

REFERENCE: BP8.R010

PROJECT: BP8.R010

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY MOORE
PROJECT DESCRIPTION REPLACE BRIDGE 620127 ON
SR 1428 (DAN ROAD) OVER BEAR CREEK

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP8.R010	1	24

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 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 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 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 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 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:
- 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.
 - 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.
TURNAGE, J. R.
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INVESTIGATED BY TERRACON CONSULTANTS

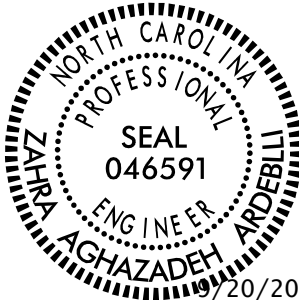
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DATE SEPTEMBER 2021

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NC REGISTERED GEOLOGIC FIRM: C-367



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F836E7663 SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

										PROJECT REFERENCE NO.		SHEET NO.	
										BP8.R010		2	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT													
SUBSURFACE INVESTIGATION													
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS													
SOIL DESCRIPTION													
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 D1586). 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, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6													
SOIL LEGEND AND AASHTO CLASSIFICATION													
GENERAL CLASS. GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS													
GROUP CLASS. A-1, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7													
SYMBOL													
% PASSING #10, #40, #200													
MATERIAL PASSING #40, LL, PI													
GROUP INDEX													
USUAL TYPES OF MAJOR MATERIALS													
GEN. RATING AS SUBGRADE													
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30													
CONSISTENCY OR DENSENESS													
PRIMARY SOIL TYPE, COMPACTNESS OR CONSISTENCY, RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE), RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)													
TEXTURE OR GRAIN SIZE													
U.S. STD. SIEVE SIZE OPENING (MM), BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE. SD.), FINE SAND (F SD.), SILT (SL.), CLAY (CL.)													
GRAIN SIZE													
SOIL MOISTURE - CORRELATION OF TERMS													
SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, GUIDE FOR FIELD MOISTURE DESCRIPTION													
LL, PL, OM, SL													
PLASTICITY													
NON PLASTIC, SLIGHTLY PLASTIC, MODERATELY PLASTIC, HIGHLY PLASTIC, PLASTICITY INDEX (PI), DRY STRENGTH													
COLOR													
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.													
GRADATION													
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: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.													
MINERALOGICAL COMPOSITION													
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.													
COMPRESSIBILITY													
SLIGHTLY COMPRESSIBLE, MODERATELY COMPRESSIBLE, HIGHLY COMPRESSIBLE, LL < 31, LL = 31 - 50, LL > 50													
PERCENTAGE OF MATERIAL													
ORGANIC MATERIAL, GRANULAR SOILS, SILT - CLAY SOILS, OTHER MATERIAL, TRACE OF ORGANIC MATTER, LITTLE ORGANIC MATTER, MODERATELY ORGANIC, HIGHLY ORGANIC													
GROUND WATER													
WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING, STATIC WATER LEVEL AFTER 24 HOURS, PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA, SPRING OR SEEP													
MISCELLANEOUS SYMBOLS													
ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION, SOIL SYMBOL, ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT, INFERRED SOIL BOUNDARY, INFERRED ROCK LINE, ALLUVIAL SOIL BOUNDARY, DIP & DIP DIRECTION OF ROCK STRUCTURES, TEST BORING, AUGER BORING, CORE BORING, MONITORING WELL, PIEZOMETER INSTALLATION, SLOPE INDICATOR INSTALLATION, CONE PENETROMETER TEST, SOUNDING ROD, TEST BORING WITH CORE, SPT N-VALUE													
RECOMMENDATION SYMBOLS													
UNDERCUT, UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL, UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL, UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL													
ABBREVIATIONS													
AR - AUGER REFUSAL, BT - BORING TERMINATED, CL - CLAY, CPT - CONE PENETRATION TEST, CSE - COARSE, DMT - DILATOMETER TEST, DPT - DYNAMIC PENETRATION TEST, e - VOID RATIO, F - FINE, FOSS - FOSSILIFEROUS, FRAC. - FRACTURED, FRACTURES, FRAGS. - FRAGMENTS, HI. - HIGHLY, MED. - MEDIUM, MICA - MICACEOUS, MOD. - MODERATELY, NP - NON PLASTIC, ORG. - ORGANIC, PMT - PRESSUREMETER TEST, SAP. - SAPROLITIC, SD. - SAND, SANDY, SL. - SILT, SILTY, SLI. - SLIGHTLY, TCR - TRICONE REFUSAL, w - MOISTURE CONTENT, V - VERY, VST - VANE SHEAR TEST, WEA. - WEATHERED, UNIT WEIGHT, DRY UNIT WEIGHT, SAMPLE ABBREVIATIONS, S - BULK, SS - SPLIT SPOON, ST - SHELBY TUBE, RS - ROCK, RT - RECOMPACTED TRIAXIAL, CBR - CALIFORNIA BEARING RATIO													
EQUIPMENT USED ON SUBJECT PROJECT													
DRILL UNITS, ADVANCING TOOLS, HAMMER TYPE, CORE SIZE, HAND TOOLS													
FRACATURE SPACING, BEDDING													
TERM, SPACING, THICKNESS													
INDURATION													
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.													
FRIABLE, MODERATELY INDURATED, INDURATED, EXTREMELY INDURATED													
TERMS AND DEFINITIONS													
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 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, CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE, COLLUVIUM - 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 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 HORIZONTAL, DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH, 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 PARENT MATERIAL, FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM, FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE 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, 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, 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 (ROD) - 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 ROCK, SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS, SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT 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 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, 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 (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER, BENCH MARK: BMI, RR SPIKE IN BASE OF 18" WALNUT TREE, STA. 10+87.00 -BL-, 112' RT, N: 620742, E: 1799701, ELEVATION: 382.24 FEET													
NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING HAR - HAND AUGER REFUSAL													
DATE: 8-15-14													

