CONTENTS SHEET NO.

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REFERENCE

DESCRIPTION TITLE SHEET LEGEND (SOIL & ROCK) SITE PLAN PROFILE

BORE LOGS SITE PHOTOGRAPHS

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

PENDER

COUNTY_ PROJECT DESCRIPTION REPLACE BRIDGE NO. 700015 ON NC 11 OVER CROOKED RUN AT **STATION** 15+55 -L-

599 う 4 **PROJECT:**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5644	1	6

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 REVEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-680. THE SUBSIFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOLL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOREAL SOLL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN 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 SOLL MOISTURE CONDITIONS MICHTED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLL 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 NUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL 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 INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPHION 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 THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR ANN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ON OF OR ANN EXTENSION OF TIME FOR ANY REASON RESULTING FOR THE ACTUAL CONTINIONS FOR ON THOSE THE SUBFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES: I, 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
RUSSEK, S. C.
STUDNICKY, R. T.
MOODY, J. R.
INVESTIGATED BY RUSSEK, S. C.
DRAWN BYFIELDS, W. D.
CHECKED BYRIGGS, Jr., A. F.
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DATE AUGUST 2019
Prepared in the Office of: Description Consulting Engineers and Scientists 2401 BRENTWOOD ROAD, SUITE 107 RALEICH, NORTH CAROLINA 27604 NC REGISTERED ENGINEERING FIRM: F-0669 NC REGISTERED GEOLOGIC FIRM: C-367
SEAL 040231 J. ALEXTIN
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Matthew J. alexan Del 2/2019
SIGNATURE DATE DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

