456 B E REN FE REI **CONTENTS**

DESCRIPTION TITLE SHEET

LEGEND (SOIL & ROCK)

SITE PLAN

PROFILE(S) BORE LOG(S)

SHEET NO.

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841 3 IE

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY JONES PROJECT DESCRIPTION BRIDGE NO. 6 ON SR 1301 (PINE ST.) OVER CHINQUAPIN BRANCH

STATE PROJECT REFERENCE NO. B-45636

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 SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNICS OR BETWEEN SAMPLED STRATA WITHIN THE BORCHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD, THE OBSERVED 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 MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MICHAELS PREFINE THE ACCORDING TO CLIMATIC CONDITIONS MICHAELS PREFINE THE MATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MICHAELS PREFINE THOU AND WIND AS WELL AS CATUED NOW. INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CALITIONED 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 DES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE THE SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE 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 REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:

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

 2. 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.

PERSONNEL S. WOODS D. RACEY BRIDGER DRILLING ENTERPRISE, Inc.

INVESTIGATED BY F&R, Inc. DRAWN BY __T.T. WALKER

CHECKED BY <u>C.</u> WANG

SUBMITTED BY P. ALTON

DATE AUGUST 2017



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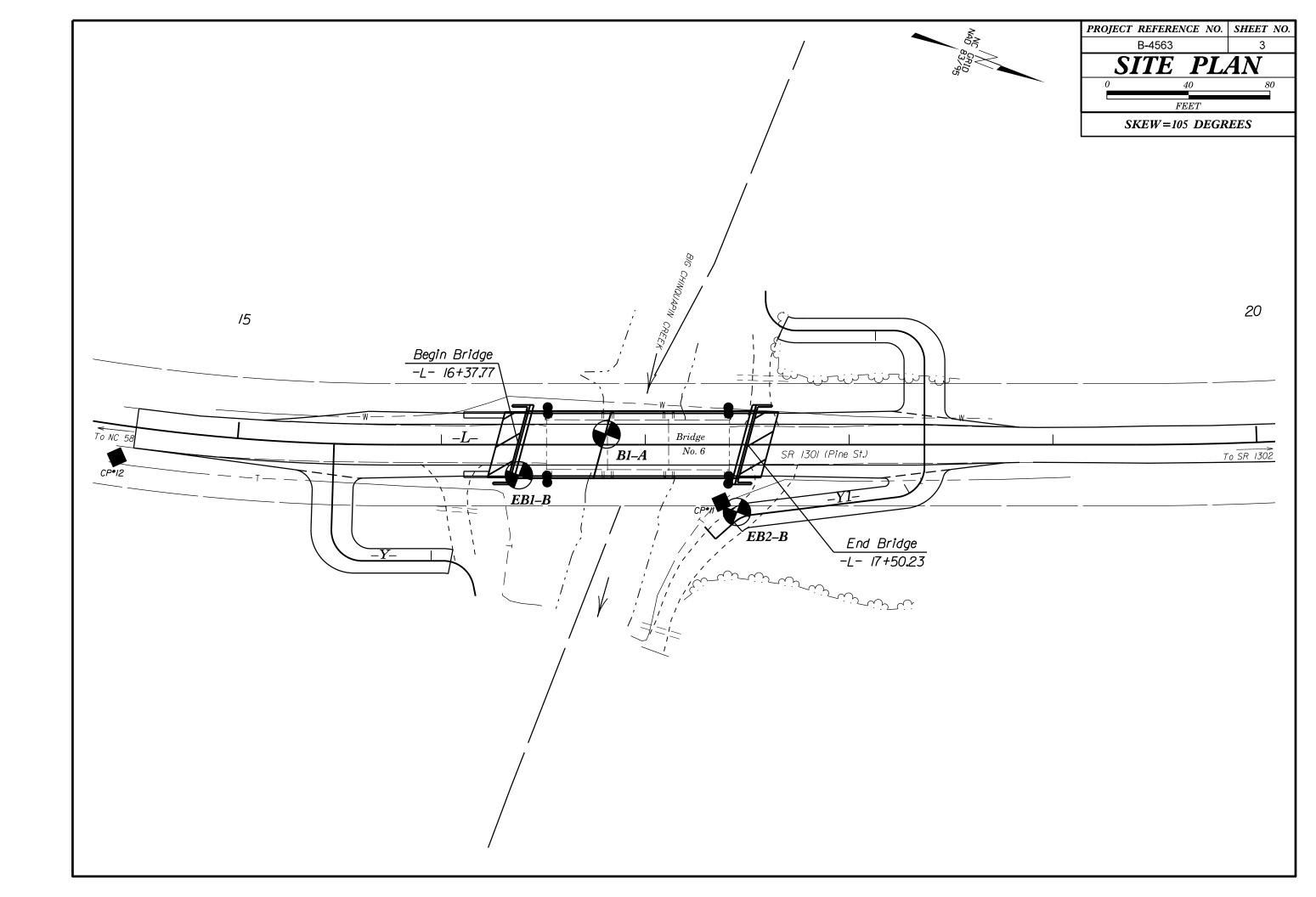
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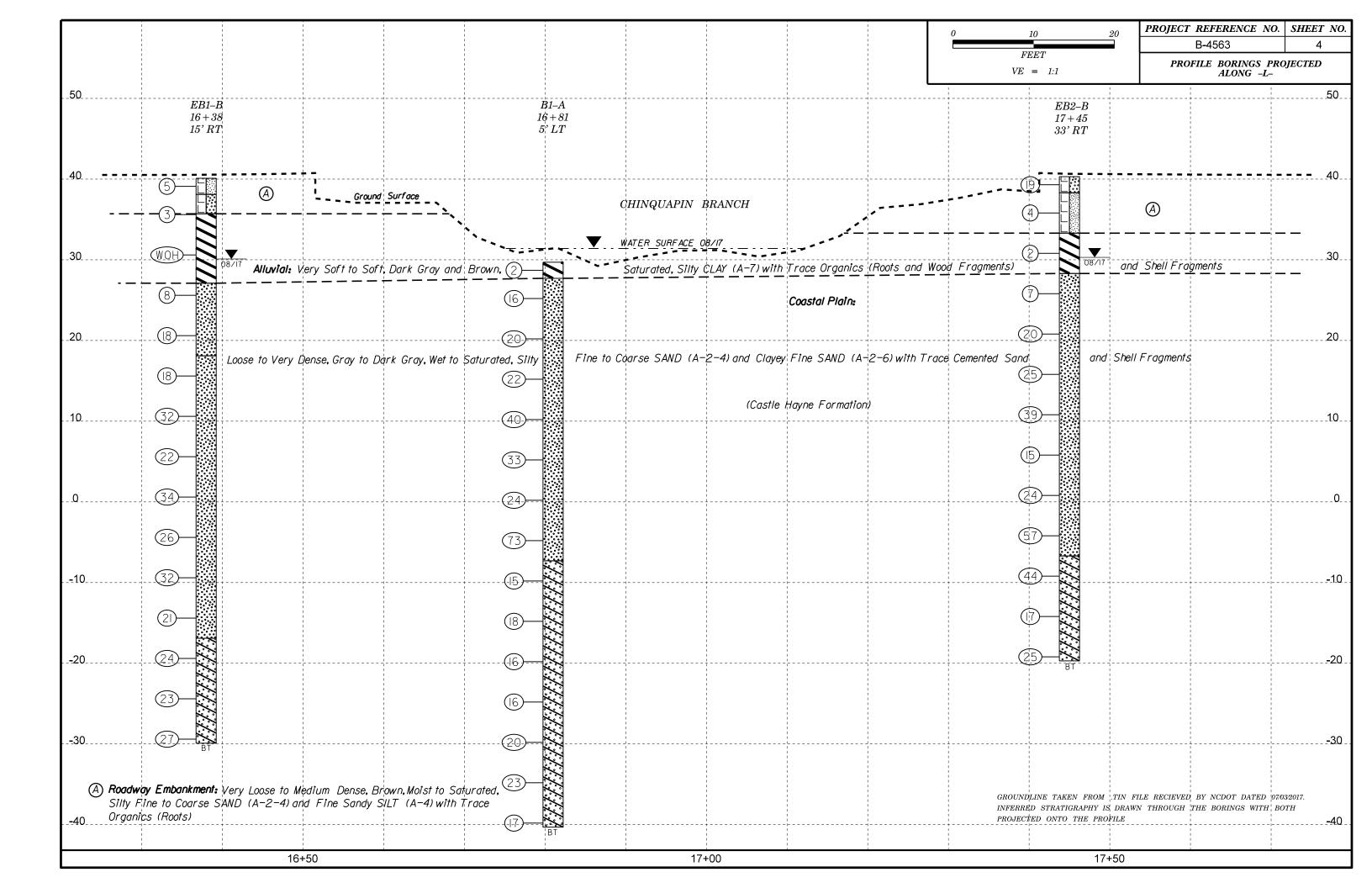
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SUBSURFACE INVESTIGATION

