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STATE OF NORTH CAROLINA

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

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## **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY \_VANCE

PROJECT DESCRIPTION REPLACE BRIDGE NO. 15 OVER LITTLE RUIN CREEK ON HORSESHOE BEND **ROAD** (SR 1125)

STATE PROJECT REFERENCE NO. BP5.R131

#### **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 (1991 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 BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BORCHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (INP-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED MATER 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 MOY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR CUJARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS, AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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.

	PERSUNNEL
	TRIGON EXP
INIVESTICATED	BY <i>LANE</i> , <i>R</i> . <i>W</i> .
DRAWN BY	HUNSBERGER, W. S.

CHECKED BY HUNSBERGER, W. S. SUBMITTED BY FALCON ENG.

DATE JANUARY 2023



DOCUMENT NOT CONSIDERED FINAL **UNLESS ALL SIGNATURES COMPLETED** 

REFERENCE

PROJECT REPERENCE NO.

BP5.R131

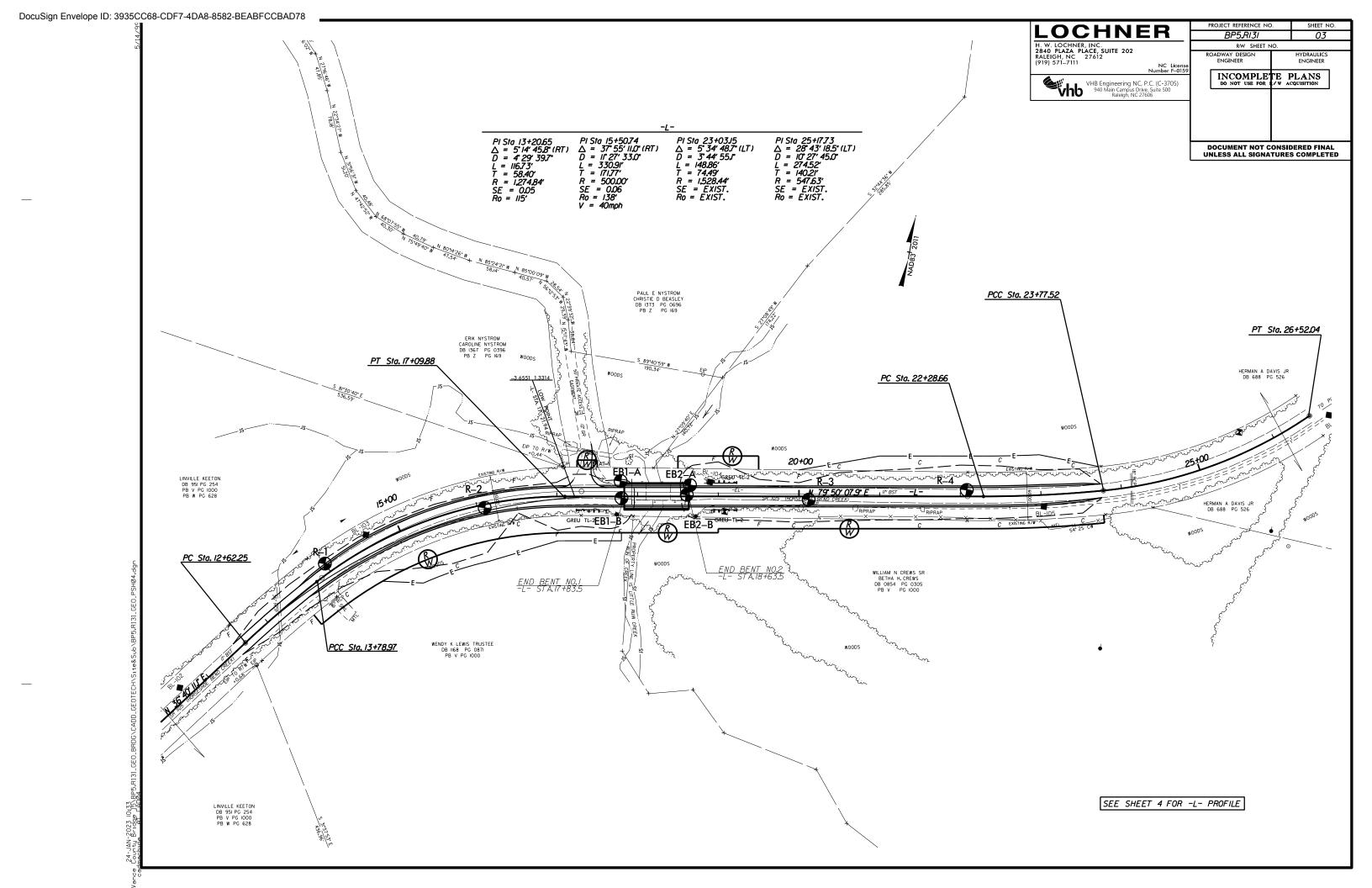
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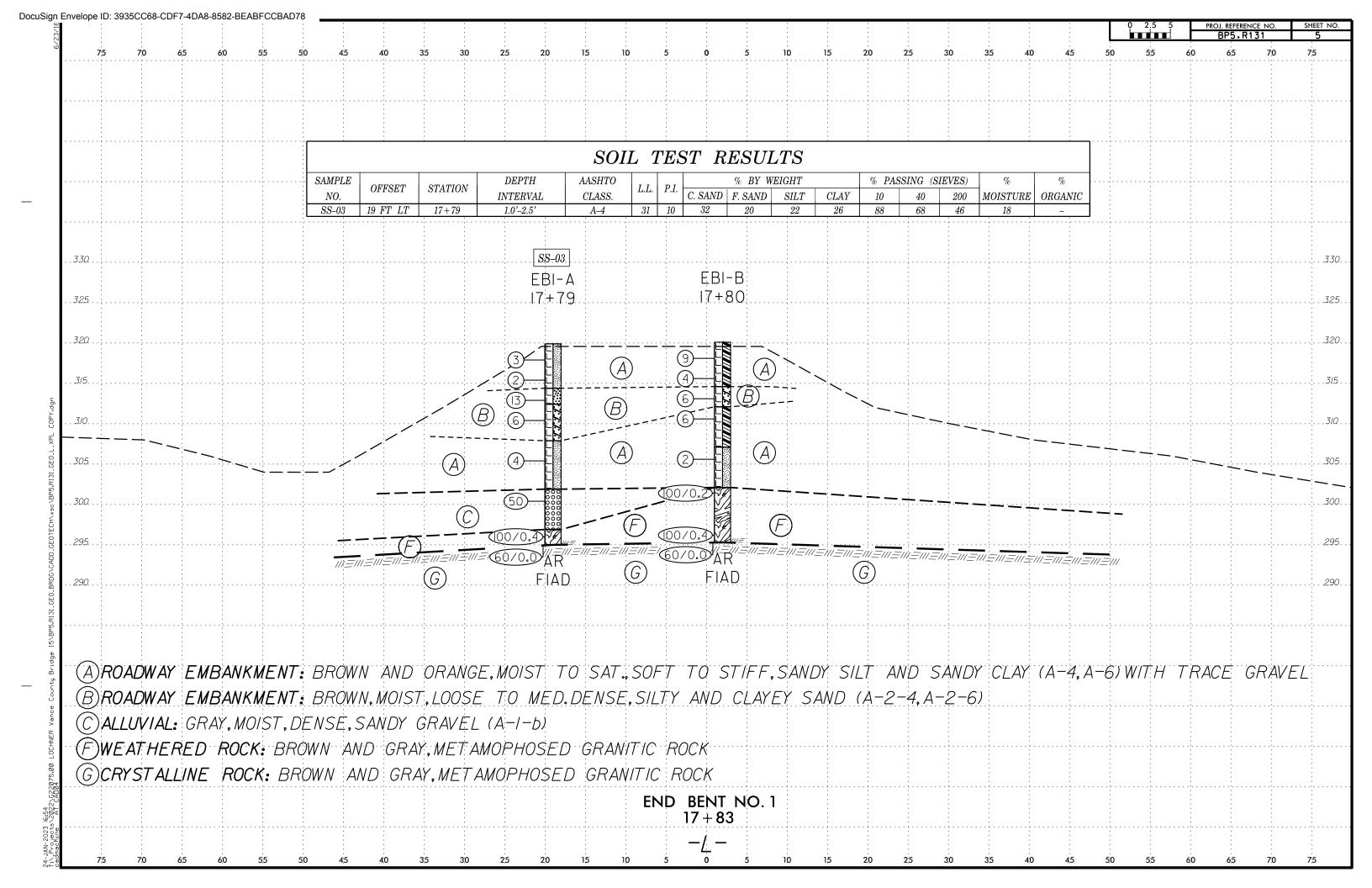
# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

