ID: B-4

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CORE PHOTOGRAPHS

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33412.1.1 B-40	16 F.A. PROJ. BRZ-1901(2)
COUNTY BURKE	
PROJECT DESCRIPTION BRIDGE NO	. 175 ON SR 1901 OVER
WHITE OAK CREEK	
SITE DESCRIPTION	

STATE	STATE PROJECT REPERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33412.1.1 B-4046	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 VARROUS FIELD BORING LOGS, ROCK CORES, AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 250-4080. RETHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIBLILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS APE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTICATION 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 SUBJECTACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

-	C.J. COFFEY	
_	L.E. RIDDLE	
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- - Investigated b	Y J.W. MANN	
CHECKED BY	W.D. FRYE	
CHECKED BY	W.D. FRYE W.D.FRYE	

PERSONNEL **D.C. ELLIOTT**



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

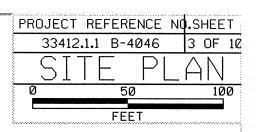
GEOTECHNICAL ENGINEERING UNIT

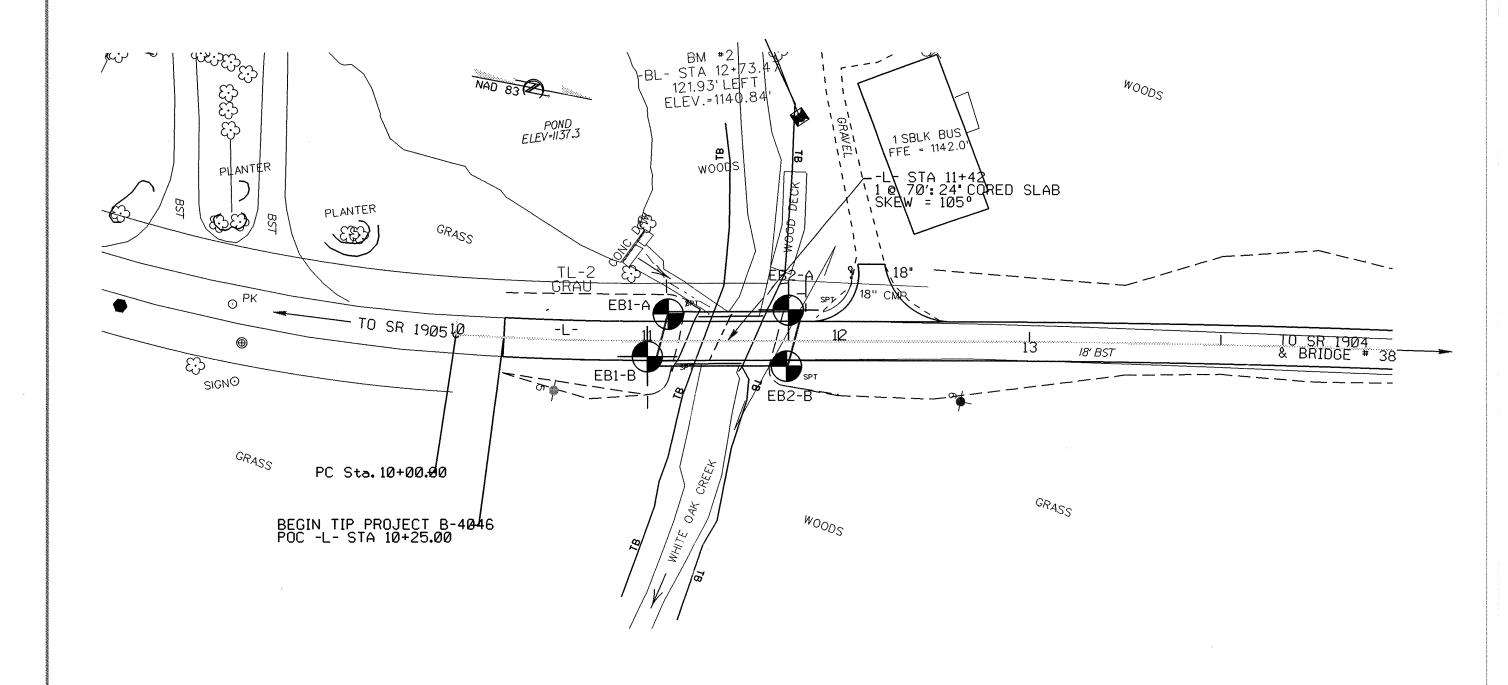
SUBSURFACE INVESTIGATION

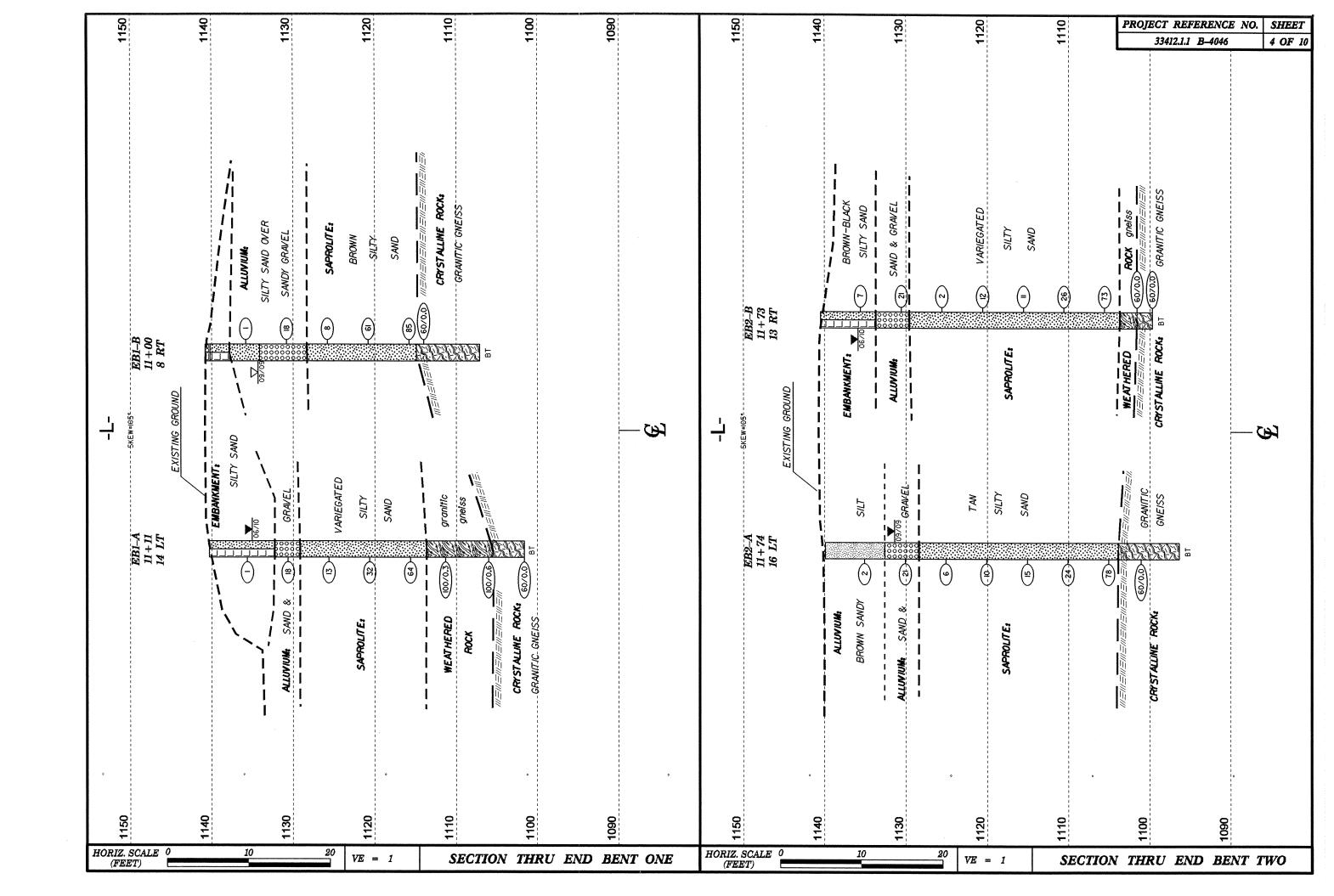
	SOIL AND RO	CK LEGEND, TERM	S, SYMBOLS, AND ABBREVI	IATIONS	
SOIL DESCRIPTION	GRADATION			DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1566). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	MELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES F UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR M ANGULARITY OF GRAINS	E SAME SIZE. (ALSO MORE SIZES.	ROCK LINE INDICATES THE LEVEL AT WHICH NON-I SPT REFUSAL IS PENETRATION BY A SPLIT SPOON	NT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED COASTAL PLAIM MATERIAL WOULD YIELD SPT REFUSAL. I SAMPLER BOUAL TO OR LESS THAM AL FOOT PER 60 BLOWS. ON BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE LOWS.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: VERY STRY, GRAV, SULY CLA, MOST WITH WITERBEDGED FAME SAMO LAVERS, MIGHLY PLASTIC, 4-7-6 SOIL LEGEND AND AASHTO CLASSIFICATION	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE SUBANGULAR, SUBROUNDED, OR ROUNDED. MINERALOGICAL COMPOSITIO		WEATHERED ROCK (WR) NON-COASTAL P BLOWS PER FOO	PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTISIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE UNHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE. COMPRESSIBILITY	USED IN DESCRIPTIONS	ROCK (CR) NON-CRYSTALLINE WOULD YIELD S GNEISS, GABBRO. FINE TO COARSE	PT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	GROUND SURFACE. CALCAREDUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-3 A-6, A-7 SYMBOL 5000 5000 5000 5000 5000 5000 5000 50	SLIGHTLY COMPRESSIBLE LIOUID LIMIT MODERATELY COMPRESSIBLE LIOUID LIMIT HIGHLY COMPRESSIBLE LIOUID LIMIT	LESS THAN 31 EQUAL TO 31-50 GREATER THAN 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTARY ROCK SPT REFUSAL. F	LITE, SLATE, SANDSTONE, ETC. SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	OF SLOPE. 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.
2 PASSING	PERCENTAGE OF MATERIAI		JOIL DEDG, ET	ATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
** 40 38 NX [58 NX 51 NN 25 MX 51 NN 25 MX 35 MX 35 MX 35 MX 35 MX 36 MN 3	<u>VROBINIL PRILEBERS</u> SOILS SOILS	O <u>ther Material</u> Ace 1 - 10% TTLE 10 - 20%	HAMMER IF CRYSTALLINE.	JOINTS MAY SHOW SLIGHT STAINING ROCK RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
LIQUID LIMIT 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 50 ILS WITH PLASTIC INDEX 6 MX NP 18 MX 19 MX 19 MN 19 MN 19 MX 18 MX		ME 20 - 35% GHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FA OF A CRYSTALLINE NATURE,	NED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, ICE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 0 1 MX 2 MX 15 MX NO MX MODERATE ORGANIC OF MAJOR SRAVEL AND SAND SOND SOND SOND SOND SOND SOND SOND SO	▼ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER D	DRILLING	SLIGHT ROCK GENERALLY FRESH, JOINTS STAIN (SLI,) 1 INCH. OPEN JOINTS MAY CONTAIN CL	ned and discoloration extends into rock up to .ay. In granitoid rocks some occasional feldspar J. Crystalline rocks ring under hammer blows,	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND GRAD GRAD GRAD GRAD GRAD GRAD GRAD GRA	STATIC WATER LEVEL AFTER 24 HOURS VPW PERCHED WATER, SATURATED ZONE, OR WATER BEARI	ING STRATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW	/ DISCOLORATION AND WEATHERING EFFECTS. IN RE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
AS A SUBGRADE EXCELLENT TO GOOD FAIR TO POOR POOR POOR POOR WASUITABED PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP		DULL SOUND UNDER HAMMER BLOWS AF WITH FRESH ROCK.	ND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED D OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
CONSISTENCY OR DENSENESS COMPACTNESS OR PRINCE OF STRONGER RANGE OF UNCONFINED COMPACTNESS OR PRINCE OF STRONGER CAMPACTNESS OF COMPACTNESS OR PRINCE OF COMPACTNESS OR CAMPACTNESS OR C	MISCELLANEOUS SYMBOLS FI ROADWAY EMBANKMENT (RE) ST EPT ST		SEVERE AND DISCOLORED AND A MAJORITY SHO (MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOL	OW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH OGIST'S PICK, ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	<u>FORMATION (FM.) -</u> A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
CONSISTENCY CONSISTENCY (N-VALUE) (TONS/FT?)	WITH SOIL DESCRIPTION VST PHT 1231 BONG	NG DESIGNATIONS S - BULK SAMPLE	IF TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORE	: D or stained. Rock fabric clear 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
GENERALLY VERY LOOSE	SOIL SYMBOL AUGER BORING	SS - SPLIT SPOON SAMPLE	(SEV.) IN STRENGTH TO STRONG SOIL. IN GR. EXTENT. SOME FRAGMENTS OF STRONG IF TESTED. YIELDS SPT N VALUES > 1		ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MATERIAL (NON-COHESIVE) DENSE VERY DENSE VERY SOFT C2 C0,25	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY MONITORING WEI	ST - SHELBY TUBE SAMPLE	VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLOREI (V SEV.) THE MASS IS EFFECTIVELY REDUCED T REMAINING, SAPROLITE IS AN EXAMPLE	D OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK E OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE, PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN
GENERALLY SOFT 2 TO 4 0.25 TO 0.50	INFERRED ROCK LINE A PIEZOMETER INSTALLATION	RS - ROCK SAMPLE RT - RECOMPACTED TRIAXIAL	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC	BRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	INTERVENING IMPERVIOUS STRATUM. <u>RESIDUAL (RES.) SOIL</u> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
MATERIAL STIFF 8 10 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD >30 >4	25/025 DIP & DIP DIRECTION OF SLOPE INDICATO	CBR - CALIFORNIA BEARING	ALSO AN EXAMPLE.	MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND
TEXTURE OR GRAIN SIZE	ROCK STRUCTURES SPT N-VALUE	RATIO SAMPLE		C HARDNESS R SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	SOUNDING ROD REED—— SPT REFUSAL ABBREVIATIONS		SEVERAL HARD BLOWS OF THE GEOLG HARD CAN BE BCRATCHED BY KNIFE OR PIG		PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY (BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	AR - AUGER REFUSAL HI HIGHLY BT - BORING TERMINATED MED MEDIUM	w - MOISTURE CONTENT V - VERY		CK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	TO THE BEDDING OR SCHISTOSITY OF THE INTENDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	CL CLAY MICA MICACEDUS CPT - CONE PENETRATION TEST MOD MODERATELY	VST - VANE SHEAR TEST WEA WEATHERED	BY MODERATE BLOWS.	OLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE NP - NON PLASTIC DMT - DILATOMETER TEST ORG ORGANIC DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST - VOID RATIO SAP SAPROLITIC	γ - unit weight γ_{a} - dry unit weight fiad - filled in	HARD CAN BE EXCAVATED IN SMALL CHIPS POINT OF A GEOLOGIST'S PICK.	NCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE (BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS	A 140 LB. HAYMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH 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 - SATURATED - USUALLY LIDUID; VERY WET, USUALLY	F - FINE SD SANDY FOSS FOSSILIFEROUS SL SILT, SILTY	AFTER DRILLING		SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
(SAT.) FROM BELOW THE GROUND WATER TABLE PLASTIC SEMISOLIDE DEVINES TO	FRAGS FRAGMENTS TCR - TRICONE REFUSAL	,	VERY CAN BE CARVED WITH KNIFE. CAN BE SOFT OR MORE IN THICKNESS CAN BE BROWN FINGERNAIL.	E EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH KEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY	STRATA POCK QUALITY DESIGNATION (SROO) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
RANGE < - WET - (W) ATTAIN OPTIMUM MOISTURE PLASTIC LIMIT - WET - (W) ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT F		FRACTURE SPACING	BEDDING TERM THICKNESS	10PSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS:	HAMMER TYPE: X AUTOMATIC MANUAL	TERM SPACING VERY WIDE MORE THAN 10 FEET	VERY THICKLY BEDDED > 4 FEET THICKLY BEDDED 1.5 - 4 FEET	BENCH MARK: BM #2: -L- STA. II+80.04 II6.07' LT. RR SPIKE IN POWER POLE
SL SHRINKAGE LIMIT	MOBILE B- CLAY BITS 6 CONTINUOUS FLIGHT AUGER		WIDE 3 TO 10 FEET - MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET	THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET	ELEVATION: II40.84′ FT.
REQUIRES ADDITIONAL WATER TO - DRY - (D) ATTAIN OPTIMUM MOISTURE	BK-51 8* HOLLOW AUGERS	CORE SIZE:	VERY CLOSE LESS THAN 0.16 FEET	THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	NOTES:
PLASTICITY	CME-45C HARD FACED FINGER BITS	X-N XWL		OURATION NING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	4
PLASTICITY INDEX (PI) DRY STRENGTH NONPLASTIC 8-5 VERY LOW	TUNGCARBIDE INSERTS	н	EDIORI E RUBBINO	G WITH FINGER FREES NUMEROUS GRAINS;	
LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM	X CASING X W/ ADVANCER PORTABLE HOIST TRICONE *STEEL TEETH	HAND TOOLS:	GENTLE	BLOW BY HAMMER DISINTEGRATES SAMPLE.	
HIGH PLASTICITY 26 OR MORE HIGH COLOR	TRICONE*TUNGCARB.	POST HOLE DIGGER HAND AUGER	BREAKS	CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; EASILY WHEN HIT WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	CORE BIT	SOUNDING ROD VANE SHEAR TEST		ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; ULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		THATE STEAM TEST		HAMMER BLOWS REQUIRED TO BREAK SAMPLE; E BREAKS ACROSS GRAINS.	