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

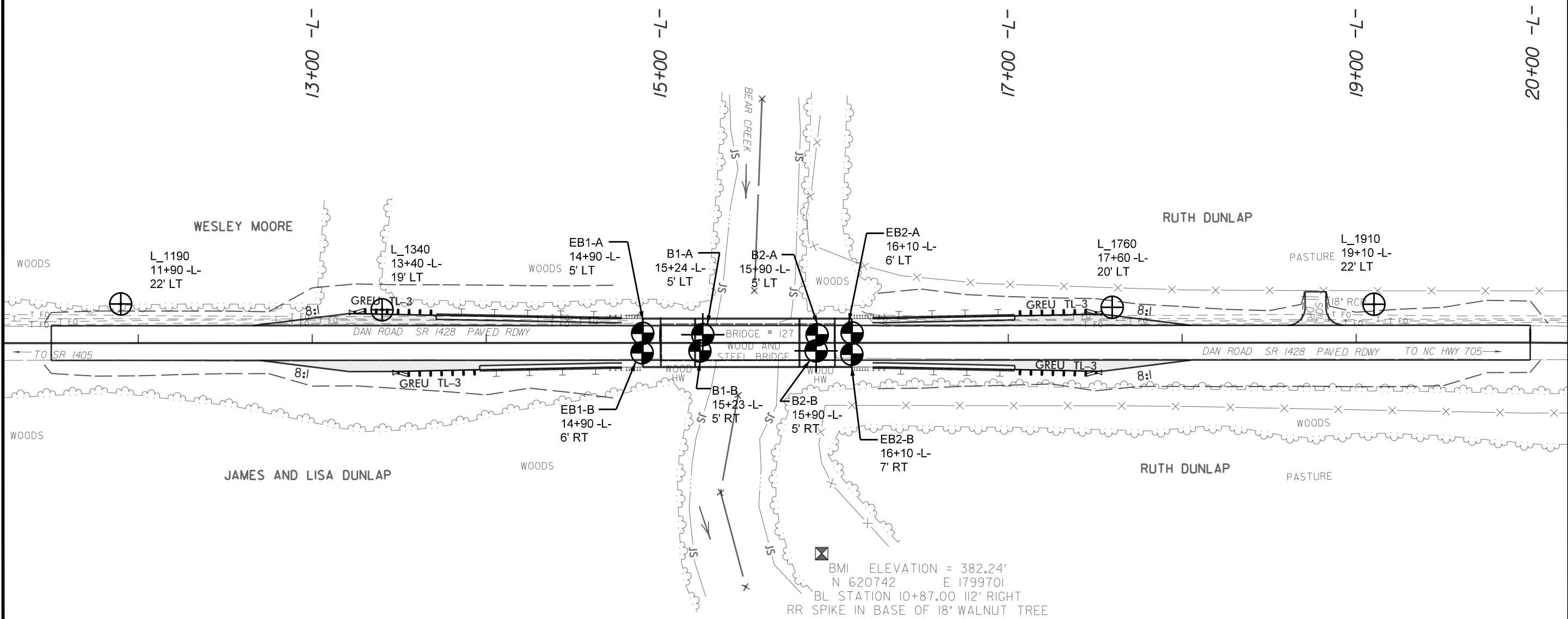
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

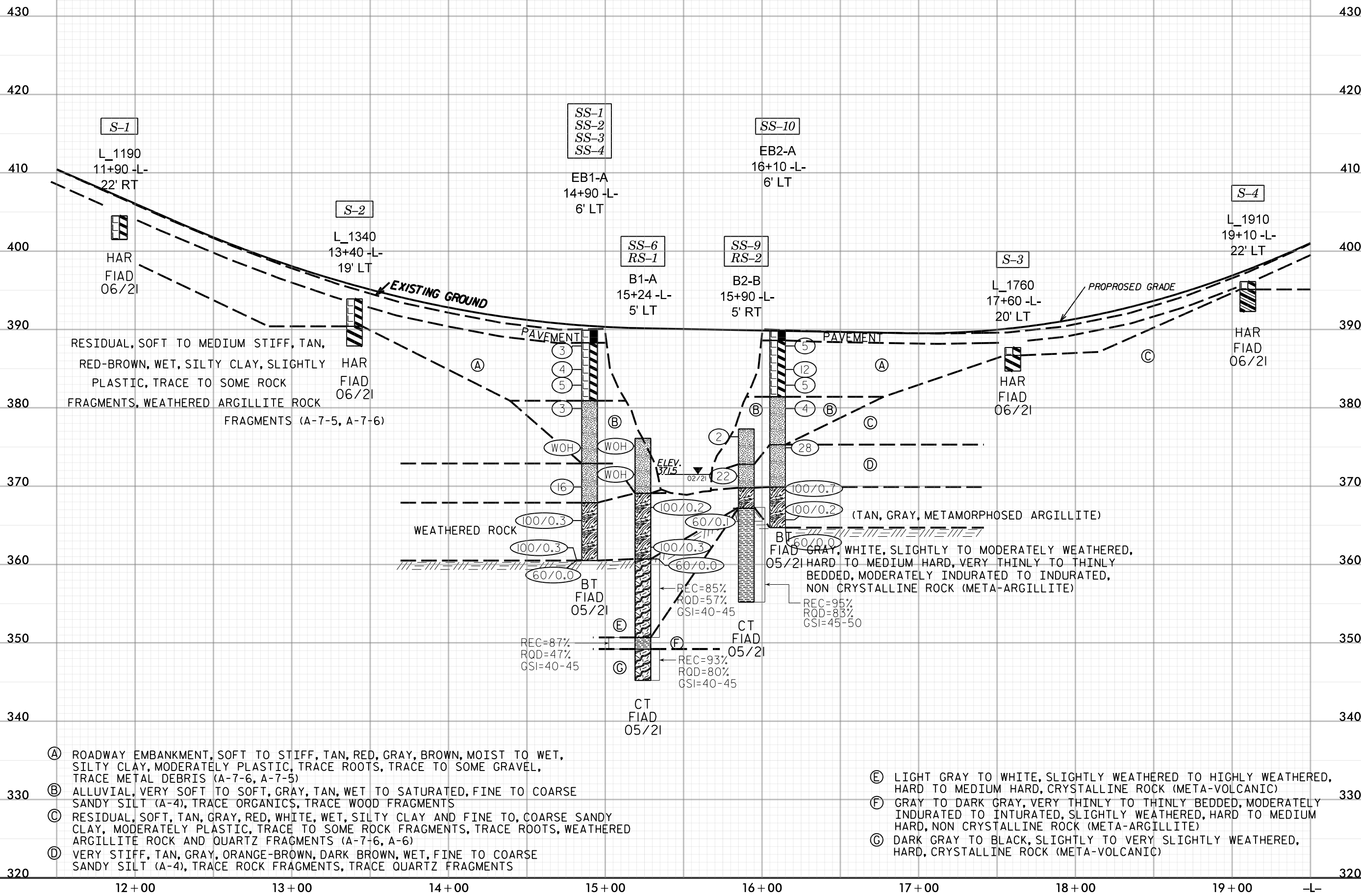
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

<p>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</p> <p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.</p>	<p>SURFACE CONDITIONS</p> <p>VERY GOOD Very rough, fresh unweathered surfaces</p> <p>GOOD Rough, slightly weathered, iron stained surfaces</p> <p>FAIR Smooth, moderately weathered and altered surfaces</p> <p>POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments</p> <p>VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings</p>	<p>STRUCTURE</p> <p>INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities</p> <p>BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets</p> <p>VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets</p> <p>BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity</p> <p>DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces</p> <p>LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes</p>	<p>DECREASING SURFACE QUALITY ➡</p> <p>DECREASING INTERLOCKING OF ROCK PIECES ➡</p>	<p>GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)</p> <p>From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.</p>	<p>SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)</p> <p>VERY GOOD - Very Rough, fresh unweathered surfaces</p> <p>GOOD - Rough, slightly weathered surfaces</p> <p>FAIR - Smooth, moderately weathered and altered surfaces</p> <p>POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments</p> <p>VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings</p>	<p>COMPOSITION AND STRUCTURE</p> <p>A. Thick bedded, very blocky sandstone. The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.</p> <p>B. Sandstone with thin inter-layers of siltstone</p> <p>C. Sandstone and siltstone in similar amounts</p> <p>D. Siltstone or silty shale with sandstone layers</p> <p>E. Weak siltstone or clayey shale with sandstone layers</p> <p>C, D, E, and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H.</p> <p>F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</p> <p>G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers</p> <p>H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.</p> <p>➡ Means deformation after tectonic disturbance</p>	<p>70</p> <p>60</p> <p>50</p> <p>40</p> <p>30</p> <p>20</p> <p>10</p>
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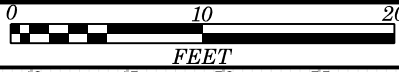
PROJECT REFERENCE NO.	SHEET NO.
BP8.010	3
SITE PLAN	
<div><div>060120</div><div>FEET</div></div>	
SKEW ANGLE 90°	