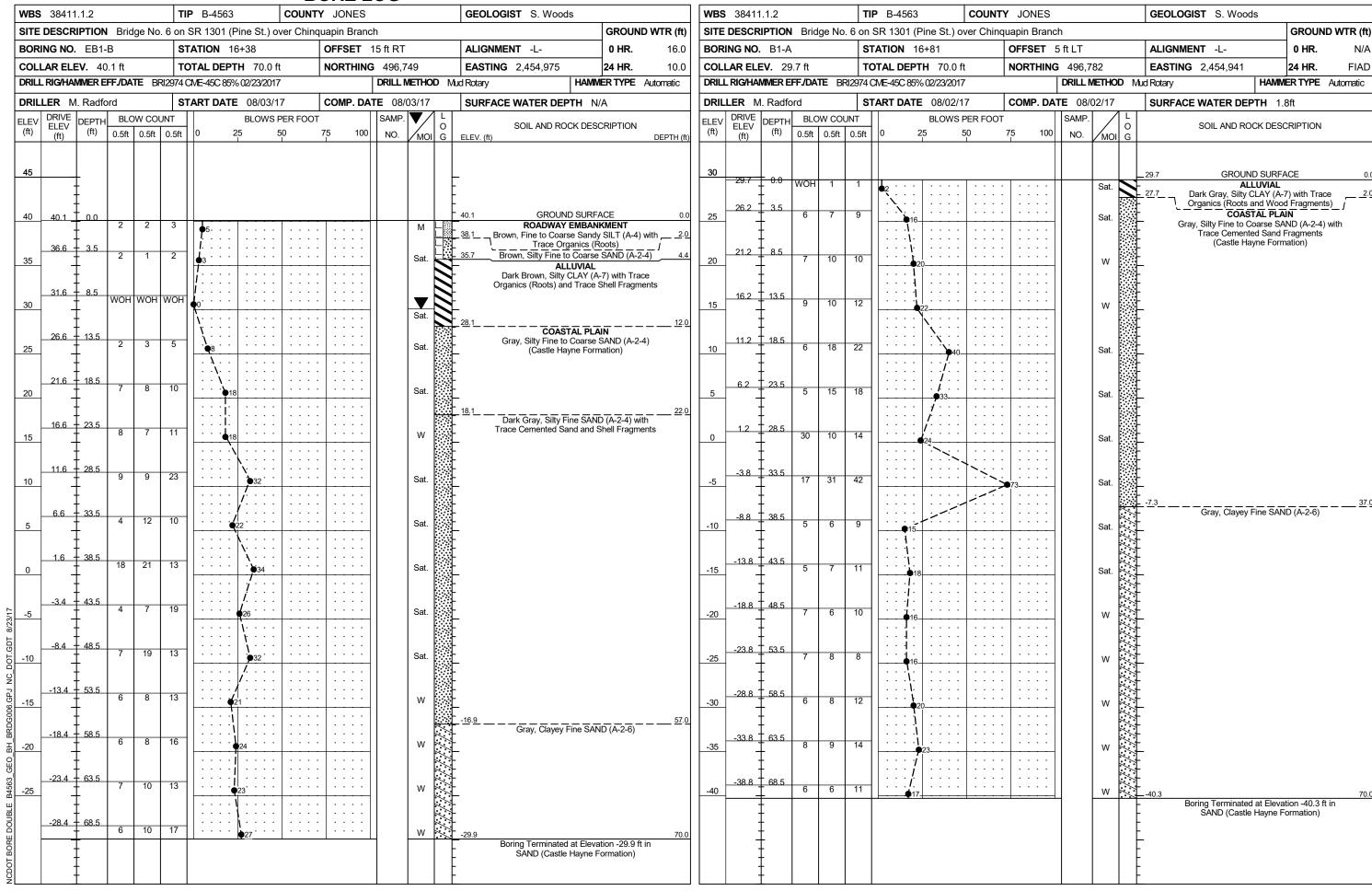
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS					
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.					
BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	<u>UNIFORMLY GRADED</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.					
IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.					
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING					
	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES >						
	MINERALOGICAL COMPOSITION							
CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRTSTALLINE WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	SURFACE.					
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5		UNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.					
CLASS. A-1-0 A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-6 A-3 A-6, A-7		NON-CHTSTALLINE SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM					
SYMBOL 0000 d00000	MODERATELY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	1					
% PASSING SILT-	HIGHLY COMPRESSIBLE LL > 50		BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.					
"10 50 MX GRANV ELMAN STAN STAN PEAT		WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT					
#200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN	ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER						
MATERIAL DASSING TAG			HORIZONTAL.					
PASSING *40	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%		DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE					
PI 6 MX NP 10 MX 11 MN 11 MN 10 MX 11 MN 11 MN 11 MN MODEDATE HIGHLY		OF A CRYSTALLINE NATURE.						
GROUP INDEX U U U 4 MX 8 MX 12 MX 16 MX NU MX AMUUNTS UF SOILS								
OF MATOR GRAVEL AND FINE SILTY OR CLAYEY SILTY CLAYEY MATTER								
	STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN						
HS SUBURHUE FUUN	SPRING OR SEEP							
	MISCELL ANEOLIS SYMPOLS							
DANCE OF STANDARD DANCE OF UNCONFINED		(MOD.SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.					
PRIMARY SOIL TYPE COMPACTINESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH		<u> </u>						
VERY LODGE / 4	1 ╚ ┦ 'cox							
