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STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY <u>HAYWOOD</u>

PROJECT DESCRIPTION REPLACE BRIDGE NO. 430169 ON SR 1876 (SONOMA RD) OVER WEST FORK PIGEON RIVER

STATE PROJECT REFERENCE NO. 22 HB-0023

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 (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 INCLORDED TO CLIMATIC CONDITIONS INCLORDED TO CLIMATIC CONDITIONS INCLORDING TO CLIMATIC CONDITIONS INCLORDING 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.

CG2 EXPLORATION S. PATTERSON, P.G. P. TOMASIC, G.I.T

INVESTIGATED BY <u>CG</u>2, PLLC

DRAWN BY ___T. WENNER, P.G.

CHECKED BY M. BREWER, P.E.

SUBMITTED BY <u>CG2,</u> PLLC

DATE MARCH 2024



Prepared in the Office of: CAROLINAS GEOTECHNICAL GROUP

2400 CROWNPOINT EXECUTIVE DRIVE SUITE 800 **CHARLOTTE, NC 28227** (980) 339-8684



D. Matthew Brewer 03/22/2024

-386129C0A\$@MAZURE

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PROJECT REFERENCE NO. SHEET NO.

HB-0023

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. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.	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 DI586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING:	GAP-GRADED - 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 BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN	AQUIFER - A WATER BEARING FORMATION OR STRATA.
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	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, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	SI//AI//A	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.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED VIGORIAN NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS	MINERALOGICAL COMPOSITION	CRYSTALLINE CRYSTA	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
LLASS. (\$\(\sigma\) 90/ PASSING "200) (> 30/ PASSING "200)	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-0 A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-2-6 A-2-7 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.
2/ PASSING	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	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.
*10 50 MX GRANULAR SIL1-	PERCENTAGE OF MATERIAL	CCP) SHELL BEDS, ETC. WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
#40 30 MX 50 MX 51 MN PEAT SOILS SOILS SOILS SOILS SOILS	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%	HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
PASSING *40 SOILS WITH	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
LL 40 MX 41 MN LITTLE OR LITTLE OR MX NP 10 MX 10 MX 11 MN 10 MX 10 MX 10 MX 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,
CODID TANCE A A A A A A A A A A A A A A A A A A A	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 FRACS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	▼ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING WATER LEVEL IN BORE HOLE HOLE IMMEDIATELY AFTER DRILLING WATER LEVEL IN BORE HOLE HOLE IMMEDIATELY AFTER DRILLING WATER LEVEL IN BORE HOLE HOLE IMMEDIATELY AFTER DRILLING WATER LEVEL IN BORE HOLE HOLE HOLE IMMEDIATELY AFTER DRILLING WATER LEVEL IN BORE HOLE HOLE HOLE HOLE HOLE HOLE HOLE HOL	(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. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
OF MAJOR GRAYEL, AND SAND GRAVEL AND SAND SOILS SOILS	STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
CEN BATING FAIR TO	─────────────────────────────────────	(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	E → SPRING OR SEEP	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	_	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 FIELD.
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH (MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	IF TESTED, WOULD YIELD SPT REFUSAL	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
(N-VALUE) (TUNS/FT-)	☐ WITH SOIL DESCRIPTION → OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4 CONTROL VERY LOOSE 4 TO 10	SOIL SYMBOL OPT DMT TEST BORING SLOPE INDICATOR INSTALLATION	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MATERIAL MEDIUM DENSE 10 TO 30 N/A	ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER THAN ROADWAY EMBANKMENT TEST	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
(NON-COHESIVE) DENSE 30 TO 50 VERY DENSE > 50	THAN ROADWAY EMBANKMENT AUGER BURING TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
VERY SOFT < 2 < 0.25	─ ─ INFERRED SOIL BOUNDARY — CORE BORING ■ SOUNDING ROD	(V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	OF AN INTERVENING IMPERVIOUS STRATUM.
GENERALLY SOFT 2 TO 4 0.25 TO 0.5 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE MONITORING WELL TEST BORING	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u> COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
MATERIAL STIFF 8 TO 15 1 TO 2	A PIEZOMETER	SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS	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
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD > 30 > 4	TTTTT ALLUVIAL SOIL BOUNDARY ALLUVIAL SOIL BOUNDARY INSTALLATION SPT N-VALUE	ALSO AN EXAMPLE.	RUN AND EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIF	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	SHALLOW STEET OF STEET OF	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	UNDERCUT ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN. 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
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	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	OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	BY MODERATE BLOWS.	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
SIZE IN. 12 3	CL CLAY MOD MODERATELY γ - UNIT WEIGHT	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. 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	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_{\sf d}$ - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN Ø.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u>	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 (SRQD) - 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 SEMISOLID; REQUIRES DRYING 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.
(PI) ATTAIN OPTIMUM MOISTURE	FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK: (BL-3) N: 650957.391E: 844232.469, -BL- STA. II+53.17,
" " PL L _ PLASTIC LIMIT	HI HIGHLY V - VERY RATIO EQUIPMENT USED ON SUBJECT PROJECT	TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	ELEVATION: 2653.63
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: 2653.63 FEET
SL SHRINKAGE LIMIT	CME-45C CLAY BITS X AUTOMATIC MANUAL	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	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	6. CONTINUOUS ELIGHT AUGER	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	F.I.A.D. = FILLED IMMEDIATELY AFTER DRILLING
PLASTICITY	CORE SIZE: X 8*HOLLOW AUGERS	INDURATION	ROADWAY DESIGN AND SURVEY INFORMATION DATED 12/15/2022
PLASTICITY INDEX (PI) DRY STRENGTH	CME-550X HARD FACED FINGER BITS X-N Q	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	PROVIDED BY TGS ENGINEERS. C.T. = CORING TERMINATED
NON PLASTIC 0-5 VERY LOW	TING -CARRIDE INSERTS	RUBBING WITH FINGER FREES NUMEROUS GRAINS;	NM = NOT MEASURED
SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM	VANE SHEAR TEST X CASING X W/ ADVANCER HAND TOOLS:	GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	REF = ROD SOUNDING REFUSAL
HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH X HAND AUGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	RS-*
COLOR	TRICONE 'TUNG-CARB, Y CONTRIVE DOD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;	= ROD SOUNDING WITH NAME DESIGNATION
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X MOBILE B-29 X CORE BIT VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER.	-
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	X DIEDRICH D-50	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	
		Line 22 State of Colors Control	

PROJECT REFERENCE NO.	SHEET NO.
HB_0023	2A

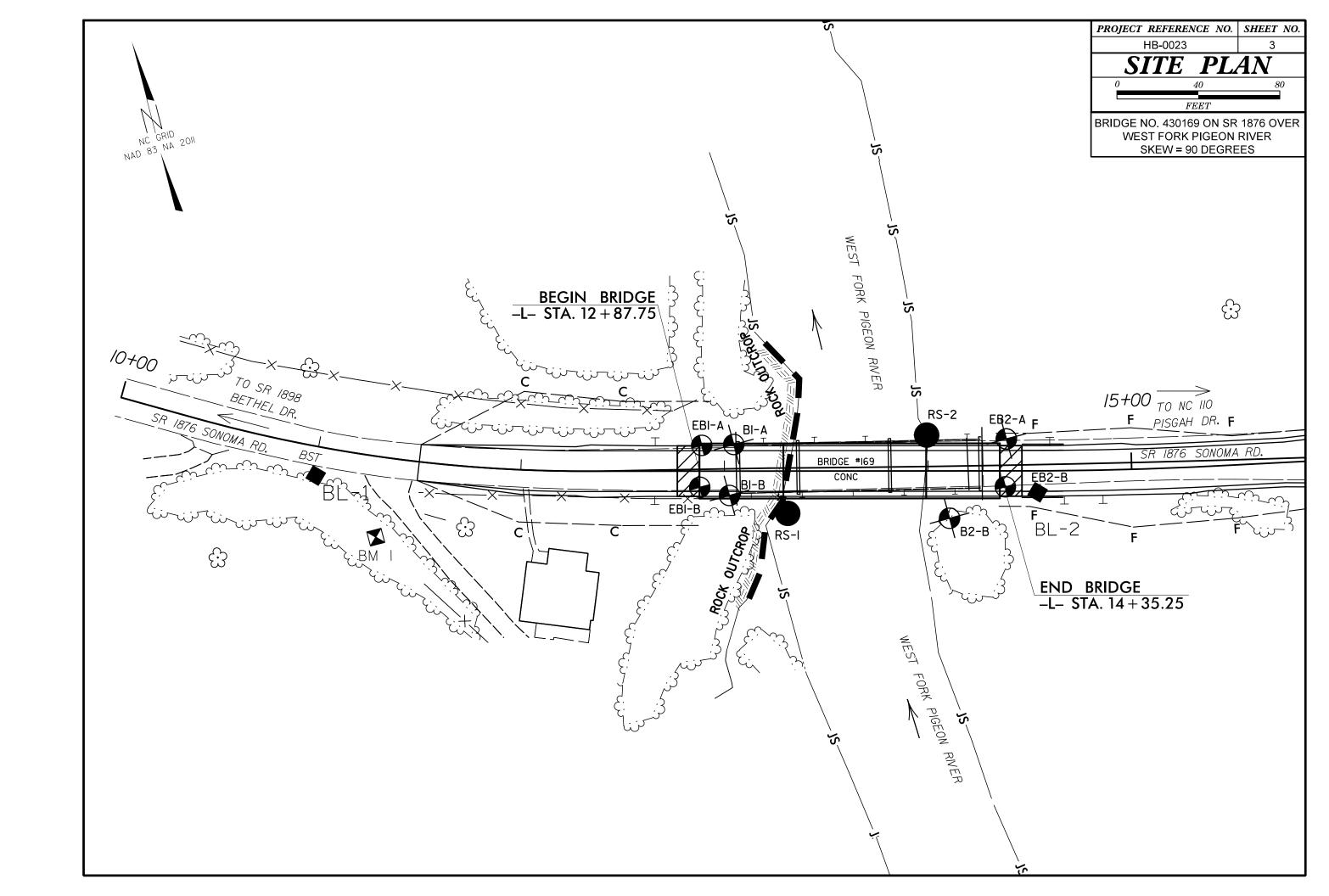
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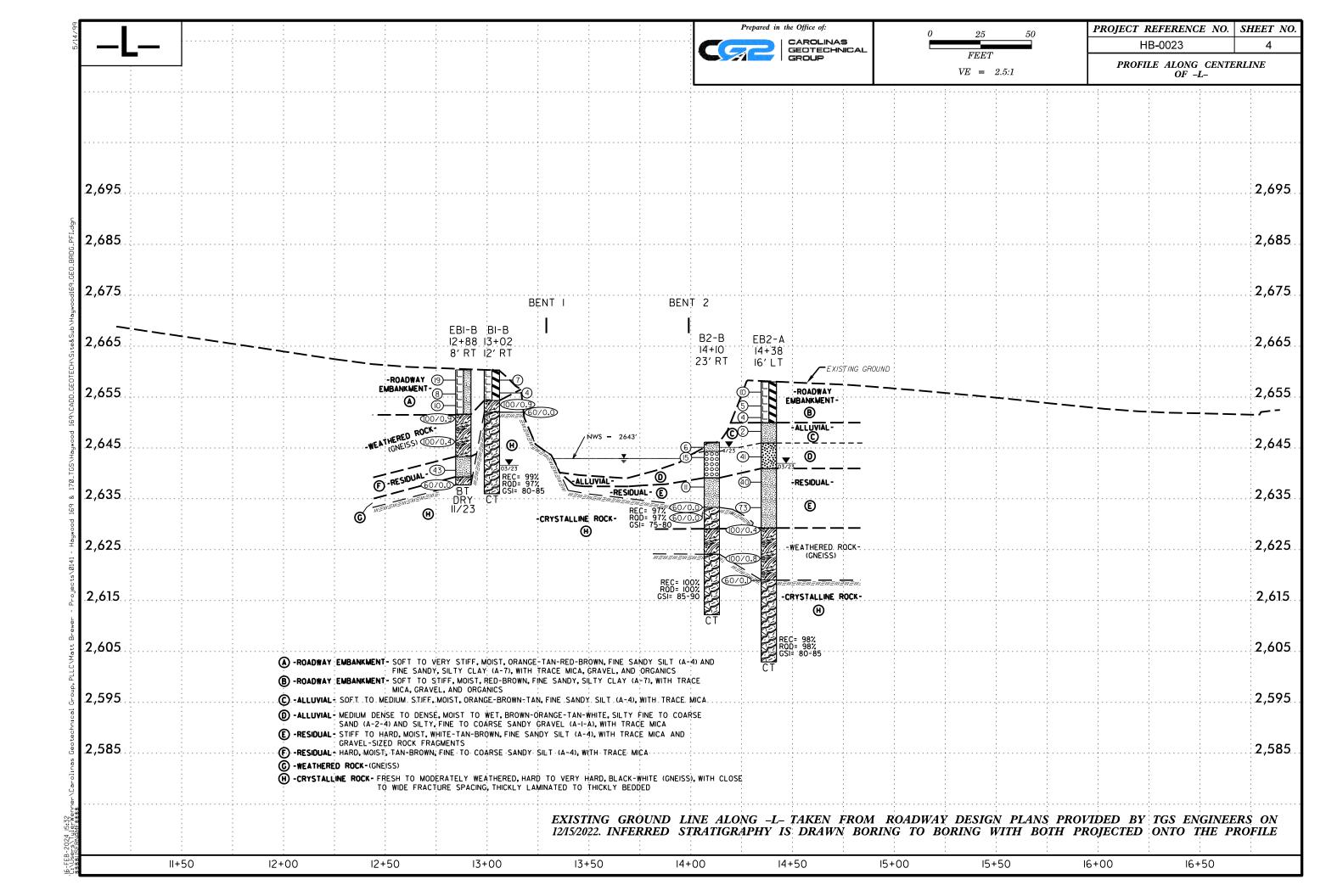
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

