STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TEACH.
N.C.	17BP.13.R.117	1	10

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REF	FERENCE NO	17BP.13.R.	117		F	.A. PR	OJ. SF-9	90117
COUNTY	YANCEY				-11.			
	DESCRIPTION	BRIDGE	NO. 117	ON	SR	1395	OVER	
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<u>SHEET</u>	DESCRIPTION		NORVILLE, C. V.
Ĭ	TITLE SHEET		HAMM, J. R.
2-2A	NCDOT DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION SOIL AND ROCK LEGEND, TERMS, SYMBOLS AND ABBREVIATIONS	•	HUNSBERGER, W. S.
3	FOUNDATION RECOMMENDATIONS AND PLAN NOTES	•	DATIT A C
4	SITE PLAN	,	PAUL, A. S.
5	BORING LOGS		TRIGON EXP
6-9	ROD SOUNDING LOGS		.,
		,	
		•	
		INVESTIGATED 6	PAUL, A. S.
		CHECKED BY	NORVILLE, C. V.
		SUBMITTED BY.	FALCON ENG
		DATE	JULY 2014

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANMING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOOS, ROCK CORES, DAD SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RAIL BIGHD BY CONTACTING THE N.C. DEPARTMENT OF THE SUBSURFACE OF PLANS AND REPORTS, NORT THE FIELD BORING LOOS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE SUBSURFACE OF PLANS AND REPORTS, NORT THE FIELD BORING LOOS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CURSURFACE OF PLANS AND REPORTS, NORT THE FIELD BORING LOOS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CURSURFACE.

CEMERAL SOL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNOS OR BETWEEN SAMPLED STRATA WITHIN THE BORREVOLE. THE LABORATORY SAMPLE DATA AND THE IN STU UN-PLACE TEST DATA CAN BE RELECT ON ONLY TO THE DEGREE OF RELIABLITY IN HERERIN IN THE STANDARD INSTITUTION OF THE STANDARD INTERPRETATION OF THE MY STANDARD INTERPRETATION OF THE STAN

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 DEFERENT, FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT, THE DEPARTMENT DOES NOT WARRANT OR CUARANTEE THE SUFFICIENCY OF ACCURACY OF THE INVESTIGATION MADE, NOT THE INTERPRETATIONS ANDE, OR OPINION OF THE DEPARTMENT TO THE TYPE OF WARRANT OR CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HINSELF 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 DEFERRING FROM THOSE INDUCATED IN THE SUBSURFACE INFORMATION.

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

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NO PESSION PAY A. HAN

DATE

DRAWN BY: HUNSBERGER, W. S.