6/23/16

08-SEP-2021 15:56
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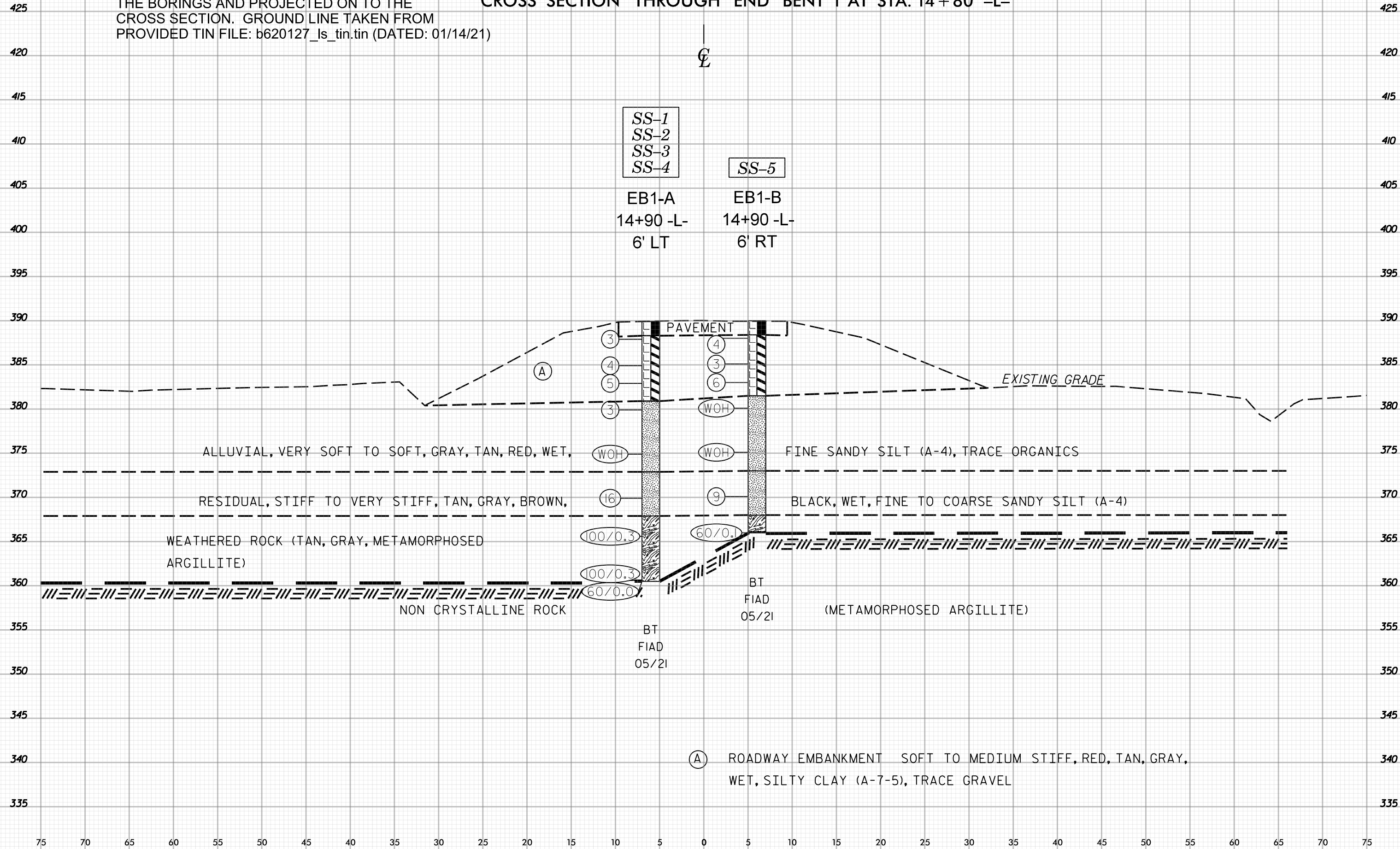


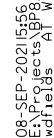
PROJ. REFERENCE NO.	SHEET NO.
BP8.R010	5

SKEW ANGLE 90°

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS AND PROJECTED ON TO THE CROSS SECTION. GROUND LINE TAKEN FROM PROVIDED TIN FILE: b620127_ls_tin.tin (DATED: 01/14/21)

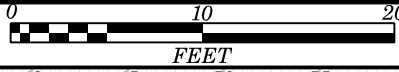
CROSS SECTION THROUGH END BENT 1 AT STA. 14 + 80 -L-





6/23/16

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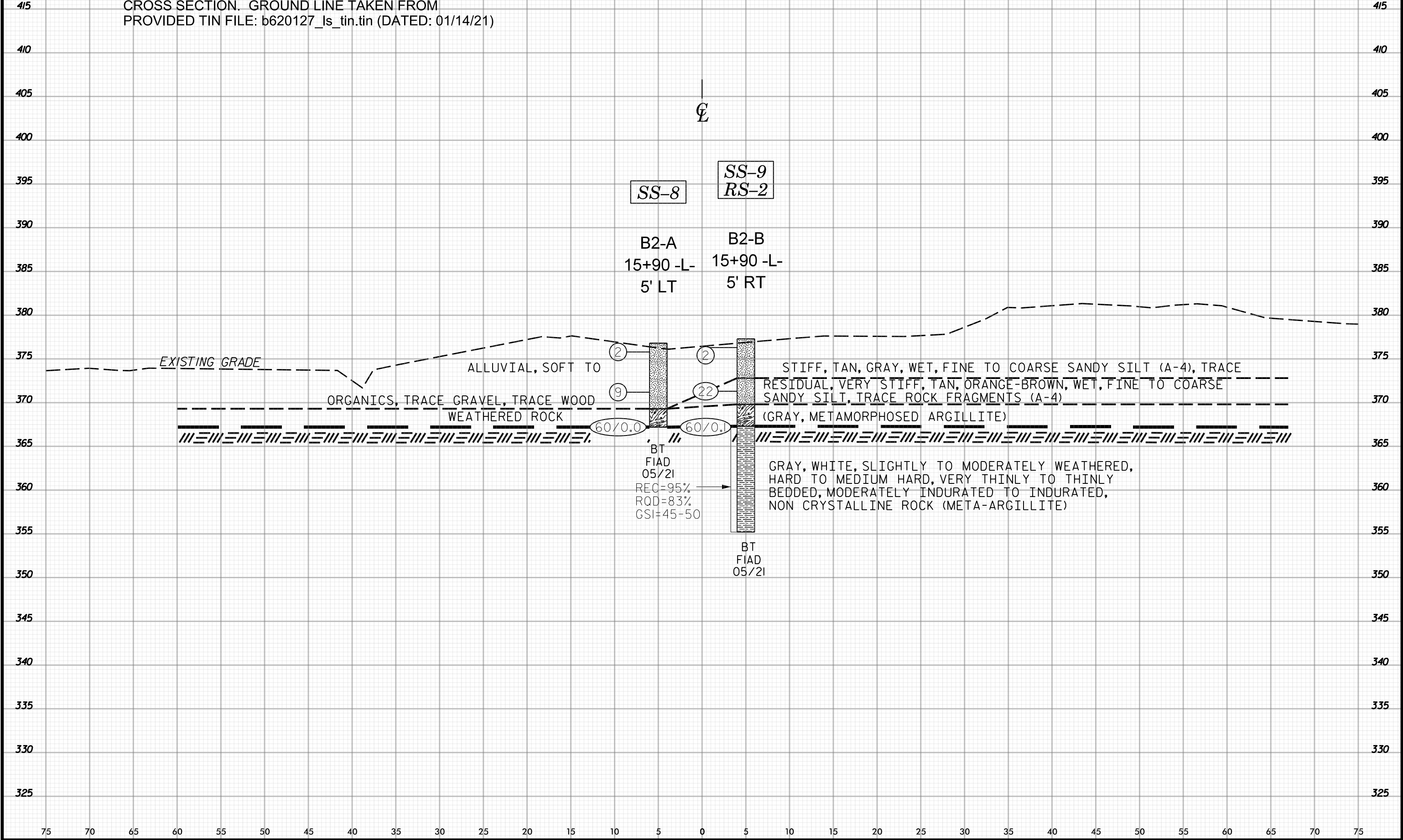


