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38 3 3

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33738.1.1(B-4513) F.A. PROJ. **BRSTP-1002(15)** COUNTY FRANKLIN PROJECT DESCRIPTION BRIDGE NO. 73 ON -L- (SR 1002) OVER PRONG CYPRESS CREEK

INVENTORY

STATE STATE PROJECT REFERENCE NO. SHEET TOTAL NO. SHEETS N.C. 33738.1.1(B-4513) 1 16

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 FILED BORING LOGS, ROCK CORES, AND SOL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING LUNTA IT 1919 250-408B. RETHIRET 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 GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A CEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUSPICIATED AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSUBFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BORFACHOR. THE LABORATORY SAMPLE DATA AND THE IN SITU UN-PLACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD, THE OBSERVED WATER LEVELS OR SOIL MOSITURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTICATIONS ARE AS RECORDED AT THE TIME OF THE INVESTICATION. THESE WATER LEVELS OR SOIL MOSITURE CONDITIONS TO CLIMATIC CONDITIONS TO CONDITIONS TO ANY ARY 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 PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR DINION 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 MODICATED IN THE SUBSUPFACE INVESTIGATED IN THE SUBSURFACE PROPMATION. THOSE INDICATED IN THE SUBSURFACE INFORMATION.

> PERSONNEL J.I. MILKOVITS, JR.

J.R. MATULA D.W. DIXON

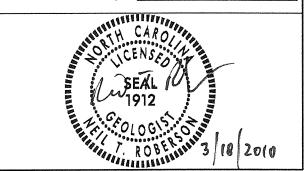
J.R. TURNAGE

INVESTIGATED BY O.B. OTT

N.T. ROBERSON

SUBMITTED BY___ N.T. ROBERSON

MARCH 2010



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.

33738.I.I(B-45I3)

SHEET NO.

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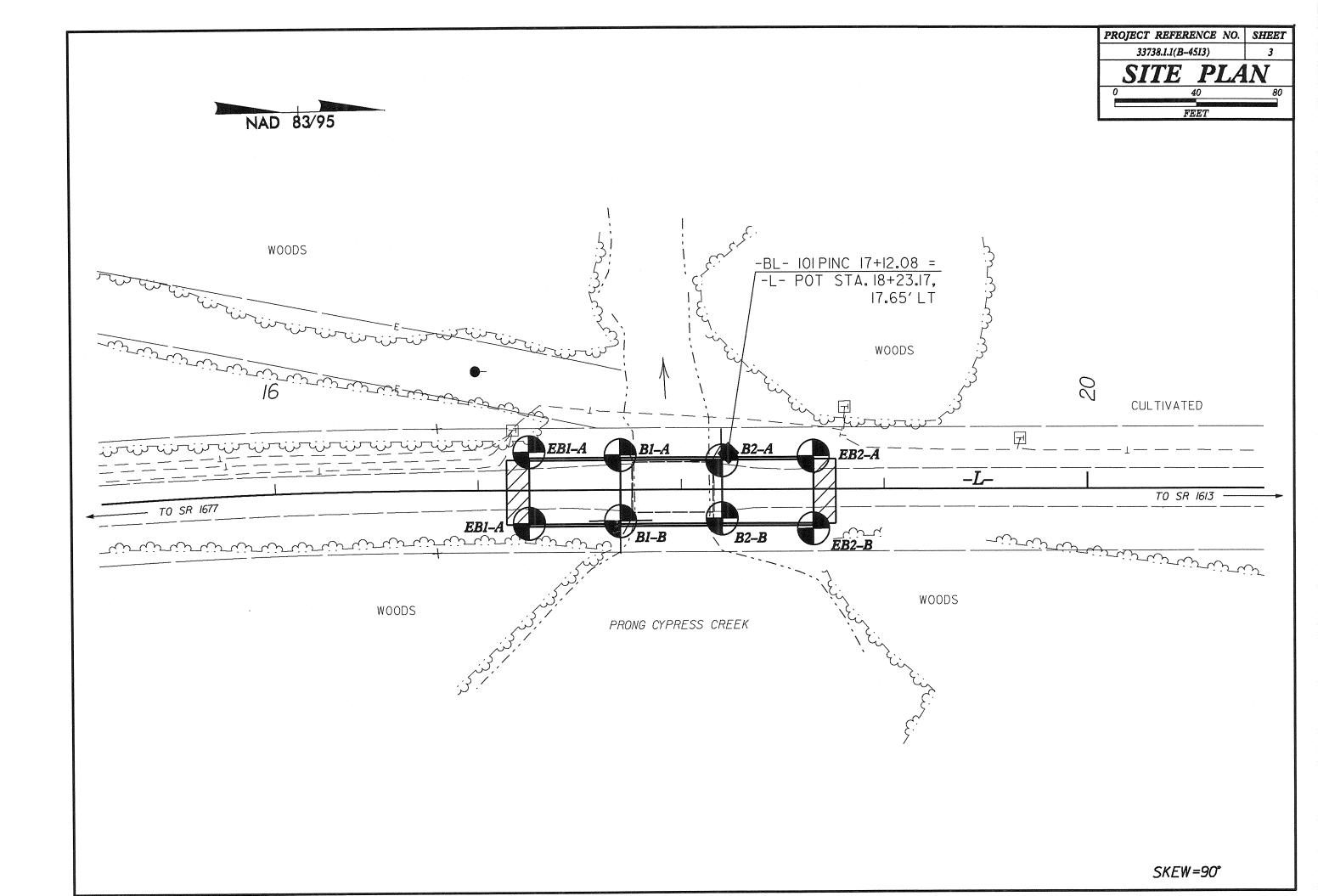
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

