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CONTENTS

DESCRIPTION

TITLE SHEET LEGEND (SOIL & ROCK)

CROSS SECTIONS

BORING LOGS

LAB RESULTS

SITE PHOTOS

SITE PLAN

PROFILE

SHEET NO.

5-8

9-13

15-16

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PR

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY MOORE COUNTY

PROJECT DESCRIPTION BRIDGE NO. 620047 OVER BIG GOVERNORS CREEK BETWEEN ON SR 1658 (WADSWORTH ROAD)

SITE DESCRIPTION BRIDGE ON SR 1658 OVER BIG GOVERNORS CREEK BETWEEN SR 1659 & **SR** 1625

STATE PROJECT REFERENCE NO. N.C. BP8.R004

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 RALE(ICH 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 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 SOIL MOISTURE CONDITIONS NDICATED 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 INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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

PERSONNEL

_	STEWART ENGINEERING
_	CAROLINA DRILLING
_	P. FALLON
	E. CREECH

INVESTIGATED BY _RK&K, LLP

DRAWN BY _B. FARMER

CHECKED BY _M. SWEITZER

SUBMITTED BY __RK&K, LLP

DATE **JULY 2023**





Gregory Goins -A40B119A1E8B48VA.TURE

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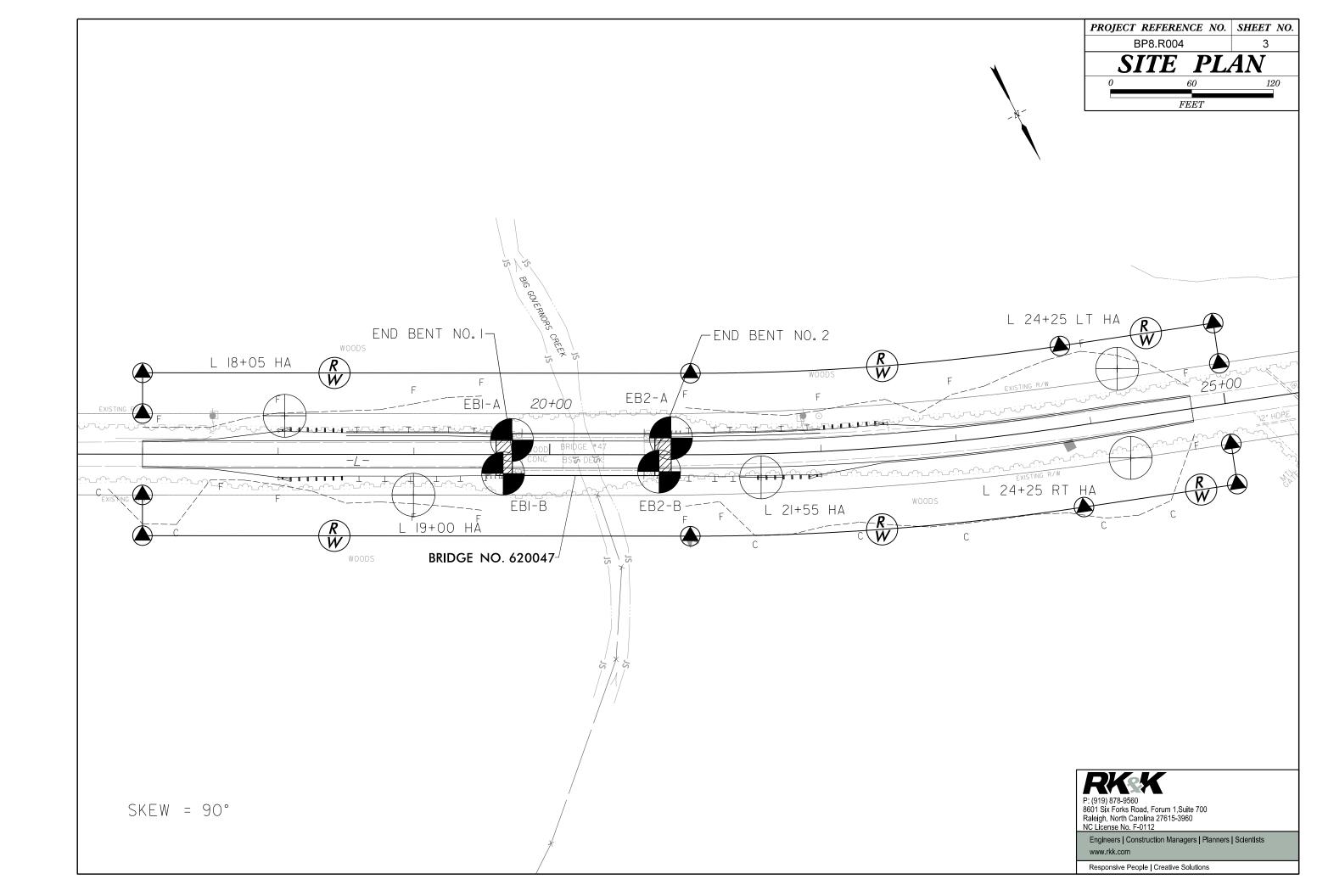
PROJECT REFERENCE NO. SHEET NO. SHEET NO. 2