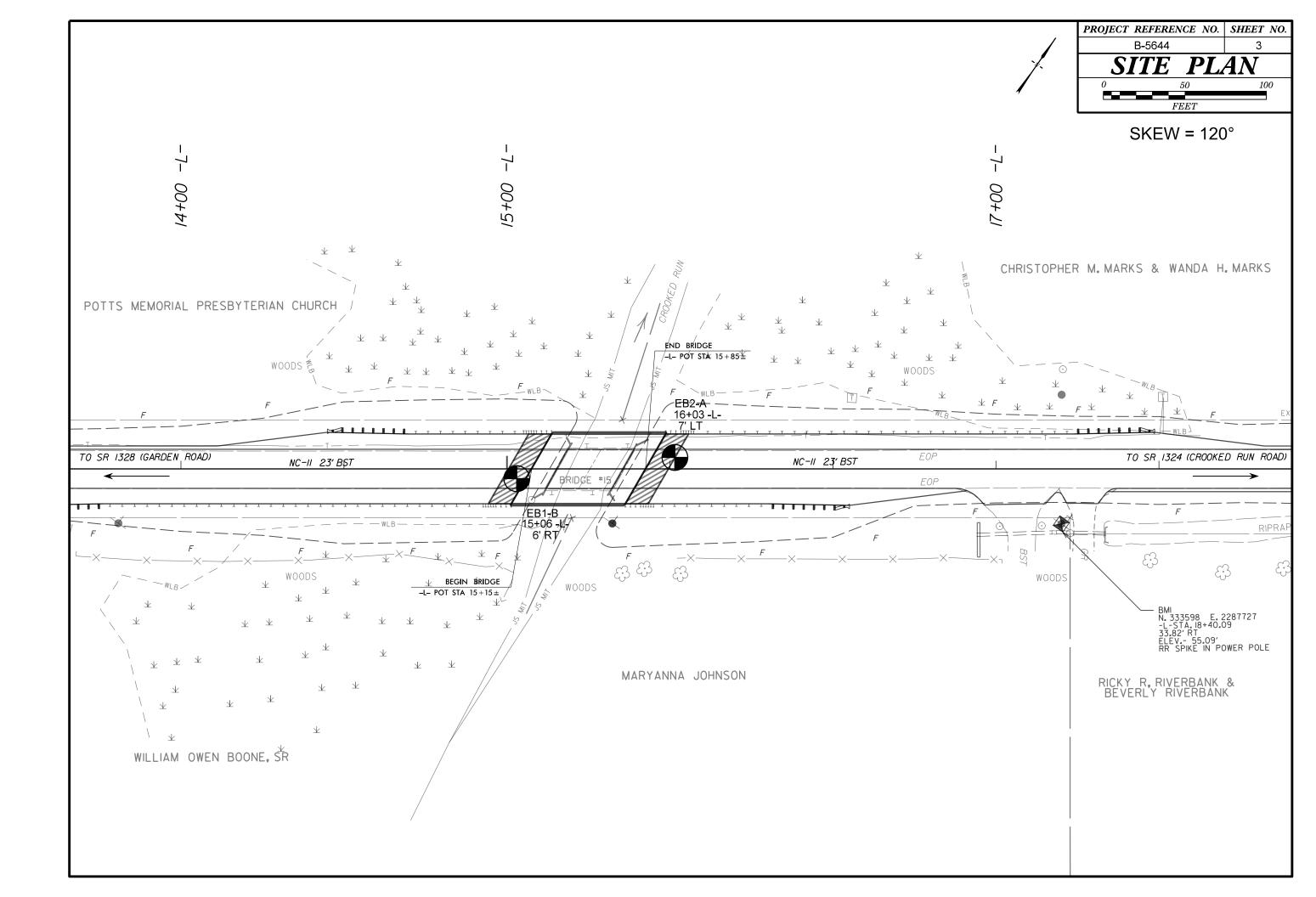
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION						
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND VIELD LESS THAN 100 BLOWS PER FOOI ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING:	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTE ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD VIELD SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK						
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:						
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT						
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR) 100 BLOWS PER FOOT IF TESTED.						
CLASS. (≤ 35%, PASSING * 200) (> 35%, PASSING * 200) UHGANIL MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	CRYSTALLINE ROCK (CR) GNEISS, GABBRO, SCHIST, ETC.						
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-6 A-2-7 A-6 A-7 A-1, A-2 A-4, A-5	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTA						
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR) ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETI COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT						
	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK SANDS SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDS						
■10 50 MX GRANULAR SIL1- MUC								
• 200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK						
MATERIAL PASSING *40 LL – – 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN P1 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN LITTLE OR HIGH	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	HAMMER IF CRYSTALLINE. VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY C (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER H						
	GROUND WATER	OF A CRYSTALLINE NATURE. SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO RO						
USUAL TYPES STONE FRACS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER OF MAJOR CRAVEL, AND CAN CRAVEL AND SAM SON SONS SONS SONS	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING ✓ STATIC WATER LEVEL AFTER <u>24</u> HOURS	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER						
MATERIALS SAND SHIP SHIPE SHIPPE SHIPE SHIPE SHIPE SHIPE SHIPE SHIPE SHIPE SHI	∇ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLA						
AS SUBGRADE EXCELLENT TO GOUD FAIR TO POUR POOR POOR ONSULT	JLE	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH WITH FRESH ROCK.						
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30 CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, IN GRANITOID ROCKS, ALL F SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LI						
CONSISTENCE ON DENSEIVESS		(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND						
PRIMARY SULL TYPE CONSISTENCY PENETRATIUM RESISTENCE CUMPRESSIVE STRENG (N-VALUE) (TONS/FT ²)		IF TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND E (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS A						
GENERALLY LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30 N/A	SOIL SYMBOL	TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</u>						
MATERIAL DENSE 30 TO 50 (NON-COHESIVE) VERY DENSE >50 VERY SOFT <2 <0.25	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER THAN ROADWAY EMBANKMENT CORE BORING • SOUNDING ROD	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS AR SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAMEWITS OF REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT						