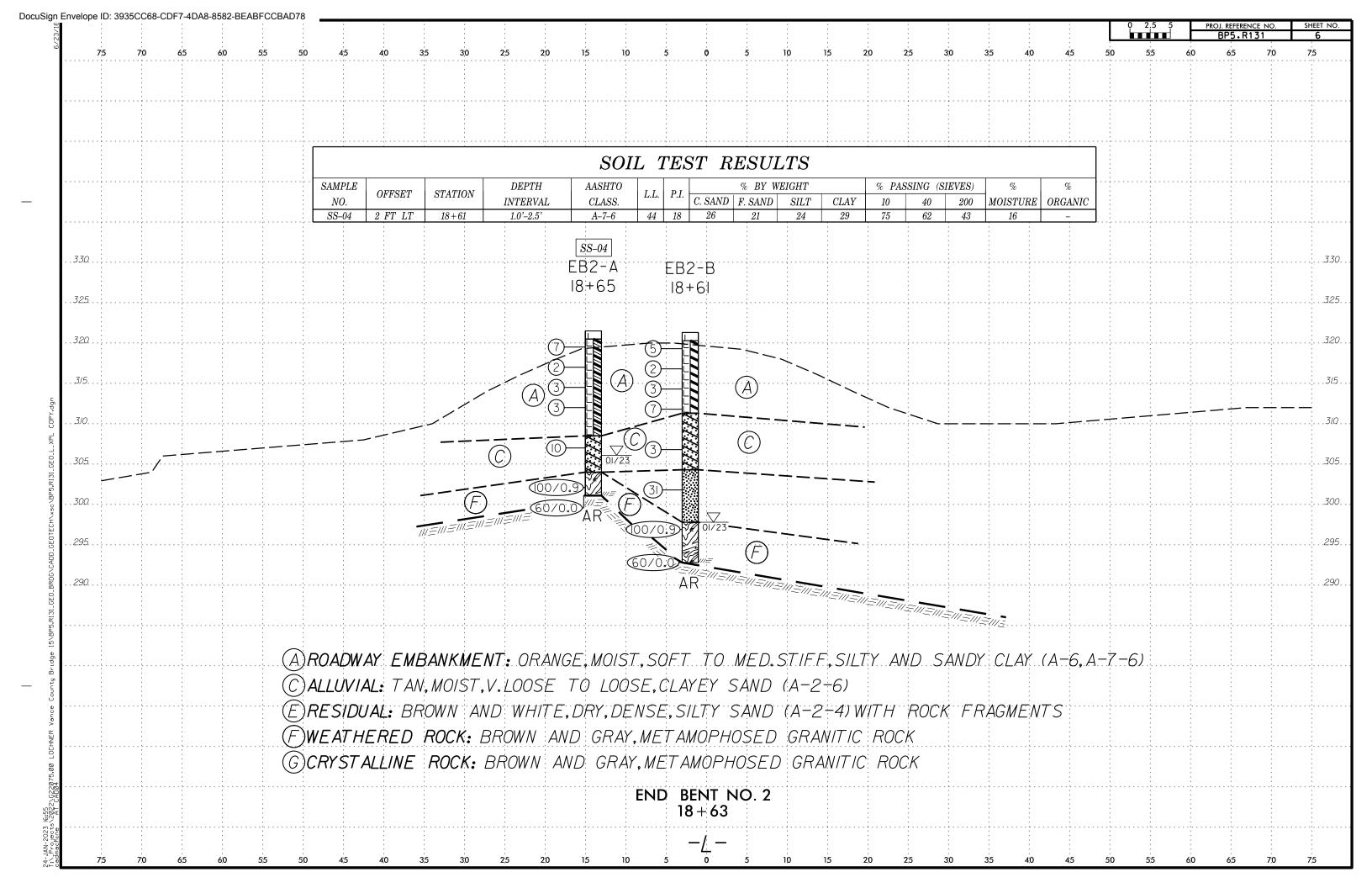
# SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT	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.
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,  VERY STIFF, GRAY, SULTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	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
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
CENEDAL CRANIII AD MATERIAL C CILT.CLAY MATERIAL C	MINERALOGICAL COMPOSITION	FINE TO COARSE CRAIN ICNEOUS AND METAMORPHIC POCK 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 GROUND
CLASS. (≤ 35% PASSING "200) (> 35% PASSING "200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	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	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	UNEISS, OHODRU, 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-3 A-6, A-7	COMPRESSIBILITY	NON-CATSTALLINE SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	OF SLOPE.  CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
7. PASSING	HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED (CP) SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
*10 50 MX   GRANULAR CLAY MUCK, **  *40 30 MX 50 MX 51 MN   SOILS CLAY PEAT	PERCENTAGE OF MATERIAL	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   36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.
MATERIAL	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	HAMMER IF CRYSTALLINE.	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
PASSING *40 40 MX 41 MN	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN 11 MN MODERATE HIGHLY	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF UNIVANIL	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAVEL, AND SAND GRAVEL AND SAND SOILS SOILS	▼ STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.  FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
CEN DATING	——───────────────────────────────────	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	PARENT MATERIAL.
AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE		DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES "CLUNK" SOUND WHEN STRUCK,  IF TESTED, WOULD YIELD SPT REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
CONSISTENCY CONSISTENCY (N-VALUE) COMPRESSIVE STRENGTH	WITH SOIL DESCRIPTION OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4	SOIL SYMBOL SPT ONT TEST BORING SLOPE INDICATOR INSTALLATION	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
GRANULAR LUUSE 4 10 100	VST PMT INSTRICTION	TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.  IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS
(NON-COHESTVE) DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER THAN ROADWAY EMBANKMENT TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERT DENSE / DE	INFERRED SOIL BOUNDARY - CORE BORING SOUNDING ROD	SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
VERY SOFT         < 2         < 0.25           GENERALLY         SOFT         2 TO 4         0.25 TO 0.5	Y	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</u>	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