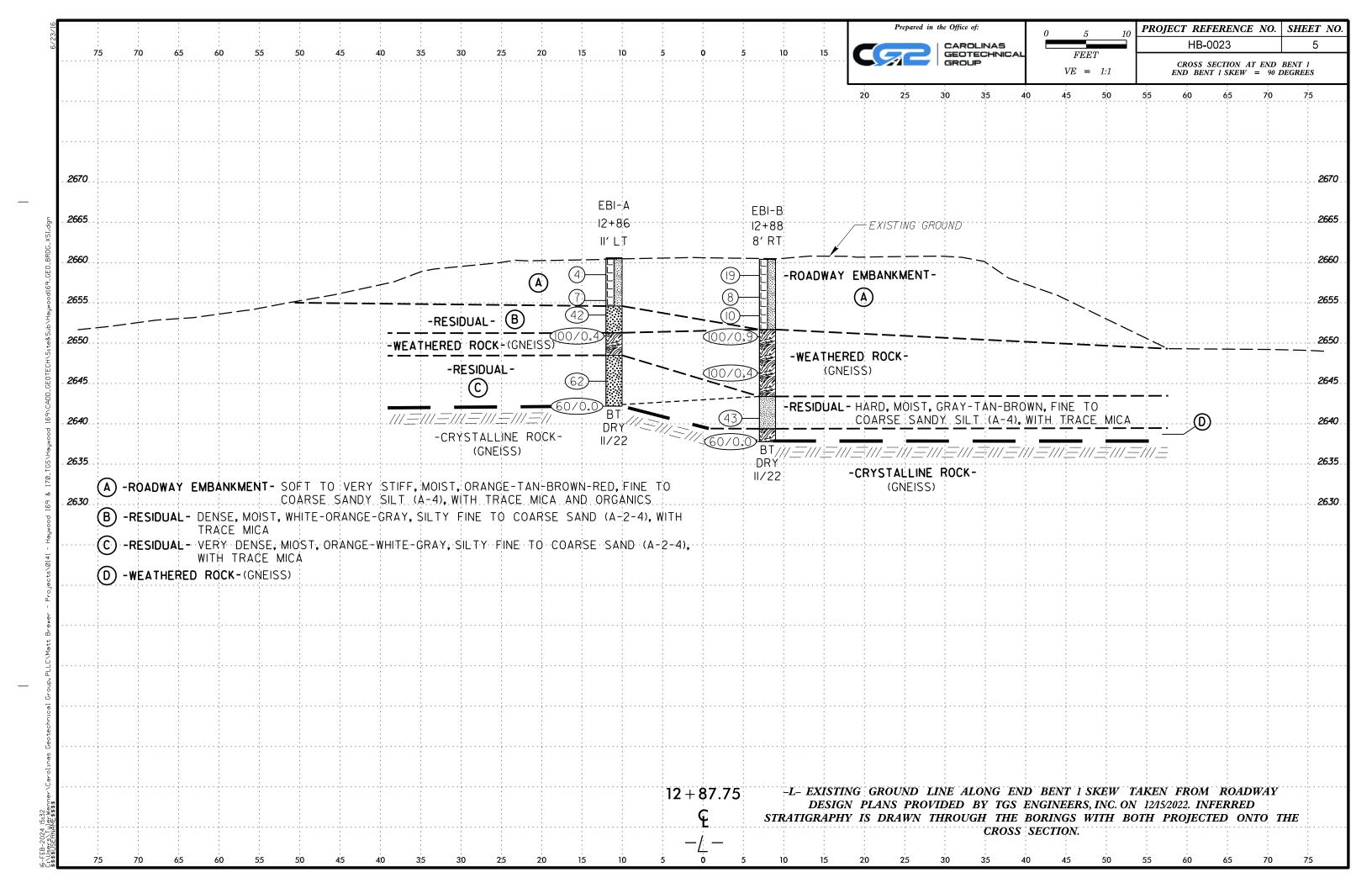
SUBSURFACE INVESTIGATION

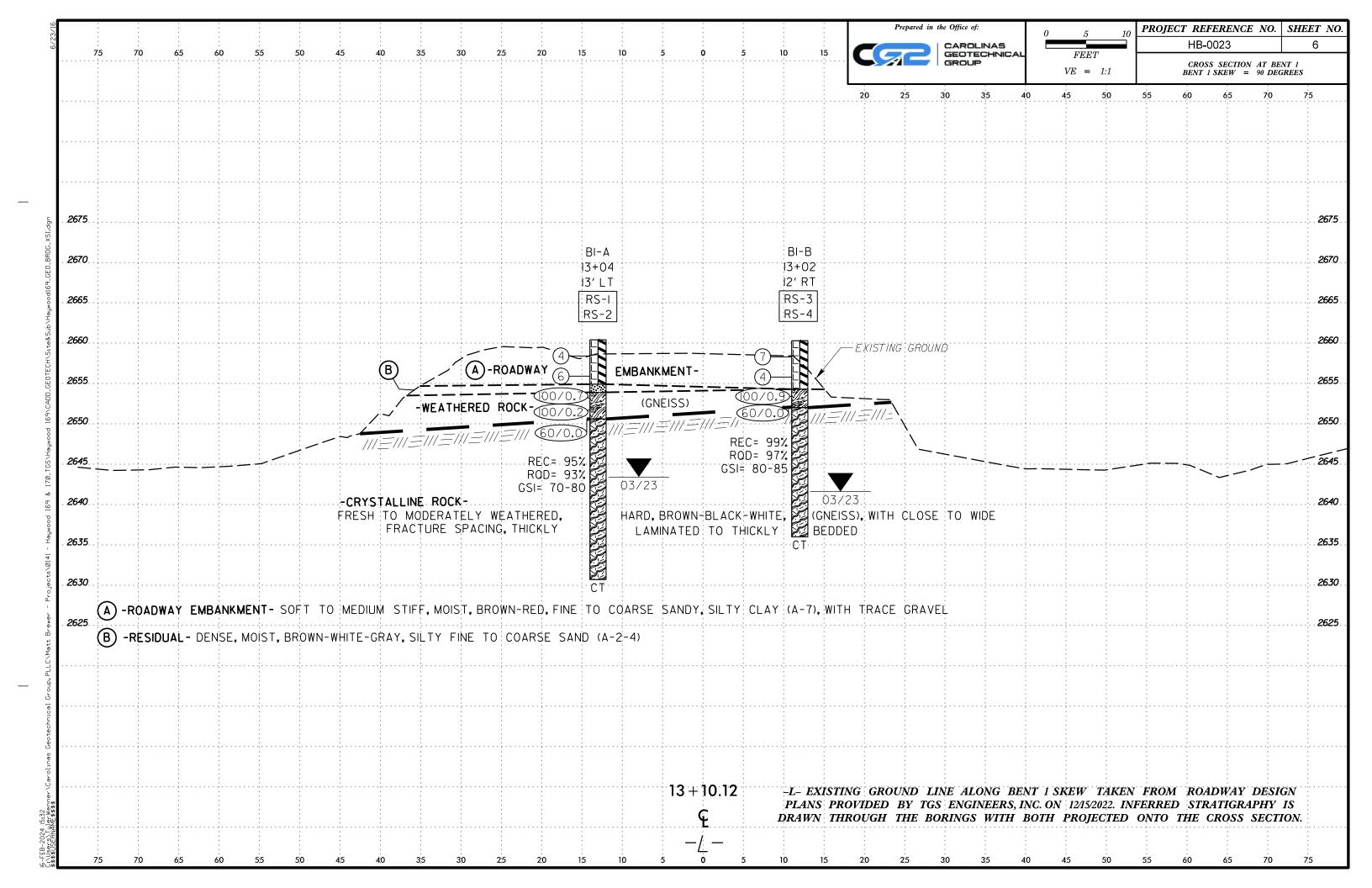
SUPPLEMENTAL LEGEND GEOLOGICAL STRENGTH INDEX (CSI) TABLES

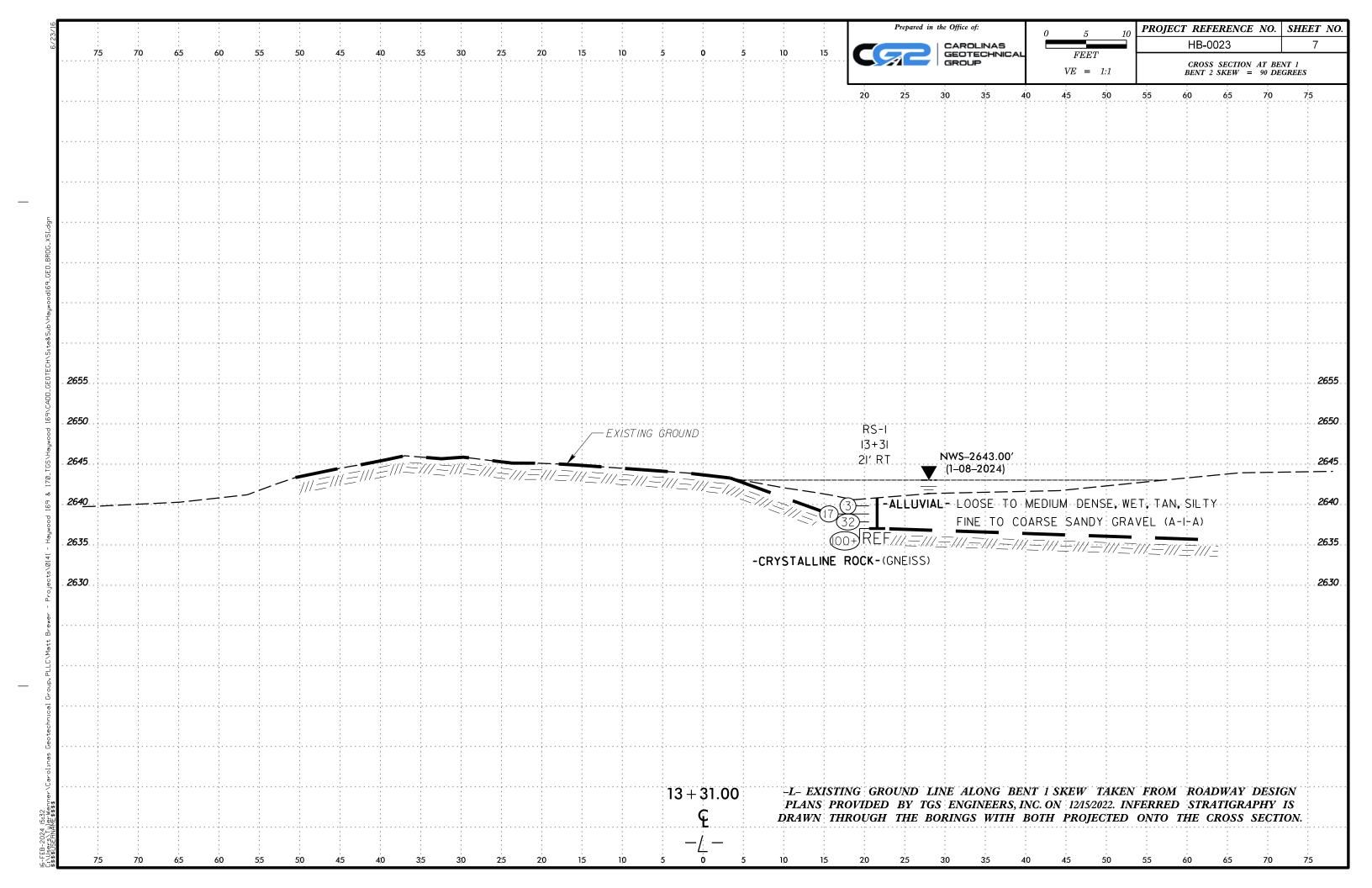
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Joi	inted Ro	ock Mass (Marinos and Hoe	k,2000)		AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Roc	k Masses (Marır	nos and Hoek,	, 2000)
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)		s p		8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)			
From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Guoting 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.	SURFACE CONDITIONS	VERY GOOD Very rough, fresh unweathered surface: GOOD Rough, slightly weathered, iron stained surfaces	FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surface with compact coatings or fillings or angular fragments VERY POOR Slickensided, highly weathered surface with soft clay coatings or fillings	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.	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slicken- sided or highly weathered surfaces with soft clay coatings or fillings
STRUCTURE		'		JALITY 📥	COMPOSITION AND STRUCTURE			
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities BLOCKY - well interlocked un-	PIECES	90 80		N/A N/A	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. 60			
disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	ROCK	70 60			8. Sand- stone with C. Sand- stone and C. Sand- stone and Stone			
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets	OCKING OF		50		thin inter-layers of layers of siltstone in similar amounts amounts amounts and stone layers layers amounts	C / [) /E	
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity	 INTERL		40	30	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.	30	F 20	
DISINTEGRATED - poorly inter- locked, heavily broken rock mass with mixture of angular and rounded rock pieces	 			20	G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of special structure with pockets of clay. Thin layers of special structure with pockets of clay. Thin layers of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay.	\$	/ / h	10
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	— II -	N/A N/A		10	sandstone are transformed into small rock pieces. Means deformation after tectonic disturbance			