GENERALLY SOFT 2 TO 4 0.25 TO 0.5 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0		VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N V</u> COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY						
MATERIAL STIFF 8 T0 15 1 T0 2 (COHESIVE) VERY STIFF 15 T0 30 2 T0 4 HARD > 30 > 4	Internet fock eine Internet fock eine With core Internet fock eine Piezometer Internet fock eine Spit N-value	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS ALSO AN EXAMPLE.						
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS						
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMEN: SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.						
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053 DOW DED COARSE FINE CUARSE FINE FINE <td>SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF</td> <td>HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BI TO DETACH HAND SPECIMEN.</td>	SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BI TO DETACH HAND SPECIMEN.						
BOULDER COBBLE GRAVEL SAND SAND SLT CLAY (BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)		MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE D						
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	BY MODERATE BLOWS. MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE O						
SOIL MOISTURE - CORRELATION OF TERMS	CL CLAY MOD MODERATELY γ - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC γ_{a} - DRY UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD POINT OF A GEOLOGIST'S PICK.						
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTI		SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POIN						
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABL	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCH						
PLASTIC BANGE SEMISOLID; REQUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL. FRACTURE SPACING BEDDING						
	FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING HI HIGHLY V - VERY RATIO	TERM SPACING TERM						
	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED WIDE 3 TO 10 FEET THICKLY BEDDED 1						
OM _ OPTIMUM MOISTURE SUCCESSION SUCCESSION AND A MERICAL PHOLONOMIC AND A MERICAL PHOLONOMICAL PHOLONOMIC	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CME-45C CLAY BITS X AUTOMATIC MANUAL	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.1 CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.0						
- DRY - (D) REQUIRES ADDITIONAL WATER TO		VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.00						
	CME-55 CME-55 B* HOLLOW AUGERS CORE SIZE: CORE SIZE: D-8H	INDURATION						
PLASTICITY PLASTICITY INDEX (PI) DRY STRENGTH	CME-550 HARD FACED FINGER BITS -N	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HE						
NON PLASTIC Ø-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS: GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.						
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST X TRICONE 3% • STEEL TEETH HAND AUGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH ST BREAKS EASILY WHEN HIT WITH HAMMER.						
COLOR	CME-45B TRICONE SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL DIFFICULT TO BREAK WITH HAMMER.						
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	CORE BIT VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE SAMPLE BREAKS ACROSS GRAINS.						

