND
ORII	NG NO.	. EB	1-A			STA	TION 1	2+65	i		0	DFFSET	15ft	t LT			ALIGNMENT -L-	0 HR.	N/A	BOF	RING NO. B	1-B			STATION	13+1	5		OFFSET	7ft RT		ALI	GNMEN	T -L-		0 HR.
OLL	AR ELI	EV . 6	55.8 ft				AL DEP					IORTHI	NG 6	679,87	2		EASTING 2,338,510	24 HR.	7.5	<u> </u>	LAR ELEV.				TOTAL DE	EPTH	59.1 ft		NORTHIN	IG 679,	861	EAS	STING	2,338,563		24 HR.
RILL	. MACH	HINE	CME	-45B		DRIL	L METH	HOD	Mud I	Rotary							HAMMER T	YPE Automatic		DRII	L MACHINE	СМ	E-45B		DRILL ME	THOD	Mud F	Rotary				· · · · · · · · · · · · · · · · · · ·		HAMME	R TYPE	Automatic
	T DATI						P. DATE					URFAC				l N/A	DEPTH TO	ROCK N/A		STA	RT DATE 0				COMP. DA	TE 0	6/12/08	3	SURFAC	E WATE	R DEPTH	0.8ft		DEPTH	TO ROCI	N/A
LEV (ft)	DRIVE ELEV (ft)	DEPT (ft)	٠٠,	LOW C				BL0 25	OWS P	PER FOO	OT 75	5 10		NO.	\mathcal{I}	O E	SOIL AND ROCK		DEPTH (ft)	ELEV (ft)	DRIVE ELEV (ft) DEF			COUNT 5ft 0.5	ft 0	B 25	LOWS PI	ER FOOT 0	7 5 10	SAMF 0 NO.	. MOI	0	;	SOIL AND RO	OCK DESC	RIPTION
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	65.8	\mathbf{I}_{00}														E 69	5.8 GROUND	SURFACE	0.0		57.1 1 0		OH W	он wo	$\frac{1}{H}$		•••	· · · · ·	 	SS-1 ²		 		AY SILTY CL		
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SITE	DESCR	IPTION	BRI	DGE I	NO. 1	ON SI	R 162	8 OVE	R RI	JN OF	BE	AVERD	AM S	WAN	1P					GROUND	WTR (ft
BORI	NG NO.	EB2-	A		S	TATIC	ON 13	3+65			C	FFSET	7ft I	_T			ALIGNME	ENT	-L-	0 HR.	N/A
COLL	AR ELE	EV. 66	.4 ft		T	OTAL	DEPT	H 64.	8 ft		N	ORTHIN	IG 6	79,8	90		EASTING	3 2	,338,607	24 HR.	7.4
DRILI	L MACH	INE C	ME-4	5B	D	RILL I	METH	OD M	ud F	Rotary									HAMMER TYPE	Automatic	
STAR	RT DATE	€ 06/1	1/08		C	OMP.	DATE	06/1	1/08		S	URFAC	E WA	TER	DEPT	H 1	V/A		DEPTH TO ROC	K N/A	
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ŀ	3.1	63.3	17	27	24	::		: : :	1	51			s	S-10		6000 6000	- - - 1.6				64
0		<u> </u>				۳							+			000	- Bo	ring	Terminated at Elevati	on 1.6 ft in ve	
	-	Ł															_		dense sand		
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B-4992 Bridge No. 1 on SR 1628 over Run of Beaverdam Swamp