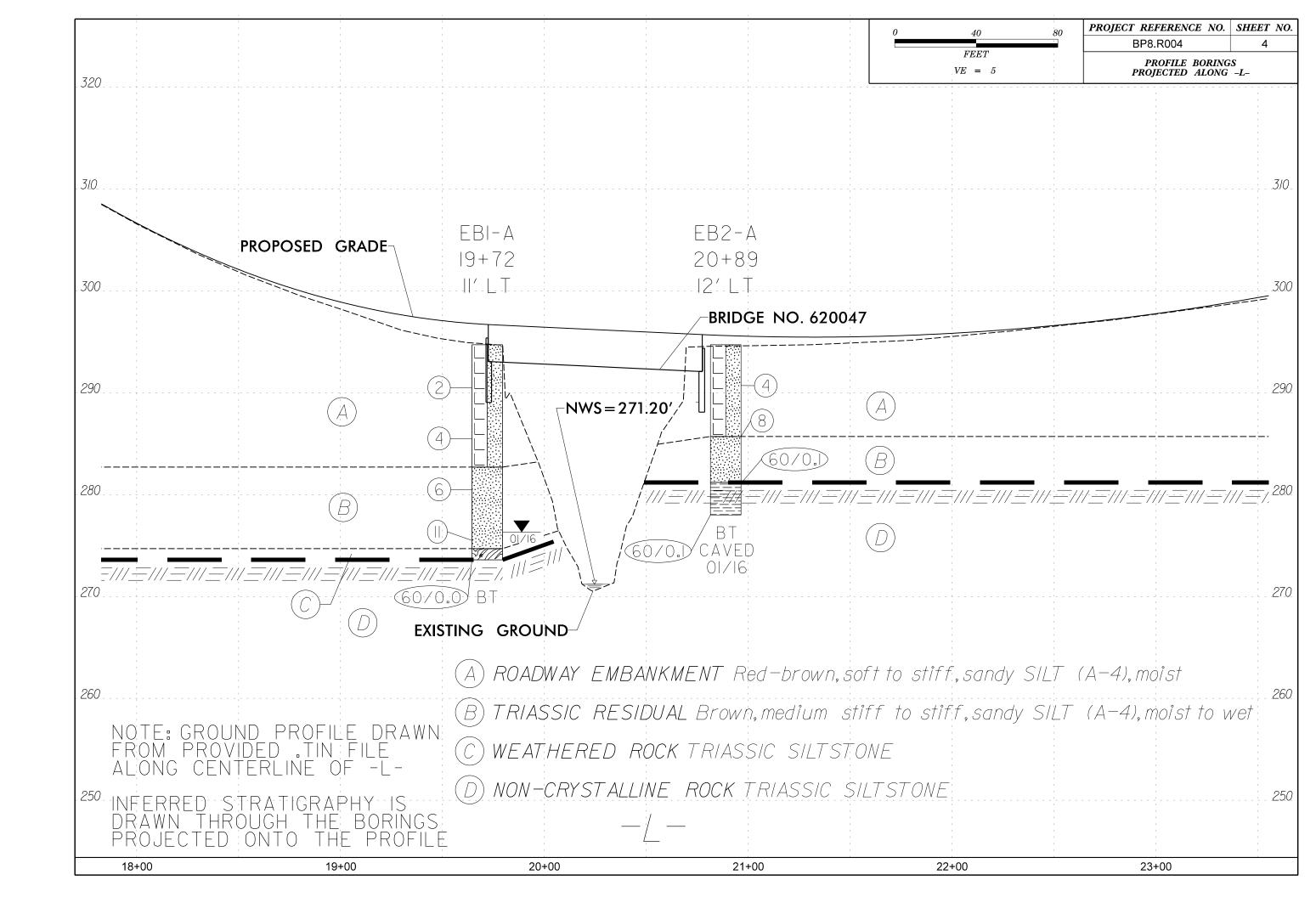
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