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						L	IVISI	ON O	k Hig	HWAYS					
					G	EOTEC	HNIC	AL E	NGINE	ERING UN	TIN				
		S	OIL AN	I DI	ROCK	LEGE	ND, T	ERM	S, SY	MBOLS, A	ND	ABBRI	EVIATIO	NS	
							and the same		2000 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10						
			SOIL DE	ecoi	TION							GRADA	STION		
enti le cone	TOEDED TO E	E THE HMC	ONSOLIDATED, SE			TUEDEN FADT	u MATEDIA:	e	WELL GRAD	DED - INDICATES A G - INDICATES THAT SO	OOD REF	PRESENTATION OF	PARTICLE SIZES F	ROM FINE TO COARS	E.
THAT CAN BE	PENETRATE	WITH A C	ONTINUOUS FLIGH	T POWER	AUGER, AND YIE	D LESS THAN	ľ	•	POORLY GR						
CLASSIFICATION	ON IS BASED	ON THE A	ASHTO SYSTEM, E	ASIC DES	CRIPTIONS GENE	RALLY SHALL	INCLUDE		GHI - GRAGE	D - INDICHTES A PILA			OF GRAINS	ione dizedi	
	GICAL COMPO	SITION, ANG	ULARITY, STRUCT	JRE, PLAS	TICITY, ETC. EXA	PLE:				JLARITY OR ROUNDNES AR, SUBROUNDED, OR 1			ESIGNATED BY THE	TERMS <u>ANGULAR</u> ,	
			ND AND A						_SCOREGUE.	-027			COMPOSITIO	IN .	
GENERAL	GRAN	ULAR MATE	ERIALS		LAY MATERIALS		NIC MATER	TAI C	MINERAL N	AMES SUCH AS QUART	TZ, FELD	SPAR, MICA, TALC			IS
CLASS.	200000000000000000000000000000000000000	Z PASSING	1. ACCESS (182)		PASSING =2001	1 130770		IHL3	WHENEVER	THEY ARE CONSIDERE	ED OF S	20010000 12001	CIDII ITV		
GROUP CLASS. A	A-1 -1-a A-1-b	A-3 A-2-4	A-2 A-2-5 A-2-6 A-2		A-5 A-6 A-	8	A-4, A-5 A-6, A-7			SLIGHTLY COMPRESSI	BLE	COMPRES	FIGUID LIMIT	LESS THAN 31	
SYMBOL 0	00000000			3						MODERATELY COMPRES HIGHLY COMPRESSIBL			LIQUID LIMIT	EQUAL TO 31-50 GREATER THAN 50	
Z PASSING	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		SECOND PROPERTY.				SILT-				PE		OF MATERIAL		
· 40 36	8 MX 589 MX 5	SI NIN				GRANULAR SOILS	CLAY	MUCK, PEAT	ORGAN	IIC MATERIAL	GRANULA SOILS		Y	OTHER MATERIAL	
• 200 15	MX 25 MX 1	0 MX 35 HX	35 HX 35 HX 35 I	1X 36 MN	36 MN 36 MN 36	ev .	SOILS	2020		ORGANIC MATTER GANIC MATTER	2 - 37	3 - 5%	TRA		
LIQUID LIMIT PLASTIC INDEX	6 MX		41 MN 48 MX 41 M 18 MX 11 MM 11 M			. JOILS				LY ORGANIC	5 - 18 >18%	12 - 20%	SOM	E 20 - 35%	
GROUP INDEX		8 6	TOTAL SECTION AND AND ADDRESS OF THE PARTY O	1000000	12 MX 16 MX No	MODER	RATE	HIGHLY	HIGHLY ON	CHNIC	710%	SROUND	WATER	HLY 35% AND I	AHOAF
USUAL TYPES ST		INE SIL	TY OR CLAYEY	SIL	TY CLAYEY	DRGAN		SOILS	又	WATER LE	VEL IN		EDIATELY AFTER D	RILLING	
OF MAJOR GF MATERIALS			VEL AND SAND	SOI		MATTE	R		▼	STATIC WA	ATER LE	VEL AFTER 2	4 HOURS		
GEN. RATING AS A	EXCE	LLENT TO	GOOD	F	AIR TO POOR	FAIR TO	POOR	UNSUITABLE	<u> </u>	PERCHED 1	WATER,	SATURATED ZONE	OR WATER BEARI	NG STRATA	
SUBGRADE						POOR			O_{M}	SPRING OF	R SEEP				
P1 0	- A-/-5 S		IS ≤ LL - 3 INSISTENC				LL - 30		U 10		ΜI	SCELLANEC	US SYMBOLS		
PRIMARY S	OII TYPE	COMPAC	TNESS OR	RANGE	OF STANDARD	RANGE	OF UNCONF		MI.	ROADWAY EMBANKM			T TOMT TEST BORIN T PMT		TEST BORING
		1000 J	SISTENCY		N-VALUE)		TONS/FT ²			WITH SOIL DESCRI	PTION			· •	W/ CORE SPT N-VALUE
GENERAL GRANULI		LOC	LOOSE OSE		4 TO 10				<u> </u>	SOIL SYMBOL		Φ	AUGER BORING	<u> </u>	
MATERIA		MEDIL	JM DENSE NSE		9 TO 30 0 TO 50		N/A			ARTIFICIAL FILL O			CORE BORING	(REF)—	SPT REFUSAL
INDIA-CI	DUESTAE)	1,000,000	DENSE	200	>50					INFERRED SOIL BO		MV	MONITORING WEL	L	
GENERAL		SOF			<2 2 TO 4	6	<0.25 1.25 TO 0.1	50	THEM :	INFERRED ROCK LI	INE	Δ	PIEZOMETER		
SILT-CL MATERIA		MEDIU STI	JM STIFF IFF		4 TO 8 8 TO 15		0.5 TO 1.0 1 TO 2	1	******	ALLUVIAL SOIL BO	JUNDARY		INSTALLATION SLOPE INDICATO	R	
(COHES	IVE)	VERY HAF	STIFF RO	15	5 TO 3Ø >3Ø		2 TD 4		25/825	DIP & DIP DIRECT		\circ	INSTALLATION	•••	
		7,110	TEXTURE (R GR	AIN SIZE		U. Bywei		├ ►	ROCK STRUCTURES	1011 01		COME PENETROM	ETER TEST	
U.S. STO. SIE	VE SIZE		4 10	40	60 21	10 270						•	SOUNDING ROD		
DPENING (MM		- 1	4.76 2.00	100300000	A DOORS							ABBREV)	ATIONS		
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100000 121	SO		STURE - C		ATION OF	TERMS				DILATOMETER TEST YNAMIC PENETRATIO	N TEST		JREMETER TEST	SAMPLE A S - BULK	BBREVIATIONS
	DISTURE SO BERG LIMIT		FIELD MO DESCRIP		GUIDE FO	R FIELD MOI	STURE DES	CRIPTION		ID RATIO		SD SAND, SI SL SILT, SI	ANDY	SS - SPLIT ST - SHELBY	
			- SATUR	ATED -		LIQUID; VER			FOSS	FOSSILIFEROUS FRACTURED, FRACTUR	n-c	SLI SLIGHT	LY	RS - ROCK	
LL	LIQUID	LIMIT	(SAT.)	FROM BE	LOW THE GR	OUND WATE	R TABLE	FRAGS	FRAGMENTS	HES	TCR - TRICON W - MOISTURE		CBR - CALIF	ACTED TRIAXIAL ORNIA BEARING
PLASTIC RANGE <			- WET	- run		D _I REQUIRES)	HI HIC	C 20100	DMEN	V - VERY	CUBICCE D	ROJECT	
(PI) PL	PLASTIC	LIMIT	7	****	ATTAIN	OPTIMUM MOI	STURE						SOBSECT F	HAMMER TYPE:	
OM _	OPTIMUM	MDISTURE	- MOIST	- (M)	SOLID	AT OR NEAR	OPTIMUM I	MOISTURE	DRILL UN	ITS:	ADVA	ANCING TOOLS:		X AUTOMATIC	MANUAL
SL _		GE LIMIT	s 						MOI	BILE 8	\mid	CLAY BITS		_	
			- DRY	- (D)		ADDITIONAL PTIMUM MOI		0	□ вк-	·51	L	6" CONTINUOUS F 8" HOLLOW AUGEI		CORE SIZE:	
	Į.		PL A	STICI	TY	constant Colors			 	-450		HARD FACED FIN	500 - No Ball-Carlo - No Ball-Carlo	L	
			PLASTICIT	- 272705	100	DRY ST	RENGTH		╽╩╙	-45C	ΙĦ	TUNGCARBIDE I	CCCC 9984.3	□"——	
NONPLASTIC	CITY		0 - 6-			VERY SLIG			Х см	E-55	ΙĦ		/ ADVANCER	Ш-н	
MED. PLASTIC	CITY		16-2	25		MED:	(UM		PO	RTABLE HOIST	ΙĦ	TRICONE	STEEL TEETH	HAND TOOLS: POST HOLE	DIGGER
mun rLASII			3077070	OR MORE		HIG			1 =			TRICONE	TUNGCARB.	HAND AUGE	
DESCRIPTION	NS MAY THE	LUDE COLO	OR OR COLOR C	500000000000000000000000000000000000000	IONS (TAN RED	YELI NW-RDI	OWN. RI LIF-	GRAY).				CORE BIT	The Association Acts (Fried College)	X SOUNDING	
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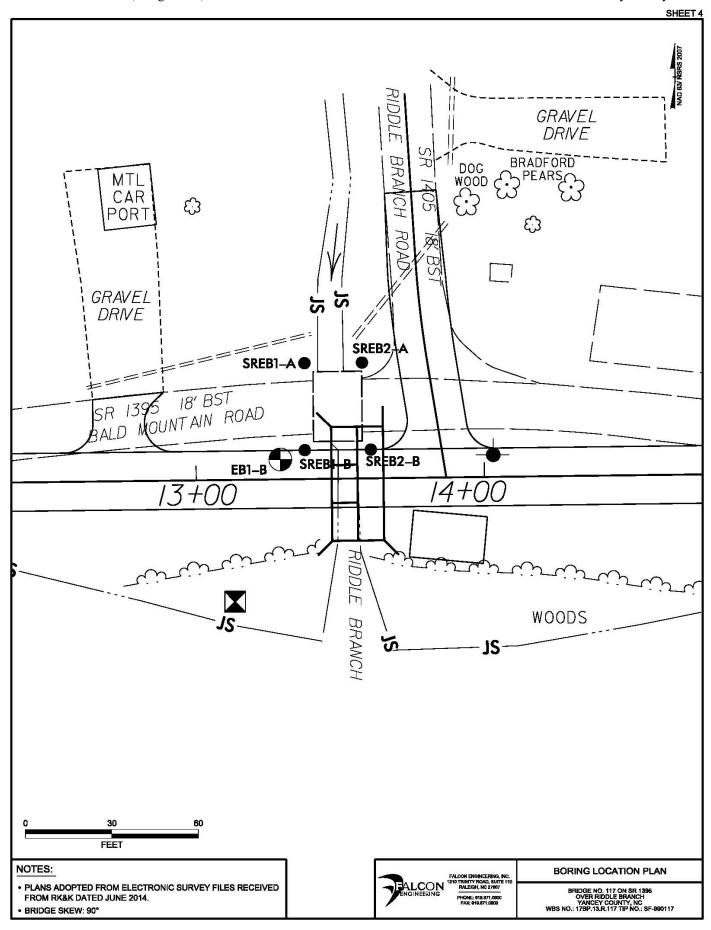
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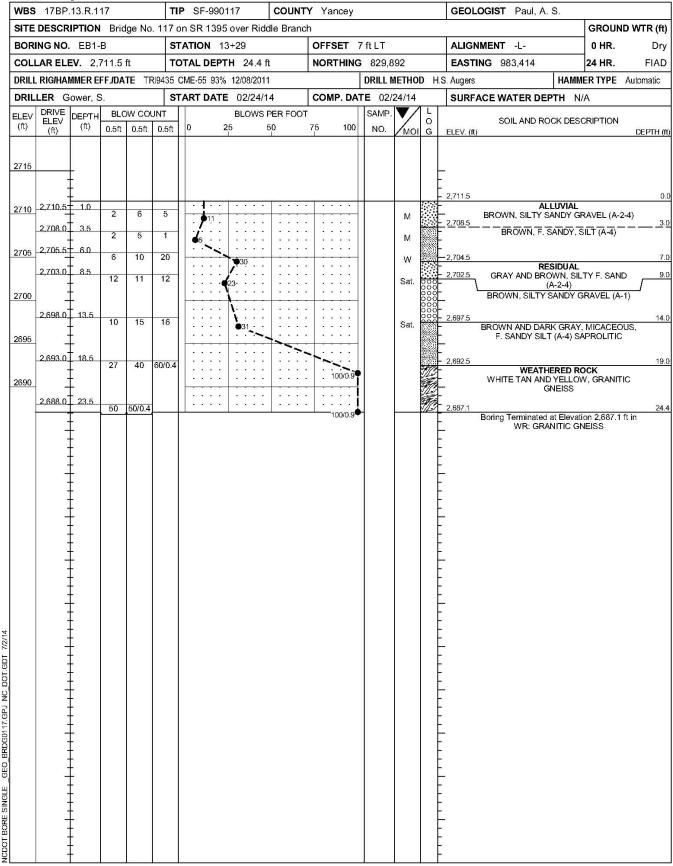
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