PROJECT REFERENCE NO. 33412.1.1 B-4046

SHEET NO. 2 OF IO







PRO.	JECT NO). 334	12.1.1	l	10	ID . B-4046				COUNTY Burke				GEOLOGIST	Γ Elliott, D. C.		
SITE	DESCRI	IPTION	Brid	ge No	. 175	on	SR 1901	over White	e Oak C	reek						GROUND \	WTR (ft
BORI	NG NO.	EB1-	A		s	STA	ATION 11	+11 .		OFFSET	14 ft LT			ALIGNMENT	Γ -L-	0 HR.	N/A
COLL	AR ELE	V. 1,	140.3	ft	T	TOTAL DEPTH 38.7 ft				NORTHIN	G 678,8	320		EASTING 1	1,231,328	24 HR.	5.3
DRIL	L MACH	INE C	ME-5	50	D	RII	LL METH	OWN C	asing w	SPT					HAMMER TYPE	Automatic	
DRIL	LER Co	offey, J	lr., C.		s	STA	RT DATE	06/09/10)	COMP. DA	TE 06	09/10		SURFACE W	VATER DEPTH N	I/A	
ELEV	DRIVE ELEV	DEPTH	BLC	w co	UNT	\prod		BLOWS P			SAMP.	∇	O L	S	OIL AND ROCK DES	CRIPTION	
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DRILL MACHINE CME-550

DEPTH

(ft)

BLOW COUNT

0.5ft 0.5ft 0.5ft

WOH WOH

3

17 21

17 20

60/0.0

11

40

DRILLER Coffey, Jr., C.

DRIVE

ELEV

(ft)

.136.8

1.131.8-

1.126.8 14.0

1.114.0 26.8

(ft)

1145

1140

1130

1125

1120

1115

1110

1105

1100

1095

1085

1080

1075

1070

BORELOG REPORT GEOLOGIST Elliott, D. C. PROJECT NO. 33412.1.1 **ID**. B-4046 **COUNTY** Burke SITE DESCRIPTION Approaches to Bridge No. 175 over White Oak Creek and Bridge No. 38 over Jacob Fork River on SR-1901 ALIGNMENT -L-OFFSET 8 ft RT **BORING NO.** EB1-B STATION 11+00 **NORTHING** 678,813 **EASTING** 1,231,351 COLLAR ELEV. 1,140.8 ft TOTAL DEPTH 33.7 ft

DRILL METHOD NW Casing W/SPT & Core

BLOWS PER FOOT

50

75

COMP. DATE 09/29/09

NO.

MOI G

1,134.1

1.114.9

100

. . .

60/0.0

161

START DATE 09/29/09

NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT GEOLOGIST Elliott, D. C. PROJECT NO. 33412.1.1 **ID**. B-4046 COUNTY Burke SITE DESCRIPTION Approaches to Bridge No. 175 over White Oak Creek and Bridge No. 38 over Jacob Fork River on SR-1901 ALIGNMENT -L-BORING NO. EB1-B STATION 11+00 OFFSET 8ftRT COLLAR ELEV. 1,140.8 ft TOTAL DEPTH 33.7 ft **NORTHING** 678,813 **EASTING** 1,231,351 **DRILL MACHINE CME-550 DRILL METHOD** NW Casing W/SPT & Core DRILLER Coffey, Jr., C. START DATE 09/29/09 COMP. DATE 09/29/09 SURFACE WATER DEPTH N/A CORE SIZE NXWL TOTAL RUN 6.9 ft RUN ELEV DRILL RATE (Min/ft) | STRATA | L | REC. | RQD | O | (ft) | (ft) | G | DEPTH RUN RQD (ft) % SAMP. DESCRIPTION AND REMARKS (ft) (ft) (ft) NO. (ft) ELEV. (ft) 113.95 Begin Coring @ 26.8 ft CRYSTALLINE ROCK 1,114.0 26.8 1.9 1,112.1 28.7 (1.5) (1.2) 79% 63% Light gray granite gneiss. Massive. Very slightly weathered to fresh. Hard. a) 5 Joints @ 10° with spacings of 0.2', 1.5' and 4.0'. (continued) 5.0 (4.7) (4.5) 94% 90% 1110 .107.1 Boring Terminated at Elevation 1,107.1 ft in granite gneiss. 1105 1100 1095 1090 1085 1080 1075 1070 1065 1060 1055 1050 1045 1040

SHEET

6.5

FIAD

GROUND WTR (ft)

0 HR.

24 HR.

HAMMER TYPE Automatic

SOIL AND ROCK DESCRIPTION

GROUND SURFACE

ROADWAY EMBANKMENT

Sand and gravel.

ROADWAY EMBANKMENT

Red-brown silty sand.

ALLUVIÁL Red-brown silty sand with clay.

> ALLUVIAL Brown sand and gravel.

> > SAPROLITE

Brown silty sand.

CRYSTALLINE ROCK

Granite gneiss.

Boring Terminated at Elevation 1,107.1 ft in

granite gneiss.