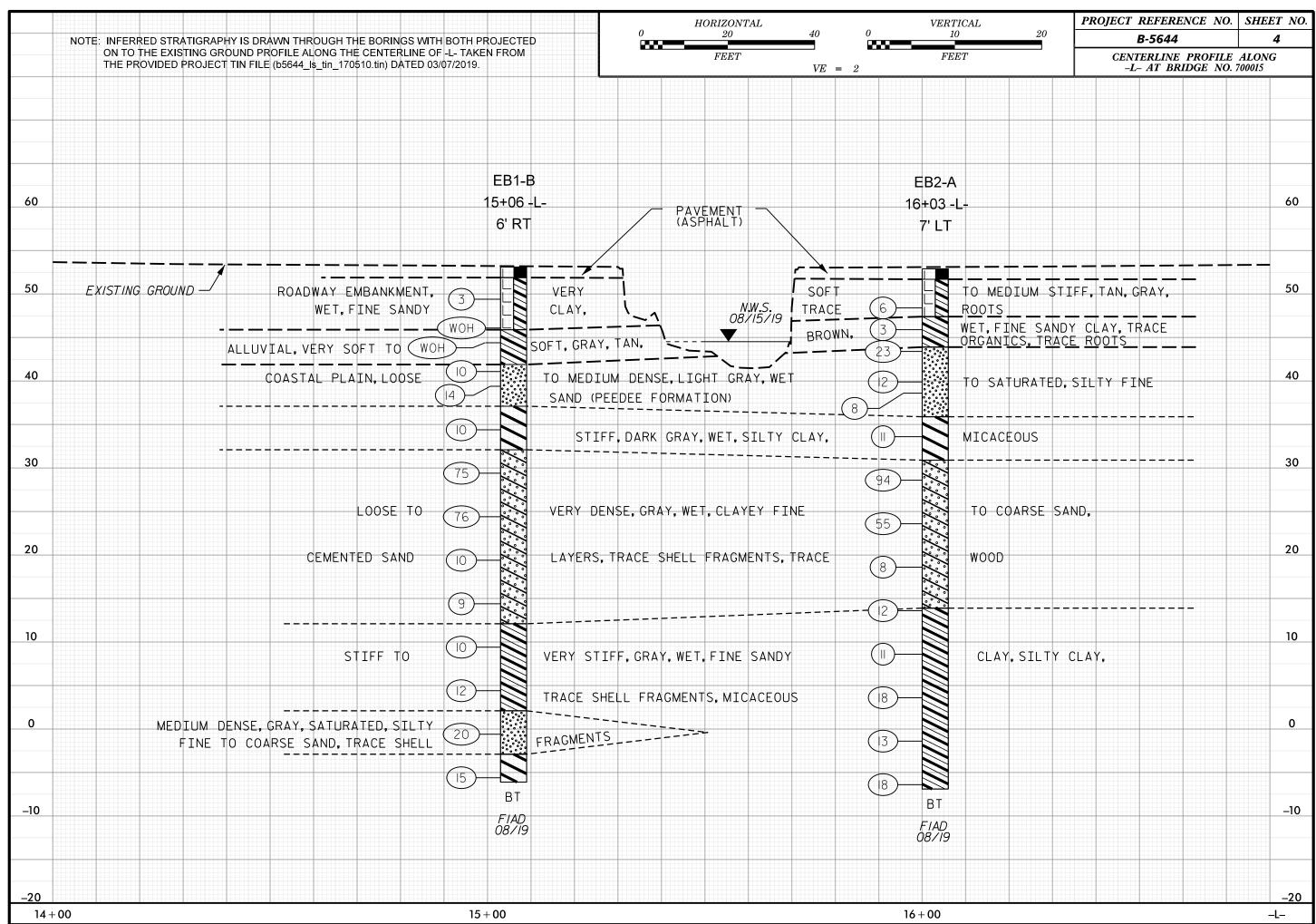
PROJECT REFERENCE NO. B-5644



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ED. AN INFERRED	TERMS AND DEFINITIONS
SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
I FOOT PER 60 IS OFTEN	AQUIFER - A WATER BEARING FORMATION OR STRATA.
13 0. 12.,	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, OR HAVING
F N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH 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 GROUND
CK THAT CLUDES GRANITE,	SURFACE.
	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
AL PLAIN IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
с.	OF SLOPE.
MAY NOT YIELD STONE, CEMENTED	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
STUNE, CEMENTED	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.
	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
OATINGS IF OPEN.	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
AMMER BLOWS IF	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
ICK UP TO IL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
R BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
S. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIG: NAL POSITION AND DISLODGED FROM
Y. ROCK HAS	PARENT MATERIAL.
H AS COMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
OSS OF STRENGTH	FIELD.
WHEN STRUCK.	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
VIDENT BUT	ITS LATERAL EXTENT.
ARE KAOLINIZED	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
RE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
F STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
f only minor Values < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
IN SMALL AND	
5. SAPROLITE IS	ROCK QUALITY DESIGNATION (RQD) - 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.
	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
S REQUIRES	ROCK.
	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
LOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT
EEP CAN BE NETACHED	OR SLIP PLANE.
	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
OR PICK POINT.	A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL
BLOWS OF THE	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
FRAGMENTS IT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL
PIECES 1 INCH	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.
HED READILY BY	
	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	BENCH MARK: BMI: -L-STA. 18+40.09, 33.82' RT, RR SPIKE IN POWER POLE
THICKNESS 4 FEET	N-333,598; E-2,287,727
.5 - 4 FEET	ELEVATION: 55.09 FEET
16 - 1.5 FEET	NOTES:
03 - 0.16 FEET 08 - 0.03 FEET	FIAD - FILLED IMMEDIATELY AFTER DRILLING
0.008 FEET	FIAD - FILLED INNINEDIATELT AFTER DIVILING
AT, PRESSURE, ETC.	
TEEL PROBE:	
PROBE;	
E;	DATE: 8-15-14
	DHTE: 8-13-14