		DC.	CV DESCRIPTION	TERMS AND DESINITIONS						
HARD ROCK	IS NON-	COASTAL PLAIN MATERIA	CK DESCRIPTION L THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED	TERMS AND DEFINITIONS ALLUVIUM (ALLUV) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.						
			NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPOON SAMPLER EQUAL TO OR LESS THAN 8.1 FOOT PER 68 BLOWS.	AQUIFER - A WATER BEARING FORMATION OR STRATA.						
IN NON-COA	ASTAL PL	AIN MATERIAL. THE TRA	NSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.						
		E TYPICALLY DIVIDED A	FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,						
Weathered Rock (WR)		BLOWS PE	TAL PLAIN MATERIAL THAT WOULD YIELD SPT N YALUES > 100 R FOOT IF TESTED.	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE						
CRYSTALLINE ROCK (CR)	8	WOULD YI	DARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT ELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, MBRRO, SCHIST, ETC.	GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.						
NON-CRYSTALL ROCK (NCR)	INE	FINE TO C	COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN RRY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED, ROCK TYPE PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRACMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.						
COASTAL PLAIN SEDIMENTARY I	n Rock	COASTAL	PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.						
iGi /		SHELL BE	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT						
		RESH, CRYSTALS BRIGHT, I	EW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK. DIP THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.						
(V SLI.)	CRYSTAL	S ON A BROKEN SPECIM	STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, EN FACE SHINE BRICHTLY. 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.						
SLIGHT	ROCK GE		STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO IN CLAY, IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.						
	CRYSTAL	S ARE DULL AND DISCO	ORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.						
(MOD.)	CRANITO	ID ROCKS, MOST FELDSPA	SHOW DISCOLORATION AND WEATHERING EFFECTS. IN IRS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS WS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.						
	WITH FR	ESH ROCK.	DUCRED OR STAINED, IN GRANITOID ROCKS, ALL FELDSPARS DULL	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.						
SEVERE (MOD. SEV.)	AND DIS	COLORED AND A MAJORIT I BE EXCAVATED WITH A	Y SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH GEOLOGIST'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.						
	7000 POLINIO	ED, WOULD YIELD SPT RE		JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.						
(SEV.)	IN STRE	NGTH TO STRONG SOIL.	JLORED OR STAINED ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME TRONG ROCK USUALLY REMAIN.	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.						
	IF TEST	'ED, YIELDS SPT N VALUE	S > 100 BPF	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.						
(V SEV.)	THE MAS	SS IS EFFECTIVELY REDI NG. SAPROLITE IS AN EX	Didred or Stained, rock fabric elements are discernible but ced to soil status, with only fracments of strong rock ample of rock meathered to a degree such that only minor K fabric remain. If Tested Vields SPT N VALUES (1888 BPF	MOTILED INDIA: 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 INTERVENING IMPERVIOUS STRATUM.						
near-contractor or the contractor			ABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.						
	SCATTER	ED CONCENTRATIONS, QUI EXAMPLE.	ARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS	ROCK QUALITY DESIGNATION (ROO) - 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 A						
VERY HARD	CANNOT		OCK HARDNESS TO OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	EXPRESSED AS A PERCENTAGE. SAPPOLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE						
HARD	CAN BE	IL HARD BLOWS OF THE SCRATCHED BY KNIFE (ACH HAND SPECIMEN.	GEOLOGIST'S PICK, OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	PAGENT 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						
MODERATELY HARD	CAN BE	SCRATCHED BY KNIFE (OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR						
MEDIUM	BY MOD	DERATE BLOWS.	.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB, HAMMER FALLING 38 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH						
HARD	POINT	OF A GEOLOGIST'S PICK.	CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	A 2 INCH DUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION COURL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.						
SOFT	FROM (ADILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS S IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN GER PRESSURE.	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.						
VERY SOFT	OR MOR	RE IN THICKNESS CAN BE	N BE EXCAYATED READILY WITH POINT OF PICK, PIECES 1 INCH BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATLM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.						
FR	FINGER	RE SPACING	BEDDING	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.						
IERM		SPACING	TERM THICKNESS	BENCH MARK:						
VERY WIDE	Ē	MORE THAN 18 FEE	T VERY THICKLY BEDDED > 4 FEET	DENGT FROM						
WIDE MODERATEI		3 TO 19 FEET	THINKEY BEDDED 1.5 - 4 FEET	ELEVATION: FT.						
CLOSE		6.16 TO 1 FEET	VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	NOTES:						
VERY CLOS	SE	LESS THAN 0.16 FE	THINLY LAMINATED (0.008 FEET	F.I.A.D FILLED IMMEDIATELY AFTER DRILLING						
FOR SEDIMENTA	ARY ROC	(S. INDURATION IS THE H	INDURATION ARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	1						
	IABLE	RL	IBBING WITH FINGER FREES NUMEROUS GRAINS; NTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.							
M00	DERATELY	INDURATED GR	AINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; EAKS EASILY WHEN HIT WITH HAMMER.							
IND	URATED	GF	IAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; FFICULT TO BREAK WITH HAMMER.							
EXT	REMELY	INDURATED SI	MARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;							
			2.000(2) 2.000(2) 400(2	RFVISED 09/23/09						





SITE DESCRIPTION Bridge No.	Committee Control of C	1807		
(Fig.	117 on SR 1395 over Riddl	e Branch		GROUND WTR (ft
BORING NO. SREB1-A	STATION 13+38	OFFSET 40 ft LT	ALIGNMENT -L-	0 HR. N//
COLLAR ELEV. 2,712.5 ft	TOTAL DEPTH 7.2 ft	NORTHING 829,926	EASTING 983,422	24 HR . N/A
DRILL RIGIHAMMER EFF./DATE N/A		DRILL METHOD F	OD SOUNDING HAMN	IER TYPE Manual
DRILLER N/A	START DATE 02/21/14	COMP. DATE 02/21/14	SURFACE WATER DEPTH N	/A
DRIVE DEPTH BLOW COUNTY (ft) 0.5ft 0.5ft	NT BLOWS PE 0.5ft 0 25 50		SOIL AND ROCK DES	CRIPTION DEPTH
2.715 2.710.5 2.0 0.5ft	0 25 50 3 3 4 13 22 41 1174			DEPTH LDER (NO SAMPLES

NCDOT GEOTECHNICAL ENGINEERING UNIT

SHEET 7

WBS	17BF	² .13.R.1	17		Т	IP	SF-99	011	7	1	col	TNL	Y	ance	у				GEOLOGI	ST Paul, A.	S.		
SITE	DESC	RIPTION	N Bric	lge No	. 117	on S	SR 139	95 o	ver R	iddle	e Br	ancl	า									GROU	ND WTR (f
30R	ING NO). SRE	B1-B	20,6/2	S	TAT	ION	13+	38				OFI	SET	10	ft LT			ALIGNME	NT -L-		0 HR.	N/A
COL	LAR EL	.EV . 2	,712.0	ft	T	OTA	L DEF	РΤΗ	6.2	ft			NO	RTHI	NG	829,8	95		EASTING	983,422		24 HR.	N/A
RILL	. RIG/H/	MMERE	FF./DA	TE N	/A											DRILL N	IETHO	D F	ROD SOUNDING		HAMM	ER TYPE	Manual
DRIL	LER I	N/A			S	TAF	RT DAT	ΓE	02/2	1/14			co	MP. [DAT	E 02/2	21/14		SURFACE	WATER DE	PTH N	'A	
LEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft	Total second	0		25 	BLOW	/S PE			75	10	00	SAMP. NO.	MO	L O I G	ELEV. (ft)	SOIL AND RO	OCK DES	CRIPTION	DEPTH
2715		100																					
	2,712.0	0.0	<u> </u>			Ш.													2,712.0		G SHOUL		
710	2,711.0 2,710.0 2,709.0 2,708.0	3.0	N/A N/A N/A	2 2 3 23	2 2 3 23	1	4 · · · · · · · · · · · · · · · · · · ·	· 							-				_	SEE BORING SUBSURFAG			
- 1	2,707.0 2,706.0	5.0	N/A N/A	39 55	39 55	Ш						~-	-0 7	148/0				2.	2,705.8	ng Terminated	at Flaveti	an 2.705 0	l ft an
			N/A	74	74															WR: GRA	NITIC GN	NEISS	
																			-				