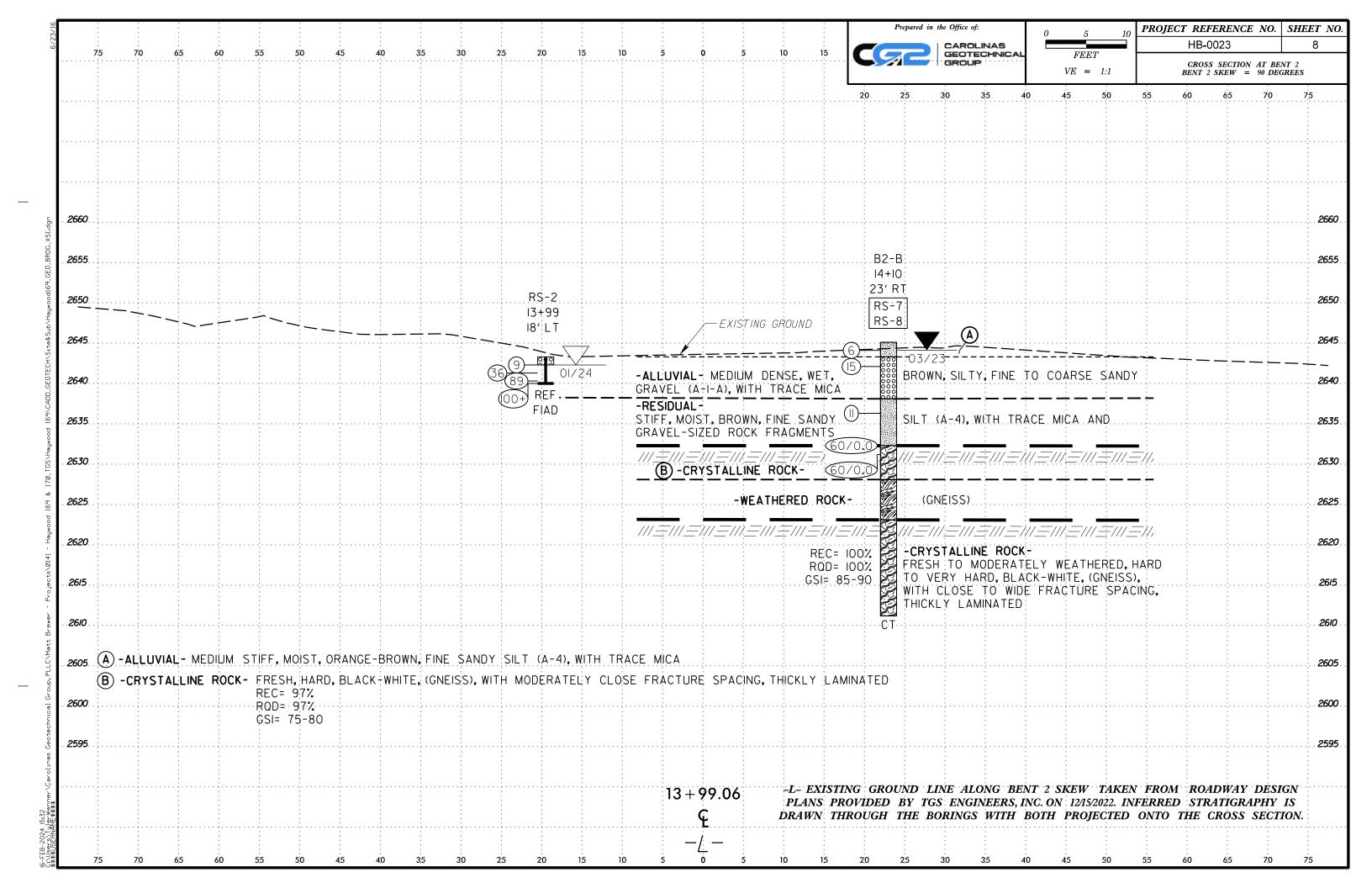


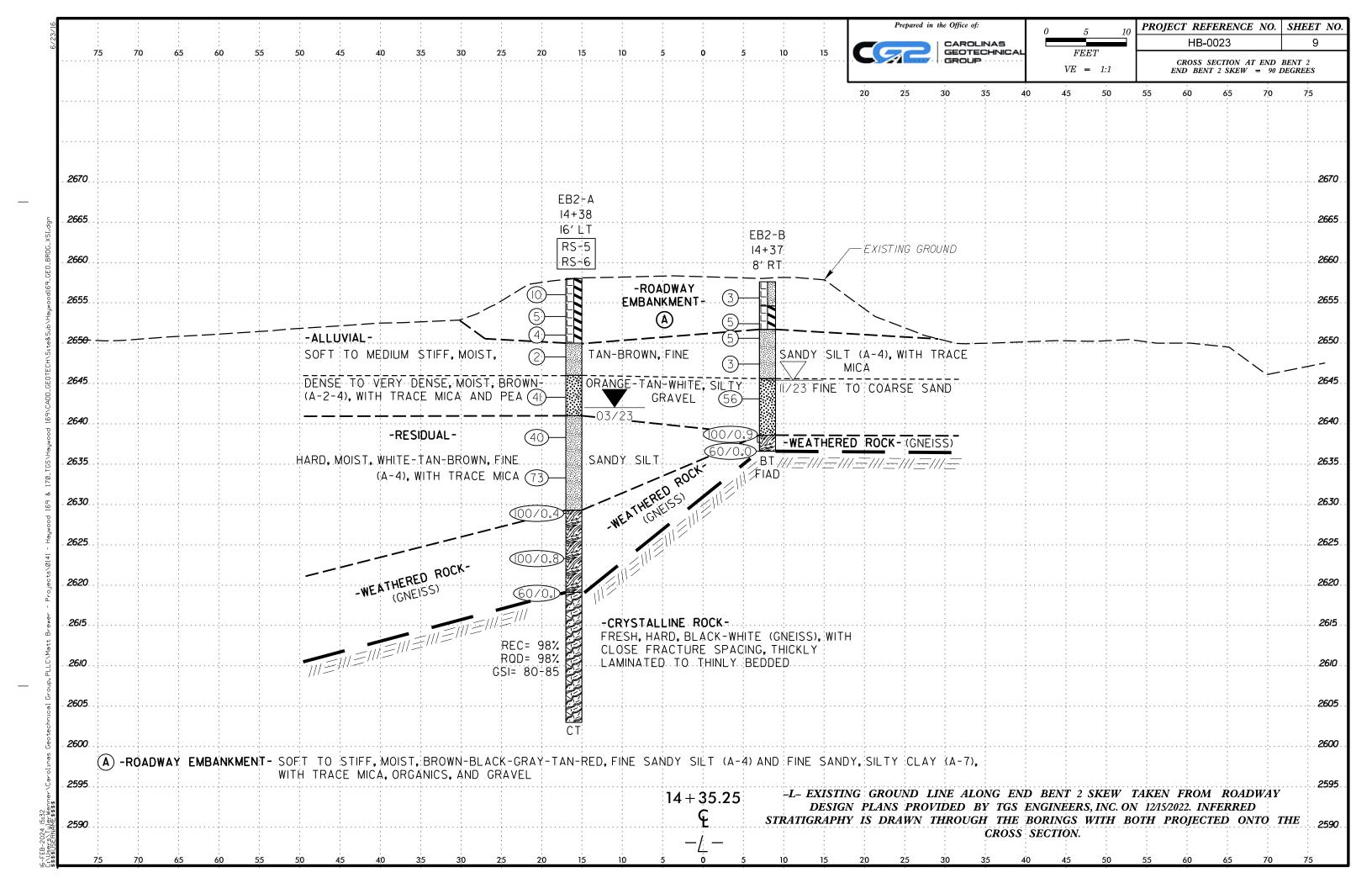












				BORE L	.00		
VBS 50345.1	1.1		TIP HB-0023	COUNTY HAYWOO	DD	GEOLOGIST P. Tomasic	
ITE DESCRIP	PTION Bridg	ge No. 4301	169 over West Fork Piged	on River on SR 1876	Sonoma Road)		GROUND WTR (f
ORING NO.	EB1-A		STATION 12+86	OFFSET	11 ft LT	ALIGNMENT -L-	0 HR. Dr
OLLAR ELEV	V. 2,660.6 f	t	TOTAL DEPTH 18.3 ft	NORTHING	651,029	EASTING 843,777	24 HR. FIAI
RILL RIG/HAMM	MER EFF./DATE	E CG29022	? Mobile B-29 86% 04/08/2022	2	DRILL METHOD H.S	i. Augers HAMN	IER TYPE Automatic
RILLER M. E	Brewer		START DATE 11/14/22	COMP. DA	TE 11/14/22	SURFACE WATER DEPTH N	/A
LEV DRIVE ELEV (ft)	OEPTH BLO (ft) 0.5ft	0.5ft 0.5ft	 	PER FOOT 50 75 100	SAMP. L O NO. MOI G	SOIL AND ROCK DES	SCRIPTION DEPTH
665						-	
2,659.6	1.0	2 2				2,660.6 GROUND SURF ROADWAY EMBAN Soft to Medium Stiff, Brow	IKMENT
2,656.4	4.2	3 4	$-\left \begin{array}{c c} \P^4 & \dots & \dots & \dots \\ N & \dots & \dots & \dots \\ N_7 & \dots & \dots & \dots \\ \end{array}\right $		M M M M M M M M M M	Coarse Sandy SILT (A-4), and organics	with trace mica s
2,654.6	9.2	12 30	42		M	-2,654.7 RESIDUAL Dense, White-Orange-Gra 2,651.4 Coarse SAND (A-2-4), w	ay, Silty Fine to ith trace mica
350	100/0.4			100/0.4		2,648.6 WEATHERED R Gray-White, (GN RESIDUAL Very Dense, Orange-White	EISS)
2,646.4	18.3	21 41		62	м	to Coarse SAND (A-2-4), v	with trace mica
						2,642.3 ft On Crystalline F	

GEOTECHNICAL BORING REPORT BORE LOG

										D	<u>Ur</u>	RE L		G								
WBS	50345	.1.1			TII	-	IB-002	3		COU	NTY	HAYW	00	D			GEOLOG	IST P. Tom	asic			
SITE	DESCR	PTION	Bridg	je No. 4	430169	ove	er Wes	t Forl	k Pige	on Riv	er on	SR 187	6 (5	Sonoma	Road))				GROUN	D WTR	(ft)
BORI	NG NO.	EB1-E	3		ST	ATI	ON 1	2+88			- 1	OFFSET	8	ft RT			ALIGNME	ENT -L-		0 HR.		Dry
	AR ELE						L DEP					NORTHII	NG				1	843,774		24 HR.		Dry
DRILL	.RIG/HAIV	MER EF	F./DATI	= CG2	9022 M	obile	B-2986	3%04/	08/2022	2				DRILL N	TETHO) H.S	i. Augers		HAMM	ER TYPE	Automat	ic
DRIL	LER M	. Brewe	er		ST	ARI	T DATI	E 11	1/14/2	2	- 1	COMP. [AT	E 11/	14/22		SURFAC	E WATER DE	PTH N/	A		
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLO 0.5ft	W COU	JNT 0.5ft	0		BL0 25		PER FO		7 5 10	00	SAMP. NO.	MOI	L O G		SOIL AND R	OCK DES	CRIPTION		
2665		- - -															=					
2660	2,659.4	1.0	14	14	5	+		 		 			_		,,		2,660.4	ROADWA	ND SURF. Y EMBANI Stiff to Ver	KMENT		0.0
2655	2,656.7-	-	3	4	4	·		19 .	·		: :		- - -		M M		Or	ange-Tan-Red		ne Sandy S	SILT	
	2,654.4 - 2,651.7-		6	4	6		10 .								М		2,651.7	14/F A T	UEDED D	201/		8.7
2650	- -	-	38	62/0.4			: : :		· · ·		: :	100/0	.9				_		HERED RO			
2645	2,646.7-	- 13.7 - -	100/0.4					: 	: :			- 100/0	.4				- 2,643.4					<u>17.0</u>
2640	2,641.7- -	- - 18.7 -	28	27	16				· · [- · · [· · •43		·		-		М	E	ŀ	Rard, Gray-Tar Sandy SILT (ESIDUAL -Brown, Fi A-4), with	ne to Coar trace mica	se	
	2,637.8-	226										60/0	\exists				2,639.4	WEAT	HERED RO	OCK		21.0
			60/0.0															Boring Term Penetration Te 637.8 ft On Cr	st Refusal	at Elevation		

WBS 50345.1.1		Y HAYWOOD	GEOLOGIST S. Patterson, P.0	
SITE DESCRIPTION Bridge No. 4				GROUND WTR (ft)
BORING NO. B1-A	STATION 13+04	OFFSET 13 ft LT	ALIGNMENT -L-	OHR. NM
COLLAR ELEV. 2,660.3 ft	TOTAL DEPTH 29.7 ft	NORTHING 651,026	EASTING 843,796	24 HR. 17.0
DRILL RIG/HAMMER EFF./DATE CG20	0446 Diedrich D50 87% 05/10/2022	DRILL METHOD SPT	Core Boring HAMMI	ER TYPE Automatic
DRILLER C. Odom	START DATE 03/29/23	COMP. DATE 03/29/23	SURFACE WATER DEPTH N/	Ά
DRIVE DEPTH BLOW COUNTER COU		75 100 100 / 0	SOIL AND ROCK DESC	CRIPTION DEPTH (ft
2660 2,659.3 1.0 3 1 2,656.8 3.5	3		2,660.3 GROUND SURFA ROADWAY EMBANY Soft to Medium Stiff, Brown Coarse Sandy, Silty CLAY (A	KMENT n-Red, Fine to
2,654.3 6.0 2 3 2,654.3 6.0 40,	3 6	M M M M M M M M M M M M M M M M M M M	gravel 2,654.8 PESIDUAL Dense, Brown-White-Gray	
2,651.8+ 8.5 2,650.5+ 9.8 100/0.2 60/0.0		· · · · · ·	Coarse SAND (Á- WEATHERED RO White-Black-Gray, (G CRYSTALLINE RO Black-White, (GNE	2-4) OCK 9.8 NEISS) OCK
2645			REC=95% RQD=93% GSI=70-80	
2640		RS-1		
2635		RS-2		
#			2,630.6 Boring Terminated at Eleva In Crystalline Rock (G	

GEOTECHNICAL BORING REPORT CORE LOG

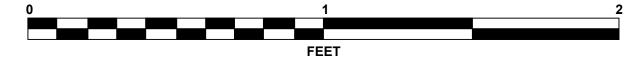
(ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft)									C	0	RE L	OG					
BORING NO. B1-A STATION 13+04 OFFSET 13 ft LT ALIGNMENT -L- 0 HR. NM	WBS	50345.1.1			TIP	HB-0	023	C	OUNT	Υ	HAYWO	OD	GEOLOGIST S. Patte	rson, P.	G.		
COLLAR ELEV. 2,660.3 ft TOTAL DEPTH 29.7 ft NORTHING 651,026 EASTING 843,796 24 HR. 17.0	SITE	DESCRIPTION	I Brid	dge No. 4	30169	over	West For	k Pige	on Riv	er d	on SR 18	76 (Sonoma Road)			GROUN	D WTR	R (ft)
DRILL RIGHAMMER EFF.JDATE C302446 Diedrich D50 87% 05/10/2022 DRILL METHOD SPT Core Boring HAMMER TYPE Automatic	BOR	ING NO. B1-A	١		STA	TION	13+04			OF	FSET	13 ft LT	ALIGNMENT -L-		0 HR.		NM
START DATE 03/29/23 COMP. DATE 03/29/23 SURFACE WATER DEPTH N/A	COL	LAR ELEV. 2,	660.3	ft	TOT	AL DE	PTH 29	.7 ft		NC	ORTHING	,			24 HR.	1	7.0
CORE SIZE NO	DRILI	RIG/HAMMER E	FF./DA	TE CG20	446 Die	drich D5	50 87% 05/	10/2022		_		DRILL METHOD SPT	Γ Core Boring	HAMM	ER TYPE	Automa	tic
ELEV (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft)			1		-					CC	OMP. DA	TE 03/29/23	SURFACE WATER DE	PTH N	/A		
ELEV (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft)	COR	1		I DDILL			N 19.91		ΔΤΔ	ļ.,							
2640 2.645.6 14.7 5.0 2.561.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	ELEV (ft)	ELEV DEFIL		RATE	REC.	RQD		REC.	RQD		ELEV. (ESCRIPTION AND REMAR	KS		DEP	TH (ft)
2640	2650 ₅ 5	2,650.5- 9.8	40	N=60/0 0	(4.9)	(4.5)		(18.9)	(18.5)		2 650 5						9.8
2640		#	4.5	5:25/0.9 5:27/1.0 5:03/1.0 2:37/1.0	100%	92%		95%	93%		2,000.0	Fresh to Slightly Wea	athered, Hard, Black-White, Spacing, Thickly Laminated			se to	0.0
2640 2.640.6 19.7 2.591.0	2645	2,043.0+ 14.7	5.0	3:09/1.0 2:19/1.0 3:10/1.0	(4.7) 94%	(4.7) 94%						Unconfined C	Unit Weight: 191.9 pcf	60 psi (1,8	319 ksf)		
2635 24.7 3.08 f.0 2.5971.0 3.08 f.0 4.0071.0 2.5121.0 1.541.0 1.541.0 2.3471.0	2640	2,640.6 19.7		2:59/1.0	(4.0)	(4.0)					†		RS-2: 26 0-26 5'				
5.0 2:02/1.0 (5.0) (5.0) (5.0) (5.0) (7.0)			5.0	3:08/1.0 2:59/1.0 3:08/1.0	86%	86%	RS-1					Unconfined C	Unit Weight: 174.3 pcf compressive Strength: 12,90	0 psi (1,8	358 ksf)		
2,630.6 29.7 2:34/1.0 2.33/1.0 2.33/1.0 2.630.6 Elevation 2,630.6 ft In Crystalline Rock (GNEISS)	2635	2,635.6+ 24.7	5.0	2:02/1.0	(5.0)	(5.0)					<u> </u>		GSI=70-80				
Boring Terminated at Elevation 2,630.6 ft In Crystalline Rock (GNEISS)		2.630.6+ 29.7		1:54/1.0		100%	RS-2				2.630.6						29.7
		1		2.04/1.0									t Elevation 2,630.6 ft In Cry	stalline R	ock (GNEI	SS)	20
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Bridge No. 430169 over West Fork Pigeon River on SR 1876 (Sonoma Road), Haywood County, NC Rock Core Photographs B1-A