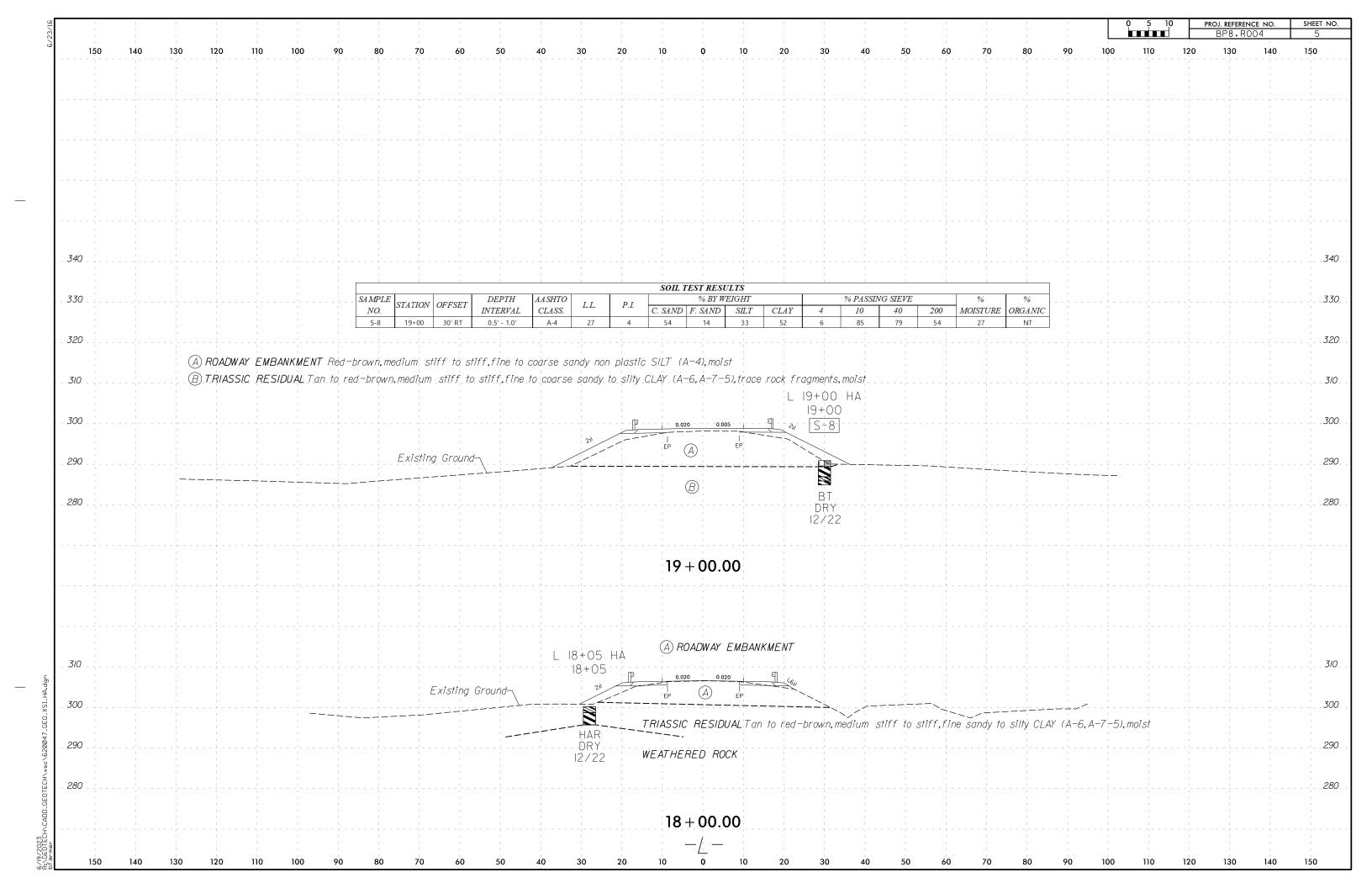
SUBSURFACE INVESTIGATION

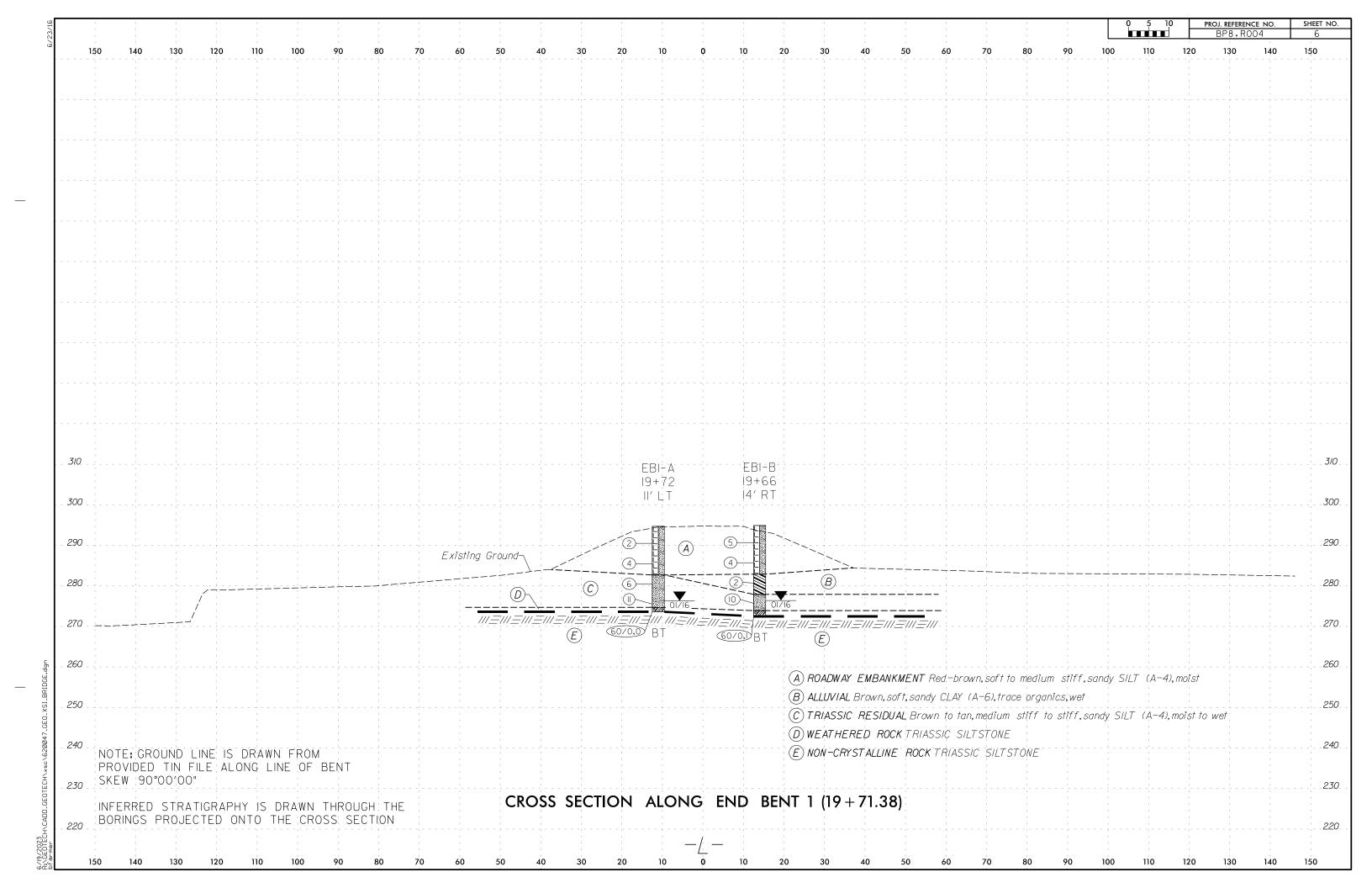
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