SILT-CLAY         MEDIUM STIFF         4 TO 8         0.5 TO 1.0           MATERIAL         STIFF         8 TO 15         1 TO 2	INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4	→ → → → → → → ALLUVIAL SOIL BOUNDARY \( \triangle \) PIEZOMETER INSTALLATION \( \triangle \)— SPT N-VALUE	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
HARD > 30 > 4	INSTREATION	ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES	ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
COARSE FINE	SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRAVEL SAND SAND SILT CLAY		MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT
(CSE, SU.) (F SU.)	ABBREVIATIONS	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	OR SLIP PLANE.
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 OR PICK POINT.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL
	CL CLAY MOD MODERATELY $\gamma$ - 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
SOIL MOISTURE - CORRELATION OF TERMS  SOIL MOISTURE SCALE   FIELD MOISTURE   QUIES FOR FIELD MOISTURE   CONTROL MOISTURE   CONT	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_d$ - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
(ATTERBERG LIMITS)    DESCRIPTION   GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	PIECES CAN BE BROKEN BY FINGER PRESSURE.	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
(SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE SL SILT, SILTY ST - SHELBY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
PLASTIC   LIQUID LIMIT   CEMICOLID. PEGLIPPES ORVING TO	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
PANCE / - WET - (W) SEMISOCIDE REGUINES BITTING TO	FRAGS FRAGMENTS $w$ - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK: BM #1-L- 19+08,19' RT
(PI) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	■ WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: 319.98 FEET
SL SHRINKAGE LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:  CME-45C CLAY BITS X AUTOMATIC MANUAL	MODERATELY CLOSE	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO	1 - 1	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	
ATTAIN OPTIMUM MOISTURE	CME-55 CME SIZE:	THINLY LAMINATED < 0.008 FEET	
PLASTICITY	X 8' HOLLOW AUGERS	INDURATION	
PLASTICITY INDEX (PI) DRY STRENGTH	CME-550 HARD FACED FINGER BITS -N	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  RUBBING WITH FINGER FREES NUMEROUS GRAINS:	
NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST UNGCARBIDE INSERTS	FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MODERATELY PLASTIC 16-25 MEDIUM	CASING W/ ADVANCER POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;	
HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST   TRICONE STEEL TEETH   HAND AUGER	BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	X MOBILE B-57 Tricone TUNGCARB. SOUNDING ROD	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	SHAPP HAMMED BLOWS REGULDED TO RDEAV SAMPLE.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-1-
TIOST TENS SOCI AS EIGHT, BAILT, STIERRES, ETC. AIR USES TO BESCHIEF AT EMAINEE.			= = = = = = = = = = = = = = = = = = = =







