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REFERENCE: U-2579AA

PROJECT: 34839

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY FORSYTH
 PROJECT DESCRIPTION WINSTON-SALEM NORTHERN
BELTWAY EASTERN SECTION (FUTURE I-74) FROM
US 311 I-40
 SITE DESCRIPTION BRIDGE NO. 733 ON US 311 FLYOVER
(-Y2FLYAB-) OVER WINSTON-SALEM NORTHERN
BELTWAY (-L-)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AA	1	30

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

S. PAPKE
 C. DRISCOLL
 TRIGON EXPLORATION

INVESTIGATED BY S. PAPKE
 DRAWN BY S. PAPKE
 CHECKED BY T. WELLS
 SUBMITTED BY KLEINFELDER, INC
 DATE MAY 2019

Prepared in the Office of:
































Signed by: Thomas R. Wells
 7DA5D2D0518F4B0
 5/16/2019

SIGNATURE DATE

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**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																										
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (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 RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																										
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED ROCK (WR)  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.																											
MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	COMPRESSION SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	CRYSTALLINE ROCK (CR)  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.																											
PERCENTAGE OF MATERIAL	GROUND WATER  WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING  STATIC WATER LEVEL AFTER 24 HOURS  PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA  SPRING OR SEEP	NON-CRYSTALLINE ROCK (NCR)  FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.																											
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS  ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION  SOIL SYMBOL  ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT  INFERRED SOIL BOUNDARY  INFERRED ROCK LINE  ALLUVIAL SOIL BOUNDARY  DIP & DIP DIRECTION OF ROCK STRUCTURES  SPT TEST BORING  AUGER BORING  CORE BORING  MONITORING WELL  PIEZOMETER INSTALLATION  SLOPE INDICATOR INSTALLATION  CONE PENETROMETER TEST  SOUNDING ROD  TEST BORING WITH CORE  SPT N-VALUE	COASTAL PLAIN SEDIMENTARY ROCK (CP)  COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.																											
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS  UNDERCUT  SHALLOW UNDERCUT  UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE  UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK	WEATHERING FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) - ROCK GENERALLY FRESH, JOINTS STAINED. SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SL.) - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> SEVERE (SEV.) - 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 TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</i> VERY SEVERE (V SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK 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> COMPLETE - ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.																											
SOIL MOISTURE - CORRELATION OF TERMS	ABBREVIATIONS AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILTY, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED % - UNIT WEIGHT %g - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO	ROCK HARDNESS VERY HARD - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD - 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 BY MODERATE BLOWS. MEDIUM HARD - CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT - CAN BE GROOVED 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 PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT - CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.																											
PLASTICITY	EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: <input type="checkbox"/> CME-45C <input checked="" type="checkbox"/> CME-55 <input type="checkbox"/> CME-550 <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE <input type="checkbox"/> STEEL TEETH <input checked="" type="checkbox"/> TRICONE <input type="checkbox"/> 1-1/8" TUNG-CARB. <input checked="" type="checkbox"/> CORE BIT HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input checked="" type="checkbox"/> -N Q2 HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST	FRACATURE SPACING <table border="1"> <tr><th>TERM</th><th>SPACING</th></tr> <tr><td>VERY WIDE</td><td>MORE THAN 10 FEET</td></tr> <tr><td>WIDE</td><td>3 TO 10 FEET</td></tr> <tr><td>MODERATELY CLOSE</td><td>1 TO 3 FEET</td></tr> <tr><td>CLOSE</td><td>0.16 TO 1 FOOT</td></tr> <tr><td>VERY CLOSE</td><td>LESS THAN 0.16 FEET</td></tr> </table> BEDDING <table border="1"> <tr><th>TERM</th><th>THICKNESS</th></tr> <tr><td>VERY THICKLY BEDDED</td><td>4 FEET</td></tr> <tr><td>THICKLY BEDDED</td><td>1.5 - 4 FEET</td></tr> <tr><td>THINLY BEDDED</td><td>0.16 - 1.5 FEET</td></tr> <tr><td>VERY THINLY BEDDED</td><td>0.03 - 0.16 FEET</td></tr> <tr><td>THICKLY LAMINATED</td><td>0.008 - 0.03 FEET</td></tr> <tr><td>THINLY LAMINATED</td><td>< 0.008 FEET</td></tr> </table>	TERM	SPACING	VERY WIDE	MORE THAN 10 FEET	WIDE	3 TO 10 FEET	MODERATELY CLOSE	1 TO 3 FEET	CLOSE	0.16 TO 1 FOOT	VERY CLOSE	LESS THAN 0.16 FEET	TERM	THICKNESS	VERY THICKLY BEDDED	4 FEET	THICKLY BEDDED	1.5 - 4 FEET	THINLY BEDDED	0.16 - 1.5 FEET	VERY THINLY BEDDED	0.03 - 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET	THINLY LAMINATED	< 0.008 FEET	
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VERY CLOSE	LESS THAN 0.16 FEET																												
TERM	THICKNESS																												
VERY THICKLY BEDDED	4 FEET																												
THICKLY BEDDED	1.5 - 4 FEET																												
THINLY BEDDED	0.16 - 1.5 FEET																												
VERY THINLY BEDDED	0.03 - 0.16 FEET																												
THICKLY LAMINATED	0.008 - 0.03 FEET																												
THINLY LAMINATED	< 0.008 FEET																												
COLOR DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE - RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED - GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED - GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED - SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING GRATE AT STA. 33+65.53 -Y2FLYAB- 12' RT (840960FT.N., I66148FT.E.) ELEVATION: 851.09 MANHOLE AT STA. 27+16.06 -Y2FLYAB- 302' RT (841378FT.N., I661779FT.E.) ELEVATION: 824.59 GRATE AT STA. 23+51.94 -Y2FLYAB- 239' RT (841267FT.N., I662205FT.E.) ELEVATION: 851.09 GRATE AT STA. 22+40.00 -Y2FLYAB- 294' RT (841280FT.N., I662350FT.E.) ELEVATION: 827.20 DATE: 8-15-14																											

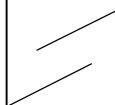
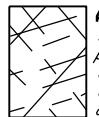
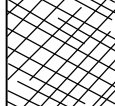
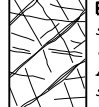



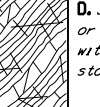

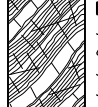


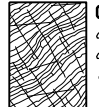
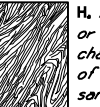
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

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

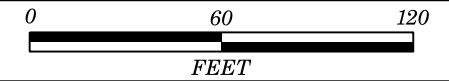
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

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

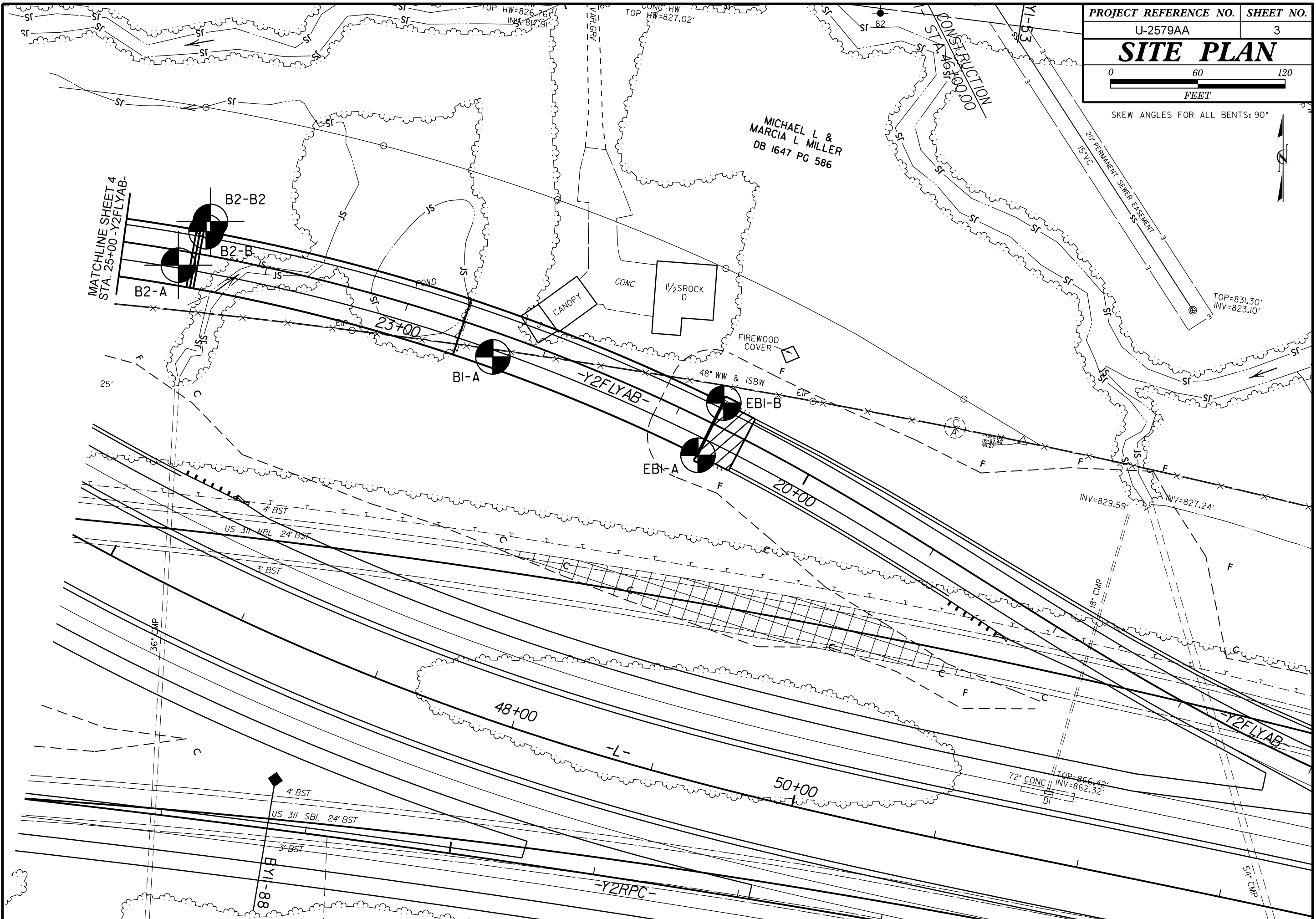
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)		SURFACE CONDITIONS					GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)		SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)				
From the lithology, structure and surface conditions 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.		VERY GOOD Very rough, fresh unweathered surfaces	GOOD Rough, slightly weathered, iron stained 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	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.		VERY GOOD - Very Rough, fresh unweathered surfaces	GOOD - Rough, slightly weathered surfaces	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, slickensided or highly weathered surfaces with soft clay coatings or fillings
STRUCTURE		DECREASING SURFACE QUALITY →					COMPOSITION AND STRUCTURE						
 INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities		90			N/A	N/A	 A. Thick bedded, very blocky sandstone. The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.	70					
 BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets		80					 B. Sandstone with thin inter-layers of siltstone	60					
 VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets			70				 C. Sandstone and siltstone in similar amounts	50					
 BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity			60				 D. Siltstone or silty shale with sandstone layers	40					
 DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces			50				 E. Weak siltstone or clayey shale with sandstone layers	30					
 LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes			40				 F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure	20					
			30				 G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers	10					
			20				 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										
		N/A	N/A										