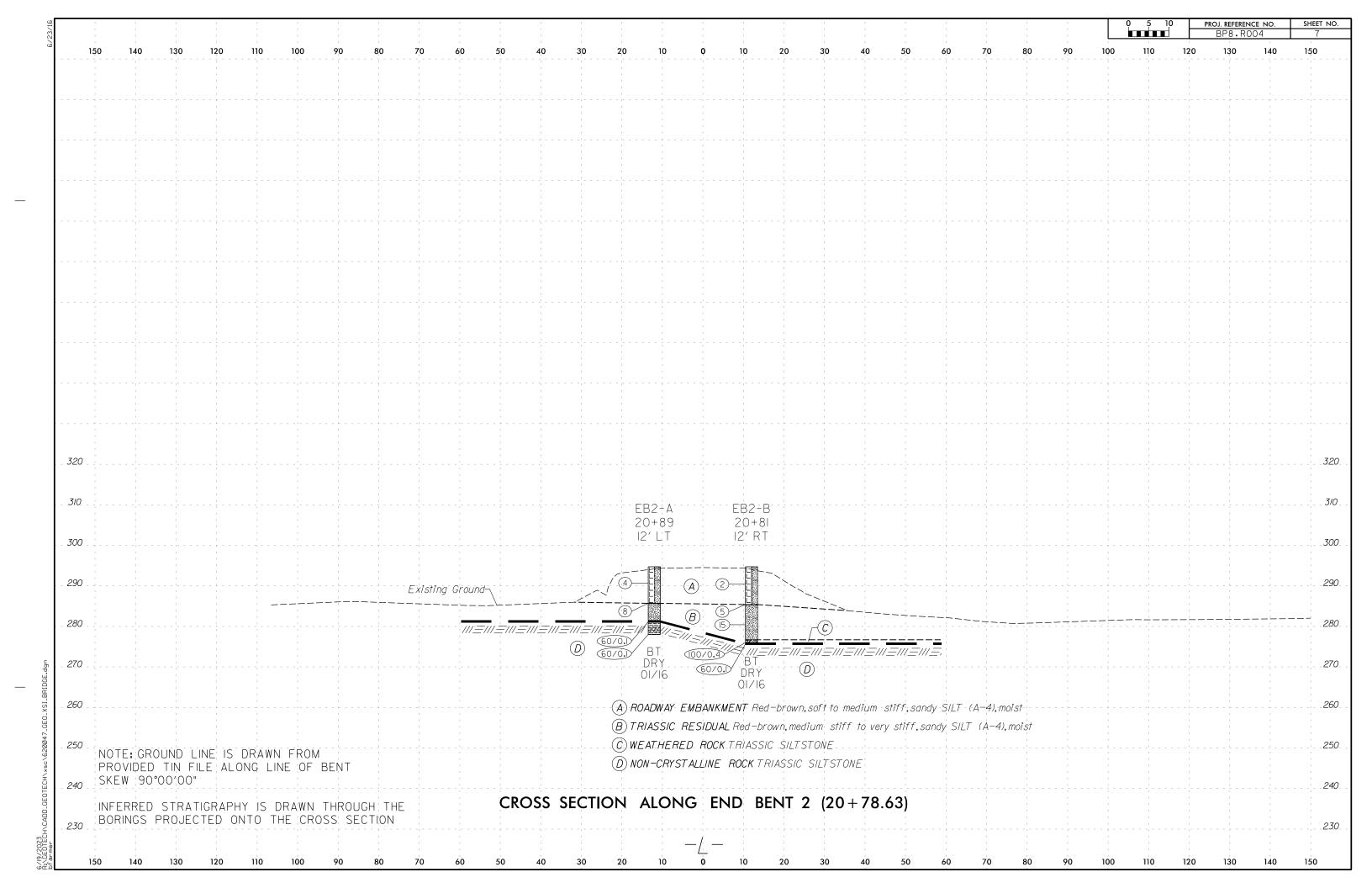
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM DISBOS, SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING; CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	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. ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	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. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1.FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. 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
VERY STIFF, GRAY, SITY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6 SOIL LEGEND AND ASHTO CLASSIFICATION GENERAL GRANULAR MATERIALS CLASS. (≤ 35% PASSING *2000 (> 35% PASSING *2000) GRANUL MATERIALS CLASS. (≤ 35% PASSING *2000)	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 180 BLOWS PER FOOT IF TESTED. CRYSTALLINE CRYSTALLINE FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE.	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 SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 SYMBOL	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	NON-CRYSTALLINE NON-CRYSTALLINE ROCK (NCR) ROCK (NCR) COASTAL PLAIN COASTAL PL	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUYIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
X PASSING *18 58 MX *40 38 MX 58 MX 51 MN *200 15 MX 25 MX 18 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN *50 MX 50	HIGHLY COMPRESSIBLE LL > 50 PERCENTAGE OF MATERIAL GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED (CP) WEATHERING FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER	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 ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
MATERIAL PASSING *40 L 48 MX 41 MN 48 MX 11 MN 11 MN 18 MX 18 MX 11 MN 18 MX 11 MN 11	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 CENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (Y SLI,) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	HORIZONTAL. <u>DIP DIRECTION (DIP AZIMUTH)</u> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 0 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF ORGANIC SOILS USUAL TYPES STONE FRAGS, OF MAJOR AMPLE, AND SAND SAND SAND SAND SAND SAND SAND	GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN. RATING EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR POOR UNSUITABLE		(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	PARENT MATERIAL. <u>FLOOD PLAIN (FP)</u> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM, <u>FORMATION (FM.)</u> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
CONSISTENCY OR DENSENESS PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY COMPACTNESS OR CONSISTENCY COMPACTNESS OR CONSISTENCY COMPACTNESS OR COMPACTNESS OR COMPACTNESS OR COMPRESSIVE STRENGTH (ITOMS/FITS)	MISCELLANEOUS SYMBOLS ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION WITH SOIL DESCRIPTION → OF ROCK STRUCTURES	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLODIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT	FIELD. 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 ITS LATERAL EXTENT.