BORE LOG				
WBS BP5.R131.1 TIP BP5.R131.1 COUNTY VANCE	GEOLOGIST Lane, R. W.	<b>WBS</b> BP5.R131.1	TIP BP5.R131.1 COUNTY VANCE	GEOLOGIST Lane, R. W.
SITE DESCRIPTION BRIDGE 15 OVER LITTLE RUIN CREEK ON SR 1125	GROUND WTR (ft)	SITE DESCRIPTION BRIDGE 15	OVER LITTLE RUIN CREEK ON SR 1125	GROUND WTR (ft)
BORING NO.         R-01         STATION         14+00         OFFSET         12 ft LT	ALIGNMENT -L- 0 HR. Dry	BORING NO. R-02	STATION 16+09 OFFSET 4 ft	RT ALIGNMENT -L- 0 HR. Dry
COLLAR ELEV.         329.9 ft         TOTAL DEPTH         10.0 ft         NORTHING         919,484	<b>EASTING</b> 2,149,625 <b>24 HR.</b> FIAD	COLLAR ELEV. 321.2 ft	TOTAL DEPTH 3.1 ft NORTHING 9	19,587 <b>EASTING</b> 2,149,807 <b>24 HR.</b> FIAD
DRILL RIG/HAMMER EFF,/DATE TRI8016 MOBILE B-57 84% 05/09/2022 DRILL METHOD H.S.	Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF/DATE TRI80	016 MOBILE B-57 84% 05/09/2022 DF	RILL METHOD H.S. Augers HAMMER TYPE Automatic
	SURFACE WATER DEPTH N/A	DRILLER Estep, J. E.	START DATE 12/30/22 COMP. DATE	12/30/22 SURFACE WATER DEPTH N/A
ELEV (ft)   DRIVE   ELEV (ft)   O.5ft   O.5ft	SOIL AND ROCK DESCRIPTION  ELEV. (ft) DEPTH (ft)	ELEV (ft) DEPTH BLOW COU	DINT   BLOWS PER FOOT   S.   S.   S.	AMP. L O SOIL AND ROCK DESCRIPTION NO. MOI G
329.0 1.0	329.9 0.3' TOPSOIL 0.0  ROADWAY EMBANKMENT  ORANGE, SOFT, SILTY CLAY (A-7-6)	325		
325 326.4 3.5 4 6 5 11 M	326.9 TAN, MED. DENSE, SILTY SAND (A-2-4)  324.4 TAN, MED. STIFF, SANDY CLAY (A-6)	320 319.3 1.9 318.1 3.1 11 89/0.4		321.2 0.3' TOPSOIL 0.0  ROADWAY EMBANKMENT GRAY, MED. DENSE, SANDY GRAVEL (A-1-a) WITH COBBLES/BOULDERS 3.1
321.4 8.5 5 6 6 6	321.9 8.0  RESIDUAL 319.9 ORANGE AND BLACK, MED. STIFF, CLAY 10.0	318.1 3.1 11 60/0.0	100/0.9 <b>0</b> 60/0.0	318.1 (A-1-a) WITH COBBLES/BOULDERS 3.1  WEATHERED ROCK GRAY, METAMORPHOSED GRANITIC ROCK
	(A-6) Boring Terminated at Elevation 319.9 ft IN RESIDUAL: (A-6)			Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 318.1 ft ON CRYSTALLINE ROCK: METAMORPHOSED GRANITIC ROCK
				NOTE: OFFSET TWICE TO ATTEMPT TO ADVANCE. ROCK OUTCROPS ON ADJACENT SLOPE
				-
1/24/23				
HE   F				