→ Means deformation after tectonic disturbance

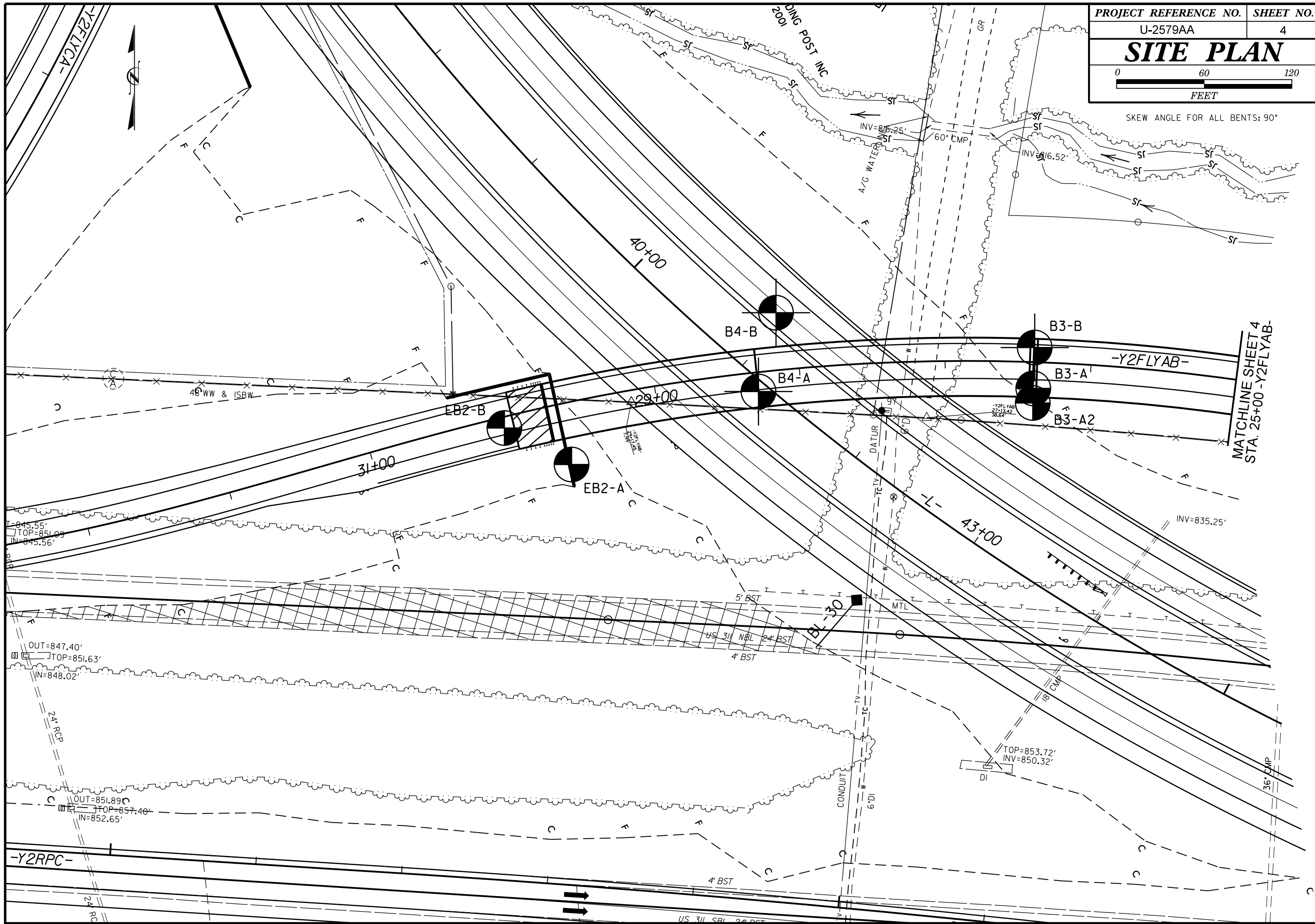
SITE PLAN

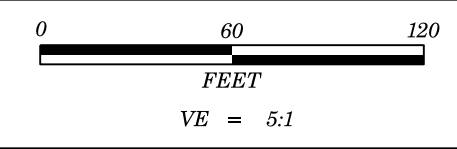


SKREW ANGLES FOR ALL BENTS: 90°

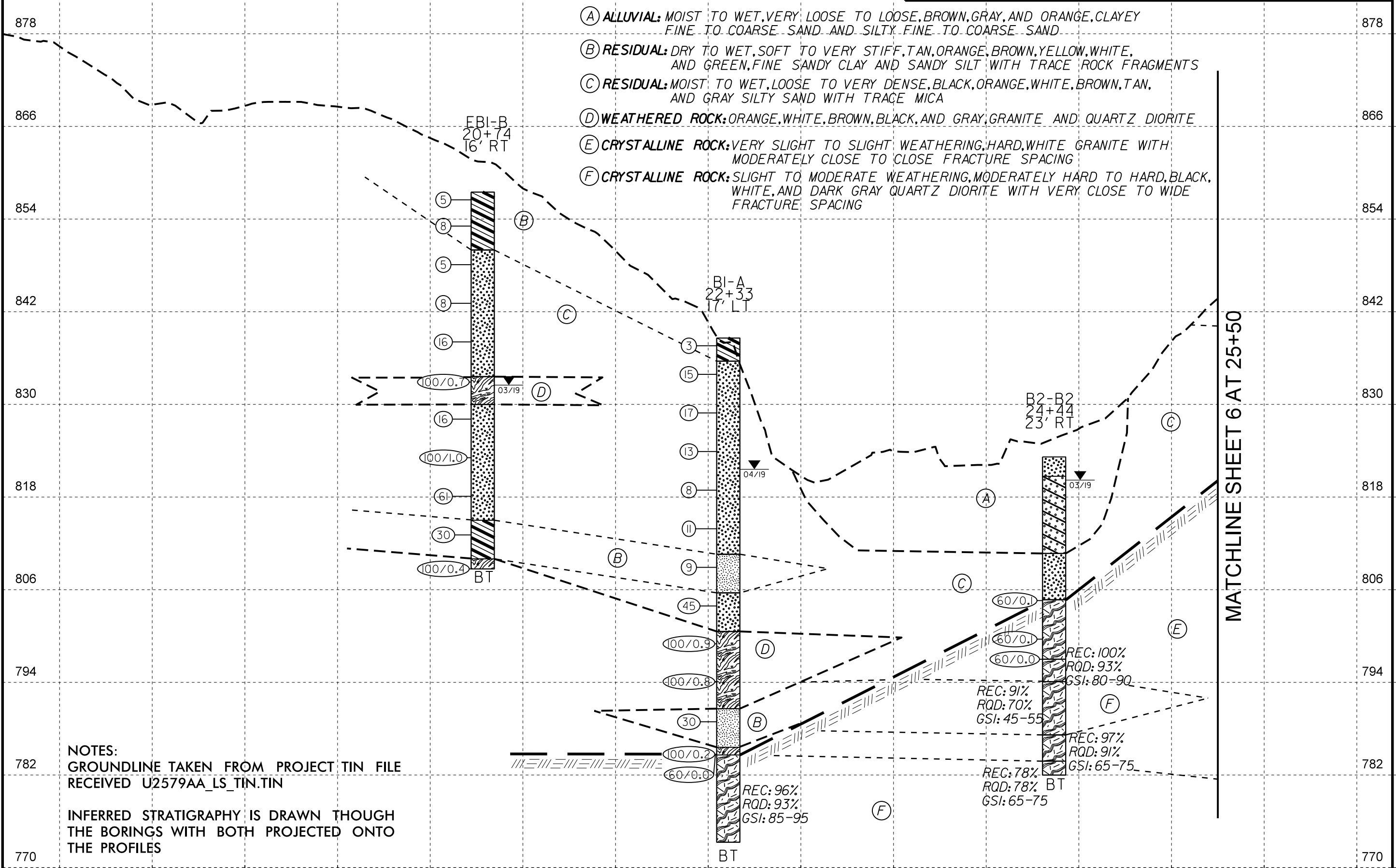


SKREW ANGLE FOR ALL BENTS: 90°





PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	5
BRIDGE NO. 733 CENTERLINE PROFILE ON US 311 FLYOVER (-Y2FLYAB-)	



- (A) **ALLUVIAL:** MOIST TO WET, VERY LOOSE TO LOOSE, BROWN, GRAY, AND ORANGE, CLAYEY FINE TO COARSE SAND AND SILTY FINE TO COARSE SAND
- (B) **RESIDUAL:** DRY TO WET, SOFT TO VERY STIFF, TAN, ORANGE, BROWN, YELLOW, WHITE, AND GREEN, FINE SANDY CLAY AND SANDY SILT WITH TRACE ROCK FRAGMENTS
- (C) **RESIDUAL:** MOIST TO WET, LOOSE TO VERY DENSE, BLACK, ORANGE, WHITE, BROWN, TAN, AND GRAY SILTY SAND WITH TRACE MICA
- (D) **WEATHERED ROCK:** ORANGE, WHITE, BROWN, BLACK, AND GRAY, GRANITE AND QUARTZ DIORITE
- (E) **CRYSTALLINE ROCK:** VERY SLIGHT TO SLIGHT WEATHERING, HARD, WHITE GRANITE WITH MODERATELY CLOSE TO CLOSE FRACTURE SPACING
- (F) **CRYSTALLINE ROCK:** SLIGHT TO MODERATE WEATHERING, MODERATELY HARD TO HARD, BLACK, WHITE, AND DARK GRAY QUARTZ DIORITE WITH VERY CLOSE TO WIDE FRACTURE SPACING