GRANIII AR LOOSE 4 TO 10		TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	<u> </u>					
MATERIAL MEDIUM DENSE 30 TO 50								
	THAN RUADWAY EMBANKMENT	SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK						
	— INFERRED SOIL BOUNDARY — CORE BORING SOUNDING ROD							
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0			<u> </u>					
	A ALLUMIAL COM POUNDARY A PIEZOMETER COT NIVALUE	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE					
	INSTHEEHTION		1					
TEXTURE OR GRAIN SIZE								
	UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION -		SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND					
Part Part								
	Second Continue Co							
	CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL					
			TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.					
- SATURATED - USUALLY LIQUID VERY WET JISTALLY		PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL					
(SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE SL SILT, SILTY ST - SHELBY TUBE							
PLASTIC			TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.					
PANCE / SEMISULIU; REGUIRES DRYING TO	FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK: TBM CP *II: N: 496847. E: 2454952					
(PI) PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE		TERM SPACING TERM THICKNESS						
OM DOTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE		WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: 39.58 FEET					
			NOTES:					
	CH CONTINUOUS ELICUT AUGED	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET						
ATTAIN OPTIMUM MOISTURE	CMF-55		-					
	<u> </u>	DIRDING WITH FINCED EDEER NUMEROUS CRAINS.						
SLIGHTLY PLASTIC 6-15 SLIGHT	I VANE SHEAR TEST □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □							
	■							
		BREAKS EASILY WHEN HIT WITH HAMMER.						
LULUK		INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.						
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	CORE BIT VANE SHEAR TEST	CHARD HAMMED DI ONE DECITIOED TO DREAK CAMPLE.						
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	 	EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14					