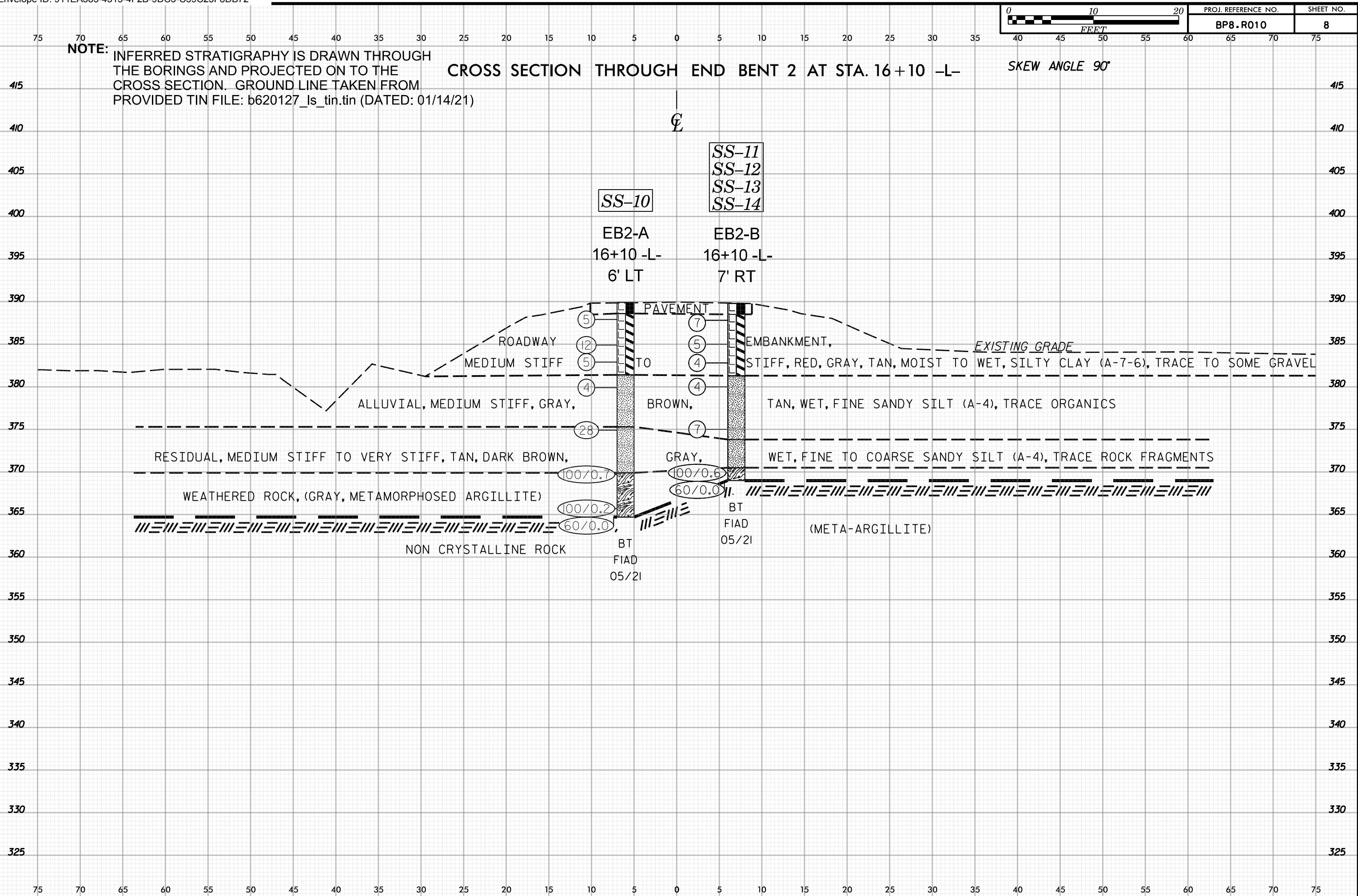
PROJ. REFERENCE NO.	SHEET NO.
BP8.R010	7

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS AND PROJECTED ON TO THE CROSS SECTION. GROUND LINE TAKEN FROM PROVIDED TIN FILE: b620127_Is_tin.tin (DATED: 01/14/21)

CROSS SECTION THROUGH BENT 2 AT STA. 15+80 -L-

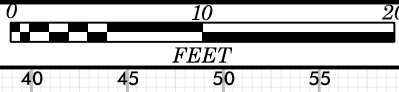
SKEW ANGLE 90°





6/23/16

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PROJ. REFERENCE NO.	SHEET NO.
BP8.R011	9

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS AND PROJECTED ON TO THE CROSS SECTION. GROUND LINE TAKEN FROM PROVIDED TIN FILE: b620127_Is_tin.tin (DATED: 01/14/21)

CROSS SECTION THROUGH EXISTING GRADE AT STA. 12 + 00 -L-

℄

S-1
L_1190
11+90 -L-
22' LT



HAR
FIAD
06/21

2:1

(A)

PROPOSED GRADE

2:1

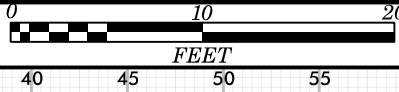
EXISTING GRADE

RESIDUAL, SOFT, TAN, RED-BROWN, WET, SILTY CLAY (A-7-5), SLIGHTLY PLASTIC, TRACE ROCK FRAGMENTS, WEATHERED ARGILLITE ROCK FRAGMENTS AT A DEPTH OF 3.0 FEET

(A) ROADWAY EMBANKMENT, SOFT, RED, WET, SILTY CLAY, MODERATELY PLASTIC, TRACE ROOTS, TRACE GRAVEL (A-7-6)

6/23/16

08-SEP-2021 15:56
C:\p\c\es\16\1608\BP8.R010.GEO.BRDG0127\B-ridge 127 - EJK\BP8.R010\BP8.R010.GEO.BRDG0127\CADD.GEOTECH\Site&Sub\BP8.R010_GEO_rdy_XSC.sdg
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PROJ. REFERENCE NO.	SHEET NO.
BP8.R011	10

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS AND PROJECTED ON TO THE CROSS SECTION. GROUND LINE TAKEN FROM PROVIDED TIN FILE: b620127_Is_tin.tin (DATED: 01/14/21)