NOTES:
 GROUNDLINE TAKEN FROM PROJECT TIN FILE RECEIVED U2579AA_LS_TIN.TIN
 INFERRED STRATIGRAPHY IS DRAWN THOUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILES

REC: 100%
 RQD: 93%
 GSI: 80-90

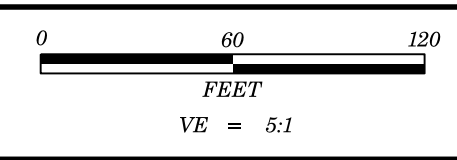
REC: 91%
 RQD: 70%
 GSI: 45-55

REC: 97%
 RQD: 91%
 GSI: 65-75

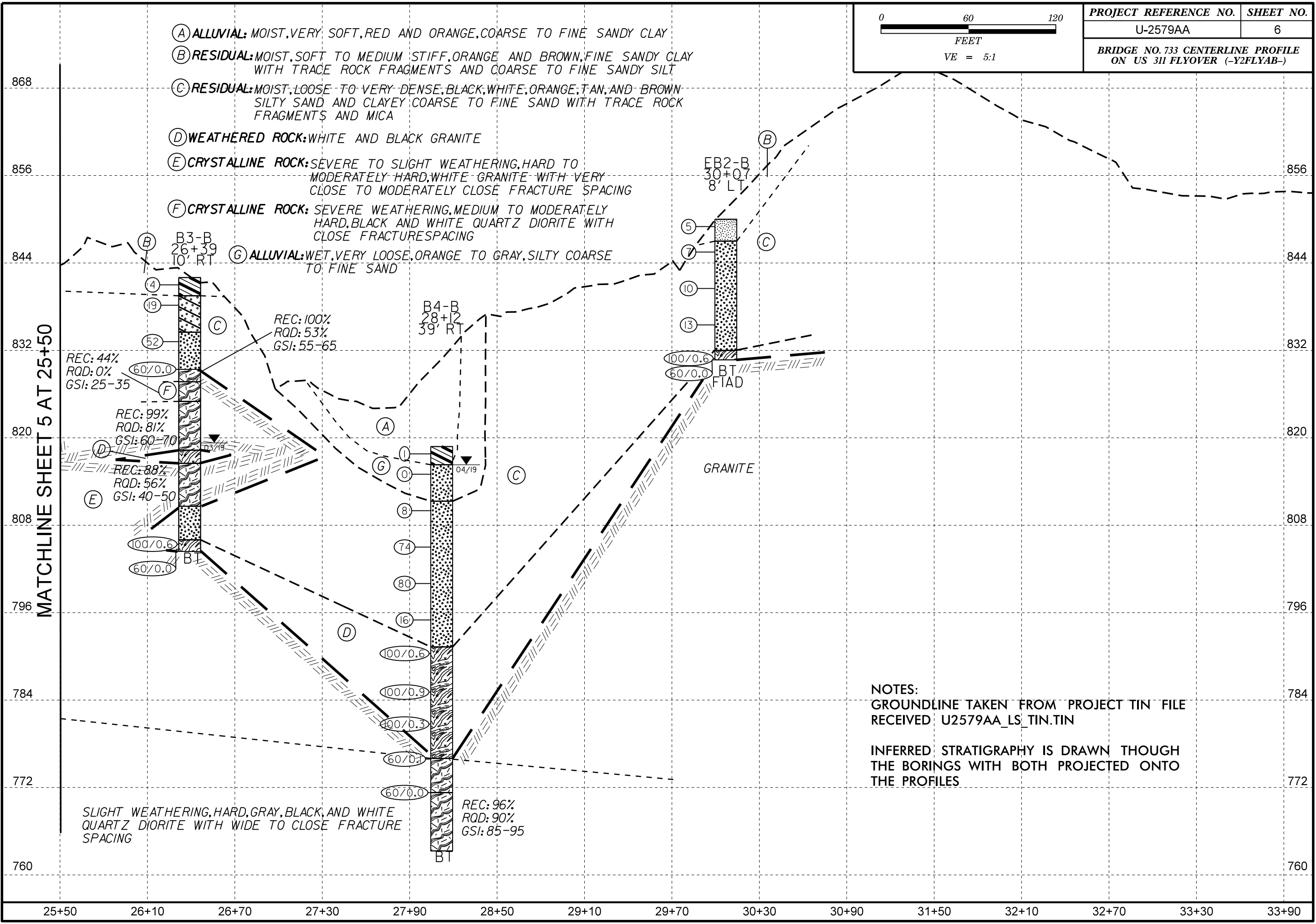
REC: 78%
 RQD: 78%
 GSI: 65-75

REC: 96%
 RQD: 93%
 GSI: 85-95

18+00 18+60 19+20 19+80 20+40 21+00 21+60 22+20 22+80 23+40 24+00 24+60 25+20 25+80 26+40



PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	6
BRIDGE NO. 733 CENTERLINE PROFILE ON US 311 FLYOVER (-Y2FLYAB-)	



- (A) ALLUVIAL: MOIST, VERY SOFT, RED AND ORANGE, COARSE TO FINE SANDY CLAY
- (B) RESIDUAL: MOIST, SOFT TO MEDIUM STIFF, ORANGE AND BROWN, FINE SANDY CLAY WITH TRACE ROCK FRAGMENTS AND COARSE TO FINE SANDY SILT
- (C) RESIDUAL: MOIST, LOOSE TO VERY DENSE, BLACK, WHITE, ORANGE, TAN, AND BROWN SILTY SAND AND CLAYEY COARSE TO FINE SAND WITH TRACE ROCK FRAGMENTS AND MICA
- (D) WEATHERED ROCK: WHITE AND BLACK GRANITE
- (E) CRYSTALLINE ROCK: SEVERE TO SLIGHT WEATHERING, HARD TO MODERATELY HARD, WHITE GRANITE WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING
- (F) CRYSTALLINE ROCK: SEVERE WEATHERING, MEDIUM TO MODERATELY HARD, BLACK AND WHITE QUARTZ DIORITE WITH CLOSE FRACTURE SPACING
- (G) ALLUVIAL: WET, VERY LOOSE, ORANGE TO GRAY, SILTY COARSE TO FINE SAND