GENERALLY VERY LOOSE 4 TO 10 GRANULAR LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30 N/A MATERIAL (NON-COHESIVE) VERY REPORT EA	SOIL SYMBOL SOIL SYMBOL SET BORING SLOPE INDICATOR INSTALLATION ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER TEST	(SEY.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERY SOFT	INFERRED SOIL BOUNDARY CORE BORING SOUNDING ROD INFERRED ROCK LINE MN MONITORING WELL TEST BORING WITH CORE	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 VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SYT N VALUES < 100 BPF COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. OUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. 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
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD > 30 > 4 TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ALSO AN EXAMPLE. ROCK HARDNESS VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
U.S. STD. SIEVE SIZE	UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK UNCLASSIFIED EXCAVATION - EXCEPTABLE BUT NOT TO BE UNCLASSIFIED EXCEPTABLE BUT NOT TO BE UNCLA	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDEO ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.) (GR.) (GSE. SD.) (F SD.) (SL.) (GL.) (GR.) (GSE. SD.) (F SD.)	ABBREVIATIONS AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA MICAGEOUS WEA WEATHERED	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	OR SLIP PLANE. 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
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION OFFICE OF THE OFFICE OF T	CL CLAY MOD MODERATELY 7 - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC 7 _d - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. 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	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. 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 FROM BELOW THE GROUND WATER TABLE PLASTIC PLASTIC PROJUCTO ADMINISTRATION OF THE PROJUCTO ADMINISTRATI	DPT - DYNAMIC PENETRATION TEST	PIECES CAN BE BROKEN BY FINGER PRESSURE. 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 FINGERNALL.	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
RANGE (PI) PLASTIC LIMIT SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	FRAGS FRAGMENTS	FRACTURE SPACING BEDDING 1ERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	BENCH MARK: TBM "I; N: 607842.53, E: 1898797.97 LOCATED ON CURB, IFOOT IN FROM END OF BRIDGE ON EBI-B SIDE. ELEVATION: 295.3 FEET
SL SHRINKAGE LIMIT - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: X CME-45C CLAY BITS X AUTOMATIC MANUAL G**CONTINUOUS FLIGHT AUGER CORE SIZE:	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	NOTES: BENCH MARK ELEVATION WAS DETERMINED WITH A SURVEY GRADE GPS UNIT.
PLASTICITY PLASTICITY INDEX (PI) DRY STRENGTH NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT	X 8' HOLLOW AUGERS	INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. RUBBING WITH FINGER FREES NUMEROUS GRAINS: FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	BORING COLLAR ELEVATIONS SURVEYED BY STEWART ENGINEERING DURING SUBSURFACE INVESTIGATION.
SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH COLOR	CASING W/ ADVANCER POST HOLE DIGGER TRICONE STEEL TEETH TRICONE STEEL	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	HAND AUGER ELEVATIONS DETERMINED USING PROVIDED TIN FILE (b5745_ls_tnl.tin). ABBREVIATIONS:
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 SOUNDING ROD VANE SHEAR TEST	INDURATED GRAINS ARE DIFFICULT TO BEPARK IN USE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHAPP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	FIAD = FILLED IMMEDIATELY AFTER DRILLING NT = NOT TESTED HAR = HAND AUGER REFUSAL