NCDOT GEOTECHNICAL ENGINEERING UNIT

WBS	17BP.	13.R.1					SF-9901	17	cou	NTY Y	'ancey				GEOL	DGIST Paul,	A. S.		
SITE	DESCR	IPTION	l Brid	ge No	. 117	on S	R 1395	over Ric	ldle Bra	nch					•			GROUNI	D WTR (
BORI	NG NO.	SRE	B2-A		\$	TAT	ON 13	+58		OF	FSET	40 ft LT			ALIGN	MENT -L-		0 HR.	N/
COLL	AR ELE	V. 2,	712.0	ft	7	OTA	L DEPTI	H 7.2 ft		NO	RTHIN	3 829,9	926		EASTI	NG 983,442		24 HR.	N/
DRILL	RIG/HAI	MMER E	FF./DA	TE N/	A							DRILL I	METHO	D RO	DD SOUND	ING	HAMM	ER TYPE	Manual
DRIL	LER N	/A			5	TAR	T DATE	02/21/	14	co	MP. DA	TE 02/			SURFA	CE WATER I	DEPTH N	/A	
(ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	W COL 0.5ft	200000000000000000000000000000000000000	0	25	BLOWS	PER FC	75 75	100	SAMP.	МОІ	C G	ELEV. (ft)	SOIL AND	ROCK DES	CRIPTION	DEPTH
2715	2,712.0 2,711.0 2,710.0 2,709.0	1.0 2.0 3.0	N/A N/A N/A	6 11 12	7 11 12		13		1. 2			•			2,712.0	EXIS [*] ROD SOUNDI	FING SHOUI NG ONLY - I TAKEN		≣S
:705	2,708.0 2,707.0 2,706.0 2,705.0	4.0 5.0	N/A N/A N/A N/A N/A	4 5 55 43 74	5 6 55 43 74		9				148/0.2				_2,704.8 	Boring Terminat WR: G	ed at Elevati GRANITIC GI		t on
	-														# 				
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WBS 1	7BP.1		Av-v			******	SF-99011	Chr. M.	COUNT	Y Yand	еу				GEOLOGIS	T Paul, A.	S.		
SITE DE	SCRI	PTION	Brid	ge No	. 117	on	SR 1395 c	ver Rid	dle Brand	:h								GROUN	D WTR (fi
BORING	NO.	SRE	32-B		S	TA	TION 13+	-61		OFFSE	T 1	0 ft LT			ALIGNMEN	T -L-		0 HR.	N//
OLLAF	RELE	V . 2,7	711.5 1	ft	Т	ОТ	AL DEPTH	8.3 ft		NORTH	HING	829,8	96		EASTING	983,445		24 HR.	N/a
RILL RI	G/HAM	MER E	FF./DAT	TE N/	A					×.		DRILL M	ETHOD	ROI	D SOUNDING		HAMM	ER TYPE	Manual
RILLEI	R N/	A			S	TA	RT DATE	02/21/1	4	COMP.	DA	Γ E 02/2	21/14		SURFACE	WATER DEF	TH N	/A	
(ft) EI	RIVE LEV (ft)	OEPTH (ft)	BLO 0.5ft	0.5ft	100 1000		0 25		PER FOO [*]		100	SAMP. NO.	7	L O G	ELEV. (ft)	SOIL AND RO	CK DES	CRIPTION	DEPTH
715 2,7 710 2,7 2,7	711.5 710.5 709.5 708.5	0.0	N/A N/A	2	3 2		5	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	4 2 4						2,711.5 ROI	EXISTING SOUNDING T			≣S
2,7 2,7 705 2,7	708.8 707.5 706.5 705.5 704.5 703.5	4.0 5.0 6.0	N/A N/A N/A N/A N/A N/A	1 1 2 4 2 19	1 1 2 4 3 19		2 2 4 8	38.							2,703.2 Boring	g Terminated a	at Elevati	on 2.703.21	t on
			N/A	74	74											WR: GRA			

STATE	STATE PROJECT REFERENCE NO.	NO.	TEXT AL
N.C.	17BP.13.R.118	1	11

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REF	FERENCE NO	17BP.13.R.1	18		F	_ F.A. PROJ. <i>SF-990118</i>					
COUNTY	YANCEY										
PROJECT	DESCRIPTION	BRIDGE	NO. 118	ON	SR	1395	OVER				
PATSY	CREEK										
O.											

CONTENTS

COLLE		MODITIE O II	- 1
<u>SHEET</u>	<u>DESCRIPTION</u>	NORVILLE, C. V.	-
1	TITLE SHEET	HAMM, J. R.	-
2-2A	NCDOT DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION SOIL AND ROCK LEGEND, TERMS, SYMBOLS AND ABBREVIATIONS	HUNSBERGER, W. S	-
3	FOUNDATION RECOMMENDATIONS		1
4	PLAN NOTES SHEET	PAUL, A. S.	-
5	PILE PAY ITEMS	TRIGON EXP	1
6	SITE PLAN		1
7-10	BORING LOGS	-	-
		-	4
			-
		-	-1
		INVESTIGATED BY HUNSBERGER, W. S	

PERSONNEL

NORVILLE, C. V. CHECKED BY____

SUBMITTED BY FALCON ENG

JULY 2014

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RAILEBURD WY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GOTTON FIELD BORING LOGS, ROCK CORES, AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OF INSPECTED IN RAILEBURD WITH CONTROL THE SUBSURFACE PLANS AND REPORTS, NOT THE FIELD BORING LOGS, ROCK CORES, OR SOLI TEST DATA ARE PART OF THE CUBICATION.

CEMENAL SOL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A COFFECINGAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT INCESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORROS OR BETWEEN SAMPLED STRATA WITHIN THE BORDPOLE THE LABORATORY SAMPLE DATA AND THE IN STU GIV-PLACEITEST DATA CAN BE RELED ON ONLY TO THE DEGREE OF RELIABLITY INTERPRETATION IN THE STANDARD TEST METHOD. THE OSTAT WITHIN THE STANDARD TEST METHOD. THE OSTAT WITHIN THE OSTAT WITHIN THE STANDARD TEST METHOD.

INVESTIGATIONS ARE 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, PRECIDITATION, AND BIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETALS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN NAMY CASES THE FINAL DESIGN DETALS ARE DIFFERENT, FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION FLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THE PROJECT, THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OF ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPERTATIONS MADE, OR OPIONION 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 INDUCATED IN THE SUBSURFACE INFORMATION.

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

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.



DRAWN BY: HUNSBERGER, W. S.

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.118	2A

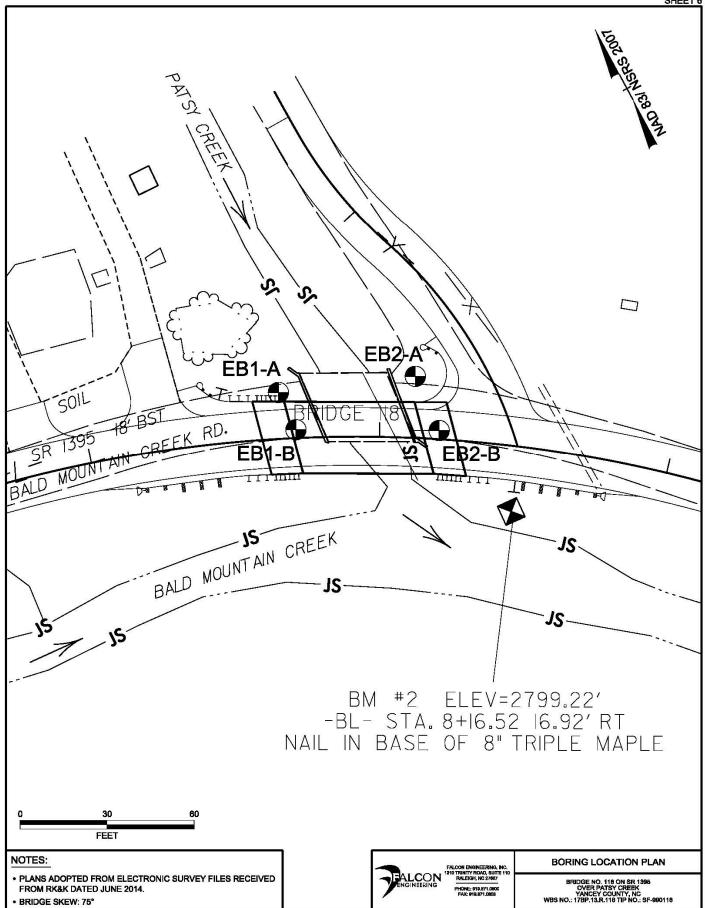
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