MATCHLINE SHEET 5 AT 25+50

REC: 44%
RQD: 0%
GSI: 25-35

REC: 99%
RQD: 81%
GSI: 60-70

REC: 88%
RQD: 56%
GSI: 40-50

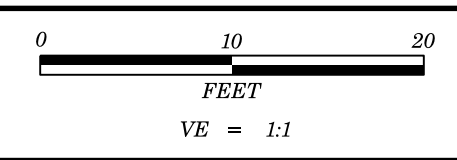
REC: 100%
RQD: 53%
GSI: 55-65

REC: 96%
RQD: 90%
GSI: 85-95

SLIGHT WEATHERING, HARD, GRAY, BLACK, AND WHITE QUARTZ DIORITE WITH WIDE TO CLOSE FRACTURE SPACING

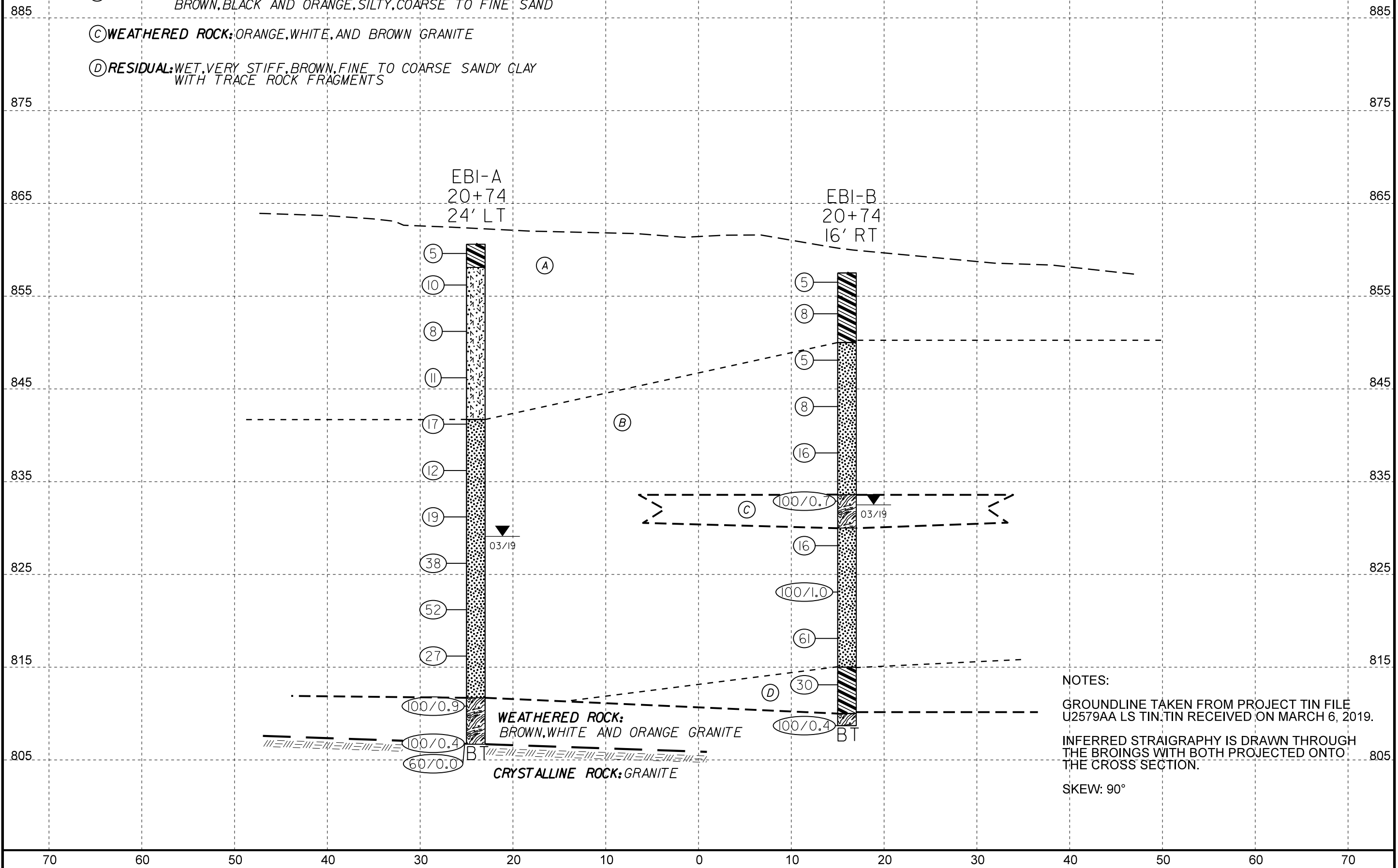
NOTES:
GROUNDLINE TAKEN FROM PROJECT TIN FILE RECEIVED U2579AA_LS_TIN.TIN

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILES

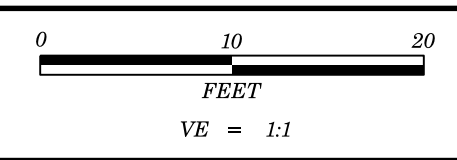


PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	7
CROSS SECTION ALONG END BENT 1 AT 20+74 -Y2FLYAB-	

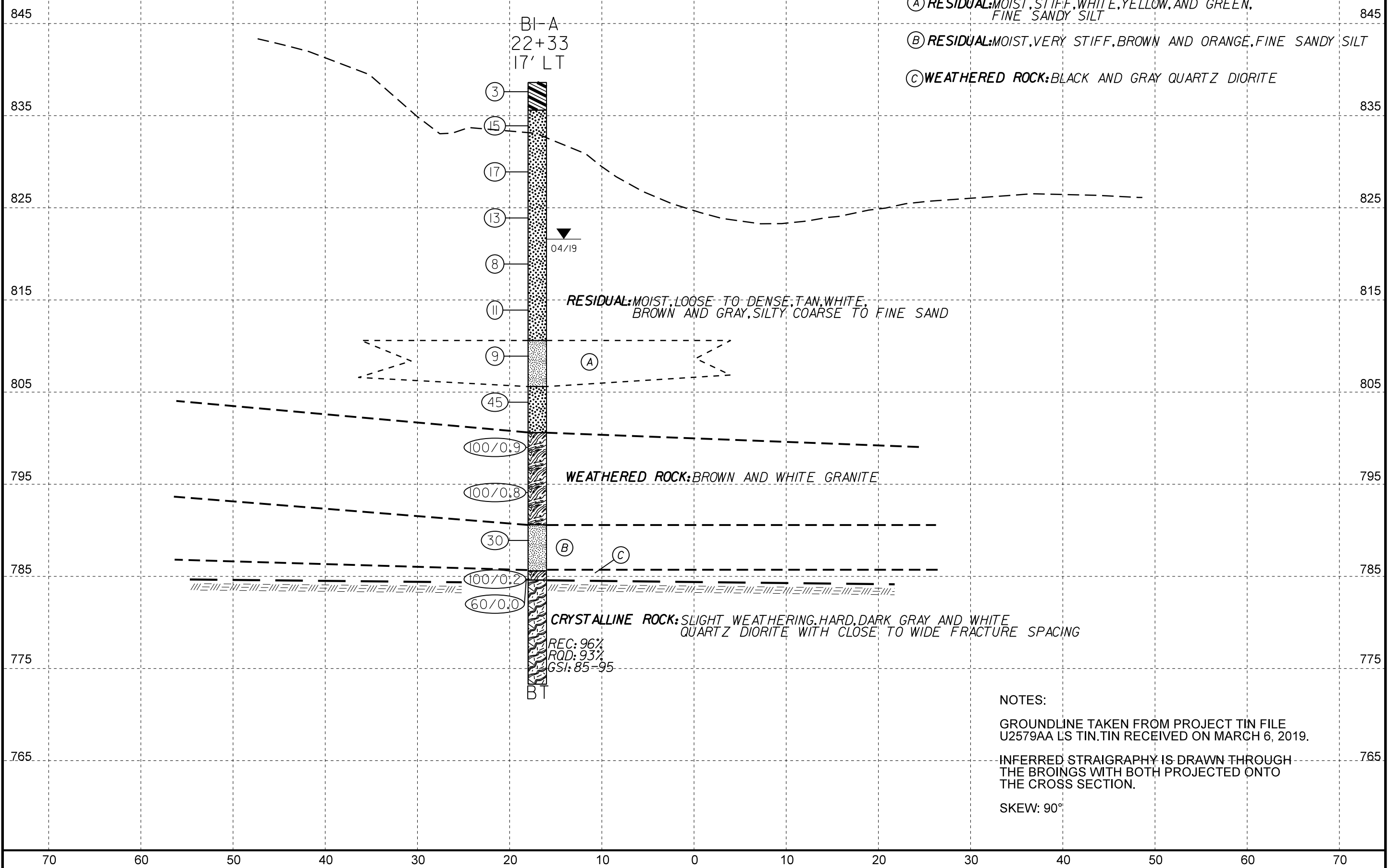
- Ⓐ RESIDUAL: DRY TO MOIST, MEDIUM STIFF TO STIFF, RED, BLACK WHITE, BROWN, AND ORANGE, SANDY CLAY AND CLAYEY SILT
- Ⓑ RESIDUAL: MOIST TO WET, LOOSE TO VERY DENSE, WHITE, BROWN, BLACK AND ORANGE, SILTY, COARSE TO FINE SAND
- Ⓒ WEATHERED ROCK: ORANGE, WHITE, AND BROWN GRANITE
- Ⓓ RESIDUAL: WET, VERY STIFF, BROWN, FINE TO COARSE SANDY CLAY WITH TRACE ROCK FRAGMENTS

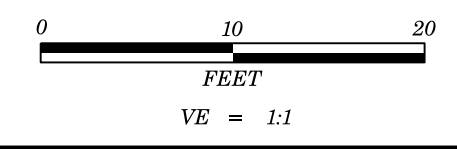


NOTES:
 GROUNDLINE TAKEN FROM PROJECT TIN FILE U2579AA LS TIN. TIN RECEIVED ON MARCH 6, 2019.
 INFERRED STRAIGRAPHY IS DRAWN THROUGH THE BROINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
 SKEW: 90°



PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	8
CROSS SECTION ALONG BENT 1 AT 22+59 -Y2FLYAB-	



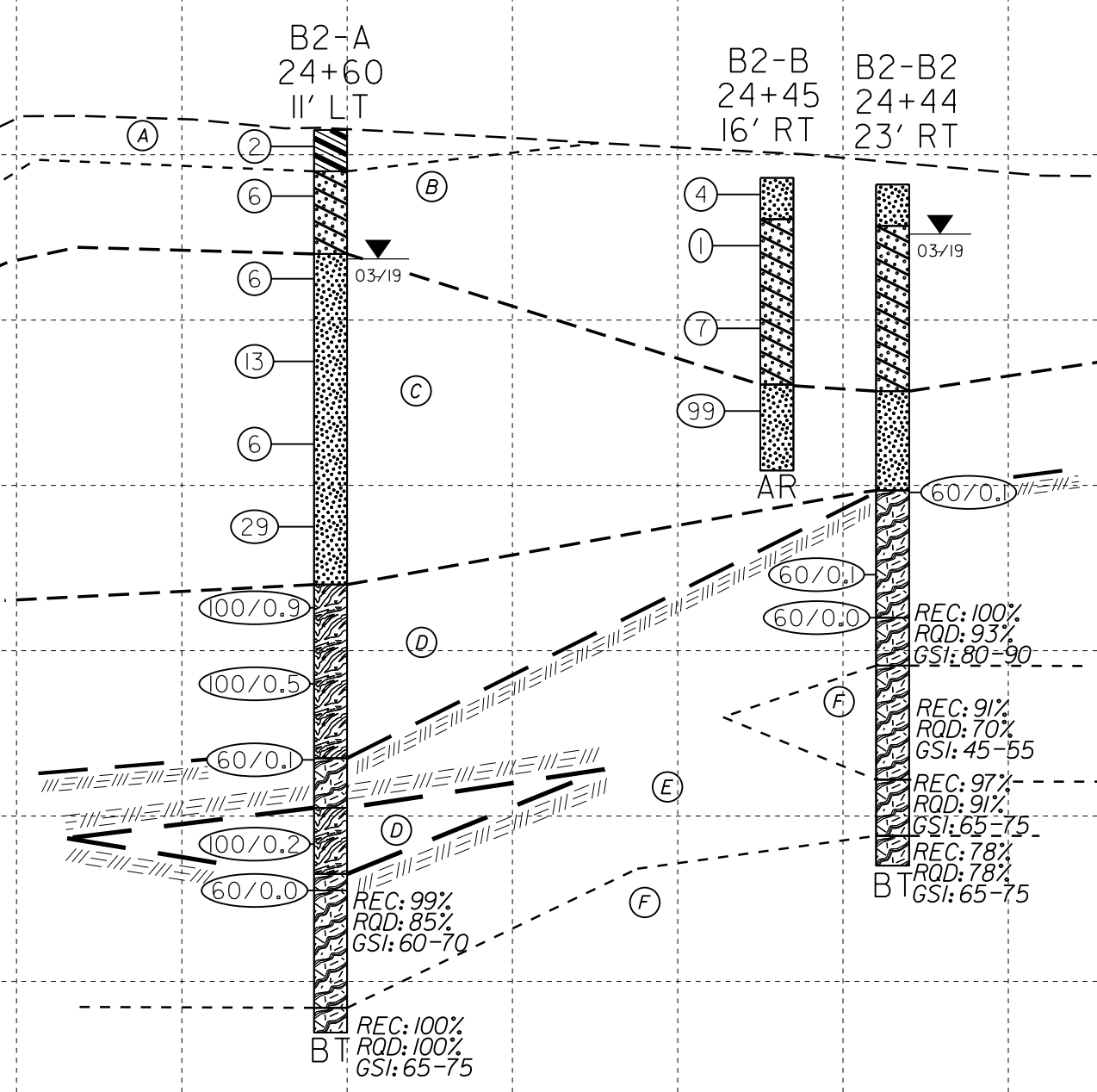


PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	9
CROSS SECTION ALONG BENT 2 AT 24+49 -Y2FLYAB-	