SURFACE WATER DEPTH N/A

SHEET 6.0010

FIAD

DEPTH (f

GROUND WTR (ft)

0 HR.

24 HR.

HAMMER TYPE Automatic



PRO	JECT N	O . 33	412.1.	1	1	D.	B-4046	COUNTY	Burke			GEOLOGIST	F Elliott, D. C.		
SITE	DESCR	RIPTIO	I App	oroach	es to	Br	ridge No. 175 over White Oal	Creek and E	Bridge N	lo. 38	over	Jacob Fork Riv	ver on SR-1901	GROUND W	VTR (ft
BOR	ING NO	. EB2	-A			ST	ATION 11+74	OFFSET 1	6 ft LT			ALIGNMENT	Γ -L-	0 HR.	N/A
COL	LAR EL	EV. 1,	139.9	ft	٦	то	OTAL DEPTH 43.5 ft	NORTHING	678,8	381		EASTING 1	1,231,313	24 HR.	8.5
DRIL	L MACH	HINE (CME-5	50	1	DR	RILL METHOD NW Casing V	V/SPT & Core)				HAMMER TYPE	Automatic	
DRIL	LER C	offey,	Jr., C.			ST	ART DATE 09/28/09	COMP. DAT	E 09/	28/09		SURFACE V	VATER DEPTH N	/A	
ELEV	DRIVE ELEV	DEPTH	BLC	ow co	UNT	\rfloor	BLOWS PER FOOT	r I	SAMP.	V /			SOIL AND ROCK DES	CDIDTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	t	0 25 50	75 100	NO.	МО	ı G	ELEV. (ft)			DEPTH (
								-	`						,
1140						$oldsymbol{\perp}$						1,139.9	GROUND SURF	ACE	0
		<u> </u>				Ī						-	ALLUVIAL Brown sandy si	ilt.	
	1,136.1	3.8						: : : : :				* .**	·		
1135	-	Ŧ	WOH	1	1		2			М		-			
		Ŧ					N				000	- 1,132.6	ALLUVIAL		7
1130	1,131.1	8.8	6	9	12	\dashv				M	000	-	Brown sand and g	ravel.	
] -	Ŧ								"	000	- 1,128.4			11
	1,126.1	‡ ₁₂ 。					: /: :::: :::					-	SAPROLITE Tan silty sand		
1125	-1,120.1	1	1	2	4	1	•			М		-			
		‡					j:::: :::: ::::					-			
1120	1,121.1	18.8	<u> </u>		<u> </u>	4	:1::: :::: ::::					- -			
1120	-	‡	1	4	6		10			М					
		t						: : : : :				-			
1115	1,116.1	23.8	3	6	9	+	15			м		-			
		ł		ľ			· · · \ \					•			
	1.111.1	T 28.8										•			
1110	-	F	4	9	15		24			М		-			
		Ŧ				1						•			
1105	1,106.1	33.8	5	43	35	4	: : : : : : : : : : : .			М		•			
	-	‡	ľ		"	1		78		IVI		1,103.9	CRYSTALLINE R	001/	36
	1.101.1	†·				İ						• •	Granite gneiss		
1100		- 30.0	60/0.0	1				60/0.0		ľ		-			
		‡										<u>.</u>			
1005		<u> </u>	ļ		├	+		.		ļ	M	1,096.4	Terminated at Elevati	ion 1 096 4 ft in	43
1095	-	ţ								l			granite gneiss		
		ţ								-					
1090	_	Ł									1 }	- -			
		ŧ										•			
		F										•			
1085	_	F								l		.			
		‡										-			
1080		‡						•				•			
1000	-	‡									t	-			
	:	‡										•			
1075	-	ţ									t	•			
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1060	-	t			1	1				1	Ιŀ	•			



SHEET 7_0P10

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	JECT N				L	B-4046					EOLOGIST Elliott, D. C.	
				roaches				er Whit	te Oak	eek and Bridge No. 38 over Jaco		GROUND WTR (ft)
 	ING NO			****			11+74				IGNMENT -L-	0 HR. N/A
	LAR EL				TOTA	AL DEI	PTH 43	.5 ft		DRTHING 678,881 EA	ASTING 1,231,313	24 HR. 8.5
	L MACI			50					sing W	T & Core	HAMMER TYPE	Automatic
	LER C				STAF	RT DA	TE 09/2	8/09	2.	OMP. DATE 09/28/09 SU	IRFACE WATER DEPTH N	/A
COR	E SIZE	MXWI	_				N 3.1 ft			****		
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft)	JN RQD (ft) %	SAMP. NO.	STR · REC. (ft) %	RQD (ft) %	DESC ELEV. (ft)	CRIPTION AND REMARKS	DEPTH (ft)
099.49	1,099.5	40.4	3.1	2:10	(3.0)	(3.0)				Be	gin Coring @ 40.4 ft CRYSTALLINE ROCK	·
	1,096.4	43.5		2:02 3:09	97%	97%				Light gray granite g	neiss. with biotite and garnets. (c	ontinued) 43.5
1095		+		\ <u>0:11/0.1</u> /						Boring Terminated	d at Elevation 1,096.4 ft in granite	gneiss.
1090	-	‡ ‡ ‡								- - - -		
1085	-	‡ ‡		,						- - - -		
1080	-	† † †								- - - -		
1075	-	‡ †								- - -		
1070	-	‡ †								- - -		
1065		<u> </u>								- - -		
1060	-	<u> </u> - -								<u>-</u>		
1055		 - -										
1050	-	 - -								-		
1045	_	† † †										
1040		 										
1035	-	-				,				- - -		
1030	-	Į Į								-		
1045 1040 1035 1030 1025	-	‡ ‡										
1020		‡								<u>-</u>		

PRO.	JECT NO) . 334	112.1.1	1	ID	D. B-4046	COUNTY	Burke			GEOLOGIS	T Elliott, D. C.		
SITE	DESCRI	IPTION	Brid	lge No	. 175 (on SR 1901 over White Oak C	reek	eek					GROUND V	VTR (ft)
BOR	NG NO.	EB2-	В		S	TATION 11+73	OFFSET 13 ft RT			ALIGNMEN	IT -L-	0 HR.	N/A	
COLI	AR ELE	V. 1,	140.5	ft	TO	OTAL DEPTH 40.8 ft	NORTHING	678,8	386		EASTING	1,231,342	24 HR.	4.6
DRIL	L MACH	INE (CME-5	50	DI	RILL METHOD NW Casing w	/ SPT				HAMMER TYPE Auto			
DRIL	LER C				s ⁻	TART DATE 06/09/10	COMP. DA	TE 06/	09/10		SURFACE	WATER DEPTH N	N/A	
ELEV	DRIVE ELEV	DEPTH	BLC	ow co		BLOWS PER FOOT	1	SAMP.		0		SOIL AND ROCK DES	SCRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25 50	75 100	NO.	MOI	G	ELEV. (ft)			DEPTH (
													,	
1145	-	-												
	1	-									- · · · · · · · · · · · · · · · · · · ·			
1140	_						+	 	 		- 1,140.5	GROUND SURI ROADWAY EMBAI	NKMENT	0
		<u> </u>									- -	Brown-black silty	Sand	
4405	1,136.6	- 3.9 -	2	3	4				V		•			
1135	-	-								$\exists \exists$	 - 1,133.7			6
	1.131.6	- 8.9								000	-	ALLUVIAL Brown Sand & G		
1130	1,131.0	0.5	9	11	10	21				000	- 1,129.6			10
	-						: : : : :				_	SAPROLIT Variegated silty		
	1,126.6	- 13.9		<u> </u>		/					-	vanegated sity	Oara	
1125		-	3	1	1	1 2					-			
	-	-				$ \lambda = \lambda = \lambda = \lambda $					-			
1120	1,121.6	- 18.9 -	2	5	7	12.					-			
1120	-	-									-			
	1.116.6-	- - 23.9	į			: j:: :::: :::		1			- -			
1115			1	3	8	11					-			
	-	-					.				-			
	1,111.6-	28.9	<u> </u>	10	14		.				-			
1110	_	Ε.	3	12	14	26					-			
	-	Ė	Ì			:::: -:::					-			
1105	1,106.6	- 33.9 -	17	31	42	:::: ::::: ::::: :::::	73				-			
1105	-	 					1				_ 1,103.7			36
	1,101.6-	- - 38.9]							- 1,101.6	WEATHERED F granitic gnei	SS SS	38
1100	1.099.7	-	60/0.0	1			60/0.0				1,099.7	CRYSTALLINE Granitic Gne		40
	-		60/0.0				60/0.0					Boring Terminated wi	th Standard	
	-	<u> </u>									- r -	1,099.7 ft in Graniti		
1095	-	ŀ									<u> </u>			
	-	-	l								<u>-</u>			
1090	-	F									-			
	-	F		İ							-			
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1085	_	<u> </u>									_			
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FIELD SCOUR REPORT

. WBS:	33412.1.1	_ ,TIP:	B-4046	COUNTY: Burke
DESCRIPTION(1):				
			EXISTING	BRIDGE
Information from:	Field I Other	nspection (explain)	X Mice BSR dated 02/26	crofilm (reel pos:) 6/10
Bridge No.:1 Foundation Type:				3 Bents in Channel: 2 Bents in Floodplain: 1
EVIDENCE OF S	COUR(2)			
11	• •	: Beneath	End Bent Two	
-				
Interior Bents:	None noted: Th	nis bent is	not part of the or	riginal structure.
-				-
Channel Bed:	None noted oth	er than th	alweg flow	
Channel Bank:	Downstream &	upstream	on northern (End	d Bent Two) bank
-				
EXISTING SCOL				
Type(3):	None other than	n abutmer	nts	
Extent(4):	N/A			
Effectiveness(5):				•
Obstructions(6):	Minor debris in	channel		

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).
- Note existing scour protection (e.g. rip rap).
- Describe extent of existing scour protection.
- Describe whether or not the scour protection appears to be working.
- Note obstructions such as dams, fallen trees, debris at bents, etc.
- Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 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).
- 14 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.

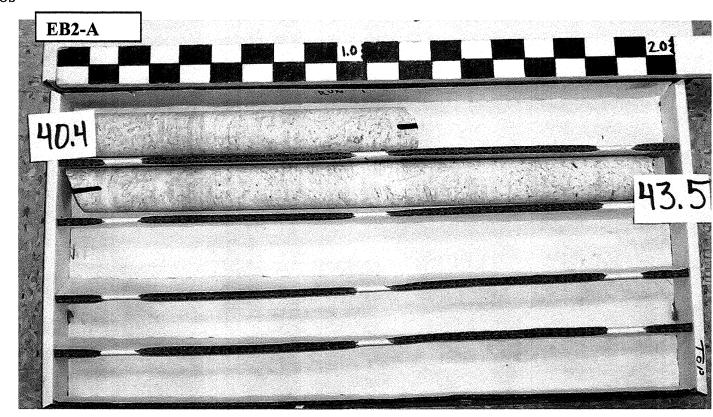
			DES	SIGN IN	IFORM	<u>ATION</u>					
Channel	Bed Material(7):	Silt, sand	d, grave	l, & cobb	les with b	oulders	upstram				
Channel E	Bank Material(8):			el ,							
Channe	l Bank Cover(9):	Trees, b	ramble,	weeds							
Flood	lplain Width(10):	~1000'									
Flood	plain Cover(11):	Grass, tr	ees, we	eds							
	Stream is(12):	Ag	grading		Degr	ading	X	Sta	itic		
Channel Migration	n Tendency(13):	Toward I	End Ber	nt Two							
Observations	and Other Comn	nonte: A c	tom ic le	sootod oo	uthwaat	of the bri	idaa				
2.2.2. Validito (O DII	-y				
DESIGN SCO	UR ELEVATION					Feet	X	Mete	ers		
	BENTS ED4										
	EB1 1135	EB2		T	I		1	T .	Т		
	1100	1100									
											
				<u> </u>						····	
	<u> </u>										
	<u> </u>	<u> </u>		<u> </u>	L		<u> </u>	<u> </u>	<u> </u>		
	f DSE to Hydrau nent with BSR da			al scour:							
	SIS RESULTS F	ROM CH	ANNEL	BED AN	D BANK	MATER	IAL				
Bed or Bank											
Sample No.											***************************************
Retained #4											***************************************
Passed #10											
Passed #40											
Passed #200											
Coarse Sand											
Fine Sand		·····									
Silt											
Clay											
LL											
PI										************	
AASHTO											
Station											
Offset											
Depth					l						
										0.47	D. 1. 17/25
									Form GEU-	U17e	Revised 7/26/20

Reported by:	J.W. Mann	Date:	6/25/2010

33412.1.1 (B-4046) BURKE COUNTY BRIDGE # 175 ON SR 1901 OVER WHITE OAK CREEK

CORE PHOTOS





ECT: 33412.1.1

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

CONTENTS

SHEET	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	CROSS SECTIONS
6-12	BORE LOG & CORE REPORT
13	SCOUR REPORT
14-16	CORE PHOTOGRAPHS

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE	NO. 33412.1	I.1 B-4046		F.A. PROJ.	BRZ-1901(2)
COUNTY BURK	E				
PROJECT DESCRIP	TION				
SITE DESCRIPTION	BRIDGE	NO. 38 ON	SR	1901 OVER	
JACOBS FORK	RIVER				
		•			

| N.C. | 33412.1.1 | B-4046 | 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 VARROUS FIELD BORING LOOS, ROCK CORES, AND SOL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, CEOTECHNICAL ENGINEERING UNIT AT 1999 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOOS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

CENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A CEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNICS OR BETWEEN SAMPLED STRATA WITHIN THE BORHENDLE. THE LABORATIORY SAMPLE DATA AND THE INSTITU MINIFLACED TEST DATA CAN BE RELIED ON ONLY TO THE DECREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE DISSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS WITH A CONDITION 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 **ARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MAREFALLS 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 THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY BEASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