CROSS SECTION THROUGH EXISTING GRADE AT STA. 13+50 -L-

CL

S-2

L_1340
13+40 -L-
19' LT

2:1

PROPOSED GRADE

2:1

EXISTING GRADE

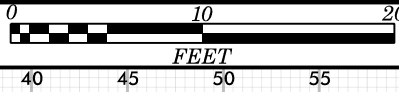
RESIDUAL, SOFT TO MEDIUM STIFF, TAN, RED-BROWN, WET, SILTY CLAY (A-7-6), SLIGHTLY PLASTIC, SOME ROCK FRAGMENTS, WEATHERED ARGILLITE ROCK FRAGMENTS AT A DEPTH OF 6.0 FEET

HAR
FIAD
06/21

Ⓐ ROADWAY EMBANKMENT, SOFT, TAN, WET, SILTY CLAY (A-7-5), MODERATELY PLASTIC, TRACE METAL DEBRIS, TRACE GRAVEL, TRACE ROOTS

6/23/16

08-SEP-2021 15:56
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E:\P\0\1556\BP8\010\GEO\BRDG0127\B-ridge 127 - EJK\BP8.R010\BP8.R010.GEO.BRDG0127\CADD.GEOTECH\Site&Sub\BP8.R010_GEO_rdy_XSC.sdg



PROJ. REFERENCE NO.	SHEET NO.
BP8.R010	11

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS AND PROJECTED ON TO THE CROSS SECTION. GROUND LINE TAKEN FROM PROVIDED TIN FILE: b620127_Is_tin.tin (DATED: 01/14/21)

CROSS SECTION THROUGH EXISTING GRADE AT STA. 17+50 -L-

CL

S-3

L_1760
17+60 -L-
20' LT

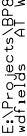
PROPOSED GRADE

EXISTING GRADE

RESIDUAL, SOFT, TAN, GRAY, WHITE, WET, SILTY CLAY (A-7-6), MODERATELY PLASTIC, TRACE TO SOME ROCK FRAGMENTS, WEATHERED ARGILLITE AND QUARTZ FRAGMENTS AT A DEPTH OF 3.0 FEET

HAR
FIAD
06/21

(A) ROADWAY EMBANKMENT, SOFT, RED-BROWN, TAN, WET, SILTY CLAY (A-7-6), MODERATELY PLASTIC






GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1			TIP SF-620127			COUNTY MOORE			GEOLOGIST Russek, S.C.									
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek											GROUND WTR (ft)							
BORING NO. EB1-A			STATION 14+90			OFFSET 6 ft LT			ALIGNMENT -L-			0 HR. 22.3						
COLLAR ELEV. 389.9 ft			TOTAL DEPTH 29.4 ft			NORTHING 620,659			EASTING 1,799,560			24 HR. FIAD						
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic								
DRILLER Turnage, J.R.			START DATE 05/25/21			COMP. DATE 05/25/21			SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)			
390														389.9	GROUND SURFACE	0.0		
385	388.9	1.0	2	1	2	3	.	.	.	.	.	SS-1	34%		388.3	PAVEMENT	1.6
	385.9	4.0	2	2	2	4	.	.	.	.	.	SS-2	26%		0.8' ASPHALT, 0.8' ABC		
	383.9	6.0	5	3	2	5	.	.	.	.	.	SS-3	21%		ROADWAY EMBANKMENT		
380	380.9	9.0	2	1	2	6	.	.	.	.	.	SS-4	31%		380.9	SOFT TO MEDIUM STIFF, RED, TAN, WET, SILTY CLAY (A-7-5), TRACE GRAVEL	
						3	.	.	.	.	.		
375	375.9	14.0	WOH	WOH	WOH	7					372.9	ALLUVIAL	9.0
						8	.	.	.	.	.		W			VERY SOFT TO SOFT, GRAY, TAN, WET, FINE SANDY SILT (A-4), TRACE ORGANICS	
370	370.9	19.0	5	8	8	9		W			372.9	RESIDUAL	17.0
						16						VERY STIFF, TAN, GRAY, BROWN, BLACK, WET, FINE TO COARSE SANDY SILT (A-4)	
365	365.9	24.0	100/0.3				.	.	.	.	.				367.9	WEATHERED ROCK	22.0
							.	.	.	.	.					(TAN, GRAY, METAMORPHOSED ARGILLITE)	
	360.9	29.0									360.5	Boring Terminated with Standard Penetration Test Refusal at Elevation 360.5 ft ON NON CRYSTALLINE ROCK (METAMORPHOSED ARGILLITE)	29.4
	360.5	29.4	100/0.3	60/0.0			.	.	.	.	.		

NC DOT BORE SINGLE BP8.R010.GEO_BRDG620127.MOORE.GPJ NC_DOT.GDT 9/8/21

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1			TIP SF-620127			COUNTY MOORE			GEOLOGIST Russek, S.C.						
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek												GROUND WTR (ft)			
BORING NO. EB1-B			STATION 14+90			OFFSET 6 ft RT			ALIGNMENT -L-			0 HR.	Caved		
COLLAR ELEV. 390.0 ft			TOTAL DEPTH 24.0 ft			NORTHING 620,657			EASTING 1,799,571			24 HR.	FIAD		
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER Turnage, J.R.			START DATE 05/25/21			COMP. DATE 05/25/21			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
390														390.0	GROUND SURFACE 0.0
385	389.0	1.0	2	2	2	4	.	.	.	.	SS-5	19%		388.4	PAVEMENT 1.6
	386.1	3.9	2	1	2	3	.	.	.	.				W	0.8' ASPHALT, 0.8' ABC
380	384.0	6.0	2	3	3	6	.	.	.	.				W	ROADWAY EMBANKMENT
	381.1	8.9	WOH	WOH	WOH	0	.	.	.	.				W	SOFT TO MEDIUM STIFF, RED, TAN, GRAY, WET, SILTY CLAY (A-7-5), TRACE GRAVEL
375						0	.	.	.	.				381.5	ALLUVIAL 8.5
	376.1	13.9	WOH	WOH	WOH	0	.	.	.	.	W	VERY SOFT, TAN, GRAY, RED, WET, FINE SANDY SILT (A-4), TRACE ORGANICS			
370							.	.	.	.				373.0	RESIDUAL 17.0
	371.1	18.9	4	5	4	9	.	.	.	.				STIFF, TAN, GRAY, BLACK, WET, FINE TO COARSE SANDY SILT (A-4)	
							.	.	.	.				368.0	WEATHERED ROCK 22.0
	366.1	23.9	60/0.1				.	.	.	.				366.1	(GRAY, METAMORPHOSED ARGILLITE) 23.9
							.	.	.	.				366.0	NON-CRYSTALLINE ROCK 24.0
							.	.	.	.					(METAMORPHOSED ARGILLITE)
							.	.	.	.					Boring Terminated with Standard Penetration Test Refusal at Elevation 366.0 ft ON NON CRYSTALLINE ROCK (METAMORPHOSED ARGILLITE)