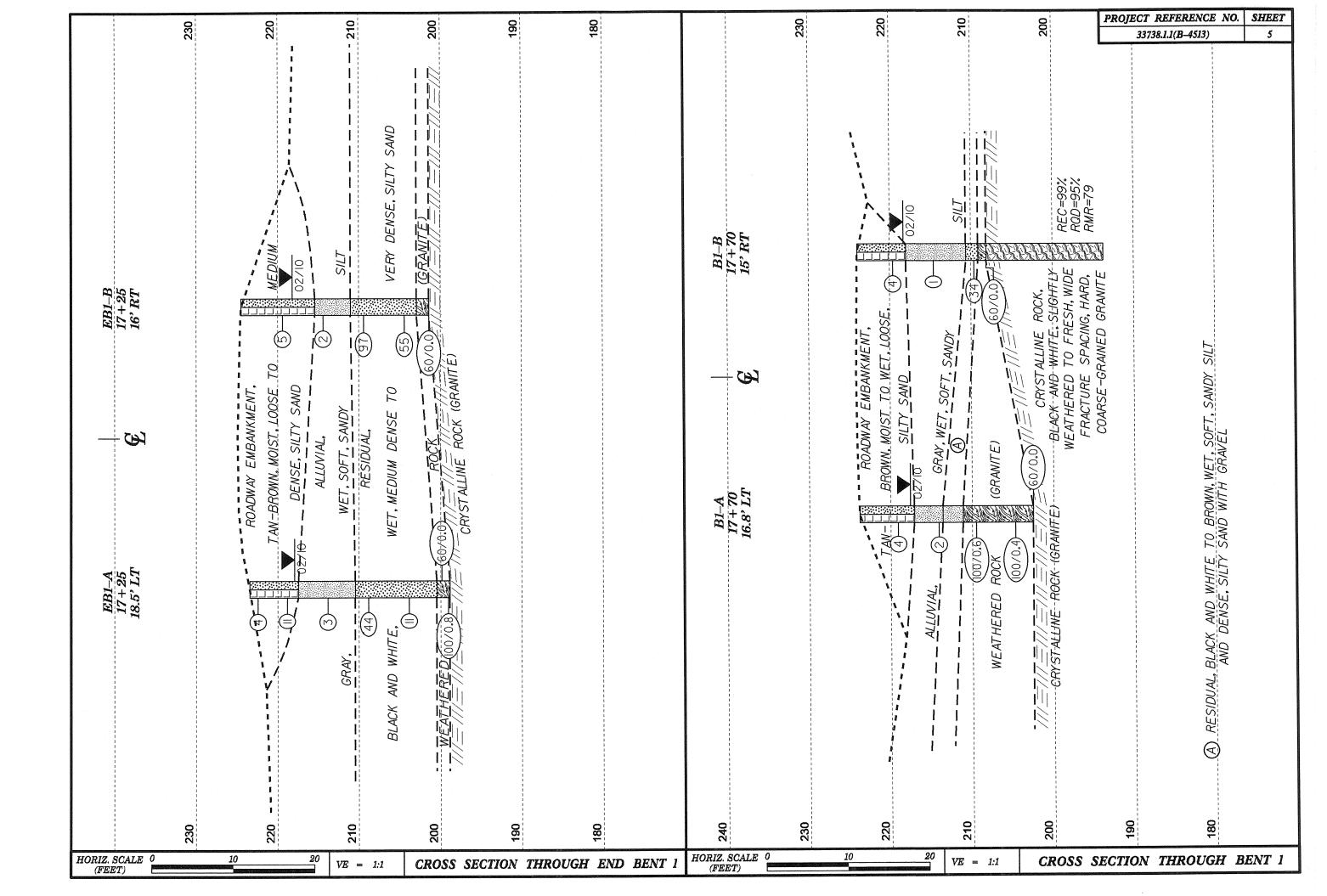
SUBSURFACE INVESTIGATION

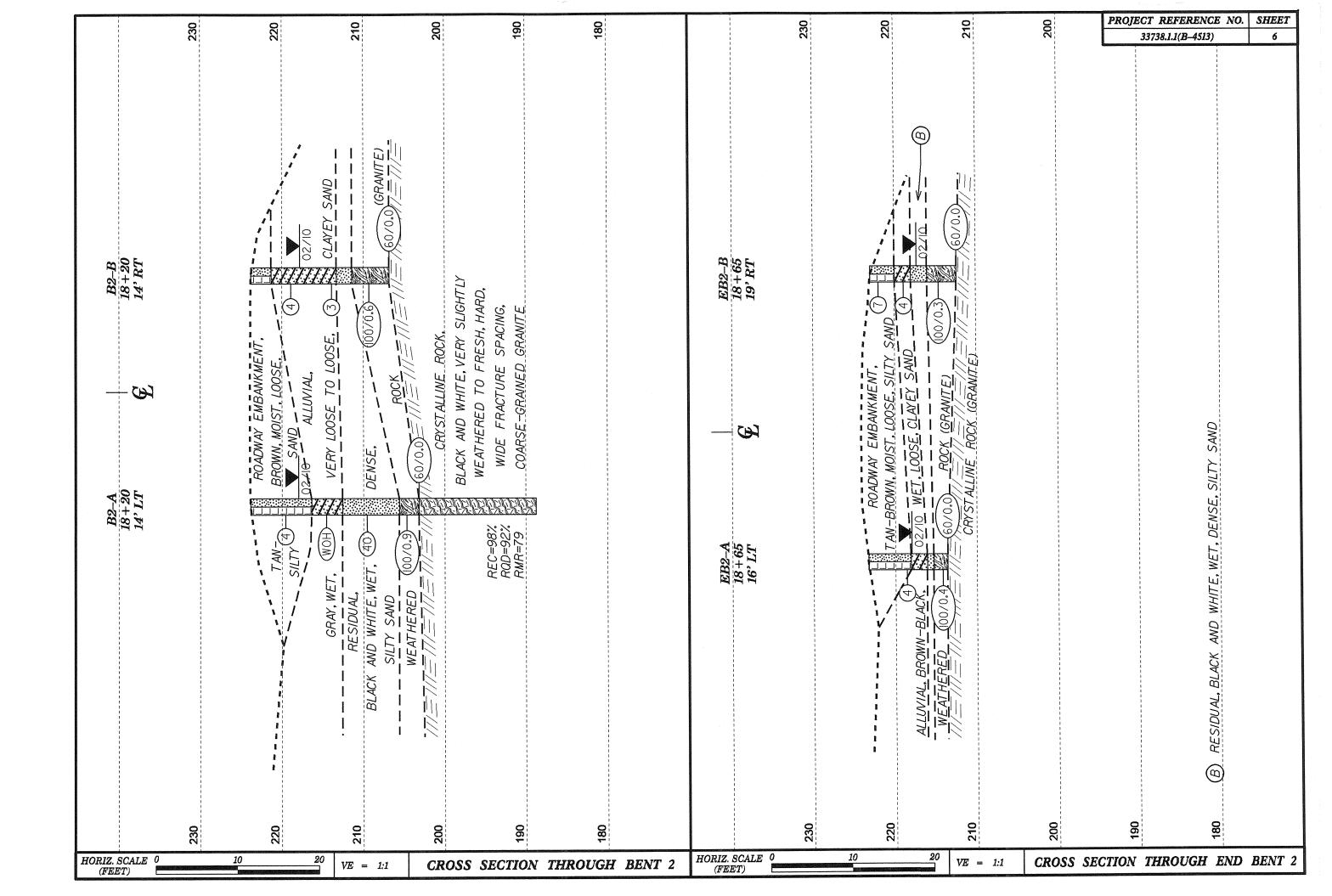
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