-	D.O. DDDD 011
	D.O. CHEEK
	C.J. COFFEY
	L.E. RIDDLE

-	***************************************
INVESTIGATED BY	J.W. MANN
CHECKED BY	W.D. FRYE
CURMITTED BY	W.D. FRYE
SUBMITTED BY Date	

PERSONNEL D.C. FILLIOTT

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

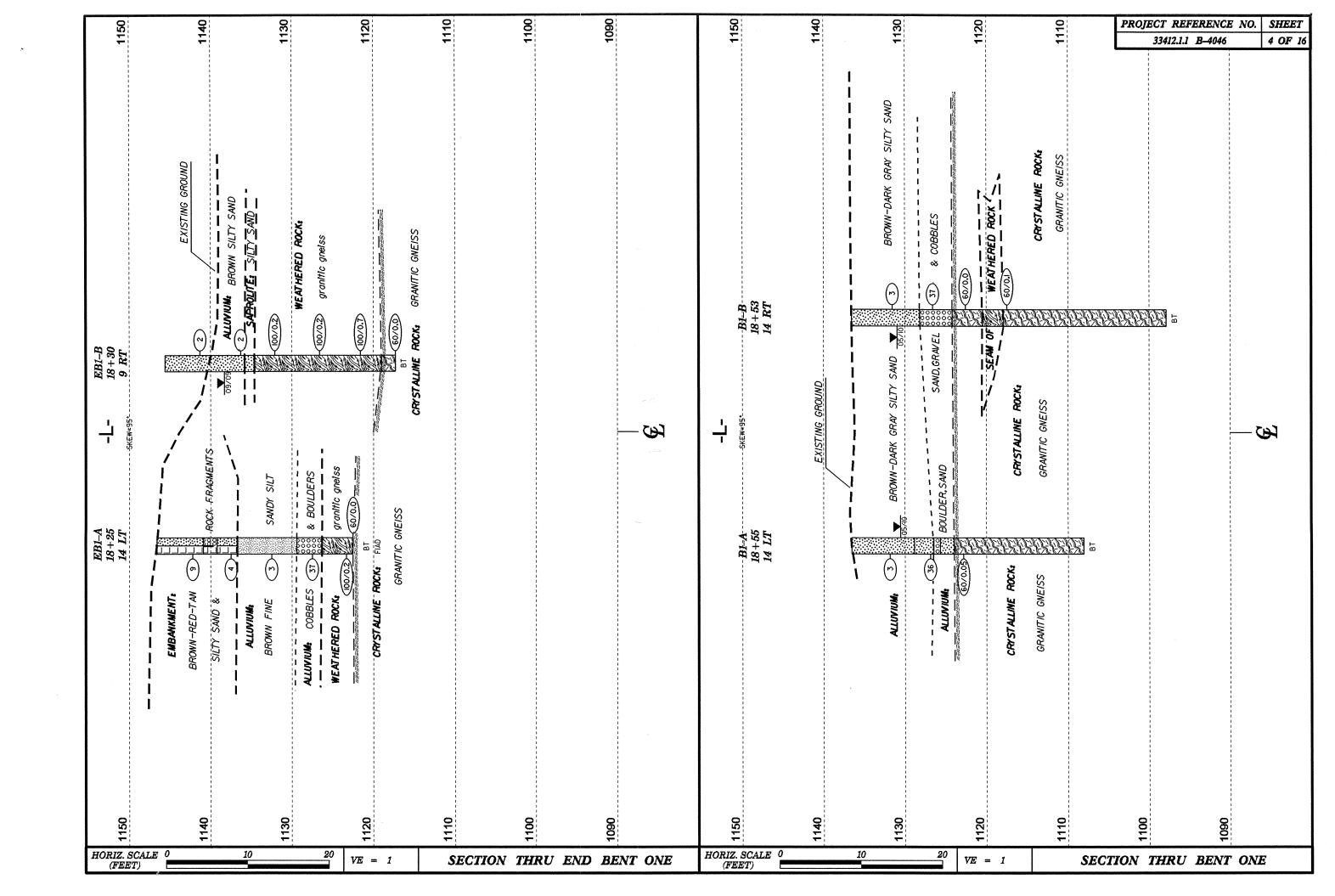
GEOTECHNICAL ENGINEERING UNIT

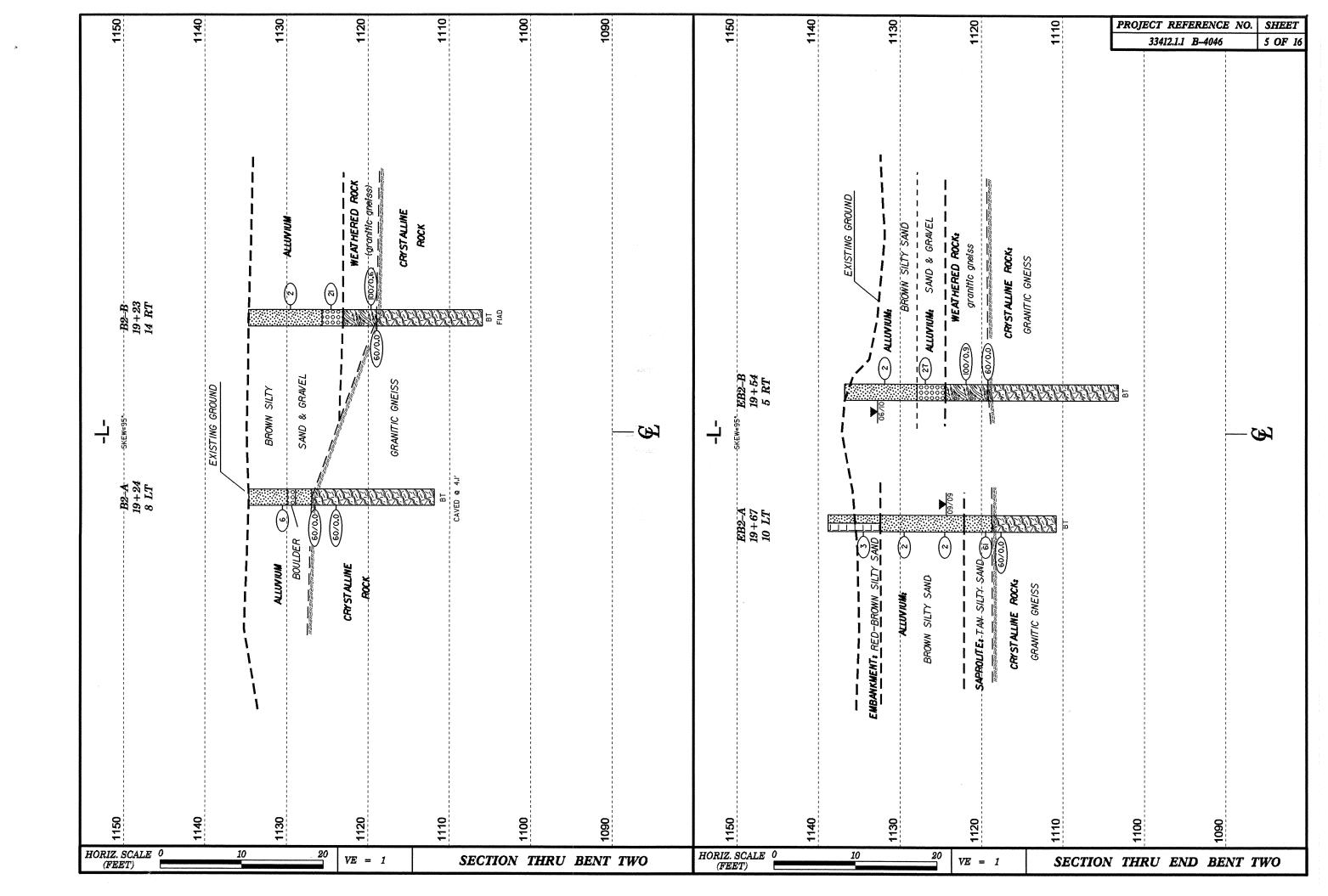
SUBSURFACE INVESTIGATION

	SOIL AND ROCK LEGEND, TER	MS, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO 1206, ASTM D-1366), SDIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE:	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) ANGULARITY OF GRAINS ANGULARITY OF GRAINS	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOLLD VIELD SPT REFUSAL AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL MOULD VIELD SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER COUAL TO OR LESS THAN 01 FOOT PER 60 BLOWS, IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK,	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUJEER - A WATER BEARING FORMATION OR STRATA.
CONSISTENCY, COLOR, TEXTURE, MOISTURE, ASSHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, AND OULARTY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: VEH STEFF, SAN, SICT CLA, MAST WITH WITERECODED FIRE SHOW LIVERS, MICHAY PLASTIC, A-7-6 SOIL LEGEND AND AASHTO CLASSIFICATION	THE ANGULARITY OR ROUNDRESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. MINERALOGICAL COMPOSITION	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. PRYSTALLINE FINE TO COARSE GRAIN JGNEOUS AND METAMORPHIC ROCK THAT	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS CASS. C≤ 35% PASSING *200) SILT-CLAY MATERIALS CS 35% PASSING *200) CRANIC MATERIALS CS 35% PASSING *200) CS 35% PASSING *200 CS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE. COMPRESSIBILITY	ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED. ROCK TYPE	GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 0000 0000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPECIAL ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED (CP) SHELL BEDS, ETC.	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.
% PASSING SILT- GRANULAR CLAY MUCK	PERCENTAGE OF MATERIAL GRANULAR SILT - CLAY	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
* 40 38 MX 58 MX 51 MN 8 MX 35 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36	ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	ROCKS OR CUTS MASSIVE ROCK. <u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
LI000D LIMIT 46 MX 41 MN 46 MX 41 MN 46 MX 41 MN 46 MX 41 MN 46 MX 41 MN 46 MX 41 MN 50ILS WITH PLASTIC MOEX 6 MX NP 18 MX 18 MX 18 MX 11 MN 18 MX 18 MX 11 MN 18 MX 11 MN LITTLE OR HIGHL	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (Y SLI) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 0 4 MX 8 MX 12 MX 16 MX 16 MX MODERATE USUAL TYPES STONE FRACS. OF MAJOR GRAVEL AND GRAVEL AND SAND SOILS GRAVEL AND SAND SOILS GRAVEL AND SAND SOILS GRAVEL AND SAND SOILS GRAVEL AND SAND SOILS	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI,) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND SHIPD STATE STATE SOLES SOLES GEN. RATING AS A EXCELLENT TO GOOD FAIR TO POOR POOR POOR POOR UNSUITA	PW DEDCHED MATER CATHRATER TONE OR MATER PEARING CYPATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
SUBGRADE PI DF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI DF A-7-6 SUBGROUP IS > LL - 30	→ O-MING OR SEEP	WITH FRESH ROCK,	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
CONSISTENCY OR DENSENESS RANGE OF STANDARD RANGE OF UNCONFINED	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH (400D. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES 'CLUNIC'S SOUND WHEN STRUCK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PRIMARY SOIL TYPE COMPRESSIVE STRENGTH (N-VALUE) COMPRESSIVE STRENGTH (TONS/F12)	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SPI CPT DET INT TEST BORING SAMPLE DESIGNATIONS	1F TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE 4 COUNTY OF LOOSE 4 TO 10	S - BULK SAMPLE AUGER BORING SS - SPLIT SPOON	(SEV.) IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
DKARNULAR MEDIUM DENSE 10 TO 30	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY MONITORING WELL RS - ROCK SAMPLE RS - ROCK SAMPLE	VERY SEVER ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT (V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH DNLY FRABHENTS OF STRONG ROCK REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED VIELDS SPT N VALUES < 100 BPF	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	ALLUVIAL SOIL BOUNDARY ZE/025 DIP & DIP DIRECTION OF APPLE/UNE IRR INSTALLATION SAMPLE SLOPE INDICATOR INSTALLATION CBR - CALIFORNIA BEARING	SCATTERED CONCENTRATIONS. QUARTZ 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 ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE	— SPT N-VALUE	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REDUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 DPENING (MM) 4.76 2,00 0,42 0,25 0,075 0.053	SOUNDING ROD REP SPT REFUSAL ABBREVIATIONS	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH 1TS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY (BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	AR - AUGER REFUSAL HI HIGHLY W - MOISTURE CONTENT BT - BORING TERMINATED MED MEDIUM V - VERY	TO DETACH HAND SPECIMEN. MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	TO THE BEDDING OR SCHISTOSITY OF THE INTRODUCE DOCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	CL CLAY MICA MICACEOUS VST - VANE SHEAR TEST CPT - CONE PENETRATION TEST MOD MODERATELY WEA WEATHERED	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE COUNTY FOR FIELD MOISTURE DESCRIPTION	CSE COARSE NP - NON PLASTIC 7 - UNIT WEIGHT DMT - DILATOMETER TEST ORG ORGANIC DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST N • VOID RATIO SAP SAPROLITIC FIAD - FILLED IN AFTER DRILLIN	MEDIUM 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 POINT OF A GEOLOGIST'S PICK. G SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS	A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH 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 USUALLY LIQUID; VERY WET, USUALLY	F - FINE SD SAND, SANDY FOSS FOSSILIFEROUS SL SILT, SILTY	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA CORE RECOVERY ISREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
LL LIQUID LIMIT (SAT.) FROM BELOW THE GROUND WATER TABL PLASTIC RANGE - WET - (W) SEMISOLID, REQUIRES DRYING TO	FRAGS FRAGMENTS TCR - TRICONE REFUSAL	VERY CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
RANGE - WET - (W) ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING BEDDING TERM SPACING TERM THICKNESS	
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTUR SL SHRINKAGE LIMIT	MOBILE B- CLAY BITS	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	BENCH MARK: BM*3 -L- STA. I8+40.0 47.87' LT. CHISELED X ON TOP OF EXISTING BRIDGE WING WALL ELEVATION: II46.82 FT.
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	6 CONTINUOUS FLIGHT AUGER CORE SIZE: B*HOLLOW AUGERS	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	NOTES:
PLASTICITY DIAGNOSTY MORE (N)	CME-45C HARD FACED FINGER BITS X -N XWL	INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	-
PLASTICITY INDEX (PI)	X CME-550 TUNGCARBIDE INSERTS -H	FRIABLE FRIEDRESS RESULTS FROM BY HAMMER DISTINGUES FREES NUMEROUS GRAIDS; GENTLE BLOW BY HAMMER DISTINGUESTES SAMPLE.	
HIGH PLASTICITY 5-15 SCIONI HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASLY WHEN HIT WITH HAMMER.	
COLOR DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN. RED. YELLOW-BROWN, BLUE-GRAY).	TRICONETUNGCARS. HAND AUGER CORE BIT SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER,	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE: SAMPLE BREAKS ACROSS GRAINS.	