NC DOT BORE SINGLE BP8.R010.GEO_BRDG620127.MOORE.GPJ NC_DOT.GDT 9/8/21




GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1				TIP SF-620127				COUNTY MOORE				GEOLOGIST Russek, S.C.					
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek												GROUND WTR (ft)					
BORING NO. B1-A				STATION 15+24				OFFSET 5 ft LT				ALIGNMENT -L-				0 HR. N/A	
COLLAR ELEV. 376.1 ft				TOTAL DEPTH 30.9 ft				NORTHING 620,693				EASTING 1,799,566				24 HR. FIAD	
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021								DRILL METHOD Wash Boring				HAMMER TYPE Automatic					
DRILLER Turnage, J.R.				START DATE 05/26/21				COMP. DATE 05/26/21				SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
380																	
375	376.1	0.0	WOH	WOH	WOH	0							W	376.1	GROUND SURFACE	0.0	
370	372.5	3.6	WOH	WOH	WOH	0							SS-6	25%	ALLUVIAL VERY SOFT, TAN, GRAY, WET TO SATURATED, FINE TO COARSE SANDY SILT (A-4), TRACE ORGANICS		
365	367.5	8.6													369.1	WEATHERED ROCK (GRAY, BROWN, METAMORPHOSED ARGILLITE)	7.0
360	362.5 360.7	13.6 15.4													360.7	CRYSTALLINE ROCK (META-VOLCANIC)	15.4
355													RS-1				
350													RS-2		350.7	NON-CRYSTALLINE ROCK (META-ARGILLITE)	25.4
															349.2	CRYSTALLINE ROCK (META-VOLCANIC)	26.9
															345.2	Boring Terminated at Elevation 345.2 ft IN CRYSTALLINE ROCK (META-VOLCANIC)	30.9

NCDOT BORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21

GEOTECHNICAL BORING REPORT
CORE LOG

WBS BP8.R010.1				TIP SF-620127				COUNTY MOORE				GEOLOGIST Russek, S.C.							
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek												GROUND WTR (ft)							
BORING NO. B1-A				STATION 15+24				OFFSET 5 ft LT				ALIGNMENT -L-				0 HR. N/A			
COLLAR ELEV. 376.1 ft				TOTAL DEPTH 30.9 ft				NORTHING 620,693				EASTING 1,799,566				24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021								DRILL METHOD Wash Boring				HAMMER TYPE Automatic							
DRILLER Turnage, J.R.				START DATE 05/26/21				COMP. DATE 05/26/21				SURFACE WATER DEPTH N/A							
CORE SIZE NQ2				TOTAL RUN 15.5 ft															
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS				DEPTH (ft)				
					REC. (ft) %	ROD (ft) %		REC. (ft) %	ROD (ft) %										
360.7	360.7	15.4	0.5	2:31/0.5	(0.5)	(0.5)	RS-1	(8.5)	(5.7)		360.7	Begin Coring @ 15.4 ft CRYSTALLINE ROCK LIGHT GRAY TO WHITE, SLIGHTLY WEATHERED TO HIGHLY WEATHERED, HARD TO MEDIUM HARD, CRYSTALLINE ROCK (META-VOLCANIC) (GSI = 40-45)		15.4					
	360.2	15.9	5.0	3:36/1.0 1:51/1.0 1:36/1.0 1:35/1.0	100% (4.2)	100% (2.7)		85%	57%										
	355.2	20.9		2:02/1.0	84%	54%	RS-2												
			5.0	2:57/1.0 4:17/1.0 2:46/1.0 3:05/1.0	(4.1) 82%	(2.5) 50%													
350	350.2	25.9		2:36/1.0				(1.3) 87%	(0.7) 47%		350.7	NON-CRYSTALLINE ROCK GRAY TO DARK GRAY, VERY THINLY TO THINLY BEDDED, MODERATELY INDURATED TO INTURATED, SLIGHTLY WEATHERED, HARD TO MEDIUM HARD, META-ARGILLITE (NON CRYSTALLINE ROCK) (GSI = 40-45)		25.4					
			5.0	1:49/1.0 2:32/1.0 2:38/1.0 2:44/1.0	(4.7) 94%	(4.4) 88%		(3.7) 93%	(3.2) 80%		349.2			26.9					
	345.2	30.9		3:01/1.0							345.2	CRYSTALLINE ROCK DARK GRAY TO BLACK, SLIGHTLY TO VERY SLIGHTLY WEATHERED, HARD, CRYSTALLINE ROCK (META-VOLCANIC) (GSI = 40-45) Boring Terminated at Elevation 345.2 ft IN CRYSTALLINE ROCK (META-VOLCANIC)		30.9					

NCDOT CORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21

CORE PHOTOGRAPHS

BRIDGE 620127 ON SR 1428 (DAN ROAD) OVER BEAR CREEK

PROJECT REFERENCE NO.	SHEET NO.
BP8.R010	15

B1-A
BOX 1 OF 2
15.4 - 25.9 FEET



B1-A
BOX 2 OF 2
25.9-30.9 FEET






GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1			TIP SF-620127			COUNTY MOORE			GEOLOGIST Russek, S.C.					
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek										GROUND WTR (ft)				
BORING NO. B1-B			STATION 15+23			OFFSET 5 ft RT			ALIGNMENT -L-		0 HR. N/A			
COLLAR ELEV. 375.1 ft			TOTAL DEPTH 12.8 ft			NORTHING 620,690			EASTING 1,799,575		24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021						DRILL METHOD Wash Boring				HAMMER TYPE Automatic				
DRILLER Turnage, J.R.			START DATE 05/26/21			COMP. DATE 05/26/21			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft) DEPTH (ft)
380														
375	375.1	0.0												375.1 GROUND SURFACE 0.0
370	372.3	2.8	1	1	1	0.1	0.2	0.3	0.4	0.5	SS-7	28%	371.3	ALLUVIAL VERY SOFT TO SOFT, GRAY, TAN, BLACK, WET, FINE TO COARSE SANDY SILT (A-4), TRACE ORGANICS 3.8
	367.3	7.8	34	64	36/0.3	1	2	3	4	5		W	366.8	RESIDUAL STIFF TO VERY STIFF, TAN, RED, WHITE, WET, FINE TO COARSE SANDY CLAY, MODERATELY PLASTIC (A-6) 8.3
365	362.3	12.8	60/0.0			6	7	8	9	10	100/0.8		362.3	WEATHERED ROCK (GRAY, BROWN, METAMORPHOSED ARGILLITE) 12.8
														Boring Terminated with Standard Penetration Test Refusal at Elevation 362.3 ft ON NON CRYSTALLINE ROCK (METAMORPHOSED ARGILLITE)

NCDOT BORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21


GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1			TIP SF-620127			COUNTY MOORE			GEOLOGIST Russek, S.C.						
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek									GROUND WTR (ft)						
BORING NO. B2-A			STATION 15+90			OFFSET 5 ft LT			ALIGNMENT -L-			0 HR. N/A			
COLLAR ELEV. 376.8 ft			TOTAL DEPTH 9.6 ft			NORTHING 620,758			EASTING 1,799,576			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021						DRILL METHOD Wash Boring			HAMMER TYPE Automatic						
DRILLER Turnage, J.R.			START DATE 05/25/21			COMP. DATE 05/25/21			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		MOI		ELEV. (ft) DEPTH (ft)	
380															
	376.8	0.0												376.8 GROUND SURFACE 0.0	
375			1	1	1	2					SS-8	30%		ALLUVIAL SOFT TO STIFF, TAN, GRAY, WET, FINE TO COARSE SANDY SILT (A-4), TRACE ORGANICS, TRACE GRAVEL WEATHERED ROCK (GRAY, METAMORPHOSED ARGILLITE)	
	372.2	4.6	1	2	7							W			369.3 7.5
370	367.2	9.6	60/0.0			60/0.0									367.2 9.6
Boring Terminated with Standard Penetration Test Refusal at Elevation 367.2 ft ON NON CRYSTALLINE ROCK (METAMORPHOSED ARGILLITE)															