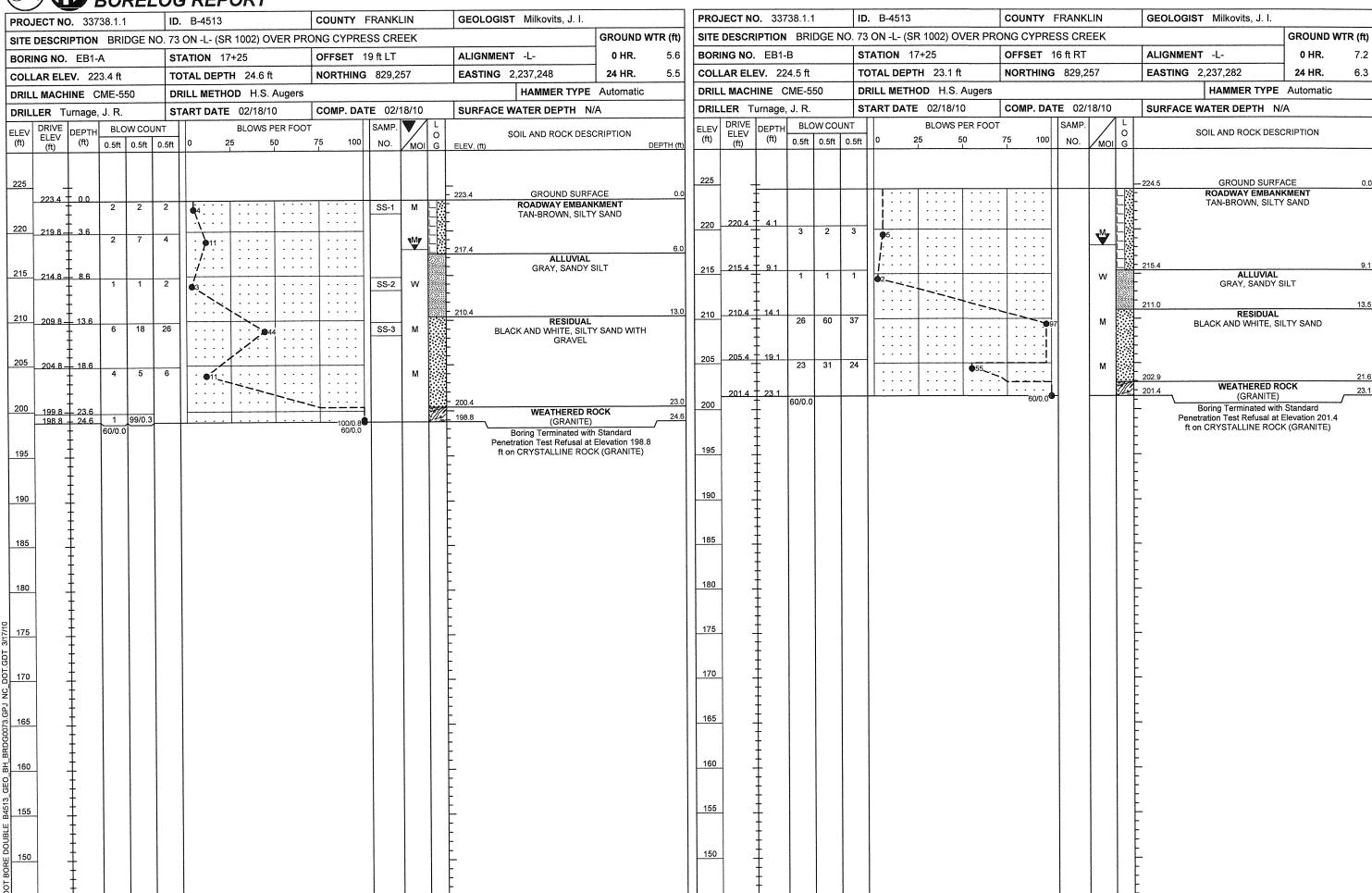
				2012 1112 111-	,	•	·			
S	OIL DESCRIPTION			GRADATION			ROCK	DESCRIPTION		TERMS AND DEFINITIONS
	DATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH	H MATERIALS	WELL GRADED - INDICATES A GOI	OD REPRESENTATION OF PARTICLE SIZES FR PARTICLES ARE ALL APPROXIMATELY THE	OM FINE TO COARSE. SAME SIZE.(ALSO	ROCK LINE INDIC	CATES THE LEVEL AT WHICH NON-	AT IF TESTED, WOULD YIELD SPT R COASTAL PLAIN MATERIAL WOULD Y	YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
THAT CAN BE PENETRATED WITH A CONTINU	OUS FLIGHT POWER AUGER, AND YIELD LESS THAN IARD PENETRATION TEST (AASHTO T206, ASTM D-15	١ ١	PODRI Y GRADED)	URE OF UNIFORM PARTICLES OF TWO OR MC		SPT REFUSAL IS IN NON-COASTAL	PENETRATION BY A SPLIT SPOON PLAIN MATERIAL, THE TRANSITI	N SAMPLER EQUAL TO OR LESS THA ION BETWEEN SOIL AND ROCK IS OF	AN 0.1 FOOT PER 60 BLOWS. TEN REPRESENTED BY A ZONE	AQUIFER - A WATER BEARING FORMATION OR STRATA.
CLASSIFICATION IS BASED ON THE AASHTO	SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL	INCLUDE:	0.	ANGULARITY OF GRAINS		OF WEATHERED F				ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND, ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AA AS MINERALOGICAL COMPOSITION, ANGULARIT	SHTO CLASSIFICATION, AND OTHER PERTINENT FAC Y, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	CTURS SUCH		OF SOIL GRAINS IS DESIGNATED BY THE T	ERMS: ANGULAR,	WEATHERED	SWASWA	PLAIN MATERIAL THAT WOULD YIELI	D SPT N VALUES > 100	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
	DIST WITH INTERBEDDED FINE SAND LAVERS, HIGHLY PLASTIC, A-7-6		SUBANGULAR, SUBROUNDED, OR RI		.1	ROCK (WR)	BLOWS PER FOO		5 01 11 WESES 7 100	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL
SOIL LEGEND	AND AASHTO CLASSIFICATION			MINERALOGICAL COMPOSITION		CRYSTALLINE		SE GRAIN IGNEOUS AND METAMORPHI SPT REFUSAL IF TESTED. ROCK TYP		AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
GENERAL GRANULAR MATERIALS CLASS. (≤35% PASSING #200	SILT-CLAY MATERIALS ORGAN (> 35% PASSING *200)	NIC MATERIALS	WHENEVER THEY ARE CONSIDERED	, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE US OF SIGNIFICANCE.	SED IN DESCRIPTIONS	ROCK (CR)	GNEISS, GABBRO	, SCHIST, ETC.		CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
GROUP A-1 A-3 A-		A-4, A-5		COMPRESSIBILITY		NON-CRYSTALLINE ROCK (NCR)	SEDIMENTARY R	E GRAIN METAMORPHIC AND NON-CO ROCK THAT WOULD YEILD SPT REFU		COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
CLASS. A-1-a A-1-b A-2-4 A-2-5		A-6, A-7	SLIGHTLY COMPRESSIB		LESS THAN 31 EQUAL TO 31-50	COASTAL PLAIN		LITE, SLATE, SANDSTONE, ETC. I SEDIMENTS CEMENTED INTO ROCK,	BUT MAY NOT YIELD	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL
SYMBOL COOCCOCC			MODERATELY COMPRESSIBLE		GREATER THAN 50	SEDIMENTARY ROCK	SPT REFUSAL. F	ROCK TYPE INCLUDES LIMESTONE, S	ANDSTONE, CEMENTED	LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
PASSING PASSING		SILT-		PERCENTAGE OF MATERIAL		ter/		ATHERING		DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
# 10 58 MX # 40 30 MX 58 MX 51 MN	GRANULAR SOILS	CLAY PEAT	ORGANIC MATERIAL G	RANULAR SILT - CLAY SDILS SDILS	OTHER MATERIAL	FRESH ROCK		JOINTS MAY SHOW SLIGHT STAINING	3. ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
	35 MX 35 MX 36 MN 36 MN 36 MN	SOILS		2 - 3% 3 - 5% TRAC 3 - 5% 5 - 12% LITT			MER IF CRYSTALLINE.			HORIZONTAL.
JOUID LIMIT 48 MX 41 MN	48 MX 41 MN 48 MX 41 MN 48 MX 41 MN SOILS	s with	MODERATELY DRGANIC	5 - 10% 12 - 20% SOME	20 - 35%			INED, SOME JOINTS MAY SHOW THIN ACE SHINE BRIGHTLY. ROCK RINGS (<u>DIP DIRECTION (DIP AZIMUTH) -</u> THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
LASTIC INDEX 6 MX NP 10 MX 10 MX	11 MN 11 MN 10 MX 10 MX II MN II MN LITTL	DATE INCOME!	HIGHLY ORGANIC	>10% >20% HIGH	LY 35% AND ABOVE		CRYSTALLINE NATURE.	OF STATE BILLOTTE I TOOK TANGE		FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
GROUP INDEX 0 0 8		NTS OF SOILS		GROUND WATER	N. 110			INED AND DISCOLORATION EXTENDS LAY. IN GRANITOID ROCKS SOME OC		SIDES RELATIVE TO DNE ANOTHER PARALLEL TO THE FRACTURE.
USUAL TYPES STONE FRAGS. FINE SILTY OF MAJOR GRAVEL, AND SAME CRAVE		NIC		EL IN BORE HOLE IMMEDIATELY AFTER DE	RILLING			D. CRYSTALLINE ROCKS RING UNDER		FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND SAND GRAVEL	AND SAND SOILS SOILS MATTE			rer level after 24 hours		HODELMINE		V DISCOLORATION AND WEATHERING ARE DULL AND DISCOLORED, SOME SI		FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN. RATING AS A EXCELLENT TO GOOD	FAIR TO POOR FAIR TO	POOR UNSUITABLE	PERCHED W	ATER, SATURATED ZONE, OR WATER BEARIN	IG STRATA			IND SHOWS SIGNIFICANT LOSS OF S		PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY
SUBGRADE	1000	1	OM SPRING OR	SEEP		ł .	FRESH ROCK.		YO ALL EFI DODADO DIA I	THE STREAM.
	STENCY OR DENSENESS	> LL - 30		MISCELLANEOUS SYMBOLS		SEVERE AND	DISCOLORED AND A MAJORITY SHI	ED OR STAINED. IN GRANITOID ROCK HOW KAOLINIZATION. ROCK SHOWS SI	EVERE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
	RANGE OF STANDARD RANGE	OF UNCONFINED	ETT ROADWAY EMBANKME		SAMPLE	(MOD, SEV.) AND	CAN BE EXCAVATED WITH A GEOL	_OGIST'S PICK. ROCK GIVES "CLUNK"	SOUND WHEN STRUCK.	THE FIELD.
PRIMARY SOIL TYPE COMPACTNES		ESSIVE STRENGTH (TONS/FT ²)	WITH SOIL DESCRIP					≝ ED OR STAINED.ROCK FABRIC CLEAF	R AND EVIDENT BUT REDUCED	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
VERY LOOS			SDIL SYMBOL	AUGER BORING	S - BULK SAMPLE	(SEV.) IN S	STRENGTH TO STRONG SOIL. IN GR	RANITOID ROCKS ALL FELDSPARS AF	RE KAOLINIZED TO SOME	ITS LATERAL EXTENT.