HOLE#	SAMPLE#	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL LI	- PI	CLASS	DEPTH	MOIST.	ORG.
EB2-A	SS-1	72	64	25	26.8	43.6	13.4	16.2 16	3 2	A-2-4(0)	1.0-2.2		
	SS-2	100	92	40	26.2	39.4	18.3	16.2 19		A-4(0)	5.0-5.5		
	SS-3	64	26	6	77.9	14.8	3.2	4.1 19	NP	A-1-b(0)	8.3-9.8		
	SS-4	100	95	84	7.3	13.4	30.6	48.7 49	28	A-7-6(24)	13.3-14.8	18.0	
	SS-5	100	98	81	6.1	18.7	40.8	34.5 39	18	A-6(14)	23.3-24.8		
	SS-6	99	80	27	35.3	40.3	10.2	14.2 26	8	A-2-4(0)	33.3-34.8		
	SS-7	100	97	38	6.7	64.1	17.0	12.2 30		A-4(0)	38.3-39.8		
	SS-8	100	97	12	22.3	67.1	2.4			` '	43.3-44.8		
	SS-9	100	98	12	33.1	57.1	2.7			` '	53.3-54.8		
	SS-10	100	50	6	70.7	24.4	1.8	3.0 20) NP	A-1-b(0)	63.3-64.8		
B1-B	SS-11	100	99	88	2.6	12.2	26.4	58.8 65	30	A-7-5(32)	1.0-1.5		15.3
	SS-12	89	30	6	84.7	9.8	0.4	5.1 🗥	₹ NP	A-1-b(0)	4.5-6.0		
	SS-13	98	90	81	10.1	10.8	24.3	54.8 49	27 ′	A-7-6(22)	8.7-10.2		
	SS-14	100	99	59	4.3	49.9	25.6	20.3 40	16	A-6(7)	18.7-20.2		
	SS-15	97	68	29	49.2	25.1	11.6	_		` ,	23.7-25.2		
	SS-16	100	95	12	25.3	64.0	2.6			` ,	33.7-35.2		
	SS-17	100	95	75	12.2	18.3	33.1	36.5 23	3 11	A-6(5)	44.2-44.7		
	SS-18	100	100	91	1.4	20.5	55.8	22.3 23	3 5	A-4(3)	53.7-55.2		
EB1-A	SS-19	95	82	33	25.8	46.7	13.4	14.2 1	5 1	A-2-4(0)	1.0-1.5		
	SS-20	100	99	54	4.3	50.1	21.3	24.3 23	3 6	A-4(1)	4.0-5.5		
	SS-21	100	100	26	15.4	64.2	9.2	11.2 22	NP	A-2-4(0)	8.3-9.8		
	SS-22	100	89	17	40.7	45.4	7.8	6.1 18	NP	A-2-4(0)	13.3-14.8		
	SS-23	100	98	84	4.5	17.0	35.9			, ,	18.3-19.8		
	SS-24	100	95	36	16.7	50.4	6.5			A-6(1)			
	SS-25	100	94	20	33.1	47.9	1.8			` '	33.3-34.8		
	SS-26	100	98	68	4.7	40.4	28.6			` ,	38.3-39.8		
	SS-27	100	88	30	29.0	45.7	10.0			` ,	43.3-44.8		
	SS-28	100	98	44	5.7	60.0	13.0			A-4(0)	53.3-54.8		
	SS-29	100	82	11	51.7	39.7	2.5				58.3-59.2		
	SS-30	100	100	78	1.2	37.5	45.0	16.2 2	1 NP	A-4(0)	63.3-64.8		



FIELD SCOUR REPORT

WBS:	41537.1.1 TIP: B-4992 COUNTY: Wilson										
DESCRIPTION(1): Bridge No. 1 on SR 1628 over Run of Beaverdam Swamp											
EXISTING BRIDGE											
Information from:	Field Inspection X Microfilm (reel pos:) Other (explain)										
Bridge No.: Foundation Type:	1 Length: 53' Total Bents: 4 Bents in Channel: 2 Bents in Floodplain: 2 Timber pile										
EVIDENCE OF S Abutments or I	SCOUR(2) End Bent Slopes: None noted										
Interior Bents:	None noted										
Channel Bed:	None noted										
Channel Bank:	None noted										
II	UR PROTECTION Wooden end walls										
Extent(4):	8' outside edge of bridge										
Effectiveness(5):	Appears satisfactory										
Obstructions(6):	Fallen trees and trash										

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 N	Material(7)): Silty cla	Silty clay with moderate amounts of organics (SS-11)									
Channel Bank N): Sandy	Sandy silt (SS-2, SS-20)										
Channel Bank	Cover(9)): Trees a	Trees and shrubs									
Floodplain	Width(10)): <u>100 +/-</u>	100 +/- feet									
Floodplain	Cover(11)): Trees a	Trees and shrubs									
			Aggrading Degrading X Static									
nannel Migration Tendency(13): Not likely, but possibly west toward End Bent 1												
Observations and Other Comments:												
												····
DESIGN SCOUR ELEVATIONS(14) Feet X Meters												
	BENTS	<u> </u>										
10 yr.Overtoppin	B1 g 52.5	T		T	<u> </u>					<u> </u>	т	
io yr.overtoppiii	9 02.0											
		<u> </u>	<u> </u>	<u> </u>						<u> </u>		
Comparison of DSE	to Hydrau	ulics Unit	theoretic	al scour:								
Design Scour Elevat					: 10 yr. o\	ertop	ping s	cour.				
SOIL ANALYSIS RE	= 2T III 2=	EDOM CH	ANNEI	RED AN	D BANK	MAT	EDIAI					
Bed or Bank	302131	IXOM CI	IVIAIATT	DLD AN	BANK	IAIV	LNIAL	-			T	
Sample No.												
Retained #4												
Passed #10												
Passed #40												
1	Passed #200 Soo Shoot 7											
	Coarse Sand See Sheet 7, "Soil Test Results",										<u> </u>	
Fine Sand			for samples:									
Silt		Channel bed SS-11										
Clay		Channel bank SS-2, SS-20										
PI												
AASHTO Station					Т						 	
Offset					-					.,	+	
Depth			_		<u> </u>						+	
					1		·				<u></u>	

Template Revised 02/07/

Reported by: FM M W sub III Date: 7-7-08