		BORE LOG	T			1	T	T	
WBS BP5.R131.1		TY VANCE	GEOLOGIST Lane, R. W.		WBS BP5.R131.1	<b>TIP</b> BP5.R131.1	COUNTY VANCE	GEOLOGIST Lane, R. W.	T
	OVER LITTLE RUIN CREEK ON SI	1	T	GROUND WTR (ft)		GE 15 OVER LITTLE RUIN CREE		T	GROUND WTR (ff
BORING NO. EB1-A	STATION 17+79	OFFSET 19 ft LT	ALIGNMENT -L-	<b>0 HR.</b> Dry	BORING NO. EB1-B	STATION 17+80	OFFSET 2 ft RT	ALIGNMENT -L-	<b>0 HR.</b> Dr
COLLAR ELEV. 319.9 ft	TOTAL DEPTH 24.9 ft	NORTHING 919,649	<b>EASTING</b> 2,149,968	24 HR. FIAD	COLLAR ELEV. 320.1 ft	TOTAL DEPTH 24.8 ft	= = = = = = = = = = = = = = = = = = = =	<b>EASTING</b> 2,149,972	24 HR. FIAI
DRILL RIG/HAMMER EFF./DATE TRI80		DRILL METHOD H.S	S. Augers HAMM	MER TYPE Automatic		TRI8016 MOBILE B-57 84% 05/09/2		H.S. Augers HA	MIMER TYPE Automatic
DRILLER Estep, J. E.	<b>START DATE</b> 12/29/22	COMP. DATE 12/29/22	SURFACE WATER DEPTH N/	/A	DRILLER Estep, J. E.	START DATE 12/29/2		SURFACE WATER DEPTH	N/A
ELEV (ft) DEPTH BLOW COUL		75 100   100   7   0	SOIL AND ROCK DES	CRIPTION DEPTH (ft)	ELEV CRIP (ft) DEPTH BLOV (ft) 0.5ft	N COUNT         BLOWS           0.5ft         0.5ft	PER FOOT SAMP.   SAMP.	O SOIL AND ROCK D	ESCRIPTION
316.4 7 3.5	2		319.9 0.3' TOPSOII ROADWAY EMBAN ORANGE, SOFT, SAND TRACE GRAV	KMENT DY SILT (A-4)	325			- - - - - - - 320.1 0.3' TOPS	GOIL
315 313.9 6.0	<u>Q</u> 2	<del>.    </del>           <del>                        </del>	= 314.4BROWN, MED. DENSE,	SILTY SAND 5.5	320 1.0	5 4	T	ROADWAY EMB	ANKMENT
311.4 T 8.5	3 66		BROWN, NIED DENSE, (A-2-4)  [A-2-4]  BROWN, LOOSE, CLAYEY  307.9  BROWN, SOFT, SANDY	Y SAND (A-2-6) 7.5	315 314.1 6.0 4 311.6 + 8.5	5 4 2 2 3 3 3	M M	BROWN AND ORANGE SANDY CLAY (A-6) GRAVE BROWN, LOOSE, CLAY	WITH TRACE
305 2 1 301.4 18.5 2 2 29	21		. 301.9		310	3 3	M M	ORANGE, MED. STIFI (A-6)  307.1  GRAY ORANGE AND SANDY SILT	BLACK, SOFT,
296.4 23.5 295 295.0 24.9 100/0.4 60/0.0			296.9 WEATHERED RE 295.0 GRAY, METAMORPHOSE ROCK	OCK 23.0	301.6 - 18.5			302.1 WEATHERED	N ROCK DSED GRANITIC
			Boring Terminated WITH PENETRATION TEST F Elevation 295.0 ft ON CR ROCK: METAMORPHOSI ROCK	REFUSAL at RYSTALLINE	296.6 - 23.5 295.3 - 24.8 100/0.4 - 60/0.0		N	Boring Terminated WI PENETRATION TES Elevation 295.3 ft ON ROCK: METAMORPHO ROCK	T REFUSAL at CRYSTALLINE DSED GRANITIC
								-	