GENERALLY LOOSE GRANULAR MEDIUM DE	4 TO 10	N/A	ARTIFICIAL FILL (A	E) DTHER	SS - SPLIT SPOON SAMPLE		ENT. SOME FRAGMENTS OF STRONG TESTED. YIELDS SPT N VALUES > 1			LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MATERIAL DENSE	3Ø TO 5Ø		THAN ROADWAY EME		ST - SHELBY TUBE	VERY SEVERE ALL	ROCK EXCEPT QUARTZ DISCOLORE	ED OR STAINED. ROCK FABRIC ELEM	ENTS ARE DISCERNIBLE BUT	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS.MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERY DENS			INFERRED SOIL BOL	INDARY W.	SAMPLE	(V SEV.) THE	MASS IS EFFECTIVELY REDUCED T AINING, SAPROLITE IS AN EXAMPLE	TO SOIL STATUS, WITH DNLY FRAGME OF ROCK WEATHERED TO A DEGR	MENTS OF STRONG ROCK EE SUCH THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN
GENERALLY SOFT	2 TO 4	<0.25 0.25 TO 0.50	INFERRED ROCK LIN	MONITORING WEL	.L RS - ROCK SAMPLE			BRIC REMAIN. IF TESTED, YIELDS		INTERVENING IMPERVIOUS STRATUM.
SILT-CLAY MEDIUM ST		Ø.5 TO 1.0		△ PIEZUMETER INSTALLATION	RT - RECOMPACTED TRIAXIAL	COMPLETE ROCK	REDUCED TO SOIL, ROCK FABRIC	NOT DISCERNIBLE, OR DISCERNIBLE MAY BE PRESENT AS DIKES OR ST	E ONLY IN SMALL AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
MATERIAL STIFF (COHESIVE) VERY STIF	F 15 TD 30	2 TO 4	ALLUVIAL SOIL BOL	SLOPE INDICATOR	SAMPLE R		O AN EXAMPLE.	THE DE TRESERT AS DIRES ON ST	TOTAL OF TOTAL TO	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
HARD	>30	>4	25/025 DIP & DIP DIRECTI ROCK STRUCTURES	ON DF INSTALLATION	CBR - CALIFORNIA BEARING RATIO SAMPLE		ROCK	K HARDNESS		EXPRESSED AS A PERCENTAGE.
TEX	TURE OR GRAIN SIZE			SPT N-VALUE				R SHARP PICK. BREAKING OF HAND	SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
U.S. STD. SIEVE SIZE	4 10 40 60 200 270		SOUNDING ROD	REF SPT REFUSAL		J	VERAL HARD BLOWS OF THE GEOLG		MAKED DI ONE DECUMPED	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
DPENING (MM) 4.	76 2,00 0.42 0.25 0.075 0.053	3		ABBREVIATIONS			N BE SCRATCHED BY KNIFE UR PIL DETACH HAND SPECIMEN.	ICK ONLY WITH DIFFICULTY. HARD F	HAMMER BLUWS REGULARD	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRA		SILT CLAY (SL.) (CL.)	AR - AUGER REFUSAL BT - BORING TERMINATED	HI HIGHLY MED MEDIUM				ICK. GOUGES OR GROOVES TO 0.25		SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
(BLDR.) (COB.) (GI	1032.30.7 1 1 30.7		CL CLAY	MICA MICACEDUS	VST - VANE SHEAR TEST		CAVATED BY HARD BLOW OF A GET MODERATE BLOWS.	OLOGIST'S PICK, HAND SPECIMENS	CAN BE DETACHED	SLIP PLANE.
GRAIN MM 305 75 SIZE IN. 12 3	2.0 0.25 0.05	0.005	CPT - CONE PENETRATION TO CSE COARSE	EST MOD MODERATELY NP - NON PLASTIC	WEA WEATHERED			INCHES DEEP BY FIRM PRESSURE OF		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
	RE - CORRELATION OF TERMS		DMT - DILATOMETER TEST	DRG DRGANIC	$\gamma_{ m d}$ - DRY UNIT WEIGHT		N BE EXCAVATED IN SMALL CHIPS INT OF A GEOLOGIST'S PICK.	S TO PEICES 1 INCH MAXIMUM SIZE	BY HARD BLOWS OF THE	A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS
SOIL MOISTURE SCALE	FIELD MOISTURE GUIDE FOR FIELD MO		DPT - DYNAMIC PENETRATION • - VOID RATIO	N TEST PMT - PRESSUREMETER TEST SAP SAPROLITIC		SOFT CA	N BE GROVED OR GOUGED READILY	Y BY KNIFE OR PICK. CAN BE EXCA		THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH.
(ATTERBERG LIMITS)	DESCRIPTION		F - FINE	SD SAND, SANDY SL SILT, SILTY			OM CHIPS TO SEVERAL INCHES IN ECES CAN BE BROKEN BY FINGER	SIZE BY MODERATE BLOWS OF A PRESSURE.	PICK POINT. SMALL, THIN	OF STRATUM AND EXPRESSED AS A PERCENTAGE.
	- SATURATED - USUALLY LIQUID; VER		FOSS FOSSILIFEROUS FRAC FRACTURED, FRACTURE					E EXCAVATED READILY WITH POINT		STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE
LL_ LIQUID LIMIT	(SAT.) FROM BELOW THE G	THE THEE	FRAGS FRAGMENTS	TCR - TRICONE REFUSAL			MORE IN THICKNESS CAN BE BRO GERNAIL.	OKEN BY FINGER PRESSURE. CAN BE	SCRATCHED READILY BY	TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
PLASTIC RANGE <	- WET - (W) SEMISOLID; REQUIRES		FOLIT	PMENT USED ON SUBJECT P	ROJECT	.1	TURE SPACING	BEDD	ING	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
(PI) PLASTIC LIMIT	- WEI - TW) ATTAIN OPTIMUM MC	UISTURE			HAMMER TYPE:	TERM	SPACING	TERM	THICKNESS	BENCH MARK: BL-IOI, STATION 18+23, 17'7 LT
	COLUMN TO NEAR	R OPTIMUM MOISTURE	DRILL UNITS:	ADVANCING TOOLS:	AUTOMATIC MANUAL	VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED THICKLY BEDDED	> 4 FEET 1.5 - 4 FEET	2.7
OM OPTIMUM MOISTURE SL SHRINKAGE LIMIT	- MOIST - (M) SOLID; AT OR NEAR	N DI TIMON MOISTONE	MOBILE B	L CLAY BITS		WIDE MODERATELY C	3 TO 10 FEET CLOSE 1 TD 3 FEET	THINLY BEDDED VERY THINLY BEDDED	0.16 - 1.5 FEET 0.03 - 0.16 FEET	ELEVATION: 223,28 FT.
SE SIMILARIOE EXITY	REQUIRES ADDITIONA	AL WATER TO		6 CONTINUOUS FLIGHT AUGER	CORE SIZE:	CLOSE VERY CLOSE	0.16 TO 1 FEET LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET	NOTES:
	- DRY - (D) ATTAIN OPTIMUM MC		BK-51	8 HOLLOW AUGERS		12.11 02.05		THINLY LAMINATED DURATION	< 0.008 FEET	
	PLASTICITY		CME-45C	HARD FACED FINGER BITS		EUB GEDIMENTARY		DURATION ENING OF THE MATERIAL BY CEMENT	TING, HEAT, PRESSURE, ETC.	
	12,10110111 1112011 1111	STRENGTH		TUNGCARBIDE INSERTS			DUDDIN	NG WITH FINGER FREES NUMEROUS (
NONPLASTIC		Y LOW IGHT	CME-550	CASING W/ ADVANCER	HAND TOOLS:	FRIABLI		E BLOW BY HAMMER DISINTEGRATES		
LOW PLASTICITY MED. PLASTICITY	16-25 MEI	DIUM	PORTABLE HOIST	TRICONESTEEL TEETH	POST HOLE DIGGER	MODERA		CAN BE SEPARATED FROM SAMPLE	WITH STEEL PROBE;	
HIGH PLASTICITY	20 01 11010	11GH	1 =	TRICONE TUNGCARB.	HAND AUGER		BREAKS	S EASILY WHEN HIT WITH HAMMER.		, '
	COLOR		┨Ш ┃	CORE BIT	SOUNDING ROD	INDURAT		S ARE DIFFICULT TO SEPARATE WIT OULT TO BREAK WITH HAMMER.	'H STEEL PROBE:	
	OR COLOR COMBINATIONS (TAN, RED, YELLOW-BI				VANE SHEAR TEST	EYTDEM		HAMMER BLOWS REQUIRED TO BREA	AK SAMPLE:	
MODIFIERS SUCH AS LIGHT, DARK,	STREAKED, ETC. ARE USED TO DESCRIBE APPE	EHMANUE.		Ш		EATREM	SAMPLE	E BREAKS ACROSS GRAINS.		
L										REVISED 02/23/06