9.8 to 29.7 Feet





										<u> </u>	'NL	. <u>L</u>	UG					
WBS	50345	5.1.1			TI	P HB-00	23		COU	NTY	HAY	woo	D			GEOLOGIST S. Patterson, F	.G.	
SITE	DESCR	IPTION	I Bric	lge No	4301	69 over V	Vest F	ork Pi	geon F	River	on SI	₹ 187	6 (Son	oma F	Road)		GROUN	ND WTR (ft)
BORI	NG NO.	B1-B	3		S1	TATION	13+02	2		c	FFSE	T 1	2 ft RT			ALIGNMENT -L-	0 HR.	NM
COLL	AR ELE	EV. 2,	660.4	ft	TC	OTAL DE	PTH	24.3 ft		N	IORTI	HING	651,0	02		EASTING 843,787	24 HR.	18.7
DRILL	. RIG/HAI	MMER E	FF./DA	TE CO	320446	Diedrich D5	0 87%	05/10/2	022				DRILL N	ETHO	D SF	T Core Boring HAM	MER TYPE	Automatic
DRIL	LER C	. Odon	1		S1	TART DA	ΓE 0:	3/29/2	3		ОМР	. DAT	E 03/2	29/23		SURFACE WATER DEPTH	I/A	
ELEV (ft)		DEPTH (ft)	1	0.5ft		0		.OWS F				100	SAMP. NO.	MOI	L O G	SOIL AND ROCK DES		DEPTH (ft)
2665	-	-													_	-		
660	2,659.4	1.0	2	3	4	1.								M		2,660.4 GROUND SURI ROADWAY EMBAI Soft to Medium Stiff, Re	NKMENT	0.0 ne
655	2,656.9 - 2,654.4	+	2	1	3	7 ′ : 4 4 · ·	: : : :	: : : : : :	: : : :	: : : :				M		Sandy, Silty CLAY (A-7), v	vith trace gr	
650	2,652.1 - -	8.3	60/0.0	94/0.4			·				. 100	0/0.9				2,652.1 WEATHERED F 2,652.1 Brown, (GNEI CRYSTALLINE Brown-Black-White,	SS) ROCK	8.3
645	- - -	<u> </u>					· ·			· ·						REC=99% RQD=97% GSI=80-85		
640	- - -	 -					· ·							V				
,	- - -						· .						RS-3 /			2,636.1 Boring Terminated at Eleva		24.
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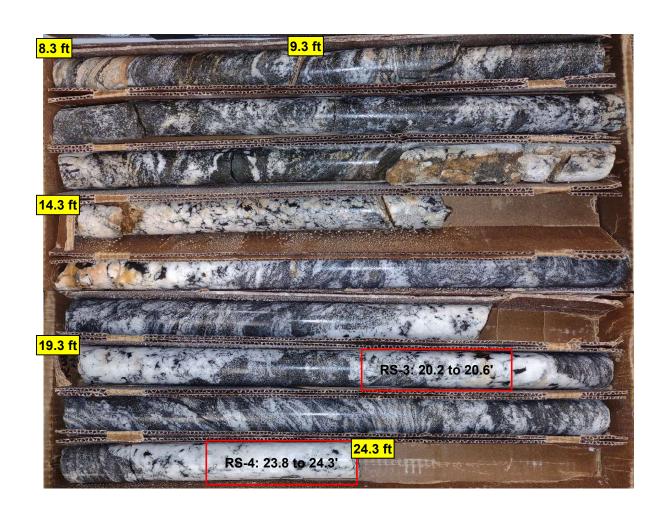
GEOTECHNICAL BORING REPORT CORE LOG

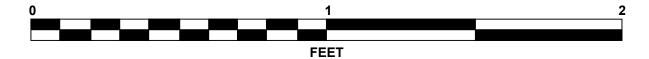
									<u>C</u>	<u>O</u> I	<u>RE L</u>	<u>.OG</u>					
WBS	50345.	.1.1			TIP	HB-00	023	C	OUNT	Υı	HAYWO	OD		GEOLOGIST S. Pa	tterson, P	.G.	
SITE	DESCRI	PTION	l Brid	lge No. 4	30169	over \	West For	k Pige	on Riv	_		76 (Sonoma Ro	oad)			GROUN	D WTR (ft)
-	ING NO.				STA	TION	13+02			OF	FFSET	12 ft RT		ALIGNMENT -L-		0 HR.	NM
	LAR ELE						PTH 24.			NC	ORTHING	651,002		EASTING 843,787	<u> </u>	24 HR.	18.7
				ATE CG20					2			DRILL METHOD	SPT	-		IER TYPE	Automatic
	LER C.		1	!	+		ATE 03/2			cc	OMP. DA	TE 03/29/23		SURFACE WATER D	EPTH N	/A	
	E SIZE		T	DRILL	RI	NI IN	JN 16.0 f	STR	RATA	L							
ELEV (ft)	ELEV (ft)	DEPTH (ft)	RUN (ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	O G		ft)	Di	ESCRIPTION AND REMA			DEPTH (ft)
2652.1	2,652.1 2,651.1	8.3 9.3	1.0	N=60/0.0 6:09/1.0	0 (0.9)			(15.8)	(15.5)) (2,652.1			Begin Coring @ 8.3 CRYSTALLINE ROC	K		8.3
2650		+	5.0	4:46/1.0 3:21/1.0 3:26/1.0 3:16/1.0 3:10/1.0	/\ <u>90%</u> / (5.0) 100%	(4.9)	1	99%	97%		<u></u>			Veathered, Hard, Brown-B y Close Fracture Spacing,			
2645	2,646.1	14.3	5.0	2:41/1.0 3:01/1.0 3:36/1.0	98%							Uncon	fined C	RS-3: 20.2-20.6' Unit Weight: 173.8 pc Compressive Strength: 11,		16 ksf)	
2640	2,641.1	19.3	5.0	2:42/1.0 5:04/1.0 6:17/1.0 8:09/1.0	(5.0) 100%		RS-3					Uncon	fined C	RS-4: 23.8-24.3' Unit Weight: 166.4 pc Compressive Strength: 16,		15 ksf)	
	2,636.1	24.3	_	4:39/1.0 6:27/1.0 11:07/1.0		<u> </u>	RS-4	<u> </u>	<u> </u>		2,636.1	Roring Termin	nated s	GSI=80-85 at Elevation 2,636.1 ft In C	'rystalline Ro	ook (GNEIS	24.3
	7	r				'		'			F	Donnig Ton	latou c	al Elevation 2,000. 1 it in 0	Луэканны т.	JOK (OIVEIO	5)
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Bridge No. 430169 over West Fork Pigeon River on SR 1876 (Sonoma Road), Haywood County, NC Rock Core Photographs B1-B

8.3 to 24.3 Feet





	BORE LOG								
WBS 50345.1.1 TIP HB-0	0023 COUNTY HAYWOOD	GEOLOGIST T. Wenner		WBS 50345.1.1		TIP HB-0023 CC	OUNTY HAYWOOD	GEOLOGIST T. Wenner	
SITE DESCRIPTION Bridge No. 430169 over W	Vest Fork Pigeon River on SR 1876 (Sonoma Road)		GROUND WTR (ft)	SITE DESCRIPTION	Bridge No. 4	430169 over West Fork Pigeon F	River on SR 1876 (Sonoma Road)	•	GROUND WTR (ft)
BORING NO. RS-1 STATION	13+31 OFFSET 21 ft RT	ALIGNMENT -L-	0 HR . N/A	BORING NO. RS-2		STATION 13+99	OFFSET 18 ft LT	ALIGNMENT -L-	0 HR. 1.0
COLLAR ELEV. 2,640.8 ft TOTAL DE	EPTH 3.8 ft NORTHING 650,987	EASTING 843,813	24 HR. N/A	COLLAR ELEV. 2,6	 343.3 ft	TOTAL DEPTH 3.3 ft	NORTHING 651,007	EASTING 843,883	24 HR. FIAD
DRILL RIG/HAMMER EFF/DATE N/A	DRILL METHOD	Rod Sounding HAMM	TER TYPE N/A	DRILL RIG/HAMMER EF	F /DATE N/A		DRILL METHOD	Rod Sounding HAW	IMERTYPE N/A
DRILLER N/A START DA	ATE 01/08/24 COMP. DATE 01/08/24	SURFACE WATER DEPTH 2.3	2ft	DRILLER N/A		START DATE 01/08/24	COMP. DATE 01/08/24	SURFACE WATER DEPTH	N/A
STATION	13+31	EASTING 843,813 Rod Sounding HAMM SURFACE WATER DEPTH 2.2	0 HR. N/A 24 HR. N/A ER TYPE N/A 2ft CRIPTION DEPTH (ft) 01/08/24) ACE 0.0 an, Silty Fine to 1.0 EL (A-1-a)	BORING NO. RS-2 COLLAR ELEV. 2,6 DRILL RIGHAMMER EF DRILLER N/A ELEV DRIVE ELEV (ft) DEPTH (ft) 2645	643.3 ft F/DATE N/A	STATION 13+99 TOTAL DEPTH 3.3 ft	OFFSET 18 ft LT	Rod Sounding HAM SURFACE WATER DEPTH N CO SOIL AND ROCK DE	O HR. 1.0 24 HR. FIAD MER TYPE N/A N/A ESCRIPTION RFACE 0.0 L 1.0 Dy Fine to Coarse / 1.0 trace gravel 3.3 varion 2,640.0 ft In D (A-2-4)
NCDOT BORE DOUBLE HAYWOOD 169_GEO_BRDG.GPJ NC_DOT.GDT 1/3									

									JUI	KE L	<u>UG</u>							
WBS	50345	5.1.1			TI	IP HB-00	23	COUN	ITY H	AYWOC	D			GEOLOG	IST S. Patte	erson, P.G.		
SITE	DESCR	IPTION	Brid	ge No.	43016	9 over We	st Fork Pi	geon Rive	r on SF	R 1876 (Sonoma	Road))				GROUND	WTR (ft)
BORI	NG NO.	B2-B			S	TATION	14+10		OFI	FSET 2	3 ft RT			ALIGNME	NT -L-		0 HR.	NM
COLL	AR ELE	EV. 2,	645.1	ft	T	OTAL DEF	PTH 33.9) ft	NO	RTHING	650,96	64		EASTING	843,889		24 HR.	1.0
DRILL	RIG/HAIV	MER EF	F./DAT	E CG	20446 C	Diedrich D50	87%05/10/	2022			DRILL N	IETHO) SP1	Core Boring		HAMME	RTYPE /	Automatic
DRIL	LER C.	Odom	1		S.	TART DAT	E 03/30)/23	СО	MP. DA	TE 03/3	30/23		SURFACE	WATER DE	PTH N/A		
ELEV	DRIVE	DEPTH	1	ow co		1		S PER FO			SAMP.	V /	1 - 1	1001417101				
(ft)	ELEV (ft)	(ft)	0.5ft			0	25	50	75 	100	NO.	MOI	O G	ELEV. (ft)	SOIL AND R	OCK DESC	RIPTION	DEPTH (
2650														-				
645	2,645.1	0.0	1	1	5								- -	2,645.1	Α	ND SURFAC		(
	2,643.1	2.0	19	8	7	•••••						l w	000	- <u>2,643.3</u> M	edium Stiff, Ora SILT (A-4	ange-Brown), with trace	, Fine San mica	dy <u>, — </u>
640	-					1			: :			**	00000	- Co	Medium Dense arse Sandy GF	e, Brown, Sil	Ity, Fine to	ice
	2,637.3	7.8		ļ.,		:			: :					2,638.1		ESIDUAL -		
635	-	ł	3	5	6							M		Si trad	tiff, Brown, Fine ce mica and gr	e Sandy SIL ⁻ avel-sized ro	T (A-4), wi ock fragme	th ents
	-	F				1 . 1 .			- -				₩F		Ü		Ü	
	2,632.3 2,631.2	12.8 13.9	60/0.0	0		: ::-	+	-: + -: -:		60/0.0				2,632.3	CRYST	ALLINE RO	CK	1
30	_	-	60/0.0						- -	-60/0.0				=	Black-W	/hite, (GNEI	SS)	
	-	‡									RS-7			2,628.1		EC=75% QD=75%		
	-	‡													G	SI=55-60		
325	-	<u> </u>												-		HERED ROO n, (GNEISS		
	-	+								:::				2,623.1		REC=0%	,	2;
320	-	Į.									RS-8				F	RQD=0%		
20	-	‡							- :					-		ALLINE RO hite, (GNEI		
	-	‡							: :							EC=75%	00)	
315	-	Ł												_	R	QD=75%		
	-	+					.		: :	: : :					G	SI=55-60		
	-	Ī								1				2,611.2				33
	_	-				['	'							ing Terminate	d at Elevatio e Rock (GNI	n 2,611.2	
	-	‡													Crystallin	e Rock (Givi	E133)	
	-	t																
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GEOTECHNICAL BORING REPORT

SHEET 16

									<u>C</u>	;0 /	RE L	.OG				
WBS	50345	5.1.1			TIP	HB-00	J23	С	OUNT	(Y	HAYWOO		GEOLOGIST S. Patte	erson, P.(G	
SITE	DESCR	IPTION	Brid	ge No. 43	0169 с	over W	est Fork [Pigeon	River	on S	3R 1876 ((Sonoma Road)			GROUN	ND WTR (ft
BOR'	ING NO.	. B2-B	,		STA	TION	14+10			OF	FFSET 2	23 ft RT	ALIGNMENT -L-		0 HR.	NN
COL	LAR ELE	EV. 2,	,645.1	ft	тот	AL DE	PTH 33.	.9 ft		NC	ORTHING	650,964	EASTING 843,889		24 HR.	1.0
ЖL	RIG/HAN	VIMER EF	F/DAT	TE CG204	46 Died	rich D50) 87% 05/10	J/2022				DRILL METHOD SPT	Core Boring	HAMIV	MER TYPE	Automatic
DRIL	LER C	. Odom	1		STA	RT DA	ATE 03/3	30/23		cc	OMP. DA	TE 03/30/23	SURFACE WATER DE	EPTH N	1/A	
COR	E SIZE	NQ					IN 20.0 f									
LEV (ft)	DUN	DEPTH (ft)	H RUN (ft)	DRILL RATE (Min/ft)	REC.	RUN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RATA RQD (ft) %	L O G)		DESCRIPTION AND REMAR	RKS		DEPTH (
31.2			+	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	//	/0		1 "	/	+	ELL V. A.	<u>t)</u>	Begin Coring @ 13.9 ft	4		D∟,
31. <u>2</u> 330	2,631.2	Ŧ	5.0	N=60/0.0 4:14/1.0 3:37/1.0 2:43/1.0 0:37/1.0 1:09/1.0	0 (3.0) 60%	(3.0) 60%	RS-7	 	(0.0)		2,628.1		CRYSTALLINE ROCK C-White, (GNEISS), with Moc Spacing, Thickly Laminate	(oderately C	Close Fract	ture
25	2,626.2	18.9	5.0	2:49/1.0 2:19/1.0 1:45/1.0	(2.0) 40%			(11.0	0%′		2,623.1	Unconfined C	RS-7: 16.5-17.0' Unit Weight: 182.3 pcf Compressive Strength: 10,6	650 psi (1,5	,534 ksf)	22
20	2,621.2	23.9	5.0	2:39/1.0 4:29/1.0 5:06/1.0 4:40/1.0 3:40/1.0	(5.0) 100%	(5.0)	RS-8	100%	(11.9) (100%				GSI=55-60 (continued) WEATHERED ROCK Brown, (GNEISS) CRYSTALLINE ROCK	(
15	2,616.2	28.9	5.0	3:38/1.0 4:16/1.0 4:06/1.0 4:15/1.0	(5.0) 100%	(5.0)	-					Fresh to Moderate (GNEISS), with Clo	tely Weathered, Hard to Ver lose to Wide Fracture Spaci RS-8: 23.4-23.9'	ery Hard, Bl cing, Thickl	ਮੈack-White dy Laminat	i, i.ed
ļ	20112	Ī.,		3:36/1.0 4:15/1.0)	,		'			£	Unconfined (Unit Weight: 181.4 pcf Compressive Strength: 9,27	.70 psi (1,3	335 ksf)	3.
J	2,611.2	33.9	+	4:00/1.0	+-	 	1	<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>	+	سراحي	2,611.2	7	GSI=55-60	•		J 33
ļ	-	Ŧ.				,		'			F.	Boring Terminated a	at Elevation 2,611.2 ft In Cry	ystalline R	Rock (GNE	ISS)
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Bridge No. 430169 over West Fork Pigeon River on SR 1876 (Sonoma Road), Haywood County, NC Rock Core Photographs B2-B