GEOTECHNICAL BORING REPORT BORE LOG



GEOTECHNICAL BORING REPORT BORE LOG

SHEET 6

SITE	DESCR		L D.::-1		TII	P B-4563	COUNT	Y JONES				OFOLOGIOT O Missis		
BOR		IPTION	D.::1			VBS38411.1.2TIPB-4563COUNTYJONESGEOLOGISTS. Woods								
	ING NO		Bria	ge No	. 6 on	SR 1301 (Pine St.) over Chinquapin Branch					GROUND WI			
COL	ING NO.	EB2-	В		ST	ATION 17+45		OFFSET 3	33 ft RT			ALIGNMENT -L-	0 HR.	17.0
	LAR ELE	EV . 40).3 ft		TC	OTAL DEPTH 60.0 ft		NORTHING	496,8	56		EASTING 2,454,954	24 HR.	10.0
DRIL	L RIG/HAI	VIMER E	FF./DA	TE B	RI2974 (DME-45C 85% 02/23/2017	•		DRILL N	IETHOD	Mu	ud Rotary HAMI	VIER TYPE	Automatic
DRIL	LER M	l. Radfo	ord		SI	ART DATE 08/02/1	7	COMP. DA	TE 08/0)2/17		SURFACE WATER DEPTH	I/A	
DRIVE DEPTH BLOW COUNT				BLOWS PER FOOT SAMP. L O NO. MOI G E			SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (
45											_	-		
40	40.3	0.0	9	9	10	19	· · · · ·			м -	-	40.3 GROUND SURF	KMENT	0.0
	36.8	3.5									 -	_38.3 Brown, Silty Fine to Coarse with Trace Organics		2-4)
35	30.0 -	3.5	3	2	2	4				W L		Dark Brown, Fine Sandy S Trace Organics (I	SILT (A-4) w	
	31.8	8.5	WOH	1	1						1	ALLUVIAL Dark Gray Fine to Coarse S	Sandy Silty (
30	-	-				\(\frac{\frac{1}{1}}{1} \cdot				Sat.	3	(A-7) with Trace Organ		12.0
25	26.8	13.5	4	3	4	1				Sat.		COASTAL PL Dark Gray, Silty Fine to ((A-2-4) with Trace Cerr	AIN Coarse SAN lented Sand	D
	21.8 -	18.5									_	Fragments (Castle Hayne For	mation)	
20	-	10.5	7	10	10	20				Sat.		-		
15	16.8	23.5	12	12	13	25				W	-			
	11.8 -	28.5										-		
10	-		8	18	21	39				W		-		
5	6.8	33.5	12	6	9	15				W	-	-		
	1.8	38.5		10										
0	-		8	10	14	24				W		-		
-5	-3.2	43.5	12	25	32		57 · ·			W	-	-		
	-8.2	48.5	6	19	25		/: : : : : : : : : : : : : : : : : : :			W %		6.7Dark Gray, Clayey Fine S	SAND (A-2-6	<u>5</u>) — <u>47.0</u>
-10	-	<u> </u>								%%%%	7///	-		
-15	-13.2 - -	53.5	7	6	11	17				w %%%	7////	-		
	-18.2 -	58.5	7	9	16	25				%%%%% W	/ ////	-19.7		60.0
	- - - -	-				, y		,			-	Boring Terminated at Elev SAND (Castle Hayne	ation -19.7 f Formation)	
	-	-										-		
	-										Ė			