This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.

This file or an individual page shall not be considered a certified document.

REFERENCE DF18314.2045380 STATE OF NORTH CAROLINA

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

CONTENTS

	DECORPORTOR
SHEET NO.	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK
3	SITE PLAN
4	PROFILE
5-8	CROSSSECTIONS
9-10	BORELOGS
II	SOIL TEST RESULTS

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY _HENDERSON
PROJECT DESCRIPTION <u>EMERGENCY DESIGN FOR</u>
SR 1605 (MIDDLE FORK ROAD/TOMS FALLS
ROAD)
SITE DESCRIPTION SITE 5

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	N/A	1	

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 707-6805. 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 INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS, AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:

 1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.

 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

P. PERRY, E.I.T. R. WELCH, G.I.T. CG2 EXPLORATION

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

DRAWN BY __M. MALISHER, E.I.T.

CHECKED BY K. DE MONTBRUN, P.E.

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



Prepared in the Office of: CAROLINAS GEOTECHNICAL GROUP 1805 SARDIS ROAD NORTH

SUITE 100 CHARLOTTE, NC 28270 (980) 339-8684



de Montleun 06/04/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

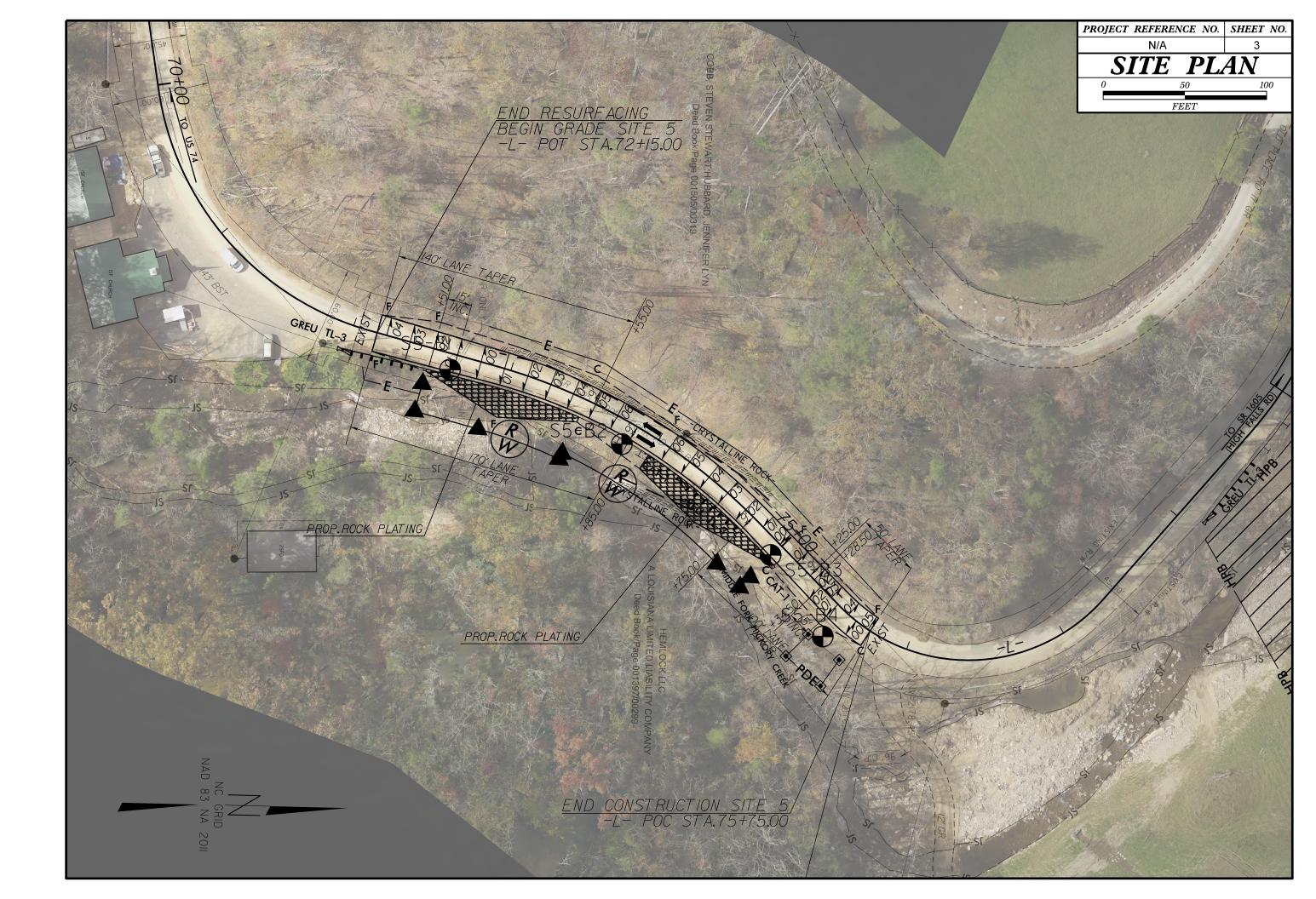
PROJECT REFERENCE NO. SHEET NO.

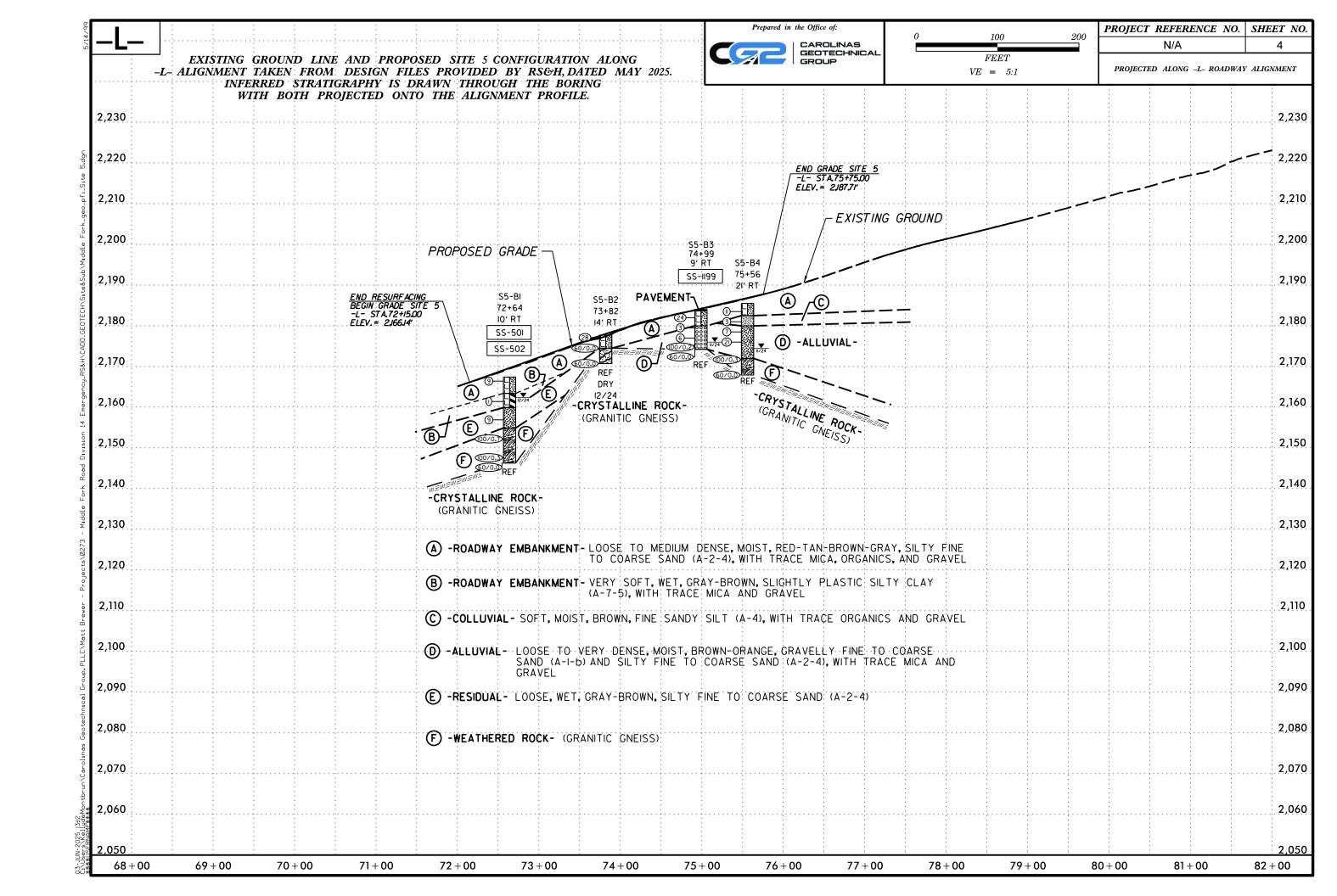
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

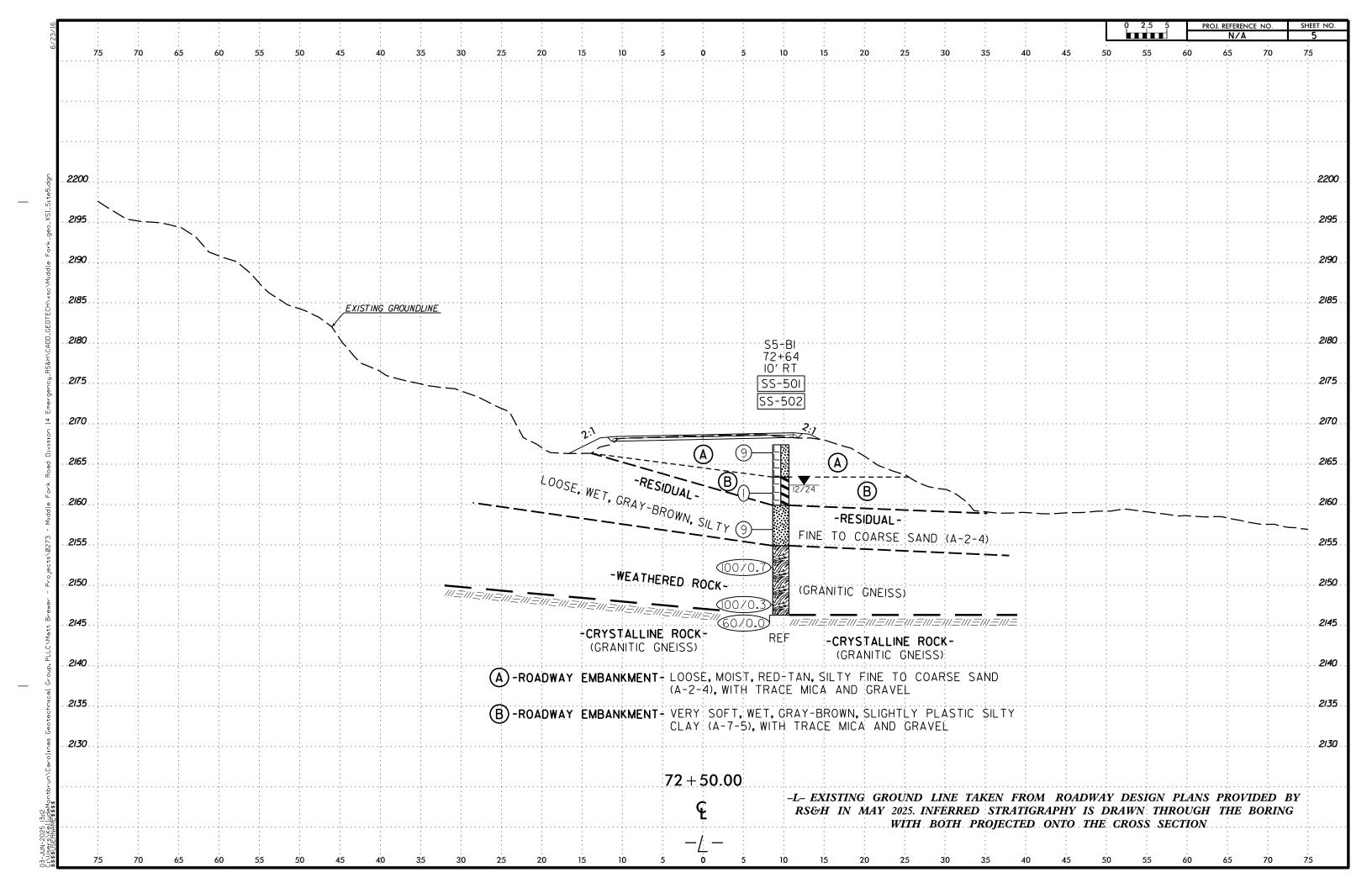
SUBSURFACE INVESTIGATION

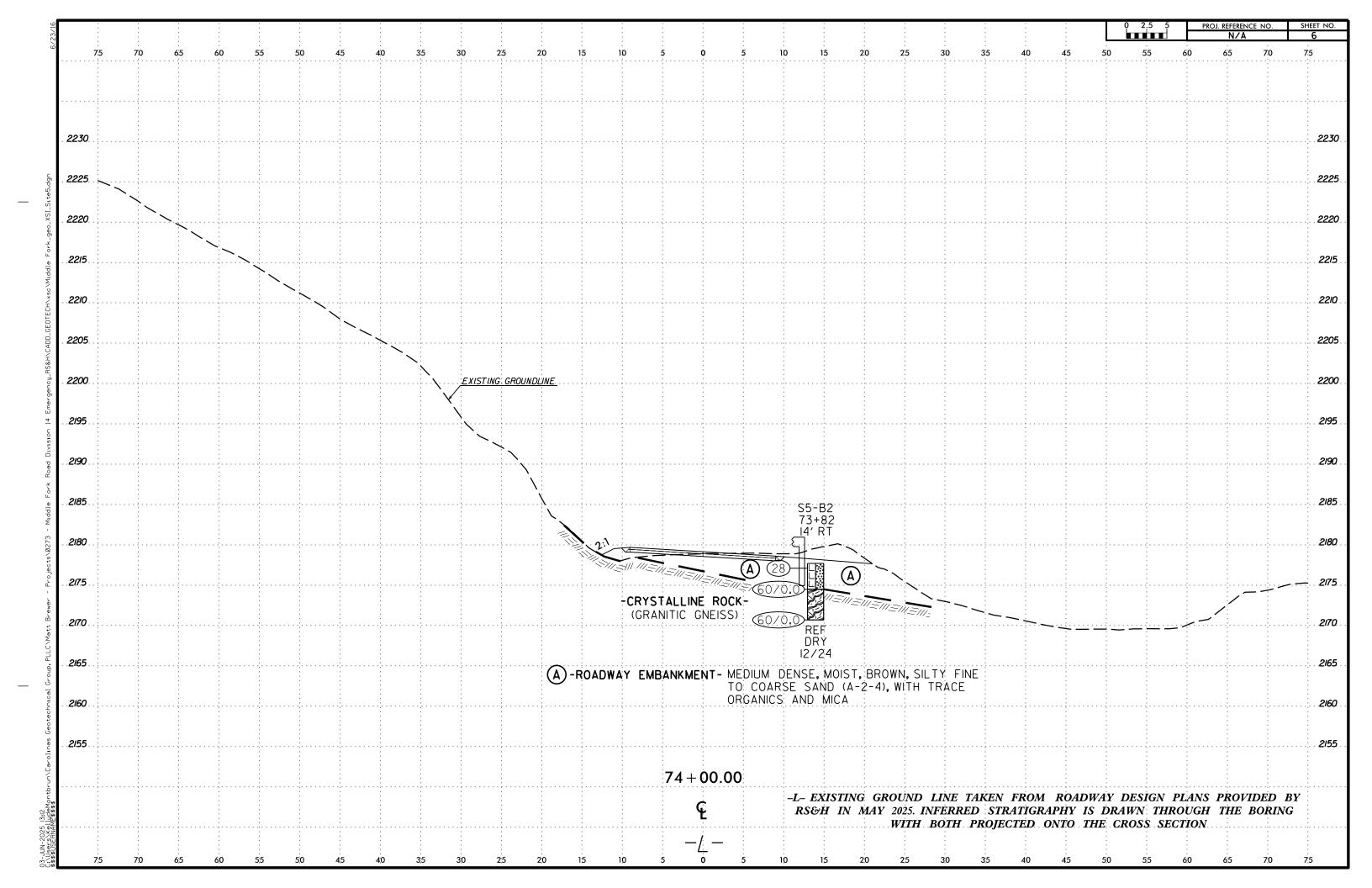
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

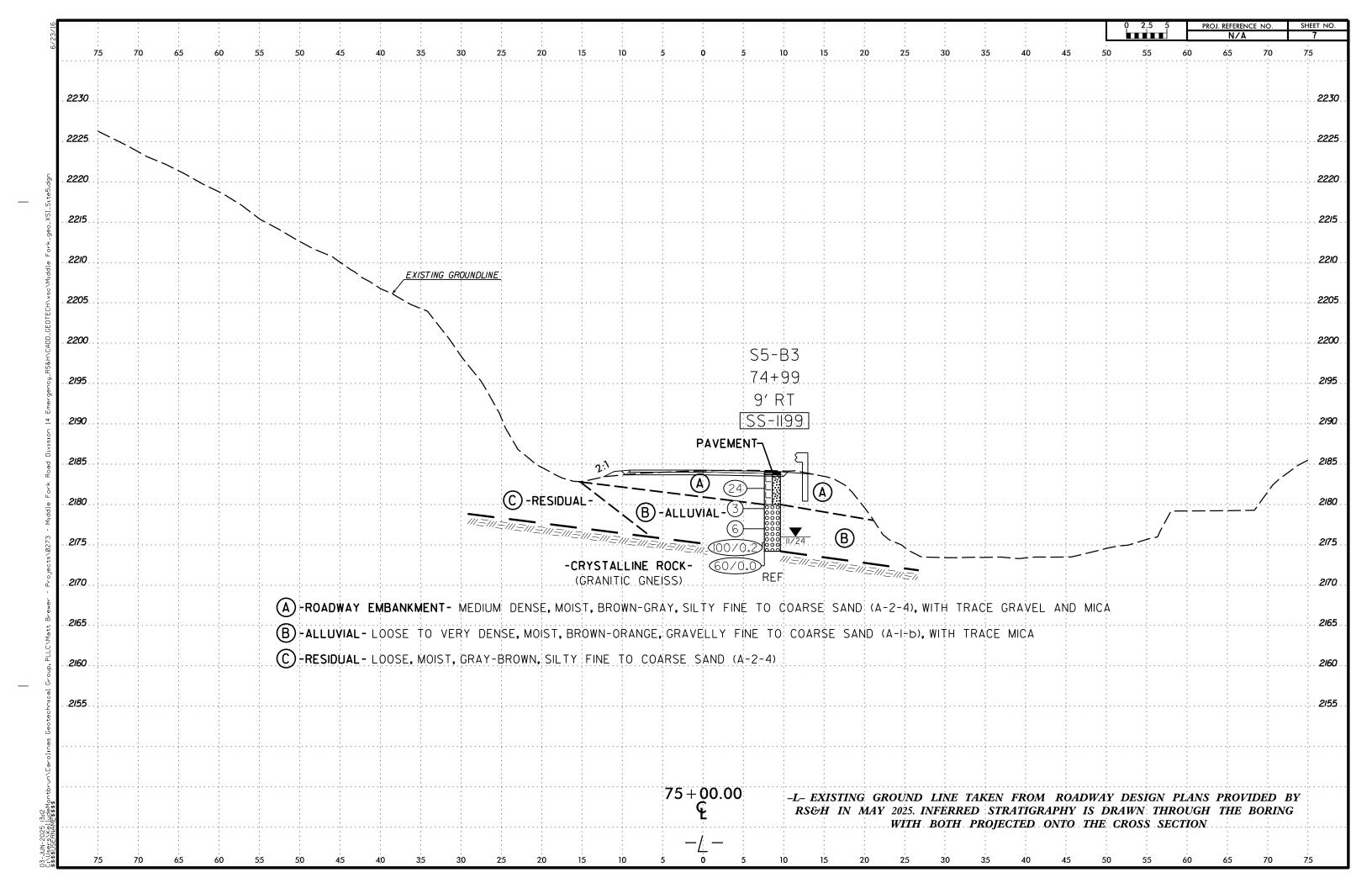
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE 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 AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
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:	WEATHERED WILL NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES >	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.	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 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.
CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) CROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	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-2-4 A-2-5 A-2-6 A-2-7 A-7-5 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 0000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.
Z PASSING	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN SEDIMENTARY ROCK COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD 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- MUCK,	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 ** *200 15 MX 25 MX 10 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.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
PASSING *40	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN LITTLE UK HIGHLY	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH,
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF SOUS	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 SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
USUAL TYPES STONE FRAGS. 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.
OF MAJOR GRAVEL, AND SAND GRAVEL AND SAND SOILS SOILS	▼ STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN. RATING EXCELLENT TO GOOD FAIR TO POOR POOR POOR UNSUITABLE	∇PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(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 SUBURHUE PUUR	SPRING OR SEEP	WITH FRESH ROCK.	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
P! OF A-7-5 SUBGROUP IS ≤ LL - 30 ;P! OF A-7-6 SUBGROUP IS > LL - 30 CONSISTENCY OR DENSENESS		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	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PANCE OF STANDARD PANCE OF LINCONFINED	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 CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/825 DIP & DIP DIRECTION WITH SOIL DESCRIPTION OF ROCK STRUCTURES	IF TESTED, WOULD YIELD SPT REFUSAL	<u>LEDGE</u> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
(N-VALUE) (TONS/FT²) VERY LOOSE < 4	SPT CLORE INDICATOR	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	ITS LATERAL EXTENT.
GRANIII AR LOOSE 4 TO 10	SOIL SYMBOL OPT DAT TEST BORING INSTALLATION SLOPE INDICATOR INSTALLATION	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. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS
MATERIAL MEDIUM DENSE 10 10 30 N/A	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
(NON-COHESIVE) VERY DENSE > 50	THAN RUADWAY EMBANKMENT C	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 GENERALLY SOFT 2 TO 4 0.25 TO 0.5	- INFERRED SOIL BOUNDARY - CORE BORING SOUNDING ROD	(V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	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	TEST BORING WITH CORE	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, ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	A PIEZOMETER	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE
HARD > 3Ø > 4	→ ALLUVIAL SOIL BOUNDARY \(\text{\Delta}\) INSTALLATION \(\text{\Delta}\) SPT N-VALUE	ROCK HARDNESS	RUN AND EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	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	UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE	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 UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRAVEL SAND SAND SILT CLAY	UNDERCOT LESS ACCEPTABLE DEGRAPABLE NOCK	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
(USE, SU.) (F SU.)	ABBREVIATIONS	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA, - MICACEOUS WEA WEATHERED	BY MODERATE BLOWS. MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB, HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL
SOIL MOISTURE - CORRELATION OF TERMS	CL CLAY MOD MODERATELY γ - UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
COLL MOISTINE SCALE FIELD MOISTINE	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_{ m d}$ - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC	POINT OF A GEOLOGIST'S PICK. 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
(ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u>	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	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. VERY CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH	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 FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	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 SEMISOLIDA PEDILIDES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
RANGE < - WET - (W) ATTAIN OPTIMUM MOISTURE (P) PL PLASTIC LIMIT	FRAGS FRAGMENTS	FRACTURE SPACING BEDDING TERM SPACING TERM THICKNESS	BENCH MARK:
	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	ELEVATION: FEET
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 MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	
SL _ SHRINKAGE LIMIT	CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET	NOTES:
- DRY - (D) ATTAIN OPTIMUM MOISTURE	CME-55 G* CONTINUOUS FLIGHT AUGER CORE SIZE:	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	ROADWAY DESIGN FILES PROVIDED BY RS&H DATED MAY 2025.
PLASTICITY	X 8*HOLLOW AUGERS	INDURATION	BORING COLLAR ELEVATIONS OBTAINED USING CARLSON BRX7 GPS.
PLASTICITY INDEX (PI) DRY STRENGTH	X CME-550X HARD FACED FINGER BITS N-N	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	REF = REFUSAL
NON PLASTIC 0-5 VERY LOW	TUNGCARBIDE INSERTS	RUBBING WITH FINGER FREES NUMEROUS GRAINS; FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM	VANE SHEAR TEST X CASING X W/ ADVANCER HAND TOOLS: POST HOLE DIGGER	CRAINC CAN BE CERABATED FROM CAMBLE WITH CIFFL BRODE.	
HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH HAND AUGER	MODERATELY INDURATED BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	X MOBILE B-29 TRICONE TUNGCARB. SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X MOBILE B-29 CORE BIT VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-1
		I .	

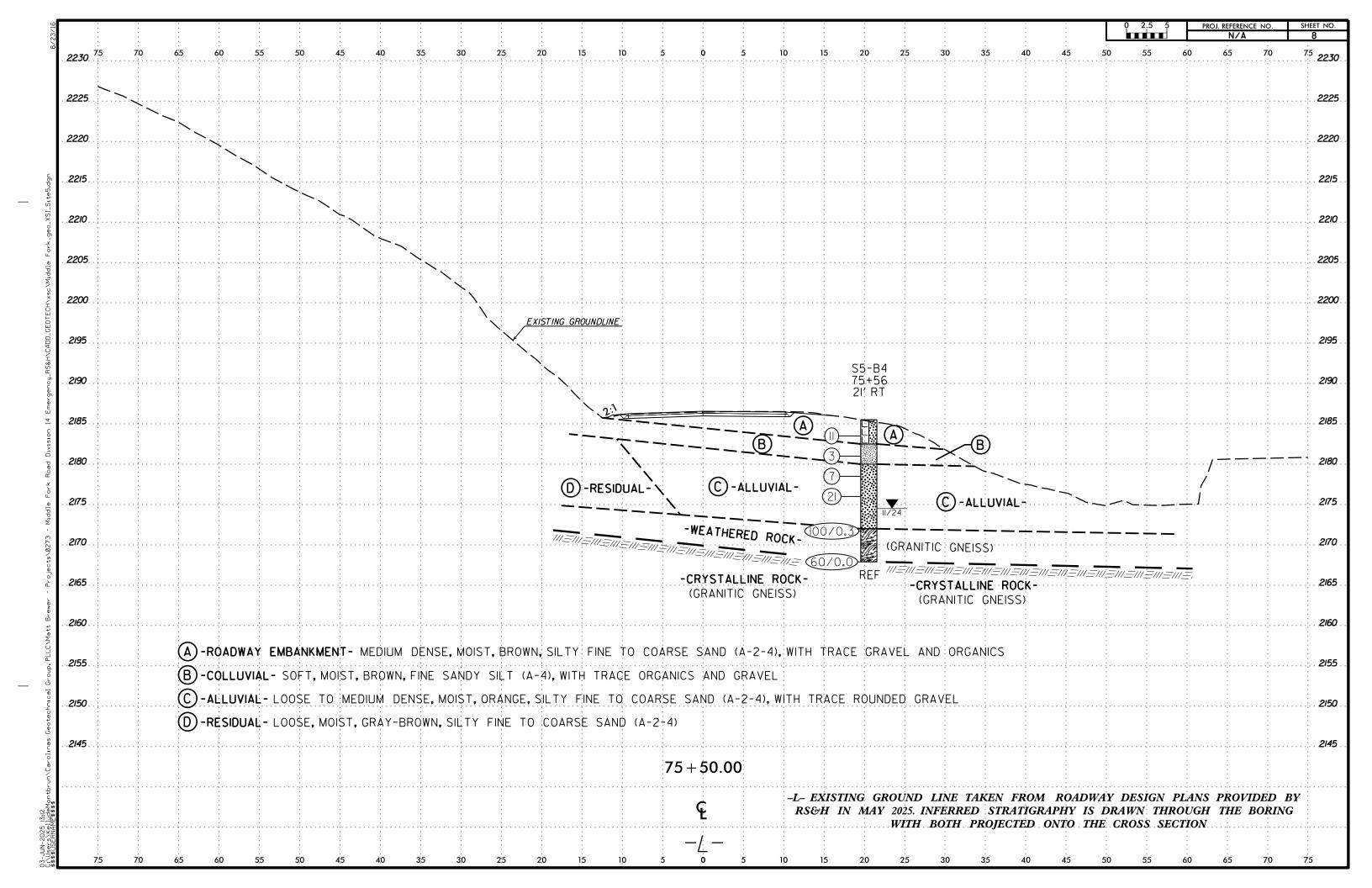












N/A

Dry

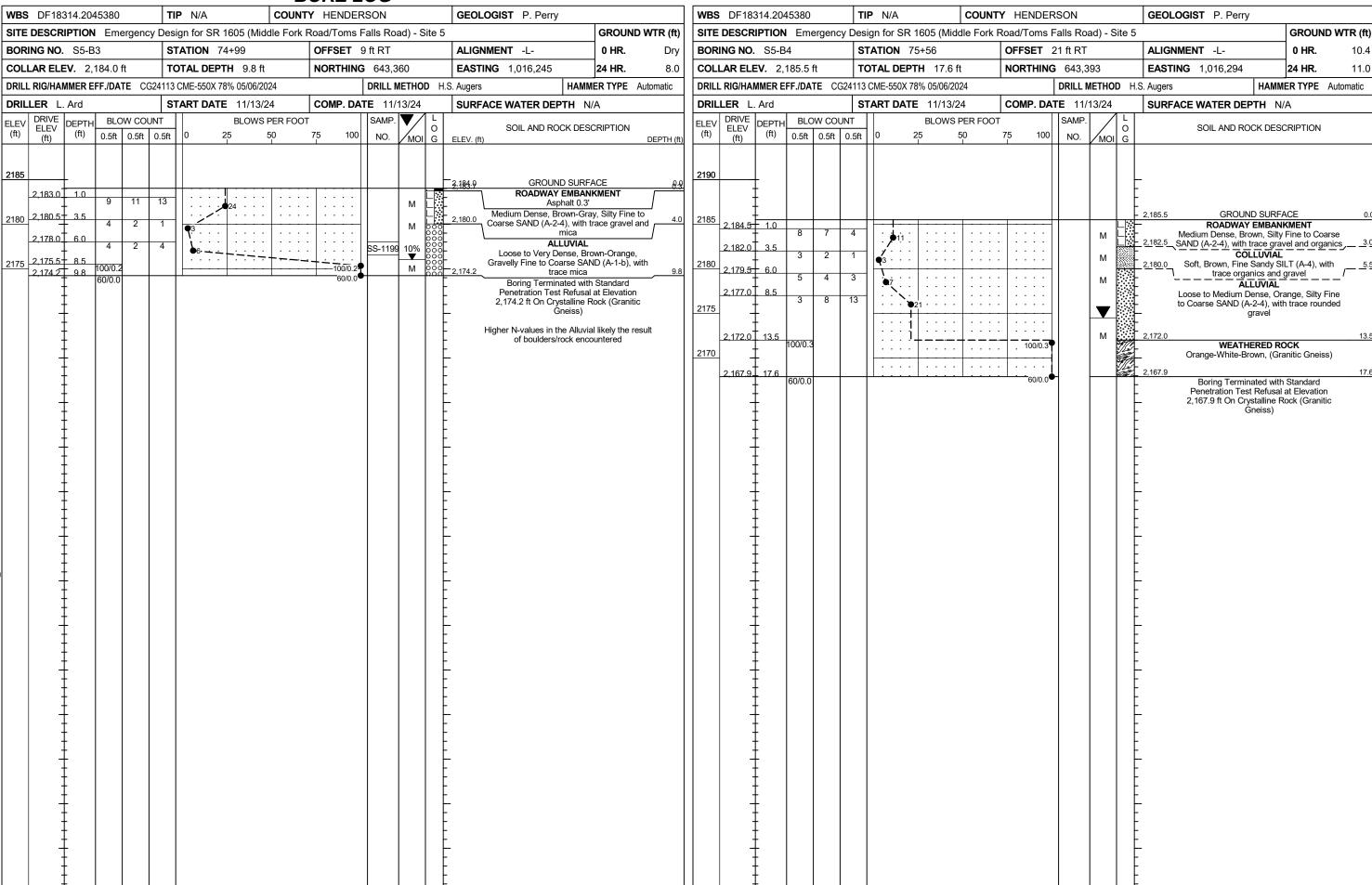
GROUND WTR (ft)

HAMMER TYPE Automatic

GEOTECHNICAL BORING REPORT **BORE LOG**

		ORE LOG							
WBS DF18314.2045380	TIP N/A COUN	TY HENDERSON	GEOLOGIST R. Welch	_	WBS DF18314.204538	O TIP N/A	COUNTY HENDERSON	GEOLOGIST R. Welch	
SITE DESCRIPTION Emerge	ncy Design for SR 1605 (Middle Fork	Road/Toms Falls Road) - Site 5	5	GROUND WTR (ft)	SITE DESCRIPTION En	nergency Design for SR 1605 (Mi	ddle Fork Road/Toms Falls Road) - Site	5	GROUND WTR
BORING NO. S5-B1	STATION 72+64	OFFSET 10 ft RT	ALIGNMENT -L-	0 HR. N/A	BORING NO. S5-B2	STATION 73+82	OFFSET 14 ft RT	ALIGNMENT -L-	0 HR .
COLLAR ELEV. 2,167.4 ft	TOTAL DEPTH 21.1 ft	NORTHING 643,161	EASTING 1,016,136	24 HR. 5.0	COLLAR ELEV. 2,177.	7 ft TOTAL DEPTH 7.0 f	ft NORTHING 643,289	EASTING 1,016,190	24 HR.
DRILL RIG/HAMMER EFF./DATE	CG29022 Mobile B-29 92% 04/09/2024	DRILL METHOD N	IW Casing w/ Advancer HAMN	MER TYPE Automatic	DRILL RIG/HAMMER EFF./D	ATE CG29022 Mobile B-29 92% 04/09		NW Casing w/ Advancer HAMN	MER TYPE Automati
DRILLER M. Brewer	START DATE 12/17/24		SURFACE WATER DEPTH N	I/A	DRILLER M. Brewer			SURFACE WATER DEPTH N	I/A
BORING NO. S5-B1 COLLAR ELEV. 2,167.4 ft DRILL RIG/HAMMER EFF./DATE DRILLER M. Brewer ELEV DRIVE DEPTH BLOW C	STATION 72+64 TOTAL DEPTH 21.1 ft CG29022 Mobile B-29 92% 04/09/2024 START DATE 12/17/24 OUNT BLOWS PER FOO 25 50	OFFSET 10 ft RT NORTHING 643,161 DRILL METHOD N COMP. DATE 12/17/24 T 75 100 NO. MOI G SS-501 15% SS-502 38%	ALIGNMENT -L- EASTING 1,016,136 W Casing w/ Advancer HAMM SURFACE WATER DEPTH N SOIL AND ROCK DESELEV. (ft)	O HR. N/A 24 HR. 5.0 MER TYPE Automatic N/A SCRIPTION DEPTH (ft) ACE 0.0 NKMENT To Coarse SAND a and gravel Athly Plastic Sitty mica and gravel This coarse 12.5 Cock C Gneiss)	BORING NO. S5-B2 COLLAR ELEV. 2,177.7. DRILL RIG/HAMMER EFF./D DRILLER M. Brewer ELEV (ft) DEPTH (ft) 0.5f 2180 2,177.7 - 0.0 2,177.7 - 0.0 3 2175 2,174.5 3.2 60/0.	STATION 73+82	OFFSET 14 ft RT	ALIGNMENT -L- EASTING 1,016,190 NW Casing w/ Advancer HAMM SURFACE WATER DEPTH N SOIL AND ROCK DES	O HR. N 24 HR. E MER TYPE Automati N/A SCRIPTION FACE NKMENT y Fine to Coarse ganics and mica ROCK ss) h Standard al at Elevation Rock (Granitic p presence of nt boulders e Roadway t of boulders/rock
DT BORE DOUBLE MIDDLE FORK ROAD DIVISION			- - - - - - - - - - - - - - - - -					- - - - - - - - - - - - - - - -	

GEOTECHNICAL BORING REPORT BORE LOG



PROJECT REFERENCE NO.	SHEET NO.
N/A	11

SOIL TEST RESULTS																		
BORING	SAMPLE	OFFSET	STATION	NORTHING	EASTING	DEPTH	AASHTO	T T	D I		% BY W	EIGHT		% PAS	SING (S	IEVES)	%	%
ID	NO.	OFFSEI	STATION	NORTHING	LASTING	INTERVAL	CLASS.	L.L.	P.1.	C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S5-B1	SS-501	10' RT	72+64 -L-	641225	1016136	0.0 - 1.5'	A-2-4	29	6	22.2	35.8	25.8	16.2	63.3	55.1	30.2	14.7	ND
S5-B1	SS-502	10' RT	72+64 -L-	641225	1015596	5.0 - 6.5'	A-7-5(5)	46	15	19.1	33.8	24.8	22.3	98.1	88.9	51.1	37.6	ND
S5–B3	SS-1199	9' RT	74+99 -L-	643393	1016294	6.0 - 7.5'	A-1-b	24	2	25.0	37.2	19.6	18.2	53.8	46.7	23.7	10.4	ND

Alx M Atmilly

AUTHORIZED SIGNATURE NCDOT CERT NO. 130-04-0212 Prepared in the Office of:
F&ME CONSULTANTS, INC.
COLUMBIA SOUTH CAROLIN

COLUMBIA, SOUTH CAROLINA NCDOT LAB CERT. NO. 130–0212

REFERENCE
JECT: DF18314.2045379
PROJEC

[1]

STATE OF NORTH CAROLINA

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

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK
3	SITE PLAN
4	PROFILE
5	CROSS SECTION
6	BORE LOG
7	SOIL TEST RESULTS

STRUCTURE SUBSURFACE INVESTIGATION

ROJEC	T DES	SCRIPTI	ION EME	<i>RGENCY</i>	DESI	<i>IGN</i>	FOR
			E FORK				
ROAL))						
SITE DE	SCRIF	TION	SITE 6				

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	N/A	1	

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 707-6805. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

CENERAL 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 LABDRATORY SAMPLE DATA AND THE IN SITU (IM-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 NIDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT, FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS, AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.