13.9 to 33.9 Feet

13.9 ft

RS-7: 16.5-17-0'

RS-8: 23.4 to 23.9

28.9 ft

1 FEET

									UKE L	<u>UG</u>					
NBS	50345	1.1			TII	P HB-0023		COUNTY	' HAYWOO	D			GEOLOGIST S. Patterson, P	G.	
SITE	DESCRI	PTION	Brido	ge No. 4	30169	9 over West Fo	ork Pigeo	n River o	n SR 1876 (Sonoma	Road)			GROU	ND WTR (ft
3ORI	NG NO.	EB2-	Ą		ST	TATION 14+3	8		OFFSET 1	6 ft LT			ALIGNMENT -L-	0 HR.	22.8
COLL	AR ELE	V. 2,	658.0	ft	т	OTAL DEPTH	55.0 ft		NORTHING	650,99	95		EASTING 843,926	24 HR.	16.0
DRILL	RIG/HAM	MER EF	F/DAT	E CG20	0446 D	Diedrich D50 87% (05/10/2022	2		DRILL M	ETHOD	SPT	Core Boring HAM	VIER TYPE	Automatic
DRIL	LER C.	Odom			ST	TART DATE	11/14/22		COMP. DAT	TE 03/3	30/23		SURFACE WATER DEPTH	I/A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0.5ft	JNT 0.5ft	0 25	LOWS PE	ER FOOT	75 100	SAMP. NO.	MOI	L O G	SOIL AND ROCK DE	SCRIPTION	N DEPTH (1
660	-	<u>-</u> -										-	2,658.0 GROUND SUR	FACE	0
2655	2,657.0 2,654.3	3.7	4	7	3	10 -					М		ROADWAY EMBA Soft to Stiff, Red-Brown, F CLAY (A-7), with trace m organics	NKMENT ine Sandy,	Silty,
	2,652.0	6.0	'			• 5 .					М				
650	2,649.3	8.7	2 WOH	1 1	1	∮ 4 · · · · · · · · · · · · · · · · · · ·					M M		2,650.0 ALLUVIAI Soft, Tan-Brown, Fine Sa		
345	0.044	- - -											with trace m 2,646.0 Dense, White-Orange-	ca an, Silty Fi	12
	2,644.3	13./ - - -	14	18	23		. 41				M		SAND (A-2-4), with 2,641.0	race mica	17
640	2,639.3	- 18.7	10	16	24		. 40				М	F	RESIDUA Hard, White-Tan-Brown, (A-4), with trace	Fine Sandy	
35	2,634.3	23.7	29	35	38				73		M				
30	2,629.3	28.7	100/0.4										2,629.3 WEATHERED I	OCK.	28
325	-	- - -	100/0.2	†					100/0.4				White-Tan-Brown,		
200	2,624.1	_ 33.9 - -	53	47/0.3					- 100/0.8						
320	2,619.1	38.9	60/0.1						- 60/0.1				2,619.1 CRYSTALLINE	BOCK	38
315	<u> </u>	- - -	00/0.1							RS-5 /			Black-White, (G REC=98%	NEISS)	
	-	• • •											RQD=989 GSI=80-89		
310	-	- - -								RS-6 /					
605		- - -											2,603.0	-ti 0 000	55
		- - - - - -											Boring Terminated at Elev Crystalline Rock (GNEISS)	O IC III
	- - - - - -	- - - -													
	-	- - -													

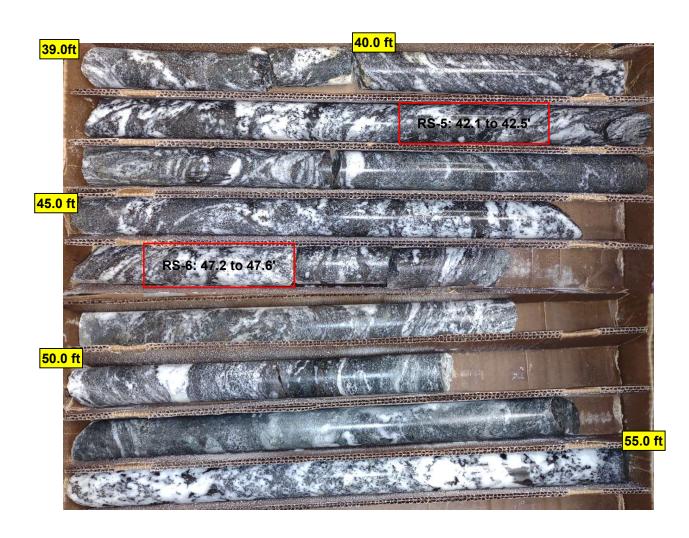
GEOTECHNICAL BORING REPORT CORE LOG

								С	O	RE L	OG					
WBS	50345.1.1			TIP	HB-00	023	С	OUNT	Υ⊢	HAYWOO)D		GEOLOGIST S. Patters	son, P.G	3 .	
SITE	DESCRIPTIO	N Brid	ge No. 43	0169 o	ver W	est Fork F	Pigeon	River	on S	R 1876 (Sonoma Road)				GROUN	ND WTR (ft)
BOR	ING NO. EB2	?-A		STA	TION	14+38			OF	FSET	16 ft LT		ALIGNMENT -L-		0 HR.	22.8
	LAR ELEV. 2					PTH 55.			NC	RTHING	650,995		EASTING 843,926		24 HR.	16.0
DRILL	RIG/HAMMER I	FF/DAT	E CG204	46 Died	rich D50	0 87% 05/10)/2022				DRILL METHOD) SPT	Core Boring	HAMM	ER TYPE	Automatic
DRIL	LER C. Odo	m		STA	RT DA	TE 11/1	4/22		CC	MP. DA	TE 03/30/23		SURFACE WATER DEP	TH N/	Α	
COR	E SIZE NQ		_			N 16.0 f										
ELEV (ft)	RUN ELEV (ft) DEPT (ft)	H RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft)	RQD (ft) %	L O G	ELEV. (ft)	DI	ESCRIPTION AND REMARK	S		DEPTH (ft)
2619	2 610 0 30 0	1 10	2.22/4.0	(4.0)	(4.0)								Begin Coring @ 39.0 ft CRYSTALLINE ROCK			
2615	2;618:8 <u>4</u> 38:8 +	5.0	3:33/1.0 3:22/1.0 3:30/1.0 2:40/1.0	(4.9)	(4.9)	RS-5				<u>-</u>	Fresh, Hard, Bl	lack-W	hite (GNEISS), with Close Fi Laminated to Thinly Bedder		Spacing, T	hickly
2010	2,613.0 45.0	5.0	2:46/1.0 2:37/1.0 3:24/1.0	98%	98%					-	Uncor	ofinad (RS-5: 42.1-42.5' Unit Weight: 174.3 pcf Compressive Strength: 8,350	nei (1.2	02 kef)	
2610	1 T		3:53/1.0 2:30/1.0 3:25/1.0	96%	96%	RS-6					Officor	ililieu (RS-6: 47.2-47.6' Unit Weight: 178.0 pcf	psi (1,2	02 KSI)	
	2,608.0 50.0	5.0	4:31/1.0 3:52/1.0	(5.0)	(5.0)	_				<u> </u>	Uncor	nfined (Compressive Strength: 8,580	psi (1,2	36 ksf)	
2605	+ + + + + + + + + + + + + + + + + + + +		3:07/1.0 3:59/1.0 4:57/1.0		100%					-			GSI=80-85 (continued)			
	2,603.0 55.0)	6:21/1.0			-			F. 6	2,603.0	Boring Termi	nated a	at Elevation 2,603.0 ft In Crys	talline R	ock (GNE	55.0 ISS)
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Bridge No. 430169 over West Fork Pigeon River on SR 1876 (Sonoma Road), Haywood County, NC Rock Core Photographs EB2-A

39.0 to 55.0 Feet





WBS	E024E															
	50545.	.1.1			TI	P HB-0023	3	COUNT	MAYWOC	D			GEOLOGIST P. Toma	sic		
SITE D	DESCRI	PTION	Brid	ge No.	43016	9 over West	Fork Pige	on River o	on SR 1876 (Sonoma	Road))			GROUN	D WTR (ft)
BORIN	IG NO.	EB2-F	3		S ⁻	TATION 14	+37		OFFSET 8	ft RT			ALIGNMENT -L-		0 HR.	12.2
COLL	AR ELE	EV. 2,0	657.6	ft	T	OTAL DEPT	H 21.0 ft		NORTHING	4,650,	972		EASTING 843,919		24 HR.	Dry
RILLE	RIG/HAM	MER EF	F./DAT	E CG	29022 N	lobile B-29 869	% 04/08/202	2		DRILL M	ETHOD) HS	. Augers	HAMME	R TYPE	
	ER M.					TART DATE			COMP. DAT				SURFACE WATER DE	_1		
	DDI\ /E		1	W CO				PER FOOT		SAMP.	T /	1 🗆	JOIN ACE WATER DE	F 111 1N/ <i>F</i>	1	
LEV (ft)	ELEV (ft)	DEPTH (ft)	0.5ft		0.5ft	0 2		50 50	75 100	NO.	MOI	0	SOIL AND RO	OCK DESC	CRIPTION	DEPTH (f
655	2,656.6 - 2,653.4	-	3	2	1	\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					M		2,657.6 GROU ROADWA Soft, Brown-Black 2,654.6 with trace Medium Stiff, Gra	, Fine San nica and o	MENT dy SILT (A rganics	
	2,651.6	-	5	3	2	\$ 5					М		2 651 7 Silty CLAY (A-7), v			
650		_	12	3	2	•5···					М			LUVIAL		
1	2,648.4	9.2	3	2	1								Soft to Medium Sandy SILT (е
			3	2	'	6 3					M			,,		10
645	2.644.1	13.5											2,645.6 Very Dense, Brow	n-Orange-	Tan, Silty F	<u>12</u> -ine
ľ	2,044.1	- 10.0	25	31	25		: : :`:`	56			М		to Coarse SAND and	(A-2-4), wi pea gravel	th trace m	ica
	‡	_						1:::						. 3		
40	2,639.1	18.5		<u> </u>				 	 				- 2,638.6			19
		- 04.0	4	14	86/0.4				100/0.9				WEATI	IERED RO		21
1	2,636.6	- 21.0	60/0.0						60/0.0	1			Boring Termi	lack, (GNE nated with		
													-			

SHEET 20

LAB	RESU	ILTS
HB-	0023	21
PROJECT RE	FERENCE NO.	SHEET NO.

				ROCK	TEST RESULTS		
SAMPLE NO.	BORING	STATION	OFFSET	DEPTH INTERVAL	ROCK TYPE	UNIT WEIGHT (PCF)	UNCONFINED COMPRESSIVE STRENGTH
RS-1	B1–A	13+04 -L-	13' LT	21.9 - 22.5'	GNEISS	191.9	12,630 psi /1,819 ksf
RS-2	B1-A	13+04 -L-	13' LT	26.0 - 26.5'	GNEISS	174.3	12,900 psi /1,858 ksf
RS–3	В1-В	13+02 -L-	12' RT	20.2 - 20.6'	GNEISS	173.8	11,220 psi/1,616 ksf
RS-4	В1-В	13+02 -L-	12' RT	23.8 - 24.3'	GNEISS	166.4	16,770 psi/2,415 ksf
RS-7	B2-B	14+10 -L-	23' RT	16.5 - 17.0'	GNEISS	182.3	10,650 psi/1,534 ksf
RS-8	B2-B	14+10 -L-	23' RT	23.4 - 23.9'	GNEISS	181.4	9,270 psi/1,335 ksf
RS-5	EB2-A	14+38 -L-	16' LT	42.1 - 42.5'	GNEISS	174.3	8,350 psi/1,202 ksf
RS-6	EB2-A	14+38 -L-	16' LT	47.2 - 47.6'	GNEISS	178.0	8,580 psi/1,236 ksf

Ahx M Atmuly

AUTHORIZEDSIGNATURENCDOTCERTNO. 130-0212



PHOTO #1: ROCK OUTCROP AT END BENT 1 OF BRIDGE NO. 430169 LOOKING WEST (DOWN STATION)



PHOTO #2: END BENT 1 OF BRIDGE NO. 430169 LOOKING EAST (UP STATION)



PHOTO #3: BRIDGE NO. 430169 LOOKING NORTH AND DOWNSTREAM

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CONTENTS

DESCRIPTION

LEGEND (SOIL & ROCK)

SUPPLEMENTAL LEGEND (GSI)

BORE LOGS, CORE LOGS, AND ROCK CORE PHOTOS

TITLE SHEET

SITE PLAN PROFILE

CROSS SECTIONS

LAB RESULTS SITE PHOTOGRAPHS

SHEET NO.

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5-8

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50345

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY <u>HAYWOOD</u>

PROJECT DESCRIPTION REPLACE BRIDGE NO. 430170 ON SR 1105 (MAX THOMPSON RD) OVER EAST PIGEON RIVER

STATE PROJECT REFERENCE NO. 15 HB-0023

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 (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 INCLORDED TO CLIMATIC CONDITIONS INCLORDED TO CLIMATIC CONDITIONS INCLORDING TO CLIMATIC CONDITIONS INCLORDING 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 BY 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.

	CG2 EXPLORATION
	P. TOMASIC, G.I.T
INVESTIGATED	BY CG2, PLLC

DRAWN BY K. DE MONTBRUN, P.E.

CHECKED BY M. WALKO, P.E.

SUBMITTED BY <u>CG2</u>, PLLC

DATE _APRIL 2024



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SIGNATURE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REPERENCE NO. SHEET NO.