- (A) **ALLUVIAL:** MOIST, VERY SOFT, BROWN, FINE SANDY CLAY
- (B) **ALLUVIAL:** MOIST TO WET, VERY LOOSE TO LOOSE, BROWN, GRAY AND ORANGE SILTY FINE TO COARSE SAND AND CLAYEY FINE TO COARSE SAND
- (C) **RESIDUAL:** MOIST, LOOSE TO MEDIUM DENSE, BLACK, ORANGE, BROWN, AND WHITE, SILTY COARSE TO FINE SAND, WITH TRACE MICA
- (D) **WEATHERED ROCK:** WHITE, BROWN, AND BLACK GRANITE
- (E) **CRYSTALLINE ROCK:** VERY SLIGHT TO MODERATE WEATHERING, HARD, WHITE AND BLACK GRANITE WITH CLOSE TO MODERATELY CLOSE FRACTURE SPACING
- (F) **CRYSTALLINE ROCK:** SLIGHT TO MODERATE WEATHERING, HARD TO MODERATELY HARD, BLACK AND WHITE QUARTZ DIORITE WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING

855
845
835
825
815
805
795
785
775

855
845
835
825
815
805
795
785
775



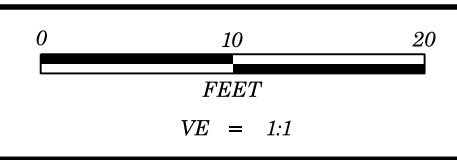
NOTES:

GROUNDLINE TAKEN FROM PROJECT TIN FILE U2579AA_LS.TIN.TIN RECEIVED ON MARCH 6, 2019.

INFERRED STRAIGRAPHY IS DRAWN THROUGH THE BROINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

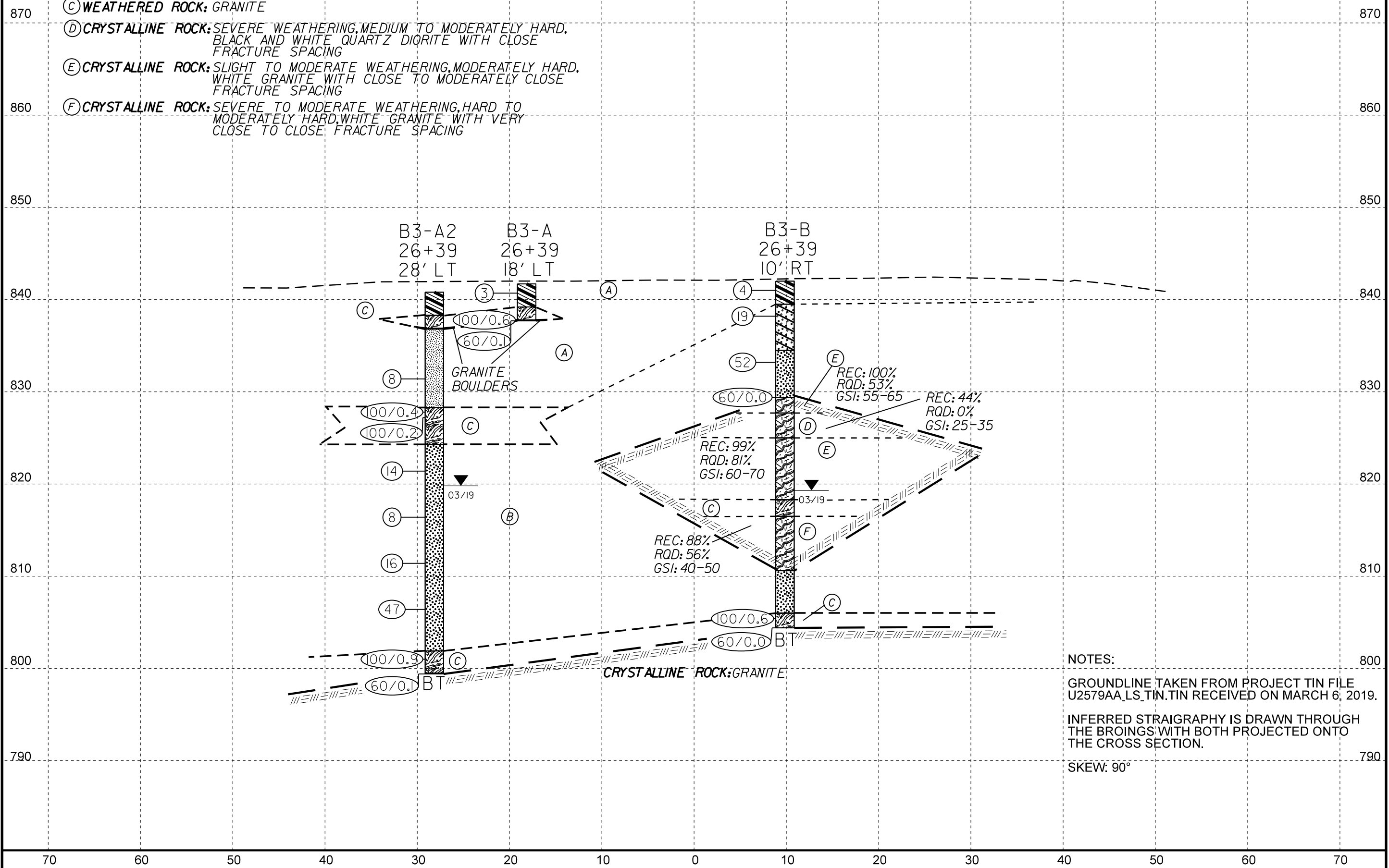
SKEW: 90°

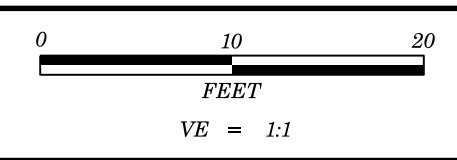
70 60 50 40 30 20 10 0 10 20 30 40 50 60 70



PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	10
CROSS SECTION ALONG BENT 3 AT 26+39 -Y2FLYAB-	

- (A) RESIDUAL: MOIST, SOFT TO MEDIUM STIFF, ORANGE AND BROWN, COARSE TO FINE SANDY CLAY AND FINE SANDY SILT WITH LITTLE MICA AND TRACE ROCK FRAGMENTS
- (B) RESIDUAL: DRY TO MOIST, LOOSE TO VERY DENSE, ORANGE, BROWN, BLACK AND WHITE, CLAYEY COARSE TO FINE SAND AND SILTY COARSE TO FINE SAND WITH LITTLE MICA AND TRACE ROCK FRAGMENTS
- (C) WEATHERED ROCK: GRANITE
- (D) CRYSTALLINE ROCK: SEVERE WEATHERING, MEDIUM TO MODERATELY HARD, BLACK AND WHITE QUARTZ DIORITE WITH CLOSE FRACTURE SPACING
- (E) CRYSTALLINE ROCK: SLIGHT TO MODERATE WEATHERING, MODERATELY HARD, WHITE GRANITE WITH CLOSE TO MODERATELY CLOSE FRACTURE SPACING
- (F) CRYSTALLINE ROCK: SEVERE TO MODERATE WEATHERING, HARD TO MODERATELY HARD, WHITE GRANITE WITH VERY CLOSE TO CLOSE FRACTURE SPACING