NCDOT BORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21

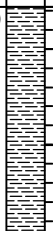


GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1			TIP SF-620127			COUNTY MOORE			GEOLOGIST Russek, S.C.						
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek									GROUND WTR (ft)						
BORING NO. B2-B			STATION 15+90			OFFSET 5 ft RT			ALIGNMENT -L-			0 HR. N/A			
COLLAR ELEV. 377.3 ft			TOTAL DEPTH 22.1 ft			NORTHING 620,756			EASTING 1,799,585			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021						DRILL METHOD Wash Boring			HAMMER TYPE Automatic						
DRILLER Turnage, J.R.			START DATE 05/28/21			COMP. DATE 05/28/21			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
380															
	377.3	0.0												377.3	0.0
375			WOH	1	1							W		GROUND SURFACE	
	372.3	5.0										16%		ALLUVIAL SOFT, TAN, WET, FINE SANDY SILT (A-4), TRACE ORGANICS, TRACE WOOD FRAGMENTS	
370			8	9	13						SS-9			RESIDUAL VERY STIFF, TAN, ORANGE-BROWN, WET, FINE TO COARSE SANDY SILT (A-4), TRACE ROCK FRAGMENTS	
	367.3	10.0												WEATHERED ROCK (GRAY, METAMORPHOSED ARGILLITE)	
365			60/0.1											367.2	10.1
360											RS-3				
											RS-4				
														355.2	22.1
Boring Terminated at Elevation 355.2 ft IN NON CRYSTALLINE ROCK (METAMORPHOSED ARGILLITE)															

NCDOT BORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21

GEOTECHNICAL BORING REPORT
CORE LOG

WBS BP8.R010.1					TIP SF-620127					COUNTY MOORE					GEOLOGIST Russek, S.C.									
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek															GROUND WTR (ft)									
BORING NO. B2-B					STATION 15+90					OFFSET 5 ft RT					ALIGNMENT -L-					0 HR. N/A				
COLLAR ELEV. 377.3 ft					TOTAL DEPTH 22.1 ft					NORTHING 620,756					EASTING 1,799,585					24 HR. FIAD				
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021										DRILL METHOD Wash Boring					HAMMER TYPE Automatic									
DRILLER Turnage, J.R.					START DATE 05/28/21					COMP. DATE 05/28/21					SURFACE WATER DEPTH N/A									
CORE SIZE NQ2					TOTAL RUN 12.0 ft																			
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS													
					REC. (ft) %	ROD (ft) %		REC. (ft) %	ROD (ft) %															
367.2																								
	367.2	10.1	2.0	2:30/1.0	(1.6)	(0.4)		(11.4)	(10.0)		Begin Coring @ 10.1 ft NON-CRYSTALLINE ROCK GRAY, WHITE, SLIGHTLY TO MODERATELY WEATHERED, HARD TO MEDIUM HARD, VERY THINLY TO THINLY BEDDED, MODERATELY INDURATED TO INDURATED (GSI = 45-50)													
365	365.2	12.1		2:33/1.0	80%	20%		95%	83%															
			5.0	2:11/1.0	(5.0)	(4.9)	RS-3																	
				2:09/1.0	100%	98%																		
				2:04/1.0																				
360	360.2	17.1		2:07/1.0																				
			5.0	2:24/1.0			RS-4																	
				2:18/1.0	(4.8)	(4.7)																		
				2:23/1.0	96%	94%																		
				2:26/1.0																				
	355.2	22.1		2:33/1.0																				
				2:50/1.0																				
Boring Terminated at Elevation 355.2 ft IN NON CRYSTALLINE ROCK (METAMORPHOSED ARGILLITE)																								

NCDOT CORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21

CORE PHOTOGRAPHS

BRIDGE 620127 ON SR 1428 (DAN ROAD) OVER BEAR CREEK

PROJECT REFERENCE NO.	SHEET NO.
BP8.R010	18

B2-B
BOX 1 OF 2
10.1 - 19.1 FEET



B2-B
BOX 2 OF 2
19.1 - 22.1 FEET









GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1				TIP SF-620127				COUNTY MOORE				GEOLOGIST Russek, S.C.						
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek												GROUND WTR (ft)						
BORING NO. EB2-A				STATION 16+10				OFFSET 6 ft LT				ALIGNMENT -L-				0 HR. Caved		
COLLAR ELEV. 389.9 ft				TOTAL DEPTH 25.2 ft				NORTHING 620,778				EASTING 1,799,578				24 HR. FIAD		
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic						
DRILLER Turnage, J.R.				START DATE 05/25/21				COMP. DATE 05/25/21				SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)			
390														389.9	GROUND SURFACE	0.0		
385	388.9	1.0		4	3	2							M		388.6	PAVEMENT	1.3	
	385.9	4.0		3	4	8							M		0.5' ASPHALT, 0.8' ABC			
380	383.9	6.0		3	3	2							W		381.4	ROADWAY EMBANKMENT	8.5	
	380.9	9.0		2	2	2							SS-10		26%	ALLUVIAL		
375															375.3	MEDIUM STIFF, TAN, GRAY, WET, FINE SANDY SILT (A-4), TRACE ORGANICS	14.6	
	375.9	14.0		6	15	13							W		RESIDUAL			
370															369.9	VERY STIFF, TAN, DARK BROWN, WET, FINE TO COARSE SANDY SILT (A-4), TRACE QUARTZ FRAGMENTS	20.0	
	370.9	19.0		9	21	79/0.2									WEATHERED ROCK			
365																(GRAY, METAMORPHOSED ARGILLITE)		
	365.9	24.0													100/0.7			
	364.7	25.2													100/0.2			
																60/0.0		
																	Boring Terminated with Standard Penetration Test Refusal at Elevation 364.7 ft ON NON CRYSTALLINE ROCK (METAMORPHOSED ARGILLITE)	

NCDOT BORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1			TIP SF-620127			COUNTY MOORE			GEOLOGIST Russek, S.C.							
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek									GROUND WTR (ft)							
BORING NO. EB2-B			STATION 16+10			OFFSET 7 ft RT			ALIGNMENT -L-			0 HR. Caved				
COLLAR ELEV. 389.8 ft			TOTAL DEPTH 20.8 ft			NORTHING 620,776			EASTING 1,799,590			24 HR. FIAD				
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic							
DRILLER Turnage, J.R.			START DATE 05/25/21			COMP. DATE 05/25/21			SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
390														389.8	GROUND SURFACE	0.0
385	388.8	1.0	2	2	5						SS-11	15%		388.5	PAVEMENT	1.3
	386.0	3.8	2	3	2						SS-12	14%		ROADWAY EMBANKMENT		
	383.8	6.0	1	1	3						SS-13	23%		MEDIUM STIFF, RED, GRAY, TAN, WET, SILTY CLAY (A-7-6), TRACE TO SOME GRAVEL		
380	381.0	8.8	2	1	3						SS-14	21%		381.3	ALLUVIAL	8.5
														MEDIUM STIFF, GRAY, BROWN, TAN, WET, FINE SANDY SILT (A-4), TRACE ORGANICS		
375	376.0	13.8	3	3	4						W			373.8	RESIDUAL	16.0
370	371.0	18.8	5	60	40/0.1									MEDIUM STIFF, TAN, GRAY, WET, FINE TO COARSE SANDY SILT (A-4), TRACE ROCK FRAGMENTS		
	369.0	20.8	60/0.0											100/0.6		370.5	WEATHERED ROCK	19.3
											60/0.0			369.0	(GRAY, METAMORPHOSED ARGILLITE)	20.8
															Boring Terminated with Standard Penetration Test Refusal at Elevation 369.0 ft ON NON CRYSTALLINE ROCK (METAMORPHOSED ARGILLITE)	