HB-0023

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, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	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.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS OPCOMIC MATERIALS	MINERALOGICAL COMPOSITION	CRYSTALLINE FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
LLASS. (\$\(\sigma\) 39% PASSING "2000) (\$\(\sigma\) 39% PASSING "2000)	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-0 A-1-0 A-1-0 A-2-4 A-2-5 A-2-6 A-2-7 B-2-6 A-2-7 A-1-4 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.
7. PASSING	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPT REFUSAL, ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	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.
*10 50 MX GRANULAR CLAY MUCK,	PERCENTAGE OF MATERIAL	CP) SHELL BEDS, ETC. WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
*40 30 MX 50 MX 51 MN SOILS PEAT *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 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%	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 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 50ILS WITH	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, (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	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 1	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 SOILS	CHOCKE WITEH	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 SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
USUAL TYPES STONE FRAGS. OF MAIOR GRAVEL AND FINE SILTY OR CLAYEY SILTY CLAYEY MATTER		(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.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS	▼ STATIC WATER LEVEL AFTER <u>24</u> HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN, RATING EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	<u> </u>	(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	PARENT MATERIAL.
AS SUBGRADE	SPRING OR SEEP	WITH FRESH ROCK.	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
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.
COMPACTNESS OF RANGE OF STANDARD RANGE OF UNCONFINED	TD 25,425	(MOD.SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE CONFIDENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT ²)	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION WITH SOIL DESCRIPTION OF ROCK STRUCTURES	IF TESTED, WOULD YIELD SPT REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT	<u>LEDGE</u> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4	SOIL SYMPOL SPI TEST BORING SLOPE INDICATOR	(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 10	M	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
MATERIAL DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERT DENSE 2 30		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	MW -	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 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 WITH CORE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4	→ → → → → → → → → → → → →	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 TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
		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	UNSUITABLE WASTE Main ACCEPTABLE, BUT NOT TO BE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	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
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	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	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	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
SOIL MOISTURE - CORRELATION OF TERMS	$oldsymbol{\bot}$ CPT - CONE PENETRATION TEST NP - NON PLASTIC $\dot{\gamma}_{ m d}$ - DRY UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE (ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
<u>'</u>	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON 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	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.
PLASTIC LIQUID LIMIT	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
BANGE / SEMISULID; REQUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK: (BM #2) N: 650806.345 E: 8446 5.809L- STA. 2 +53.50.
(PI) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS	ELEVATION: 2,655.89'
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: 2655.89 FEET
SL _ SHRINKAGE LIMIT	□ DRILL UNITS: ■ ADVANCING TOOLS: HAMMER TYPE: □ CME-45C □ CLAY BITS ▼ AUTOMATIC ■ MANUAL	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	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO	CL CONTINUOUS FLICHT AUSED	VERY CLOSE LESS THAN Ø.16 FEET THICKLY LAMINATED Ø.008 - 0.03 FEET	F.I.A.D. = FILLED IMMEDIATELY AFTER DRILLING
ATTAIN UPTIMUM MUISTURE	CME-55	THINLY LAMINATED < 0.008 FEET INDURATION	ROADWAY DESIGN AND SURVEY INFORMATION DATED 10/13/2023
PLASTICITY		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	PROVIDED BY TGS ENGINEERS.
PLASTICITY INDEX (PI) DRY STRENGTH NON PLASTIC 0-5 VERY LOW	CME-550X HARD FACED FINGER BITS X-N Q X-N Q	RUBBING WITH FINGER FREES NUMEROUS GRAINS;	C.T. = CORING TERMINATED
SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST X CASING X W/ ADVANCER HAND TOOLS:	GENILE BLUW BY HAMMER DISINTEGRATES SAMPLE.	NM = NOT MEASURED
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH	POSTABLE HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TRICONE TUNG-CARB.	CRAINC ARE DISCIPLE TO SERABATE WITH STEEL PROBE.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X DIEDRICH D-50 X CORE BIT SOUNDING ROD VANE SHEAR TEST	INDURATED DIFFICULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	THE STEAM TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	
		SHIFTE DIEHKS HURUSS URHINS.	

PROJECT REFERENCE NO.	SHEET NO.
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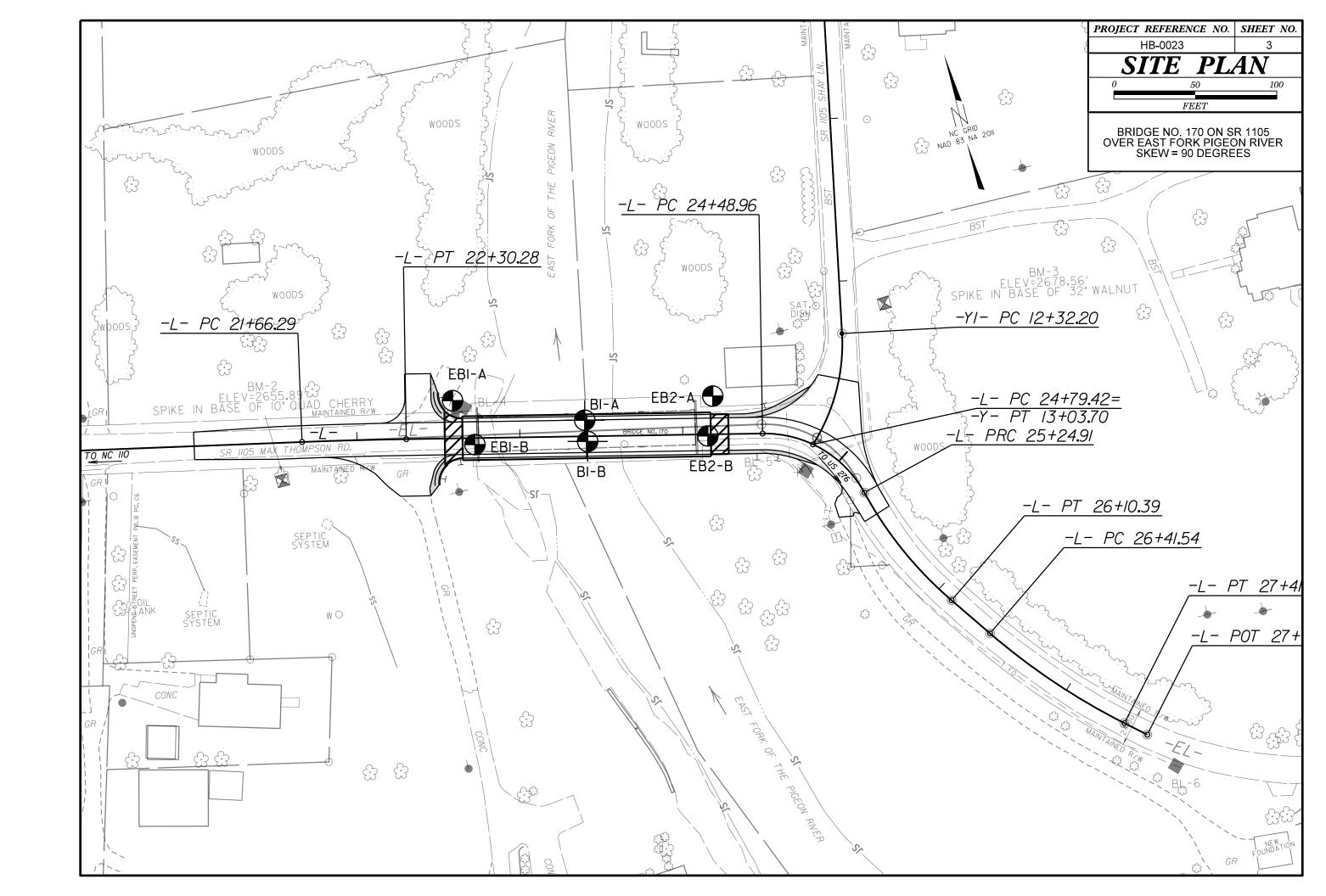
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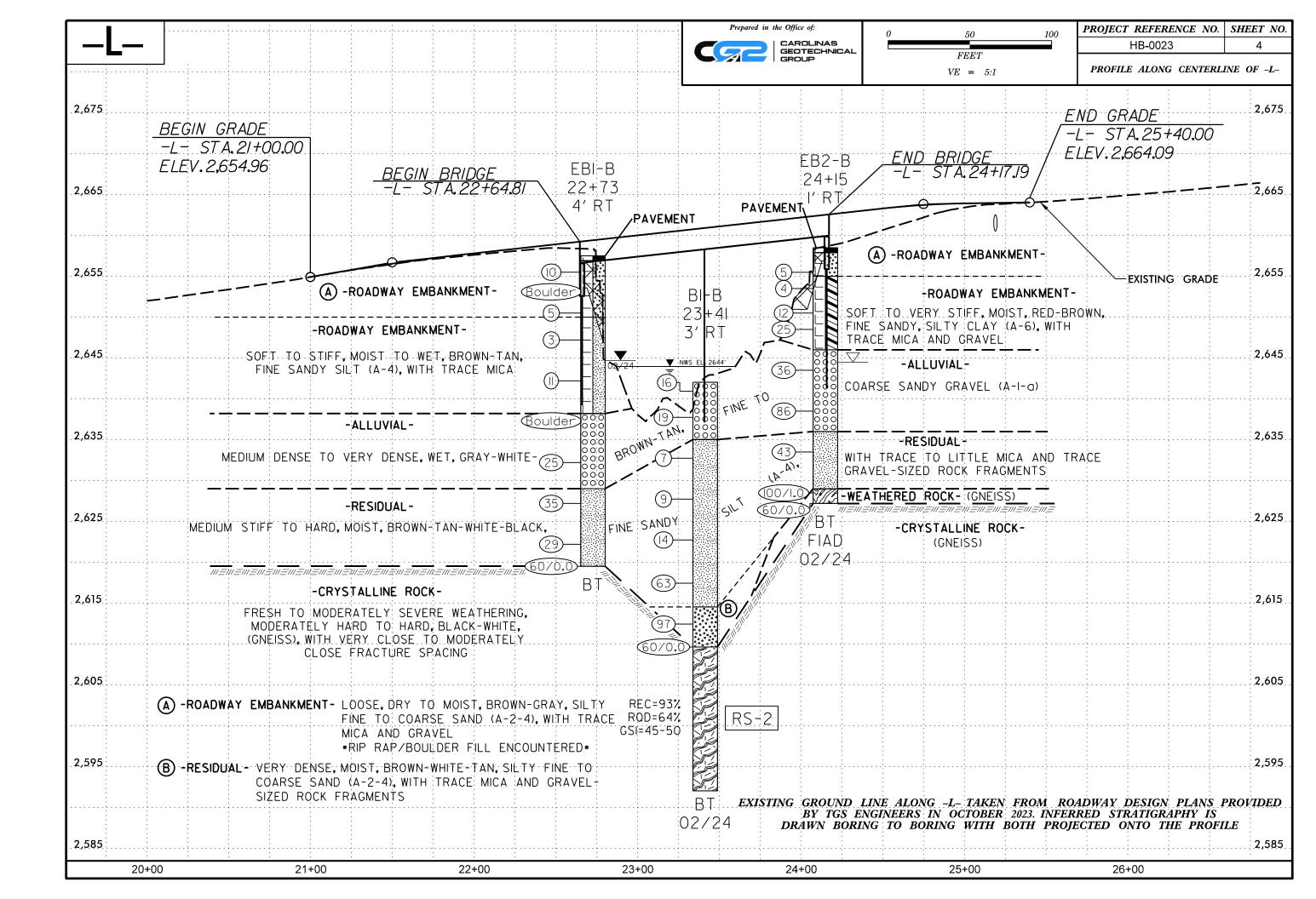
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