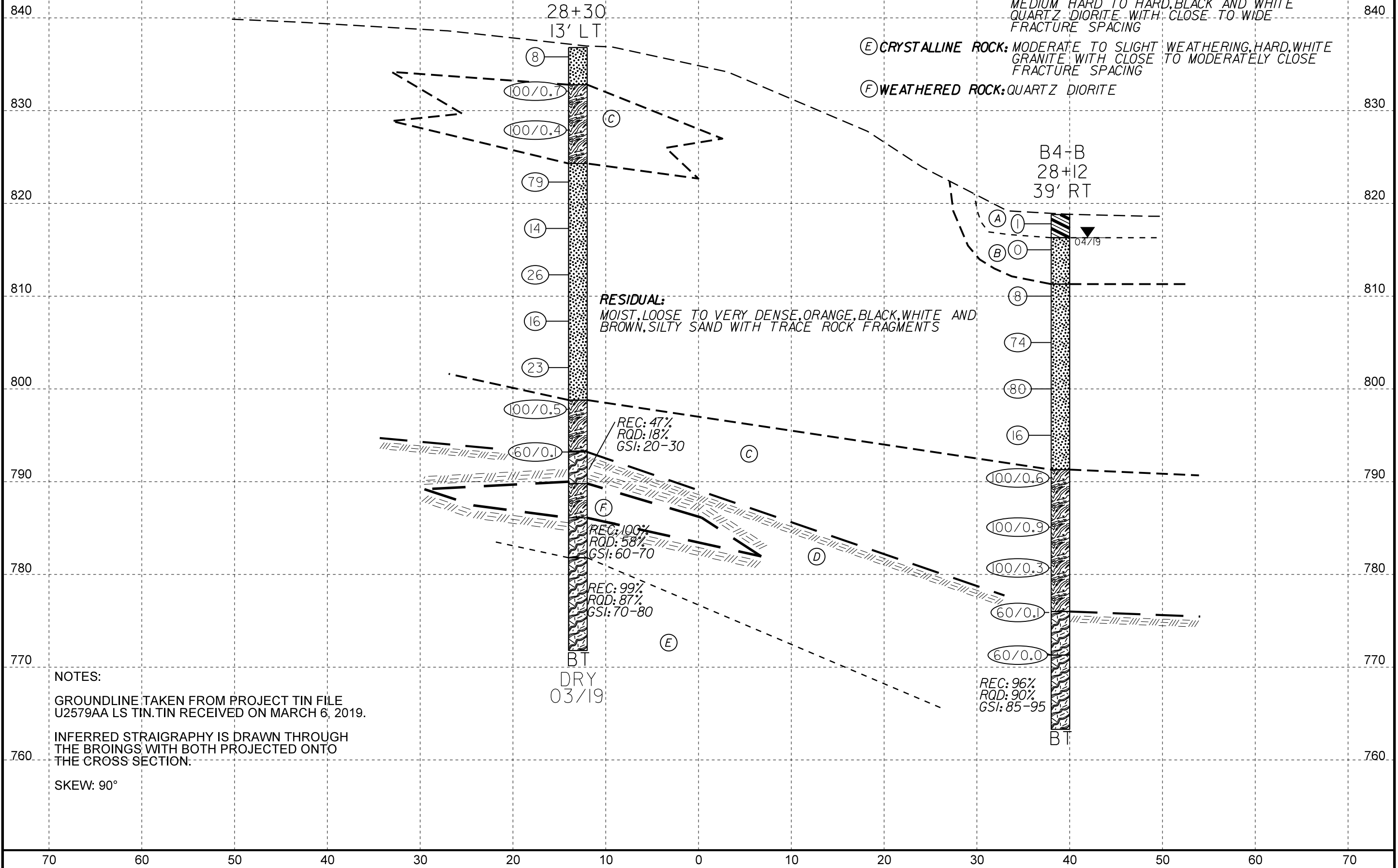




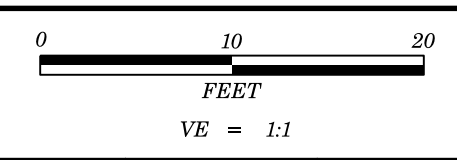
PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	11
CROSS SECTION ALONG BENT 4 AT 28+29 -Y2FLYAB-	

- (A) ALLUVIAL: WET, VERY SOFT, RED AND ORANGE, COARSE TO FINE SANDY CLAY
- (B) ALLUVIAL: WET, VERY LOOSE, ORANGE TO GRAY, SILTY COARSE TO FINE SAND
- (C) WEATHERED ROCK: WHITE AND BLACK GRANITE

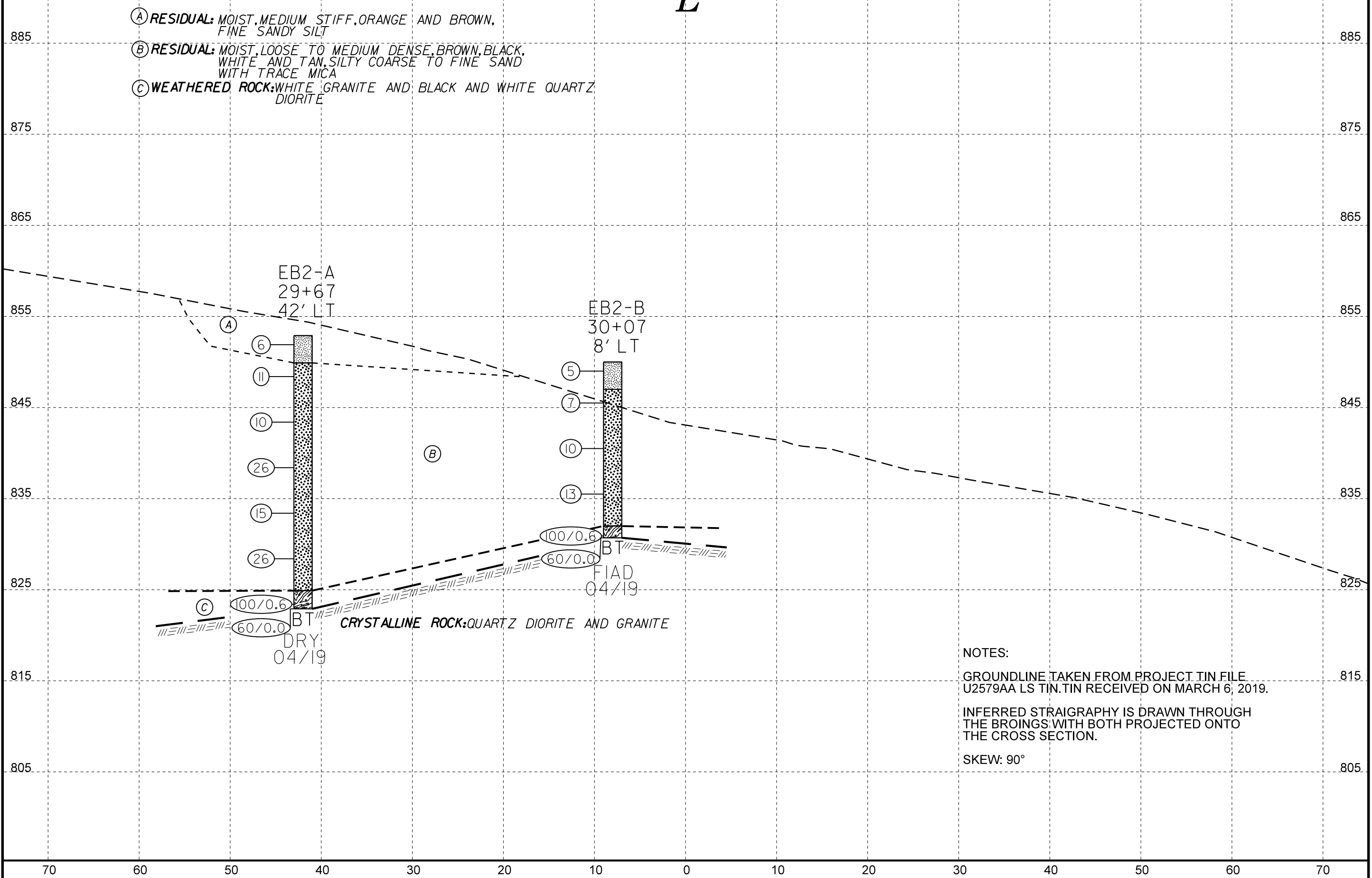
- (D) CRYSTALLINE ROCK: MODERATELY SEVERE TO SLIGHT WEATHERING, MEDIUM HARD TO HARD, BLACK AND WHITE QUARTZ DIORITE WITH CLOSE TO WIDE FRACTURE SPACING
- (E) CRYSTALLINE ROCK: MODERATE TO SLIGHT WEATHERING, HARD, WHITE GRANITE WITH CLOSE TO MODERATELY CLOSE FRACTURE SPACING
- (F) WEATHERED ROCK: QUARTZ DIORITE



NOTES:
GROUNDLINE TAKEN FROM PROJECT TIN FILE U2579AA LS TIN. TIN RECEIVED ON MARCH 6, 2019.
INFERRED STRAIGRAPHY IS DRAWN THROUGH THE BROINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
SKEW: 90°



PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	12
CROSS SECTION ALONG END BENT 2 AT 29+75 -Y2FLYAB-	



- Ⓐ **RESIDUAL:** MOIST, MEDIUM STIFF, ORANGE AND BROWN, FINE SANDY SILT
- Ⓑ **RESIDUAL:** MOIST, LOOSE TO MEDIUM DENSE, BROWN, BLACK, WHITE AND TAN, SILTY COARSE TO FINE SAND WITH TRACE MICA
- Ⓒ **WEATHERED ROCK:** WHITE GRANITE AND BLACK AND WHITE QUARTZ DIORITE

EB2-A
29+67
42' LT

EB2-B
30+07
8' LT

100/0.6
60/0.0
BT
FIAD
04/19
CRYSTALLINE ROCK: QUARTZ DIORITE AND GRANITE
BT
DRY
04/19

NOTES:
GROUNDLINE TAKEN FROM PROJECT TIN FILE U2579AA LS TIN. TIN RECEIVED ON MARCH 6, 2019.
INFERRED STRAIGHTGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
SKEW: 90°

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke										
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)									
BORING NO. EB1-A		STATION 20+74		OFFSET 24 ft LT		ALIGNMENT -Y2FLYAB-										
COLLAR ELEV. 860.6 ft		TOTAL DEPTH 53.9 ft		NORTHING 840,917		EASTING 1,662,396										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER R. Toothman		START DATE 03/26/19		COMP. DATE 03/26/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
865																
860	860.6	0.0														860.6 GROUND SURFACE 0.0
	857.2	3.4	2	2	3											RESIDUAL Orange, Fine Sandy CLAY
855	852.2	8.4	4	5	5											858.1 Orange, Red, and Black, Clayey SILT 2.5
	852.2	8.4	3	4	4											
850	847.2	13.4	3	4	7											
845	842.2	18.4	6	7	10											
840	837.2	23.4	8	4	8											841.7 White, Brown, Black, and Orange, Silty Coarse to Fine SAND 18.9
835	832.2	28.4	3	9	10											
830	827.2	33.4	10	15	23											
825	822.2	38.4	17	22	30											
820	817.2	43.4	10	12	15											
815	812.2	48.4	8	27	73/0.4											
810	807.2	53.4														811.7 WEATHERED ROCK Brown, White, and Orange GRANITE 48.9
	806.7	53.9														806.7 WEATHERED ROCK Brown, White, and Orange GRANITE 48.9
																Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 806.7 ft on CRYSTALLINE ROCK: GRANITE

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke										
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)									
BORING NO. EB1-B		STATION 20+74		OFFSET 16 ft RT		ALIGNMENT -Y2FLYAB-										
COLLAR ELEV. 857.5 ft		TOTAL DEPTH 48.8 ft		NORTHING 840,953		EASTING 1,662,414										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER R. Toothman		START DATE 03/25/19		COMP. DATE 03/25/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
860																
	857.5	0.0														857.5 GROUND SURFACE 0.0
855	854.1	3.4	2	3	5											RESIDUAL Orange, Coarse to Fine Sandy CLAY
850	849.1	8.4	2	2	3											850.0 Orange, White, and Brown, Silty Coarse to Fine SAND 7.5
845	844.1	13.4	3	4	4											
840	839.1	18.4	3	6	10											
835	834.1	23.4	26	60	40/0.2											833.6 WEATHERED ROCK Orange, White, and Brown GRANITE 23.9
830	829.1	28.4	8	9	7											830.0 RESIDUAL Brown, Silty Fine to Coarse SAND 27.5
825	824.1	33.4	35	43	57											
820	819.1	38.4	21	31	30											
815	814.1	43.4	13	12	18											815.0 Brown, Fine to Coarse Sandy CLAY with Trace Rock Fragments 42.5
810	809.1	48.4														810.0 WEATHERED ROCK GRANITE 47.5
																808.7 WEATHERED ROCK GRANITE 48.8
																Boring Terminated at Elevation 808.7 ft in WEATHERED ROCK: GRANITE