NCDOT BORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21



GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1						TIP SF-620127			COUNTY MOORE					GEOLOGIST Russek, S.C.				
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek														GROUND WTR (ft)				
BORING NO. L_1190						STATION 11+90			OFFSET 22 ft LT			ALIGNMENT -L-			0 HR. Dry			
COLLAR ELEV. 404.5 ft						TOTAL DEPTH 3.0 ft			NORTHING 620,365			EASTING 1,799,498			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE N/A									DRILL METHOD Hand Auger					HAMMER TYPE Automatic				
DRILLER N/A						START DATE 06/04/21			COMP. DATE 06/04/21			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼ MOI	L O G	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft) DEPTH (ft)				
405														GROUND SURFACE 404.5 0.0				
												W	19%	ROADWAY EMBANKMENT 401.5 3.0				
												S-1		SOFT, RED, WET, SILTY CLAY (A-7-6), MODERATELY PLASTIC, TRACE ROOTS, TRACE GRAVEL Boring Terminated at Elevation 401.5 ft ON RESIDUAL SILTY CLAY DUE TO HAND AUGER REFUSAL				

NCDOT BORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1						TIP SF-620127			COUNTY MOORE					GEOLOGIST Russek, S.C.				
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek														GROUND WTR (ft)				
BORING NO. L_1340						STATION 13+40			OFFSET 19 ft LT			ALIGNMENT -L-			0 HR. Dry			
COLLAR ELEV. 393.9 ft						TOTAL DEPTH 6.0 ft			NORTHING 620,513			EASTING 1,799,524			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE N/A									DRILL METHOD Hand Auger					HAMMER TYPE Automatic				
DRILLER N/A						START DATE 06/04/21			COMP. DATE 06/04/21			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼ MOI	L O G	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft) DEPTH (ft)				
395														GROUND SURFACE 393.9 0.0				
												W	30%	ROADWAY EMBANKMENT 390.4 3.5				
390												S-2		SOFT, TAN, WET, SILTY CLAY (A-7-5), MODERATELY PLASTIC, TRACE METAL DEBRIS, TRACE GRAVEL, TRACE ROOTS				
												W		RESIDUAL 387.9 6.0				
														SOFT TO MEDIUM STIFF, TAN, RED-BROWN, WET, SILTY CLAY (A-7-6), SLIGHTLY PLASTIC, SOME ROCK FRAGMENTS, WEATHERED ARGILLITE ROCK FRAGMENTS AT A DEPTH OF 6.0 FEET Boring Terminated at Elevation 387.9 ft ON RESIDUAL SILTY CLAY DUE TO HAND AUGER REFUSAL				

NCDOT BORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21



GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1					TIP SF-620127			COUNTY MOORE					GEOLOGIST Russek, S.C.						
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek													GROUND WTR (ft)						
BORING NO. L_1760					STATION 17+60			OFFSET 20 ft LT			ALIGNMENT -L-			0 HR. Dry					
COLLAR ELEV. 387.7 ft					TOTAL DEPTH 3.0 ft			NORTHING 620,928			EASTING 1,799,586			24 HR. FIAD					
DRILL RIG/HAMMER EFF./DATE N/A								DRILL METHOD Hand Auger					HAMMER TYPE Automatic						
DRILLER N/A					START DATE 06/04/21			COMP. DATE 06/04/21			SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION					
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					ELEV. (ft) DEPTH (ft)				
390																			
															387.7 GROUND SURFACE 0.0				
															386.7 ROADWAY EMBANKMENT 1.0				
385											S-3	W 19%			384.7 SOFT, RED-BROWN, TAN, WET, SILTY CLAY (A-7-6), MODERATELY PLASTIC 3.0				
															RESIDUAL SOFT, TAN, GRAY, WHITE, WET, SILTY CLAY (A-7-6), MODERATELY PLASTIC, TRACE TO SOME ROCK FRAGMENTS, WEATHERED ARGILLITE AND QUARTZ FRAGMENTS AT A DEPTH OF 3.0 FEET Boring Terminated at Elevation 384.7 ft ON RESIDUAL SILTY CLAY DUE TO HAND AUGER REFUSAL *2 OFFSETS ATTEMPTED, 3 FEET UP STATION AND DOWN STATION, BOTH HAD REFUSAL AT AN APPROXIMATE DEPTH OF 1.0 FEET				

NCDOT BORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP8.R010.1					TIP SF-620127			COUNTY MOORE					GEOLOGIST Russek, S.C.						
SITE DESCRIPTION Bridge 620127 on SR 1428 (Dan Road) over Bear Creek													GROUND WTR (ft)						
BORING NO. L_1910					STATION 19+10			OFFSET 22 ft LT			ALIGNMENT -L-			0 HR. Dry					
COLLAR ELEV. 396.1 ft					TOTAL DEPTH 3.8 ft			NORTHING 621,077			EASTING 1,799,607			24 HR. FIAD					
DRILL RIG/HAMMER EFF./DATE N/A								DRILL METHOD Hand Auger					HAMMER TYPE Automatic						
DRILLER N/A					START DATE 06/04/21			COMP. DATE 06/04/21			SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION					
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					ELEV. (ft) DEPTH (ft)				
400																			
															396.1 GROUND SURFACE 0.0				
															395.1 ROADWAY EMBANKMENT 1.0				
395											S-4	W 21%			392.3 SOFT, RED-BROWN, WET, SILTY CLAY (A-7-6), MODERATELY PLASTIC, TRACE ROOTS 3.8				
															RESIDUAL SOFT, TAN, RED, WHITE, WET, FINE TO COARSE SANDY CLAY (A-6), MODERATELY PLASTIC, TRACE ROOTS, TRACE TO SOME ROCK FRAGMENTS, WEATHERED ARGILLITE ROCK FRAGMENTS AT A DEPTH OF 3.8 FEET Boring Terminated at Elevation 392.3 ft ON RESIDUAL SILTY CLAY DUE TO HAND AUGER REFUSAL				

NCDOT BORE SINGLE BP8.R010_GEO_BRDG620127_MOORE.GPJ NC_DOT.GDT 9/8/21

LABORATORY TESTING SUMMARY

PROJECT NUMBER: BP8.R010

TIP: BP8.R010

COUNTY: Moore

DESCRIPTION: Bridge 620127 on SR 1428 (Dan Road) over Bear Creek

[illegible]

NP - NON-PLASTIC

Stephanie H. Huffman

Certified Lab Technician Signature

114-01-1203

Certification Number

LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

PROJECT NO.: BR8.R010

F.A. NO.: N/A

COUNTY: Moore

[illegible]

PROJECT REFERENCE NO.	SHEET NO.
BP8.R010	24

SITE PHOTOGRAPHS

BRIDGE 620127 ON SR 1428 (DAN ROAD)
OVER BEAR CREEK



SOUTHEAST OF BRIDGE DOWN STATION TOWARD END BENT 1



LOOKING NORTH FROM END BENT 1 TOWARD END BENT 2