PROJECT REFERENCE NO. 33412.1.1 B-4046

SHEET NO. 2 OF 16







PRO	JECT N	O . 33	412.1.	1	Ti	ID.	. B-4046	T	COUNTY	Burke			GEOLOGIST Elliott, D. C.		
SITE	DESCR	IPTIO	N Bric	lge No	o. 38	or	n SR 1901 over Jacob Fork	< Riv	/er					GROUND \	WTR (ft)
BOR	ING NO	. EB1	-A		:	ST	TATION 18+25	T	OFFSET	14 ft LT			ALIGNMENT -L-	0 HR.	FIAD
COL	LAR ELI	EV. 1,	146.6	ft	1	TO	OTAL DEPTH 24.1 ft		NORTHING	679,5	523		EASTING 1,231,271	24 HR.	N/A
DRIL	L MACH	IINE (CME-5	50	Ti	DR	RILL METHOD NW Casing	3 w/	SPT				HAMMER TYPE	Automatic	
DRIL	LER C	hilders	, R.			ST	TART DATE 06/07/10	\sqcap	COMP. DA	TE 06/	07/10		SURFACE WATER DEPTH	N/A	
ELEV	DRIVE ELEV	DEPTH	BLC	ow co	UNT	\prod	BLOWS PER FO	TOC		SAMP.	V /	L	SOIL AND ROCK DE	SCRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5f	ft	0 25 50		75 100	NO.	MO	Ğ	ELEV. (ft)		DEPTH (ft
1150										`			- CPOUND CUE		
1145	:	!	 			+			T	 	<u> </u>		_ 1,146.6 GROUND SURI - ROADWAY EMBAI	NKMENT	0.0
1145	1.143.5	3.1					L						Brown-red silty	Sand	
		ļ .	9	7	2		. • 9	: :	: : : :			H	_ 		5.7
1140	-	‡				l	-'		• • • •				ROADWAY EMBAI		7.4
	1.138.5	8.1	2	2	2	\dashv		: :				H	ROADWAY EMBAI	VKMENT	
1135	-	<u> </u>				١		: :					1,136.7 Brown-tan silty		9.9
1133	1,133.5	13.1											Brown fine sand	ly Silt	
	-		1	1	2		•3 · · · · · · · · · · · · · · · · · · ·	: :							
1130	-	-				1									17.2
	1,128.5	18.1	13	19	18	\dashv	37	- ,-				000	- ALLUVIAL Cobbles & Bou		
1125	-	-				1	: : : : : \	: -	╽ ┾┾┾┤				T 1,126.3 WEATHERED F	ROCK	20.3
1125	1,123.5	- - 23.1				۱	1 1]				granitic gnei	ss	
	1,122.5	- 24.1 -	100/0.2			+			- 100/0.2 60/0.0	1			- 1,122.5 - CRYSTALLINE		24.1
1120	_	-											Granitic Gnei Boring Terminated wit Penetration Test Refusa	th Standard	
	-	-											1,122.5 ft on Granit		
1115	-	-											<u>-</u>		
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1110	-	-									,				
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GDT	1	-											-		
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1070	1	•								l		1	- -		



SHEET 60F16

PRO.	JECT NO	O. 334	112.1.	1	IC).	B-4046	COUNTY	Burke			GEOLOGIST Elliott, D. C.	
SITE	DESCR	IPTION	Brio	ige No	o. 38 c	on :	SR 1901 over Jacob Fork Ri	<u> </u>					GROUND WTR (ft)
BOR	ING NO.	EB1	В		S	TA	ATION 18+30	OFFSET 9	ft RT			ALIGNMENT -L-	0 HR. N/A
COLI	LAR ELE	E V. 1,	145.6	ft	T	от	TAL DEPTH 28.3 ft	NORTHING	679,5	19		EASTING 1,231,292	24 HR. 7.3
DRIL	L MACH	IINE (ME-5	50	D	RII	LL METHOD NW Casing w	/ SPT			***************************************	HAMMER TYPE	Automatic
DRIL	LER C	offey,	Jr., C.		S	TA	ART DATE 09/24/09	COMP. DAT	TE 09/	24/09		SURFACE WATER DEPTH N/	Ą
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)		0.5ft	·	-	BLOWS PER FOOT 0 25 50	75 100	SAMP. NO.		L O G	SOIL AND ROCK DESC	RIPTION DEPTH (ft)
1150	-	- -										-	
1145	-	<u> </u>				H						1,145.6 GROUND SURFA - ALLUVIAL	CE 0.0
1140	1,142.3	3.3	1	1	1					м		Brown silty sand	l.
1135	1,137.3	8.3	1	1	1		22			М		1,135.8 -1,134.6 SAPROLITE Tan silty sand.	9.8
1130	1,132.3	13.3	100/0.2	2		-		100/0.2		ווגכנשוגכנשוג		WEATHERED RO Weathered rock of gr	
1125	1,127.3	18.3	38	100/0.2				. 100/0.7		25 X 1845 X 1845 X 1845 X 1845 X 1845 X 1845 X 1845 X 1845 X 1845 X 1845 X 1845 X 1845 X 1845 X 1845 X 1845 X	公	-	
1120	1,122.3	23.3	63	37/0.2	:			. 100/0.7		I KE GAIRE GAIRE		1,119.0	26.6
1115	1,117.3	28.3	60/0.0					60/0.0				CRYSTALLINE RC Granite gniess. Boring Terminated with Penetration Test Refusal a 1,117.3 ft on granite g	Standard at Elevation
1110	11111	-										- 1,717.5 it on graine s	jiliess.
1105		- - -										-	
1100		- - - -										-	
1095		- - -											
1095 1090 1085 1075	- - - -				*		•					-	
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1080	-	-										-	
1075	-											-	
1070	1										Ē		



PRO.	JECT NO					. B-40		ORT		COUNTY	Burke			GEOLOGIS	T Elliott, D. C.		
L								er Jacob f	L						`	GROUND V	VTR (ft)
	ING NO.			<u> </u>			1 18+5			OFFSET	14 ft LT			ALIGNMEN	T -L-	0 HR.	N/A
	LAR ELE			ft				28.5 ft		NORTHING	679,5	53		EASTING	1,231,288	24 HR.	6.0
	L MACH				Di	RILL M	ETHOD	NW Ca	sing w/	SPT					HAMMER TYPE	Automatic	
<u></u>	LER C							05/27/10		COMP. DA	TE 05/	27/10		SURFACE	WATER DEPTH N	′A	
ELEV	DRIVE ELEV	DEPTH	BLC	W CO	UNT		E	BLOWS PER	R FOOT		SAMP.	V /	L		SOIL AND ROCK DES	CRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25 	50		75 100	NO.	МОІ		ELEV. (ft)			DEPTH (ft)
											ì						
1140														_			
	1	-												-			
	1	-	ļ	ļ		1				T	 			_ 1,136.6	GROUND SURFA		0.0
1135	-	_													Brown silty Sar	nd	
	1,132.9	3.7	3	2	1	3 :			 			_		- -			
1130		-										Y		- 			
	1.127.9	8.7				::	: }\;	:		::::				1,128.9 	ALLUVIAL		7.7
		-	1	4	32	::		36	<u> </u>	<u> </u>			000	- 1,126.5 - 1,125.7	Dark gray-brown silt	y Sand	10.1 10.9
1125	1	_												1,124.0	Boulder ALLUVIAL		12.6
	1,122.9	13.7	60/0.05	5		::				60/0.05					Sand		_
1120	1	-					• •	• • • •						-	CRYSTALLINE R Granitic Gneis	s	
	1	-				::	:: :	: : : : :		::::				- Run 2	1: 15.7-18.5' REC=98 2: 18.5-23.5' REC=100)% RQD=100%	•
						::		: : : : ;			RS-1			- Run -	3: 23.5-28.5' REC=96	6% RQD=82%	
1115	-	_				 					500			-			
	-					::		: : : :			RS-2	1		-			
1110	_	L				<u> </u>	• • •		· · · ·					-			
						1	<u>··</u>	<u> </u>			<u> </u>	ļ	Sign 1	1,108.1	g Terminated at Elevat	ion 1 100 1 ft in	28.5
4405	-	-													Granitic Gneis		•
1105	_	-												-			
	1	-												-			
1100	_	_												-			
		-												-			
1005	1	-												-			
1095		-												-			
	1	-												-			
1090														-			
	1	-												-			
4005	1													-			
1085	-	-															
	1	_												- -			
1080		<u> </u>	İ											- 			
		<u> </u>												- -			
40		-												<u>-</u> -			
1075	-	<u> </u>									-			 -			
		<u> </u>				l								-			
1070		<u> </u>												_			
]	_												<u>-</u>			
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1065	-	<u> </u>												_			
1090 1085 1080 1075 1070	1	_												_			
1060	1	-												-			