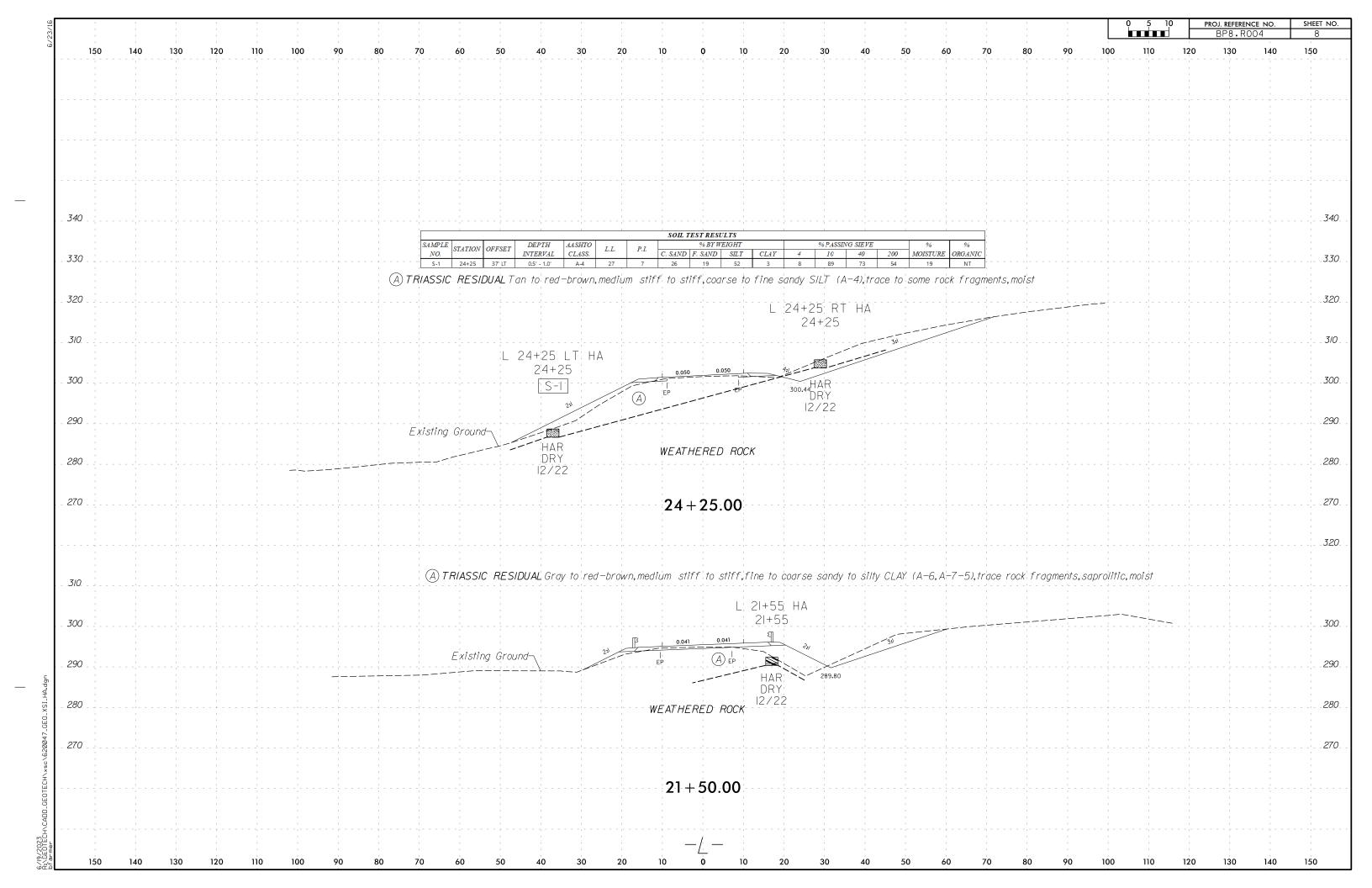




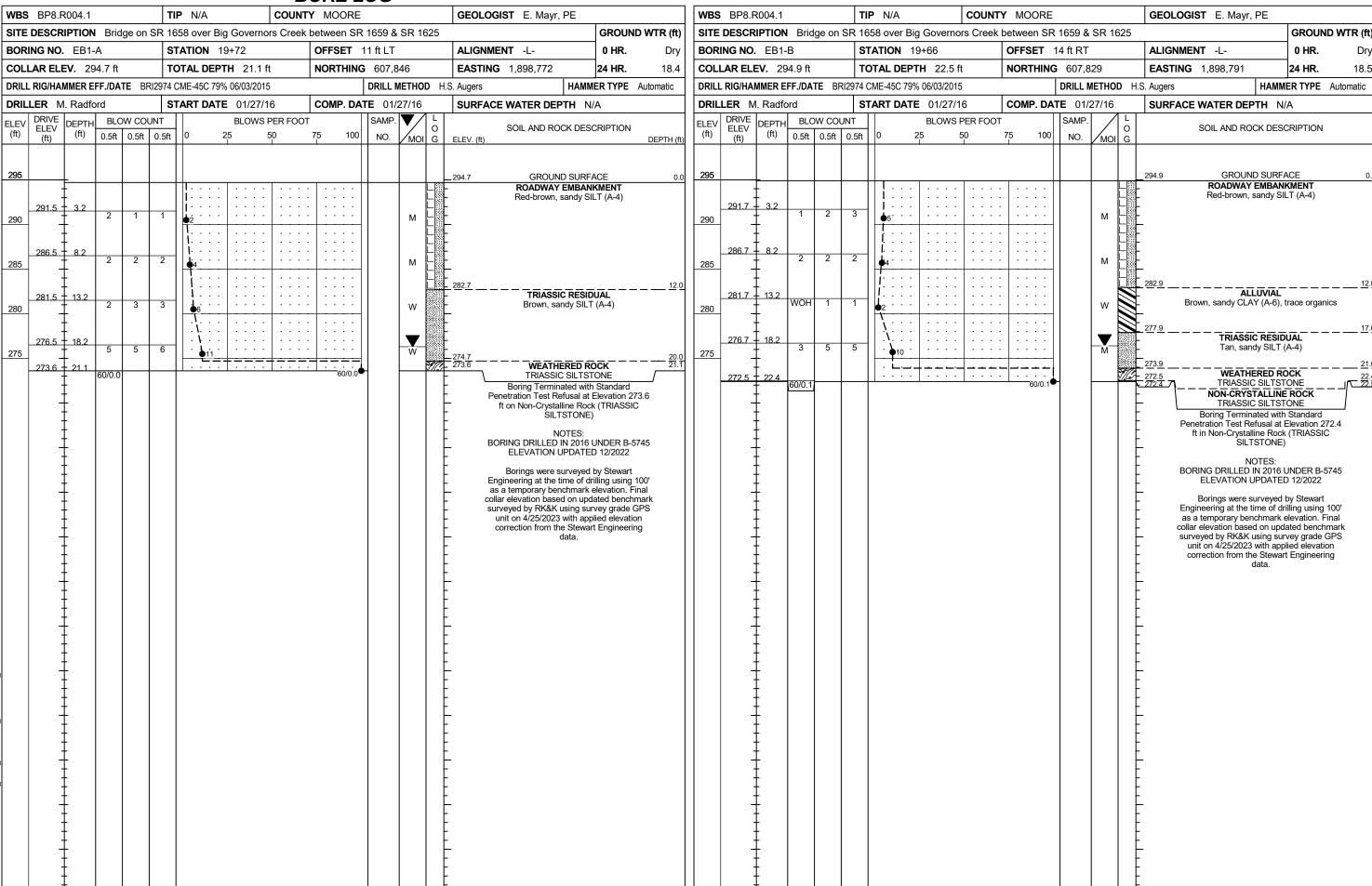








WBS BP8.R004.1 SITE DESCRIPTION BORING NO. L 18+			ITY MOORE			GEOLOGIST P. Fall	l		WDC DD0	D0044		l									
	N Bridge on SR					SESESSION 1:1 and	ion		WBS BP8	.R004.1		TIP	N/A	COUNTY	MOORE			GEOLOG	SIST P. Fallon	·	
BORING NO. L 18+		1658 over Big Governors Cree	k between SR	1659 & SR	1625			GROUND WTR (ft)	SITE DESC	RIPTION Br	idge on SF	R 1658	over Big Governor	rs Creek l	petween SF	R 1659 &	SR 1625			GRO	OUND WTR (f
	3+05 HA	STATION 18+05	OFFSET	28 ft LT		ALIGNMENT -L-		0 HR. Dry	BORING N) . L 19+00 F	HA A	STAT	TION 19+00		OFFSET	30 ft RT		ALIGNMI	ENT -L-	0 H	R. Dr
COLLAR ELEV. 300	00.2 ft	TOTAL DEPTH 4.5 ft	NORTHING	607,705		EASTING 1,898,680	2	24 HR. FIAD	COLLAR E	LEV. 290.9 f	ft	TOTA	AL DEPTH 6.0 ft		NORTHIN	G 607,7	63	EASTING	1,898,775	24 H	R. FIAI
DRILL RIG/HAMMER EF	EFF./DATE N/A		•	DRILL METH	HOD Hand	d Auger	HAMME	R TYPE N/A	DRILL RIG/H	AMMER EFF./D	ATE N/A	•				DRILL M	ETHOD	Hand Auger		HAMMER TY	PE N/A
DRILLER N/A		START DATE 12/30/22	COMP. DA	TE 12/30/2	22	SURFACE WATER DE	EPTH N/A	١	DRILLER	N/A		STAF	RT DATE 12/30/2	2	COMP. DA	TE 12/3	0/22	SURFAC	E WATER DEP	TH N/A	
ELEV DRIVE ELEV (ft) DEPTH (ft)	BLOW COUNT 0.5ft 0.5ft 0.5		75 100	SAMP. NO.	L O IOI G		ROCK DESCF	RIPTION DEPTH (ft)	ELEV DRIVE ELEV (ft)		OW COUNT			PER FOOT	75 100	SAMP. NO.	MOI G		SOIL AND RO	CK DESCRIPT	ON
305					-				295	<u> </u>								-			
300					- 3		UND SURFAC		290	1		+			1	00	27%	× -	DO A DIA/AV		T
LE BP8.R004_MOORE 47_HAND AUGERS.GPJ NC_DOT.GDT 6/19/23						TRIAS Tan to red-brown 295.7 Tan to red-brown CL Boring Termina Elevation 295.7 Cl Hand auger refus	ssic RESIDU n, medium stir dy CLAY (A-6 n, medium stir LAY (A-7-5) ated by Auge 7 ft Triassic Re LAY (A-7-5)	