NCDOT BORE DOUBLE U2579AA_GEO_BRDG_GINT.GPJ NC_DOT.GDT 5/8/19

GEOTECHNICAL BORING REPORT

BORE LOG

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST C. Driscoll									
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)								
BORING NO. B1-A		STATION 22+33		OFFSET 17 ft LT		ALIGNMENT -Y2FLYAB-									
COLLAR ELEV. 838.6 ft		TOTAL DEPTH 65.3 ft		NORTHING 840,985		EASTING 1,662,255									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary/Core		HAMMER TYPE Automatic									
DRILLER R. Toothman		START DATE 04/01/19		COMP. DATE 04/02/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
840	838.6	0.0	1	1	2	3							M	838.6 GROUND SURFACE	0.0
835	834.9	3.7	5	8	7								M	835.6 RESIDUAL Tan and Brown, Fine to Coarse SANDY CLAY	3.0
830	829.9	8.7	7	8	9								M	835.6 Tan, Brown, White, and Gray, Silty Coarse to Fine SAND	
825	824.9	13.7	6	6	7								M		
820	819.9	18.7	6	4	4								M		
815	814.9	23.7	5	4	7								M		
810	809.9	28.7	3	3	6								M	810.6 White, Yellow, and Green, Fine SANDY SILT	28.0
805	804.9	33.7	18	22	23								M	805.6 Tan and White, Silty Fine to Coarse SAND	33.0
800	799.9	38.7	60	40/0.4									M	800.6 WEATHERED ROCK Brown and White GRANITE	38.0
795	794.9	43.7	25	75/0.3									M		
790	789.9	48.7	10	14	16								M	790.6 RESIDUAL Brown and Orange, Fine SANDY SILT	48.0
785	784.9	53.7											M	785.6 WEATHERED ROCK Black and Gray QUARTZ DIORITE	53.0
780	784.6	54.0	100/0.2	60/0.0									M	784.6 WEATHERED ROCK Dark Gray and White QUARTZ DIORITE	54.0
775													M	773.3 Boring Terminated at Elevation 773.3 ft in CRYSTALLINE ROCK: QUARTZ DIORITE	65.3

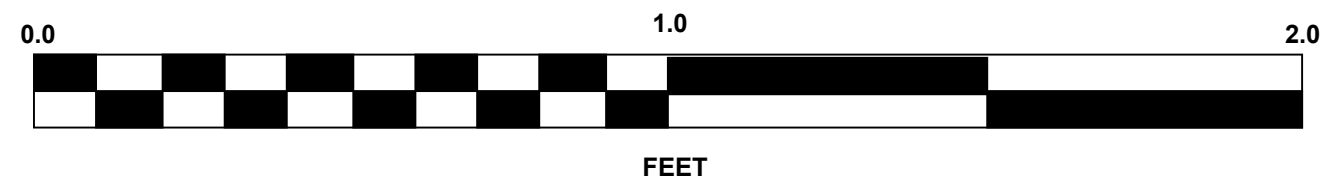
WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST C. Driscoll						
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)					
BORING NO. B1-A		STATION 22+33		OFFSET 17 ft LT		ALIGNMENT -Y2FLYAB-						
COLLAR ELEV. 838.6 ft		TOTAL DEPTH 65.3 ft		NORTHING 840,985		EASTING 1,662,255						
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary/Core		HAMMER TYPE Automatic						
DRILLER R. Toothman		START DATE 04/01/19		COMP. DATE 04/02/19		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
784.6	784.6	54.0	1.3	N=60/0.0	(1.0)	(0.7)		(10.9)	(10.5)		Begin Coring @ 54.0 ft	
780	783.3	55.3	5.0	1:30/0.3 6:00/1.0 4:30/1.0 5:45/1.0 5:30/1.0 5:00/1.0 4:30/1.0	77%	54%		96%	93%		CRYSTALLINE ROCK Slight Weathering, Hard, Dark Gray and White, QUARTZ DIORITE with Close to Wide Fracture Spacing (GSI: 85-95)	54.0
775	778.3	60.3	5.0	6:00/1.0 7:00/1.0 5:30/1.0 5:00/1.0 2:30/1.0	(4.9)	(4.8)						
	773.3	65.3									Boring Terminated at Elevation 773.3 ft in CRYSTALLINE ROCK: QUARTZ DIORITE	65.3

NCDOT BORE DOUBLE U2579AA_GEO_BRDG_GINT.GPJ NC_DOT.GDT 5/8/19

CORE PHOTOGRAPHS

B1-A

BOX 1 & 2: 54.0 to 65.3 FEET



GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke										
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)									
BORING NO. B2-A		STATION 24+60		OFFSET 11 ft LT		ALIGNMENT -Y2FLYAB-										
COLLAR ELEV. 826.5 ft		TOTAL DEPTH 54.6 ft		NORTHING 841,048		EASTING 1,662,039										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary/Core		HAMMER TYPE Automatic										
DRILLER R. Toothman		START DATE 03/22/19		COMP. DATE 03/22/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
830																
825	826.5	0.0	WOH	1	1							M		826.5	GROUND SURFACE	0.0
	823.5	3.0		3	3							W		824.0	ALLUVIAL Brown, Fine Sandy CLAY	2.5
	818.5	8.0		5	4									819.0	RESIDUAL Orange, Brown, and White, Silty Coarse to Fine SAND with Trace Mica, Saprolitic	7.5
	813.5	13.0		4	9							M				
	808.5	18.0		3	2							M				
	803.5	23.0		3	4							M				
	798.5	28.0		35	65/0.4									799.0	WEATHERED ROCK White, Brown, and Black GRANITE	27.5
	793.5	33.0		100/0.5												
	788.5	38.0		60/0.1										788.5	CRYSTALLINE ROCK GRANITE	38.0
	783.5	43.0		100/0.2										785.5	WEATHERED ROCK White and Black GRANITE	41.0
	780.5	46.0		60/0.0										781.5 780.5	CRYSTALLINE ROCK GRANITE	45.0 46.0
														773.4	Black and White QUARTZ DIORITE	53.1
														771.9	Boring Terminated at Elevation 771.9 ft in CRYSTALLINE ROCK: QUARTZ DIORITE	54.6

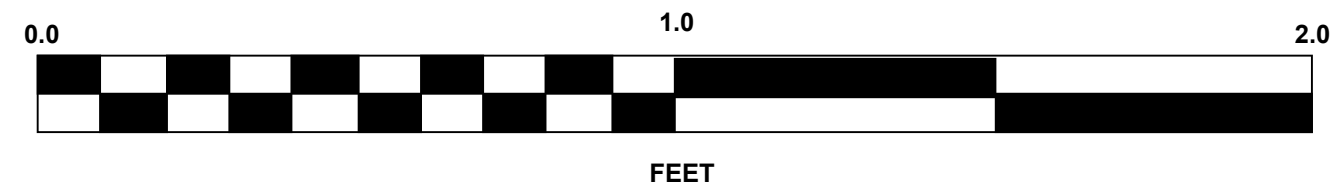
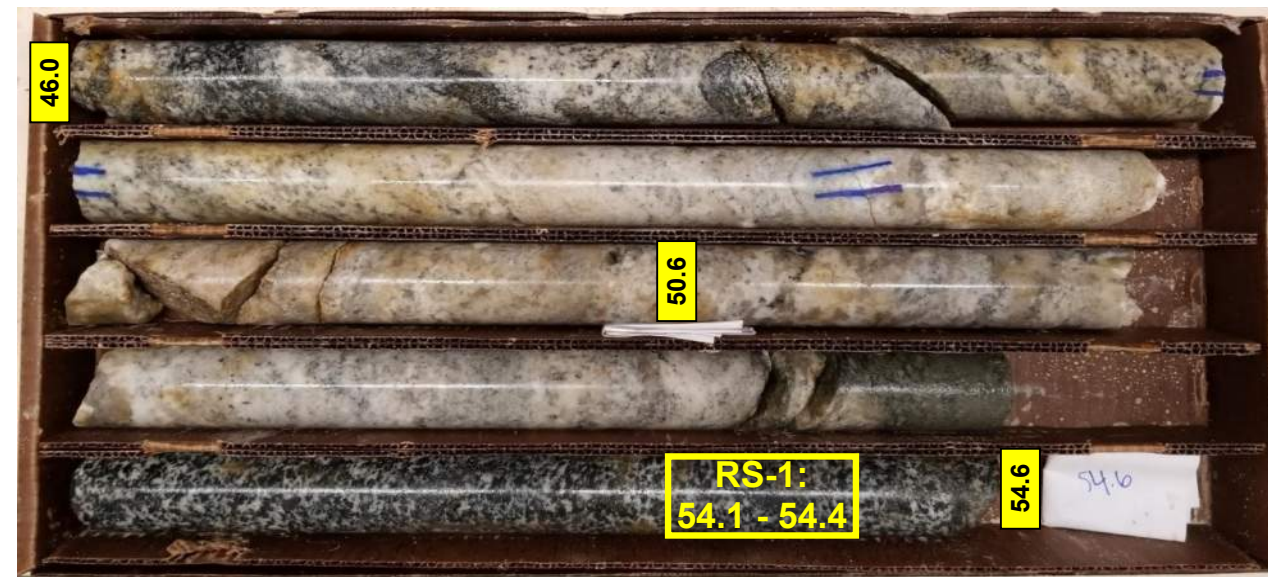
WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke						
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)					
BORING NO. B2-A		STATION 24+60		OFFSET 11 ft LT		ALIGNMENT -Y2FLYAB-						
COLLAR ELEV. 826.5 ft		TOTAL DEPTH 54.6 ft		NORTHING 841,048		EASTING 1,662,039						
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary/Core		HAMMER TYPE Automatic						
DRILLER R. Toothman		START DATE 03/22/19		COMP. DATE 03/22/19		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		ELEV. (ft)	DEPTH (ft)
780.5	780.5	46.0	4.6	N=60/0.0 2:00/0.6 3:53/1.0 6:57/1.0 6:20/1.0 3:43/1.0	(4.5) 98%	(3.9) 85%		(7.0) 99%	(6.0) 85%			Begin Coring @ 46.0 ft
775	775.9	50.6	4.0	3:24/1.0 3:14/1.0 3:15/1.0 3:13/1.0	(4.0) 100%	(3.6) 90%		(1.5) 100%	(1.5) 100%			Slight to Moderate Weathering, Hard, White and Black GRANITE with Close to Moderately Close Fracture Spacing (GSI: 60-70)
	771.9	54.6					RS-1					Slight Weathering, Hard, Black and White QUARTZ DIORITE with Moderately Close Fracture Spacing (GSI: 65-75) Boring Terminated at Elevation 771.9 ft in CRYSTALLINE ROCK: QUARTZ DIORITE