		BORE LOG	T									
/BS BP5.R131.1		NTY VANCE	GEOLOGIST Lane, R. W.		WBS BP5.R13				TY VANCE		GEOLOGIST Lane, R. W.	T
	15 OVER LITTLE RUIN CREEK ON		44.00.000	GROUND WTR (ft)				R LITTLE RUIN CREEK ON S			4.101	GROUND W
ORING NO. EB2-A	<b>STATION</b> 18+65	OFFSET 14 ft LT	ALIGNMENT -L-	<b>0 HR.</b> 15.4	BORING NO.			<b>TATION</b> 18+61	OFFSET		ALIGNMENT -L-	0 HR.
OLLAR ELEV. 321.5 ft	TOTAL DEPTH 20.4 ft	NORTHING 919,659	<b>EASTING</b> 2,150,053	24 HR. FIAD  MER TYPE Automatic	COLLAR ELEV			OTAL DEPTH 28.5 ft	NORTHING	<u>.                                    </u>	EASTING 2,150,052	24 HR.
	RI8016 MOBILE B-57 84% 05/09/2022	DRILL METHOD H						/OBILE B-57 84% 05/09/2022		DRILL METHOD		MIMER TYPE Autor
RILLER Estep, J. E.  EV DRIVE DEPTH BLOW C	OUNT   12/29/22	COMP. DATE 12/29/22   DOT	SURFACE WATER DEPTH NA	/A	DRILLER Este	<u> </u>		START DATE 12/29/22 BLOWS PER FO		TE 12/29/22	SURFACE WATER DEPTH	N/A
ft) ELEV (ft) 0.5ft 0.5ft		(	SOIL AND ROCK DES	SCRIPTION  DEPTH (ft)	(ft) (ft)	EPTH BLOW (ft) 0.5ft (	0.5ft 0.5ft	<b>-</b>	75 100			DESCRIPTION
25	<u> </u>	<del></del>	- - 321.5 - 320.5 0.7' ASPHAL		325	1.0 _					- 321.3 - 320.3 0.7' BITUMINOUS	
318.0 3.5 6 4	3 7		0.3' AGGREGATE BAS  ROADWAY EMBAN  ORANGE, SOFT TO MED.	IKMENT		3.5	3 2	<b>\$</b> 5	: ::::	SS-04 16% L	0.3' AGGREGATE E  ROADWAY EME  ORANGE, SOFT TO M	BANKMENT
5 315.5 + 6.0 1 2	1		CLAY (A-6)		315 315.3	6.0	1 2	<b>1 1 2 2 3 3 4 3 4 3 4 3 4 4 3 4 4 4 4 4 4 4 4 4 4</b>			CLAY (A-	
313.0 2 8.5 2 1	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				312.8	8.5	3 4	<del>                                  </del>			<b>1</b>	
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				310			7			TAN, V. LOOSE, CLAYE	
308.0 13.5 2 8	2 .\		- 308.5 - ALLUVIAL TAN, LOOSE, CLAYEY F.	<u>13.0</u> . SAND (A-2-6)	307.8	13.5	1 2	-		M ***		•
<u> </u>			304.0	17.5	305						304.3 RESIDU	ΙΔΙ
303.0 18.5 55 45/0 301.1 20.4	4	· · · · · · · · · · · · · · · · · · ·	WEATHERED R BROWN, METAMORPHOS ROCK		+	18.5	15 16	11		D	BROWN AND WHITE SAND (A-2-4) WITH RO	E, DENSE, SILTY
[60/0.0]		60/0.0	Boring Terminated WITH PENETRATION TEST F	REFUSAL at	300	_					007.0	
‡			Elevation 301.1 ft ON CF ROCK: METAMORPHOSI ROCK	RYSTALLINE ED GRANITIC	1	23.5 30 7	0/0.4		100/0 9	- I I I I I I I I I I I I I I I I I I I	297.8  WEATHEREI  GRAY, METAMORPH	
					295	28.5					ROCk 292.8	<
‡			_		1	60/0.0			60/0.0		Boring Terminated W PENETRATION TES Elevation 292.8 ft ON	ST REFUSAL at
† †			-		1   ‡						- ROCK: METAMORPH	OSED GRANITIC
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BORE LOG					
WBS BP5.R131.1 TIP BP5.R131.1 COUNTY VANCE	GEOLOGIST Lane, R. W.	<b>WBS</b> BP5.R131.1	TIP BP5.R131.1 COUNTY VANCE		