SHEET ZOF16

	\geq			NE B	т					т					····
STATION 18-56 OFFSET 14 ft.LT ALIGNMENT L Q HR NA					<u> </u>					<u></u>	UNTY Burke	GEOLOGIS	T Elliott, D. C.		
COLLAR ELEV. 1,136.6 TOTAL DEPTH 28.5 NORTHING 679.553 EASTING 1,231,288 24 Hz 6.0	SITE	DESCRIPTIO	N Brid	lge No. 3	38 on S	SR 190	01 over J	acob F	ork R	iver				GROUND W	TR (ft)
DRILLE Cheek D. O. START DATE DRILL METHOD NW Casing W SPT DRILLER Cheek D. O. START DATE G5/27/10 SURFACE WATER DEPTH N/A	BOR	ING NO. B1-	·A		STA	TION	18+55			OF	FSET 14 ft LT	ALIGNMEN	Γ -L-	0 HR.	N/A
STANT DATE 05/27/10 SURFACE WATER DEPTH NA	COLI	LAR ELEV.	1,136.6	ft	TOT	AL DE	PTH 28	.5 ft		NO	RTHING 679,553	EASTING	1,231,288	24 HR.	6.0
DRILLER Cheek, D. O. START DATE 05/27/10 SURFACE WATER DEPTH N/A	DRIL	L MACHINE	CME-5	50	DRIL	L ME1	HOD N	W Cas	sing w	/ SP	T		HAMMER TYPE	Automatic	
COME SEEM COME					 					т		SURFACE	<u> </u>		
ELD	<u></u>				 							TOOK! AOL!	TATER DEI III		
100 100	-	RUN		DRILL	RI	JN		STF	ATA	L					
100		ELEV /ft\			REC.	RQD (ft)		REC.	RQD (ft)	0		DESCRIPTION A	ND REMARKS	D	CDTU (4)
1100 1.00	120.00		1	(111111)	70	76		76	70	Ŭ	ELEV. (II)	Donin Conin	~ @ 45.7.6		CPIH (II)
1.10.1 16.3 50 12.10.2 (1.00) (1.00) 17.10.2 (1.00)	1120	1,120.9 15.7	2.8	1:39	(2.8)	(2.8)		 		1	*	CRYSTALI	INE ROCK		
1115 1.113.1 2.5 3.3 (4.8) (4.1) RS-2 1.108.1 2.5 5.0 4.51 6.0 95% 82% 82% 82% 82% 82% 82% 82% 82% 82% 82		1,118.1 18.5		1:21/0.8		i					Fresh, hard, typicall			w joints @ 0° &	
11131 23.5 3.35 4.5		±	5.0	2:39 2:45	(5.0) 100%	(5.0) 100%	RS-1	1			<u>.</u>				
1.113.1 23.5	1115	+		3:35							-				
1110		1,113.1 23.5		3:51	(4.8)	(4.1)	RS-2	1			- -				
1106.	1110	Ŧ		4:51							- -				
1105 Boring Terminated at Blevation 1,108.1 ft in Grantic Greess Boring Terminated at Blevation 1,108.1 ft in Grantic Gr	<u> </u>	1.108 1 28 5		6:40							- * 1 108 1				20 5
1100.		1 20.0	1	0.10								inated at Elevation	n 1,108.1 ft in Granitio	c Gneiss	20.3
1095 1096 1086 1087 1088 1088 1088 1088 1088 1088 1088	1105	#									<u>.</u> -				
1095 1096 1086 1087 1088 1088 1088 1088 1088 1088 1088		‡									- -				
1095 1096 1086 1087 1088 1088 1088 1088 1088 1088 1088	1400	†							İ		<u>.</u>				
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1080 1080 1080 1080 1080 1080 1080 1080		1							į		- -				
1085	1095	+									-				
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1075 1070 1065 1060 1065 1060	1000	‡									 -				
1075 1070 1065 1060 1065 1060		‡									- -				
1070	1080	#									<u>.</u>				
1070		‡									- -				
1070	10	‡									- -				
1065	10/5	†									<u></u> -				
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1065	1070	\mathbf{I}									- -				
1060		Ŧ									- -				
1060		Ŧ									-				
1055	1065	1 ‡													
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1055	1060	‡									- -				
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1050		‡									<u>.</u>				
	1055	‡									<u>.</u>				
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		<u> </u>									<u>-</u>				
	1050	+									<u>-</u>				
		Ŧ									-				
	1045	‡									- -				
		†									- -				
	1065 1060 1055 1050	‡									- -				



PRO.	ECT NO). 334	112.1.1	1	1	D.	B-4046	COUNTY	3urke			GEOLOGIST Elliott, D. C.		
SITE	DESCR	IPTION	l Brid	ge N	o. 38	on	SR 1901 over Jacob Fork	River					GROUND W	TR (
	NG NO.						ATION 18+53	OFFSET 1	4 ft RT			ALIGNMENT -L-	0 HR.	N
COLL	AR ELE	V. 1,	136.6	ft	1	гот	TAL DEPTH 38.7 ft	NORTHING	679,5	35		EASTING 1,231,310	24 HR.	5
	_ MACH					DRI	ILL METHOD NW Casing	W/SPT & Core				HAMMER TYPE	Automatic	
	ER C				18	STA	ART DATE 05/28/10	COMP. DAT	E 06/	02/10		SURFACE WATER DEPTH N	I/A	
LEV		DEPTH	Y	w co	UNT	П	BLOWS PER FOO	т	SAMP.	V/	L	SOIL AND ROCK DES	CDIDTION	
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	t	0 25 50	75 100	NO.	MOI	O G	ELEV. (ft)		EPTI
						П		_	1			·		•
140												_		
	7	-										•		
	1				<u> </u>	Щ			<u> </u>			1,136.6 GROUND SURF		
135	1	-										Brown silty Sa		
	1.132.6	- - 4.0										<u>.</u>		
	1	-	2	1	2		•3			V		• •		
30	-	_					 							
	1,127.6	9.0	11	18	19	41					000	ALLUVIAL Gravel & Cobb		
125	-	-	''	"	"							-	nes	
	Ι							-+				1,124.2 CRYSTALLINE I		
	1,122.6	<u>- 14.0</u>	60/0.0					60/0.0				Granitic Gnei	SS	
20	1	-									1	- 1,120.5 - WEATHERED R		
	1,117.6-	- - 19.0			İ	Ш						1,117.9 granitic gneis		
			60/0.1		l	П						Granitic Gnei	SS	
15	-	_								l		Run 1: 21.0-23.7' REC=9 Run 2: 23.7-28.7' REC=9	98% RQD=86%	
	-				1			: : : : :			M	- Run 3: 28.7-33.7' REC=10 - Run 4: 33.7-38.7' REC=10	00% RQD=100% 00% RQD=100%	
10	1								RS-1	1				
	-	-												
	1	-	l	ŀ					RS-2	1		• •		
105												-		
	1	-			ļ		:::: :::: ::::					- -	•	
	1	_	ĺ									- -		
100	-											-		
				 	 	+	 		 	l		1,097.9 Boring Terminated at Eleva	tion 1,097.9 ft in	
95					l						t	Granitic Gne	SS	
	7	F				I					H	.		
	1]			
90		_			ŀ							<u>-</u>		
	1	-										- -		
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85		_		l								<u> </u>		
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)75	-	-										-		
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SHEET 80F/6

2	少Vu	D (CO	RE B	OR	INC	RE	PO	RT						aurie
	JECT NO					B-404				7	UNTY Burke	GEOLOGIS	F Elliott, D. C.		
SITE	DESCRI	PTION	Brid	ge No. 3	8 on S	R 190	1 over Ja	acob F	ork R	iver	ti (1900) - 1900 (1904) (1904) - 1904 (1904) - 1904 (1904) - 1904 (1904) - 1904 (1904) - 1904 (1904) - 1904 (1904)	·		GROUND V	VTR (ft)
BOR	ING NO.	B1-B			STAT	TION	18+53			OF	FSET 14 ft RT	ALIGNMENT	Г -L-	0 HR.	N/A
COL	LAR ELE	V. 1,	136.6	ft	TOTA	AL DE	PTH 38.	7 ft		NO	RTHING 679,535	EASTING	1,231,310	24 HR.	5.6
DRIL	L MACH	INE C	ME-5	50	DRIL	L MET	HOD N	W Cas	sing V	V/SP	T & Core		HAMMER TYPE	Automatic	
DRIL	LER C	neek, C). O.		STAF	RT DA	TE 05/2	8/10	٠	CO	MP. DATE 06/02/10	SURFACE V	VATER DEPTH N	/A	
COR	E SIZE	NXWL			TOTA	AL RUI	N 17.7 f								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft)	JN RQD (ft) %	SAMP. NO.	STR 'REC. (ft) %	RATA RQD (ft) %	-10G	DE ELEV. (ft)	ESCRIPTION A	ND REMARKS		DEPTH (ft)
1115.58												Begin Coring	g @ 21.0 ft		
1110	1,107.9	23.7	5.0	1:28 1:51 1:31/0.7 1:44 1:39 1:49 1:52 1:58 1:57 2:04 2:02	(2.5) 93% (4.9) 98% (5.0) 100%	(1.9) 70% (4.3) 86% (5.0) 100%	RS-1				Rock is typically fresh, are low angle and	hard, & widely	INE ROCK fractured Granitic Gne st & top of 2nd runs. (d	siss. Most joints continued)	5
1100	1,102.9	33.7	5.0	1:59 2:10 2:07 2:11 2:05	(5.0) 100%	(5.0) 100%									
	1,097.9	38.7		2:17 2:11							1,097.9 Boring Termina	ated at Elevatio	n 1,097.9 ft in Granitio	: Gneiss	38.7
1095	- - - - -	- -													
1090		•									<u>-</u> - -				
1085		-									<u>-</u>				
1080	<u></u>	· ·									-				
1075	+ - - - - -	•									-				
1070	- - - - -	• • •									-				
1065	-	- -									_				
1060											-				
.555		•									 - - -				
1055		• •									- - - -				
1050		-									- - - -				
1045	+ + - + + +										- - -				
1040		•									- - - -	ě			
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PRO	JECT NO) . 334	412.1.1	1	IC). B-4046	3		COUNTY	Burke			GEOLOGIS	ST Elliott, D. C.		
SITE	DESCR	IPTION	I Brid	lge N	o. 38 c	on SR 190	1 over Jacob F	ork Rive	er						GROUND W	TR (ft)
BOR	ING NO.	B2-A	١		S	TATION	19+24	- 0	OFFSET 8	ft LT			ALIGNMEN	IT -L-	0 HR.	N/A
COL	LAR ELE	E V. 1,	134.7	ft	T	OTAL DEF	PTH 22.8 ft		NORTHING	679,6	606		EASTING	1,231,332	24 HR. Caved	d@4.1
DRIL	L MACH	INE (CME-5	50	D	RILL MET	HOD NW Cas	ing W/S	SPT & Core)				HAMMER TYP	PE Automatic	
DRIL	LER C	offey,	Jr., C.			TART DAT	ΓE 06/04/10		COMP. DAT		Y		SURFACE	WATER DEPTH	N/A	
ELEV (ft)	DRIVE ELEV	DEPTH (ft)	BLC	W CO			BLOWS PER		r 100	SAMP.	V /			SOIL AND ROCK D	ESCRIPTION	
(11)	(ft)	(11)	0.5ft	0.5ft	0.5ft	0	25 50	7	5 100	NO.	MOI	G	ELEV. (ft)		D	EPTH (
															*	
1135	-	<u> </u>	ļ			 						200	1,134.7	GROUND SUI		0
	1.131.6	2,1												Brown silty		
1130	1,131.0	3.1	3	3	3	∳ 6							1,130.0			4.
	-					T	+					200	1,129.0	ALLUVIA Boulder		5.
	1,126.6	8.1	60/0.0			!:			60/0.0				1,127.0	ALLUVIA Sand	\L	<u></u>
1125	1,124.0	10.7				l 			: : : : : :					CRYSTALLINE		1
	-	-	60/0.0			::::	. .	: : :	60/0.0					Granitic Gn 1: 10.7-12.8' REC	=93% RQD=93%	
1120	-	_							• • • •	RS-5	1			n 2: 12.8-17.8' REC 3: 17.8-22.8' REC=		
	_	_				::::			::::	(NO-5)	1		• •			
4445	-	-				::::				RS-6						
1115	-	_				1				1.00	1		•			
		-					<u> </u>	• • • •	<u>::::1</u>				1,111.9			22.
1110		-											Borir	ng Terminated at Elev Granitic Gn		
	-	-											•			
1105	-	-									ŀ					
1105	-												-			
	1	-				ļ							• •			
1100	_	-											-			
	-	-											• •		•	
1095	1	_											•			
1000	-	- -											-			
	1	-											•			
1090	1	- -											<u>.</u>			
	1												•			
1085	1	-											•			
	7	-											- •			
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1080	4	_							*				- .			
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1075	‡	-											•			
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1065	1	-								1			· ·			
	7	-											- ·			
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1060	7	-										F	-			
	1	-											•			
1055	1	-											•			