2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

P. PERRY, E.I.T. CG2 EXPLORATION INVESTIGATED BY <u>CG2, PLLC</u> DRAWN BY M. MALISHER, E.I.T.

CHECKED BY K. DE MONTBRUN, P.E. SUBMITTED BY <u>CG2</u>, PLLC





DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

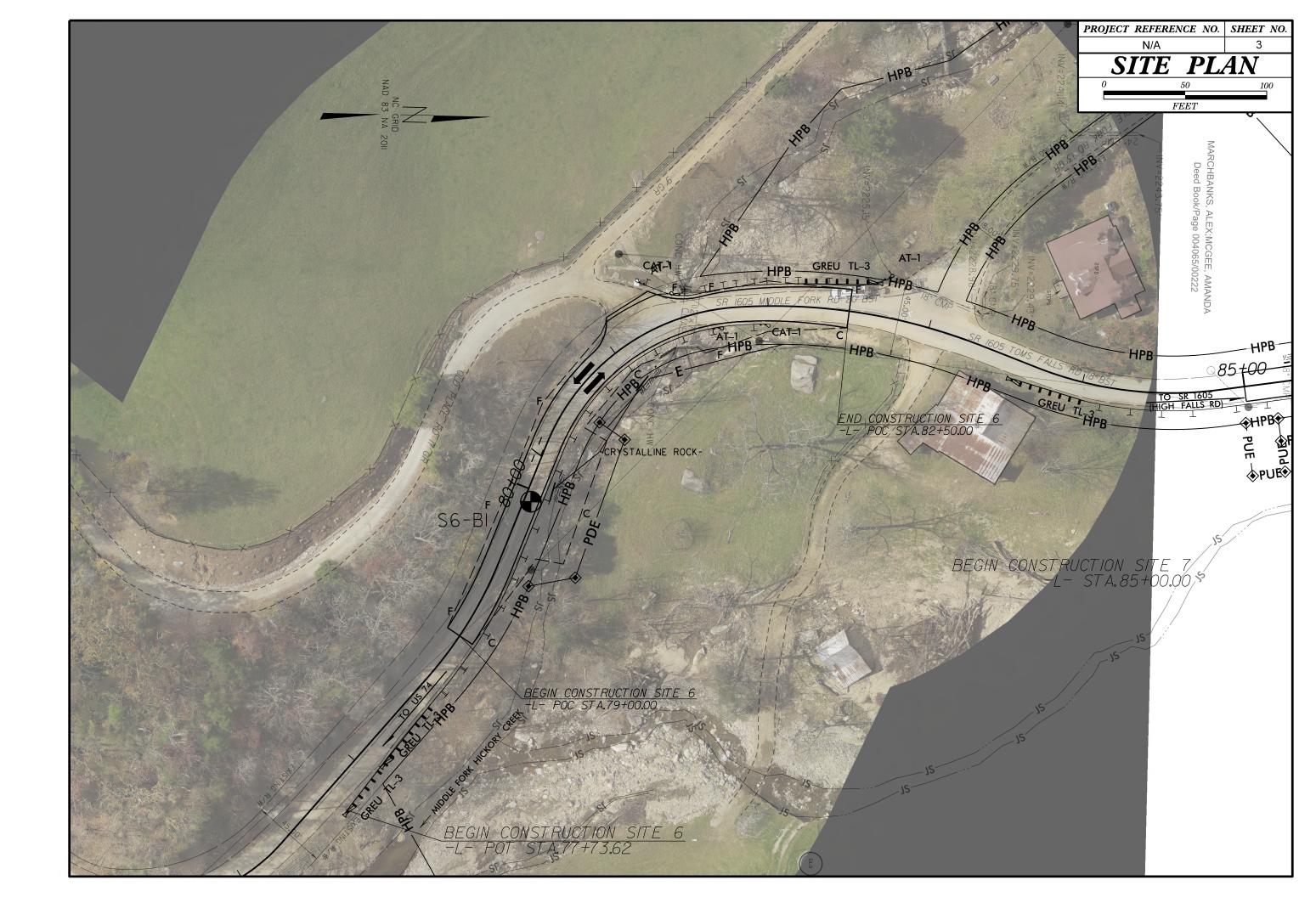
PROJECT REFERENCE NO. SHEET NO.

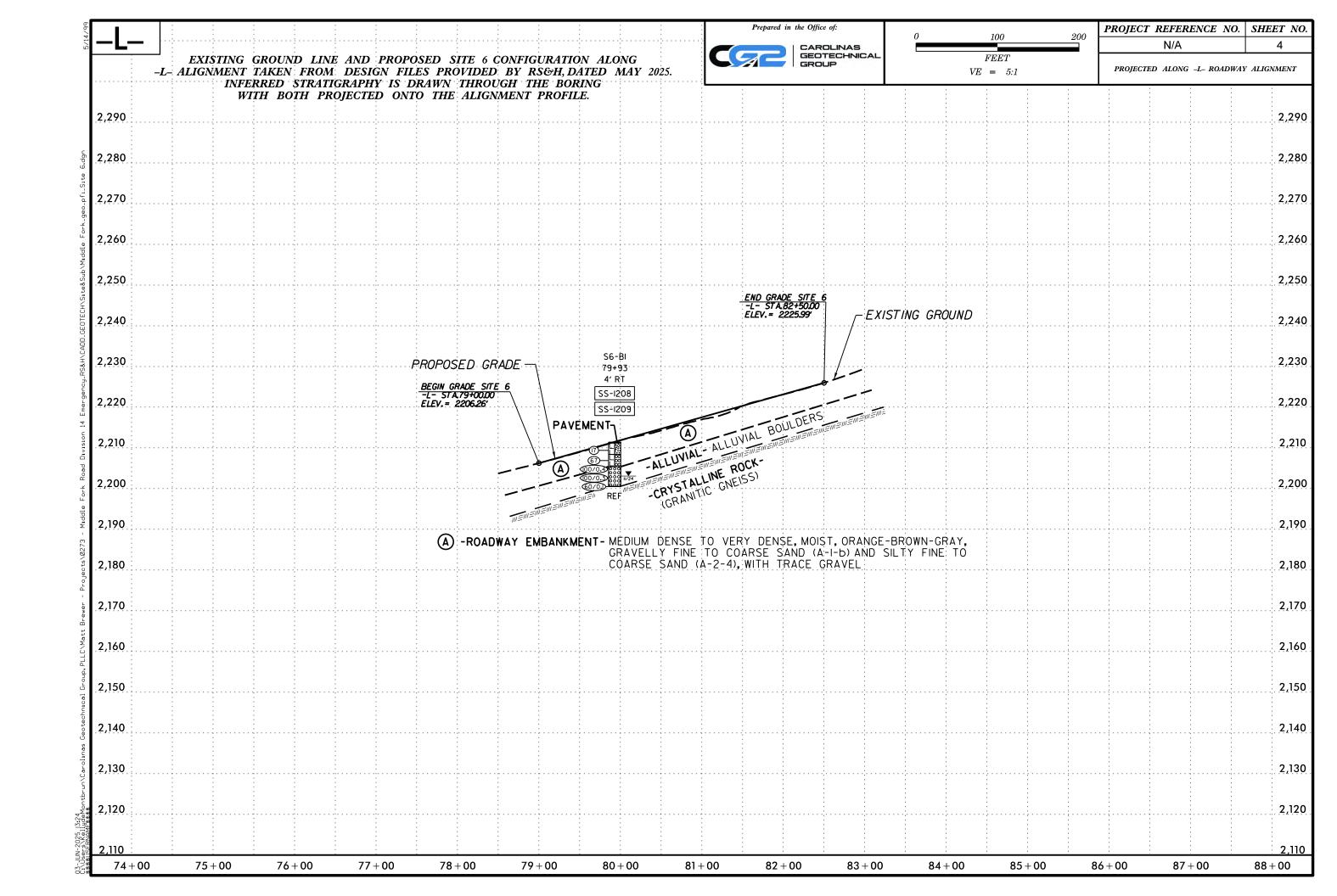
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

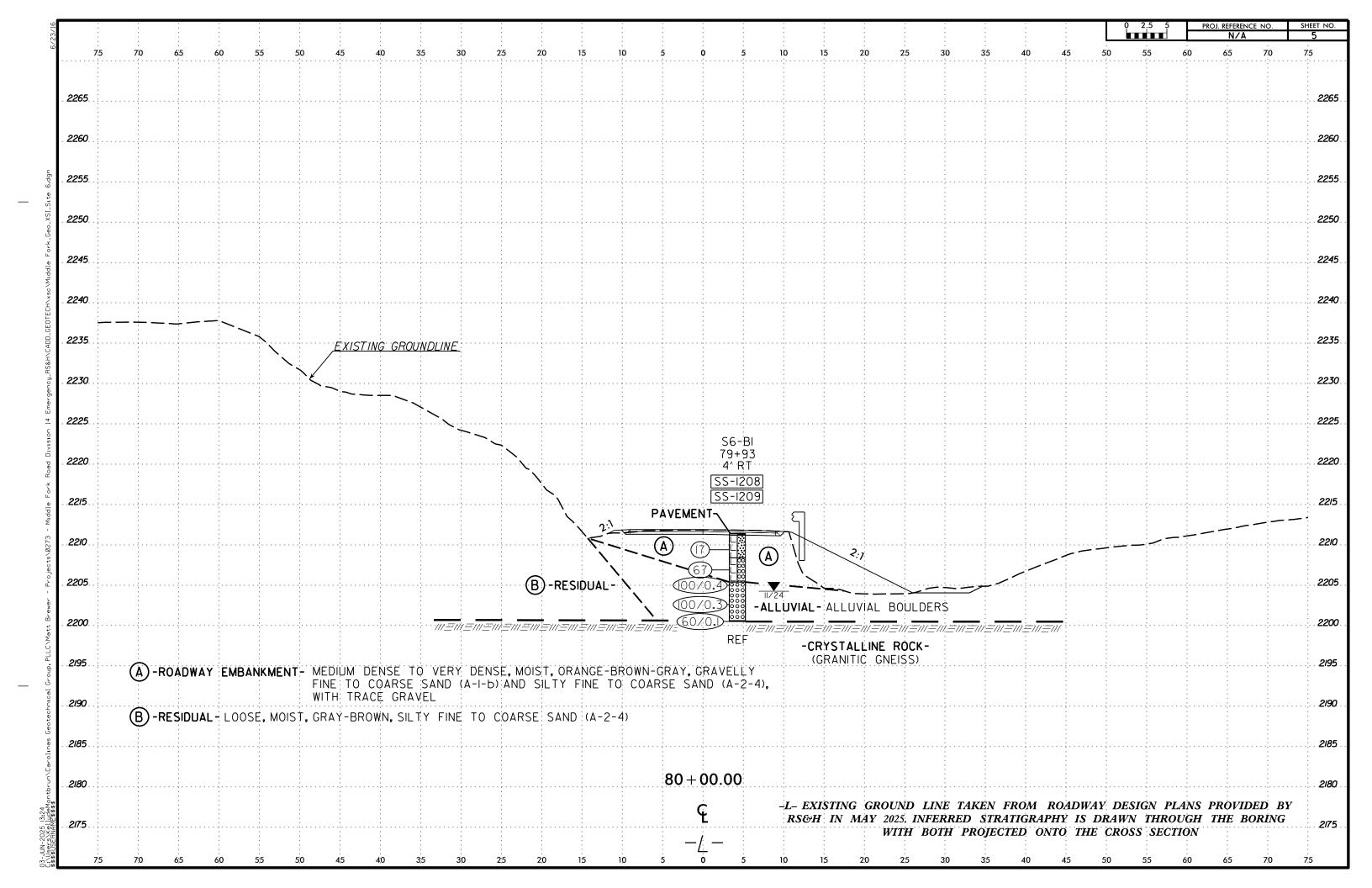
SUBSURFACE INVESTIGATION

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	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.
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	<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,	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
VERY STIFF,GRAY,SILTY CLAY,MOIST WITH INTERBEDDED FINE SAND LAYERS,HIGHLY PLASTIC,A-7-6 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.	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
CENERAL CRAMIII AR MATERIALS SLIT-CLAY MATERIALS	MINERALOGICAL COMPOSITION	FINE TO COARSE CRAIN ICNEOUS AND METAMORPHIC ROCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
CLASS. (\$\leq 35% PASSING \(^2\)200) (> 35% PASSING \(^2\)200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	ROCK (CP) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-0 A-1-0 A-1-0 A-2-4 A-2-5 A-2-6 A-2-7 A-2-6 A-3 A-6, A-7	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. COMPRESSIBILITY	ONEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN FOR TOP TO THE TOTAL PLAIN AND THE PLAIN AND THE TOTAL PLAIN FOR TOP TO THE TOTAL PLAIN AND THE PLAIN AND THE TOTAL PLAIN FOR TOP TOTAL PLAIN AND THE PLAIN AND THE TOTAL PLAIN FOR TOTAL PLAIN AND THE TOTAL PLAIN AND THE PLAIN AND THE TOTAL	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
0000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 0000 d0000 d00000 d0000 d00000 d0000 d00000 d0000 d00000 d0000 d00000 d0000 d00000 d0000 d000000	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
7. PASSING SIMT SILT-GRANULAR SILT-MUCK,	PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
*40 30 MX 50 MX 51 MN SOILS CLAY PEAT	GRANULAR SILT - CLAY	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
*200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 36 MN 36 MN	ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
PASSING *40 SOILS WITH	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	HORIZONTAL.
LL — — 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN LITTLE OR HIGHLY	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% 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.	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
CODUD TAMES OF A A A MY A MY 12 MY 16 MY NO MY AMOUNTS OF ORGANIC	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) I INCH. OPEN JOINTS MAY CONTAIN CLAY, IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAVEL, AND SAND SAND SAND SOILS SOILS	STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
CEN RATING FAIR TO	<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 EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	SPRING OR SEEP	WITH FRESH ROCK.	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI 0F A-7-5 SUBGROUP IS ≤ LL - 30 ;PI 0F A-7-6 SUBGROUP IS > LL - 30 CONSISTENCY OR DENSENESS		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.
DANCE OF CTANDARD DANCE OF UNCONFINED	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 PENETRATION RESISTENCE COMPRESSIVE STRENGTH (IN-VALUE) (TONS/FT ²)	ROADWAY EMBANKMENT (RE) ROADWAY EMBANKMENT (RE) STORY OF ROCK STRUCTURES	IF TESTED, WOULD YIELD SPT REFUSAL	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
VERY LONGE / /	1 ¹	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL, IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
GENERALLY LOOSE 4 TO 10	SOIL SYMBOL	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 MEDIUM DENSE 10 TO 30 N/A MATERIAL DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER THAN ROADWAY EMBANKMENT AUGER BORING TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
(NON-COHESIVE) VERY DENSE > 50		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	── INFERRED SOIL BOUNDARY ← CORE BORING SOUNDING ROD	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	INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4	PIEZOMETER SPT N-VALUE	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
HARD > 30 > 4 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 DPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNSUITABLE WASTE	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 CORRIE CRAVEL COARSE FINE STIT CLAY	SHALLOW 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 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 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	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 CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	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	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 GUIDE FOR FIELD MOISTURE DESCRIPTION (ATTERBERG LIMITS) 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 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	PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL
(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 SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY	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 FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNALL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
BANGE / SEMISOLIDE REQUIRES DRYING TO	FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK:
(PI) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: FEET
SL SHRINKAGE LIMIT	CME-45C CLAY BITS X AUTOMATIC MANUAL	MODERATELY CLOSE	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	6' CONTINUOUS FLIGHT AUGER	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	ROADWAY DESIGN FILES PROVIDED BY RS&H DATED MAY 2025.
PLASTICITY	CME-55 CONE-55E CONE-51ZE: -B -H	INDURATION	BORING COLLAR ELEVATIONS OBTAINED USING CARLSON BRX7 GPS.
PLASTICITY INDEX (PI) DRY STRENGTH	X CME-550X HARD FACED FINGER BITS -N	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	REF = REFUSAL
NON PLASTIC 0-5 VERY LOW	TUNGCARBIDE INSERTS	RUBBING WITH FINGER FREES NUMEROUS GRAINS;	
SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM	VANE SHEAR TEST CASING W/ ADVANCER HAND TOOLS:	GENILE BLUW BY HAMMER DISINIEGRATES SAMPLE.	
HIGHLY PLASTIC 26 OR MORE HIGH	POST HOLE DIGGER POSTABLE HOIST TRICONE STEEL TEETH HAND AUGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TRICONE TUNGCARB. SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	CORE BIT VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14
		1	







GEOTECHNICAL BORING REPORT BORE LOG

MDC DE40044												
WD3 DF18314.	.2045379		TII	P N/A		COUNTY	/ HENDERS	SON			GEOLOGIST P. Perry	
SITE DESCRIPT	ION Eme	rgency	/ Desig	n for SR 16	605 (Middle	Fork Roa	d/Toms Falls	Road) -	Site 6			GROUND WTR (ft)
BORING NO. S	6-B1		SI	TATION 7	9+93		OFFSET 4	ft RT			ALIGNMENT -L-	0 HR. Dry
COLLAR ELEV.	2,211.4 f	t	ТС	OTAL DEP	TH 10.9 f	t	NORTHING	643,7	12		EASTING 1,016,054	24 HR. 8.3
ORILL RIG/HAMME	R EFF./DATI	E CG2	24113 C	ME-550X 78	% 05/06/2024	1		DRILL M	ETHOD	H.S.	Augers HAMME	R TYPE Automatic
DRILLER L. Ard	d		ST	TART DAT	E 11/13/2	24	COMP. DAT	E 11/	13/24		SURFACE WATER DEPTH N//	4
ELEV DRIVE DE	PTH BLC	W CO	UNT		BLOWS	PER FOOT		SAMP.	V /	L	SOIL AND DOCK DESC	CDIDTION
		0.5ft	0.5ft	0	25	50	75 100	NO.	моі	O G	SOIL AND ROCK DESC ELEV. (ft)	DEPTH (ft
2215	1.0 7	13	4		7			SS-1208	9%		3.311.4 GROUND SURFA ROADWAY EMBANI Asphalt (0.2') Medium Dense, Orange-Bro	KMENT
2,207.9 3	3.5	49	18		· · · · · ·	+-:-:		SS-1209	6%		2,208.4 Medium Dense, Orange-Bro Fine to Coarse SAND (A-2	own-Gray, Silty — _3.9 -4), with trace /
2,205.4 6	3.0						1 · · · · · · 1	55-1208	0 70		2,205.4 Very Dense, Orange-Brown	, i
	100/0.4						100/0.4				to Coarse SAND (A	4-1-b)
	100/0.3						100/0.3		Ť		ALLUVIAL Alluvial Boulde	rs
2.200.6+ 10	0.8 60/0.1						60/0.1			000	2,200.6 CRYSTALLINE R	
											Boring Terminated with Penetration Test Refusal 2,200.5 ft In Crystalline Re Gneiss)	Standard at Elevation

SHEET 6

PROJECT REFERENCE NO.	SHEET NO.
N/A	7

						SOIL	TEST F	RES	UI	LTS								
BORING	ZING SAMPLE OFFSET STATION NORTHING I		EACTING	DEPTH	AASHTO	L.L.	DІ	% BY WEIGHT				% PASSING (SIEVES)			%	%		
ID	NO.	OFFSEI	STATION	NORTHING	EASTING	$\it INTERVAL$	CLASS.	$\mid L.L. \mid P$		C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S6-B1	SS-1208	4' RT	79+93 <i>-L</i> -	643712	1016054	1.0 - 2.5'	A-2-4	NP	NP	29.6	38.5	17.8	14.1	76.9	63.5	29.1	8.9	ND
S6-B1	SS-1209	4' RT	79–93 <i>–L</i> –	643712	1016054	3.5 - 5.0'	A-1-b	NP	NP	36.9	39.3	19.8	4.0	47.5	36.0	14.3	5.8	ND

Alx M Atmilly

AUTHORIZED SIGNATURE NCDOT CERT NO. 130-04-0212 Prepared in the Office of:

F&ME CONSULTANTS, INC. COLUMBIA, SOUTH CAROLINA NCDOT LAB CERT. NO. 130–0212

STATE OF NORTH CAROLINA

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

CONTENTS

SHEET NO.	<u>DESCRIPTION</u>
ľ	TITLE SHEET
2	LEGEND (SOIL & ROCK)
2A	SUPPLEMENTAL LEGEND (GSI)
3-5	SITE PLAN
6-7	PROFILE
8-21	CROSS SECTIONS
22-45	BORE LOG(S), CORE REPORT(S), & CORE PHOTOGRAPH(S)

SOIL TEST RESULTS

STRUCTURE SUBSURFACE INVESTIGATION

COUN	TY _HENDERSON	
PRO.	ECT DESCRIPTION <u>EMERGENCY DESIGN FOR</u>	
	1605 (MIDDLE FORK ROAD/TOMS FALLS	
RO	1 <i>D</i>)	
SITE	DESCRIPTION SITE 7	

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	N/A	1	

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 707-6805. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

CENERAL 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 LABDRATORY SAMPLE DATA AND THE IN SITU (IM-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 NIDICATED 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 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 OF 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.

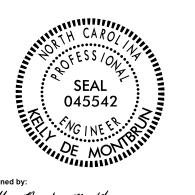
P. PERRY, E.I.T. R. WELCH, G.I.T. P. TOMASIC, P.G. CG2 EXPLORATION INVESTIGATED BY <u>CG2, PLLC</u> DRAWN BY _P. PERRY, E.I.T. CHECKED BY K. DE MONTBRUN, P.E.

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



CAROLINAS GEOTECHNICAL GROUP 1805 SARDIS ROAD NORTH

SUITE 100 **CHARLOTTE, NC 28270** (980) 339-8684



de Montbun06/04/2025 ESIGNATURE

DOCUMENT NOT CONSIDERED FINAL

UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO. SHEET NO.

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,	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		
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.		
SOIL LEGEND AND AASHTO CLASSIFICATION GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS CONSTRUCTIONS CONTROL OF THE PROPERTY O	MINERALOGICAL COMPOSITION	ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND		
CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	BOCK (CB) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	SURFACE.		
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	FINE TO COADER COATH METAMORPHIC AND NON-COASTAL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.		
CLASS. A-1-0 A-1-6 A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-7-6 A-3 A-6, A-7	COMPRESSIBILITY	NUN-CRISTALLINE SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM		
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	OF SLOPE.		
7. PASSING	HIGHLY COMPRESSIBLE LL > 50	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- 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 PEAT 9200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.		
MATERIAL	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE		
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,	HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE		
LL — — 40 MX 41 MN 10 MX 41 MN LITTLE OR 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,		
CROILE INDEX A A A MY B MY 12 MY 16 MY NO MY AMOUNTS OF ORGANIC	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		
UCIAL TYPES STORE EDAGS ORGANIC SUILS	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) I INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.		
OF MAJOR GRAVEL, AND FAME CAMP CAMP CONTROL COLLC		CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.		
MATERIALS SANU		MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.		
GEN. RATING EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE		DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.		
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP	WITH FRESH ROCK.	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 OR RANGE OF STANDARD RANGE OF UNCONFINED	ETT	(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 COMPLETIVESS OF CONSISTENCY 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	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO		
VERY LOOSE 44	SPT SI OPE INDICATOR	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	ITS LATERAL EXTENT.		
GENERALLY LOOSE 4 TO 10	SOIL SYMBOL SOFT DMT TEST BORING INSTALLATION	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. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS		
MATERIAL MEDIUM DENSE 10 10 30 N/A	ARTIFICIAL FILL (AF) OTHER AUGER BORING COME PENETROMETER	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.		
(NON-COHESIVE) VERY DENSE > 50	THAN ROADWAY EMBANKMENT TEST	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 VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	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 MN MONITORING WELL TEST BORING	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 DIE TOMETED	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	***** ALLUVIAL SOIL BOUNDARY \(\triangle \) INSTALLATION \(\triangle \) SPT N-VALUE	ALSO AN EXAMPLE.	RUN AND EXPRESSED AS A PERCENTAGE.		
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS	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	TOTAL UNICLASSIFIED EVICAVATION.	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES 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	UNSUITABLE WASTE ACCEPTABLE, BUT NOT TO BE	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		
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW 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.) (SE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	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 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		
SOIL MOISTURE - CORRELATION OF TERMS	CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.		
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_{ m d}$ - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC	POINT OF A GEOLOGIST'S PICK. 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		
(ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.		
- SATURATED - USUALLY LIQUID; YERY 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 CEMICOLID. DECULIDES 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.		
	FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK:		
(P) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET			
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: FEET		
SL _ SHRINKAGE LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: 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	G. CONTINUOUS ELICHT AUGED	VERY CLOSE LESS THAN Ø.16 FEET THICKLY LAMINATED Ø.008 - Ø.03 FEET	ROADWAY DESIGN FILES PROVIDED BY RS&H DATED MAY 2025.		
ATTAIN UPTIMUM MUISTURE	CME-555	THINLY LAMINATED < 0.008 FEET	BORING COLLAR ELEVATIONS OBTAINED USING CARLSON BRX7 GPS.		
PLASTICITY	8* HOLLOW AUGERS	INDURATION	REF = REFUSAL		
PLASTICITY INDEX (PI) DRY STRENGTH	X CME-550X HARD FACED FINGER BITS X-N Q	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. RUBBING WITH FINGER FREES NUMEROUS GRAINS:			
NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST UNGCARBIDE INSERTS	FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	CT = CORE TERMINATED		
MODERATELY PLASTIC 16-25 MEDIUM	X CASING X W/ ADVANCER POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;			
HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH HAND AUGER	BREAKS EASILY WHEN HIT WITH HAMMER.			
COLOR	TRICONE TUNGCARB. SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;			
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X CORE BIT VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER.			
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14		
			2 2.7 12 1		

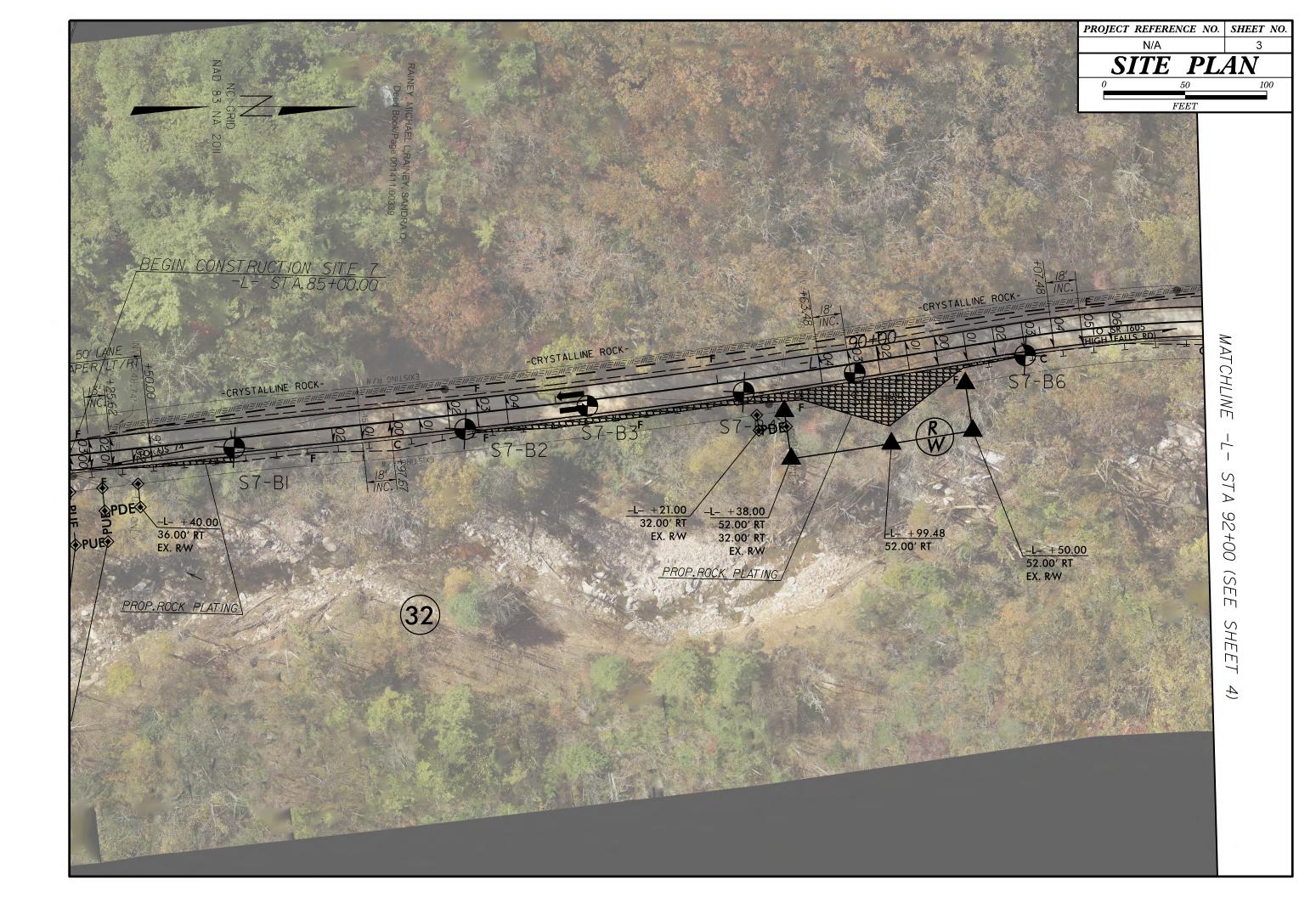
ROJECT REFERENCE NO.	SHEET NO.
N/A	2A

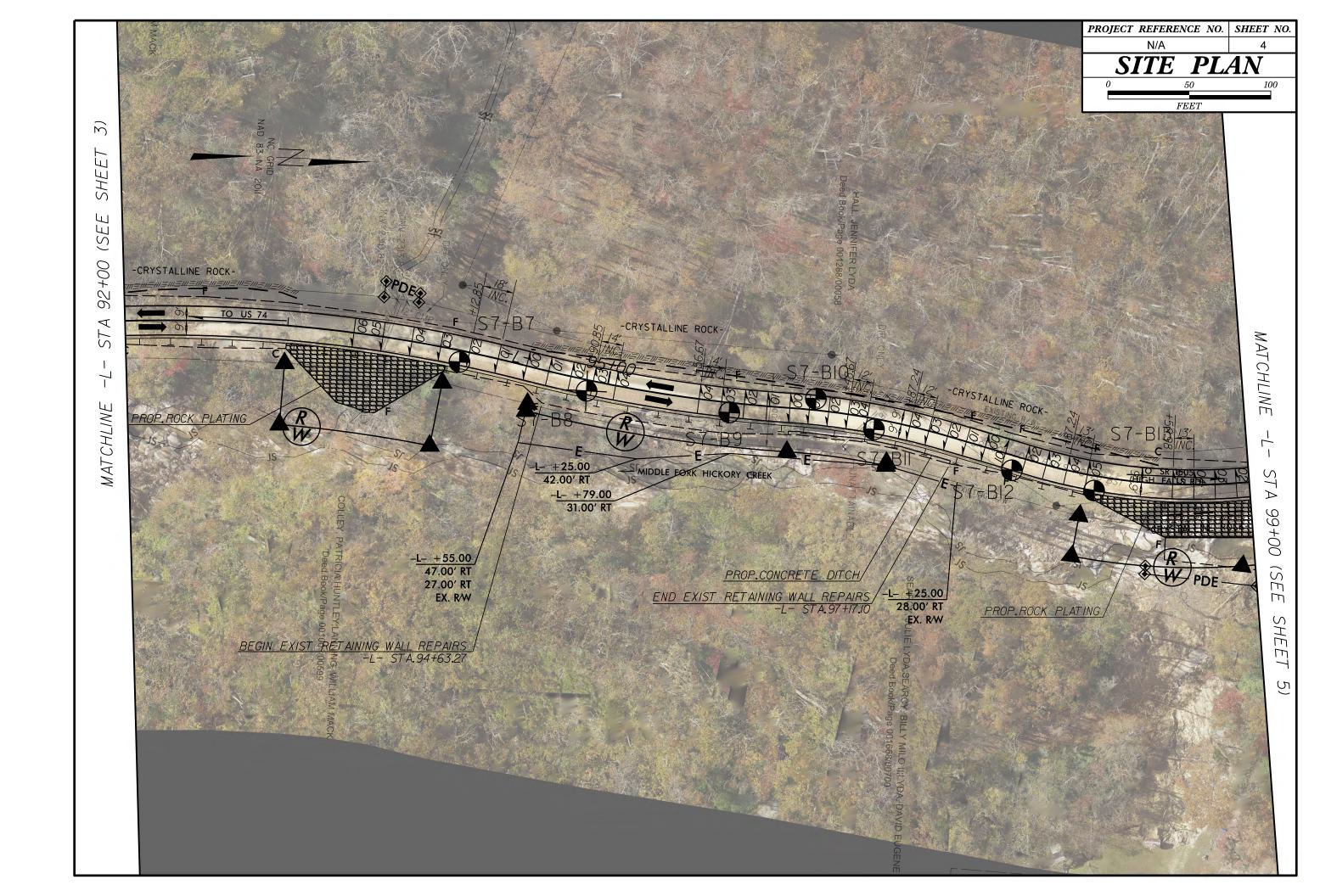
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