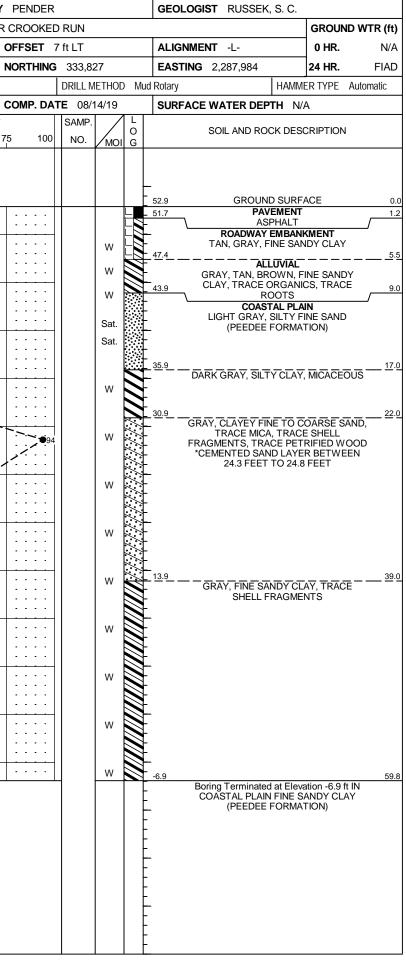


GEOTECHNICAL BORING REPORT

BORE LOG

COLLAR ELEV. 53.1 ft TOTAL DEPTH 59.2 ft NORTHING 333,760 EASTING 2,287,912 24 HR. FIAD COLLAR ELEV. 52.9 ft TOTAL DEPTH 59.8 ft NORTHING 59.8 ft NORTHING 333,760 DRILL RIG/HAMMER EFF./DATE TER1974 CME-45B 85% 02/15/2019 DRILL METHOD Mud Rotary HAMMER TYPE Automatic DRILL RIG/HAMMER EFF./DATE TER1974 CME-45B 85% 02/15/2019 DRILL RIG/HAMMER EFF./DATE TER1974 CME-45B 85% 02/15/2019 DRILL RIG/HAMMER EFF./DATE TER1974 CME-45B 85% 02/15/2019 DRILLER STUDNICKY, R. T. START DATE 08/15/19 COMP. DATE 08/15/19 SURFACE WATER DEPTH N/A DRILLER STUDNICKY, R. T. START DATE 08/14/19 COULAR ELEV. 52.9 ft			gineeree		onnioto						.00															
BORING ND. EPS-1 STATION 15-05 OPERATION <	WBS	45599	9.1.1			TI	IP B-5644	1	COUNT	Y PENDER	1			GE	EOLOGIST RUSSEK, S. C.		WBS	45599	.1.1			TI	P B-5644		COUNT	ΥF
COLLAR ELV. S1.11 TOTAL DEPTH 89.21 MORTHMO 333.700 LASTNO 2287.912 Jail Jail COLLAR ELV. S2.11 COLLAR ELV. S2.11 COLLAR ELV. S2.11 COLLAR ELV. S2.11 MORTHMO 333.700 Lastno 2287.912 Jail Jail COLLAR ELV. S2.11 MORTHMO MORTHMO MARKEN MORTHMO MORTHMO MARKEN MORTHMO MORTHMO MORTHMO MORTHMO MARKEN MUMARENT TOXAND MORTHMO MORTHMO MORTHMO MORTHMO MURAN	SITE	DESCR	IPTION	REP	LACE	BRIDO	GE NO. 70	0015 ON N	C 11 OVE	R CROOKEI	D RUN					GROUND WTR (ft)	SITE	DESCR	IPTION	REPL	ACE	BRIDG	E NO. 700	015 ON N	C 11 OVE	RC
DBL BX: LUM:OP: VT AUTOR DEVENUE	BOR	ing no.	EB1-I	В		S	TATION	15+06		OFFSET	6 ft RT			AL	IGNMENT -L-	0 HR. N/A	N/A BORING NO. EB2-A STATION 16		STATION 16+03			OF				
DelLes STUDNICK'R.T. ETART DATE Delle StUDNICK'R.T. ETART DATE DELLEY DELLEY <thdeley< th=""> <thdeley< th=""> <thdeley< t<="" td=""><td>COL</td><td>LAR EL</td><td>EV. 53</td><td>8.1 ft</td><td></td><td> те</td><td>OTAL DEF</td><td>PTH 59.2 ft</td><td>t</td><td>NORTHING</td><td>333,7</td><td>60</td><td></td><td>EA</td><td>STING 2,287,912</td><td>24 HR. FIAD</td><td>COL</td><td>LAR ELE</td><td>EV. 52</td><td>2.9 ft</td><td></td><td>т</td><td>OTAL DEP</td><td>TH 59.8 ft</td><td>t</td><td>NO</td></thdeley<></thdeley<></thdeley<>	COL	LAR EL	EV. 53	8.1 ft		те	OTAL DEF	PTH 59.2 ft	t	NORTHING	333,7	60		EA	STING 2,287,912	24 HR. FIAD	COL	LAR ELE	EV. 52	2.9 ft		т	OTAL DEP	TH 59.8 ft	t	NO
DEV DMO DMP V L SOL AND ROCK DESCRIPTION BEEN ID DEV	DRILL	_ RIG/HAN	/MER EF	F./DAT	e ter	R1974 C	ME-45B 85%	% 02/15/2019			DRILL N	NETHO	D M	ud Rota	ary HAMM	ER TYPE Automatic	DRILI	_ RIG/HAM	IMER EF	F./DATE	TER	R1974 C	ME-45B 85%	02/15/2019		
(1) (1) (1) (2) (DRIL	LER S	TUDNIC	CKY, R	. Т.	S	TART DAT	E 08/15/1	9	COMP. DA	TE 08/	15/19		รเ	JRFACE WATER DEPTH N/	A	DRIL	LER S	TUDNIC	CKY, R.	. Т.	S		E 08/14/1	9	CC
(1) (1) (1) (2) (ELEV	DRIVE	DEPTH	BLC	W CO	UNT		BLOWS	PER FOOT	Γ	SAMP.	V /					ELEV	DRIVE	DEPTH	BLO	W CO	UNT		BLOWS	PER FOO	T
S0 S04 S2 S2 S34 CHOWN SWOH S3 S0 S4 S2 S3 CHOWN SWOH S3 S34 S2 S4 S2 S3 S4 S2 S4 S3 S4 S2 S3 S4 S2 S3 S4 S3 <td>(ft)</td> <td></td> <td>(ft)</td> <td></td> <td>0.5ft</td> <td>0.5ft</td> <td>0</td> <td>25</td> <td>50</td> <td>75 100</td> <td>NO.</td> <td>мо</td> <td></td> <td>ELE</td> <td></td> <td></td> <td>(ft)</td> <td></td> <td>(ft)</td> <td></td> <td>0.5ft</td> <td>0.5ft</td> <td>0</td> <td>25</td> <td>50</td> <td>75</td>	(ft)		(ft)		0.5ft	0.5ft	0	25	50	75 100	NO.	мо		ELE			(ft)		(ft)		0.5ft	0.5ft	0	25	50	75
S0 S04 S2 S2 S34 CHOWN SWOH S3 S0 S4 S2 S3 CHOWN SWOH S3 S34 S2 S4 S2 S3 S4 S2 S4 S3 S4 S2 S3 S4 S2 S3 S4 S3 <td></td>																										
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00 0.04 2.2 2 1 01 0.04 2.2 1			<u> </u>											-	PAVEMENT			-]			
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46 BAG 20 W GRAY, FRANCE CANDINGAY, TRACE 40 Autor 11 12 7 7 7 40 Autor 12 7 7 7 11 40 Autor 12 7 7 7 11 414 115 2 6 6 2 11 40 Autor 12 7 7 7 11 <td></td> <td></td> <td>Т</td> <td>WOH</td> <td>WOH</td> <td>woн</td> <td></td> <td></td> <td> </td> <td></td> <td></td> <td>w </td> <td>LÈ</td> <td>45.9</td> <td></td> <td>7.2</td> <td></td> <td>46.9</td> <td>6.0</td> <td></td> <td>1</td> <td>2</td> <td></td> <td></td> <td></td> <td>. .</td>			Т	WOH	WOH	woн						w	LÈ	45.9		7.2		46.9	6.0		1	2				. .
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SHEET 5 OF 6