SHEET 9.0F16

				KE D	UN	IIV	JAL		N I	,			
PRO.	JECT NO) . 334	12.1.	1	ID.	B-404	6			CC	DUNTY Burke	GEOLOGIST Elliott, D. C.	
SITE	DESCR	IPTION	Brid	lge No. 3	8 on 9	SR 190)1 over Ja	acob F	ork R	iver			GROUND WTR (ft)
BOR	NG NO.	B2-A			STA	TION	19+24			OF	FSET 8ft LT	ALIGNMENT -L-	0 HR. N/A
COLI	AR ELE	V . 1,	134.7	ft	TOT	AL DE	PTH 22	.8 ft		NC	PRTHING 679,606	EASTING 1,231,332	24 HR.Caved@4.1
DRIL	L MACH	INE C	ME-5	50	DRIL	L ME1	HOD N	W Cas	sing V	V/SP	T & Core	HAMMER TYPE	Automatic
DRIL	LER C	offey, J	r., C.		STAI	RT DA	TE 06/0	4/10		CC	MP. DATE 06/04/10	SURFACE WATER DEPTH N/	A
COR	E SIZE	NXWL		·	TOT	AL RU	N 12.1 f			Π			
ELEV	RUN ELEV	DEPTH		DRILL RATE	REC.	AL RUI UN RQD (ft) %	SAMP.	STR • REC.	ATA RQD	P L	D	DESCRIPTION AND REMARKS	
(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ	ELEV. (ft)		DEPTH (ft)
123.97	1,124.0	10.7	2.1	N=60/0.0	(2.0)	(2.0)			<u> </u>			Begin Coring @ 10.7 ft CRYSTALLINE ROCK	
	1,121.9		2.1	N=60/0.0 2:06 2:22 0:15/0.1	(2.0) 93%	(2.0) 93%					Light gray-white, fr	esh, hard Granitic Gneiss. Rock is typ	ically widely
1120		-	5.0	\ <u>0:15/0.1</u> / 2:04	(4.9) 98%	(4.6) 92%	RS-5				- fractured with a few	low angle joints at the bottom of Run 2	. (continuea)
	1,116.9	17.8		2:04 1:58 1:59 2:00 1:48 1:54 1:48 1:57									
1115	1,110.9	-	5.0	1:48 1:54	(5.0)	(5.0)	RS-6				-		
1110	-	-		1:48 1:57	100%	100%					- -		
	1,111.9	22.8	ļ	1:46							1,111.9	1.	22.8
1110	_	-									Boring Termir	nated at Elevation 1,111.9 ft in Granitic	Gneiss
	-	-								l	- -		
1105	-	-								l	- -		
1105	-	-	.								- -		
	-	-									- -		
1100	-	-									-		
	-	-									- -		
1005	-										<u>-</u>		
1095	-	-									- -		
	-	-									- -		
1090		-									-		
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1005	-	-									- -		
1085	-	-									-		
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1080	_	-									-		
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1075	-	<u> </u>									- -		
1075	_	-	İ								-		
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1070		<u> </u>									<u> </u>		
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1005	-	ţ									<u> </u>		
1065	-	<u> </u>									<u>-</u>		
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1060	_	E				1					<u>-</u>		
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1055	_	E									E		
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1050	-	E									_		
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	-	F									F		
1045	_	F									F		
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NCDOT GEOTECHNICAL ENGINEERING UNIT

SHEET

PRO	JECT NO	O. 33	412.1.	1	II	D.	. B-4046	COUNTY	Burke			GEOLOGIST Elliott, D. C.	
SITE	DESCR	IPTION	l Bric	lge No	o. 38	on	n SR 1901 over Jacob Fork R	iver					GROUND WTR (fi
BOR	NG NO.	B2-E	3.		S	ST	ATION 19+23	OFFSET 1	I4 ft RT			ALIGNMENT -L-	0 HR. N/A
COL	AR ELE	ΞV . 1,	134.7	ft	T	LO.	TAL DEPTH 28.7 ft	NORTHING	679,5	592		EASTING 1,231,350	24 HR. FIAE
DRIL	L MACH	IINE (CME-5	50	<u> </u>	OR	RILL METHOD NW Casing V	//SPT & Core	9			HAMMER TYPE	Automatic
DRIL	LER C	offey,	Jr., C.		S	ST/	ART DATE 06/02/10	COMP. DAT	TE 06/	03/10		SURFACE WATER DEPTH N	I/A
ELEV	DRIVE ELEV	DEPTH	·	W CO		4	BLOWS PER FOOT		SAMP.	V /	1 b	SOIL AND ROCK DES	SCRIPTION
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	4	0 25 50	75 100	NO.	MO	l G	ELEV. (ft)	DEPTH (
									``				
1135	-					1			<u> </u>	ļ		1,134.7 GROUND SURF	
	-											- ALLUVIAL - Brown silty Sa	
1130	1,130.6	4.1_										• •	
.,,,,,	-	-	1	1	1		• <u>2</u>	1				 -	
	1	-										• •	
1125	1,125.6	9.1	10	10	11	$\ $	21	1			000	- 1,125.7 - ALLUVIA L	
	1	-									000	1,123.1 Sand & Grave WEATHERED R	11
1120	1,120.3	- 111										granitic gneis	
1120	1,119.0			35/0.1				. 100/0.6				1,119.0	15
	1	-	60/0.0					60/0.0				CRYSTALLINE R Granitic Gneis	SS
115		_							RS-7		M	Run 1: 15.7-18.7' REC=9 Run 2: 18.7-23.7' REC=10	3% RQD=93% 0% RQD=100%
	1	- -					: : : : : : : : : : : :	: : : :	1.07		滔	Run 3: 23.7-28.7' REC=9	8% RQD=98%
	1	_							RS-8		冠	•	
110									1.00	1	N	- -	
	}										N	•	
1105						┦			 			1,106.0 Boring Terminated at Elevat	28. tion 1 106 0 ft in
	7	_										Granitic Gneis	
	7	-				l						•	
1100	4	-										- -	
	1	-										.	٧
1095	‡	•										•	
-	7	-											
	‡	•										•	
090	#	- -										-	
l	‡											•	
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SHEET 100×16

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PRO.	JECT NO.	334	12.1.1		ID.	B-404	6			co	UNTY Burke GEOLOGIST Elliott, D. C.							
SITE	DESCRIP	MOIT	Brid	ge No. 3	8 on 9	SR 190	1 over J	acob F	ork R	iver	GROUND WTR	R (ft)						
BOR	ING NO.	B2-B			STA	ΓΙΟΝ	19+23			OF	FSET 14 ft RT ALIGNMENT -L- 0 HR.	N/A						
COLI	LAR ELEV	/. 1,1	134.7	ft	TOT	AL DE	PTH 28	.7 ft		NORTHING 679,592 EASTING 1,231,350 24 HR.								
DRIL	L MACHIN	NE C	ME-5	50	DRIL	L ME1	HOD N	W Cas	sing W	W/SPT & Core HAMMER TYPE Automatic								
DRILLER Coffey, Jr., C. START DATE 06/02/10								2/10		со	MP. DATE 06/03/10 SURFACE WATER DEPTH N/A							
CORE SIZE NXWL TOTAL R							N 13.0 f											
ELEV (ft)	RUN ELEV (ft)	EPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	STF REC. (ft)	RQD (ft) %	L O G	DESCRIPTION AND REMARKS ELEV. (ft) DEP	TH (ft)						
1118.97											Begin Coring @ 15.7 ft							
1115	T	15.7 18.7	5.0	N=60/0.0 2:55 2:48 2:46 2:49 2:30 2:40 2:17	(2.8) 93% (5.0) 100%	(2.8) 93% (5.0) 100%	RS-7			HANNEY.	CRYSTALLINE ROCK Light gray-white, fresh, hard Granitic Gneiss with widely fractured spacing typical, & a few low angle joints.	15.7						
1110	1,111.0		5.0	2:24 2:38 2:43 2:41 2:32 2:26	(4.9) 98%	(4.9) 98%	RS-8				1,106.0	28.7						
1105	+	2011		2.20							Boring Terminated at Elevation 1,106.0 ft in Granitic Gneiss	20.1						
1100	† † †			,														
1095																		
1090																		
1085	<u> </u>										- - -							
1080											-							
1075																		
1070	 																	
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1055		1	210 g g g	<u></u>														
1050						,												
1065 1060 1055 1055 1045											- - -							



PRO.	JECT NO) . 33 ⁴	112.1.1	1	ID	D.	4046	COUNTY	3urke			GEOLOGIST Elliott, D. C.		
SITE	DESCR	IPTION	l Brid	ge N	o. 38 c	on S	1901 over Jacob Fork R	iver				<u></u>	GROUND WTR	t (ft
	NG NO.						ON 19+67	OFFSET 1	0 ft LT			ALIGNMENT -L-	OHR.	N/A
COLI	AR ELE	V. 1,	138.8	ft	T	ОТ	. DEPTH 28.0 ft	NORTHING	679,6	 348		EASTING 1,231,346	24 HR 1	14.5
	L MACH				D	RIL	METHOD NW Casing W	//SPT & Core				HAMMER TYPE	Automatic	
	LER C						DATE 09/28/09	COMP. DAT		28/09		SURFACE WATER DEPTH N	/A	
ELEV	DRIVE	DEPTH	T	w co		П	BLOWS PER FOOT	L	SAMP.	V /	1-1			
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	11	25 50	75 100	NO.	МО	0 G	SOIL AND ROCK DES	CRIPTION DEPT	TH (f
						П		-			П		•	
1140					1								هم	
	-	- 	ļ		ļ	$\!$				ļ		1,138.8 GROUND SURF. ROADWAY EMBAN		0.
]	-				\parallel						Red-brown silty sand with c		
1135	1,135.5	- <u>3.3</u> -	1	1	2	┨,				м		<u> </u>		
	-	- -										- - 1,132.4		6.
1120	1,130.5	- 8.3										- ALLUVIAL Brown silty sar	nd.	
130		-	WOH	1	1			 		М		-		
	_	_						: : : : :				- -		
125	1,125.5	13.3	1	1	1			.		M		• -		
	-	_	'	'	'			: : : : :		-M_		•		
	4 400 5	40.0						: : : : :				1,122.1 SAPROLITE		16.
1120	1,120.5	- 18.3	17	34	27	1ŀ	61			м		Tan silty sand with trace of 1,118.7 weathered roc		20.
	1,117.6-	- 21.2	00/0 0			П		60/0.0				- CRYSTALLINE R	OCK	
1115	-	-	60/0.0									- Granite gneis:	5.	
1110	-	-										•		
	-	-				\parallel						- - - 44400		20
1110	-	-			\dagger	卄	 		1	\vdash	7			28.
	-	_										granite gneiss	5.	
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1105	_	-										- -		
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1080	_	<u> </u>										<u></u> -		
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1065	-	-				l						- -		
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1060		-		1	1					1] [-		