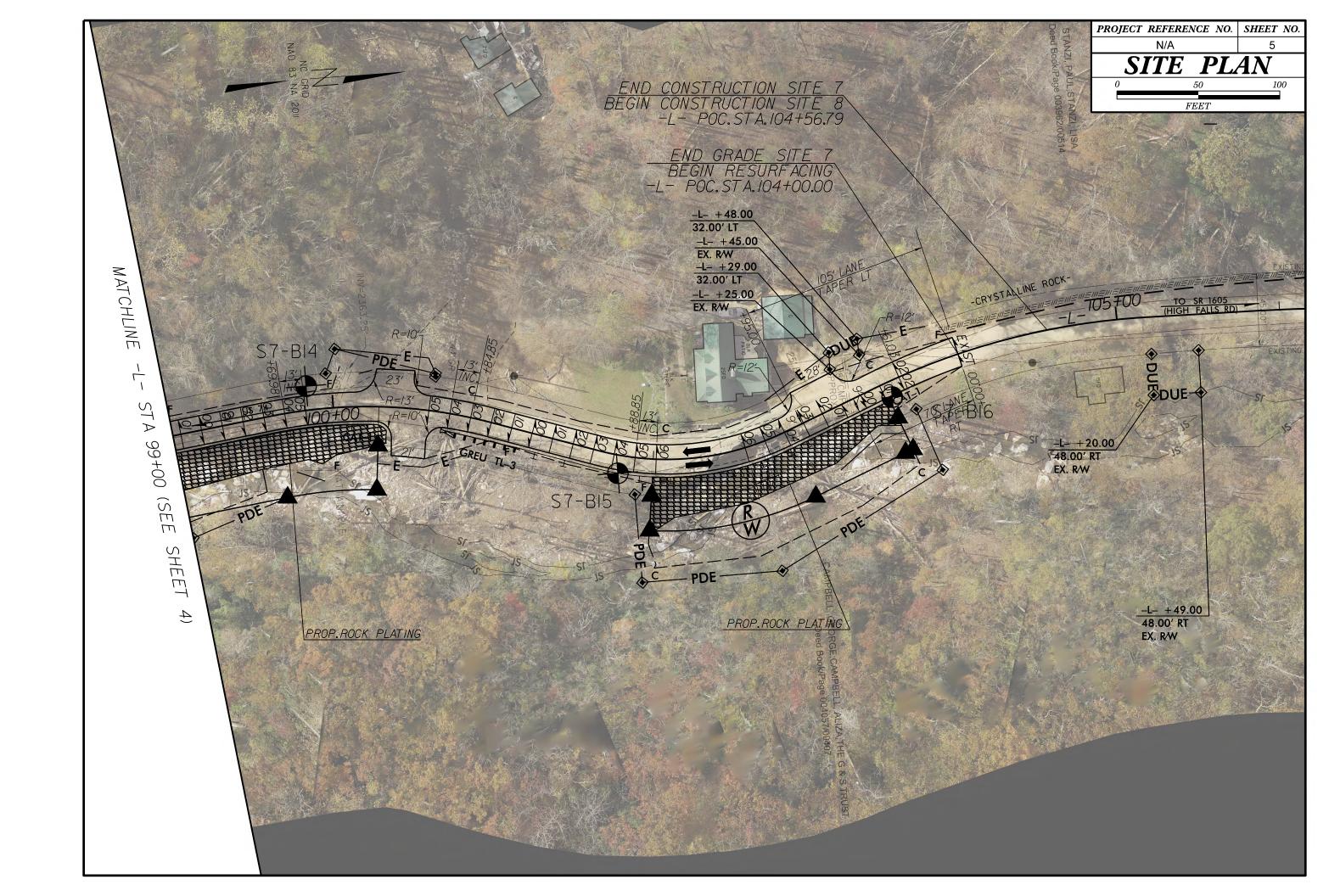
SUBSURFACE INVESTIGATION

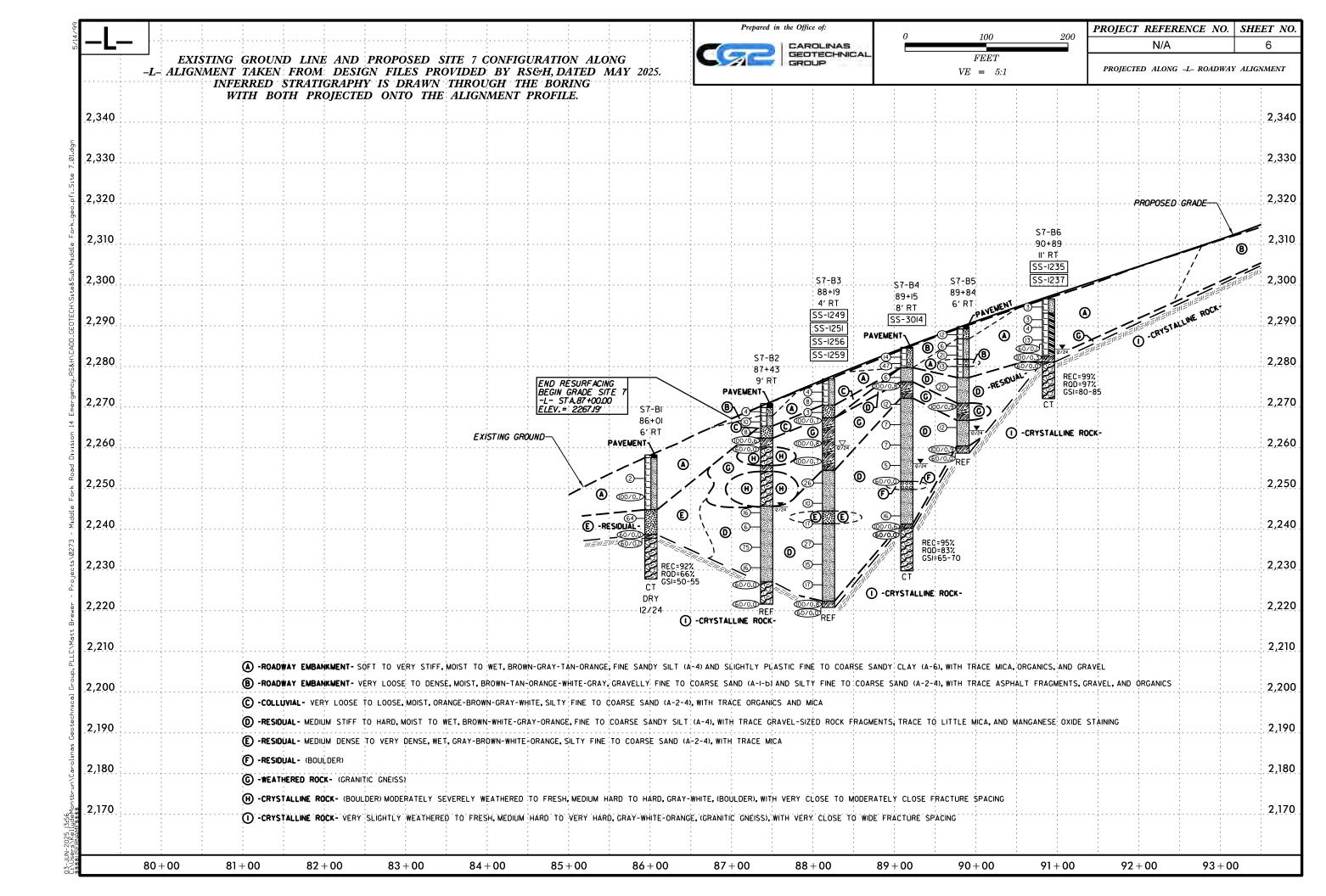
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRED BRIDGE DESIGN SPECIFICATIONS

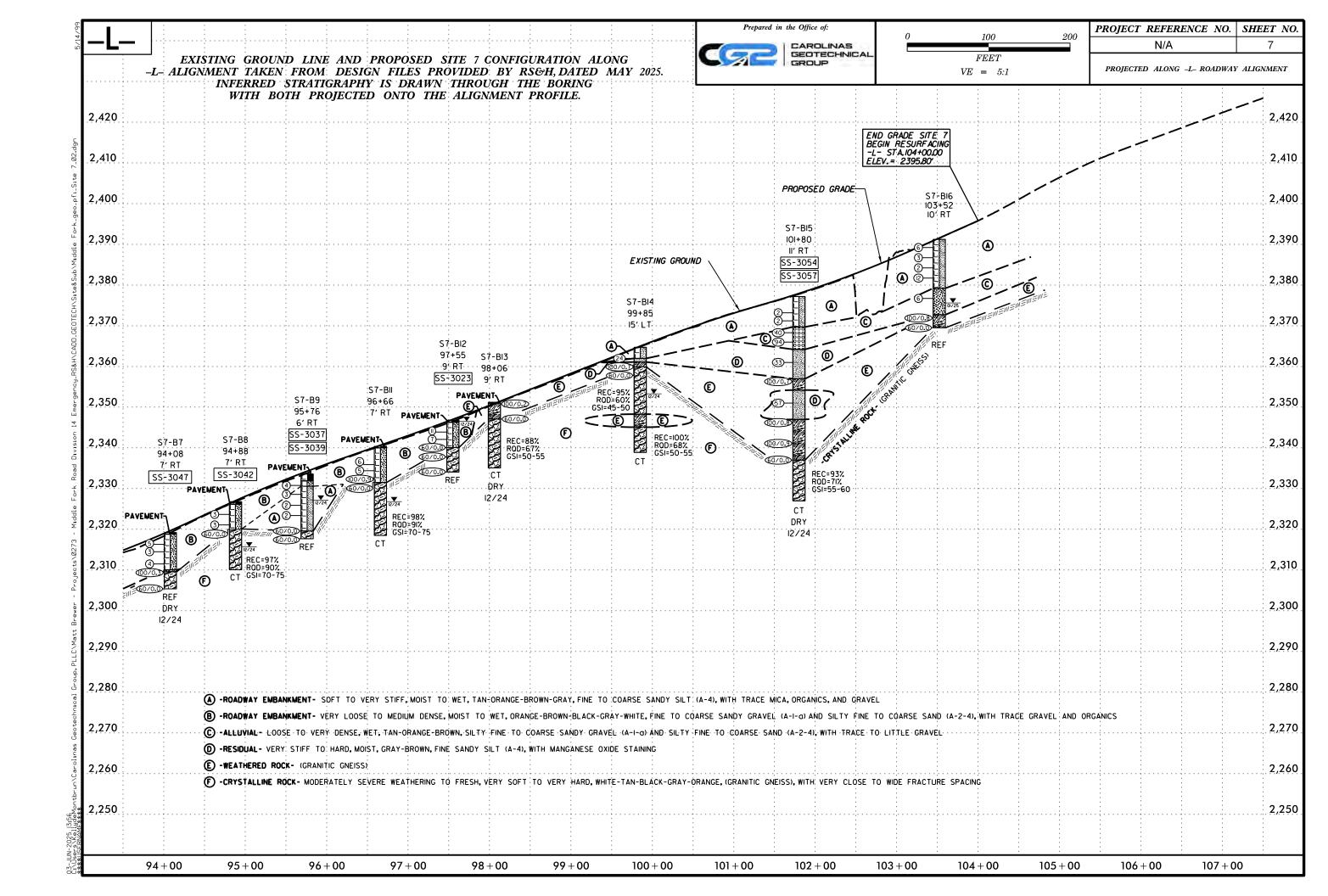
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Join		FR	OM AAS	HTO LRF	D BRID	AL STRENGTH INDEX (GSI) TABLES GE DESIGN SPECIFICATIONS AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) 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. STRUCTURE	SURFACE CONDITIONS VERY GOOD Very rough, fresh unweathered surfaces	COOD Surfaces Surfaces	FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000) 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. COMPOSITION AND STRUCTURE
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	00 CES	A STATE OF THE STA	OI HEL GO	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
BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	OF ROCK PIE	70 60				8. Sand- stone with stone and stone and stone and stone and stone with stone with stone and ston
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets	OCKING		50			layers of siltstone amounts stone layers shale with sandstone layers 40
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity	ASING 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.
DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces	DECRE			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
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	N/A	N/A			10	sandstone are transformed into small rock pieces. → Means deformation after tectonic disturbance DATE: 8-19-1