				DESCRIPTION		TERMS AND DEFINITIONS				
ROCK LINE	INDICATE	S THE LEVEL	AT WHICH NON-C	T IF TESTED, WOULD YIELD SPT I COASTAL PLAIN MATERIAL WOULD	YIELD SPT REFUSAL.	ALLUYIUM (ALLUY.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.				
IN NON-COA	ASTAL PL	AIN MATERIAL	A SPLIT SPOON THE TRANSITION	SAMPLER EQUAL TO OR LESS TH ON BETWEEN SOIL AND ROCK IS O	IAN 0.1 FOOT PER 60 BLOWS. FTEN REPRESENTED BY A ZONE	ADUIFER - A WATER BEARING FORMATION OR STRATA,				
OF WEATHER ROCK MATER			DIVIDED AS FOLL	.0WS:		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.				
WEATHERED		1/5//6		LAIN MATERIAL THAT WOULD YIEL	D SPT N VALUES > 100	OR HAYING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.				
ROCK (WR)		3 3	BLOWS PER FOO	T IF TESTED. GRAIN IGNEOUS AND METAMORPH	IC ROCK THAT	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				
CRYSTALLINE ROCK (CR)		1		T REFUSAL IF TESTED, ROCK TY		GROUND SURFACE. CALCAREDUS (CALC.) - SDILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.				
NON-CRYSTALL ROCK (NCR)	.INE		FINE TO COARSE SEDIMENTARY RO	GRAIN METAMORPHIC AND NON-C ICK THAT WOULD YEILD SPT REFU ITE, SLATE, SANDSTONE, ETC.	OASTAL PLAIN JSAL IF TESTED, ROCK TYPE	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.				
COASTAL PLAII SEDIMENTARY (CP)			SPT REFUSAL. R	SEDIMENTS CEMENTED INTO ROCK OCK TYPE INCLUDES LIMESTONE,		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.				
IGF)			SHELL BEDS, ETC	ATHERING		DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.				
		RESH, CRYSTAL IF CRYSTALL		DINTS MAY SHOW SLIGHT STAININ	G. ROCK RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.				
VERY SLIGHT	ROCK GE CRYSTAL	NERALLY FRE	SH, JOINTS STAIN EN SPECIMEN FAC	ED, SOME JOINTS MAY SHOW THIN CE SHINE BRIGHTLY. ROCK RINGS		DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.				
SLIGHT	ROCK GE		SH, JOINTS STAIN	ED AND DISCOLORATION EXTENDS		FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.				
				AY, IN GRANITOID ROCKS SOME DI CRYSTALLINE ROCKS RING UNDER		FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.				
GMOD.)	CRANITO	ID ROCKS, MOS	T FELDSPARS AR	DISCOLORATION AND WEATHERING E DULL AND DISCOLORED, SOME S	HOW CLAY. ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.				
	WITH FR	ESH ROCK.		D SHOWS SIGNIFICANT LOSS OF S		FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.				
SEVERE	AND DIS	COLORED AND	A MAJORITY SHO) OR STAINED, IN GRANITOID ROCK MY KAOLINIZATION, ROCK SHOWS S DGIST'S PICK, ROCK GIVES 'CLUNK	EVERE LOSS OF STRENGTH	THE FIELD.				
	IF TEST	ED, WOULD YIE	LO SPT REFUSAL			JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.				
	IN STRE	NGTH TO STRE	ONG SOIL. IN GRA	O OR STAINED ROCK FABRIC CLEA WITOID ROCKS ALL FELDSPARS A ROCK USUALLY REMAIN.		LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.				
			T N VALUES > H			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				
) OR STAINED. ROCK FABRIC ELEM O SOIL STATUS, WITH ONLY FRAG		SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.				
\$4.75) NOOTH COOK				OF ROCK WEATHERED TO A DEGR RIC REMAIN. <i>IF TESTED. YIELDS</i>		PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.				
				NOT DISCERNIBLE, OR DISCERNIBL		RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.				
		ED CONCENTR		MAY BE PRESENT AS DIKES OR S	TRINGERS, SAPROLITE IS	ROCK QUALITY DESIGNATION (RDD) - 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.				
VERY HARD	CANNOT	BE SCRATCH	19 16 16 16 16 16 16 16 16 16 16 16 16 16	SHARP PICK, BREAKING OF HAND	SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE				
HARD	SEVERA	L HARD BLOW	S OF THE GEOLO			PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND BELATIVELY THIN COMPARED WITH ITS LATERAL EVENT THAT HAS BEEN EMBLACED BARALES				
54,642,060		ACH HAND SPI		K. GOUGES OR GROOVES TO 0.25	INCHES OFFE CAM BE	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.				
HARD	EXCAVA		BLOW OF A GED	LOGIST'S PICK. HAND SPECIMENS		SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT DR SLIP PLANE.				
MEDIUM HARD	CAN BE		IN SMALL CHIPS	CHES DEEP BY FIRM PRESSURE O TO PEICES 1 INCH MAXIMUM SIZE		STANDARD PENETRATION TEST UPENETRATION RESISTANCE (SPT) - NUMBER OF BLOWS IN OR BPF) OF A 140 LB, HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SDIL WITH A 2 INCH DUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN &LI FOOT PER 60 BLOWS.				
SOFT	FROM	CHIPS TO SEVI		BY KNIFE OR PICK, CAN BE EXCA SIZE BY MODERATE BLOWS OF A		STRATA COME RECOVERY (SPEC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.				
VERY SOFT	CAN BE	CARVED WITH	KNIFE. CAN BE	EXCAVATED READILY WITH POINT EN BY FINGER PRESSURE, CAN BE		STRATA ROCK QUALITY DESIGNATION (SRDD) - 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.				
FR	FINGER	RE SPACI	NG	BEDD	ING	<u>IOPSDIL (TS.)</u> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.				
IERM			ACING	IERM	THICKNESS	BENCH MARK:				
VERY WIDE	Ē	MORE TH 3 TO 10	IAN 18 FEET	VERY THICKLY BEDDED THICKLY BEDDED	> 4 FEET 1.5 - 4 FEET					
MODERATE	LY CLOS	E 1 TO 3 F	EET	THINLY BEODED VERY THINLY BEODED	0.16 - 1.5 FEET 0.03 - 0.16 FEET	ELEVATION: FT.				
CLOSE VERY CLOS	SE	0.16 TO LESS TH	AN Ø.16 FEET	THICKLY LAMINATED THINLY LAMINATED	0.008 - 0.03 FEET < 0.008 FEET	NOTES: F.I.A.D FILLED IMMEDIATELY AFTER DRILLING				
				URATION	Marie Marie Carlo (A. 1906)	The STATE AND CONTROL OF THE STATE OF THE ST				
FOR SEDIMENT	ARY ROCI	(S, INDURATION		ING OF THE MATERIAL BY CEMEN						
FRI	ABLE			WITH FINGER FREES NUMEROUS (BLOW BY HAMMER DISINTEGRATES						
M00	ERATELY	INDURATED		CAN BE SEPARATED FROM SAMPLE EASILY WHEN HIT WITH HAMMER,	WITH STEEL PROBE;					
IND	URATED			ARE DIFFICULT TO SEPARATE WIT T TO BREAK WITH HAMMER.	TH STEEL PROBE;					
ЕХТ	REMELY	INDURATED		IAMMER BLOWS REQUIRED TO BREA BREAKS ACROSS GRAINS.	AK SAMPLE;					
						DEVICED -00/27/00				



NCDOT GEOTECHNICAL ENGINEERING UNIT

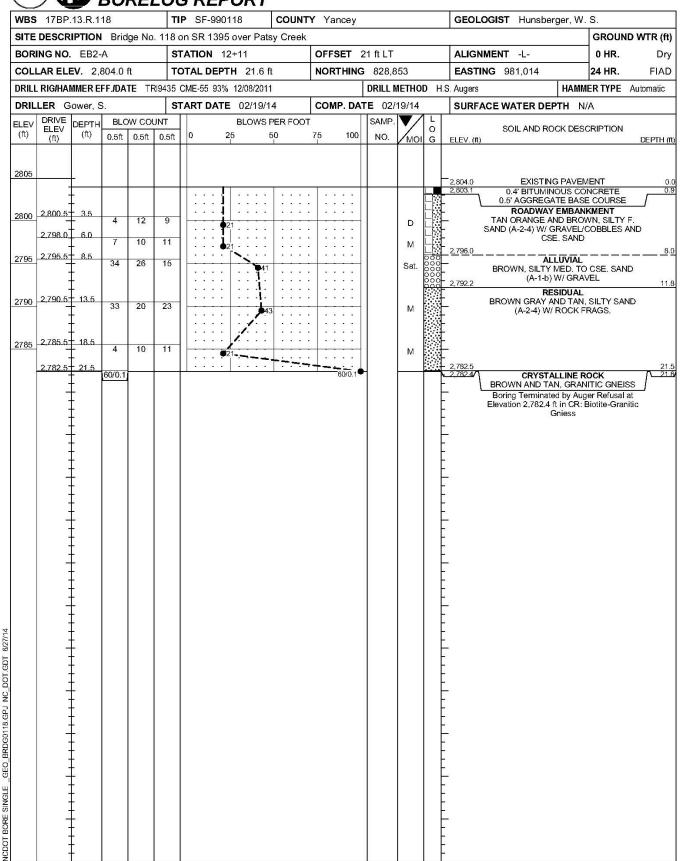
TIP SF-990118 **COUNTY** Yancey WBS 17BP.13.R.118 GEOLOGIST Hunsberger, W. S. GROUND WTR (ft) SITE DESCRIPTION Bridge No. 118 on SR 1395 over Patsy Creek BORING NO. EB1-A OFFSET 16 ft LT ALIGNMENT -L-0 HR. STATION 11+66 5.4 **EASTING** 980,969 **NORTHING** 828,868 COLLAR ELEV. 2,804.0 ft TOTAL DEPTH 10.4 ft 24 HR. FIAD DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 93% 12/08/2011 DRILL METHOD H.S. Augers HAMMER TYPE Automatic DRILLER Gower, S. **START DATE** 02/19/14 COMP. DATE 02/19/14 SURFACE WATER DEPTH N/A DRIVE. **BLOW COUNT** SAMP. DEPTH 0 SOIL AND ROCK DESCRIPTION **ELEV** (ft) (ft) 100 0.5ft 0.5ft 0.5ft NO. ELEV. (ft) DEPTH (ft) 2805 EXISTING PAVEMENT 2,804.0 0.5' BITUMINOUS CONCRETE 0.5' AGGREGATE BASE COURSE 2,803.0 1.0 50 17 20 D 2,801.5 2.5 ROADWAY EMBANKMENT BROWN AND TAN, SILTY F. SAND (A-2-4) W/ GRAVEL AND PROBABLE 55 14 2800 D 2,798.5 2,798.0 6.0 BOULDER/COBBLE 48 Sat. RESIDUAL BROWN TAN AND ORANGE, SILTY SAND (A-2-4) W/ ROCK FRAGS. 2,795.5 8.5 2795 100/0. 100/0.5 60/0.1 2,793.7-10.3 WEATHERED ROCK 60/0.1 ORANGE AND TAN, BIOTITE-GRANITIC
GNEISS CRYSTALLINE ROCK ORANGE AND TAN, BIOTITE-GRANITIC GNEISS Boring Terminated by Auger Refusal at Elevation 2,793.6 ft in CR: Biotite-Granitic Gniess NC DOT.GDT BRDG0118.GPJ GEO SINGLE NCDOT