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									 				FEET = 1:1		38.1.1(B-4513) E BORINGS PR ALONG -L-	OJECTED
240	EB1-B 				Bi	′–B + 70				<i>B2-</i>	-B 20				EB2-B 18+65	240
 	16' RT			 	15'	RT	1 1 1 1 1 1 1 1			14' 1	RT		1	1 1 1 1 1 1 1 1	19' RT	
230											· .		1	1 · · · · · · · · · · · · · · · · · · ·		230
	FØ	ROADWAY	EMBANKMEN	 Г.		,	1 1 1 1 1 1 1 1 1 1 1					RO IAN-BROW	ADWAY EMBA	NKMENT,	(T) (SA	 ND 220
220 T	5 V AN- 02/1		101ST. LOOSE ALLU	, SILTY SAND	4 	02710	WATER	SURFACE_06/0	29	4	02/10 GRAY	ALLUV WET, LOOSE,	CLAYEY SANI	TY SAND	9 02/10	
210	* 7 BEEN 1	ESIDUAL,	PAY,WET,SOF	T, SANDY SI					-	SIDUAL. — (00/0.6)	BLACK AM	WEATHERE CRYSTALI	D ROCK (GR	ANITE) RANITE)	60.	/0.0/210
BLACK DENSE,					(60/0.0)	CRYS	TALLINE ROC ND WHITE.S		7 = 7/7 = 7%	7=77/=7	(60/0.0)	CRYSTALI	INE ROOK	; ; ; ; ; ; ; ; ; ;		200
BLACK SANDY	AND WHITE	CRYSTALUM WET. DENSE			REC=99% RQD=95% RMR=79	FRACTUI	RED TO FRE RE SPACING, GRAINED GF	HARD,		, , , , , , , , , , , , , , , , , , ,			 			
190	SILT													; ; ; ; ; ;		190
180														 		180
170				i 												170
160				1						 						160
		 	; ; ; ; ; ; ; ;				7					1		OFILE TAKEN DATED 03/0	1	
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(ft) C(ft) (ft) 0.5ft 0.5ft 0.5ft 0 25 50 75 100 NO. MOI G																					
BORNING NO. B1-A STATION 17+70 OFFSET 17 RLT ALIGNMENT	PRO	ECT NO). 337	'38.1.1		IE).	B-4513				COU	VTY	FI	RANKI	.IN		GEOLOGIST	Γ Milkovits, J. I.		
COLLAR ELEV. 223 8	SITE	DESCRI	PTION	BRI	DGE I	NO. 73	3 C	ON -L- (SR	1002)	OVEF	R PRO	NG C	YPR	ES	S CRE	EK				GROUND W	TR (ft)
DRILLE MACHINE CME-550 DRILL METHOD H.S. Augers	BORI	NG NO.	B1-A			s	TA	ATION 17	+70			OFFS	ET	17	ft LT			ALIGNMENT	r -L-	0 HR.	7.2
DRILLET TURBOR J. R. START DATE 02/23/10 COMP. DATE 02/23/10 SURFACE WATER DEPTH N/A	COLL	AR ELE	V. 22	3.8 ft		Т	ОТ	TAL DEPT	H 21.	3 ft		NORT	THING	3	829,3)2		EASTING 2	2,237,250	24 HR.	6.2
ELEV (P) P(P) ELEV (CONT) BLOWS PER FOOT SAMP LEV (P) P(P) P	DRIL	L MACH	INE C	ME-5	50	D	RI	ILL METHO	D H.	S. Aug	gers								HAMMER TYPE	Automatic	
ER C C C C C C C C C	DRIL	LER To	urnage	J. R.		s	TA	ART DATE	02/23	3/10		COMI	P. DA	TE	02/2	3/10		SURFACE V	VATER DEPTH N	/A	
190 190	ELEV	DRIVE													ı			S	OIL AND ROCK DES	CRIPTION	
220 2201 S.7 3 2 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	\parallel	0 2	5	50 		75 	100	\parallel	NO.	/MOI	G		.,,,		
220 2201 S.7 3 2 2 4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2																					
220 220.	225	_	-															223.8	GROUND SURF	ACE	0.0
220 20.1 13.7 S 43.0.1 10.00 WOR 2 210 210.1 13.7 S 43.0.1		-	-				Ħ	<u></u>		· ·		T		\parallel				-	ROADWAY EMBAN	KMENT	
215 215.1 8.7 WOR WOR 2 210 210.1 13.7 57 430.1 200 200 200 200 200 200 200 200 200 200	220	220.1	3.7									: :						-	TAN-BROWN, SILT	IOAND	- 1
215		-	-	3	2	2	11	4								M	F	-			
WOH WOH 2 2 2 3 1000.4 1000.6		1						i : : :				: :						217.1	ALLUVIAL		6.7
RESIDUAL 210 210.1 13.7 57 43/0.1 205 205.1 18.7 0000.4 202 203 21.3 600.0 5	215	215.1	8.7	WOH	WOH	2	$\ \cdot\ $			+-		+	• •			w		213.6	GRAY, SANDY	SILT	10.2
205 205.1 18.7 1000.4 1000.0 WEATHEREO ROCK (GRANTE) 205 205.1 18.7 1000.4 1000.0 WEATHEREO ROCK (GRANTE) 206 207.6 21.3 600.0 Documentation from the Medical of Elevation 202.5 in or CRYSTALLINE ROCK (GRANTE) 198 199 190 195 195 195 195 195 195 195 195 195 195		-	-				П	2 :										10/		CANDY SILT	
205 205.1 18.7 1000.4 202.5 21.3 600.0 (GRANTE) 206 207 1 18.7 1000.4 202.5 21.3 600.0 (GRANTE) 207 1 1000.4 202.5 21.3 600.0 (GRANTE) 208 1 1000.4 202.5 21.3 600.0 (GRANTE) 209 1 100 1 10	210	210.1	13.7									 					773	211.1 VV	WEATHERED R		12.7
205 205.1 18.7		-		57	43/0.1					: :		- 1	00/0.6				1	_	(GRANITE)		
200 100,0.4 200,0.4]	E							: :								-			
200	205	205.1	18.7	100/0.4	<u>}</u>					+		1.1	00/0.4					_			
200 Penetation Text Refusal at Elevation 202.5		202.5	21.3	60/0.0			μ					<u> </u>	 60/0.0	Ы					Soring Terminated with	Standard	21.3
190	200	_	E	80/0.0														Penet	ration Test Refusal at	Elevation 202.5	
190 185 175 170 165 160 160		_	Ĺ															-	ONTO MEEME NOO	/((
190 185 175 170 165 160 160		-	L															-			
180 180 175 176 160 150	195	_	<u> </u>															_			
180 180 175 176 160 150		-	<u> </u>															<u>-</u> -			
180	190	-	L															_			
180			<u> </u>											-				-			
180		-	<u> </u>															- -			
175	185	-	‡															-			
175		-	‡															-			
165 160 155 150 150 1	180	-	‡															-			
165 160 155 150 150 1			‡											1				-			
165 160 155 150 150 1	475		‡															 -			
165 160 150 160 1	1/5	-	‡															-			
165 160 150 160 1		:	‡															-			
160	170	-	‡															_			
160			‡															-			
160	165		‡															<u> </u>			
155	100	-	‡															F			
155			‡															F			
150	160	-	‡															<u> </u>			
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150	155		‡															F			
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	150	-	‡															E			
			‡															F			
	145		‡															F			