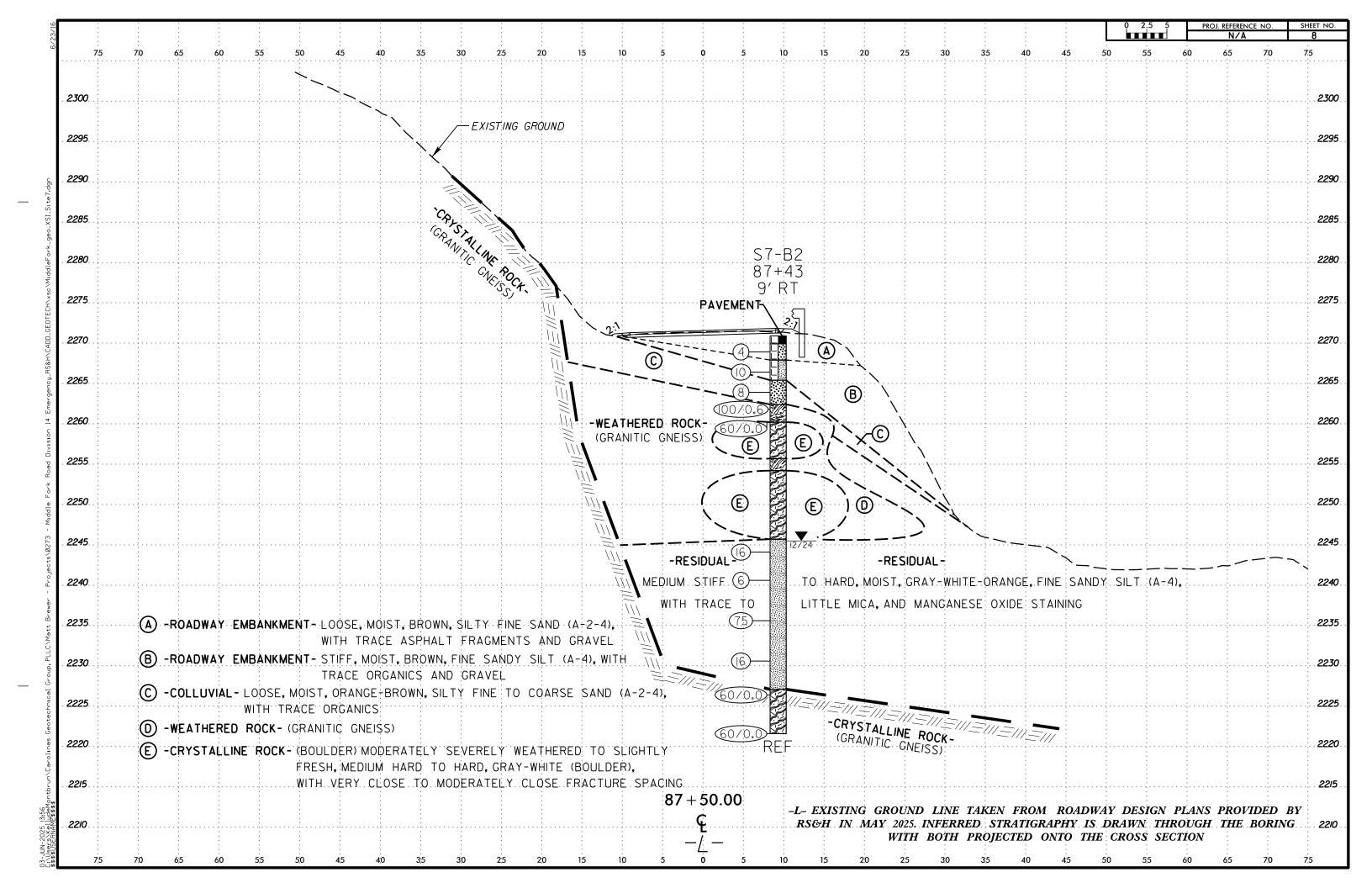


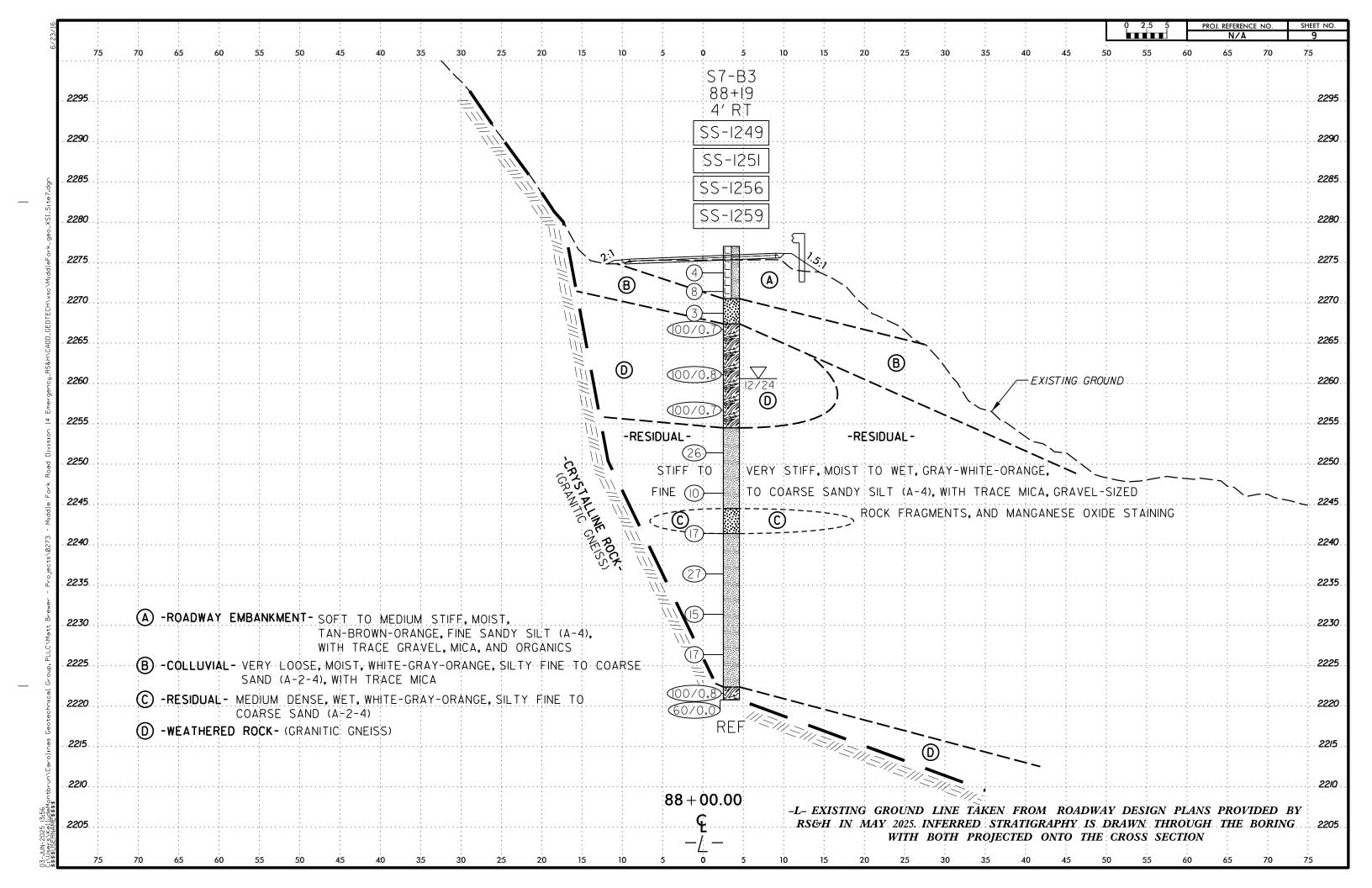


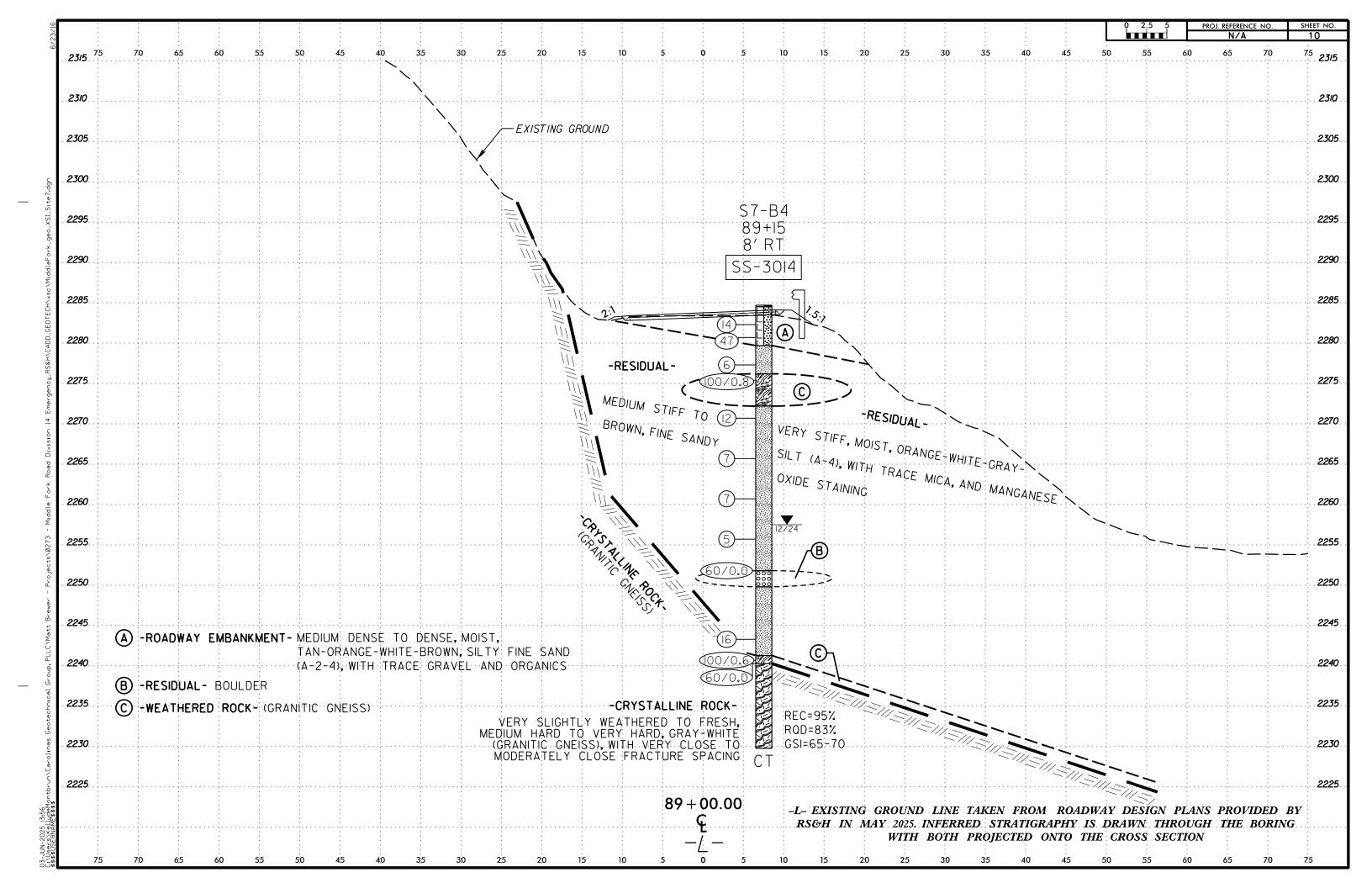


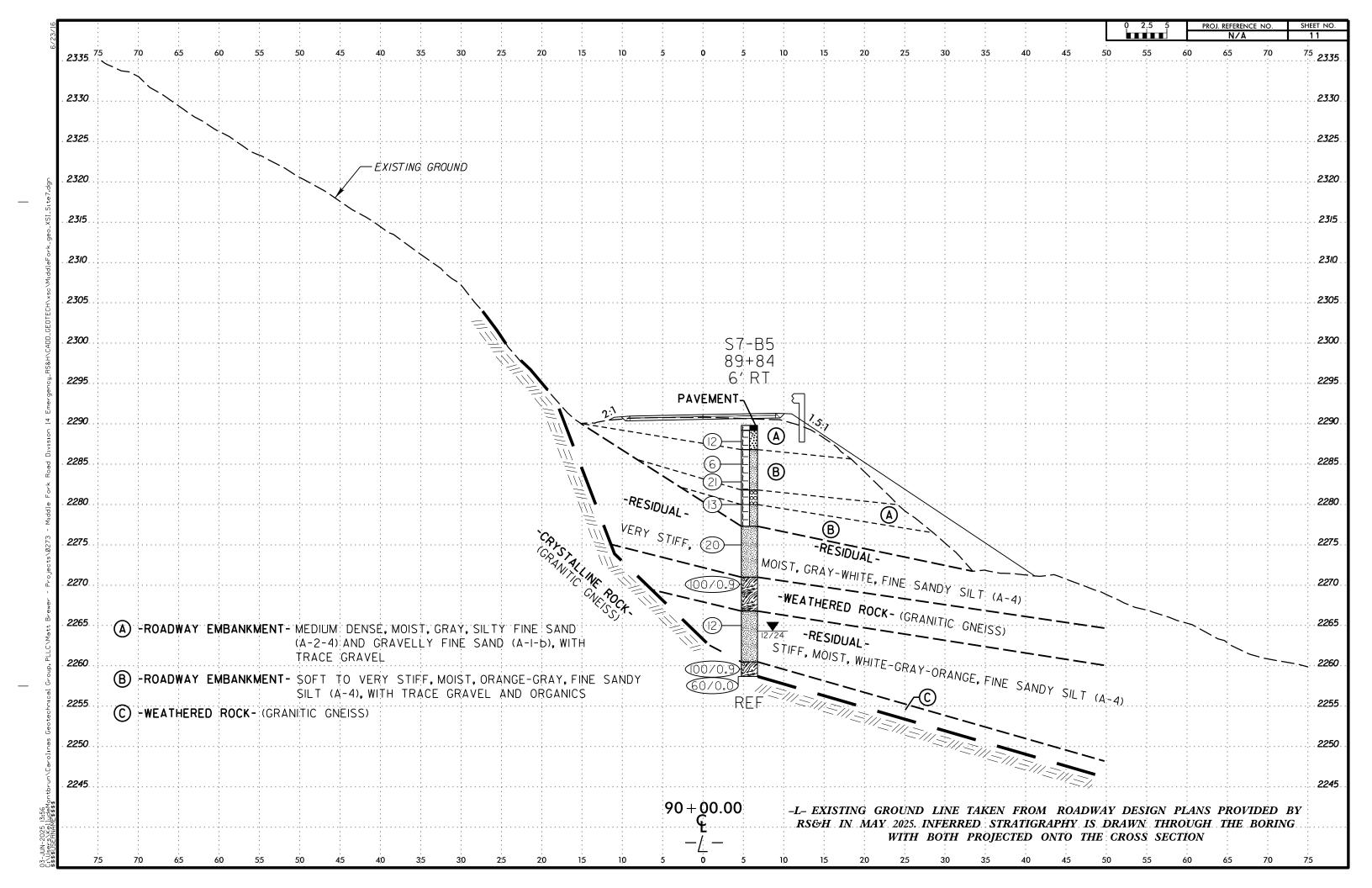


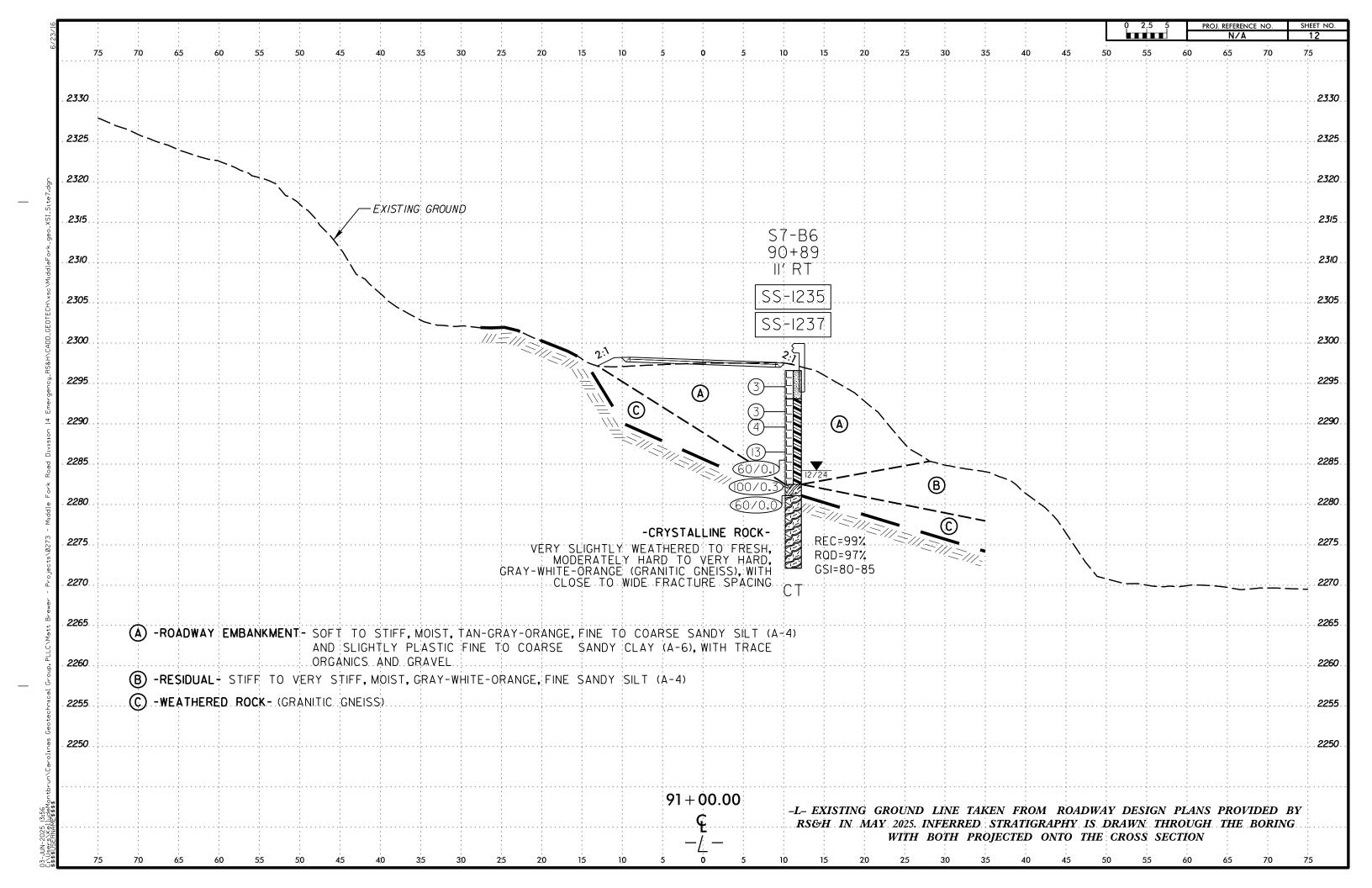


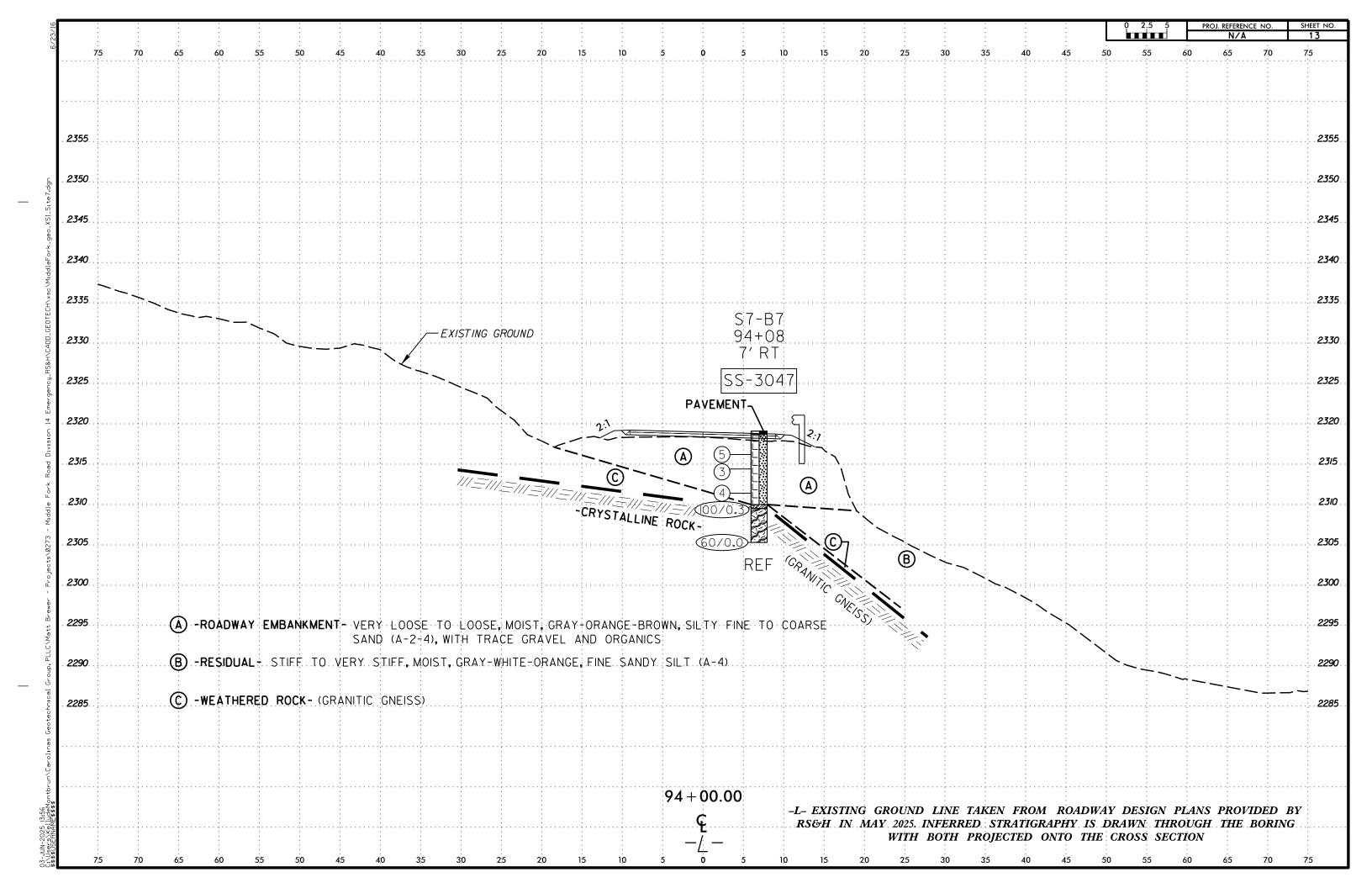


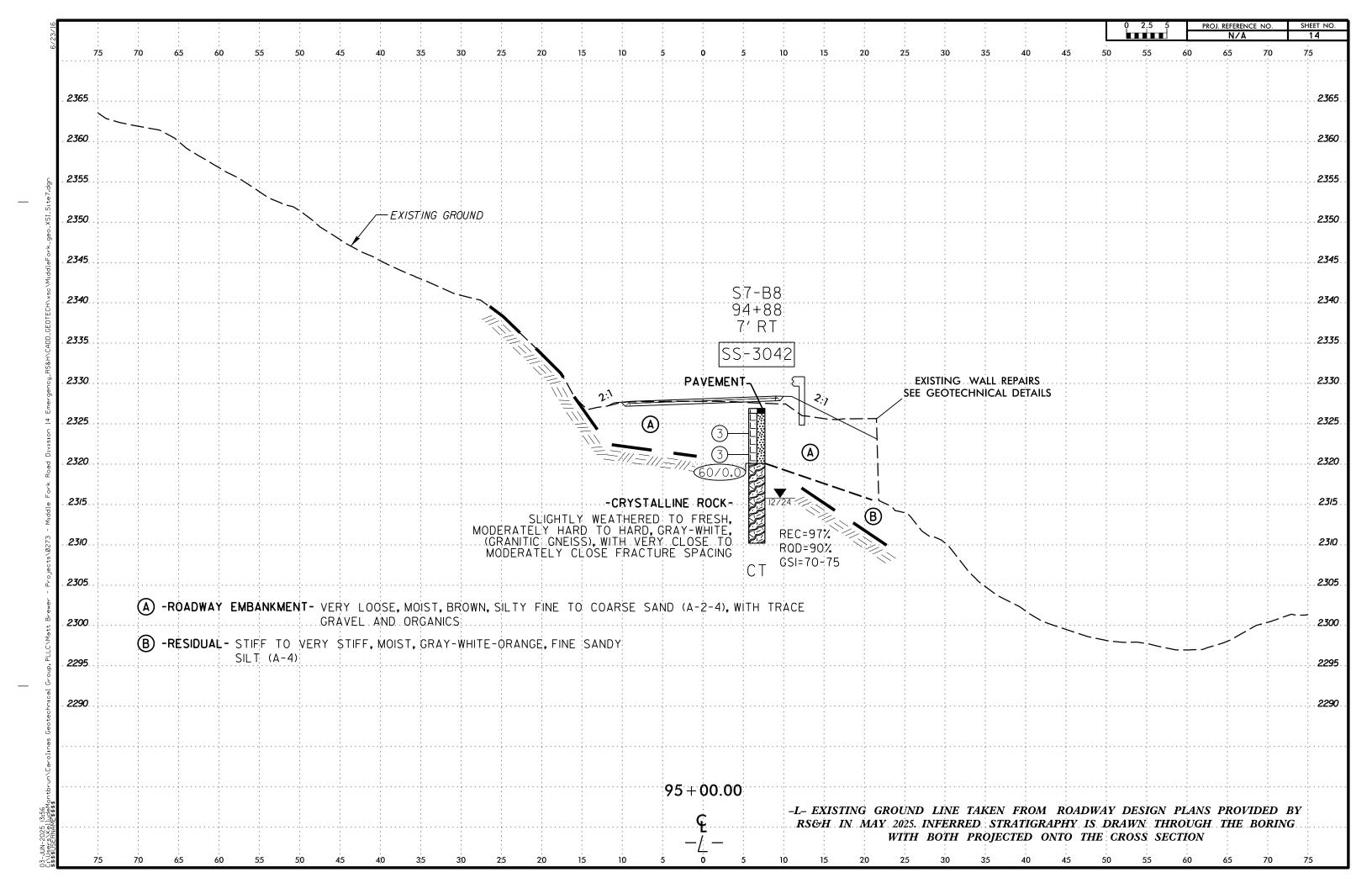


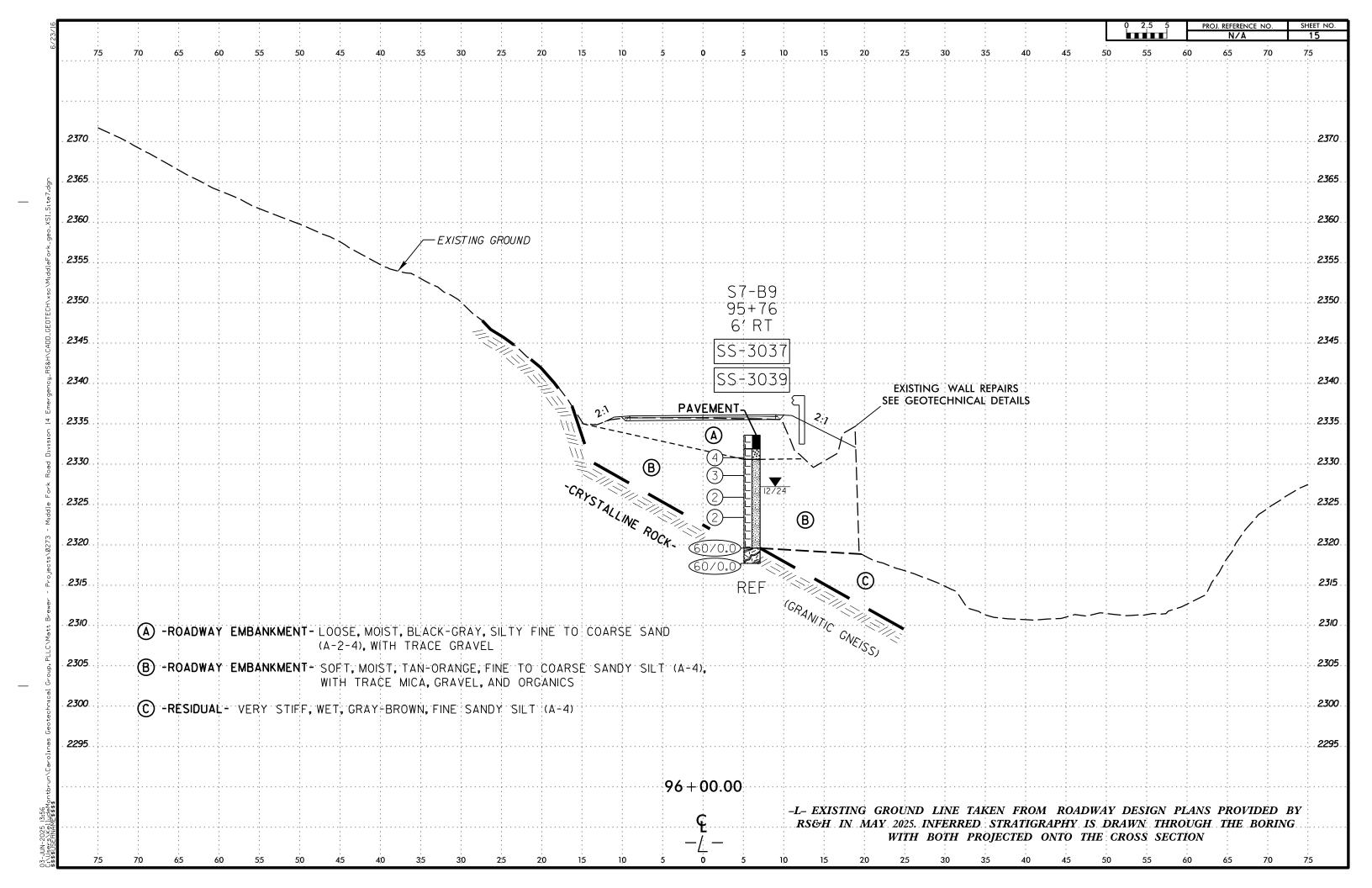


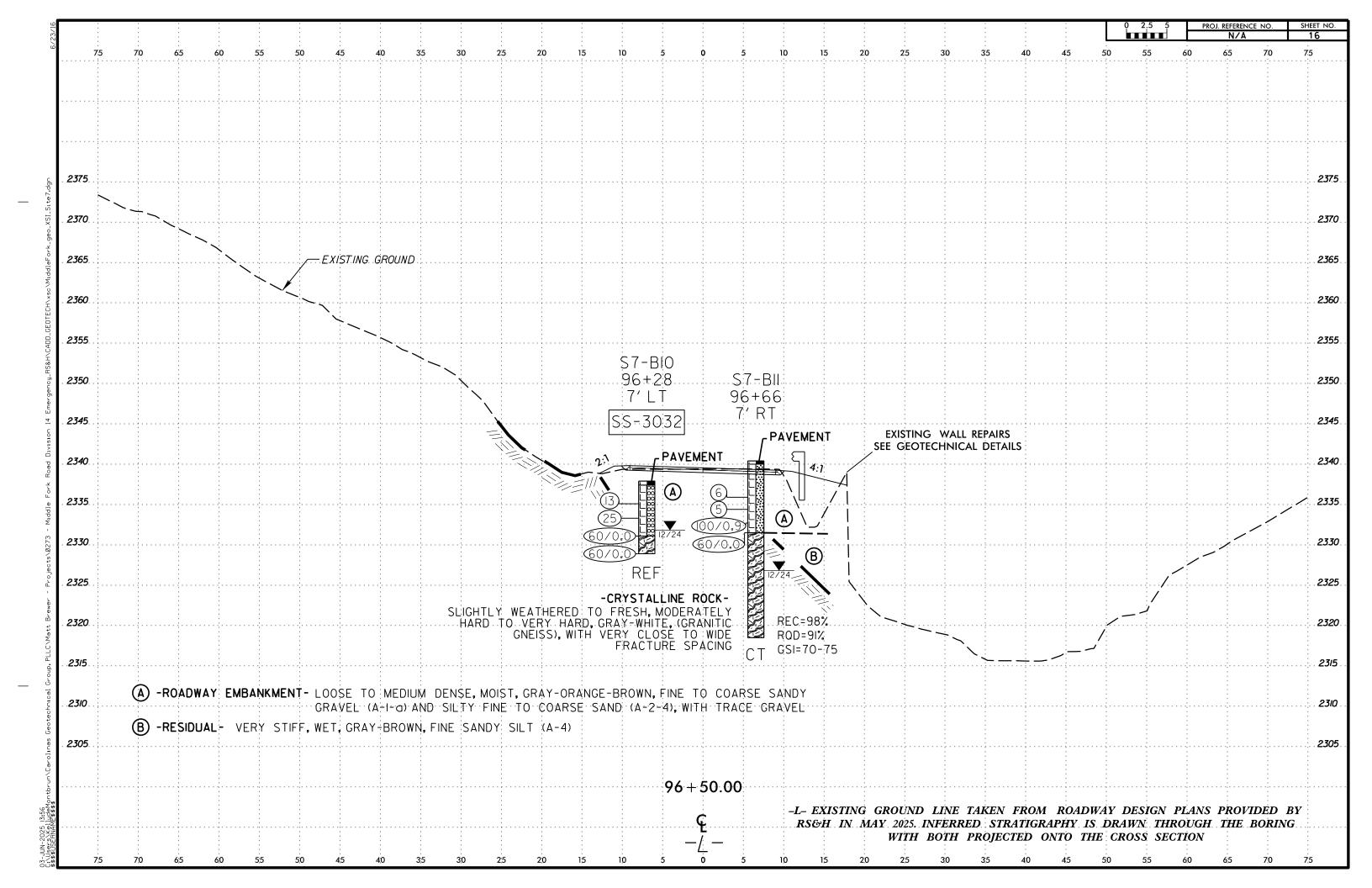


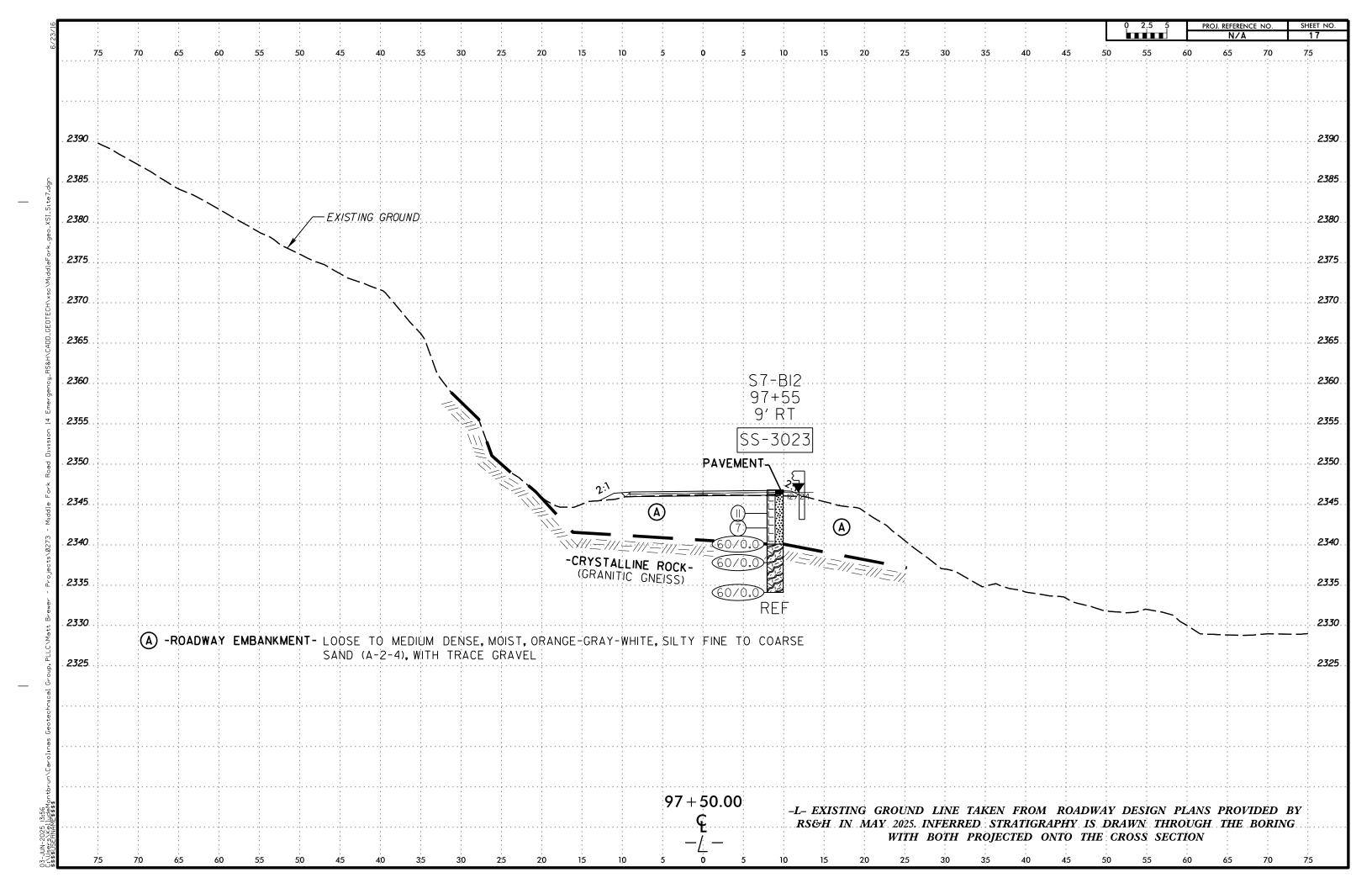


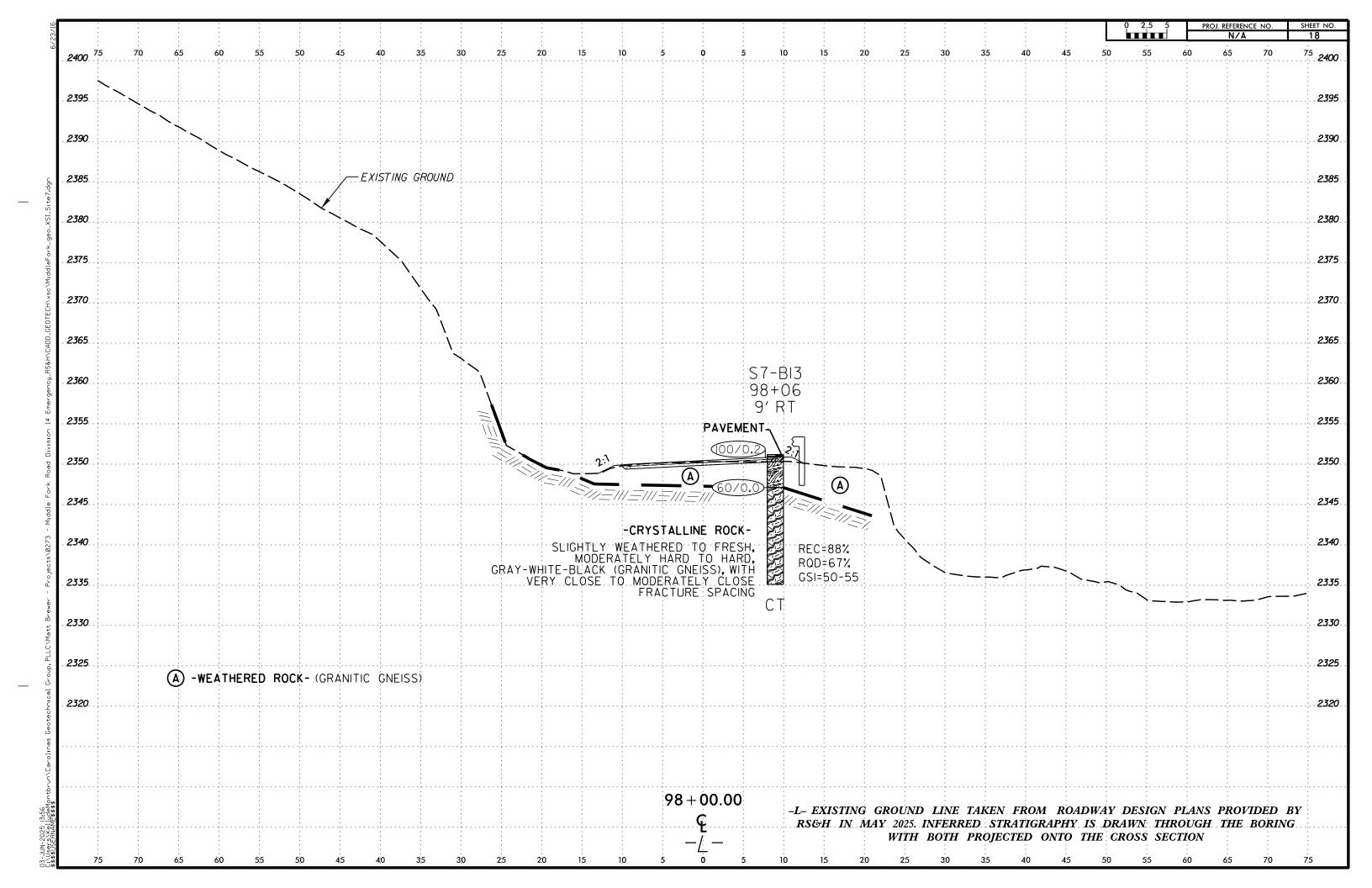


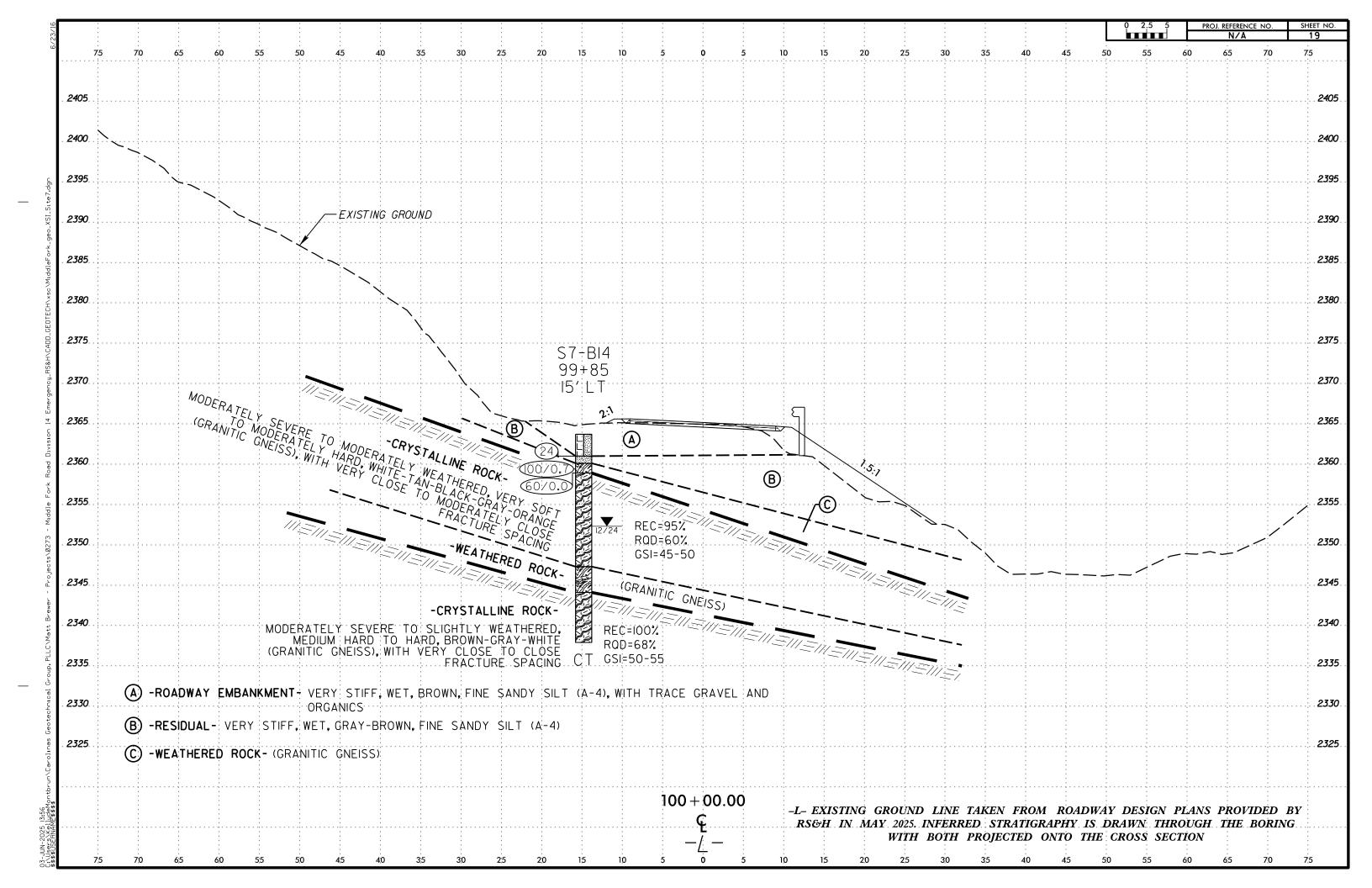


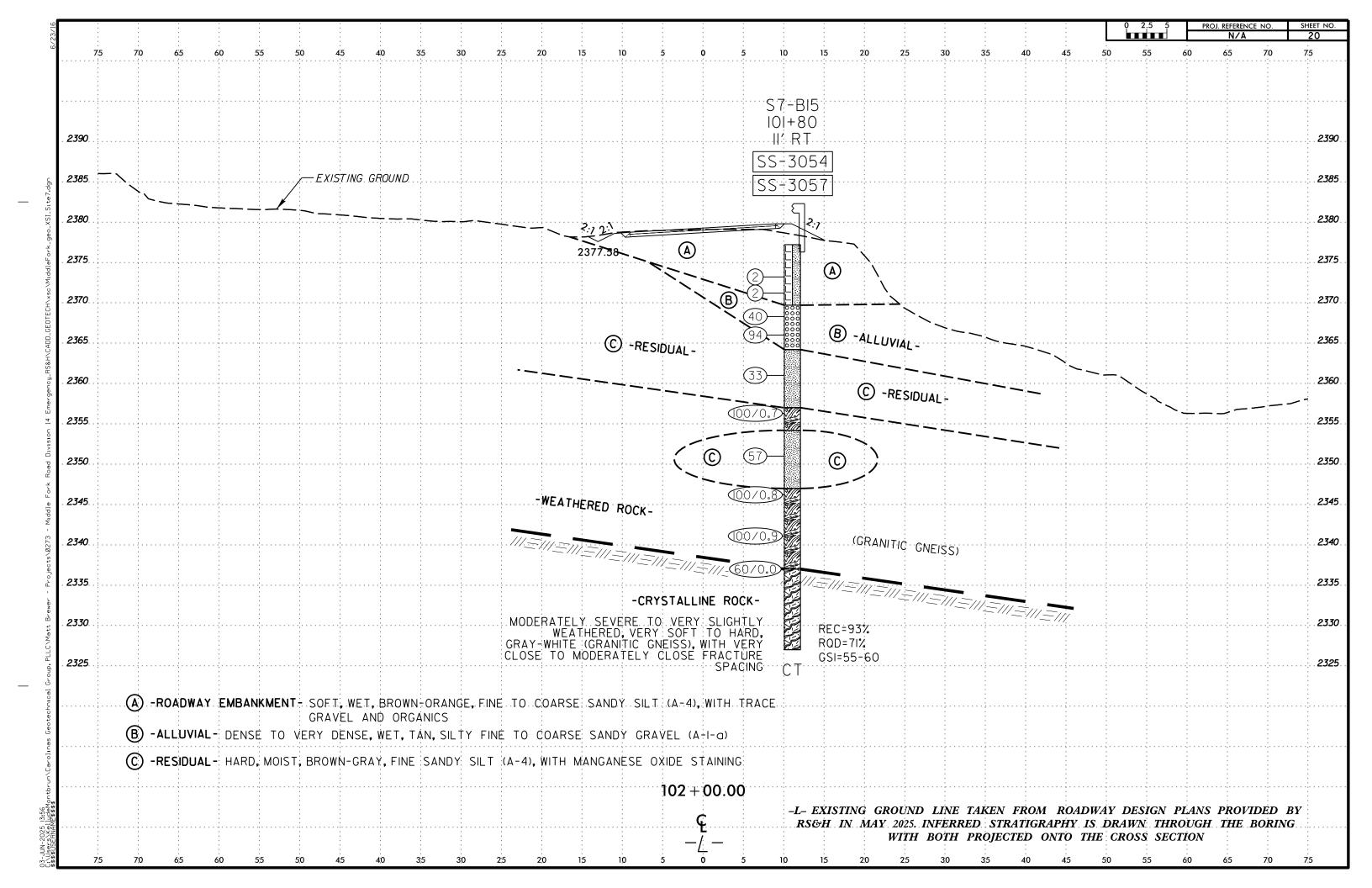


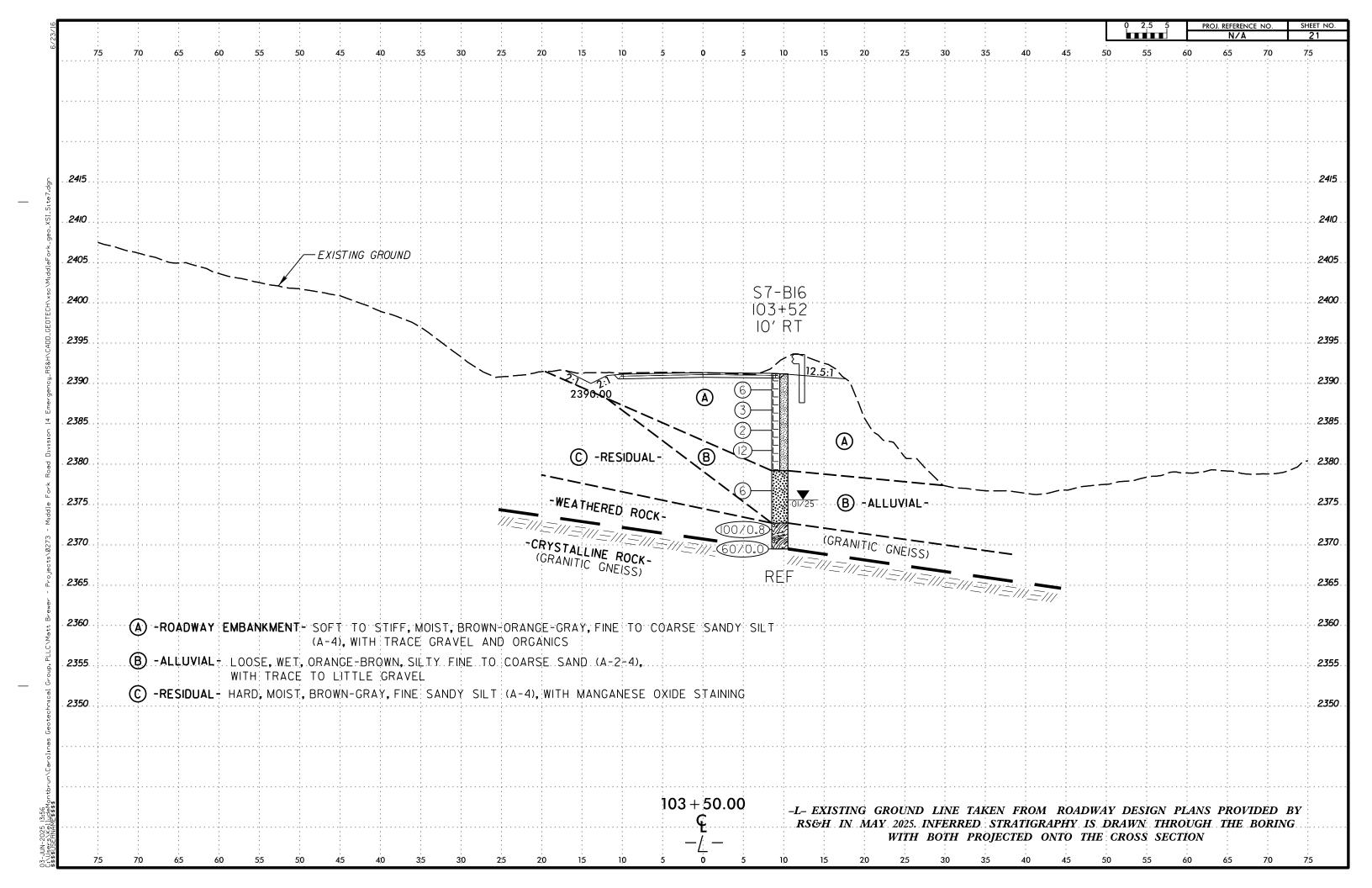












TIP N/A **WBS** DF18314.2045417 COUNTY HENDERSON GEOLOGIST R. Welch **SITE DESCRIPTION** Emergency Design for SR 1605 (Middle Fork Road/Toms Falls Road) - Site 7 **GROUND WTR (ft)** OFFSET 6 ft RT STATION 86+01 ALIGNMENT -L-BORING NO. S7-B1 0 HR. N/A COLLAR ELEV. 2,258.3 ft TOTAL DEPTH 30.5 ft **NORTHING** 644,249 **EASTING** 1,015,963 24 HR. Dry DRILL RIG/HAMMER EFF./DATE CG29022 Mobile B-29 92% 04/09/2024 DRILL METHOD HAMMER TYPE Automatic SPT Core Boring DRILLER M. Brewer **START DATE** 12/17/24 COMP. DATE 12/17/24 SURFACE WATER DEPTH N/A ELEV CHI DEPTH BLOW COUNT (ft) (ft) 0.5ft 0.5ft 0.5ft **BLOWS PER FOOT** SAMP. SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft NO. MOI G 75 100 ELEV. (ft) **GROUND SURFACE** ROADWAY EMBANKMENT Asphalt (0.7') 2255 Soft, Brown-Gray, Fine Sandy SILT (A-4), with trace mica 2,253.5 WOH W Boulder ~ 9.7 ft 2250 2,248.7 9.6 100/0.7 W 2245 2,243.7 14.6 Very Dense, Gray-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica W 2240 2,238.7 2,237.9 20.4 60/0.0 60/0.0 CRYSTALLINE ROCK Gray-White, (Granitic Gneiss) Gray-White, (Granitic Gneiss) 2235 REC = 92% RQD = 66% GSI = 50-55 2230 Boring Terminated at Elevation 2,227.8 ft In Crystalline Rock (Granitic Gneiss)