ff to stiff, fine	285							S-8 /	27% M	286.9 285.9 284.9 Re	ROADWAY Red-brown, medium coarse sandy no TRIASSI ed-brown, medium (A-7-5), trace n to red-brown, m coarse san ed-brown, medium	on plastic SILI C RESIDUAL a stiff to stiff, si a rock fragment edium stiff to st dy CLAY (A-6) a stiff to stiff, si a rock fragment d at Elevation 2	fine to (A-4) — 4 Ity CLAY — 5 S — 1 iff, fine to (S) s = 84.9 ft



BORE LOG				
WBS BP8.R004.1 TIP N/A COUNTY MOORE	GEOLOGIST E. Mayr, PE		COUNTY MOORE	GEOLOGIST E. Mayr, PE
SITE DESCRIPTION Bridge on SR 1658 over Big Governors Creek between SR 1659 & SR		·		
	ALIGNMENT -L- 0 HR. Dr	y BORING NO. EB2-B STATION 20+81		ALIGNMENT -L- 0 HR. Dr
	EASTING 1,898,824 24 HR. Cave			EASTING 1,898,842 24 HR. Cave
DRILL RIG/HAMMER EFF./DATE BRI2974 CME-45C 79% 06/03/2015 DRILL METH	D H.S. Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE BRI2974 CME-45C 79% 06/03/2015	DRILL METHOD	H.S. Augers HAMMER TYPE Automatic
DRILLERM. RadfordSTART DATE01/27/16COMP. DATE01/27/16	SURFACE WATER DEPTH N/A	DRILLER M. Radford START DATE 01/27/16		SURFACE WATER DEPTH N/A
BORING NO. EB2-A COLLAR ELEV. 294.7 ft TOTAL DEPTH 16.7 ft DRILL RIG/HAMMER EFF./DATE BRI2974 CME-45C 79% 06/03/2015 DRILLER M. Radford START DATE 01/27/16 ELEV DRIVE DEPTH BLOW COUNT ELEV DRIVE DEPTH BLOW COUNT BLOWS PER FOOT SAMP.	ALIGNMENT -L- EASTING 1,898,824 D H.S. Augers HAMMER TYPE Automatic SURFACE WATER DEPTH N/A L O SOIL AND ROCK DESCRIPTION G ELEV. (ft) DEPTH 294.7 GROUND SURFACE ROADWAY EMBANKMENT Red-brown, sandy SILT (A-4) L D C C C C C C C C C C C C C C C C C C	BORING NO. EB2-B	OFFSET 12 ft RT NORTHING 607,932 DRILL METHOD COMP. DATE 01/27/16 ER FOOT 75 100 NO. MOI G	ALIGNMENT -L-
4CDOT BORE DOUBLE B5745_GEO_BRDG0047_BH.GPJ NC_E				

FIAD

GROUND WTR (ft)