NCDOT GEOTECHNICAL ENGINEERING UNIT

	<u>y</u> Ų		BO	RE	LO	G REP	ORT							
	JECT N). B-4513		COUNTY				GEOLOGIST Milkovits, J. I.		
SITE	DESC	RIPTIO	N BR	IDGE I			R 1002) OVER PF	RONG CYPR	ESS CR	EEK			GROUND W	TR (ft)
BOR	NG NO	. B1-E	3		S	TATION 1	7+70	OFFSET				ALIGNMENT -L-	0 HR.	N/A
	AR EL					OTAL DEPT		NORTHIN	G 829,	302		EASTING 2,237,282	24 HR.	5.7
DRIL	L MAC	HINE	CME-5	550			OD NW Casing		·····			HAMMER TYPE		
DRIL	LER 7					TART DATE	02/25/10	COMP. D		7		SURFACE WATER DEPTH N/	Α	
ELEV (ft)	DRIVE ELEV	DEPTH (ft)	·	OW CO	T		BLOWS PER FOC 25 50	T 75 100	SAMP		0	SOIL AND ROCK DESC		
(17)	(ft)	1 119	0.5ft	0.5ft	0.5ft		1 30	75 100	NO.	MOI	G	ELEV. (ft)	D	EPTH (ft)
225		<u> </u>					·				<u>_</u>	224.0 GROUND SURFA		0,0
		‡										ROADWAY EMBANI TAN-BROWN, SILTY		
220	220.6	3.4	3	1	3				_	_w_		<u>. </u>		
		‡								W		218.0 ALLUVIAL		6.0
215	215.6	+ + 8.4										GRAY, SANDY S	ILT	
213	•	‡	WOH	WOH	1	1			11	W	F			
		‡												. 40.4
210	•	<u>† 13.4</u> 	9	17	17		34					210.6	SII TY SAND	13.4
	208.1	T 15.9	60/0.0					60/0.0				WEATHERED RO		15.9
205		‡		1					11			(GRANITE)		
		‡										CRYSTALLINE RO BLACK AND WHITE, S	LIGHTLY	
200		‡										. WEATHERED TO FRES FRACTURE SPACING,	SOUND,	
200		‡										COARSE-GRAINED G	RANITE	
		‡										REC=99% RQD=95%		
195		‡							RS-1	1		RMR=79 . 193.7		30.3
ŀ		‡	1	†	ļ	 	1 1	-1	1			Boring Terminated at Elevat		00.0
190		Ī										- OKYON EERAE NOOK (310 WHTE)	
		Ŧ												
		<u> </u>												
185		+										<u>-</u>		
		‡										•		
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175 175 175 175 175 175 175 175 175 175		Ŧ									F			
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NCDOT GEOTECHNICAL ENGINEERING UNIT