WBS	DF183	314.204	 15417		TIP	N/A		С			RE L			GEOLOGIST R. Welc			
	DESCR			ergency D			1605 (Mi					Road) - Site 7		1	-	GROUN	ID WTR (ft)
	ING NO.			o. goo, 2			86+01			_	FSET 6	-		ALIGNMENT -L-		0 HR.	N/A
	LAR ELE			ft			PTH 30	.5 ft		+		644,249		EASTING 1,015,963		24 HR.	Dry
	RIG/HAM						9 92% 04/0					DRILL METHOD	SPT	Γ Core Boring	НАММ		Automatic
	LER M						TE 12/1			СС	MP. DAT	E 12/17/24		SURFACE WATER DEF			
	E SIZE						N 10.0 f										
ELEV	DUN	DEPTH	RUN	DRILL		UN	SAMP.		RATA	Ļ							
(ft)	(ft)	(ft)	(ft)	RATE (Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	Ö G	ELEV. (f	:)	DI	ESCRIPTION AND REMARI	KS		DEPTH (ft
237.8	3													Begin Coring @ 20.5 ft			
0005	2,237.8_	20.5	5.0	2:32/1.0 3:28/1.0	(4.6) 92%	(2.5) 50%		(9.2) 92%	(6.6) 66%		2,237.8	Very Slightly W (Granitic Gne	eathe	red to Fresh, Moderately Ha with Close to Moderately Cl	rd to Har ose Fract	d, Gray-W ture Spacii	hite, 20.5 ng
2235				3:34/1.0 2:08/1.0 0:47/1.0							_	·		GSI = 50-55			
	2,232.8_	25.5	5.0	1 2:37/1.0	(4.6)	(4.1)					_						
2230	_			3:21/1.0 3:34/1.0	92%	82%					_						
	2,227.8	30.5		3:18/1.0 2:45/1.0							2,227.8						30.5
	-	_									<u>-</u>	Boring Termir	nated a	at Elevation 2,227.8 ft In Cry Gneiss)	stalline F	Rock (Grar	itic
	-	<u> </u>									_						
	-	Ĺ									L						
	-	F									F						
	-	F									_						
	-	ļ									Ė						
	_	<u> </u>									_						
	-	E									E						
	-	F									Ē						
	_	F									_						
	:	‡									-						
	-	<u> </u>									- -						
	-	<u> </u>									_						
	-	Ė									L						
	-	-									_						
	-	F															
	-	ļ									-						
	_	_									_						
	-	<u> </u>															
	-	E									E						
	-	-									_						
	-	F									F						
	-	ļ									-						
	-	<u> </u>															
	-	_									_						
	_	E									<u>L</u>						
	-	-									_						
	-	F									F						
	_	F															
	-										-						
		‡									-						
	-	‡									<u> </u>						
	-	ŀ									L						
	-	<u> </u>									<u> </u>						
	-	F									-						
		‡									<u> </u>						
	-	ţ									L						
	-	+									}						



Boring: S7-B1 20.5 to 30.5 Feet





WBS DF18314.2045417 TIP N/A COUNTY HENDERSON **GEOLOGIST** P. Perry **GROUND WTR (ft)** STATION 87+43 OFFSET 9 ft RT ALIGNMENT -L-BORING NO. S7-B2 0 HR. N/A COLLAR ELEV. 2,270.9 ft TOTAL DEPTH 49.3 ft **NORTHING** 644,389 **EASTING** 1,015,945 24 HR. 25.4 **DRILL RIG/HAMMER EFF./DATE** CG24113 CME-550X 78% 05/06/2024 NW Casing W/SPT & Core **HAMMER TYPE** Automatic DRILL METHOD **DRILLER** L. Ard **START DATE** 11/13/24 COMP. DATE 12/13/24 SURFACE WATER DEPTH N/A ELEV DRIVE DEPTH BLOW COUNT (ft) (ft) (ft) 0.5ft 0.5ft 0.5f **BLOWS PER FOOT** SAMP. SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft 75 100 NO. MOI G ELEV. (ft) 2275 **GROUND SURFACE** 2270 2,269.9 1.0 ROADWAY EMBANKMENT Asphalt (1.0') 2,267.9 Loose, Brown, Silty Fine SAND (A-2-4), , ______3.0 with trace asphalt fragments and gravel Stiff, Brown, Fine Sandy SILT (A-4), with trace organics and gravel M 2265 2,264.9 М COLLUVIAL 2,262.4 Loose, Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace organics 60 40/0.1 2,260.2 100/0.6 2260 2,260.2 10.7 WEATHERED ROCK -60/0.0 White-Orange-Brown, (Granitic Gneiss) CRYSTALLINE ROCK Gray-White (Boulder) 2255 WEATHERED ROCK 16.7 (Granitic Gneiss) CRYSTALLINE ROCK Gray-White (Granitic Gneiss) 2250 T 2245 2,245.1<u>1</u> 25.8 RESIDUAL Medium Stiff to Hard, Gray-White-Orange, Fine Sandy SILT (A-4), with trace to little M mica, Manganese Oxide staining 2,241.6 29.3 М 2240 26 М 2,231.6 10 Μ ပ္က 2230 43 8 2,226.4 44.5 CRYSTALLINE ROCK <u>E</u> 2225 - -60/0.0 (Granitic Gneiss) 49.3 2,221.6 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,221.6 ft In Crystalline Rock (Granitic Note: Very Hard Drilling at 43.8'

(ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft)										C	U	RE L	UG					
BORING NO. S7-B2 STATION 87+43 OFFSET 9 ft RT ALIGNMENT -L O HR N/A	WBS	DF183	314.204	5417		TIP	N/A		C	OUNT	Υ	HENDER	SON		GEOLOGIST P. Perry	/		
COLLAR ELEV. 2,270.9 t	SITE	DESCR	IPTION	Eme	ergency D	esign 1	for SR	1605 (Mi	ddle Fo	ork Ro	ad/T	oms Falls	Road) - Site 7				GROUN	ID WTR (ft)
DRILL RIGHAMMER EFF, DATE CG24113 CME-550X 78% 05/06/2024 DRILL METHOD NIV Casing WISPT & Core HAMMER TYPE Automatic	BORI	NG NO.	S7-B	2		STA	TION	87+43			OF	FFSET 9	ft RT		ALIGNMENT -L-		0 HR.	N/A
DRILLER L. Ard START DATE 11/13/24 COMP. DATE 12/13/24 SURFACE WATER DEPTH N/A	COLI	LAR ELE	EV. 2,	270.9 f	ft	тот	AL DE	PTH 49.	.3 ft		NC	ORTHING	644,389		EASTING 1,015,945		24 HR.	25.4
CORE SIZE NO	DRILL	RIG/HAN	IMER EF	F./DATE	E CG24	113 CM	IE-550X	78% 05/06	/2024			[DRILL METHOD	NW	Casing W/SPT & Core	HAMME	R TYPE	Automatic
ELEV (ft) C(ft)	DRIL	LER L	. Ard			STAI	RT DA	TE 11/1	3/24		CC	OMP. DAT	E 12/13/24		SURFACE WATER DE	PTH N/	A	
ELEV (ft) (ft) (ft) (ft) (ft) (ft) (ft) (ft)	COR	E SIZE	NQ			TOT	AL RUI	N 14.5 f	t					•				
2255 2,255.7 15.2 2,031.0 3.02.1 0 91% 91% 96% 91% 91% 96% 91% 91% 96% 91% 91% 96% 91% 91% 96% 91% 91% 96% 91% 91% 96% 91% 91% 96% 91% 9	ELEV (ft)	ELEV			RATE	REC.	RQD		REC.	RQD	0	ELEV. (fi	:)	DE	ESCRIPTION AND REMAR	KS		DEPTH (ft)
S. 0. 1.33 3.3 (2.1) (0.0)	2 25 \$02																	
S. 0 3.33 3.3 3.4 3.5 3.		2,260.2	10.7	4.5	N=60/0.0 3:02/1.0		(4.1) 91%			(4.1) 91%		2,260.2						10.7
S. 0 3.33 3.3 3.4 3.5 3.		2 255 7	15.2		2:35/1.0 2:35/1.0 2:03/1.0							2 255 7	Very Slightly W	Veather	red to Fresh. Moderately H	ard to Har	d. Grav-W	hite 15.2
1.38/1.0 1.38/1.0	2255		10.2	5.0	<u> U. 15/U.5</u> /		(2.1)			(0.0)	The state of the s	4			ery Close to Moderately Clo			1 /
2250 2,245.7 25.2 5.0 1:05/1.0 (3.3) (0.9) (24/1.0 0:37/1.0		-	‡		3:09/1.0	66%	42%					-			(Granitic Gneiss)			
Substitution	2250	2,250.7	20.2		0:49/1.0				78%	35%		1						
2245 2.245.7 25.2 0.37/1.0 0.3	2230	-	‡	5.0	0:47/1.0		(0.9) 18%					-	Moderately :	Severe		/ledium Ha	rd to Hard	.
N=16	2245	2,245.7	25.2		0:37/1.0							2,245.7			der), with Very Close to Clo			g
1	2245	-	‡		N=16							F	Medium Stiff to	to Hard	, Gray-White-Orange, Fine	Sandy SII	_T (A-4), v	with
2235 N=75 N=16 2230 N=60/0.0 N=60/0.0 N=60/0.0 N=60/0.0 N=60/0.0 N=60/0.0 N=60/0.0 N=60/0.0 N=60/0.0 N=75 CRYSTALLINE ROCK (Granitic Gneiss) 49.3		-	‡									ŧ	tra	race to	little mica, Manganese Ox	de stainin	9 `	
2230 N=16 2225 N=60/0.0 N=60/	2240	•	Ĺ		N=6							Ł						
2230 N=16 2225 N=60/0.0 N=60/		-	Ł									ŧ						
2230 N=16 2225 N=60/0.0 N=60/		-	F		N-75							F						
2225 N=60/0.0	2235	_	F		N=75							F						
2225 N=60/0.0		-	‡]						
2225 N=60/0.0	0000	-	‡		N=16							1						
2225 N=60/0.0	2230	-	<u> </u>									Ł						
2225 (Granitic Gneiss) N=60/0.0		-	Ł									2,227.1						43.8
N=60/0.0	2225	-	F		N=60/0.0							F						
N=60/0.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,221.6 ft In Crystalline Rock (Granitic Gneiss)		-	F									F			,			
2,221.6 ft In Crystalline Rock (Granitic Gneiss)					.,						F	2,221.6	<u> </u>					
Note: Very Hard Drilling at 43.8'		_	ļ		N=60/0.0							F	Boring Termina 2,2	nated wi ,221.6 f	ith Standard Penetration i ft In Crystalline Rock (Gran	est Refusi itic Gneiss	aiat⊨ieva s)	ition
		-	‡									ļ.		N	Note: Very Hard Drilling at 4	13.8'		
		-	‡									<u> </u>			, 3			
		_	<u> </u>									<u> </u>						
		-	Ĺ									Ł						
		-	-									-						
		-	F									F						
		-	‡									ļ.						
		-	‡									L						
		-	t									E						
		-	ł									E						
		_	F									F						
		-	ļ.									F						
		-	ļ									ļ.						
		-	‡									F						
		-	‡									ţ						
		-	Ł									Ł						
		-	F									F						
		-	ļ.									F						
		-	‡									Ļ						
		-	‡									ţ						
		-	‡									<u> </u>						



Boring: S7-B2 10.7 to 25.2 Feet



							UKE L				1	
WBS	DF18314.204	5417		TII	P N/A	COUNTY	/ HENDERS	SON			GEOLOGIST P. Perry	
SITE	DESCRIPTION	Eme	ergency	/ Desig	n for SR 1605 (Middle	Fork Road	d/Toms Falls	Road) -	Site 7			GROUND WTR (ft)
BORI	ING NO. S7-B3	3		SI	FATION 88+19		OFFSET 4	ft RT			ALIGNMENT -L-	0 HR. 16.4
COLI	LAR ELEV. 2,2	277.0	ft	т	OTAL DEPTH 56.21	t	NORTHING	644,46	64		EASTING 1,015,927	24 HR. Caved
DRILL	RIG/HAMMER EF	F./DAT	E CG2	29022 M	lobile B-29 92% 04/09/202	4		DRILL M	ETHOD	H.S.	Augers HAMME	R TYPE Automatic
DRIL	LER L. Ard			ST	TART DATE 12/12/2	4	COMP. DAT	Γ E 12/1	13/24		SURFACE WATER DEPTH N/A	4
ELEV (ft)	DRIVE DEPTH (ft)		0.5ft	UNT 0.5ft	BLOWS 0 25	PER FOOT	75 100	SAMP.	" /	L O G	SOIL AND ROCK DESC	CRIPTION DEPTH (ft)
2280	-									-	2,277.0 GROUND SURFA	ACE 0.0
2275	2.274.7 2.3									F	ROADWAY EMBANK Soft to Medium Stiff, Tan-Bi	
	7,273.7	3	2	2	4			SS-1249	22%	₩F	Fine Sandy SILT (A-4(0)), wi mica, and organi	th trace gravel,
	2,272.4	1	1	7					М		, ,	
2270	2,269.7 7.3				<u>-</u> 3° · · · · · · ·					░	2,270.5 COLLUVIAL	6.5
	2.267.4 9.6	6	2	1	93 : : : : : : :			SS-1251	15%		Very Loose, White-Gray-Ora 2,267.4 to Coarse SAND (A-2-4), w	
	7,207.3	52	48/0.2				100/0.7		9		WEATHERED RO	OCK
2265	†					 	+				White-Gray-Brown, (Gran	nitic Gneiss)
	2,262.4 14.6	9	36	64/0.3			: : : :			建		
260	1		30	04/0.5			100/0.8	1				
	T											
	2,257.4	73	27/0.2				100/0.7					
255	‡					<u> </u>	. 100/0:/				-2,254.5	22.
	2.252.4 24.6									*	RESIDUAL Stiff to Very Stiff, Gray-White	e-Orange, Fine
050	1	1	8	18	26				М	#	Sandy ŚILT (A-4(0)), with Manganese Oxide st	trace mica,
250	† ‡				 /. 		1				·	aming
	2,247.4 29.6	9	6	4	: ½: : ::::					₩Ł		
245	l Ŧ	9	"	+	10 . 110			SS-1256	37%	₩F	2.244.5	22
	Ŧ				\					F	-2,244.5 Medium Dense, White-Gray	
	2,242.4 34.6	14	9	8	17				w		Fine to Coarse SAND	35.
240	‡									X.	Stiff to Very Stiff, Orange-Grate to Coarse Sandy SILT (A-4)	ay-White, Fine 0)), with trace
	2,237.4 39.6				:::::\\::::::					*	gravel-sized rock fragmen	
005	1	10	13	14					w	#		
235	† †					 				**		
	2,232.4 44.6	3	5	10	:::/: :::::		: : : :			St.		
230] 🖠			'0	15			SS-1259	34%	₩F		
	 									₩F		
	2,227.4	5	6	11					М	₩F		
225	‡					ļ · · · ·						
	2,222.4 54.6				: : : <u> : : : : :</u>	<u> </u>	<u> </u>			點	2,222.4	54.
	2,220.8 56.2	6	94/0.3				100/0.8		₩		2,220.8 WEATHERED RO Gray-White, (Granitic	OCK 56.
	†	60/0.0	'				60/0.0			F	Boring Terminated with	Standard
	<u> </u>									E	Penetration Test Refusal 2,220.8 ft On Crystalline R	
	±									E	Gneiss)	
	1 1									F		
	 									F		
	‡									F		
	‡									F		
	‡									þ		
	‡									F		
	‡									þ		
	+									F		



GEOLOGIST P. Tomasic WBS DF18314.2045417 TIP N/A COUNTY HENDERSON SITE DESCRIPTION Emergency Design for SR 1605 (Middle Fork Road/Toms Falls Road) - Site 7 **GROUND WTR (ft)** BORING NO. S7-B4 STATION 89+15 OFFSET 8 ft RT ALIGNMENT -L-0 HR. 26.6 COLLAR ELEV. 2,284.7 ft TOTAL DEPTH 54.9 ft **NORTHING** 644,559 **EASTING** 1,015,914 24 HR. 27.2 **DRILL RIG/HAMMER EFF./DATE** CG23639 CME-550X 90% 03/10/2023 NW Casing W/SPT & Core HAMMER TYPE Automatic DRILL METHOD DRILLER J. Kiker **START DATE** 12/16/24 COMP. DATE 12/17/24 SURFACE WATER DEPTH N/A ELEV DRIVE DEPTH BLOW COUNT **BLOWS PER FOOT** SAMP. SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft 75 100 NO. MOI G ELEV. (ft) DEPTH (ft GROUND SURFACE 2.284.7 ROADWAY EMBANKMENT 2,283.3 Asphalt (0.2') 2.281.7 3.0 Medium Dense to Dense, 29 18 Tan-Orange-White-Brown, Silty Fine SAND 2280 (A-2-4), with trace gravel and organics ______5.0 2,278.3 4 Medium Stiff, Orange-White-Gray, Fine Sandy SILT (A-4), with trace mica М 2,276.7 2275 WEATHERED ROCK -100/0.8 Gray-White-Orange, (Granitic Gneiss) 2,271.7+ 13.0 RESIDUAL М Medium Stiff to Stiff, 2270 Brown-Gray-White-Orange, Fine Sandy SILT (A-4(0)), with trace mica, Manganese Oxide staining 2,266.7 18.0 3 SS-3014 25% 2265 Μ - - - -2260 V 2,256.7 28.0 2255 2,251.8 32.9 -60/0.0 (Boulder) 2250 Very Stiff, Orange-Gray-White, Fine Sandy SILT (A-4), with trace mica, Manganese Oxide staining 2245 2,244.3 40.4 М 2,241.8 42.9 70 30/0.1 ي <u>2240 2,240.3 44.4</u> WEATHERED ROCK 44.4 Gray-White, (Granitic Gneiss) CRYSTALLINE ROCK (Granitic Gneiss) 2235 REC = 95% RQD = 83% GSI = 65-70 [2230 Boring Terminated at Elevation 2,229.8 ft In Crystalline Rock (Granitic Gneiss)

								C	OI	<u>RE L</u>	OG	j									
WBS	DF18314.20	04541	7	TIP	N/A		С	OUNT	Υŀ	HENDER	SON			GEOLOG	SIST	P. To	omas	ic			
SITE	DESCRIPTIO	N E	mergency	Design	for SR	1605 (Mi	ddle Fo	ork Ro	ad/T	oms Falls	Road	d) - Site	7						GROUN	ID WTR	₹ (ft)
BOR	NG NO . S7-	B4		STA	TION	89+15			OF	FSET 8	ft R1			ALIGNME	ENT	L-			0 HR.	2	26.6
COL	LAR ELEV.	2,284.	7 ft	TOT	AL DE	PTH 54	.9 ft		NO	RTHING	644	1,559		EASTING	1	,015,9	14		24 HR.	2	27.2
	. RIG/HAMMER E		TE CG2			90% 03/10						_ METHO	D NW	Casing W/SI					R TYPE	Automa	atic
	LER J. Kiker	-		+		TE 12/1			CC	MP. DA	ΓE 1	2/17/24		SURFAC	E W	ATER	DEP	TH N//	Α		
	E SIZE NQ		DRILL		AL RUI UN	N 17.5 f		RATA	-												
ELEV (ft)	RUN ELEV (ft) DEPT (ft)		N DATE	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	Ö G	ELEV. (1	ft)		DI	ESCRIPTIO	N AI	ND REM	MARK	S		DEP	TH (ft)
2251.8	2,251.8 \(\) 32.9	2.0) N=60/0	2 (1.6)	(0.8)		(1.6)	(0.8)	000	2 251 8				Begin Co		@ 32.9 lder)	9 ft				32.9
2250	2,249.8 34.9	5.0	3:17/1.0	0%	(0.0) (0.0) 0%		80%	40%	000	2,251.8 2,249.8 _ _ _ _ _	Ver	y Stiff, O	range-G	iray-White, I Manganes	Fine	Sandy		A-4), wit	h trace m	iica,	34.9
00.40	2 240 3 + 44 4		N=100/0	6					2000	2,241.3 2,240.3				WEAT	UED	ED ROC	אי				43.4 44.4
2240	2,240.3	0.5	N=60/0.	(0.4)	(0.4)		(10.0) 95%	(8.7) 83%						(Grar	nitic	Gneiss))				
2235	2,234.8 49.9		7 4:09/1.0 3:00/1.0 3:18/1.0 3:21/1.0	(4.8) 96%	(4.2) 84%		9370	0370		- - -	G	Very Sli ray-White	ghtly Wo	eathered to litic Gneiss)	Fres , wit	INE ROO sh, Medi h Very C Spacing	um H	ard to Ve to Moder	ery Hard, rately Clo	se	
		5.0	4:27/1.0 4:02/1.0 4:45/1.0 5:34/1.0	(4.8) 96%	(4.1) 82%					- - -				GS	SI = (65-70					
2230	2,229.8 54.9)	5:20/1.0)						2,229.8	Во	ring Tern	ninated	at Elevation	2,22	29.8 ft In	Crys	talline R	ock (Grar	nitic	54.9



Boring: \$7-B4 32.9 to 54.9 Feet





						UKE L	<u> </u>			1	
WBS	DF18314.204	5417		TI	TIP N/A COUNTY	/ HENDERS	SON			GEOLOGIST P. Perry	
SITE	DESCRIPTION	Eme	ergency	Desig	gn for SR 1605 (Middle Fork Road	d/Toms Falls	Road) -	Site 7			GROUND WTR (ft)
BOR	ING NO. S7-B5	5		S	STATION 89+84	OFFSET 6	ft RT			ALIGNMENT -L-	0 HR. 22.8
COL	LAR ELEV. 2,2	289.8	ft	т	OTAL DEPTH 31.1 ft	NORTHING	644,62	26		EASTING 1,015,899	24 HR. 25.5
ORILL	RIG/HAMMER EF	F./DAT	E CG2	9022 M	Mobile B-29 92% 04/09/2024		DRILL M	ETHOD	H.S.	Augers HAMME	R TYPE Automatic
DRIL	.LER M. Brewe	er		S	START DATE 12/11/24	COMP. DAT	Γ E 12/2	12/24		SURFACE WATER DEPTH N/A	A
LEV	DRIVE DEPTH		ow co		BLOWS PER FOOT		SAMP.	V /	L	SOIL AND ROCK DESC	
(ft)	(ft) (ft)	0.5ft	0.5ft	0.5ft	0 25 50	75 100	NO.	моі		ELEV. (ft)	DEPTH (ft
290										2,289.8 GROUND SURFA	
	2,288.8 1.0	20	6	6				М		ROADWAY EMBANK Asphalt (0.6')	(MENT
	2,286.0 3.8				12.			"		2,286.8 Medium Dense, Gray, Silty	
285	2,283.8- 6.0	3	4	2		+		М	F	(A-2-4), with trace of Medium Stiff to Very Stiff, C	Drange-Gray,
	2,265.64 0.0	2	2	19	1 1			М	F	Fine Sandy SILT (A-4), with 2,281.8 and organics	n trace gravel
80	2,281.0 8.8	54	11	2	: : <i>]</i> /: : : : : : : : :			М		Medium Dense, Gray, Grave 2,280.0 (A-1-b)	elly Fine SAND 9.
	1 7			_	13-			IVI		Soft, Orange, Fine Sandy	
	1 10 0				:: <u>:</u> ; :::: ::::					2,277.3 RESIDUAL	12
75	2,276.0 13.8	5	8	12	20			М	I	Very Stiff, Gray-White, Find (A-4)	e Sandy SILT
										(7-4)	
	2,271.0 18.8		05/0.4							2,271.0	18
70		15	85/0.4			100/0.9				WEATHERED RO Gray, (Granitic Gn	
	1 1									2,266.8	23
35	2,266.0 23.8	11	7	5		7			F	RESIDUAL Stiff, White-Gray-Orange, Fi	
	Ŧ				12-				F	(A-4)	ne danay die i
	Z.261.0 28.8							М	J.		
0	+ +	5	7	93/0.4		100/0.0			77.5	2,260.5 WEATHERED RO	
	2,258.7 + 31.1	60/0.0)			100/0.9 60/0.0			-	2,258.7 Gray-Orange-White, (Gran Boring Terminated with	
	‡									Penetration Test Refusal 2,258.7 ft On Crystalline R	at Elevation
	‡									Gneiss)	ock (Granilic
	‡ '										
	<u> </u>								L		
	l Ŧ								 -		
	 								F		
	Į Į								l F		
	‡										
	‡										
	‡										
	<u> </u>								l		
	1 1								lE		
	 								F		
	‡										
	‡								-		
	‡										
									ŀ		
	 								F		
	†										
	‡										
	‡										
	‡										
	1 1										

SHEET 29

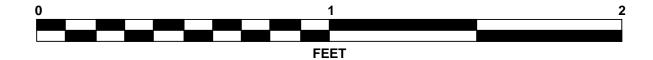
						BURE LUG	
	DF183					N/A COUNTY HENDERSON	GEOLOGIST P. Perry
SITE	DESCRI	PTION	Eme	ergenc	y Desi	or SR 1605 (Middle Fork Road/Toms Falls Road) - Site 7	GROUND WTR (ft)
BORII	NG NO.	S7-B	6		S	ION 90+89 OFFSET 11 ft RT	ALIGNMENT -L- 0 HR. N/A
COLL	AR ELE	V. 2,	296.61	ft	T	L DEPTH 24.5 ft NORTHING 644,730	EASTING 1,015,883 24 HR. 12.4
DRILL	RIG/HAM	MER EF	F./DATI	E C	G29022	ile B-29 92% 04/09/2024 DRILL METHOD 1	W Casing W/SPT & Core HAMMER TYPE Automatic
DRILL	ER M	. Brewe	er		S	T DATE 12/11/24 COMP. DATE 12/13/24	SURFACE WATER DEPTH N/A
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	'——	0.5ft		BLOWS PER FOOT SAMP. CONTROL S	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
295	2,295.6-	- - - - 1.0	2	2	1	SS-1235 24% L	
	- 2,292.5 2,290.6-	-	1 2	2	1 2	M SS-1237 24%	Care Soft to Stiff, Orange, Slightly Plastic Fine to Coarse Sandy CLAY (A-6(4)), with trace organics and gravel
	- 2,287.5 2,285.6-	-	2 60/0.1	5	8	13. — — — — — — — — — — — — — — — — — — —	Boulder ~ 11.0 ft
	- 2,282.5 2,281.1 - -	L	100/0.3 60/0.0	1		100/0.3	2,282.5 2,281.1 WEATHERED ROCK Gray-White-Orange, (Granitic Gneiss) CRYSTALLINE ROCK Gray-White-Orange, (Granitic Gneiss)
275	- - -	- - - -					REC= 99% RQD= 97% GSI= 80-85 2,272.1 Boring Terminated at Elevation 2,272.1 ft In
		-					
		-					- - - - - - - - - -
	- - - - - - -	- - - - - - -					
	-	- - - - -					- - - - - - -
	- - -	- - - -					- - -

	C	ORE LOG	
WBS DF18314.2045417	TIP N/A COUNTY	F HENDERSON GEOLOGIST P. Perry	
SITE DESCRIPTION Emergency De	esign for SR 1605 (Middle Fork Roa	ad/Toms Falls Road) - Site 7	GROUND WTR (ft)
BORING NO. S7-B6	STATION 90+89	OFFSET 11 ft RT ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 2,296.6 ft	TOTAL DEPTH 24.5 ft	NORTHING 644,730 EASTING 1,015,883	24 HR. 12.4
	022 Mobile B-29 92% 04/09/2024		ER TYPE Automatic
DRILLER M. Brewer	START DATE 12/11/24	COMP. DATE 12/13/24 SURFACE WATER DEPTH N/	'A
	TOTAL RUN 9.0 ft	. 1	
ELEV RUN ELEV (ft) DEPTH RUN RATE (Min/ft)	REC. RQD (ft) (ft) % NO. (ft) (ft) (ft) %	L DESCRIPTION AND REMARKS G ELEV. (ft)	DEPTH (ft)
2281.08 2280 2,281.1 15.5 4.0 N=60/0.0	(2.0) (2.0) (0.7)	Begin Coring @ 15.5 ft CRYSTALLINE ROCK	45.5
2,277.1 19.5 4:43/1.0 4:00/1.0 4:51/1.0 4:31/1.0 5.0 3:24/1.0	(3.9) (3.8) 98% (8.9) (8.7) 99% 97% (5.0) (4.9) 100% 98%	2,281.1 CRYSTALLINE ROCK Very Slightly Weathered to Fresh, Moderately Hard to Gray-White-Orange (Granitic Gneiss), with Close to Wi Spacing GSI = 80-85 2,272.1 Boring Terminated at Elevation 2,272.1 ft In Crystalline R Gneiss)	ide Fracture
		Gneiss)	



Boring: S7-B6 15.5 to 24.5 Feet





										D		EL	UG	•										
WBS	DF183	314.204	45417		TII	P N/A			col	UNTY	' HE	NDER:	SON				GEOLO	GIS	T P.	Perry				
SITE	DESCR	IPTION	Eme	rgency	Desig	n for SR	1605	(Middl	e Fork	Road	d/Tom	s Falls	Road) - Si	ite 7							GROUN	D WTR ((ft)
BOR	ING NO.	S7-B	7		ST	TATION	94+	08			OFF	SET 7	ft RT				ALIGN	MEN	T -L	-		0 HR.	N	I/A
COL	LAR ELE	EV. 2,	319.1 f	t	т	OTAL DE	EPTH	13.8	ft		NOR'	THING	645	,044			EASTIN	NG -	1,015	,872		24 HR.		Dry
DRILI	_ RIG/HAN	IMER EF	F./DATE	E CG2	23639 CI	ME-550X	90% 0	3/10/202	.3				DRILL	. MET	THOD	Was	sh Boring				HAMN	JER TYPE	Automatic	<u> </u>
	LER J.					ART DA					СОМ	P. DA					SURFA	CE V	VATE	R DE				_
LEV	DDI\/E	DEPTH	BLO	W CO				BLOWS					SAM		7/	L	1							_
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25		50		75 	100	NO	. /	MOI	O G	ELEV. (ft)		SOIL A	ND RO	OCK DES	SCRIPTION	DEPTI	⊣ (fi
2 320		1.9	2 2 3 100/0.3	2 2	3 1 2	\$5 \$3 \$4						00/0.3	SS-30		M M M 29%	G	2,310.0 2,309.5 2,305.3	Silty Boring C	oose Fine tra White	ADWAY Asp to Loo to Coa ce grav WEATH e-Gray (Grar ninated line Ro	halt (0.4 se, Gray- rse SANI rel and o IERED R (Graniti ALLINE F ittic Gnei at Eleva ck (Gran	IKMENT ') -Orange-Bro D (A-2-4), w rganics OCK C Gneiss) ROCK	own, ith	9. 9.
																	-							

SHEET 32

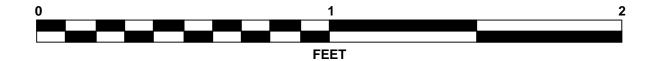
COUNTY HENDERSON **WBS** DF18314.2045417 TIP N/A **GEOLOGIST** P. Perry **GROUND WTR (ft) SITE DESCRIPTION** Emergency Design for SR 1605 (Middle Fork Road/Toms Falls Road) - Site 7 OFFSET 7 ft RT **STATION** 94+88 ALIGNMENT -L-BORING NO. S7-B8 N/A COLLAR ELEV. 2,326.9 ft TOTAL DEPTH 16.7 ft **NORTHING** 645,123 **EASTING** 1,015,886 24 HR. 11.1 **DRILL RIG/HAMMER EFF./DATE** CG23639 CME-550X 90% 03/10/2023 DRILL METHOD HAMMER TYPE Automatic SPT Core Boring DRILLER J. Kiker **START DATE** 12/18/24 COMP. DATE 12/18/24 SURFACE WATER DEPTH N/A **BLOWS PER FOOT** SAMP. SOIL AND ROCK DESCRIPTION MOI G (ft) 0.5ft 0.5ft 0.5ft 75 NO. 100 ELEV. (ft) **GROUND SURFACE** ROADWAY EMBANKMENT 2325 2,324.8 Asphalt (0.6') SS-3042 33% ROADWAY EMBANKMENT Very Loose, Brown, Silty Fine to Coarse SAND (A-2-4), with trace gravel and 2,322.2 М organics 2320 2,320.1 6.8 --60/0.0 CRYSTALLINE ROCK (Granitic Gneiss) **V** 2315 RQD = 90% GSI = 70-75 Boring Terminated at Elevation 2,310.2 ft In Crystalline Rock (Granitic Gneiss)

									C	Ol	RE L	OG						
WBS	DF183	314.204	5417		TIP	N/A		С	OUNT	Υŀ	HENDER	SON			GEOLOGIST P. Perry			
SITE	DESCR	IPTION	Eme	ergency D	esign f	or SR	1605 (Mi	ddle Fo	ork Ro	ad/T	oms Falls	Road) - S	ite 7				GROUN	ID WTR (ft)
BOR	ING NO.	S7-B	8		STA	ΓΙΟN	94+88			OF	FSET 7	ft RT			ALIGNMENT -L-		0 HR.	N/A
COL	LAR ELE	EV. 2,	326.91	ŧ	TOT	AL DE	PTH 16.	.7 ft		NO	RTHING	645,123			EASTING 1,015,886		24 HR.	11.1
DRILI	_ RIG/HAN	IMER EF	F./DATI	CG23	639 CM	E-550X	90% 03/10	/2023				DRILL MET	HOD	SPT	Core Boring	HAMM	ER TYPE	Automatic
DRIL	.LER J.	Kiker			STAI	RT DA	TE 12/1	8/24		CC	MP. DA	E 12/18/	24		SURFACE WATER DEP	TH N	/A	
COR	E SIZE	NQ			TOT	AL RU	N 9.9 ft											
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC.	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	L O G	ELEV. (1	t)		DE	ESCRIPTION AND REMARK	(S		DEPTH (ft)
23320	9														Begin Coring @ 6.8 ft			
2215	2,320.1		4.9	N=60/0.0 2:09/1.0 2:39/1.0 2:22/1.0 2:32/1.0 2:05/1.0	(4.6) 94%	(4.1) 84%		(9.6) 97%	(8.9) 90%		2,320.1 - -	Slightly (Granitic (Weatl Gneiss	hered	CRYSTALLINE ROCK I to Fresh, Moderately Hard h Very Close to Moderately	to Hard, Close Fra	Gray-Whi acture Spa	6.8 te, acing
2313	-		5.0	4:23/1.0 2:29/1.0 2:46/1.0 3:25/1.0	(5.0) 100%	(4.8) 96%					- - -				GSI = 70-75			
	2,310.2	16.7		6:14/1.0							2,310.2	Davis s T		-41-	at Elevation 2,310.2 ft In Cry)l- (O	16.7
															Gneiss)			



Boring: \$7-B8 6.8 to 16.7 Feet





N/A

6.1

GROUND WTR (ft)