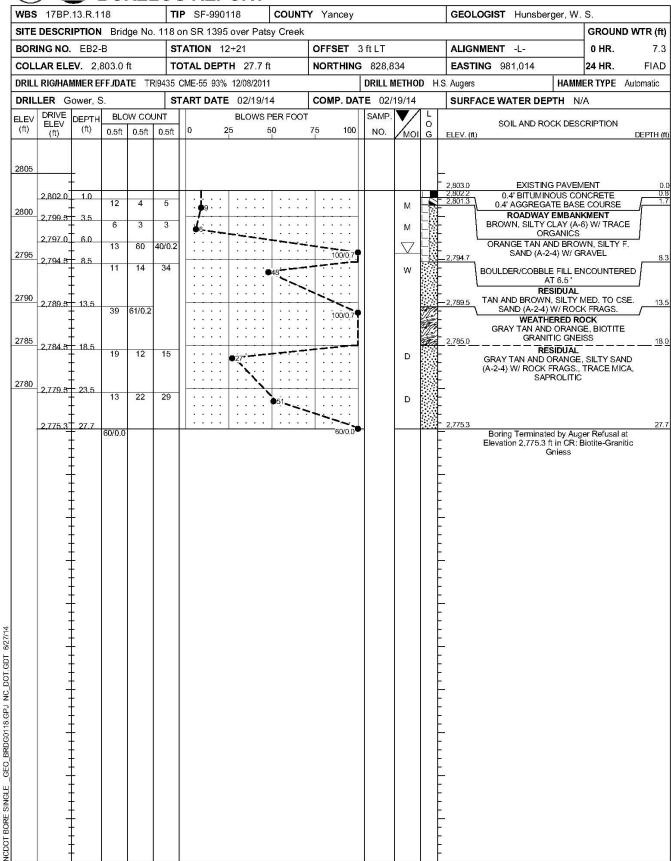
NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

TIP SF-990118 **COUNTY** Yancey WBS 17BP.13.R.118 GEOLOGIST Hunsberger, W. S. **GROUND WTR (ft)** SITE DESCRIPTION Bridge No. 118 on SR 1395 over Patsy Creek BORING NO. EB1-B OFFSET 3 ft LT ALIGNMENT -L-0 HR. STATION 11+71 6.3 **EASTING** 980,969 **NORTHING** 828,854 COLLAR ELEV. 2,804.0 ft TOTAL DEPTH 18.5 ft 24 HR. FIAD DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 93% 12/08/2011 DRILL METHOD H.S. Augers HAMMER TYPE Automatic DRILLER Gower, S. **START DATE** 02/19/14 COMP. DATE 02/19/14 SURFACE WATER DEPTH N/A DRIVE. **BLOW COUNT** SAMP. DEPTH 0 SOIL AND ROCK DESCRIPTION **ELEV** (ft) (ft) 100 0.5ft 0.5ft 0.5ft NO. ELEV. (ft) DEPTH (ft) 2805 EXISTING PAVEMENT 2,804.0 0.4' AGGREGATE BASE COURSE 2,803.0 1.0 D ROADWAY EMBANKMENT , BROWN, F. SANDY SILT (A-4) W/TRACE / MICA AND TRACE ORGANICS , 2.800.5 35 2800 D 2,798.0 6.0 BROWN GRAY AND ORANGE, SILTY 18 SAND (A-2-4) W/ GRAVEL

RESIDUAL

BROWN, SILTY MED. TO CSE. SAND W 2,795.5 2795 27 Sat. (A-2-4) W/ ROCK FRAGS. 2790 2,790.5 15 16 W 18.5 2.785.5 18.5 60/0.0 Boring Terminated by Auger Refusal at Elevation 2,785.5 ft in CR: Biotite-Granitic BRDG0118.GPJ NC DOT.GDT GEO SINGLE





STATE	STATE PROJECT REFERENCE NO.	NO.	超出
N.C.	17BP.13.R.145	1	11

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO	17BP.13.R.145	_ F.A. PROJ. <u>SF-990036</u>
COUNTY YANCEY		
PROJECT DESCRIPTION	BRIDGE NO. 036 ON	SR 1317 OVER
BRUSH CREEK		

CONT	ENTS	PERSONNEL
<u>SHEET</u>	DESCRIPTION	NORVILLE, C. V.
Î	TITLE SHEET	HAMM, J. R.
2-2A	NCDOT DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION SOIL AND ROCK LEGEND, TERMS, SYMBOLS AND ABBREVIATIONS	HUNSBERGER, W. S.
3	FOUNDATION RECOMMENDATIONS	TRICON EVE
4	PLAN NOTES SHEET	TRIGON EXP
5	PILE PAY ITEMS	
6	SITE PLAN	·
7-10	BORING LOGS	(-
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		4 <u> </u>
		INVESTIGATED BY HUNSBERGER, W. S.
		CHECKED BY NORVILLE, C. V.
		SUBMITTED BY FALCON ENG
		DATE OCTOBER 2014

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANMING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES, THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANMING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES, THE SUBSURFACE PLANS AND REPORTS, NOT THE PURPOSE OF STUDY, PLANMING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES, THE SUBSURFACE PLANS AND REPORTS, NOT THE PORT DESIGN OF SOURCE, SOURCE OF SOURCE PLANS AND REPORT OF THE CONTRACT.

CENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND THE IN STU GH-PLACE TEST DATA CAN BE RELED ON THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN STU GH-PLACE TEST DATA CAN BE RELED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OSSERVED WASTER LEVELS OR SOIL MOSTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION THESE WATER LEVELS OR SOIL MOSTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATE FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETALS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETALS ARE DIFFERENT, FOR BIDDING AND CONSTRUCTION PLEMPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT, THE DEPARTMENT DOES NOT MARRIANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPERTATIONS ADDE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY INNELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT, THE CONTRACTOR SHALL HAVE NO CLAM FOR AUDITIONAL COMPANSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED ON THE SITE DEFERRING FROM THOSE INDICATED IN THE SUBSURFACE INVESTIGATION.

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

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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DRAWN BY: HUNSBERGER, W. S.

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N. 100 April 1972				PLASTICI	45 ST 35 ST 35 ST 2	0.285		DRY ST				E-45C	ᅵ片	TUNGCARBIDE		📙 "			
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				1277-0	COLOF	999								TRICONE	TUNGCARB.		HAND AUG		
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MODIFIER	rs such a	S LIGH	IT, DARK,	STREAKED,	ETC. AR	e used	TO DESC	RIBE APPEA	RANCE.		U _			S=			renc art	-1 (E)	