	JECT NO				ــــــــــــــــــــــــــــــــــــــ	B-451					UNTY FRANKLIN	GEOLOGIS	ST Milkovits, J. I.		
SITE	DESCR	IPTION	BRI	DGE NO	. 73 O	N -L- (SR 1002) OVE	R PR	ONG	CYPRESS CREEK			GROUND	WTR (ft)
BOR	ING NO.	B1-B			STA	TION	17+70			OF	FSET 15 ft RT	ALIGNMEN	VT -L-	0 HR.	N/A
COL	LAR ELE	EV. 22	4.0 ft		TOT	AL DE	PTH 30	.3 ft		NO	RTHING 829,302	EASTING	2,237,282	24 HR.	5.7
DRIL	L MACH	INE C	ME-5	50	DRIL	L MET	HOD N	IW Ca	sing w	/ Co	е		HAMMER TYP	E Automatic	
DRIL	LER T	urnage,	J. R.		STAF	RT DA	TE 02/2	25/10		СО	MP. DATE 02/25/10	SURFACE	WATER DEPTH	N/A	
COR	E SIZE	NWXL			TOTA	AL RU	N 14.41	ft							***************************************
LEV	RUN	DEPTH	T	DRILL	RI	JN RQD	SAMP.		ATA RQD	L					
(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	(ft) %	NO.	(ft) %	(ft) %	O G	ELEV. (ft)	DESCRIPTION	AND REMARKS		DEPTH (fi
208.1												Begin Corin	ng @ 15.9 ft		
~~~~~	208.1	15.9	4.4	1:5471.0 2:21/1.0	(4.2) 95%	(3.8) 86%		(14.2) 99%	(13.7) 95%		208.1	CRYSTAL	LINE ROCK Y WEATHERED TO F	EDECH WIDE	15.
205	_	-		1:41/1.0	3370	0070		3370	9576				D, COARSE-GRAINE		
	203.7 -	_ 20.3 -	5.0	1.43/0.4	(5.0)	(4.9)					- -				
200	-	-		4:11/1.0 5:49/1.0 9:19/1.0 9:11/1.0	100%	98%					- -				
200	198.7 ₋	_ - 25.3		9:56/1.0							<del></del>				
	-		5.0	8:07/1.0 3:43/1.0		(5.0) 100%					•				
195		-		2:46/1.0 4:42/1.0			RS-1	}							
	193.7	30.3		9:53/1.0				ļ		بتفيع	- 193.7 - Boring Terminat	ed at Elevation	193.7 ft in CRYSTAL	LINE BOCK	30.
	1	_									- bonny rentinat		ANITE)	LINE NOON	
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	-	-									•				
85	-	-									•				
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170	1	-									•				
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65		-									<del>-</del>				
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### NCDOT GEOTECHNICAL ENGINEERING UNIT

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PRO.	JECT N	O. 337	738.1.	1	IC	).	B-4513			cou	INTY	FRANK	LIN		GEOLOGIST	Milkovits, J. I.		
SITE	DESCF	RIPTION	BRI	DGE I	NO. 73	3 (	ON -L- (SR	1002) O	VER PR	ONG (	CYPRE	SS CRI	EEK				GROUND W	/TR (ft)
BOR	NG NO	. B2-A	`		S	TA	ATION 18	+20		OFF	SET	14 ft LT			ALIGNMENT	-L-	0 HR.	N/A
COLI	AR EL	EV. 22	23.9 ft		T	01	TAL DEPTI	4 35.1 f	t	NOF	THING	829,3	352		EASTING 2	,237,253	24 HR.	5.9
DRIL	L MACI	HINE (	CME-5	50	D	RI	ILL METHO	D NW	Casing V	V/SPT	& Cor	е				HAMMER TYPE	Automatic	
DRIL	LER T	urnage	, J. R.		S	TA	ART DATE	02/23/1	0	CON	IP. DA	TE 02/	23/10		SURFACE W	ATER DEPTH N/	Α	
ELEV	DRIVE ELEV	DEFIN	BLC	ow co	UNT	$\prod$		BLOWS I	PER FOO			SAMP.	V/	L	SC	OIL AND ROCK DESC	CRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	$\coprod$	0 25	; ;	50 1	75	100	NO.	МО	1 1	ELEV. (ft)			EPTH (ft)
225		1													223.9	GROUND SURFA	ACE .	0.0
		‡				H	<u> </u>			.   .		<b>†</b>		-13	<del>-</del>	ROADWAY EMBANI	KMENT	
220	220.6	+ 3.3	<u> </u>							:   :	: : :	-			- -	TAN-BROWN, SILTY	SAND	
220		‡	1	2	2		4						W					
		‡					j:::::				: : :				216.4			7.5
215	215.6	<del>+</del> 8.3	WOH	WOH	WOH		0		ļ · · · ·	- -			w	//	-	ALLUVIAL GRAY, CLAYEY S	AND	
		‡								:   :	: : :				- 212.6			11.3
210	210.6	† <u>† 13.3</u>	ļ							:   :	: : :				- - BL	<b>RESIDUAL</b> ACK AND WHITE, SII	LTY SAND	
2.10	•	‡	9	15	25			40		.   .			W		-			
		‡							: ```						- - 205.6			18.3
205	205.6	+ 18.3 +	11	89/0.4						<del>                                     </del>	100/0.9	,		10		WEATHERED RO	OCK	
	203.2	T 20.7	60/0.0								60/0.0	)			203.2	(GRANITE)  CRYSTALLINE RO		20.7
200	_	I													WEATH	CK AND WHITE, VER' HERED TO FRESH, H	ARD, SOUND,	
		1								-   :						MIDE FRACTURE SP COARSE-GRAINED G		
		<u> </u>								:   :	: : :	.			-	REC=98%		
195	-	<u>†</u>														RQD=92% RMR=79		
		‡								:   :	: : :				-			
190		‡								<u> </u>		<u> </u>			<u>-</u>			
1		‡	<b> </b>	<del> </del>		۲	<u> </u>		<u> </u>			RS-2		بجمينا	188.8 Boring	Terminated at Elevat	ion 188.8 ft in	35.1
185		‡													- UN	YSTALLINE ROCK (	SKANITE)	
100	-	‡									_				-			
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NCDOT GEOTECHNICAL ENGINEERING UNIT

PRO	JECT NO	<b>o</b> . 337	38.1.1		ID.	B-451	3	-		co	UNTY FRANKLIN	GEOLOGIS	T Milkovits, J. I.		
SITE	DESCR	IPTION	BRI	DGE NO	. 73 O	N -L- (	SR 1002	) OVE	R PR	ONG	CYPRESS CREEK			GROUND W	VTR (ft)
BOR	ING NO.	B2-A	·····	······································	STAT	TION	18+20	***************************************		OF	FSET 14 ft LT	ALIGNMEN	T -L-	0 HR.	N/A
COL	LAR ELI	EV. 22	3.9 ft		TOTA	AL DE	PTH 35	.1 ft		NO	RTHING 829,352	EASTING	2,237,253	24 HR.	5.9
DRIL	L MACH	IINE (	ME-5	50	DRIL	LMET	HOD N	IW Ca	sing V	V/SP	Γ & Core		HAMMER TYPE	Automatic	
DRIL	LER T	urnage	, J. R.		STAF	RT DA	TE 02/2	23/10		СО	MP. DATE 02/23/10	SURFACE \	VATER DEPTH N	//A	******************************
COR	E SIZE	NWXL			TOTA	AL RU	N 14.4	ft				Language and the second			
ELEV	RUN ELEV	DEPTH	RUN	DRILL RATE	REC.	JN ROD	SAMP.	STR REC.	RATA	L		ESCRIPTION /	ND REMARKS		
(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	G	ELEV. (ft)				DEPTH (ff
203.2	000.0							ļ	ļ			Begin Corin			
	203.2	20.7	4.4	1:43/1.0 1:51/1.0		(4.4) 100%		98%	(13.3) 92%		203.2 BLACK AND WHITE,	VERY SLIGHT	LINE ROCK LY WEATHERED TO	FRESH, HARD,	20.7
200	198.8	25.1		1:59/1.0 1:39/1.0				İ			SOUND, WIDE FRA	ACTURE SPAC	NG, COARSE-GRAIN	ED GRANITE	
	-	- 20.1	5.0	:10/0.4 :35/1.0	(4.7) 94%	(3.9) 78%		ŀ			· -				
195	-	F		:35/1.0 1:20/1.0 1:51/1.0 2:15/1.0	3470	7070					- -				
	193.8	30.1	5.0	1:41/1.0 1:20/1.0	(5.0)	(5.0)									
	-	F	0.0	1:29/1.0		100%					• •				
190	188.8	35.1		2:17/1.0 3:54/1.0			RS-2	1			 188.8				35.1
	100.0	- 00.7		3.34/1.0			110-2						188.8 ft in CRYSTALLI NITE)	INE ROCK	
185	-	F									•	(017)	((() ( ) ( )		
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PRO	IECT NO	337	38 1 1		In		B-4513				COU	NTY	FRANK	IIN		GEOLOGIST Milkovits, J. I.		
<u> </u>							D-4515 DN -L- (S	R 1002	) OVF	R PRC						T STORY OF THE STORY OF THE	GROUND WT	R (ft)
	NG NO.			DOL I			TION 1		., 0 1 2				4 ft RT			ALIGNMENT -L-	0 HR.	6.6
							AL DEP		n ff				829,3			EASTING 2,237,281	24 HR.	6.0
<b></b>	AR ELE										NOR	HING	029,3					0.0
ļ	L MACH			50			LL METH			gers						HAMMER TYPE		
DRIL	LER T	urnage,				TA	RT DAT					P. DAT	TE 02/2	22/10	, ,	SURFACE WATER DEPTH	I/A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft	O.5ft		0	BLO\ 25	NS PER		75 	100	SAMP. NO.	моі	L O G	SOIL AND ROCK DES	SCRIPTION	
225	-	_						T			Т					223.8 GROUND SURI		0.0
	-	F					į		.							- _{221.3} TAN-BROWN, SILT	'Y SAND	2.5
220	219.9	3.9				┨├	· · · ·	<u> </u>			• •					- ALLUVIAL GRAY, CLAYEY		
215	- - - 214.9	8.9	3	2	2		4		· ·   ·					M			<b>.</b> ,	
	- 217.0		WOH	WOH	3		<b>3</b> 3. · · ·		.					w		213.3		10.5
	-	‡							:_[:	 . <u></u> .	1::					RESIDUAL 211.4 BLACK AND WHITE, S		12.4
210	209.9	13.9	<b></b>			1		1			T=:					WEATHERED F	ROCK	
		t	64	36/0.1				::	: :   :	 	• 1	00/0.6		l		(GRANITE	)	
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SIT	E DES	CRIPTIO	N BR	DGE N	10. 73	ON -L- (SR 10	002) OVER PF	RONG CYPI	RESS C	REEK					GROUND W	TR (ft)	SITE	DESCF	IPTION	BRID	DGE N		ON -L- (SF									GROUND	
во	RING N	ю. EB2	?-A		ST	ATION 18+6	5	OFFSET	16 ft L	Т		ALIGNN	MENT -L-		0 HR.	7.8	BOF	RING NO	. EB2-	·B			TATION 18			OFFSET	19 ft RT	·		ALIGNMEN	T -L-	0 HR.	5.7
СО	LLAR I	ELEV. 2	23.3 ft		TC	TAL DEPTH	9.7 ft	NORTHI	NG 829	9,397		EASTIN	<b>IG</b> 2,237,252		24 HR.	5.3	COL	LAR EL	<b>EV</b> . 22	23.0 ft		TC	OTAL DEPT	<b>H</b> 10.6	ft	NORTHING				EASTING		24 HR.	5.7
DRI	LL RIG/	HAMMER E	EFF/DA	TE C	/IE-550				DRIL	L METH	H <b>DOI</b>	.S. Augers		HAMME	R TYPE Aut	matic	DRIL	L RIG/HA	MMER E	FF./DAT	TE CM									.S. Augers	] 1	HAMMER TYPE A	utomatic
DR	ILLER	Turnage	e, J. R.		ST	ART DATE 0	2/19/10	COMP. D				SURFA	CE WATER DEI	PTH N/A	\		DRII	LLER T					TART DATE	02/19/	′10	COMP. DA	<del></del>	<del>, , , , , , , , , , , , , , , , , , , </del>	<del></del>	SURFACE V	WATER DEPT	H N/A	
ELE (ft)	V DRIV	VE V DEPTH (ft)	0.5ft	0.5ft		BI 0 25	LOWS PER FOO 50	OT 75 10	1 1	IP. M	101	ELEV. (ft)	SOIL AND RO	OCK DESC		EPTH (ft)	ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	W COL 0.5ft		0 2	BLOWS	50 50	75 100	SAMP.	MOI	O G		SOIL AND ROCH	DESCRIPTION	
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220	219	6 + 3.7	+-	2	2	1			.	<b>■</b> M	h 5 ***	 218.1				5.2	220	219.9.	-31	3	2	2	<b>4</b> 4				SS-5	М		=	ALLU BROWN-BLACK	VIAL CLAYEY SAND	5.0
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21	5 214	.6 + 8.7							=	l		216.1 215.3 - 213.6	RE	SIDUAL		8.0	215	214.9.	8.1	100/0.3				• • • •		. 100/0.3				216.0 B - - - 212.4	WEATHER		
	_213	6 + 9.7	100/0.			<u> </u>		100/0 60/0	48	-	122	- 213.6		ERED RO		9.7		212.4	10.6							60/0.0	11			- 212.4	(GRA		10.6
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			S	OIL T	TE.	ST	RE	SUL	TS						
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	18.5' LT	17+25	0.0-1.5	A-2-4(0)	20	2	53.9	22.0	12.0	12.1	86	52	23		
SS-2	18.5' LT	17+25	8.6-10.1	A-4(0)	29	9	40.6	18.2	17.1	24.2	93	65	40		-
SS-3	18.5' LT	17+25	13.6-15.1	A-2-4(0)	27	NP	47.7	37.4	8.8	6.1	81	57	15	-	-

#### EB2-B

SOIL TEST RESULTS															
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-4	19' RT	18+65	0.0-1.5	A-2-4(0)	29	10	46.0	20.2	9.6	24.2	86	57	32	-	
SS-5	19' RT	18+65	3.1-4.6	A-2-6(0)	37	12	46.8	19.2	11.8	22.2	83	55	30	_	-