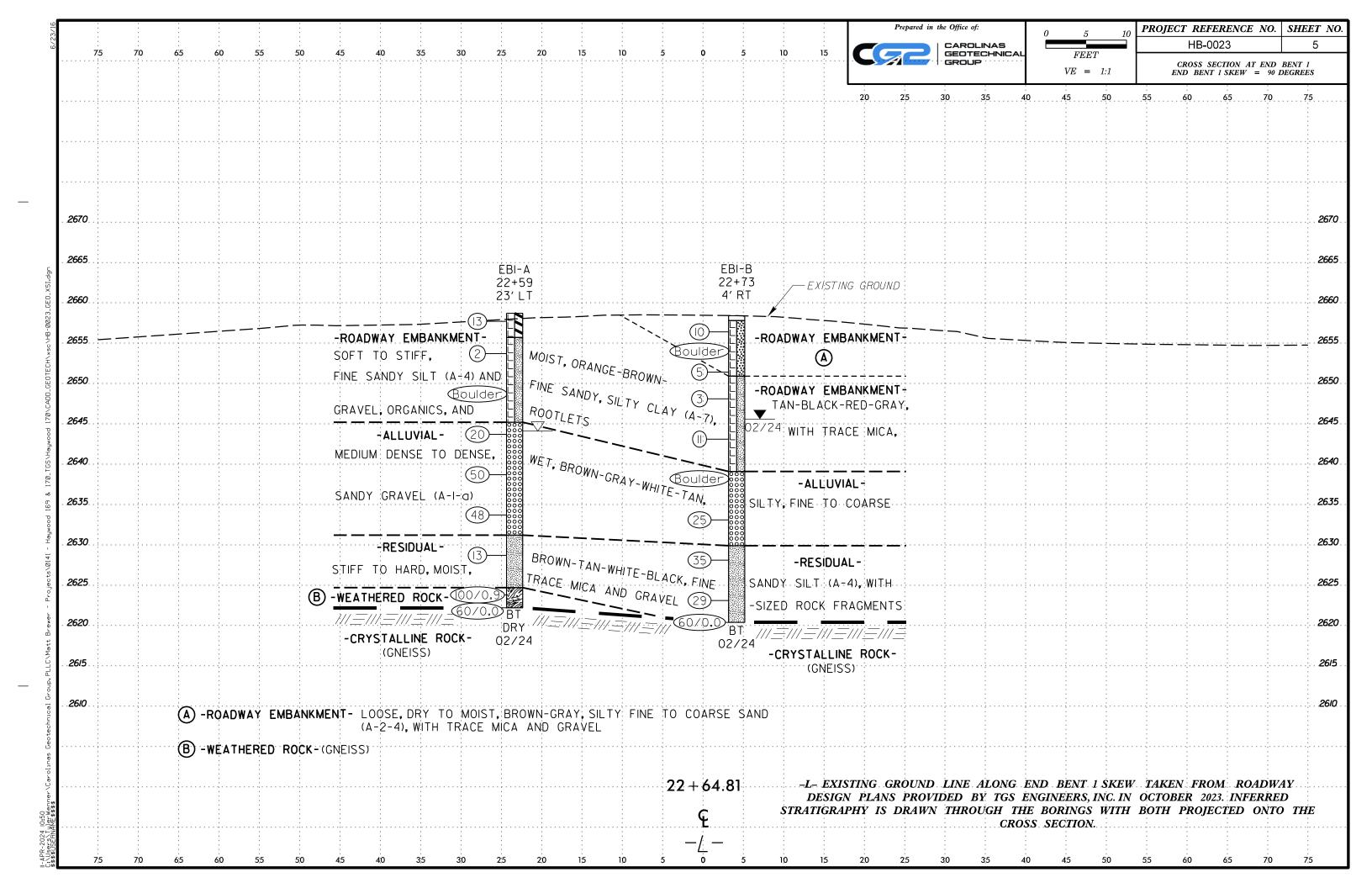
SUBSURFACE INVESTIGATION

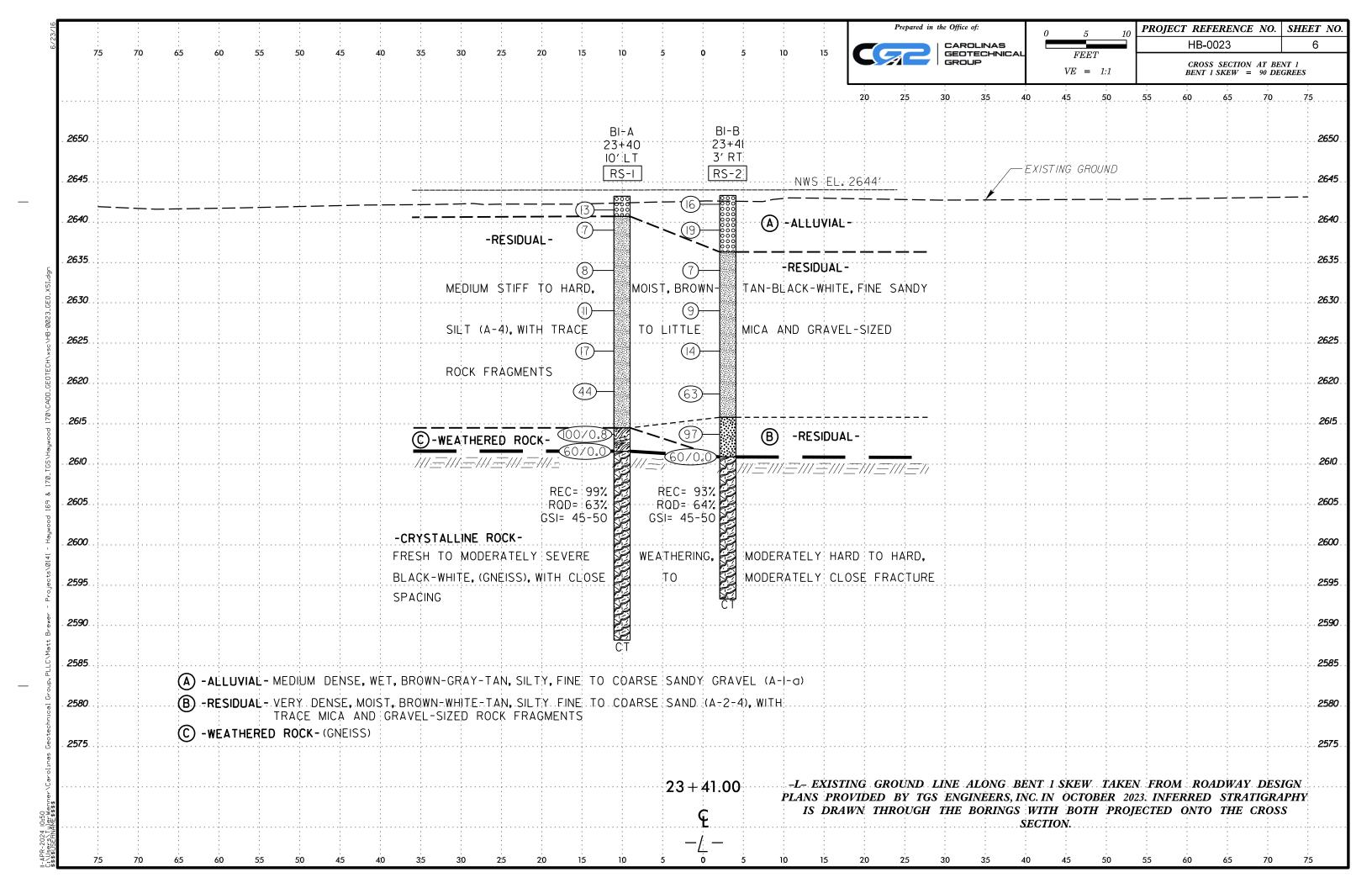
SUPPLEMENTAL LEGEND GEOLOGICAL STRENGTH INDEX (CSI) TABLES

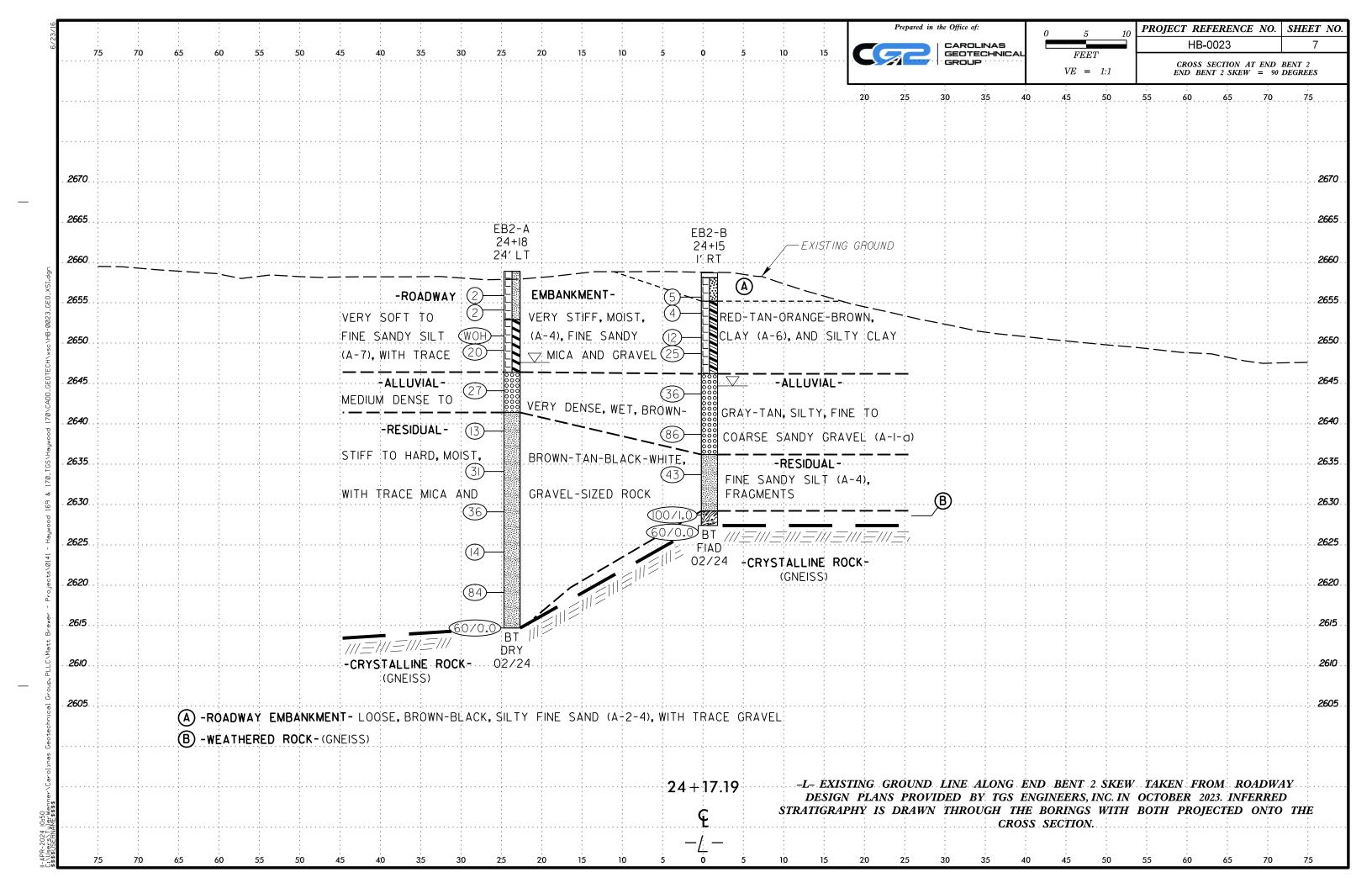
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Joi	inted Ro	ock Mass (Marinos and Hoe	k,2000)		AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Roc	k Masses (Marır	nos and Hoek,	, 2000)
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)		s p		8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)			
From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Guoting 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.	SURFACE CONDITIONS	VERY GOOD Very rough, fresh unweathered surface: GOOD Rough, slightly weathered, iron stained surfaces	FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surface with compact coatings or fillings or angular fragments VERY POOR Slickensided, highly weathered surface with soft clay coatings or fillings	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.	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slicken- sided or highly weathered surfaces with soft clay coatings or fillings
STRUCTURE		'		JALITY 📥	COMPOSITION AND STRUCTURE			
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities BLOCKY - well interlocked un-	PIECES	90 80		N/A N/A	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. 60			
disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	ROCK	70 60			8. Sand- stone with C. Sand- stone and C. Sand- stone and Stone			
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets	OCKING OF		50		thin inter-layers of layers of siltstone in similar amounts amounts amounts and stone layers layers amounts	C / [) /E	
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity	 INTERL		40	30	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.	30	F 20	
DISINTEGRATED - poorly inter- locked, heavily broken rock mass with mixture of angular and rounded rock pieces	 			20	G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of special structure with pockets of clay. Thin layers of special structure with pockets of clay. Thin layers of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay. The same of special structure with pockets of clay.	\$	/ / h	10
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	— II -	N/A N/A		10	sandstone are transformed into small rock pieces. Means deformation after tectonic disturbance			

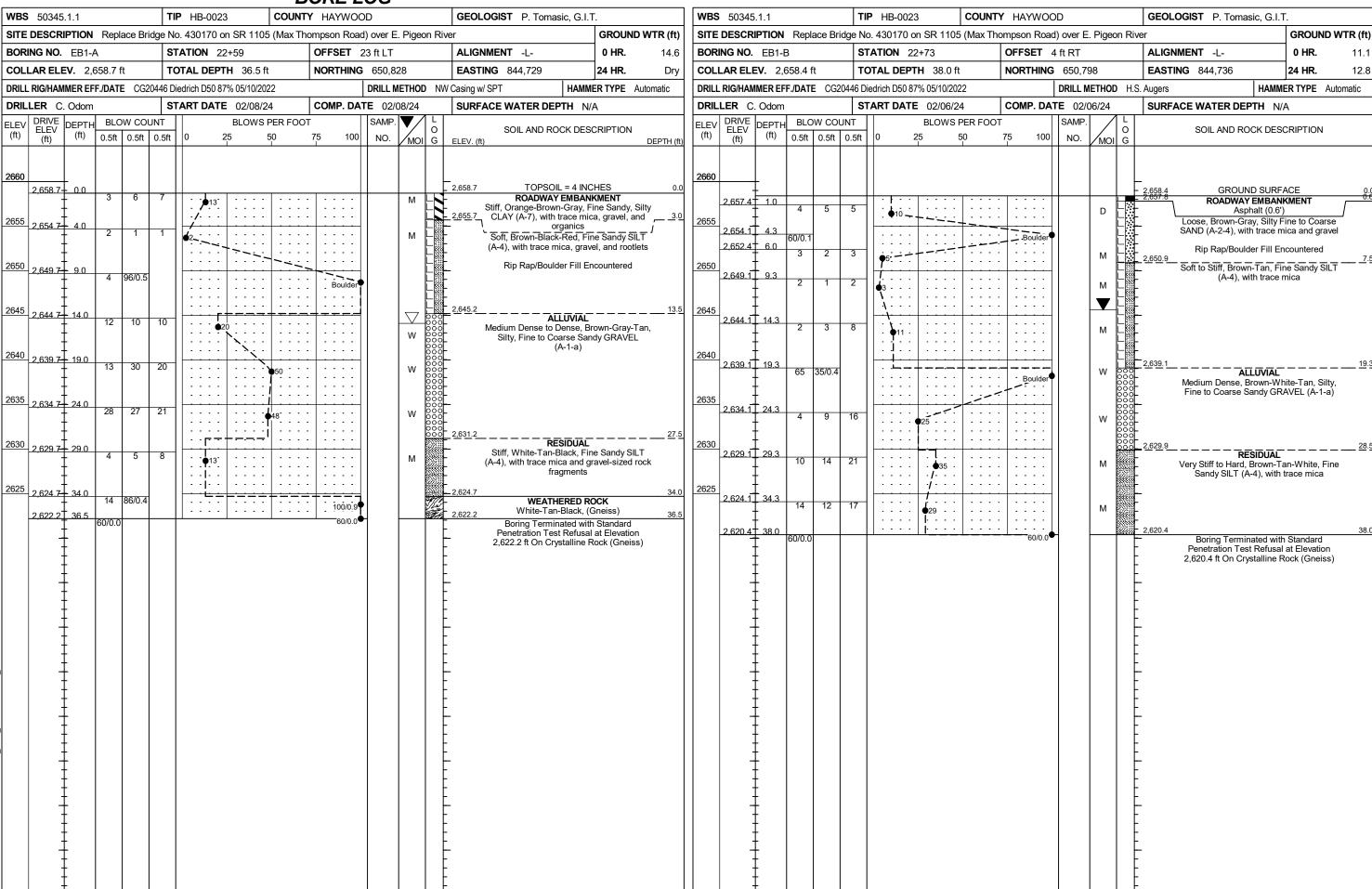












WRS	50345	1 1			Т	P HB-002	23	COUNT						GEOLOGIST P. Tomasic, G.I.	т
			Ren	lace B				105 (Max Th				= Pine	on Riv	ļ	GROUND WTR (ft)
	NG NO.			, acc D		TATION 2		TOO (Wax 11			10 ft LT	1 190	OIII	ALIGNMENT -L-	0 HR. N/A
	AR ELE			ft		OTAL DEP) ft	+		650,7	96		EASTING 844,805	24 HR. N/A
	RIG/HAM					Diedrich D50					DRILL N) NV	·	ER TYPE Automatic
	LER C.					TART DAT			COM	IP. DA	ΓE 02/0		140	SURFACE WATER DEPTH 1.	
LEV	DRIVE	DEPTH	T	ow co				S PER FOO			SAMP.	V /	1 L T		
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75	100	NO.	MOI	O G	SOIL AND ROCK DESC	CRIPTION DEPTH (ft
							•		•						
645														WATER SURFACE ((n2/n7/24)
	2.642.5	- 0.7				<u> </u>								2,643.2 GROUND SURF	
	· †	-	4	6	7				. .			w		ALLUVIAL 2,640.7 Medium Dense, Brown-C	Gray, Fine to
640	2,640.0	3.2	8	5	2	1	 					М		Coarse Sandy GRAVE	<u> </u>
	1	-							.					Medium Stiff to H Brown-Tan-White-Black, Fi	ne Sandv SILT
635	2,635.0	8.2				<u>- </u>			-					(A-4), with trace mica and gi fragments	ravel-sizéd rock
	‡	-	2	4	4	- 6 8 · ·			.			M		3	
	1	-				: :::			.						
530	2,630.0	_ 13.2 -	4	5	6	- 11 -	 		-			М		-	
	‡	-				: :\. :			.						
25	2,625.0	18.2							· · ·					_	
	‡	-	6	9	8	: : 🔩	7		.			M			
		-) <u></u>		- - ·						
20	2,620.0	23.2	5	8	36		· · · · ·	044				М		-	
	‡	- -						: : : : :	. .						
615	2,615.0	28.2	10	20	70/0.0									-2,614.5	28.7
	‡	• •	16	30	70/0.3				- T - ;	100/0.8	•			WEATHERED RO Brown-Black-White, (OCK
610	2,611.6	31.6	60/0.0	1					. .	60/0.0	•			2,611.6 CRYSTALLINE R	31.6 OCK
310	+	-					 							- Black-White, (GNI	EISS)
	+	-							.	: :	RS-1			REC=99% RQD=63%	
605	‡	-							-					GSI=45-50	
	‡	-							.						
200	‡	-							.						
000	†	-					1							_	
	‡	.							.						
595	‡	-							-					-	
	‡	-							.						
590	‡	-							- - :						
550	1	-												- 2,588.2	55.0
İ	+					<u>'</u>	1			- '	1		 	Boring Terminated at Elevat Crystalline Rock (G	ion 2,588.2 ft In
	‡	-												-	
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GEOTECHNICAL BORING REPORT CORE LOG