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.145	2A

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

				DESCRIPTION		TERMS AND DEFINITIONS				
ROCK LINE	INDICAT	TES THE LEVEL	. AT WHICH NON-C	T IF TESTED, WOULD YIELD SPT RE COASTAL PLAIN MATERIAL WOULD YI SAMPLER EQUAL TO OR LESS THAN	ELD SPT REFUSAL.	ALLUYIUM (ALLUY.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.				
	ASTAL P	LAIN MATERIAL		N BETWEEN SOIL AND ROCK IS OF		<u>ADUIFER</u> - A WATER BEARING FORMATION OR STRATA, <u>ARENACEOUS</u> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.				
ROCK MATE			DIVIDED AS FOLL			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.				
Weathered Rock (WR)			NON-COASTAL PL BLOWS PER FOO	AIN MATERIAL THAT WOULD YIELD T IF TESTED.	SPT N VALUES > 100	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL				
CRYSTALLINE ROCK (CR)	S.		WOULD YIELD SP GNEISS, GABBRO,		INCLUDES GRANITE,	AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.				
NON-CRYSTALL ROCK (NCR)	LINE		SEDIMENTARY RO	GRAIN METAMORPHIC AND NON-COA CK THAT WOULD YEILD SPT REFUS ITE, SLATE, SANDSTONE, ETC.		COLLUYUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY CRAYITY ON SLOPE OR AT BOTTOM OF SLOPE.				
COASTAL PLAT SEDIMENTARY (CP)	N ROCK		COASTAL PLAIN	SEDIMENTS CEMENTED INTO ROCK, E OCK TYPE INCLUDES LIMESTONE, SA		CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUM AND EXPRESSED AS A PERCENTAGE.				
				THERING		<u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.				
FRESH		RESH, CRYSTAL		DINTS MAY SHOW SLIGHT STAINING.	ROCK RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.				
VERY SLIGHT	ROCK C	GENERALLY FRE	SH, JOINTS STAIN KEN SPECIMEN FAC	ED, SOME JOINTS MAY SHOW THIN (E SHINE BRIGHTLY, ROCK RINGS U		DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.				
SLIGHT	ROCK 0		SH, JOINTS STAIN	ED AND DISCOLORATION EXTENDS I		FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.				
(SL1.)				AY, IN GRANITOID ROCKS SOME OCC CRYSTALLINE ROCKS RING UNDER		FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.				
MODERATE (MOD.)				DISCOLORATION AND WEATHERING E E DULL AND DISCOLORED, SOME SHI		FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.				
	WITH F	RESH ROCK.		D SHOWS SIGNIFICANT LOSS OF ST		<u>FLOOD PLAIN (FP)</u> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.				
MODERATELY SEVERE (MOD. SEV.)	AND DI	SCOLORED AND IN BE EXCAVAT	A MAJORITY SHO	OR STAINED, IN GRANITOID ROCKS W KAOLINIZATION, ROCK SHOWS SE' GIST'S PICK, ROCK GIVES 'CLUNK'!	ÆRE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.				
SEVERE			<u>ELD SPT REFUSAL</u> IARTZ DISCOLOBED	OR STAINED ROCK FABRIC CLEAR	AND EVIDENT BUT BEDUCED	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.				
(SEV.)	IN STR	ENGTH TO STR	ONG SOIL. IN GRA	NITOID ROCKS ALL FELDSPARS ARE		LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.				
	IF TES	<i>TED, YIELDS S</i> ICK EXCEPT QU	<i>PT N VALUES > 16</i> JARTZ DISCOLORED	<u>88 BPF</u> OR STAINED. ROCK FABRIC ELEME		LENS - A BODY OF SUIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTILED INDIJ: PREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTILING IN SOILS USUALLY INDICATES POOR REARTION AND LACK OF GOOD DRAIMAGE.				
(V SEV.)	REMAIN	ING. SAPROLIT	E IS AN EXAMPLE	O SOIL STATUS, WITH ONLY FRAGME OF ROCK WEATHERED TO A DEGRE KIC REMAIN. <i>IF TESTED, YIELDS S</i>	E SUCH THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.				
COMPLETE				NOT DISCERNIBLE, OR DISCERNIBLE MAY BE PRESENT AS DIKES OR STR		RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE MEATHERING OF ROCK.				
		N EXAMPLE.	A CONTRACTOR OF THE STATE OF TH	HARDNESS	morro, or north 10	ROCK BUALITY DESIGNATION GROOP 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 AN EXPRESSED AS A PERCENTAGE.				
VERY HARD	CANNO	T BE SCRATCH		SHARP PICK, BREAKING OF HAND SI	PECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE				
HARD	CAN B	E SCRATCHED		BIST'S PICK. CONLY WITH DIFFICULTY. HARD HA	MMER BLOWS REQUIRED	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				
MODERATELY HARD	CAN E		BY KNIFE OR PICE	C. GOUGES OR GROOVES TO 0.25 IN LOGIST'S PICK. HAND SPECIMENS CO		TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. <u>SLICKENSIDE</u> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT DR				
MEDIUM	BY MO	DERATE BLOWS	S.	CHES DEEP BY FIRM PRESSURE OF		SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF				
HARD	CAN E		IN SMALL CHIPS	TO PEICES 1 INCH MAXIMUM SIZE E		A 140 LB HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH DUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 8.1 FOOT PER 60 BLOWS.				
SOFT	FROM	CHIPS TO SEV		BY KNIFE OR PICK, CAN BE EXCAY. SIZE BY MODERATE BLOWS OF A PI RESSURE.		STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.				
VERY SOFT	OR MO	RE IN THICKNE		EXCAVATED READILY WITH POINT O		STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY TH TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.				
FF	FINGE	IRE SPAC	ING	BEDDII	NG	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.				
IERM			ACING	TERM VERY THICKLY BEDDED	THICKNESS > 4 FEET	BENCH MARK:				
VERY WIDE		3 TO 18		THICKLY BEDDED THINLY BEDDED	1.5 - 4 FEET 0.16 - 1.5 FEET	ELEVATION: FT.				
MODERATE CLOSE		6.16 TO	1 FEET	VERY THINLY BEDDED THICKLY LAMINATED	9.03 - 0.16 FEET 0.008 - 0.03 FEET	NOTES:				
VERY CLO	SE	LESS TH	HAN Ø16 FEET	THINLY LAMINATED	(0.008 FEET	F.I.A.D FILLED IMMEDIATELY AFTER DRILLING				
FOR SEDIMENT	ARY ROO	CKS, INDURATIO		URATION NG OF THE MATERIAL BY CEMENTI	NG, HEAT, PRESSURE, ETC.					
	IABLE	-	RUBBING	WITH FINGER FREES NUMEROUS GR BLOW BY HAMMER DISINTEGRATES !	AINSI					
мос	DERATEL	Y INDURATED		AN BE SEPARATED FROM SAMPLE TEASILY WHEN HIT WITH HAMMER.	WITH STEEL PROBE;					
IND	JURATED			ARE DIFFICULT TO SEPARATE WITH T TO BREAK WITH HAMMER.	STEEL PROBE;					
ЕХТ	REMELY	INDURATED		AMMER BLOWS REQUIRED TO BREAK BREAKS ACROSS GRAINS.	SAMPLE					

FOUNDATION RECOMMENDATIONS

WBS # 17BP.14.R.145

T.I.P. NO. SF-990036

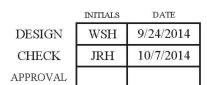
COUNTY Yancey

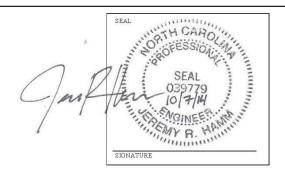
STATION 12+64.70 -L-

DESCRIPTION Bridge No. 36 on SR 1317

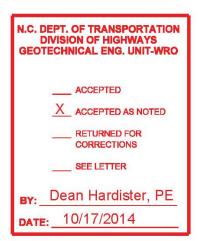
over Brush Creek

SHEET 3





	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
END BENT NO. 1	12+47.20 -L-	Cap on HP 12x53 Steel Piles	65 tons/pile	Average Bottom of Cap Elev. = 2241.6 ± ft Minimum Tip Elevation = 2227 ft 20 Average Estimated Pile Length = 15 ft Number of Vertical Piles = 5 Pile Spacing = 7 feet 6 inches
END BENT NO. 2	12+82.20 -L-	Cap on HP 12x53 Steel Piles	65 tons/pile	Average Bottom of Cap Elev. = 2241.1 ± ft Minimum Tip Elevation = 2226 ft Average Estimated Pile Length = 20 ft Number of Vertical Piles = 5 Pile Spacing = 7 feet 6 inches



TIP # SF-990036 County Yancey

FOUNDATION RECOMMENDATION NOTES ON PLANS

- 1. FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 2. PILES AT END BENTS NO. 1 & 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 65 TONS PER PILE.
- 3. DRIVE PILES AT END BENTS NO. 1 & 2 TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.
- 4. INSTALL PILES AT END BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 2227 FT.
- 5. INSTALL PILES AT END BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 2226 FT.
- 6. PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 2227 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
- 7. FILE EXCAVATION IS REQUIRED TO INSTALL PILES AT END BENT NO. 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 2226 FT. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.
 - 4 8. CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1 AND END BENT NO. 2. FILL HOLES WITH EXCAVATABLE FLOWABLE FILL ABOVE THE TOP OF ROCK.