#### <u>B1-B</u>

	ROCK TEST RESULTS											
SAMPLE NO.	STATION	OFFSET DEPTH AREA (in²)			UNIT WEIGHT (lbs/ft³)	H/D RATIO	ULTIMATE LOAD (lbf)	ULTIMATE CORRECTED (ksi)	SEC MOD @ 40% (Mpsi)			
RS-1	17+70	15' RT	27.3-27.9	2.7172	163.7	1.88	58500	21.5	5.01			

#### B2-A

	ROCK TEST RESULTS												
SAMPLE NO.	STATION	OFFSET (FT)	INTERVAL		UNIT WEIGHT (lbs/ft³)	H/D RATIO	ULTIMATE LOAD (lbf)	ULTIMATE CORRECTED (ksi)	SEC MOD @ 40% (Mpsi)				
RS-2	18+20	14' LT	34.1-35.1	2.7172	155.9	1.995	52000	19.15	6.52				

## FIELD SCOUR REPORT

WBS:	33738.1.1 TIP:	B-4513	COUNTY: Franklin	
DESCRIPTION(1): BI	ridge No. 073 on -L- (S	R 1002, Seven Pa	ths Road) over Prong Cypr	ress Creek
		EXISTING	BRIDGE	
Information from:	Field Inspectior Other (explain	Micr )	ofilm (reel	pos:)
Bridge No.: 73 Foundation Type:	B' Length: 40.1'	Total Bents: 2	Bents in Channel: 0	Bents in Floodplain: 2
EVIDENCE OF SC Abutments or En	d Bent Slopes: None			
Interior Bents: N	one			
Channel Bed: N	one			
Channel Bank: <u>N</u>	one observed			
EXISTING SCOUF Type(3): T	R PROTECTION imber abutment and w	ng wall on End Be	nt 1&2	
Extent(4): <u>6</u>	' x 30' at both end Bent			
Effectiveness(5): V	ery effective		<u> </u>	
Obstructions(6): L	ogs in the channel, up	and down stream		

#### **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.

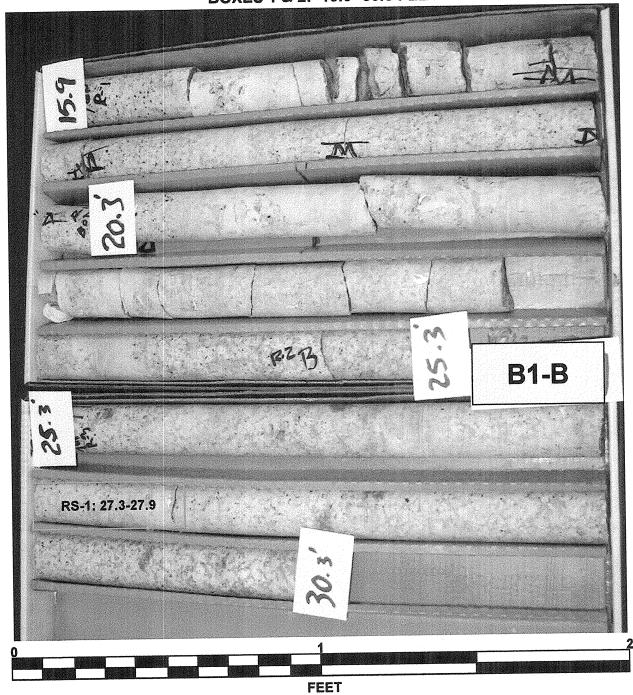
Channel Bed Material(7): SS-5 Loose, Brown-Black, Clayey, Sand  Channel Bank Material(8): SS-2 Soft, Gray, Sandy Slit (A-4)  Channel Bank Cover(9): Grass, brush, small and large trees  Floodplain Width(10): 300 feet  Floodplain Cover(11): Grass, brush, small and large trees  Stream is(12): Aggrading Degrading Static  nannel Migration Tendency(13): Toward the west  Observations and Other Comments: Some logs up and down stream  DESIGN SCOUR ELEVATIONS(14) FeetX Meters  BENTS  B1-A B1-B B2-A B2-B  210.5 209.0 209.0 211.0				DES	SIGN IN	FORM	<u>OIT</u>	N					
Channel Bank Cover(9): Grass, brush, small and large trees  Floodplain Width(10): 300 feet  Floodplain Cover(11): Grass, brush, small and large trees  Stream is(12): Aggrading Degrading _X Static  nannel Migration Tendency(13): Toward the west  Observations and Other Comments: Some logs up and down stream  DESIGN SCOUR ELEVATIONS(14) Feet _X Meters  BENTS  B1-A B1-B B2-A B2-B  210.5 209.0 209.0 211.0	Channel Bed Material(7): SS-5 Loose, Brown-Black, Clayey, Sand												
Channel Bank Cover(9): Grass, brush, small and large trees  Floodplain Width(10): 300 feet  Floodplain Cover(11): Grass, brush, small and large trees  Stream is(12): Aggrading Degrading _X Static  nannel Migration Tendency(13): Toward the west  Observations and Other Comments: Some logs up and down stream  DESIGN SCOUR ELEVATIONS(14) Feet _X Meters  BENTS  B1-A B1-B B2-A B2-B  210.5 209.0 209.0 211.0													
Floodplain Width(10): 300 feet  Floodplain Cover(11): Grass, brush, small and large trees  Stream is(12): Aggrading Degrading _X Static  nannel Migration Tendency(13): Toward the west  Observations and Other Comments: Some logs up and down stream  DESIGN SCOUR ELEVATIONS(14) Feet _X Meters  BENTS  B1-A B1-B B2-A B2-B  210.5 209.0 209.0 211.0	Channel Bank Material(8): SS-2 Soft, Gray, Sandy Silt (A-4)												
Floodplain Cover(11): Grass, brush, small and large trees  Stream is(12): Aggrading Degrading _X Static  nannel Migration Tendency(13): Toward the west  Observations and Other Comments: Some logs up and down stream  DESIGN SCOUR ELEVATIONS(14) Feet _X Meters  BENTS  B1-A B1-B B2-A B2-B  210.5 209.0 209.0 211.0	Channel Bank Cover(9): Grass, brush, small and large trees												
Stream is(12): Aggrading Degrading _X Static	Floodplain Width(10): 300 feet												
DESIGN SCOUR ELEVATIONS(14)  BENTS B1-A B1-B B2-A B2-B  210.5 209.0 209.0 211.0	Floodplain Cover(11): Grass, brush, small and large trees												
DESIGN SCOUR ELEVATIONS(14)  BENTS  B1-A B1-B B2-A B2-B  210.5 209.0 209.0 211.0  Design Scour Elevations are equal or about 2.5 feet higher at all bent compared to the Hydraulic unit's estimates for the 100 year storm events.  SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL  Bed or Bank Sample No. Retained #4 Passed #10 Passed #20 Coarse Sand Fine Sand F	Stream is(12): Aggrading Degrading _ X Static												
DESIGN SCOUR ELEVATIONS(14)  BENTS B1-A B1-B B2-A B2-B  210.5 209.0 209.0 211.0	hannel Migratio	n Tendency(13	3): <u>Toward t</u>	the west									
DESIGN SCOUR ELEVATIONS(14)  BENTS B1-A B1-B B2-A B2-B  210.5 209.0 209.0 211.0	Observations	and Other Con	nments: So	me logs	up and o	down stre	am						
BENTS   B1-A   B1-B   B2-A   B2-B     210.5   209.0   209.0   211.0													
BENTS   B1-A   B1-B   B2-A   B2-B     210.5   209.0   209.0   211.0													
B1-A   B1-B   B2-A   B2-B	DESIGN SCO	UR ELEVATIO	NS(14)				Fe	et <u>X</u>	Me	ters			
Comparison of DSE to Hydraulics Unit theoretical scour:  Design Scour Elevations are equal or about 2.5 feet higher at all bent compared to the Hydraulic unit's estimates for the 100 year storm events.  SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL  Bed or Bank Sample No. Retained #4 Passed #10 Passed #40 Passed #200 Coarse Sand "Soil Test Results", for samples: Silt SS-2 Clay SS-5 LL PI AASHTO Station Offset		BENT	<u>'S</u>										
Comparison of DSE to Hydraulics Unit theoretical scour: Design Scour Elevations are equal or about 2.5 feet higher at all bent compared to the Hydraulic unit's estimates for the 100 year storm events.  SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL  Bed or Bank Sample No. Retained #4 Passed #10 Passed #40 Passed #40 Passed #200 Coarse Sand Fine Sand Fine Sand Silt Clay SS-2 Clay LL PI AASHTO Station Offset				_								<del>,                                     </del>	
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Design Scour Elevations are equal or about 2.5 feet higher at all bent compared to the Hydraulic unit's estimates for the 100 year storm events.  SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL  Bed or Bank Sample No. Retained #4 Passed #10 Passed #40 Passed #200 See Sheet 12 Soil Test Results", for samples: SS-2 SS-5 LLL PI AASHTO Station Offset											<u> </u>		
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Design Scour Elevations are equal or about 2.5 feet higher at all bent compared to the Hydraulic unit's estimates for the 100 year storm events.  SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL  Bed or Bank Sample No. Retained #4 Passed #10 Passed #40 Passed #200 See Sheet 12 Soil Test Results", for samples: SS-2 SS-5 LLL PI AASHTO Station Offset		(DOF ( ) ! !			-1								
SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL  Bed or Bank Sample No. Retained #4 Passed #10 Passed #200 Coarse Sand Fine Sand Silt Clay LL PI AASHTO Station Offset						er at all h	ent co	mnared	to the Hvo	łraulic ur	nit's estim	ates	
SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL  Bed or Bank Sample No. Retained #4 Passed #10 Passed #200 Coarse Sand Fine Sand Silt Clay LL PI AASHTO Station Offset				JULI 2.3	reet nigh	or at all D	OH OC	mpareu	to the rigo	a auto ul	iii o couiii		
Bed or Bank Sample No. Retained #4 Passed #10 Passed #200 Coarse Sand Fine Sand Silt Clay LL PI AASHTO Station Offset				A	DED 4	D D 4 1 1 7 7	5887	-DIA:					
Sample No.         Retained #4           Passed #10         Passed #40           Passed #200         See Sheet 12           Coarse Sand         "Soil Test Results", for samples:           Silt         SS-2           Clay         SS-5           LL         PI           AASHTO         Station           Offset         Offset	-	SIS RESULTS	FROM CH	ANNEL	RFD W	η RANK	MATE	KIAL			T	1	
Retained #4 Passed #10 Passed #40 Passed #200 Coarse Sand Fine Sand Silt Clay LL PI AASHTO Station Offset	1												
Passed #10         See Sheet 12           Passed #200         See Sheet 12           Coarse Sand         "Soil Test Results", for samples:           Silt         SS-2           Clay         SS-5           LL         PI           AASHTO         AASHTO           Station         Offset													
Passed #40         See Sheet 12           Passed #200         See Sheet 12           Coarse Sand         "Soil Test Results", for samples:           Silt         SS-2           Clay         SS-5           AASHTO         Station           Offset         Offset	3					I	1-1						
Passed #200         See Sheet 12           Coarse Sand         "Soil Test Results", for samples:           Silt         SS-2           Clay         SS-5           AASHTO         Station           Offset         Offset	1												
Coarse Sand Fine Sand Silt Clay LL Pl AASHTO Station Offset			0 05-	. 40									
Fine Sand Silt Clay LL Pl AASHTO Station Offset	i				11								
Silt					•								
Clay	Silt	Silt SS-2											
LL       PI         PI       PI         AASHTO       PI         Station       PI         Offset       PI	Clay												
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Form GEU-017e Revised 7/26/2007

ported by: Junch at Sti

### **CORE PHOTOGRAPHS**

**B1-B**BOXES 1 & 2: 15.9- 30.3 FEET

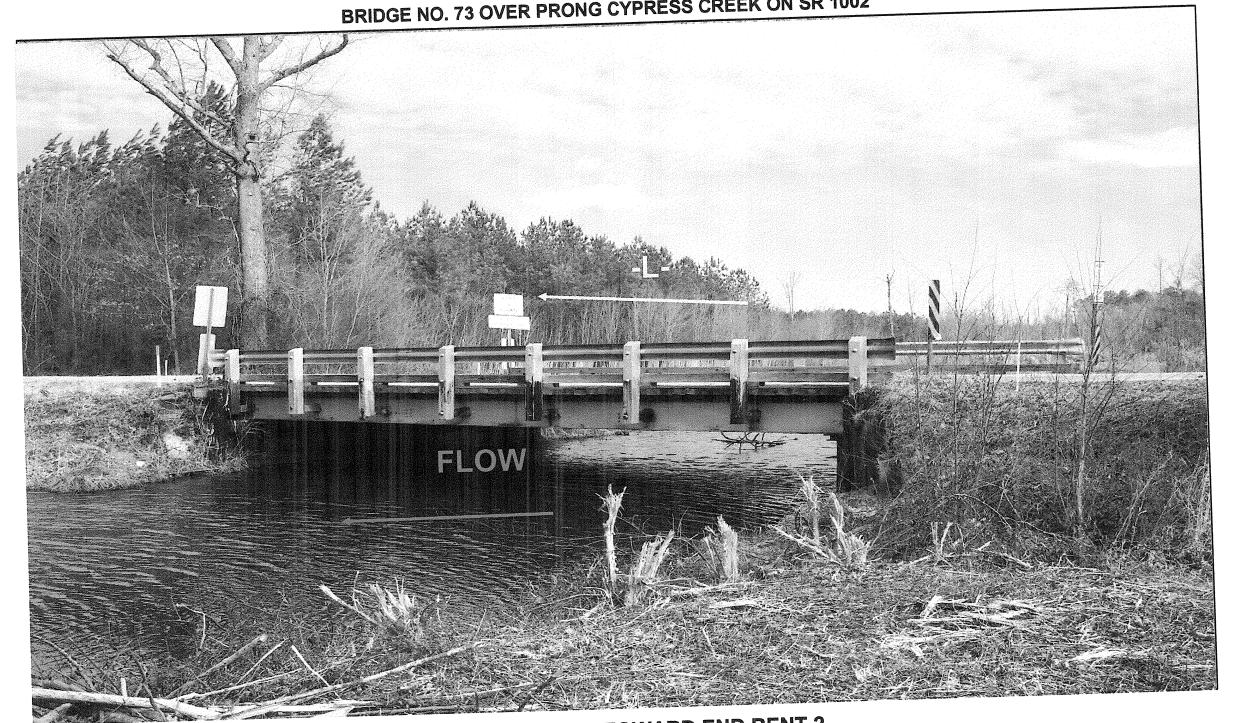


**B2-A**BOXES 1 & 2: 20.7 - 35.1 FEET



SITE PHOTO

BRIDGE NO. 73 OVER PRONG CYPRESS CREEK ON SR 1002



LOOKING NORTHEAST TOWARD END BENT 2