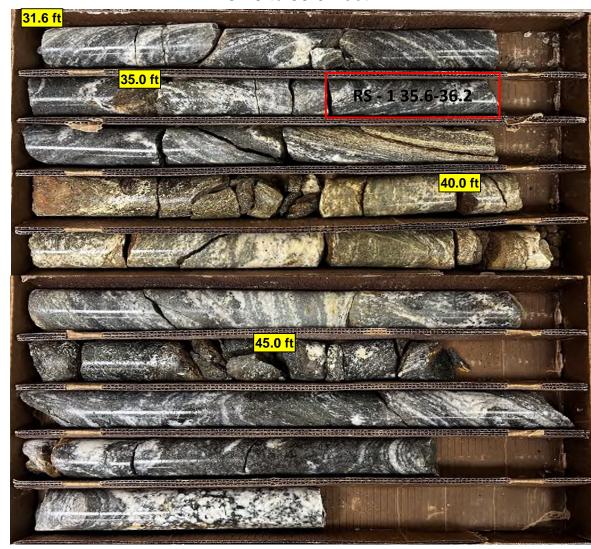
									<u>C</u>	<u>Ol</u>	RE L	OG				
WBS	50345	.1.1			TIP	HB-00)23	C	TNUC	Y H	HAYWOO	D	GEOLOGIST P. Tomas	sic, G.I.T		
SITE	DESCR	IPTION	Rep	lace Bridg	je No. 4	43017	on SR 1	1105 (N	∕lax Th	omp	son Road	l) over E. Pigeon Riv	/er		GROUN	D WTR (ft)
BOR	NG NO.	B1-A			STAT	ΓΙΟΝ	23+40			OF	FSET 1	0 ft LT	ALIGNMENT -L-		0 HR.	N/A
COLI	AR ELE	EV. 2,6	643.2 f	.t	TOTAL DEPTH 55.0 ft						RTHING	650,796	EASTING 844,805 24 HR.			N/A
DRILL	RIG/HAN	IMER EF	F./DATE	E CG204			50 87% 05/						V Casing W/SPT & Core	HAMME	R TYPE	Automatic
DRILLER C. Odom START DATE 02/07/24										co	MP. DAT	E 02/07/24	SURFACE WATER DEP	PTH 1.3	Bft	
COR	E SIZE	NQ	1	I DDILL		AL RUI JN	1 23.4 f	t STR	ΔΤΔ		1					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft)	RQD (ft) %	L O G	ELEV. (fi		DESCRIPTION AND REMARK	(S		DEPTH (ft)
2611.6	2,611.6-	31.6	3.4	N=60/0.0	(2.3)	(1.3)		(22.0)	(14.7)		2,611.6		Begin Coring @ 31.6 ft CRYSTALLINE ROCK			31.6
2610	2,608.2	-		N=60/0.0 5:00/1.0 2:49/1.0 2:54/1.0 1:29/0.4	68%	38%		94%			2,011.0		Weathered, Moderately Hard th Close to Moderatley Close			
2605	-	<u>-</u>	5.0	3:23/1.0 3:44/1.0 2:19/1.0 2:47/1.0 3:37/1.0	(4.7) 94%	(1.8) 36%	RS-1				<u>-</u>		RS-1: 35.6-36.2' Unit Weight: 177.0 pcf			
	2,603.2	40.0	5.0	3:37/1.0 3:14/1.0 2:32/1.0	(5.0) 100%	(2.8) 56%					 - -	Unconfined (Compressive Strength: 18,74	0 psi (2,6	99 ksf)	
2600	2,598.2	45.0		3:24/1.0 4:18/1.0 3:11/1.0							_		GSI= 45-50			
2595	-		5.0	2:42/1.0 3:21/1.0 3:21/1.0 4:27/1.0	(5.0) 100%	(3.9) 78%										
	2,593.2	50.0	5.0	5:51/1.0 3:52/1.0 2:38/1.0		(4.9) 98%					<u> </u>					
2590	2,588.2	55.0		2:25/1.0 2:24/1.0 3:08/1.0							2,588.2	Davis a Tamaia atau	-4 Flourities 0 500 0 ft la Cou	-4-II: D	l-/O	55.0
	-	-									_	Boring Terminated	at Elevation 2,588.2 ft In Crys	stalline K	ock (Gnei	SS)
	-										-					
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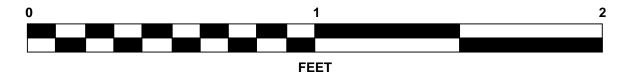


WBS: BP13.R049 - Replace Bridge No. 430170 on SR 1105 (Max Thompson Road) over E. Pigeon River

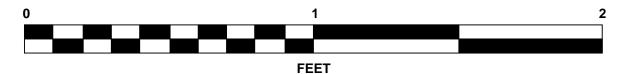
Rock Core Photographs Bridge No. 430170 - B1-A

31.6 to 55.0 Feet









							SURE L	<u> </u>				
NBS	50345	.1.1			TII	P HB-0023 COUN	TY HAYWOO	D			GEOLOGIST P. Tomasic, G.I.	Г.
SITE	DESCR	IPTION	Rep	olace Br	idge N	lo. 430170 on SR 1105 (Max	hompson Road) over E	. Piged	n Riv	er	GROUND WTR (ft
BORII	NG NO.	B1-E	3		SI	FATION 23+41	OFFSET 3	ft RT			ALIGNMENT -L-	0 HR. N/A
COLL	AR ELE	EV. 2,	643.3	ft	TC	OTAL DEPTH 50.0 ft	NORTHING	650,78	33		EASTING 844,803	24 HR. N/A
RILL	RIG/HAM	IMER EF	F./DAT	E CC	320446	Diedrich D50 87% 05/10/2022		DRILL M	ETHOD	NW	/ Casing W/SPT & Core HAMM	ER TYPE Automatic
DRILL	L ER C	. Odom	1		ST	TART DATE 02/06/24	COMP. DAT	E 02/0	7/24		SURFACE WATER DEPTH 1.	3ft
LEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	0.5ft		BLOWS PER FO 0 25 50	75 100	SAMP. NO.	MOI	L O G	SOIL AND ROCK DESC	CRIPTION DEPTH (
645	2,643.2	- 0.1	6	6	10				V		. WATER SURFACE ((2,643.3 GROUND SURF, ALLUVIAL	
640	2,640.0 -	3.3	5	6	13				W S	000	Medium Dense, Gray-Brov Fine to Coarse Sandy GR.	wn-Tan, Silty, AVEL (A-1-a)
635	2,635.0 -	8.3	2	3	4				M		2,636.3 RESIDUAL Medium Stiff to Hard, Brow	
630	2,630.0	13.3	2	3	6	1 -1			М	#	Fine Sandy SILT (A-4), with mica and trace gravel-sized	rock fragments
625	2,625.0	18.3	5			- 1				Ŧ		
620	- - 2,619.7	23.6		6	8	14			М	ŧ		
	2,614.7-		16	21	42		3.		М		2,615.8 Very Dense, Brown-White-T	an Silty Fine to
	2,614.7- - - 2,610.9-		40	50	47		· · · · · • 97		М		Coarse SAND (A-2-4), with gravel-sized rock fra	trace mica and gments 32
605	-	-									Black-White, (GNI REC=93% RQD=64%	
	- - - -	- - -						RS-2			GSI=45-50	
595	-	- - - -										
555											2,593.3	50
											Boring Terminated at Elevat Crystalline Rock (G	ion 2,593.3 ft In

GEOTECHNICAL BORING REPORT CORE LOG

								<u></u>	<u>Ui</u>	LOG			
50345	.1.1			TIP	HB-00)23	C	OUNT	Υ	OOD GEOLOGIST P. Tomasic, G.I.T.			
DESCRI	PTION	Rep	lace Bridg	ge No.	43017	0 on SR 1	1105 (N	Max Th	omp	toad) over E. Pigeon River GROUND WTR	(ft)		
NG NO.	B1-B			STA	TION	23+41			OFFSET 3 ft RT ALIGNMENT -L- 0 HR.				
COLLAR ELEV. 2,643.3 ft TOTAL DEPTH 50.0 ft									NO	NG 650,783 EASTING 844,803 24 HR.	N/A		
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022										DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automat	tic		
DRILLER C. Odom START DATE 02/06/24									CO	DATE 02/07/24 SURFACE WATER DEPTH 1.3ft			
	NQ		l ppili			N 17.6 f		ΛΤΛ	١.				
ELEV (ft)	DEPTH (ft)	RUN (ft)	RATE (Min/ft)	REC. (ft)	RQD (ft) %	SAMP. NO.	REC. (ft)	RQD (ft)	O G	DESCRIPTION AND REMARKS V. (ft) DEPT	TH (ft)		
2 610 9	32 4	2.6	N-60/0 0	(2.1)	(0.7)		(16.3)	(11.2)		Begin Coring @ 32.4 ft	32.4		
	Γ	5.0	7:44/1.0 5:00/1.0 4:51/0.6 7:44/1.0 4:21/1.0	(2.1) 81% (4.7) 94%	(0.7) 27% (2.8) 56%		93%	64%		Fresh to Moderately Severe Weathering, Moderately Hard to Hard, Black-White, (GNEISS), with Very Close to Moderately Close Fracture Spacing	32.4		
2,603.3	- - 40.0 - -	5.0	5:09/1.0 3:43/1.0 4:40/1.0 5:23/1.0	(5.0) 100%	(3.9) 78%	RS-2				RS-2: 41.1-41.7' Unit Weight: 166.8 pcf Unconfined Compressive Strength: 11,370 psi (1,637 ksf)			
2,598.3	- - 45.0 - -	5.0	3:07/1.0 3:43/1.0 7:07/1.0 6:37/1.0	(5.0) 100%	(3.9) 78%					GSI=45-50			
2 593 3	- - 50.0		3:00/1.0							3 3	50.0		
	-		0.02/1.0							Boring Terminated at Elevation 2,593.3 ft In Crystalline Rock (Gneiss)			
	DESCRI NG NO. AR ELE RIG/HAM ER C SIZE RUN ELEV (ft) 2,610.9 2,608.3	AR ELEV. 2,4 RIG/HAMMER EF LER C. Odom SIZE NQ RUN ELEV (ft) DEPTH (ft)	DESCRIPTION Rep NG NO. B1-B AR ELEV. 2,643.3 f RIG/HAMMER EFF./DATI LER C. Odom E SIZE NQ RUN DEPTH RUN (ft) (ft) (ft) (ft) 2,610.9 32.4 2.6 2,608.3 35.0 5.0 2,603.3 40.0 5.0 2,598.3 45.0 5.0	Replace Bridge Repl	DESCRIPTION Replace Bridge No.	DESCRIPTION Replace Bridge No. 43017 NG NO. B1-B STATION AR ELEV. 2,643.3 ft TOTAL DE RIG/HAMMER EFF./DATE CG20446 Diedrich DE LER C. Odom START DA SIZE NQ TOTAL RUI RUN	DESCRIPTION Replace Bridge No. 430170 on SR 1	DESCRIPTION Replace Bridge No. 430170 on SR 1105 (No. No. No. B1-B STATION 23+41	TIP HB-0023 COUNT	TIP HB-0023 COUNTY HAYW	DESCRIPTION Replace Bridge No. 430170 on SR 1105 (Max Thompson Road) over E. Pigeon River GROUND WTR NG NO. B1-B STATION 23+41 OFFSET 3 ft RT ALIGNMENT -L- 0 HR.		

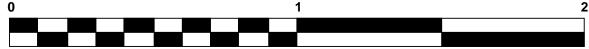


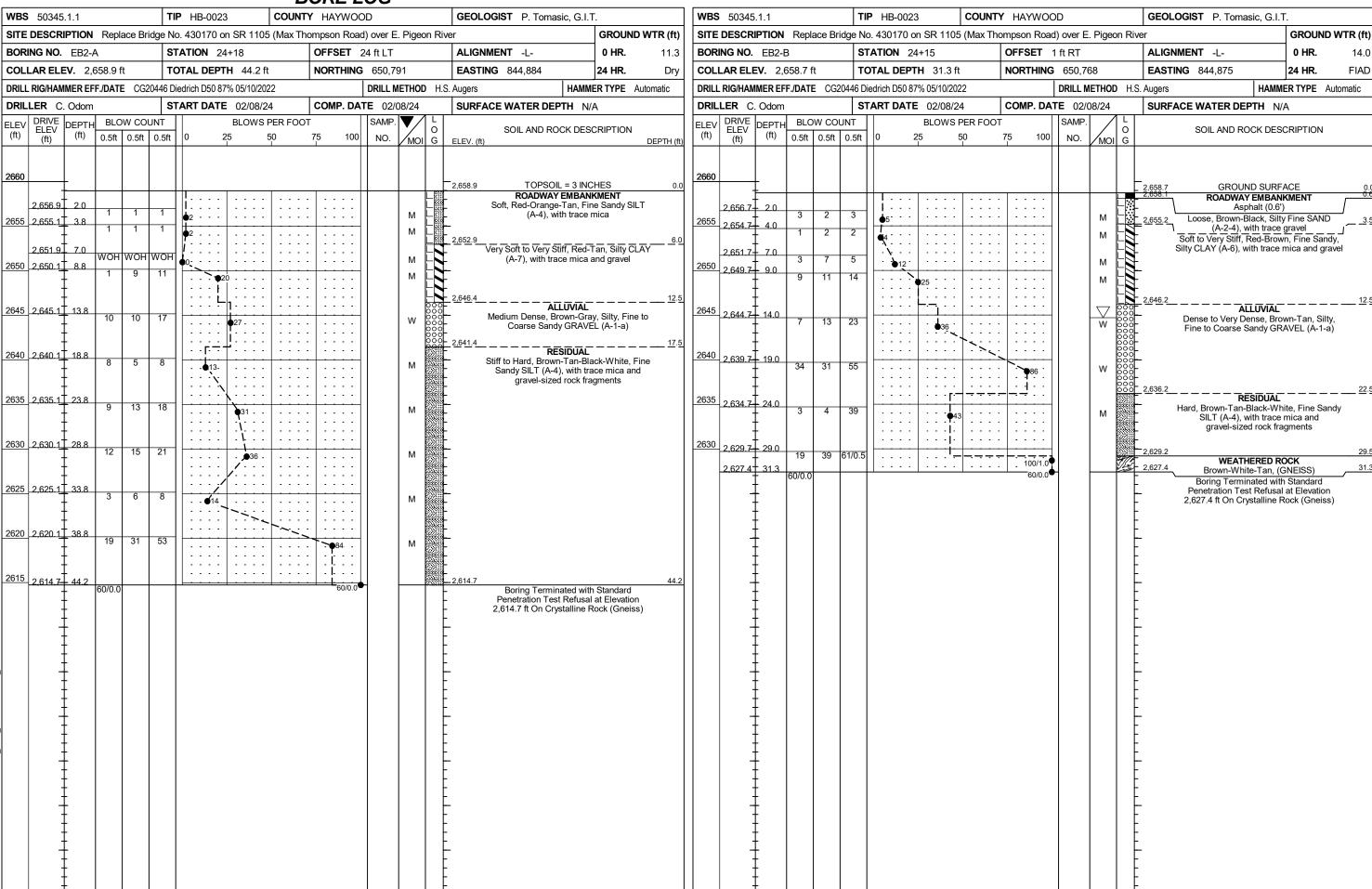
WBS: BP13.R049 - Replace Bridge No. 430170 on SR 1105 (Max Thompson Road) over E. Pigeon River

Rock Core Photographs Bridge No. 430170 - B1-B

32.4 to 50.0 Feet







HB-	HB-0023						
$\perp I.AB$	RESU						

ROCK TEST RESULTS											
SAMPLE NO.	BORING	STATION	OFFSET	DEPTH INTERVAL	ROCK TYPE	UNIT WEIGHT (PCF)	UNCONFINED COMPRESSIVE STRENGTH				
RS-1	B1–A	23+40 -L-	10' LT	35.6' - 36.2'	GNEISS	177.0	18,740 psi/2,699 ksf				
RS-2	B1-B	23+41 -L-	3RT	41.1' - 41.7'	GNEISS	166.8	11,370 psi/1,637 ksf				

Alex M Atmilly

AUTHORIZEDSIGNATURENCDOTCERTNO. 130-0212

SITE PHOTOS



PHOTO #1: VIEW OF END BENT 2 OF BRIDGE NO. 430170 FACING WEST (DOWN STATION).



PHOTO #3: VIEW OF BRIDGE NO. 430170 FACING EAST (UP STATION).



PHOTO #2: END BENT 1 OF BRIDGE NO. 430170 LOOKING EAST (UP STATION)



PHOTO #4: VIEW OF BRIDGE NO. 430170 FACING WEST (DOWN STATION).