HAMMER TYPE Automatic

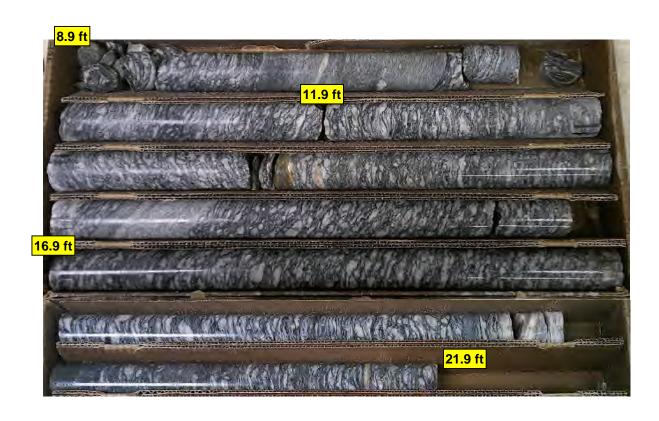
		BORE LOG			· <u></u>				
WBS DF18314.2045417	TIP N/A	COUNTY HENDERSON	GEOLOGIST P. Perry		WBS DF18314.2045417	TIP N/A	COUNTY HENDERSON	GEOLOGIST P. Perry	
SITE DESCRIPTION Emergency De	esign for SR 1605 (Middle F	ork Road/Toms Falls Road) - Site 7		GROUND WTR (ft)	SITE DESCRIPTION Emergency	Design for SR 1605 (Middle	e Fork Road/Toms Falls Road) - Site 7		GROUND WTF
BORING NO. S7-B9	STATION 95+76	OFFSET 6 ft RT	ALIGNMENT -L-	0 HR. N/A	BORING NO. S7-B10	STATION 96+28	OFFSET 7 ft LT	ALIGNMENT -L-	0 HR.
COLLAR ELEV. 2,333.6 ft	TOTAL DEPTH 15.9 ft	NORTHING 645,211	EASTING 1,015,895	24 HR. 6.4	COLLAR ELEV. 2,337.9 ft	TOTAL DEPTH 9.0 ft	NORTHING 645,264	EASTING 1,015,884	24 HR.
DRILL RIG/HAMMER EFF./DATE CG236	39 CME-550X 90% 03/10/2023	DRILL METHOD \	Vash Boring HAMM	IER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE CG2	23639 CME-550X 90% 03/10/2023	3 DRILL METHOD	Wash Boring HAMN	IER TYPE Automa
DRILLER J. Kiker	START DATE 12/18/24		SURFACE WATER DEPTH N/	'A		START DATE 12/17/2		SURFACE WATER DEPTH N/	/A
COLLAR ELEV. 2,333.6 ft DRILL RIG/HAMMER EFF./DATE CG2363 DRILLER J. Kiker ELEV DRIVE ELEV (ft) (ft) 0.5ft 0.5ft 0.5ft 0. 2335 2,331.8 1.8 3 2 2,3329.6 4.0 2 2 2,326.9 6.7 1 1 2325 2,324.4 9.2	TOTAL DEPTH 15.9 ft 39 CME-550X 90% 03/10/2023 START DATE 12/18/24 T BLOWS PE 5ft 0 25 50 2 1 93	NORTHING 645,211 DRILL METHOD NORTHING NORTHING	EASTING 1,015,895 Wash Boring HAMM SURFACE WATER DEPTH N/ SOIL AND ROCK DESELEV. (ft) 2,333.6 CROUND SURFACE WATER DEPTH N/ SOIL AND ROCK DESELEV. (ft) CROOM SURFACE WATER DEPTH N/ SOIL AND ROCK DESELEV. (ft)	24 HR. 6.4 IER TYPE Automatic A CRIPTION DEPTH (ft) ACE 0.0 KMENT 1.7 Fine to Coarse 7. 3.0 ace gravel 7. 3.0 ACC 7. 3.0 ACC 8. 15.9 In Standard 1 at Elevation	COLLAR ELEV. 2,337.9 ft DRILL RIG/HAMMER EFF./DATE CG2 DRILLER J. Kiker ELEV (ft) DRIVE (ELEV (ft) 0.5ft	TOTAL DEPTH 9.0 ft 23639 CME-550X 90% 03/10/2023 START DATE 12/17/2 UNT BLOWS 0.5ft 0 25	NORTHING 645,264 3	Wash Boring HAMM SURFACE WATER DEPTH N/ SOIL AND ROCK DES	24 HR. MER TYPE Automa MA SCRIPTION FACE MKMENT The control of the control
NCDOT BORE DOUBLE MIDDLE FORK ROAD DIVISION 14 EMERGENCY - SITE 7.0									

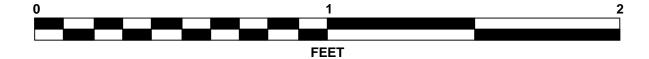
												<u>UU</u>				
	DF183					P N/A			COUNT						GEOLOGIST P. Perry	
				ergenc		gn for SR	-		Fork Roa			-	- Site	7		ROUND WTR (ft)
	NG NO.				-	TATION						7 ft RT				HR. N/A
	LAR ELI					OTAL DE				NOR	THING	645,3			<u> </u>	HR. 13.6
	. RIG/HAN		F./DAT	TE C		CME-550X						DRILL N		D NV	V Casing W/SPT & Core HAMMER 1	TYPE Automatic
	LER J.		1			TART DA					P. DA	TE 12/	17/24	1 	SURFACE WATER DEPTH N/A	
(ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	OW CO		0	25 -	50 50 1	ER F001)	75 	100	NO.	МО	O G	SOIL AND ROCK DESCRI	PTION DEPTH (f
2345	- - -	-												-	- 3.348.4 GROUND SURFACE	Ξ <u></u>
340	2,336.9		5	4	2	1							M		ROADWAY EMBANKME Asphalt (0.4') Loose, Orange-Brown, Silty Fine SAND (A-2-4), with trace of	e to Coarse
335	2,335.4 2,333.6 2.331.5	6.8	2	98/0.4	3	9 6		-:		- 1	00/0.9	,	M		(Boulder)	8.9
330	2,331.3	0.9	60/0.0	Ō							60/0.0]			CRYSTALLINE ROCK (Granitic Gniess)	(
325	- - -										· ·		▼		REC=98% RQD=91% GSI=70-75	
	- - -															
320	-	_								<u> </u>		1			- 2,318.5 Boring Terminated at Elevation 2	21.9 2 318 5 ft In

								C	Ol	RE L	OG							
WBS	DF18314.204	5417		TIP	N/A		С	OUNT	Υŀ	HENDER	SON			GEOLOGIS	T P. Perr	у		
SITE	DESCRIPTION	Em	ergency D	esign 1	for SR	1605 (Mi	ddle Fo	ork Ro	ad/To	oms Falls	Road) -	Site 7					GROUN	ND WTR (ft)
BOR	ING NO. S7-B	11		STA	TION	96+66			OF	FSET 7	ft RT			ALIGNMEN ^T	T -L-		0 HR.	N/A
COL	LAR ELEV. 2,	340.4	ft	тот	AL DE	PTH 21	.9 ft		NO	RTHING	645,30	00		EASTING	1,015,901		24 HR.	13.6
DRILI	L RIG/HAMMER EF	F./DAT	E CG23	639 CM	IE-550X	90% 03/10	/2023				DRILL ME	ETHOD	NW	Casing W/SPT	& Core	HAMM	ER TYPE	Automatic
DRIL	LER J. Kiker			STAI	RT DA	TE 12/1	7/24		СО	MP. DA	Γ E 12/1	7/24		SURFACE V	VATER DE	EPTH N	/A	
COR	E SIZE NQ			TOTA	AL RUI	N 13.0 f	t											
ELEV (ft)	RUN ELEV (ft) DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	UN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	LOG	ELEV. (f	t)		DE	ESCRIPTION A	AND REMAR	RKS		DEPTH (f
2331.4	9													Begin Corin	ıg @ 8.9 ft			
2330	2,331.5 8.9 2,328.5 11.9	5.0	N=60/0.0 2:24/1.0 3:02/1.0 3:21/1.0	(2.8) 93%	(2.1) 70%		(12.8) 98%	(11.8) 91%		2,331.5				CRYSTALI Fresh, Moders s), with Very C		o Very Har		hite,
2325	T T	3.0	2:31/1.0 2:36/1.0 2:45/1.0 4:20/1.0	(5.0) 100%	(4.8) 96%					- -				GSI=	70-75			
	2,323.5+ 16.9	5.0	3:42/1.0 3:57/1.0 2:59/1.0	(5.0) 100%	(4.9) 98%													
2320	2,318.5+ 21.9		2:43/1.0 2:51/1.0 2:42/1.0								Boring	Terminat	ted a	at Elevation 2,3	318.5 ft In C	rvstalline F	Rock (Gran	21.
	#									- - -		,		Gne	eiss)	,		
										- - -								
										_ - -								
	#									- - -								
	‡									- - -								
	<u> </u>									_ _ _								
	#									- - -								
	<u> </u>									_								
	†									_ - -								
	#									- - -								
										_ - -								
	#									<u>-</u> -								
										- -								
										_ - -								
	‡									- - -								
										<u> </u>								
	‡									- - -								
	1 ‡									<u> </u>								



Boring: S7-B11 8.9 to 21.9 Feet





									ORE L	UG						
WBS	DF183	314.204	5417		TI	P N/A		COUNT	Y HENDER	SON			GEOLOGIST P. Perry			
SITE	DESCR	IPTION	Eme	rgency	/ Desig	n for SR 16	605 (Middle	e Fork Roa	d/Toms Falls	Road) -	Site 7				GROUND	WTR (ft)
BORI	NG NO.	S7-B	12		ST	TATION 9	7+55		OFFSET 9	ft RT			ALIGNMENT -L-		0 HR.	N/A
COLI	AR ELI	EV. 2,	346.8 f	t	т	OTAL DEP	TH 12.7	ft	NORTHING	645,3	86		EASTING 1,015,922		24 HR.	0.3
DRILL	RIG/HAN	IMER EF	F./DATI	E CG2	23639 C	ME-550X 90°	% 03/10/202	3	•	DRILL N	IETHOE) Wa	sh Boring	HAMME	ER TYPE A	utomatic
DRIL	LER J.	Kiker			ST	TART DAT	E 12/17/	24	COMP. DA	TE 12/	17/24		SURFACE WATER DEP	TH N/	Ą	
LEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	'	W CO 0.5ft		0	BLOWS	PER FOOT 50	75 100	SAMP. NO.	MOI	L O G	SOIL AND RO	CK DESC	CRIPTION	DEPTH (f
2350	- - -	- - - -									•	-	- 2.348.8 GROUN ROADWAY			<u> </u>
2345	2,344.9	1.9	2	4	7								_	nalt (0.5')		
	2,343.1	3.7	7	4	3					SS-3023	1		Loose to N Orange-Gray-Whit	ledium D e, Silty F	ense, ine to Coars	se
23/10	2,340.1	67	'								M		ŠAND (A-2-4) 2,340.1	, with tra	ce gravel	6.
2040		Ļ	60/0.0				 		60/0.0	'			CRYSTA			<u> </u>
	2,337.8-	9.0	60/0.0						60/0.0	•			(Giaili	tic Gneis	s)	
2335	2.334.1	<u> </u>											⁻ 2,334.1			12.
	-	-	60/0.0						60/0.0				Boring Termin Penetration Test 2,334.1 ft In Crys	Refusal	at Elevation	
													-			
													-			
	- - - - - - - -	† - - - - - - - - - - - - - - - - - - -											-			

SHEET 38

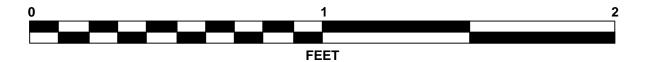
				ORE LC			
NBS DF18314	.2045417	TIP N/A	COUNT	Y HENDERSO	NC	GEOLOGIST P. Perry	
SITE DESCRIPT	ION Emerg	ency Design for S	R 1605 (Middle Fork Ro	ad/Toms Falls F	Road) - Site 7		GROUND WTR (ft)
BORING NO. S	S7-B13	STATION	l 98+06	OFFSET 9 f	t RT	ALIGNMENT -L-	0 HR. N/A
OLLAR ELEV.	2,351.2 ft	TOTAL D	DEPTH 16.1 ft	NORTHING	645,437	EASTING 1,015,932	24 HR. Dry
RILL RIG/HAMME	R EFF./DATE	CG23639 CME-550	0X 90% 03/10/2023	D	RILL METHOD SP	T Core Boring HAMMI	ER TYPE Automatic
RILLER J. Kil	ker	START D	DATE 12/17/24	COMP. DATE	12/17/24	SURFACE WATER DEPTH N/	A
	PTH BLOW (ft) 0.5ft 0	COUNT 0	BLOWS PER FOOT 25 50	75 100	SAMP. LONG G	SOIL AND ROCK DESC	CRIPTION DEPTH (ft
350	1.2 100/0.2 4.1 60/0.0			60/0.0		GROUND SURFA ROADWAY EMBANI Asphalt (0.2') WEATHERED RC Gray-White, (Granitic CRYSTALLINE R (Granitic Gneis) REC=88% RQD=67% GSI=50-55	CMENT DCK Gneiss) OCK 4.1
						Boring Terminated at Elevati Crystalline Rock (Granit	16.1 (on 2,335.1 ft In tic Gneiss)

									<u> </u>	<u>U</u>	RE LOG	
WBS	DF183	14.204	5417		TIP	N/A		C	OUNT	ΥI	HENDERSON GEOLOGIST P. Perry	
SITE	DESCRI	PTION	Eme	ergency D	esign 1	for SR	1605 (Mi	ddle Fo	ork Ro	ad/T	Foms Falls Road) - Site 7 GROUND WTR (f	ft)
BOR	ING NO.	S7-B	13		STA	TION	98+06			OF	FFSET 9 ft RT ALIGNMENT -L- 0 HR. N	/A
COL	LAR ELE	V. 2,	351.21	ft	TOT	AL DE	PTH 16.	.1 ft		NC	DRTHING 645,437 EASTING 1,015,932 24 HR. D	ry
DRILI	RIG/HAM	MER EF	F./DATE	E CG23	639 CM	IE-550X	90% 03/10	/2023			DRILL METHOD SPT Core Boring HAMMER TYPE Automatic	;
DRIL	LER J.	Kiker			STAI	RT DA	TE 12/1	7/24		CC	OMP. DATE 12/17/24 SURFACE WATER DEPTH N/A	
COR	E SIZE	NQ			TOT	AL RUI	N 12.0 f	t			•	
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC.	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RATA RQD (ft) %	L O G		(ft)
2347.0				(IVIIII/IC)	%	9/0		90	%	Ť	Begin Coring @ 4.1 ft	(π)
	2,347.1 2,345.1	4.1 6.1	2.0	N=60/0.0 3:16/1.0	(2.0) 100%	(1.7) 85%		(10.6) 88%	(8.0) 67%			4.1
2545	2,0 10.1		5.0	5:10/1.0 2:05/1.0	(4.5)	(2.9)		00 70	07 70		(Granitic Gneiss), with Very Close to Moderately Close Fracture Spacing	
		- -		N=60/0.0 3:16/1.0 5:10/1.0 2:05/1.0 1:49/1.0 2:33/1.0 3:24/1.0	90%	58%					GSI=50-55	
2340	2,340.1	11.1	5.0	2:33/1.0 3:32/1.0	(4.1)	(3.4)						
		-	5.0	3:58/1.0 3:58/1.0 3:20/1.0	82%	68%						
	2 225 4	- 16 1		2:06/1.0								0.4
	2,335.1	16.1		1:54/1.0							Boring Terminated at Elevation 2,335.1 ft In Crystalline Rock (Granitic	6.1
	1 1	-									L Gneiss)	
	1 ±	•									_	
	+	-									+	
	 	-									-	
	-	-									F-	
		-									-	
		-										
		- -										
	1	-										
	1 ±	-									_	
	1 7	•									F	
	 	-									-	
	4	-									<u></u>	
		-									-	
		-									‡	
		- -									-	
	‡	- -										
		-										
	1 1	-									E	
	1 1	-									_	
	-	-										
	 	-									-	
		-									-	
		-									-	
		- -									‡	
		-										
	1	-										
		-									<u>t</u>	
	-	-									-	
		-									-	
	‡	-									F	
		-									F	
		- -									‡	
		- -										
		-									‡	



Boring: **S7-B13** 4.1 to 16.1 Feet





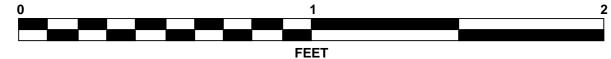
VBS	DF183	14.204	15417		TI	P N	I/A				CO	UNT	/ HE	NDEF	RSC	ON			GEOL	OGIST P. P	erry		
SITE	DESCRI	PTION	Em	ergeno	y Desi	gn fo	r SR	160	5 (N	1iddle	For	k Roa	ad/Tor	ns Fal	lls F	Road) -	Site 7	7				GROUND	WTR (ft)
BORI	NG NO.	S7-B	14				ON							SET						IMENT -L-		0 HR.	N/A
COLL	AR ELE	V. 2,	364.7	ft	TO	DTAL	_ DE	PTH	1 2	5.8 ft			NOR	THING	G	645,6	16		EASTI	NG 1,015,8	98	24 HR.	11.4
RILL	RIG/HAMI	MER EF	F./DAT	E C	G23639	CME-	-550X	90%	6 03/1	0/202	:3				D	RILL M	ETHO) SI	PT Core Bo	ring	HAMN	IER TYPE A	utomatic
PRILI	LER J.	Kiker			S	TART	Γ DA	TE	12/	18/2	4		CON	P. DA	ΙΤΕ	12/1	18/24		SURF	ACE WATER	DEPTH N	/A	
LEV	ELEV	DEPTH	'	DW CO								TOOT				SAMP.	lacktriangledown/	0		SOIL AND	ROCK DES	CRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0		25)		50		75	100	+	NO.	/MOI	G	ELEV. (ft)	1			DEPTH (ft)
365		=				Щ_									Щ			1 822	_2,364.7		OUND SURF		0.0
-	2,363.0	1.7	3	7	17	:				: :	-						w		2,362.0	Very Stiff, Bro	way EMBAN own, Fine Sai	ndy SILT (A-4), _{2.7}
360	2,361.1 2,359.9	3.6	43	57/0.2		:		- 🕶 2		- <u>-</u> -	 		 - -				VV	477	2,361.1		ce gravel and RESIDUAL		3.6
	2,559.9	- 4.0	60/0.0			-					-		-	00/0.7 60/0.0	•					Very Stiff, Gr	ay-Brown, Fi (A-4)	ne Sandy SIL ⁻	г [
	1	-				:	: :	:			-									WE Brown-C	ATHERED R Gray, (Graniti	OCK c Gneiss)	
355	7	-				-		-			-		-		$\{ \mid$		_		- '	CRY	STALLINE F	ROCK	_
	Ŧ	-				:		-			-		-						•	(0	Granitic Gnei	55)	
350	Ŧ	-				-		-			-		-						-		REC=95% RQD=60%		
	7	-									-]				2,348.3		GSI=45-50 ered Zone: 5.	6' to 6.1'	16.4
	Ŧ	-				:		-			-		-						-		ATHERED R n, (Granitic C		
345		-						-			-		+:-		$\{ \ \cdot \ $				2,345.1		/STALLINE F	•	19.6
	}	•											-		$\ \cdot \ $				•	(0	Granitic Gnei	ss)	
340	$\frac{1}{2}$	-									-								•		REC= 100% RQD=68%		
	- 7	-				Г.									4				2,338.9	Boring Termin	GSI=50-55		25.8
	Ŧ	-																	•	Crystalline	e Rock (Gran	itic Gneiss)	. 111
		-																	-				
	‡	-																					
	‡	-																	•				
	7	-																					
	‡	-																	•				
	- ‡	-																	- -				
	‡	-																	•				
	‡	-																	•				
	7	-																	-				
	‡	-																					
	#	-																	-				
	‡	-																					
	‡	-																					
	†	-																	-				
	1	-																					
	<u> </u>	-																	-				
	İ	-																					
]	-																					
	7	-																	_				
	‡	-																	•				
	‡	-																	•				
	†	-																	- ·				
	‡	-																	•				
	‡	-																	-				
	+	-																1 }					
	-																						

									C	O	RE L	OG .					
WBS	DF183	314.204	5417		TIP	N/A		С	OUNT	Υŀ	HENDERS	ON		GEOLOGIST P. Perry			
SITE	DESCR	IPTION	Eme	ergency D	esign f	for SR	1605 (Mi	ddle Fo	ork Ro	ad/To	oms Falls	Road) - Site 7				GROUN	ND WTR (ft)
BORI	NG NO.	S7-B	14		STA	TION	99+85			OF	FSET 1	5 ft LT		ALIGNMENT -L-		0 HR.	N/A
COLI	LAR ELE	EV . 2,	364.7	ft	TOT	AL DE	PTH 25.	.8 ft		NO	RTHING	645,616		EASTING 1,015,898		24 HR.	11.4
DRILL	. RIG/HAM	MER EF	F./DATI	E CG23	639 CM	E-550X	90% 03/10	/2023				DRILL METHOD	SP	Γ Core Boring	HAMM	ER TYPE	Automatic
	LER J.				STAI	RT DA	TE 12/1	8/24		co	MP. DAT	E 12/18/24		SURFACE WATER DE	PTH N/	Α	
COR	E SIZE	NQ		l ppul	1	AL RUI Jn	1 21.0 f	t STR	Λ Τ Λ	ļ.,	1						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft)	RQD (ft) %	O G	ELEV. (ft)	DI	ESCRIPTION AND REMAR	KS		DEPTH (ft)
2359.89		4.8	1.0	N=60/0.0	(0.8)	(0.0)		(11.0)	(7.0)		2,359.9			Begin Coring @ 4.8 ft CRYSTALLINE ROCK			4.8
2355	2,359.9 - - 2,353.9 - -	10.8	5.0	1:40/1.0 1:35/1.0 1:45/1.0 1:30/1.0 1:50/1.0 2:14/1.0 2:01/1.0 1:10/1.0 1:09/1.0	(0.8) (80%) (5.0) 100% (4.6) 92%	(0.0) 0% / (3.2) 64% (3.8) 76%		(11.0) 95%	(7.0) 60%		_ 2,359.9 	Moderately Son Hard, White-Ta	an-Bla	to Moderately Weathered, Nock-Gray-Orange, (Granitic Moderately Close Fracture S GSI=45-50 Weathered Zone: 5.6' to 6	Sneiss), v pacing	o Moderat vith Very C	ely
	2,348.9_	15.8	5.0	1:28/1.0 1:21/1.0	(2.5)	(0.0)		(0.7)	(0.0)		2,348.3			WEATHERED ROCK			16.4
22 <i>1E</i>	- -	-		1:03/1.0	50%	0%		22%	0%		2,345.1			Brown, (Granitic Gneiss)			19.6
2345	2,343.9	20.8	5.0	1:36/1.0 1:12/1.0 2:41/1.0 2:07/1.0	(5.0) 100%	(4.2) 84%		(6.2) 100%	(4.2) 68%		2,343.1	Moderately Brown-Gray-W	Seve	CRYSTALLINE ROCK re to Slightly Weathered, Me Granitic Gneiss), with Very	edium Ha	rd to Hard Close Frac	,
2340	2,338.9 <u> </u>	25.8		1:49/1.0 2:14/1.0 2:10/1.0							2,338.9			Spacing			25.8
												Doing rolling		at Elevation 2,338.9 ft In Cry Gneiss)			



Boring: **S7-B14** 4.8 to 25.8 Feet





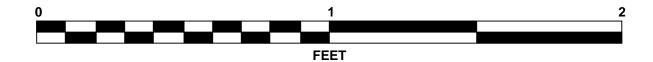
NBS	DF183	314.204	5417		TI	P N/A		COUNTY	/ HEND	ERS	SON			GEOLOGIST P. Perry		
SITE	DESCRI	PTION	Eme	ergenc	y Desi	gn for SR 160	05 (Middle	Fork Roa	nd/Toms	Falls	Road) -	Site 7	7		GROUND	WTR (ft)
BORII	NG NO.	S7-B	15		S	TATION 10	1+80		OFFSE	Г 1	1 ft RT			ALIGNMENT -L-	0 HR.	N/A
COLL	AR ELE	V. 2,	377.2 1	ft	TO	OTAL DEPTI	H 50.2 ft		NORTH	ING	645,8	03		EASTING 1,015,966	24 HR.	Dry
RILL	RIG/HAM	MER EF	F./DATI	E C	G23639	CME-550X 909	% 03/10/202	3			DRILL M	ETHO) NV	V Casing W/SPT & Core HAMM	ER TYPE A	Automatic
RILL	ER J.	Kiker			S	TART DATE	12/18/24	1	COMP.	DAT	E 12/1	8/24		SURFACE WATER DEPTH N	Ά	
LEV	DRIVE ELEV	DEPTH	BLC	W CO	UNT		BLOWS F	ER FOOT	•		SAMP.	$\overline{f V}/$	LO	SOIL AND ROCK DES	CRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	5 5	0	75 <i>′</i>	100	NO.	<u>/MOI</u>		ELEV. (ft)		DEPTH (ff
380		_												-		
	-	-											l þ	2,377.2 GROUND SURFA	ACE	0.
375	-	-												ROADWAY EMBANI Soft, Brown-Orange, Fine to	KMENT	
	2,374.2	3.0	3	1	1	<u> </u>				-		W		SILT (A-4(0)), with trace organics		uy
-	2,372.2	5.0	WOH	1	1	$\begin{bmatrix} \mathbf{\Phi}^2 & \cdots & \cdots \\ \mathbf{I} & \cdots & \cdots \end{bmatrix}$:	SS-3054			organics		
370	- 2.369.3	- - 79				● ²	 			_	55-3054	3470		_2,369.7		
			7	9	31		1 .			:		W	0000	ALLUVIAL Dense to Very Dense, Tar	ı, Silty Fine to	0
	2,367.0_ -	10.2	32	62	32					- ●94		W	000 000 000	Coarse Sandy GRAVE	L (A-1-a)	
365	-	-					.1			+				2,364.2 RESIDUAL		<u>13</u> .
	2,362.0	15.2		40	20		:\::::			-				Hard, Brown-Gray, Fine	Sandy SILT	
360	-	_	6	13	20		- 33			_	SS-3057	21%	Mt.	(A-4(0))		
		-					:			:				0.057.0		20
	2,357.0_ -	20.2	65	35/0.2			:		- 100/	0.7				2,357.0 WEATHERED RO		20.:
355	-	-						.,	 					2,354.2 Brown-Gray, (Granitic	: Gneiss) - — — — — -	23.
	2,352.0	25.2	9	04	20					-				Hard, Brown-Gray, Fine Sar	ndy SILT (A-4	4),
350	-	_	9	24	33			57		_		М	Mt.	Manganese Oxide s	taining	
	-	-						1		-						
	2,347.0_ -	30.2	28	72/0.3				- '	- 100/	0.8				2,347.0 WEATHERED RO	OCK .	30.2
345	-	-												Gray-Brown, (Granitic	Gneiss)	
	2,342.0	35.2	0.7	00/0.4						:						
340	-	_	37	63/0.4					- 100/	0.9				_		
	-	-														
	2,337.0	40.2	60/0.0						60/	0.0				2,337.0 CRYSTALLINE R		40.2
335	-	-								\exists				Gray-White, (Granitic	Gneiss)	
	-	_								:				REC= 93% RQD= 71%		
330	-	-								-1				GSI=55-60 -		
	-	-														
-									1					Boring Terminated at Elevat	ion 2,327.0 ft	50.: t In
	_	-												_ Črystalline Rock (Grani	tic Gneiss)	
	-	-														
	_	_											<u> </u>	-		
	-	_											E			
	-	_											E			
	_	-											[-		
	_	_											E			
	-	_											F	_		
	-	[F	-		
	-	-														
	-	-												-		
	-	-														
	_	t											1 F			

				C	ORE LOG	
WBS DF18314.20	45417	TIP N/A	col	TNU	HENDERSON GEOLOGIST P. Perry	
SITE DESCRIPTION	M Emergency D	esign for SR	1605 (Middle Fork	k Roa	d/Toms Falls Road) - Site 7 GROUND	WTR (ft)
BORING NO. S7-E	315	STATION	101+80		OFFSET 11 ft RT ALIGNMENT -L- 0 HR.	N/A
COLLAR ELEV. 2	,377.2 ft	TOTAL DE	PTH 50.2 ft		NORTHING 645,803 EASTING 1,015,966 24 HR.	Dry
DRILL RIG/HAMMER E	FF./DATE CG23	639 CME-550X	90% 03/10/2023		DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE A	utomatic
DRILLER J. Kiker		START DAT	TE 12/18/24		COMP. DATE 12/18/24 SURFACE WATER DEPTH N/A	
CORE SIZE NQ		TOTAL RUN	N 10.0 ft			
/ft\	RUN DRILL RATE	RUN REC. RQD (ft) (ft) %	SAMP. REC. F	TA RQD	L O DESCRIPTION AND REMARKS	
(II) (ft) (II) 337.04	(ft) (Min/ft)	(11) (11)	NO. (1)	(ii) %	G ELEV. (ft) Begin Coring @ 40.2 ft	DEPTH (ft)
2,337.0 40.2 2335 2,332.0 45.2 2,327.0 50.2	5.0 N=60/0.0 1.28/1.0 1.31/1.0 2.38/1.0 3.05/1.0 5.0 3.19/1.0 2:44/1.0 3:03/1.0 4:20/1.0	(5.0) (4.3)	(9.3) (93% 7	7.1) 71%	2,337.0 CRYSTALLINE ROCK Moderately Severe to Very Slightly Weathered, Very Soft to Hard, Gray-White (Granitic Gneiss), with Very Close to Moderately Close Fracture Spacing GSI= 55-60 Boring Terminated at Elevation 2,327.0 ft In Crystalline Rock (Granitic Gneiss)	50.2



Boring: **S7-B15** 40.2 to 50.2 Feet





											KE L					1		
	DF183					P N/A			COUN							GEOLOGIST P. Perry		
SITE	DESCR	PTION	Emer	rgency	Desig	n for SR	1605	(Middle	Fork Ro	ad/To	ms Falls	s R	oad) -	Site 7			GROUND WTF	र (ft)
BOR	NG NO.	S7-B1	6		SI	TATION	103·	+52		OF	FSET	10	ft RT			ALIGNMENT -L-	0 HR.	17.0
COL	LAR ELE	V . 2,3	91.2 f	t	TC	OTAL DE	PTH	21.7 ft		NO	RTHING	3	645,97	4		EASTING 1,015,932	24 HR.	15.6
DRILL	RIG/HAM	MER EFF	./DATE	CG2	9022 M	obile B-29	92% (04/09/202	4			D	RILL MI	ETHOD	H.S.	Augers HAMME	R TYPE Automa	itic
DRIL	LER M	. Brewei	-		ST	TART DA	ΛΤΕ	01/07/2	5	СО	MP. DA	TE	01/0	7/25		SURFACE WATER DEPTH N/A	١	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLO 0.5ft	W COL	JNT 0.5ft	0	25	BLOWS I	PER FOO	75	100	11	SAMP. NO.	MOI	L O G	SOIL AND ROCK DESC		PTH (ft)
2395	-	-													 - -			
	-	-										Ш			-	2,391.2 GROUND SURFA		0.0
2390	2,390.2	1.0	2	3	3	1	-					$\left\{ \right\}$		М	LWF	ROADWAY EMBANK Soft to Stiff, Brown-Orange-		
	- 2,387.7-	- - 3.5				[] ⁶								141	-#	Coarse Sandy SILT (A-4), wi	th trace gravel	
0005	_	-	2	1	2	4 3 · ·	-							М		and organics		
2385	2,385.2	6.0	1	1	1	12	-+		 			$\ \ $		М				
	2,382.7-	- 8.5				 '			: : :	. :					L#F			
2200	_	-	6	5	′	12	2 -			: :				М				
2380	_	-								-		11				2,379.2		12.0
	2,377.7-	- 13.5	0				-			. .				W	F	ALLUVIAL Loose, Orange-Brown, Silty I	Fine to Coarse	
0075	_	-	2	4	2	∳ 6				: :				\blacksquare		SAND (A-2-4), with trace to	little gravel	
2375	-	-				1			<u> </u>	-		1	[
	2,372.7-	- 18.5	30	70/0.3		╽╁╌	\perp		↓ <u></u>	- -	. <u></u>				<u>-</u>	2,372.7	-014	18.5
2270	_	-	30	70/0.3							100/0.8	•				WEATHERED RO Gray-Orange, (Granitio		
2370	2,369.5	21.7	60/0.0			_	-				60/0.0				<i>972</i>	2,369.5 Boring Terminated with	,	21.7
																Penetration Test Refusal 2,369.5 ft On Crystalline R Gneiss)		

SHEET 45

PROJECT REFERENCE NO.	SHEET NO.
N/A	46

						SOIL	TEST	RES	SUI	LTS								
BORING	SAMPLE	OFFGE	CTATION	NODWIING	E A COUNT	DEPTH	AASHTO	7.7	ז מ		% BY W	EIGHT		% PAS	SSING (S.	IEVES)	%	%
ID	NO.	OFFSET	STATION	NORTHING	EASTING	INTERVAL	CLASS.	L.L.	P.I.	C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S7-B3	SS-1249	4' RT	88+19 -L-	644464	1015927	2.3 - 3.8'	A-4(0)	33	4	18.0	38.3	27.6	16.1	98.8	91.0	48.3	22.2	_
S7-B3	SS-1251	4' RT	88+19 -L-	644464	1015927	7.3 - 8.8'	A-2-4	NP	NP	29.2	38.2	28.6	4.0	90.2	75.0	31.8	14.5	-
S7-B3	SS-1256	4' RT	88+19 -L-	644464	1015927	29.6 - 30.9'	A-4(0)	NP	NP	14.7	47.6	33.7	4.0	98.9	94.2	45.2	37.4	_
S7-B3	SS-1259	4' RT	88+19 -L-	644464	1015927	44.6 - 46.1'	A-4(0)	NP	NP	16.5	49.2	32.3	2.0	99.0	95.2	39.8	33.5	_
S7-B4	SS-3014	8' RT	89+15 -L-	644559	1015914	18.0 - 19.5'	A-4(0)	NP	NP	20.7	43.2	30.1	6.0	94.6	86.5	40.3	25.3	_
S7-B6	SS-1235	11' RT	90+89 -L-	644730	1015883	1.0 - 2.5'	A-4(0)	NP	NP	18.0	44.4	23.4	14.2	89.4	82.5	40.2	24.1	_
S7-B6	SS-1237	11' RT	90+89 -L-	644730	1015883	6.0 - 7.5'	A-6(4)	35	13	20.5	31.7	13.4	34.4	97.4	87.3	51.0	24.1	_
S7-B7	SS-3047	7' RT	94+08 -L-	645044	1015872	6.7 - 8.2	A-2-4	NP	NP	24.9	39.4	21.6	14.1	64.4	55.0	27.2	29.2	_
S7-B8	SS-3042	7' RT	94+88 -L-	645123	1015886	2.1 - 3.6'	A-2-4	26	5	14.5	41.2	26.1	18.2	68.4	65.3	35.1	32.7	_
S7-B9	SS-3037	6' RT	95 + 76 - L -	645211	1015895	4.0 - 5.5'	A-4(0)	NP	NP	25.4	38.5	24.0	12.1	85.7	73.6	36.3	25.1	_
S7-B9	SS-3039	6' RT	95 + 76 - L -	645211	1015895	9.2 - 10.7'	A-4(3)	30	9	19.5	29.3	22.7	28.5	97.5	86.6	54.5	25.3	_
S7-B10	SS-3032	7' LT	96+28 -L-	645264	1015884	1.8 - 3.3'	A-1-a	NP	NP	42.6	36.3	15.0	6.1	26.9	19.0	7.3	_	_
S7-B12	SS-3023	9' RT	97+55 -L-	645386	1015922	1.9 - 3.5'	A-2-4	NP	NP	27.2	39.4	27.3	6.1	76.3	65.2	29.4	20.2	_
S7-B15	SS-3054	11' RT	101+80 -L-	645803	1015966	5.0 - 6.5'	A-4(0)	27	7	26.0	38.5	21.4	14.1	92.2	79.5	38.0	34.0	_
S7-B15	SS-3057	11' RT	101+80 -L-	645803	1015966	15.2 - 16.7'	A-4(0)	NP	NP	9.9	60.4	25.7	4.0	86.5	84.2	36.2	21.4	_

Alx M Atmilly

AUTHORIZED SIGNATURE NCDOT CERT NO. 130-04-0212 Prepared in the Office of:

F&ME CONSULTANTS, INC.