												<u>.OG</u>	1																																	
WE	S BP	8.R004	.1		Т Т	P N/A		CC	OUNT	Y MC	ORE				GE	OLOG	SIST P	P. Fallo	on				→ ⊢	WBS	BP8.	R004.1			Т Т	TIP N	/A		COL	INTY	MOOR					GEOLC	OGIST	P. Fallo	n			
SIT	E DES	CRIPTI	ON B	idge or	n SR 16	558 over E	ig Gove	ernors C						1625						GF	ROUNI	OWTR (ft) :	SITE	DESCF	RIPTIO	N Brid	dge on	SR 16	658 o	ver Big	Govern	ors Cre	eek bet	ween S	R 1659	& SR	162	5					GROUN	ND WI	ſR (
во	RING I	NO. L2	21+55	HA	S	TATION	21+55			OFFS	SET	17 ft R	Т		AL	IGNME	ENT -	L-		0	HR.	D	ry L	BORII	NG NO). L 24	1+25 L	Т НА	S	STATIO	ON 24	+25		OI	FFSET	37 ft L	Т			ALIGNI	MENT	-L-		0 HR.		D
		ELEV.				OTAL DE	PTH 2.	0 ft		NOR		607					1,89	8,880			HR.	FIA					88.7 ft			OTAL	DEPT	H 3.5 f	ft	NO	ORTHIN	IG 608					NG 1,8	98,928		24 HR.		FIA
DRI	LL RIG/	HAMME	R EFF./D	ATE N											Hand Au	ger			HAI	MMER 1	ГҮРЕ	N/A	[_	DRILL	RIG/HA	MMER	EFF./DA	ATE N	I/A							DRILL	METI	HOD	Hand	l Auger			HAMN	IER TYPE	N/A	
DR	LLER					TART DA					P. DA	TE 12		<i>.</i>	SU	RFAC	E WAT	ER DE	PTH	N/A			_ -		ER N					START	DATE	12/30			OMP. D	ATE 12		22		SURFA	CE WA	TER DE	PTH N	/A		
ELE (ft)	/ DRI' ELE (ft	VE V DEP (ft	TH B 0.5	OW CO	OUNT 0.5ft	0	BLO 25	WS PER 50		75 	100		P. ▼ M	′ 0	ELEV	′. (ft)	SOIL	AND R	OCK DI	ESCRIP	PTION	DEPTH	1 1	(ft)	DRIVE ELEV (ft)	DEPTI (ft)	O.5ft	OW CO		0	2: 	BLOWS	S PER FO	OOT 75	100	SAMF NO.	1/	101 G	~		SO	L AND RO	OCK DES	CRIPTION		
295																								290																						
		T											М		292.4			TDIACO	NO DE	RFACE SIDUAL			0.0			Ī				.						S-1	19 N)% Л	<u> </u>	88.7 T	Tan to re	TRIASS d-brown, r	ND SURF IC RESID medium si	DUAL tiff to stiff, f	fine to	_
		‡					.						M	_≥	290.9 290.4	-7 Re	ed-brown to coarse	i to gray	, mediu	um stiff t (A-6), tr	to stiff,	fine	2.0		-	‡				П.		• • •		• •					2	85.2		fra	agments), trace roc	- /	
		‡														Re	ed-browr	n, mediu (A-7- erminat	ragment um stiff -5), sap ted by	ts to stiff, rolitic Auger R	silty CL	AY J			.	† - - -																S	ILT (A-4)	ger Refusa Residual: sa eet, offset t		
		‡														E	Elevation and auge	290.4 f CL	ft Triass AY (A-7	sic Resid 7-5)	dual: si	ty				† †															nanu au	times	s to confin	m.	unee	
		‡													-		J	times	s to cor	nfirm.					- - -	† -																				
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ORE DOUE		Ī													<u></u>										- -	<u> </u>													[
NCDOT B		‡													-									ĺ		 													-							

	<i>B</i>	ORE LOG		
WBS BP8.R004.1	TIP N/A COUNT	Y MOORE	GEOLOGIST P. Fallon	
SITE DESCRIPTION Bridge on SF	R 1658 over Big Governors Creek	between SR 1659 & SR 1625		GROUND WTR (ft)
BORING NO. L 24+25 RT HA	STATION 24+25	OFFSET 29 ft RT	ALIGNMENT -L-	0 HR . Dry
COLLAR ELEV. 305.8 ft	TOTAL DEPTH 2.0 ft	NORTHING 608,246	EASTING 1,898,991	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE N/A	•	DRILL METHOD Har	nd Auger HAMM	ER TYPE N/A
DRILLER N/A	START DATE 12/30/22	COMP. DATE 12/30/22	SURFACE WATER DEPTH N/	/A
DRIVE DEPTH BLOW COUNT Color Color	T BLOWS PER FOOT 0 25 50	75 100 110 7 0	SOIL AND ROCK DESC	CRIPTION DEPTH (f
305			TRIASSIC RESID Tan to red-brown, mediun coarse to fine sandy SILT (some rock fragme Boring Terminated by Aug Elevation 303.8 ft Triassic R SILT (A-4) Hand auger refused at 3.5 fe times to confirm	UAL n stiff to stiff, (A-4), trace to ents ler Refusal at tesidual: sandy

SHEET 13

SHEET 14

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAY MATERIALS & TESTS UNIT SOILS LABORATORY

T. I. P. No.	N/A	-				
	REPORT ON SAM	PLES OF	Replacement of	Bridge 47	over Govern	ers Creek on SR 1658
Project	N/A	County	Cumberland		Owner	RK&K
Date: Sampled		Received	1/24/23		Reported	2/20/23
Sampled from		_		By		

Submitted by Bethany Farmer

TEST RESULTS

Proj. Sample No.	S-1	S-8		
Boring No.	L24+25 LT	L19+00 HA		
Retained #4 Sieve %	8	6		
Passing #10 Sieve %	89	85		
Passing #40 Sieve %	73	79		
Passing #200 Sieve %	54	54		

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%					
Coarse Sand Ret - #60	%	26.2	14.2		
Fine Sand Ret - #270	%	18.8	32.5		
Silt 0.05 - 0.005 mm	%	52.1	52.4		
Clay < 0.005 mm	%	2.9	0.9		
Passing #40 Sieve	%	82.5	92.4		
Passing #200 Sieve	%	61.4	63.4		

L. L.	27	27	
P. I.	7	4	
AASHTO Classification	A-4	A-4	
Group Index	1	0	
рН	N/A	N/A	
Station	24+25	19+00	
OFFSET	37.0	30.0	
ALIGNMENT	L	L	
Depth (Ft)	0.5	0.5	
to	1.0	1.0	
Natural Moisture %	18.9	26.7	



2008 Standard Specifications

M & T Form 503





Facing Upstation from End Bent 1

Facing Downstation from End Bent 1



Bridge on SR 1658 over Big Governors Creek between SR 1659 & SR 1625 White Hill, NC Moore County

DATE: 5/5/2023

PAGE: 15





Facing Upstation from End Bent 2

Facing Downstation from End Bent 2



Bridge on SR 1658 over Big Governors Creek between SR 1659 & SR 1625
White Hill, NC
Moore County

DATE: 5/5/2023

PAGE: 16