SHEET 11_0F/6

PRO	JECT NO) . 334	12.1.1	1	ID.	B-404	6			CO	UNTY Burke	GEOLOGIST	F Elliott, D. C.		
SITE	DESCR	IPTION	Brid	lge No. 3	8 on S	SR 190	1 over J	acob F	ork R	iver			***************************************	GROUND V	VTR (ft)
BOR	RING NO.	EB2-	A		STAT	TION	19+67		***************************************	OF	FSET 10 ft LT	ALIGNMENT	Γ -L-	0 HR.	N/A
COL	LAR ELE	V. 1,	138.8	ft	TOTA	AL DE	PTH 28	.0 ft		NO	RTHING 679,648	EASTING 1	1,231,346	24 HR.	14.5
DRIL	L MACH	INE C	ME-5	50 .	DRIL	L MET	HOD N	W Cas	sing V	//SP	T & Core		HAMMER TYPE	Automatic	
DRII	LER C	offey, J	r., C.		STAF	RT DA	TE 09/2	8/09	٠.	CO	MP. DATE 09/28/09	SURFACE W	VATER DEPTH N	/A	
COR	E SIZE	NXWL					N 6.8 ft								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STR REC. (ft)	ATA RQD (ft) %	L O G	ELEV. (ft)	DESCRIPTION A	ND REMARKS	[DEPTH (ft)
117.5	9											Begin Coring	ı @ 21.2 ft		
1115	1,117.6- 1,115.8.	23.0	1.8	N=60/0.0 2:17 1:48/0.8	(1.8) 100%	(1.8) 100%					Light gray granite gne	CRYSTALL eiss. with biotite,	INE ROCK phlogopite and game	ets. Very slightly	
<u> </u>		- -	5.0	2:01 1:50	(4.7) 94%	(4.6) 92%					_	weathered to from	esh; very hard. n @ 10°. (continued)		
	1,110.8	28.0		2:01 1:50 1:54 1:55 1:57		070					• •	ŭ	,		
1110	1,110.02	-		1:57								nated at Elevatio	n 1,110.8 ft in granite	gneiss.	28.0
		-									- -				
1105		-									- -				
] =	-									- -				
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1100	-	_									. -				
		_									- - -				
1095		_									- - -				
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I 1040	-	-									- 				
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PRO	JECT NO). 334	412.1.	1	IC). E	B-4046			COUNT	ΓY	Burke			GEOLOGIS	ST Elliott, D. C.			
SITE	DESCR	PTION	I Brid	lge N	o. 38 c	on S	SR 1901	over Jac	ob Fork R	iver							GROUND W	TR (ft)	
BOR	NG NO.	EB2	-B		S	TAT	TION 19	9+54		OFFSET 5 ft RT					ALIGNMEN	0 HR.	N/A		
COL	AR ELE	V. 1,	136.8	ft	T	OTA	AL DEPT	TH 33.6	ft	NORTH	HING	679,6	23		EASTING 1,231,360 24 HR.				
DRIL	L MACH	INE (CME-5	50	D	RIL	L METH	OD NW	Casing W	//SPT &	Core)			HAMMER TYPE Automatic				
DRIL	LER C	offey, .	Jr., C.		S	TAF	RT DATE	06/03/	10	сомр.	. DAT	FE 06/	03/10		SURFACE	WATER DEPTH	N/A		
ELEV	DRIVE ELEV	DEPTH	' 	W CO		\prod_{n}			PER FOOT		400	SAMP.	/	0		SOIL AND ROCK DE	ESCRIPTION		
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	110		25 1	50	75 	100	NO.	/MOI	G	ELEV. (ft)			EPTH (f	
1140	_	- -													-		*		
	j	-				₩		T	T	T	\dashv	ļ			1,136.8	GROUND SUF		0.0	
1135	-	- -						 	 	 	-		_		-	Brown silty S			
	1,132.9	<u>3.9</u>	2	1	1	l				: : :			V	對					
1130		- -					• • • •			1					- .				
	1,127.9	- - 8.9] <u> </u>		<u>.</u>							1,127.9			8.9	
4405		-	3	9	18			27 · · ·	: : : :							ALLUVIA Brown-gray Sand			
1125	1	- -	į			胩		l	+	+	-=			3777	1,124.4	WEATHERED	BOCK	12.4	
	1,122.9	<u>. 13.9</u>	47	18	72/0.4		<i>.</i>	: : : :	: : : :	· · ·						granitic gne			
1120		-				\parallel			1	- 100	0/0.9				- 1 110 0			47.	
	1,119.2	17.6 -	60/0.0					: : : :	1::::	60	0.0\				1,119.2	CRYSTALLINE		17.	
	1	-						: : : :	: : : :	: : :						Granitic Gn 1: 17.6-18.6' REC	=80% RQD=50%		
115	1	-				旪		 	 	 	\exists				Run	2: 18.6-23.6' REC= 3: 23.6-28.6' REC=	100% RQD=100%		
	1	-						: : : :	1::::	: : :					Run	4: 28.6-33.6' REC=	100% RQD=100%		
1110		-								<u> </u>					-				
	1	-						: : : :	1::::	: : :	:								
	_	-						::::	1 : : :	: : :									
1105		-	ľ			╟		 	+	 	-				.				
		- -	 		 	廾		L	_L			1			1,103.2 Borir	ng Terminated at Elev		33.6	
100	1	- -													-	Granitic Gn	eiss		
	‡	•																	
1095	‡	-																	
1095	1	-													-				
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SHEET 12.0F16

PRO.	JECT NO). 334	12.1.1		ID.	B-4046	3			CO	UNTY Burke	GEOLOGIST	Elliott, D. C.		
SITE	DESCRI	PTION	Brid	ge No. 3	8 on S	R 190	1 over Ja	acob F	ork R	iver		<u> </u>		GROUND W	/TR (ft)
BOR	NG NO.	EB2-	В		STAT	TION	19+54			OF	FSET 5 ft RT	ALIGNMENT	-L-	0 HR.	N/A
COLI	COLLAR ELEV. 1,136.8 ft TOTAL DEPTH 33.6 ft									NO	RTHING 679,623	EASTING 1	,231,360	24 HR.	4.0
DRIL	L MACH	INE C	ME-5	50	DRIL	L MET	HOD N	W Cas	sing W	//SP	T & Core	HAMMER TYPE	Automatic		
DRIL	LER C	offey, J	lr., C.		STAF	RT DA	TE 06/0	3/10	,	CO	MP. DATE 06/03/10	SURFACE W	ATER DEPTH N	/A	
-	E SIZE			······································	TOTA	AL RUI	N 16.0 f	t	·······			<u> </u>			
ELEV	RUN	DEPTH	RUN	DRILL	RU	JN POD	SAMP.	STR • REC.	ATA	L			ND DEL 14 DVO		
(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	NO.	(ft) %	RQD (ft) %	O G	L ELEV. (ft)	DESCRIPTION A	ND REMARKS		DEPTH (ft)
1119.17	,											Begin Coring			
	1:118:27	18:8	1.0 5.0	N=60/0.0 1:42	(0.8) 80%	(0.5) 50%					1,119.2 Gray-white slightly	CRYSTALL weathered to ge	nerally fresh, hard Gra	nitic Gneiss.	17.6
1115	1	-	0.0	1:53 1:49 1:53 2:02 2:12	(5.0) 100%	(4.2) 84%					Fracture spacing is c	lose to moderate	ely close in 1st two core re. Fractures are ~0-2	e runs & widely	
	1,113.2	23.6		2:02 2:12	100%	0476				冕	-				
			5.0	2:01 2:04	(5.0) 100%	(5.0) 100%									
1110				2:10 1:59	10070	10070					-				
	1,108.2	28.6	5.0	2:11 2:10	(5.0)	(5.0)					-				
1105		<u> </u>	"."	2:13 2:08	100%	100%					-				
1105	 1,103.2	33.6		2:02 2:04							1,103.2				33.6
	1,700.2	- 55.0		2.04						منز را	Boring Termin	nated at Elevation	n 1,103.2 ft in Granitic	Gneiss	00.0
1100	_	-									<u>-</u>				
1	-	_									- -				
	-	_													
1095	-	-									-				
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FIELD SCOUR REPORT

WBS:_	33412.1.1	_ TIP:	B-4046	COUNTY: Burke	
DESCRIPTION(1): B	ridge No. 38 o	n SR 190 ⁻	1 over Jacobs Fo	rk River	
			EXISTING	BRIDGE	
Information from:	Field Ir Other	nspection (explain)	X Mice BSR dated 02/26	rofilm (reel po 5/10	os:)
Bridge No.: 3 Foundation Type: F			Total Bents:	Bents in Channel: 2	Bents in Floodplain:2_
EVIDENCE OF SO Abutments or Er		: None no	vted		
Interior Bents: S			ipstream)		
Channel Bed: <u>N</u>	lone noted	-			
Channel Bank: <u>N</u>	linor sloughing	& erosior	n on southern bar	ık.	
EXISTING SCOU	R PROTECTIO	N			
Type(3): <u>N</u>	lone				·····
Extent(4): <u>n</u>	/a				
Obstructions(6): N					

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.

SHEET 13 of 16

			DES	SIGN IN	IFORM.	ATION					
Channel Bed I	Material(7):	Sand, gi	ravel, co	bbles, &	a few bo	ulders					

Channel Bank I	Material(8):	Sand, gi	ravel, co	bbles		······					
Channel Ban	k Cover(9):	Trees &	bramble)	·						
Floodplain	Width(10):	~700"							***************************************		
Floodplain	Cover(11):	Trees, b	ramble,	undergro	wth				·····	**************************************	was to his discount of the same
Str	eam is(12):	Ą	ggrading		Degra	ading	<u>X</u>	Sta	atic	-	
Channel Migration Ter	ndency(13):	Toward	End Ben	t One							
Observations and C	Other Comm	nents:									
		A-land-man									
DESIGN SCOUR E	I FVATION	S(14)				Foot	t X	Met	are		
DEGION GOODINE	BENTS	0(14)				1 66		Wet		-	
	B1	B2									
							1				\vdash
Comparison of DSE	to Hydraul	ice I Init t	hoorotic	al scour							
DSE is in agreemer					r from BS	R dated	1 02/26/10)			
						, c datoc	. 02/20/10				
SOIL ANALYSIS R	ESULTS F	ком сн	ANNFI	BED AN	D BANK	MATER	ΡΙΔΙ				
Bed or Bank							<u> </u>	T			
Sample No.											
Retained #4											
Passed #10											
Passed #40				****						ļ	
Passed #200 Coarse Sand					1						
Fine Sand								_			
Silt		***************************************						_			
Clay											
LL											
PI											
AASHTO											
Station											
Offset											
Depth					L					<u> </u>	
									Form GEU	I-017e Re	evised 7/26/20

Reported by:	J.W. Mann	Date:	5/27/2010
-		-	

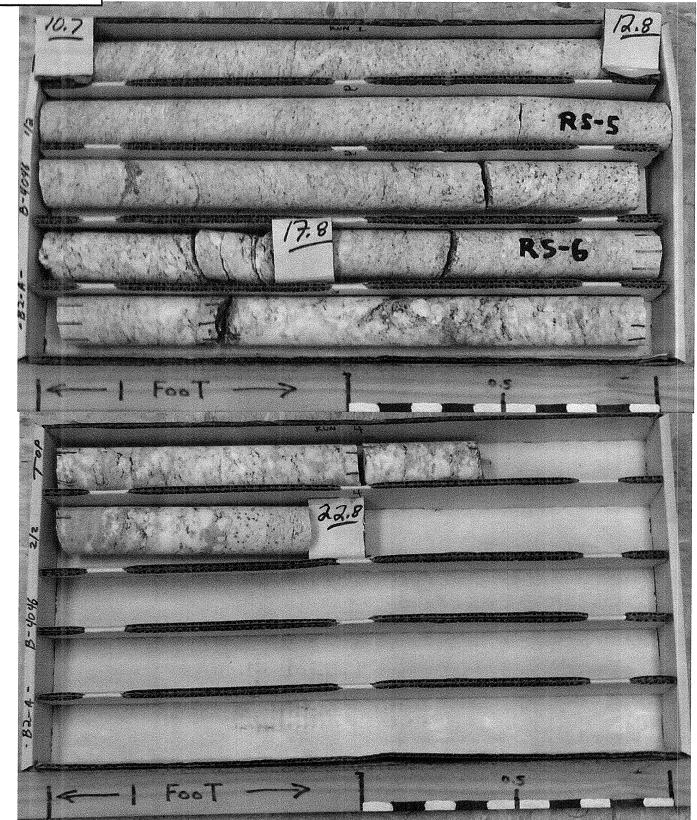
33412.1.1 (B-4046) BURKE COUNTY BRIDGE # 38 ON SR 1901 OVER JACOBS FORK RIVER CORE PHOTOS





33412.1.1 (B-4046) BURKE COUNTY BRIDGE # 38 ON SR 1901 OVER JACOBS FORK RIVER CORE PHOTOS

B2-A





33412.1.1 (B-4046) BURKE COUNTY BRIDGE # 38 ON SR 1901 OVER JACOBS FORK RIVER CORE PHOTOS

B1-A