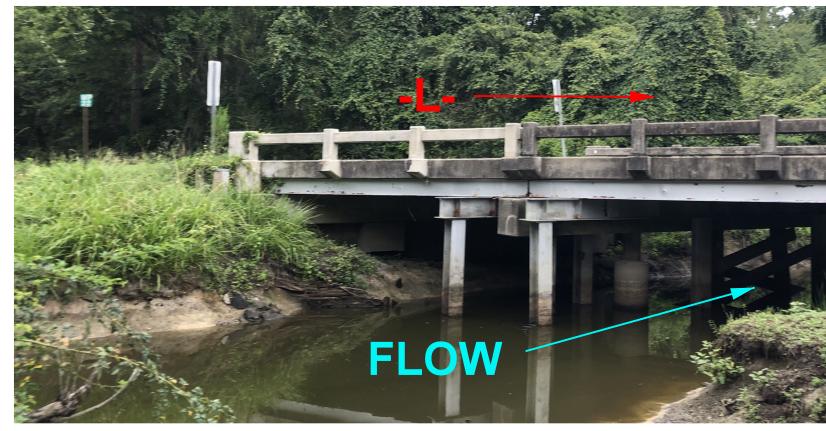


SITE PHOTOGRAPHS

REPLACE BRIDGE NO. 700015 ON NC 11 OVER CROOKED RUN



LOOKING FROM END BENT 2, WEST TOWARD END BENT 1



SOUTH OF BRIDGE, LOOKING DOWNSTREAM

	PROJECT	REFERENCE	<i>NO</i> .	SHEET	<i>NO</i> .
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	4				
	177				
	105				
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