FOUNDATION RECOMMENDATION SPECIAL NOTES ON PLANS

- 1. PZ27 SHEET PILES ARE TO BE DRIVEN IN FRONT (STREAM SIDE) OF HP12X53 PILES AT END BENTS NO. 1 & 2 AS SHOWN ON PLANS.
- 2. STEEL SHEET PILES SHOULD BE DRIVEN TO REFUSAL BELOW ELEVATION 2236 FT.
- 3. THE SCOUR CRITICAL ELEVATION FOR END BENTS NO. 1 & 2 IS THE SHEET PILE TIP ELEVATION. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

FOUNDATION RECOMMENDATION COMMENTS

- 1. Bridge end bent slopes of 1.5:1 (H:V) are ok with slope protection.
- 2. Bridge approach fills for subregional tier bridges are required for both end bents (in accordance with 2012 Roadway Standard Drawing No. 422.11).
- 3. The average factored axial load at End Bent No. 1 is 63 tons per pile.
- 4. The average factored axial load at End Bent No. 2 is 63 tons per pile.
- 5. The sheet pile to cap connection should be designed for an unfactored shear force due to horizontal earth pressure of 2 kips per linear foot along the abutment wa

AND WITH A PENETRATION OF AT LEAST 5 FT INTO ROCK AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

N.C. DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENG. UNIT-WRO

ACCEPTED

ACCEPTED AS NOTED

RETURNED FOR CORRECTIONS

SEE LETTER

BY: Dean Hardister, PE

DATE: 10/17/2014

PILE PAY ITEMS

(Revised 8/15/12)

TIP NO. SF-990036 COUNTY Yancey STATION 12+64.70 -L- DESCRIPTION Bridge No. 36 on SR 1317 ACCEPTED ACC	WBS ELEMENT		17BP.14.R.14	15			DATE	9/24/2014
DESCRIPTION Bridge No. 36 on SR 1317 Over Brush Creek NUMBER OF BENTS WITH PILES NUMBER OF PILES PER BENT NUMBER OF PILES PER END BENT NUMBER OF PILES PER END BENT NUMBER OF PILES PER END BENT NUMBER OF PILES PER END BENT Steel Pile Pile Pile Pile Pile Pile Pile P	TIP NO.		SF-990036		•	DESIG	NED BY	WSH
DESCRIPTION Bridge No. 36 on SR 1317 X ACCEPTED X A	COUNTY		Yancey		•	e Prince	PT-OF TRA	NSPORTATION
DESCRIPTION Bridge No. 36 on SR 1317 Over Brush Creek NUMBER OF BENTS WITH PILES NUMBER OF PILES PER BENT NUMBER OF END BENTS WITH PILES NUMBER OF PILES PER END BENT NUMBER OF PILES PER END BENT Steel Pile Pipe Pile Pipe Pile Pipe Pile Predrilling Pile Pre	STATION		12+64.70 -L	-		GEOTI	ECHNICAL E	NG. UNIT-WRO
NUMBER OF BENTS WITH PILES NUMBER OF PILES PER BENT NUMBER OF PILES PER END BENT NUMBER OF PILES PER END BENT Steel Pile Pile Pile Pile Pile Pile Predrilling For Piles Redrives Redrives For Piles Redrives For Piles For Piles Pind Bent # (yes/no) (yes/no/maybe) Pind Bent # (yes/no)	DEGCO IDEION	8		D '1- N- 06	CD 1015		ACCEPT	ED
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NUMBER OF END BENTS WITH PILES NUMBER OF PILES PER END BENT PILE PAY ITEM QUANTITIES Steel Pile Pipe Pile Pine Plates For Piles For Piles Redrives For Piles Redrives For Piles For Pile	NUMBE	ER OF BEN	NTS WITH PILES	_	.]		No. of the Control of	Composition
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Steel Pipe Pile Predrilling Pile (per linear ft) Excavation (per linear ft) PDA Bent # or End Bent # or End Bent Mo. 1 (yes/no) (yes/no/maybe) (per linear ft) (per each) Soil Soil Testing (per each) End Bent No. 1 no 37 36 38 38 39 End Bent No. 2 no 1 </td <td></td> <td></td> <td>p.</td> <td>ILE PAY ITEM</td> <td>OHANTIT</td> <td>IRS</td> <td></td> <td>500</td>			p.	ILE PAY ITEM	OHANTIT	IRS		500
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	End Bent # End Bent No. 1	Pile Points (yes/no) no	Pipe Pile Plates	Predrilling For Piles	Pile Redrives (per each)	Exca (per l In Soil	nvation inear ft) Not In Soil	Testing
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Notes:

Blanks or "no" represent quantity of zero.

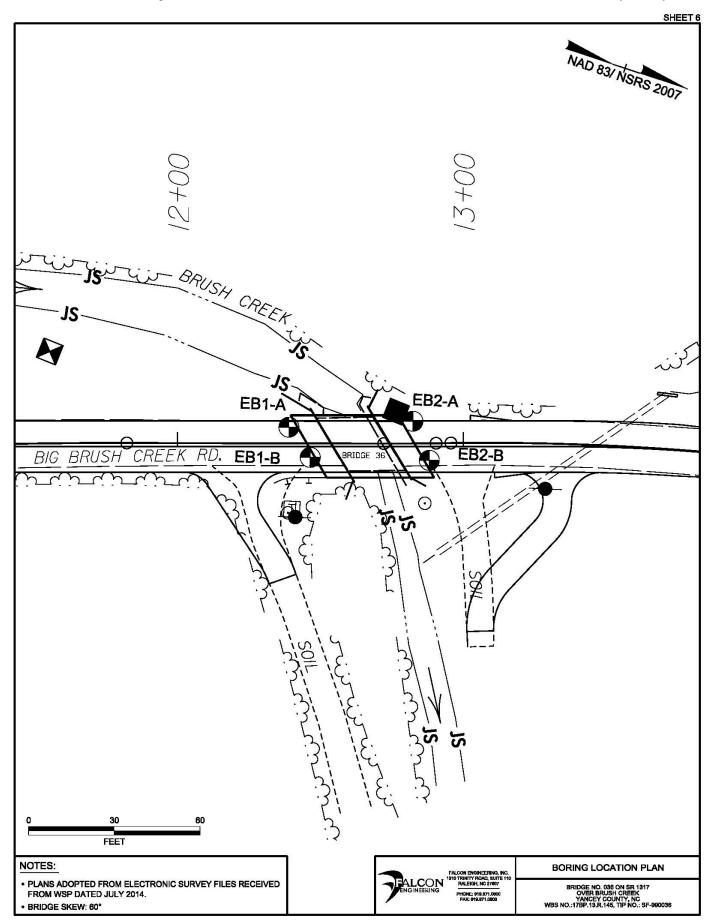
If steel pile points are required, calculate quantity of "Steel Pile Points" as equal to the number of steel piles.

If pipe pile plates are or may be required, calculate the quantity of "Pipe Pile Plates" as equal to the number of pipe piles.

Show quantity of "PDA Testing" on the plans as total only.

If quantity of "PDA Testing" is 3 or less, reference "Pile Driving Criteria" provision in PDA notes on plans and include "Pile Driving Criteria" provision in the contract.

^{*} Pile Excavation quantities shown should be included as a contigency only.



NCDOT GEOTECHNICAL ENGINEERING UNIT

SHEET 7

WBS	17BP.13.R.				F SF-990036	COUNT	Y Yancey				GEOLOGIST Hunsberger, W.	S.
SITE	DESCRIPTIO	N Brid	dge No		n SR 1317 over Brush	Creek	(2)					GROUND WTR (ft
BOR	ING NO. EB1	I-A	200	S	TATION 12+39		OFFSET 7	ft LT			ALIGNMENT -L-	0 HR. 7.6
COL	LAR ELEV. 2	,247.0	ft	т	OTAL DEPTH 11.4 f		NORTHING	832,1	72		EASTING 1,043,600	24 HR . FIAE
			- Andrew - Allere	RI9435	CME-55 93% 12/08/2011			DRILL N	ЛЕТНО	DН	I.S. Augers HAMMI	ER TYPE Automatic
DRIL	LER Gower,	S.		S	TART DATE 02/19/1	4	COMP. DA	Γ E 02/	19/14		SURFACE WATER DEPTH N/	A
ELEV (ft)	DRIVE ELEV (ft) DEPT (ft)		0.5ft	UNT 0.5ft		PER FOOT	75 100	SAMP. NO.	MOI	L 0 G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION DEPTH (
2250	2,246.0 1.0	3	4	5	9				D		2,247.0 EXISTING PAVEM 2,246.0 0.5' BITUMINOUS CON 0.5' AGGREGATE BASE	COURSE 1
	2,243.5 3.5	4	6	19							- ROADWAY EMBANI - BROWN GRAY AND TAN,	
1202001	2,241.0 6.0	162	8300	52530	25				D	- ::	2,241.5 (A-2-4) W/ GRAVEL AND T	
2240	2,238.5 8.5	2	1	WOH	• 1 5 				∇		2,239.0 BROWN, SANDY SILT (A-4	W/TRACE 7
	2,230.5	13	13	9	22				М		MICA GRAY, F. SANDY CLAY (A-	7) W/ TRACE
	2,235.6 11.4	60/0.0					60/0.0					
	#										-	
	#										Boring Terminated by Aug Elevation 2,235.6 ft on CR: M	
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NCDOT GEOTECHNICAL ENGINEERING UNIT

SHEET 8