COLUMBIA, SOUTH CAROLINA

NCDOT LAB CERT. NO. 130–0212

REFERENCE DF18314.20453

STATE OF NORTH CAROLINA

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

CONTENTS

SHEET NO.	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
2A	SUPPLEMENTAL LEGEND (GSI)
3	SITE PLAN
4	PROFILE
5-6	CROSS SECTIONS
7-10	BORE LOG(S), CORE REPORT(S), & CORE PHOTOGRAPH(S)

SOIL TEST RESULTS

STRUCTURE SUBSURFACE INVESTIGATION

COUN	TY _ <i>H</i>	ENDE	RSON				
PROJ	ECT D	ESCRIP	TION EMP	ERGENCY	DESI	IGN FO	OR
SR	1605	(MIDD	LE FORK	ROAD/T	OMS	FALLS	•
ROA	4 D)						
SITE	DESC	RIPTION	SITE 8				

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	N/A	1	11

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.

CENERAL 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 LABDRATORY SAMPLE DATA AND THE IN SITU (IM-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 NIDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS INTO COLUMNIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS, AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.

2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES 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.

P. PERRY, E.I.T. CG2 EXPLORATION INVESTIGATED BY <u>CG2, PLLC</u> DRAWN BY _P. PERRY, E.I.T. CHECKED BY K. DE MONTBRUN, P.E. SUBMITTED BY _CG2, PLLC



Montlun 06/04/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO. SHEET NO.

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	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.					
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	<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,	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					
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.					
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	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					
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	SURFACE.					
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	GNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.					
CLASS. A-1-0 A-1-6 A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-7-6 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE ROCK (NCR) 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 MODERATELY COMPRESSIBLE LL = 31 - 50	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	OF SLOPE.					
7 PASSING	HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK 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- 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 PEAT ** *200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.					
MATERIAL CONTROL CONTR	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	HAMMER IF CRYSTALLINE.	$\overline{ ext{DIP}}$ - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.					
PASSING *40	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,	<u>DIP DIRECTION (DIP AZIMUTH)</u> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE					
LL — — 40 MX (41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN LITTLE OR LICELY	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.					
CROIR INDEX A A A MY A MY 12 MY 15 MY NO MY AMOUNTS OF ORGANIC	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					
USIAN TYPES STONE EPAGS ORGANIC SUILS		(SLI.) I INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.					
OF MAJOR GRAVEL, AND SAND GRAVEL AND SAND SOLIS SOLIS	▼ STATIC WATER LEVEL AFTER 24 HOURS	CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS,	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.					
MATERIALS SANU		MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	<u>FLOAT</u> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.					
GEN, RATING EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	il	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.					
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP	WITH FRESH ROCK.	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 OR RANGE OF STANDARD RANGE OF UNCONFINED	ET	(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 CONSISTENCY 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.					
VERY LOOSE 4.4		(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.					
CRANIII AP LOOSE 4 TO 10	SOIL SYMBOL POPT DMT TEST BORING SLUPE INDICATOR INSTALLATION	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 MEDIUM DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER AUGER BORING COME PENETROMETER THAN ROADWAY EMBANKMENT AUGER BORING TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.					
(NON-COHESIVE) VERY DENSE > 50	T T TEST	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 VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u>	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	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 (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE					
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD > 30 > 4	****** ALLUVIAL SOIL BOUNDARY \(\triangle \tr	ALSO AN EXAMPLE.	RUN AND EXPRESSED AS A PERCENTAGE.					
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS	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	UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION -	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES 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	LECENTRICE, BUT NOT TO BE	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					
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.					
(BLDR.) (COB.) (GR.) (SE. 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	<u>SLICKENSIDE</u> - 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	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					
SOIL MOISTURE - CORRELATION OF TERMS	CL CLAY MOD MODERATELY γ - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC γ_a - DRY UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.					
SOIL MOISTURE SCALE FIELD MOISTURE COLOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC	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					
(ATTERBERG LIMITS) DESCRIPTION GOIDE FOR FIELD POISTORE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS 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.	TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.					
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH	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 FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	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 CEMICOLID. DEGLIDES DRVING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.					
(P) ATTAIN OPTIMUM MOISTURE	FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK:					
"" PL L _ PLASTIC LIMIT	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET						
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: FEET					
SL _ SHRINKAGE LIMIT	DRILL UNITS: ADVANCING TOULS: HAMMER TYPE: 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	G. CONTINUOUS ELIGHT AUGED	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	ROADWAY DESIGN FILES PROVIDED BY RS&H DATED MAY 2025.					
ATTAIN UPTIMUM MUISTURE	CME-55	THINLY LAMINATED < 0.008 FEET	BORING COLLAR ELEVATIONS OBTAINED USING CARLSON BRX7 GPS.					
PLASTICITY	8 * HOLLOW AUGERS	INDURATION CONTROL OF A STATE OF	REF = REFUSAL					
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.						
NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT	TUNGCARBIDE INSERTS HAND TOOLS.	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	CT = CORING TERMINATED					
MODERATELY PLASTIC 16-25 MEDIUM	X CASING X W/ ADVANCER POST HOLE DIGGER	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;						
HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH HAND AUGER	MODERATELY INDURATED BREAKS EASILY WHEN HIT WITH HAMMER.						
COLOR	TRICONE 'TUNGCARB. COUNDING DOD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE:						
		DIFFICULT TO BREAK WITH HAMMER.						
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X CORE BIT VANE SHEAR TEST	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;						

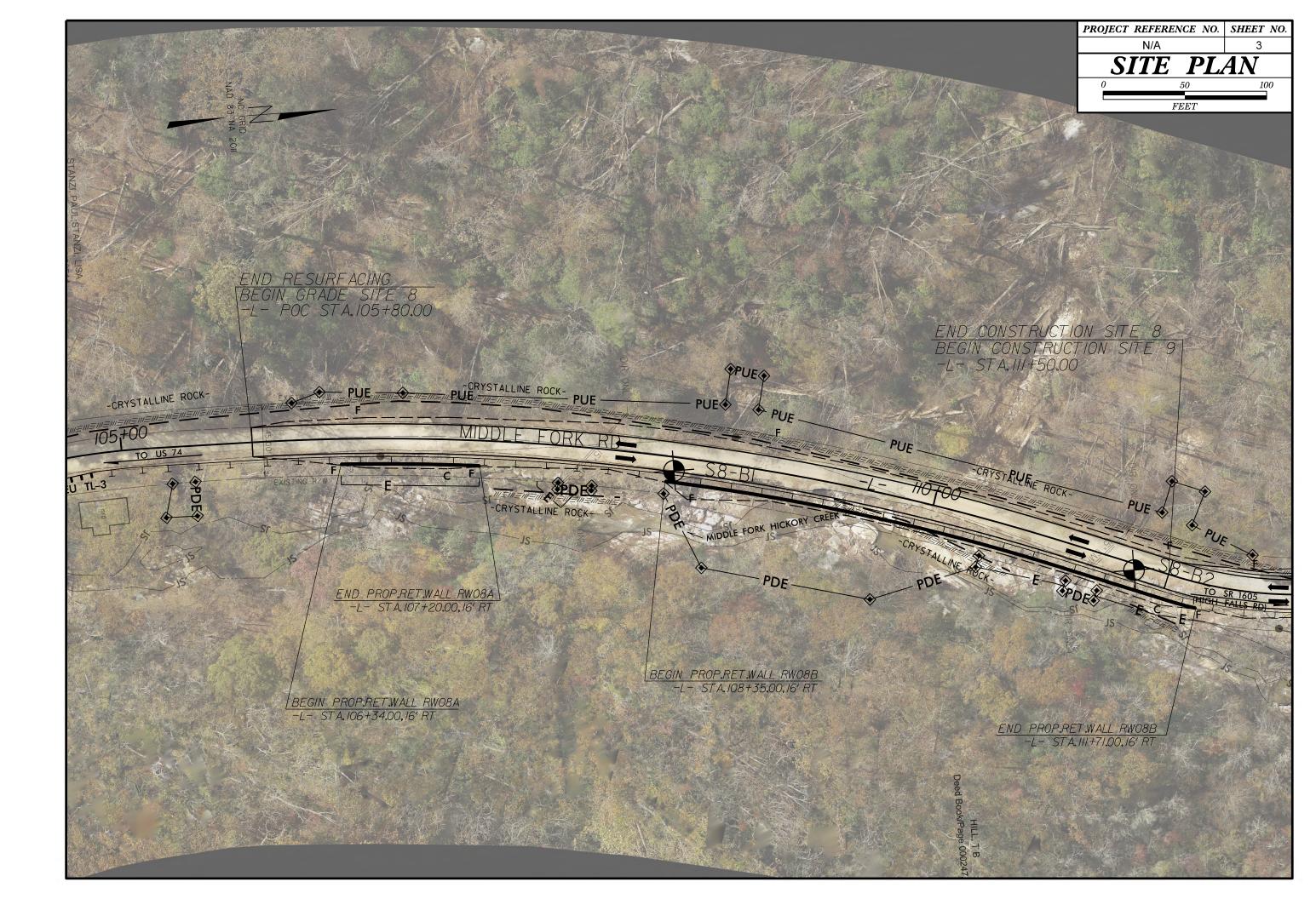
ROJECT REFERENCE NO.	SHEET NO.
N/A	2A

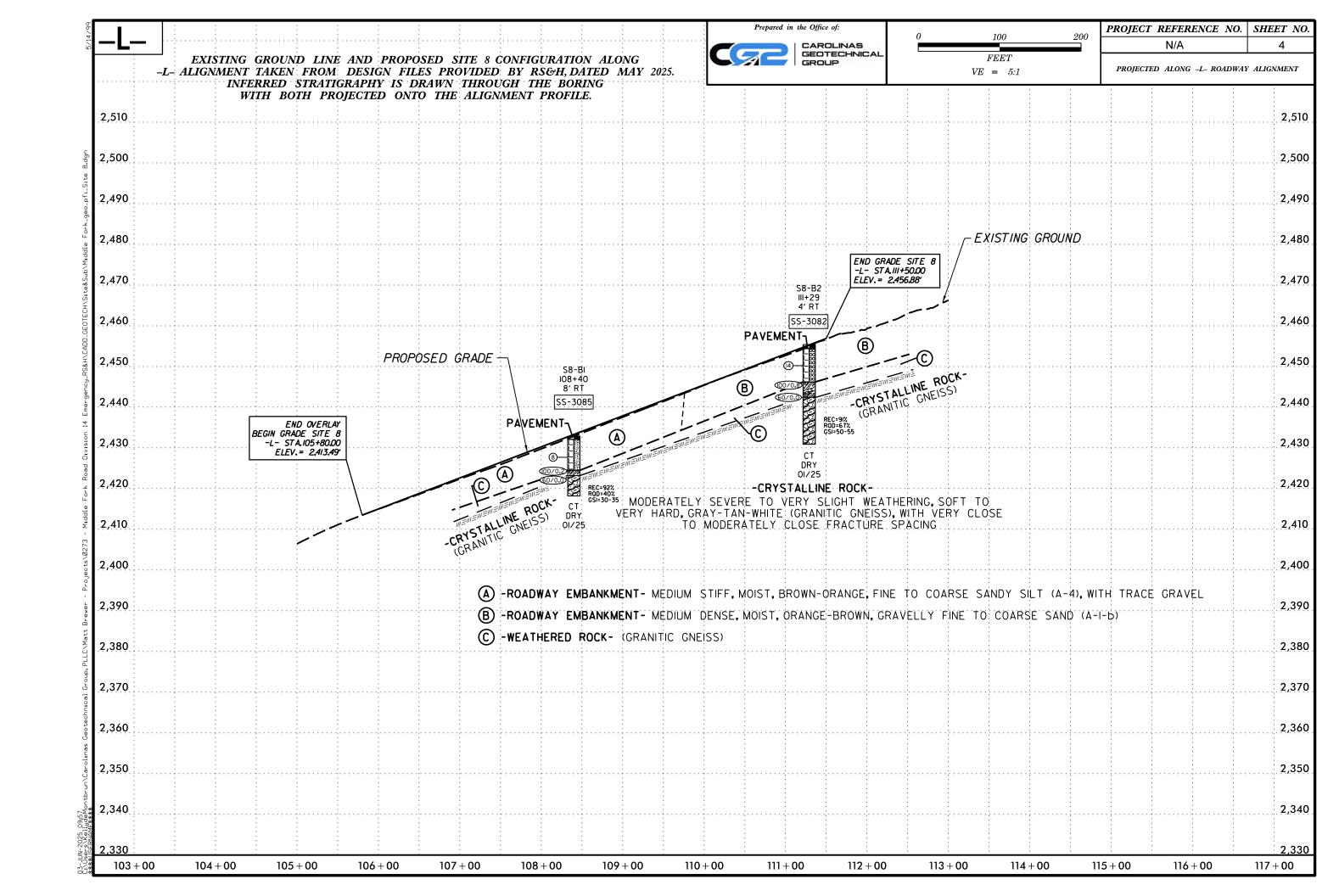
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

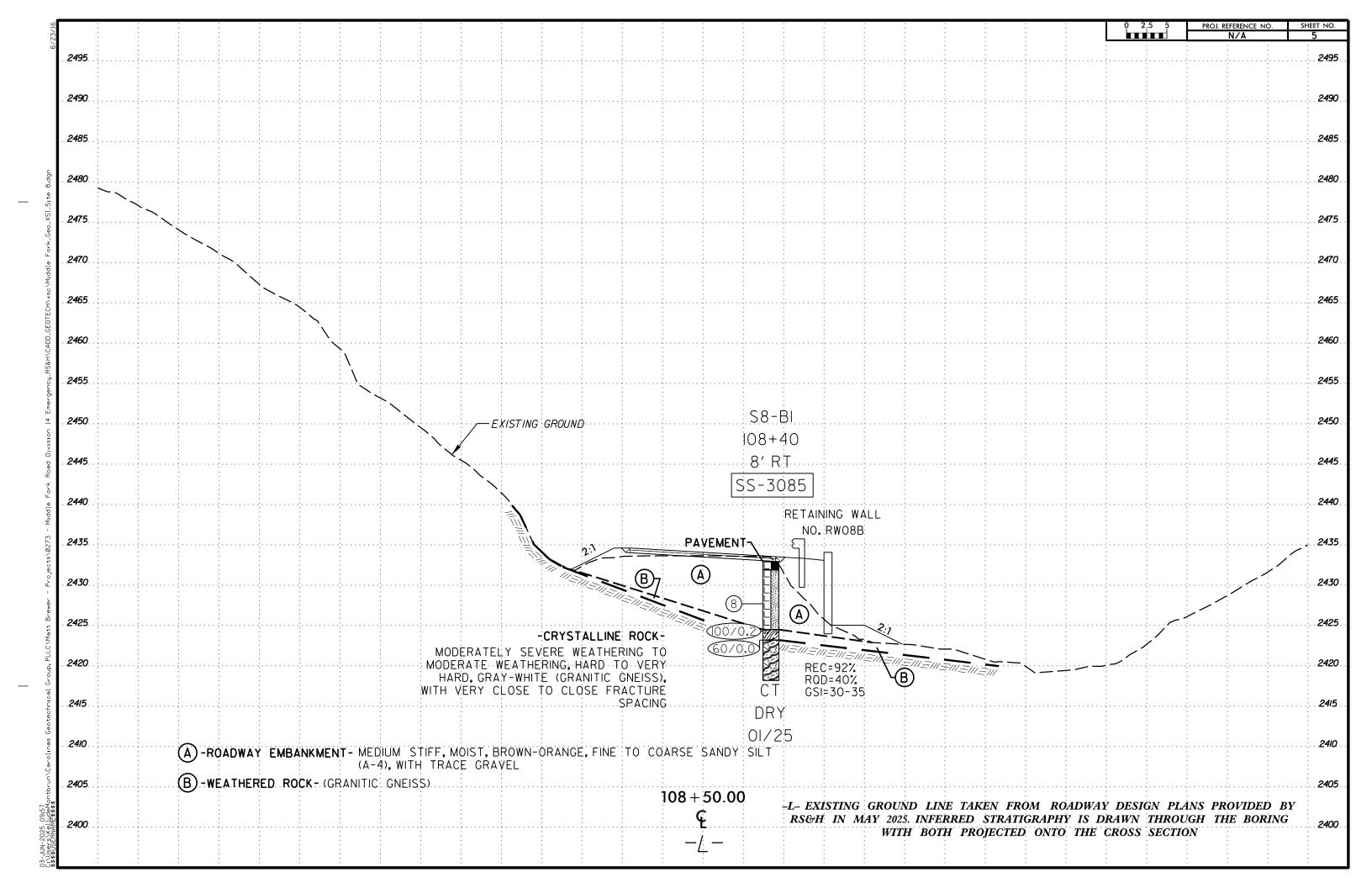
SUBSURFACE INVESTIGATION

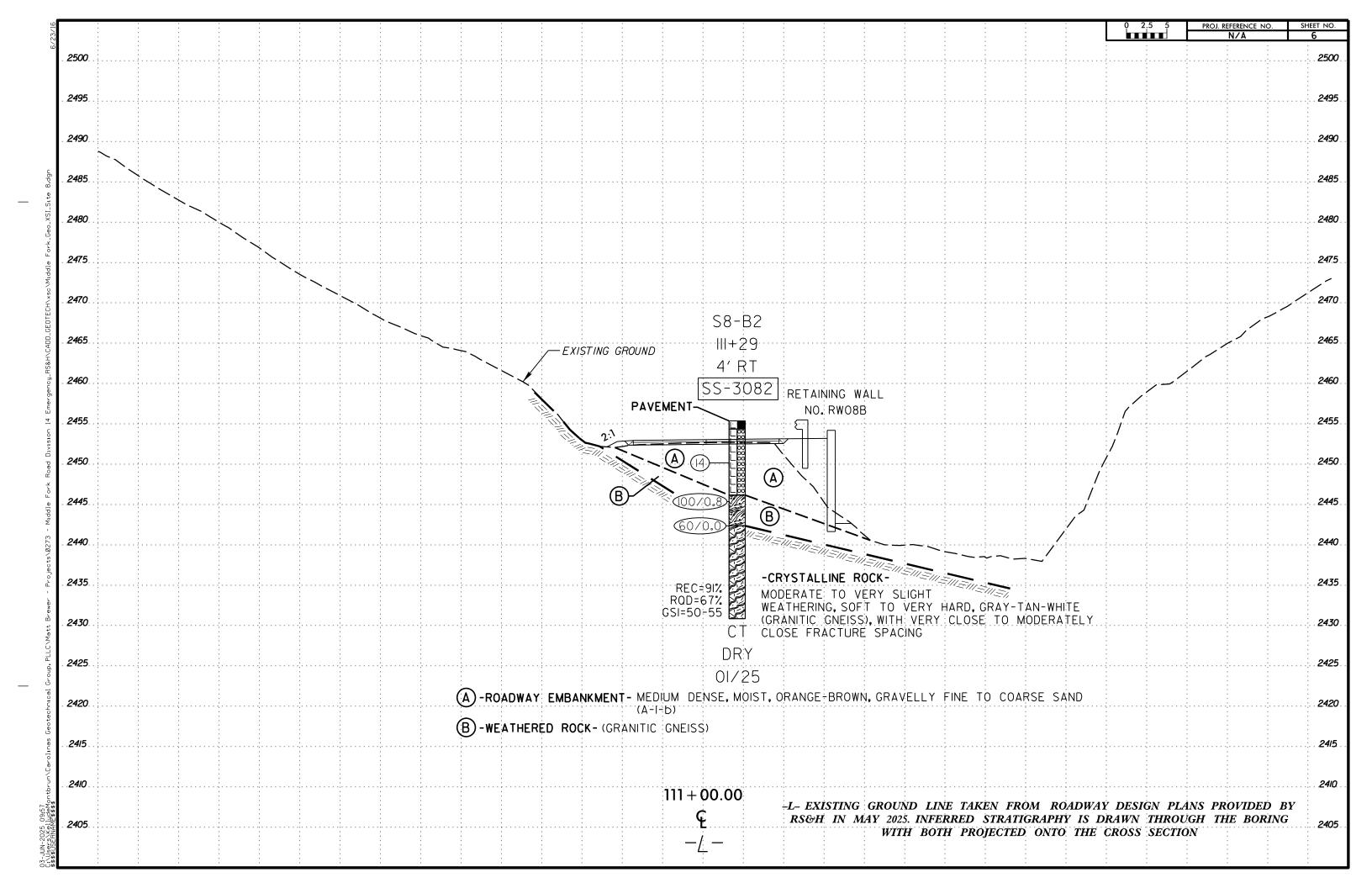
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRED BRIDGE DESIGN SPECIFICATIONS

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)								
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) 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. STRUCTURE	SURFACE CONDITIONS VERY GOOD Very rough, fresh unweathered surfaces	COOD Surfaces Surfaces	FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000) 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. COMPOSITION AND STRUCTURE		
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	00 CES	A STATE OF THE STA	OI HEL GO	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		
BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	OF ROCK PIE	70 60				8. Sand- stone with stone and stone and stone and stone and stone with stone with stone and ston		
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets	OCKING		50			layers of siltstone amounts stone layers shale with sandstone layers 40		
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity	ASING 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.		
DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces	DECREK			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		
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	N/A	N/A			10	sandstone are transformed into small rock pieces. → Means deformation after tectonic disturbance DATE: 8-19-10		









							1	ORE L				T	
	DF183					IP N/A		Y HENDER		011 0		GEOLOGIST P. Perry	
				ergenc		gn for SR 1605	•	1		Site 8		ALICAIMENT :	GROUND WTR (ft)
	ING NO.			F+		TATION 108+4 OTAL DEPTH		OFFSET 8		<u> </u>		ALIGNMENT -L-	0 HR. N/A
	LAR ELE					Mobile B-29 92% (NORTHING	DRILL M		NNA	EASTING 1,015,933	24 HR. Dry ER TYPE Automatic
	LER M			_ ()		TART DATE 0		COMP. DA			INVV	Casing W/SPT & Core HAMME SURFACE WATER DEPTH N/A	
ELEV	DRIVE	DEPTH	T	W CO			OWS PER FOO	L	SAMP.		L	I	
(ft) 2435	ELEV (ft)	(ft)	0.5ft		0.5ft	0 25	50	75 100	NO.		O G	SOIL AND ROCK DESC	CRIPTION DEPTH (ft)
2430	2,428.7-	4.2	2	4	4	.1			SS-3085	15%		2,432.9 GROUND SURFA 2,431.9 ROADWAY EMBANH Asphalt (0.2'), ABC Medium Stiff, Brown-Oral Coarse Sandy SILT (A-4(0 gravel	(0.8') 1.0 nge, Fine to
2425	2,424.5 2,423.2		100/0.2	2		- 		- 100/0.2			an	2,424.5 2,423.2 Gray-Orange, (Granitic CRYSTALLINE RO Gray-White, (Granitic	C Gneiss)
_+20	-									g e		2,418.2 REC = 92% RQD = 40% GSI = 30-35 Boring Terminated at Elevati	14.7
	- - - - - - - -	- - - - - - - - - - - - -											
	- - - - -	- - - - - - -									-		
	- - - - -										- - - - -		
	- - - - -												
	- - - -	 - - - -									-		
	- - - -										- - - -		
	-										-		
	- - -	 - -									-		

GEOTECHNICAL BORING REPORT CORE LOG

									C	<u>Ui</u>	KE L	UG					
WBS	DF183	314.204	15378		TIP	N/A		С	OUNT	Υ⊢	IENDER	SON		GEOLOGIST P. Perry			
SITE	DESCR	PTION	Em	ergency D	esign 1	for SR	1605 (Mi	ddle Fo	ork Ro	ad/To	oms Falls	s Road) - Sit	e 8			ROUN	D WTR (ft)
BOR	ING NO.	S8-B	1		STA	TION	108+40			OF	FSET 8	3 ft RT		ALIGNMENT -L-		0 HR.	N/A
COL	LAR ELE	V. 2,	432.9	ft	тот	AL DE	PTH 14.	7 ft		NO	RTHING	646,451		EASTING 1,015,933	2	4 HR.	Dry
DRIL	L RIG/HAM	MER EF	F./DAT	E CG29	022 Mo	bile B-2	9 92% 04/0	9/2024				DRILL METH	IOD NW	Casing W/SPT & Core	HAMMER	TYPE	Automatic
DRIL	LER M	. Brewe	er		STA	RT DA	TE 01/0	6/25		СО	MP. DA	FE 01/06/2	25	SURFACE WATER DEF	TH N/A		
COR	E SIZE	NQ			TOT	AL RU	N 5.0 ft							•			
ELEV	RUN ELEV	DEPTH	RUN	DRILL RATE	REC.	UN RQD (ft)	SAMP.	STR REC.	RATA	LO			D	ESCRIPTION AND REMARI	/S		
(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ	ELEV. (ft)		ESCRIPTION AND REMARK			DEPTH (ft)
423.2	5 5	- 0.7				(2.2)		(1.5)	(2.2)					Begin Coring @ 9.7 ft			
	2,423.2	- 9.7 -	5.0	N=60/0.0 6:40/1.0 12:04/1.0 10:04/1.0 4:47/1.0 7:27/1.0	(4.6) 92%	(2.0) 40%		(4.6) 92%	(2.0) 40%		2,423.2	Moder	ately Seve	CRYSTALLINE ROCK ere to Moderate Weathering,	Hard to Ver	y Hard,	9.7
2420		- 447		10:04/1.0 4:47/1.0									(Granitic	Gneiss), with Very Close to	Close Fract	ture Spa	
	2,418.2	14.7		7:27/1.0			-				2,418.2	_	erminated	GSI = 30-35 at Elevation 2,418.2 ft In Cry	stalline Roc	k (Gran	14.7
	-										-			Gneiss)			
	-	-									-						
]										-						
	_	_									_						
		-									-						
	_	_									-						
	-	_									-						
	-	-									-						
	_	-									<u>-</u>						
		-									-						
	_	-									-						
	_	-									-						
	-	-									-						
	_	-									- -						
		-									-						
	_	-									-						
	_	-									-						
	-	-									-						
	_	_									<u>-</u>						
		-									-						
	-	-									-						
	_	-									-						
	-	-									-						
	_	-									<u>-</u>						
	-	-									-						
	-	-									-						
	-	_									<u> </u>						
	-	_									-						
	_	_									-						
		_									_						
	-	_									_						
	-	L									Ŀ						
		-									-						
											-						
	-	<u> </u>									_						
		<u> </u>									-						
	-	<u> </u>									<u>-</u>						
	-	-									Ļ						



Emergency Design for SR 1605 (Middle Fork Road/Toms Falls Road) - Site 8 Henderson County, North Carolina Rock Core Photographs

Boring: S8-B1 9.7 to 14.7 Feet





WBS DF18314.2045378 COUNTY HENDERSON TIP N/A **GEOLOGIST** P. Perry GROUND WTR (ft) OFFSET 4 ft RT BORING NO. S8-B2 **STATION** 111+29 ALIGNMENT -L-0 HR. N/A COLLAR ELEV. 2,455.4 ft TOTAL DEPTH 24.5 ft **NORTHING** 646,727 **EASTING** 1,016,015 24 HR. Dry DRILL RIG/HAMMER EFF./DATE CG29022 Mobile B-29 92% 04/09/2024 DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic DRILLER M. Brewer **START DATE** 01/06/25 **COMP. DATE** 01/06/25 SURFACE WATER DEPTH N/A SAMP. **BLOWS PER FOOT** SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft MOI G 75 100 NO. ELEV. (ft) 2460 2,455.4 GROUND SURFACE 2455 ROADWAY EMBANKMENT Asphalt (0.2'), ABC (0.8') Medium Dense, Orange-Brown, Gravelly Fine to Coarse SAND (A-1-b) 2,451.2 4.2 2450 SS-3082 15% 53 47/0.3 WEATHERED ROCK 2445 —100/0.8**°** Gray-Orange, (Granitic Gneiss) 2,442.4 13.0 - 60/0.0¶ CRYSTALLINE ROCK 2440 REC = 91% RQD = 67% GSI = 50-55 2435 Boring Terminated at Elevation 2,430.9 ft In Crystalline Rock (Granitic Gneiss)

GEOTECHNICAL BORING REPORT CORE LOG

	С	ORE LOG		
WBS DF18314.2045378	TIP N/A COUNT	Y HENDERSON	GEOLOGIST P. Perry	
SITE DESCRIPTION Emergency [Design for SR 1605 (Middle Fork F	Road/Toms Falls Road) - Site 8		GROUND WTR (ft)
BORING NO. S8-B2	STATION 111+29	OFFSET 4 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 2,455.4 ft	TOTAL DEPTH 24.5 ft	NORTHING 646,727	· · · · · · · · · · · · · · · · · · ·	24 HR . Dry
DRILL RIG/HAMMER EFF./DATE CG29		DRILL METHOD NW	-	ER TYPE Automatic
DRILLER M. Brewer	START DATE 01/06/25	COMP. DATE 01/06/25	SURFACE WATER DEPTH N/A	A
CORE SIZE NQ	TOTAL RUN 11.5 ft RUN STRATA	L		
ELEV RUN DEPTH RUN CRITE (ft) (ft) (ft) (ft) CRILL RATE (Min/ft)	RUN STRATA REC. ROD REC. ROD NO. (ft) (ft) % %		ESCRIPTION AND REMARKS	DEPTH (ft)
2442.39	D (1.3) (1.1) (10.5) (7.7)	2,442.4	Begin Coring @ 13.0 ft CRYSTALLINE ROCK	13.0
2,435.9 19.5 5.0 2.17/0.5 3:16/1.0 3:04/1.0 4:39/1.0 2,68/1.0 6:06/1.0	96% 72%	Moderately to Very S	light Weathering, Soft to Very Hard, Gi th Very Close to Moderately Close Frac GSI = 50-55	ray-Tan-White
2435 5.0 5:10/1.0 10:04/1.0 6:34/1.0 8:32/1.0 22:42/1.0	88% 60%	2,430.9 Boring Terminated	at Elevation 2,430.9 ft In Crystalline Ro	24.5



Emergency Design for SR 1605 (Middle Fork Road/Toms Falls Road) - Site 8 Henderson County, North Carolina Rock Core Photographs

Boring: S8-B2 13.0 to 24.5 Feet





PROJECT REFERENCE NO.	SHEET NO.
N/A	11

							SOIL	TEST I	RES	\overline{SUI}	LTS								
BOR.	RING	SAMPLE	OFFSET	STATION	NORTHING	EASTING	DEPTH	AASHTO	T T	D I		% BY W	EIGHT		% PAS	SING (SI	(EVES)	%	%
II	D	NO.	OFFSEI	SIAIION	NONTHING	EASTING	INTERVAL	CLASS.	L.L.	Γ.1.	C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S8-1	-B1	SS-3085	8' RT	108+40 -L-	646451	1015933	4.2 - 5.7	A-4(0)	NP	NP	28.0	36.5	19.4	16.1	91.1	77.2	37.5	15.4	ND
S8-1	·B2	SS-3082	4' RT	111+29 -L-	646727	1016015	4.2 - 5.7'	A-1-b	18	3	38.1	37.1	16.8	8.0	45.5	34.5	13.7	14.9	ND

Alx M Atmilly

AUTHORIZED SIGNATURE NCDOT CERT NO. 130-04-0212 Prepared in the Office of:

F&ME CONSULTANTS, INC. COLUMBIA, SOUTH CAROLINA NCDOT LAB CERT. NO. 130–0212

REFERENCE: N/A	
PROJECT: DF18314.2045377	

STATE OF NORTH CAROLINA

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

CONTENTS

SHEET NO.	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
2A	SUPPLEMENTAL LEGEND (GSI)
3	SITE PLAN
4	PROFILE
5-8	CROSS SECTIONS
9-12	BORE LOG(S), CORE REPORT(S), & CORE PHOTOGRAPH(S)

SOIL TEST RESULTS

STRUCTURE SUBSURFACE INVESTIGATION

PROJE	ECT DESCRIPTION EMERGENCY D	ESIGN FOR
	1605 (MIDDLE FORK ROAD/TON	
ROA	4D)	
SITF (DESCRIPTION SITE 9	

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	N/A	1	

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 707-6805. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

CENERAL 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 LABDRATORY SAMPLE DATA AND THE IN SITU (IM-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 NIDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS INTO COLUMNIC 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 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.

P. PERRY, E.I.T. CG2 EXPLORATION INVESTIGATED BY <u>CG2, PLLC</u> DRAWN BY _P. PERRY, E.I.T. CHECKED BY K. DE MONTBRUN, P.E. SUBMITTED BY <u>CG2</u>, PLLC

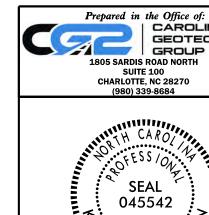
> CAROLINAS GEOTECHNICAL

GROUP

SUITE 100

(980) 339-8684

H CAROL



de Montleun 06/04/2025

ESIGNATURE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO. SHEET NO.