SITE DESCRIPTION BRIDGE 15 OVER LITTLE RUIN CREEK ON SR 1125	GROUND WTR (ft)	SITE DESCRIPTION BRIDGE 15	OVER LITTLE RUIN CREEK ON SR 1125		GROUND WTR (ft)
BORING NO. R-03 STATION 20+12 OFFSET 4 ft RT	ALIGNMENT -L- 0 HR. Dry	BORING NO. R-04	STATION 22+08 OFFSET	8 ft LT ALIGNMENT -L-	<b>0 HR.</b> Dry
COLLAR ELEV.         327.7 ft         TOTAL DEPTH         10.0 ft         NORTHING         919,668	<b>EASTING</b> 2,150,201 <b>24 HR.</b> FIAD	COLLAR ELEV. 338.7 ft	TOTAL DEPTH 10.0 ft NORTHING	<b>G</b> 919,714 <b>EASTING</b> 2,150,392	24 HR. FIAD
DRILL RIG/HAMMER EFF,/DATE TRI8016 MOBILE B-57 84% 05/09/2022 DRILL METHOD H.S	S. Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF/DATE TRI80	016 MOBILE B-57 84% 05/09/2022	DRILL METHOD H.S. Augers HAMME	RTYPE Automatic
DRILLER Estep, J. E. START DATE 12/30/22 COMP. DATE 12/30/22	SURFACE WATER DEPTH N/A	DRILLER Estep, J. E.		ATE 12/30/22 SURFACE WATER DEPTH N/A	
ELEV (ft)   DEPTH   BLOW COUNT   BLOWS PER FOOT   SAMP.   Unit of the control of	SOIL AND ROCK DESCRIPTION  ELEV. (ft) DEPTH (ft)	ELEV (ft) DEPTH BLOW COULD (ft) 0.5ft 0.5ft 0	NT BLOWS PER FOOT 0.5ft 0 25 50 75 100	SAMP. L O SOIL AND ROCK DESC	RIPTION
330	- . 327.7 0.3' TOPSOIL 0.0	340		338.7 0.3' TOPSOIL	0.0
1 324.2 3.3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	327.7 0.3' TOPSOIL 0.0  RESIDUAL  RED AND BROWN, STIFF, SANDY CLAY  (A-6) SAP. 3.0  TAN WHITE AND BLACK, DENSE,  CLAYEY SAND (A-2-6) SAP. 5.5		4 6	M - ORANGE AND TAN, SOFT SANDY SILT (A-4) \$	T TO STIFF, SAP.
321.7 + 6.0   9   9   26	GRAY AND TAN, DENSE, SILTY SAND (A-2-4)	330 330.2 + 8.5   3   4	4 8	D	
319.2	GRAY WHITE AND TAN, V. DENSE, 317.7 SANDY GRAVEL (A-1-a)  Boring Terminated at Elevation 317.7 ft IN RESIDUAL: (A-1-a)	1 1 3	•   . •11 .	D 328.7  Boring Terminated at Elevation RESIDUAL: (A-4)	
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#### LABORATORY TEST RESULTS

Vance County Bridge No. 15
Vance County, NC
NCDOT Project: BP5.R131

Falcon Engineering Project No: G22075.00

	SAMPLE	DEPTH	AASHTO	ATTERBE	RG LIMITS		PERCENT I	BY WEIGHT		PERCE	ENT PASSING	SIEVE	MOISTURE	BULK DENSITY	ORGANICS
NO.	LOCATION	INTERVAL	CLASS.	LL	PI	C.SAND	F.SAND	SILT	CLAY	#10	#40	#200	(%)	(pcf)	(%)
SS-01	R-1	1.0-2.5	A-7-6(11)	44	20	22	18	26	34	95	80	62	21	N/A	N/A
SS-02	R-3	1.0-2.5	A-6(4)	40	13	33	21	22	24	95	72	48	21	N/A	N/A
SS-03	EB1-A	1.0-2.5	A-4(2)	31	10	32	20	22	26	88	68	46	18	N/A	N/A
SS-04	EB2-B	1.0-2.5	A-7-6(4)	44	18	26	21	24	29	75	62	43	16	N/A	N/A

Certification: 105-0803 Falcon Engineering, Inc. 1210 Trinity Road, Suite 110, Cary, NC 27513