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	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.
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	<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,	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
VERY STIFF,GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6 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.	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
CENERAL CRANIII AR MATERIALS SILT-CLAY MATERIALS	MINERALOGICAL COMPOSITION	FINE TO COARSE CRAIN ICNEOUS AND METAMORPHIC POCK THAT	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. A-1-6 A-1-6 A-2-4 A-2-5 A-2-6 A-2-7 A-7-6 A-3 A-6, A-7	SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LL = 31 - 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
7. PASSING GRANULAR SILT- MUCK,	HIGHLY COMPRESSIBLE LL > 50 PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
*40 30 MX 50 MX 51 MN SOILS CLAY PEAT		WEATHERING WEATHERING	<u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
"200 IS MX 25 MX 05 MX	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS TRACE OF ORGANIC MATTER 2 - 3%, 3 - 5%, TRACE 1 - 18%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
MATERIAL PASSING *40 SOILS WITH	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	HORIZONTAL.
LL — — 40 MX 41 MN 140 MX 41 MN 40 MX 141 MN 40 MX 41 MN 40 MX 141 MN LITTLE OR HIGHLY	MODERATELY ORGANIC	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	<u>DIP DIRECTION (DIP AZIMUTH)</u> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
CROLIE INDEX & & & A MY 8 MY 12 MY 16 MY MO MY AMOUNTS OF ORGANIC	GROUND WATER	OF A CRYSTALLINE NATURE. 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
USIAN TYPES CTOME EPAGS ORGANIC	▼ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) I INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAYEL, AND SAND GRAYEL AND SAND GRAYEL AND SAND SOILS SOILS	STATIC WATER LEVEL AFTER 24 HOURS	CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
CEN DATING	─────────────────────────────────────	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	PARENT MATERIAL.
AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	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 RANGE OF STANDARD RANGE OF UNCONFINED	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 CONSIDERED PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	<u>IF TESTED, WOULD YIELD SPT REFUSAL</u>	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 SET UP TO	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4 GRANULAR LOOSE 4 TO 10 GRANULAR LOOSE 4 TO 10	SOIL SYMBOL OPT ONT TEST BORING SLOPE INDICATOR INSTALLATION	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 10 30 N/A	ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
(NON-COHESIVE) VERY DENSE > 50	THAN ROADWAY EMBANKMENT THOUGH BURING TEST	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 GENERALLY SOFT 2 TO 4 0.25 TO 0.5	— INFERRED SOIL BOUNDARY — CORE BORING SOUNDING ROD	(V SEV.) REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</i>	OF AN INTERVENING IMPERVIOUS STRATUM, RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	A ALLUMIA SOIL BOUNDARY A PIEZOMETER COST NUMBER	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE
HARD > 30 > 4	INSTALLATION	ROCK HARDNESS	RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES	ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	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
COARCE FINE	SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRAVEL SAND SAND SILT CLAY CLAY	ABBREVIATIONS	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 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
SOIL MOISTURE - CORRELATION OF TERMS	CL CLAY MOD MODERATELY γ - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC γ_a - DRY UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC	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
(HITERBERG EIMITS) DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS 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.	TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - 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	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.
LL _ LIOUID 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.
PLASTIC SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL W - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	BENCH MARK:
(PI) PL PLASTIC LIMIT	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS	DENCH MHRK:
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: FEET
SL _ SHRINKAGE LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	NOTES:
- DRY - (D) REQUIRES ADDITIONAL WATER TO	CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	ROADWAY DESIGN FILES PROVIDED BY RS&H DATED MAY 2025.
ATTAIN UPTIMUM MUISTURE	CORE SIZE:	THINLY LAMINATED < 0.008 FEET INDURATION	BORING COLLAR ELEVATIONS OBTAINED USING CARLSON BRX7 GPS.
PLASTICITY		INDUMATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	REF = REFUSAL
PLASTICITY INDEX (PI) DRY STRENGTH NON PLASTIC 0-5 VERY LOW	CME-550X	DURRING WITH FINGED EDEES NUMEROUS CRAINS.	CT = CORE TERMINATED
SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST X CASING X W/ ADVANCER HAND TOOLS:	FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH	TRICONE LOCAL POST HOLE DIODER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TOTAL	CRAINC ARE DISCIPLE TO SERABATE WITH STEEL PROBE.	
	X MOBILE B-29	INDURATED DIFFICULT TO BREAK WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	CORE BIT VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	
		SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
N/A	2A

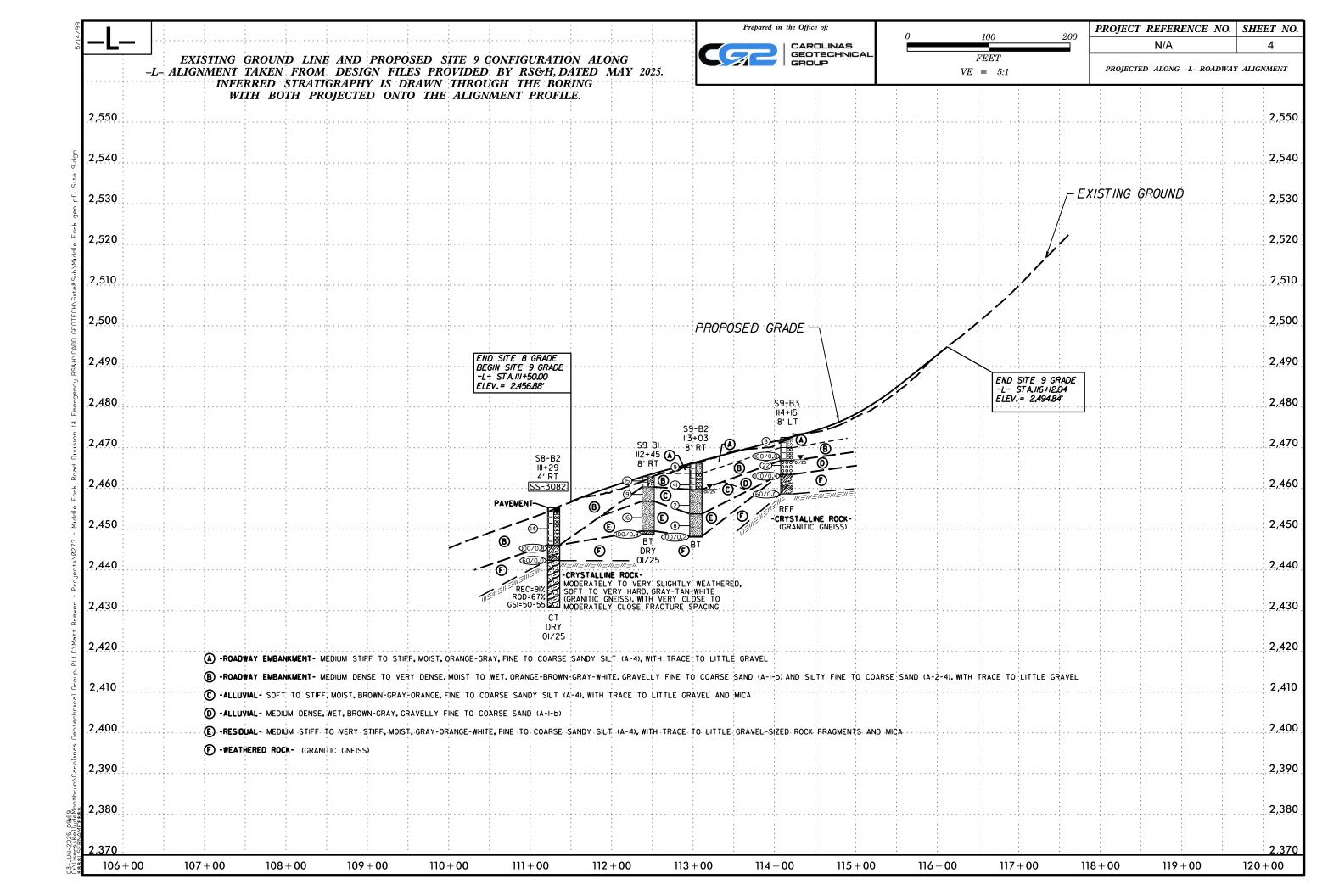
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

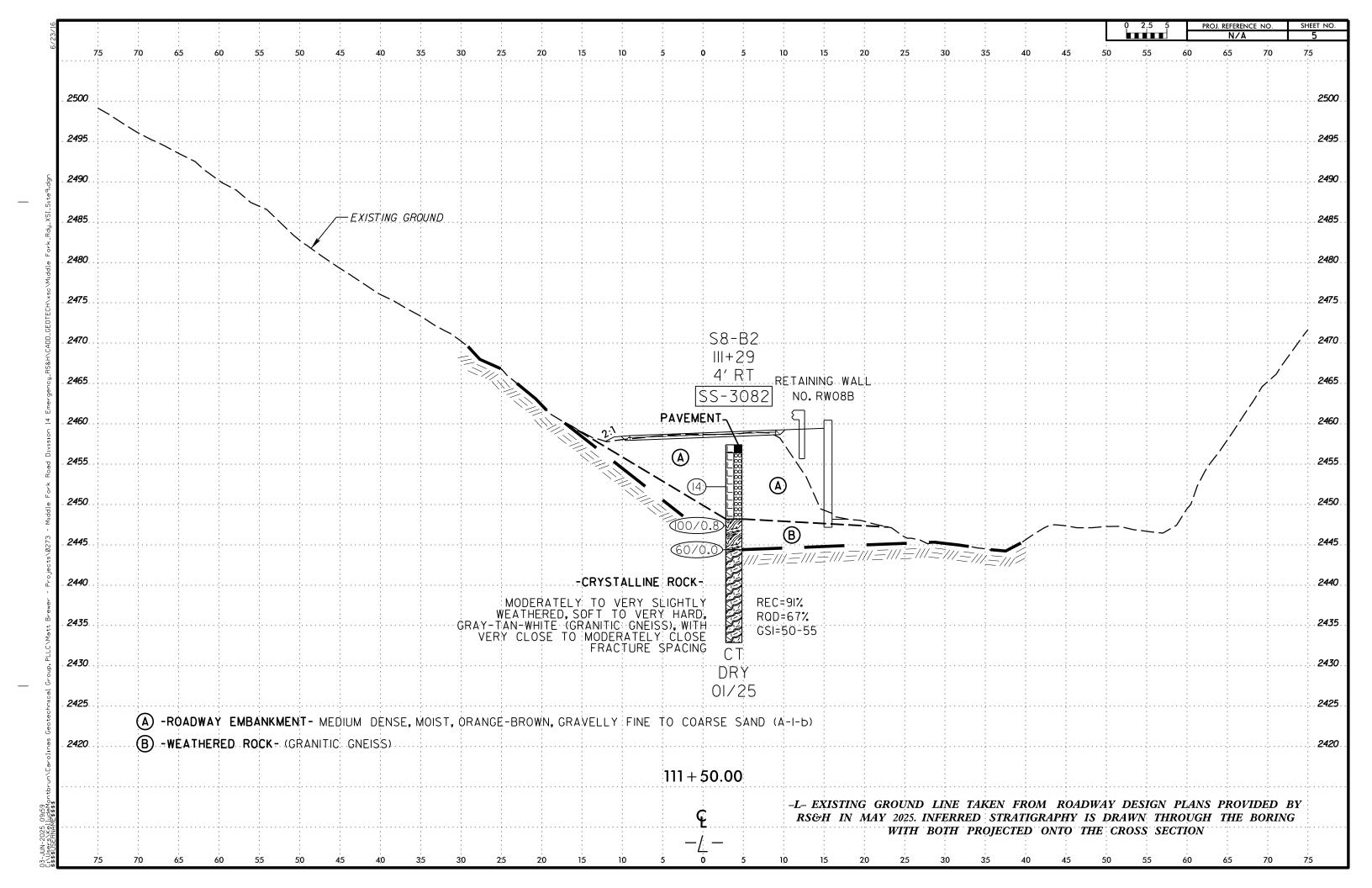
SUBSURFACE INVESTIGATION

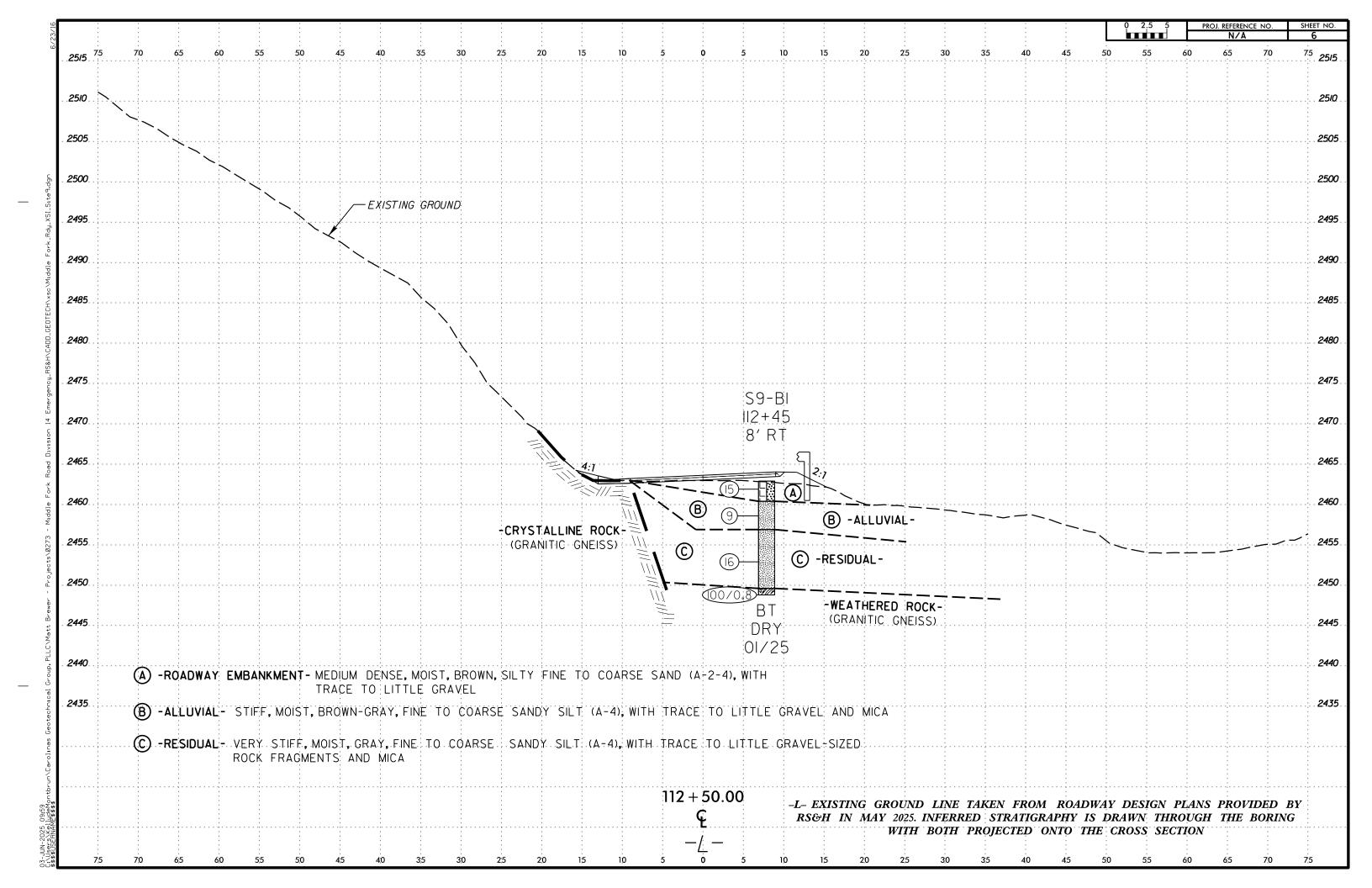
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES

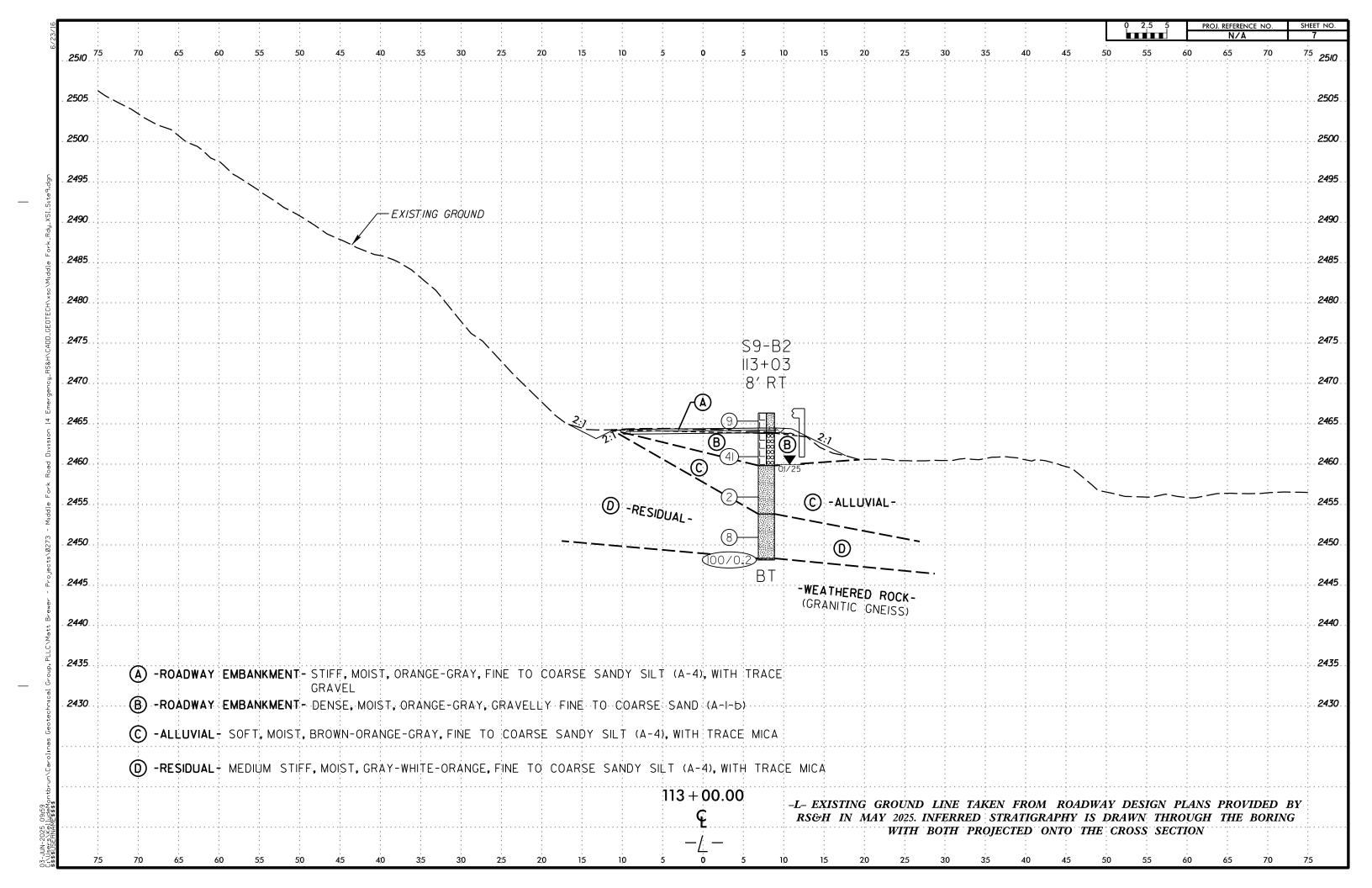
	F	ROM AASHTO LRFD E	GICAL STRENGTH INDEX (GSI) TABLES RIDGE DESIGN SPECIFICATIONS		
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. 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. STRUCTURE	VERY GOOD Very rough, fresh unweathered surfaces GOOD Rough, slightly weathered, iron stained surfaces	moderately weathered and surfaces surpact coatings or fillings	AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically De GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000) 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. COMPOSITION AND STRUCTURE	ugh, fresh	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
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	90 80	N/A N	Thick hedded wery blacky sandstone	70 A	
BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets	70 ACKING OF THE PORT OF THE P	50	8. Sand- stone with stone and siltstone or silty shale with sand- stone layers siltstone or clayey stone layers layers	, / / /B ,	C D E
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity		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	DECKE ASING	20	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 sandstone are transformed into small rock pieces.		# 10
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	N/A N/A	10	Means deformation after tectonic disturbance		DATE: 8-

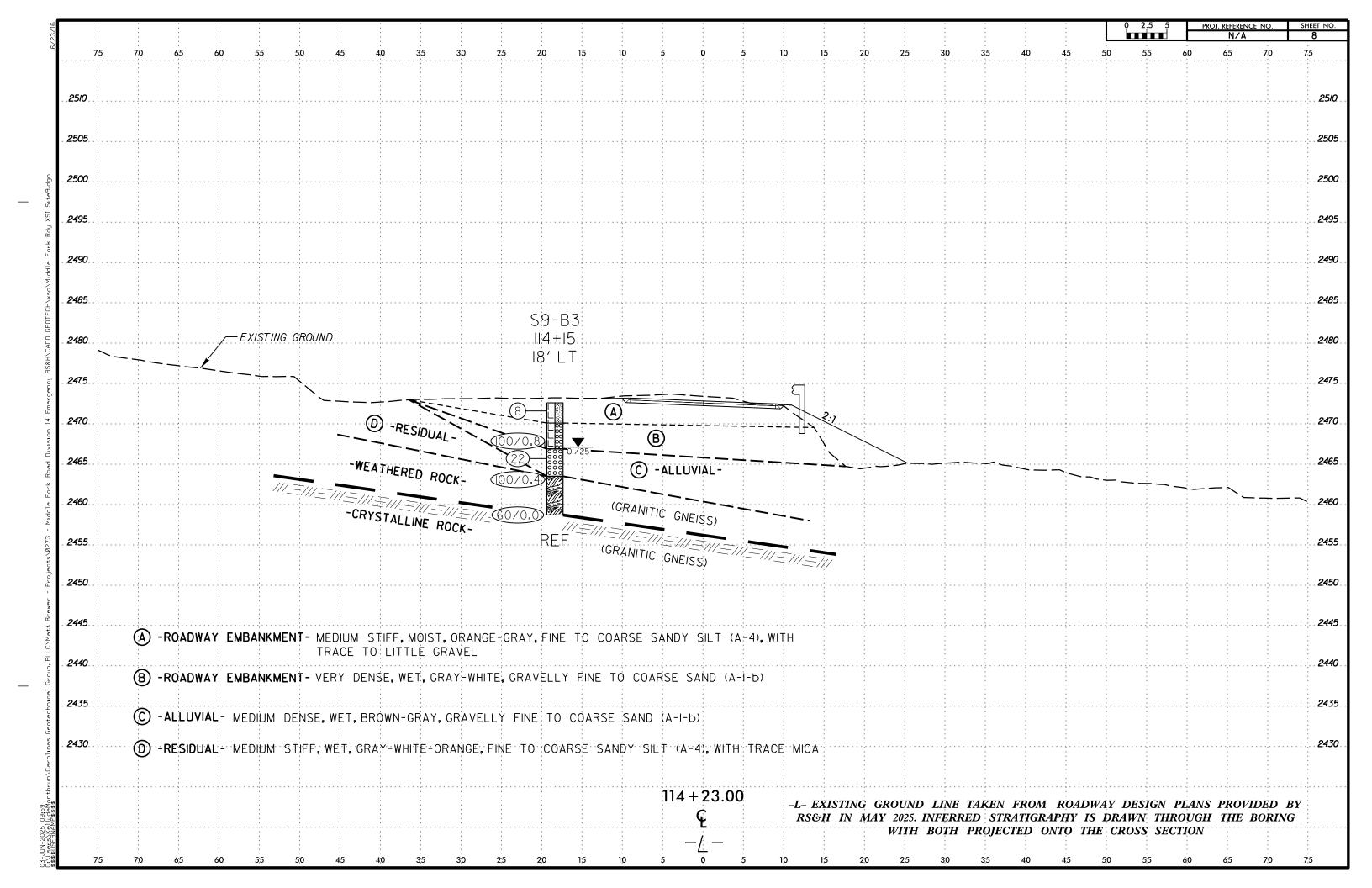












WBS DF18314.2045377 COUNTY HENDERSON TIP N/A **GEOLOGIST** P. Perry GROUND WTR (ft) **STATION** 111+29 OFFSET 4 ft RT BORING NO. S8-B2 ALIGNMENT -L-0 HR. N/A COLLAR ELEV. 2,455.4 ft TOTAL DEPTH 24.5 ft **NORTHING** 646,727 **EASTING** 1,016,015 24 HR. Dry DRILL RIG/HAMMER EFF./DATE CG29022 Mobile B-29 92% 04/09/2024 DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic DRILLER M. Brewer **START DATE** 01/06/25 **COMP. DATE** 01/06/25 SURFACE WATER DEPTH N/A SAMP. **BLOWS PER FOOT** SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft MOI G 75 100 NO. ELEV. (ft) 2460 2,455.4 GROUND SURFACE 2455 ROADWAY EMBANKMENT Asphalt (0.2'), ABC (0.8') Medium Dense, Orange-Brown, Gravelly Fine to Coarse SAND (A-1-b) 2,451.2 4.2 2450 SS-3082 15% 53 47/0.3 WEATHERED ROCK 2445 —100/0.8⁹ Gray-Orange, (Granitic Gneiss) 2,442.4 13.0 - 60/0.0¶ CRYSTALLINE ROCK 2440 REC = 91% RQD = 67% GSI = 50-55 2435 Boring Terminated at Elevation 2,430.9 ft In Crystalline Rock (Granitic Gneiss)

GEOTECHNICAL BORING REPORT CORE LOG

	<u> </u>	ORE LOG		
WBS DF18314.2045377	TIP N/A COUNTY	Y HENDERSON	GEOLOGIST P. Perry	
SITE DESCRIPTION Emergency [Design for SR 1605 (Middle Fork R	Road/Toms Falls Road) - Site 8		GROUND WTR (ft)
BORING NO. S8-B2	STATION 111+29	OFFSET 4 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 2,455.4 ft	TOTAL DEPTH 24.5 ft	NORTHING 646,727		24 HR. Dry
DRILL RIG/HAMMER EFF./DATE CG29	1	DRILL METHOD NW	-	ER TYPE Automatic
DRILLER M. Brewer	START DATE 01/06/25	COMP. DATE 01/06/25	SURFACE WATER DEPTH N/	A
CORE SIZE NQ	TOTAL RUN 11.5 ft RUN STRATA	L		
ELEV RUN DEPTH RUN RATE (ft) (ft) (ft) (ft)	RUN STRATA REC. RQD R(t) (ft) (ft) % % % %		ESCRIPTION AND REMARKS	DEPTH (ft)
2442.39 2,442.4 13.0 1.5 N=60/0.0 2,440.9 14.5 2.27/1.0	0 (1.3) (1.1) (10.5) (7.7)	2,442.4	Begin Coring @ 13.0 ft CRYSTALLINE ROCK	13.0
2440 5.0 2.77/0.5 3:16/1.0 3:04/1.0 4:39/1.0 2:58/1.0 2.435.9 19.5 6:06/1.0	96% 72%		lightly Weathered, Soft to Very Hard, G th Very Close to Moderately Close Frac GSI = 50-55	
2,430.9 24.5 5.0 5:10/1.0 5:10/1.0 10:04/1.0 6:34/1.0 8:32/1.0 22:42/1.0	88% 60%	2,430.9		24.5
		Boring Terminated	at Elevation 2,430.9 ft In Crystalline Ro Gneiss)	ock (Granitic



Emergency Design for SR 1605 (Middle Fork Road/Toms Falls Road) - Site 8 Henderson County, North Carolina Rock Core Photographs

Boring: S8-B2 13.0 to 24.5 Feet





STE DESCRIPTION Emergency Design for SR 1605 (Middle Fork Read/Toms Falls Road) - Site 9 GROUND WTR (ft)	E	BORE LOG			
BORING NO. S8-B1		•	WBS DF18314.2045377	TIP N/A COUNTY HENDERSON	GEOLOGIST P. Perry
COLLAR ELEV. 2,462.9 ft TOTAL DEPTH 14.1 ft NORTHING 646,840	SITE DESCRIPTION Emergency Design for SR 1605 (Middle Fork Ro	Road/Toms Falls Road) - Site 9	GROUND WTR (ft) SITE DESCRIPTION Emerge	ency Design for SR 1605 (Middle Fork Road/Toms Falls Road) - Site	e 9 GROUND WTR (ft)
DRILL RIGHAMMER EFF./DATE CG29022 Mobile 8-29 92% 040992024 DRILL METHOD NV Casing wf Advancer HAMMER TYPE Automatic	BORING NO. S9-B1 STATION 112+45	OFFSET 8 ft RT ALIGNMENT -L-	0 HR. N/A BORING NO. S9-B2	STATION 113+03 OFFSET 8 ft RT	ALIGNMENT -L- 0 HR. N/A
DRILLER M. Brower START DATE 01/03/25 COMP. DATE 01/03/25	COLLAR ELEV. 2,462.9 ft TOTAL DEPTH 14.1 ft	NORTHING 646,840 EASTING 1,016,046	24 HR. Dry COLLAR ELEV. 2,466.3 ft	TOTAL DEPTH 18.2 ft NORTHING 646,899	EASTING 1,016,044 24 HR. 6.4
ELEV CRIVE CRIVE	DRILL RIG/HAMMER EFF./DATE CG29022 Mobile B-29 92% 04/09/2024	DRILL METHOD NW Casing w/ Advancer HAM	AMMER TYPE Automatic DRILL RIG/HAMMER EFF./DATE	CG29022 Mobile B-29 92% 04/09/2024 DRILL METH	HOD NW Casing w/ Advancer HAMMER TYPE Automatic
2465 2.462 9 GROUND SURFACE 0.0		COMP. DATE 01/03/25 SURFACE WATER DEPTH			25 SURFACE WATER DEPTH N/A
DAK BOAD DINKSHOW 14 EMERGENG	STATION 112+45	OFFSET 8 ft RT NORTHING 646,840 DRILL METHOD NW Casing w/ Advancer HAM COMP. DATE 01/03/25 SURFACE WATER DEPTH OO SOIL AND ROCK DE ELEV. (ft) M ROADWAY EMBY 2,460.4 Stiff, Brown-Gray, Fine to C Modium Dense, Brown, S SAND (A-2-4), with trace to mica RESIDUY Very Stiff, Gray, Fine to C (A-4), with trace to little of fragments and 100/0.8 M ALIGNMENT -L- HAM ROADWAY EMBY 2,460.4 Stiff, Brown-Gray, Fine to C (A-4), with trace to little of fragments and 2,449.6 Gray-White, (Gran Boring Terminated at Eleventage of the control	DESCRIPTION DEPTH (ft) URFACE BANKMENT Silty Fine to Coarse ace to little gravel to little gravel and to little gravel and mica DESCRIPTION DEPTH (ft) DEPTH	STATION 113+03	ALIGNMENT -L- EASTING 1,016,044 HOD NW Casing w/ Advancer SURFACE WATER DEPTH N/A SOIL AND ROCK DESCRIPTION O SOIL AND ROCK DESCRIPTION O SOIL AND ROCK DESCRIPTION TO SOIL AND ROCK DESCRIPTION O SOIL AND ROCK DESCRIPTION AND ROCK DESCRIPTION SURFACE COATS SAND (A-1-b) Dense, Orange-Gray, Fine to Coarse Sandy SILT (A-4), with trace gravel Dense, Orange-Gray, Gravelly Fine to Coarse SAND (A-1-b) ALLUVIAL Soft, Brown-Orange-Gray, Fine to Coarse Sandy SILT (A-4), with trace mica ALLUVIAL Soft, Brown-Orange-Gray, Fine to Coarse Sandy SILT (A-4), with trace mica 2,453.8 RESIDUAL Medium Stiff, Gray-White-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica 2,448.3 RESIDUAL Medium Stiff, Gray-White-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica 18.0 Caray-White, (Granitic Gneiss) Boring Terminated at Elevation 2,448.1 ft In

	1		UKE LUG			
WBS DF18314.2045377	TIP N/A	COUNTY	/ HENDERSON		GEOLOGIST P. Perry	
SITE DESCRIPTION Eme	gency Design for SR 1	605 (Middle Fork Roa	d/Toms Falls Road) - 9	Site 9		GROUND WTR (ft)
BORING NO. S9-B3	STATION ^	114+15	OFFSET 18 ft LT		ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 2,472.6 f	TOTAL DEP	TH 13.9 ft	NORTHING 647,01	9	EASTING 1,016,040	24 HR. 5.5
DRILL RIG/HAMMER EFF./DATI	CG29022 Mobile B-29 9	2% 04/09/2024	DRILL ME	ETHOD NW	Casing w/ Advancer HAMME	R TYPE Automatic
DRILLER M. Brewer	START DAT	E 01/03/25	COMP. DATE 01/0	3/25	SURFACE WATER DEPTH N/A	\
ELEV C(ft) DEPTH ELEV (ft) DEPTH (ft) 0.5ft	W COUNT 0.5ft 0.5ft 0	BLOWS PER FOOT 25 50	75 100 NO.	MOI G	SOIL AND ROCK DESC	RIPTION DEPTH (ft)
2475	3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	22	100/0.8	W	2,472.6 ROADWAY EMBANK Medium Stiff, Orange-Gray, I Sandy SILT (A-4), with trace Very Dense, Gray-White, Gray-White, Gray-White, Gray-White, Gray-White, (Granitic Gray-White, (Granitic 2,458.7) Boring Terminated with Penetration Test Refusal 2,458.7 ft On Crystalline Right Gneiss) Higher N-values in the Embankment likely the boulders/rock encou	MENT ine to Coarse to little gravel avelly Fine to 1-b) 5.7 Gravelly Fine -1-b) 9.1 CK Gneiss) Standard at Elevation ock (Granitic Roadway result of

SHEET 12

PROJECT REFERENCE NO.	SHEET NO.				
N/A	13				

						SOIL	TEST I	RES	\overline{UI}	LTS								
BORING	SAMPLE	OFFGET	COTATION.	NODTHING	EACTING	DEPTH	AASHTO	7.7	DI		% BY W	EIGHT		% PAS	SING (SI	(EVES)	%	%
ID	NO.	OFFSET	STATION	NORTHING	EASTING	$\it INTERVAL$	CLASS.		P.I.	C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S8-B2	SS-3082	4' RT	111+29 -L-	646727	1016015	4.2 - 5.7'	A-1-b	18	3	38.1	37.1	16.8	8.0	45.5	34.5	13.7	14.9	ND

Alex M Atmilly

AUTHORIZED SIGNATURE NCDOT CERT NO. 130-04-0212 Prepared in the Office of:

F&ME CONSULTANTS, INC. COLUMBIA, SOUTH CAROLINA NCDOT LAB CERT. NO. 130–0212