NCDOT BORE DOUBLE U2579AA_GEO_BRDG_GINT.GPJ NC_DOT.GDT 4/26/19

CORE PHOTOGRAPHS

B2-A

BOX 1: 46.0 to 54.6 FEET



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke										
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)									
BORING NO. B2-B		STATION 24+45		OFFSET 16 ft RT		ALIGNMENT -Y2FLYAB-										
COLLAR ELEV. 823.6 ft		TOTAL DEPTH 17.7 ft		NORTHING 841,071		EASTING 1,662,058										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER R. Toothman		START DATE 03/25/19		COMP. DATE 03/25/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
825														823.6	0.0	GROUND SURFACE
	823.6	0.0	2	2	2							M		821.1	2.5	ALLUVIAL Brown, Silty Fine to Coarse SAND
820	820.5	3.1	2	1	0							M				Brown, Gray, and Orange, Clayey Fine to Coarse SAND
815	815.5	8.1	4	4	3							W				
810	810.5	13.1	5	9	90									811.1	12.5	RESIDUAL Black and White, Silty Fine to Coarse SAND with Trace Mica
														805.9	17.7	Boring Terminated BY AUGER REFUSAL at Elevation 805.9 ft in RESIDUAL SOIL: Silty SAND
																NOTE: Boring terminated due to inability to clean out borehole to test split spoon at sample depth. Boring was offset and redrilled as B2-B2.

NCDOT BORE DOUBLE U2579AA_GEO_BRDG_GINT.GPJ NC_DOT.GDT 5/8/19

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

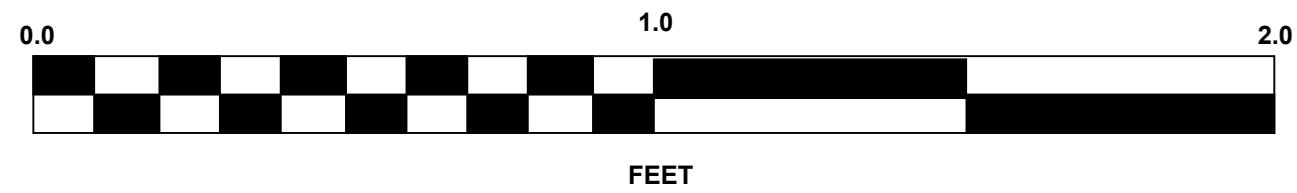
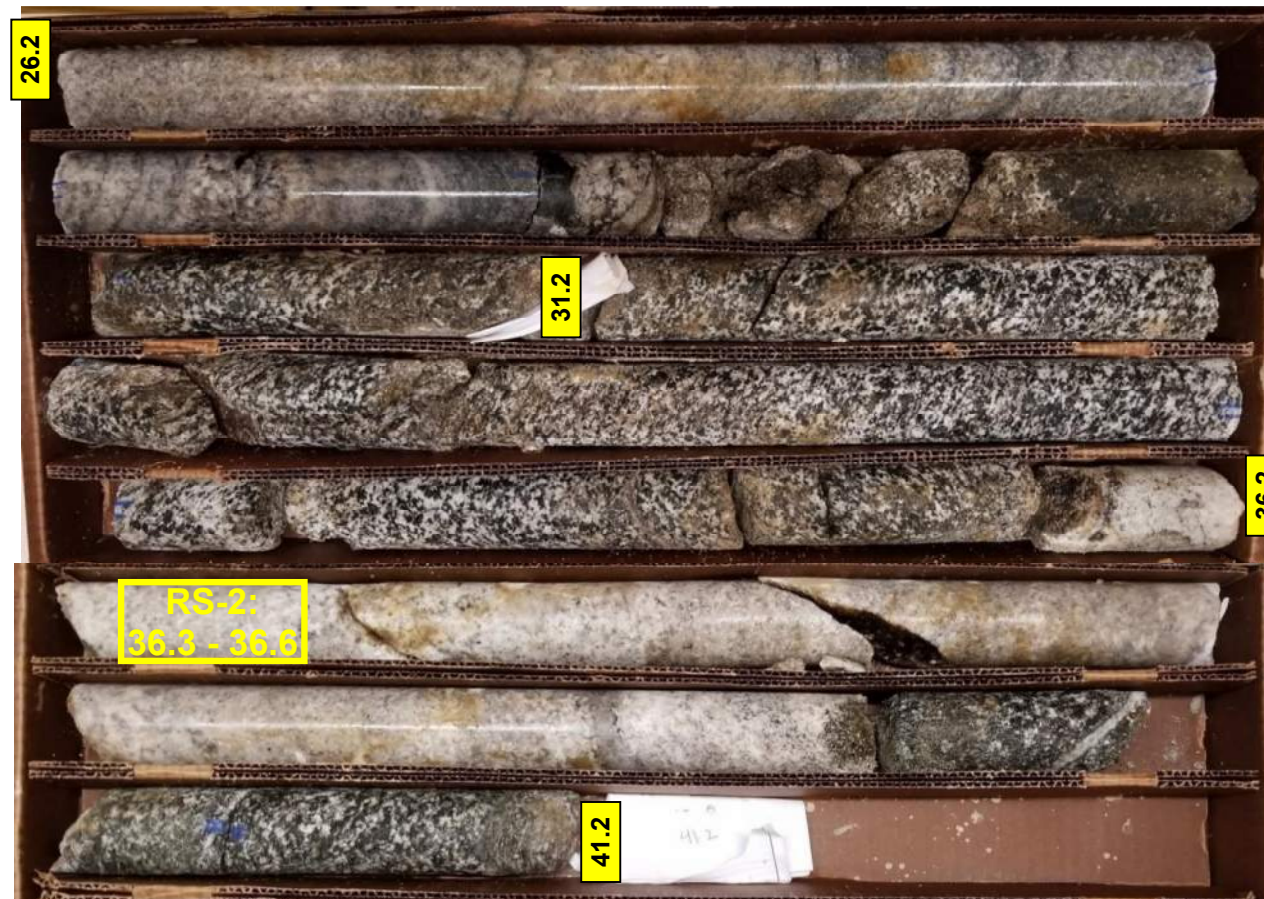
WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke										
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)									
BORING NO. B2-B2		STATION 24+44		OFFSET 23 ft RT		ALIGNMENT -Y2FLYAB-										
COLLAR ELEV. 823.2 ft		TOTAL DEPTH 41.2 ft		NORTHING 841,078		EASTING 1,662,061										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary/Core		HAMMER TYPE Automatic										
DRILLER R. Toothman		START DATE 03/26/19		COMP. DATE 03/27/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
825														823.2	GROUND SURFACE	0.0
820														820.7	ALLUVIAL Brown, Silty Fine to Coarse SAND Brown, Gray, and Orange, Clayey Fine to Coarse SAND	2.5
815																
810														810.7	RESIDUAL Black and White, Silty Fine to Coarse SAND with Trace Mica	12.5
805	804.7	18.5												804.7	CRYSTALLINE ROCK White and Black GRANITE	18.5
800	799.7	23.5														
795	797.0	26.2	60/0.1											797.0	White GRANITE	26.2
790														794.1	Black and White QUARTZ DIORITE	29.1
785														787.2	White GRANITE	36.0
														783.8	Black and White QUARTZ DIORITE	39.4
														782.0	Black and White QUARTZ DIORITE	41.2
Boring Terminated at Elevation 782.0 ft in CRYSTALLINE ROCK: QUARTZ DIORITE																
NOTE: Auger Probe From 0.0 - 18.5' bgs (See Boring B2-B for SPT Sampling)																

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke						
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)					
BORING NO. B2-B2		STATION 24+44		OFFSET 23 ft RT		ALIGNMENT -Y2FLYAB-						
COLLAR ELEV. 823.2 ft		TOTAL DEPTH 41.2 ft		NORTHING 841,078		EASTING 1,662,061						
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary/Core		HAMMER TYPE Automatic						
DRILLER R. Toothman		START DATE 03/26/19		COMP. DATE 03/27/19		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
797												
795	797.0	26.2	5.0	N=60/0.0 4:31/1.0 5:08/1.0 5:52/1.0 2:52/1.0 4:20/1.0	(4.5) 90%	(4.1) 82%		(2.9) 100%	(2.7) 93%		Begin Coring @ 26.2 ft Very Slight Weathering, Hard, White GRANITE with Moderately Close Fracture Spacing (GSI: 80-90)	26.2
790	792.0	31.2	5.0	2:54/1.0 2:58/1.0 3:10/1.0 3:07/1.0 3:22/1.0	(4.9) 98%	(3.4) 68%		(6.3) 91%	(4.8) 70%		Moderate Weathering, Moderately Hard, Black and White QUARTZ DIORITE with Very Close to Close Fracture Spacing (GSI: 45-55)	29.1
785	787.0	36.2	5.0	2:47/1.0 3:47/1.0 4:45/1.0 3:17/1.0 4:03/1.0	(4.5) 90%	(4.5) 90%	RS-2	(3.3) 97%	(3.1) 91%		Slight Weathering, Hard, White GRANITE with Close Fracture Spacing (GSI: 65-75)	36.0
	782.0	41.2						(1.4) 78%	(1.4) 78%		Moderate Weathering, Moderately Hard, Black and White QUARTZ DIORITE with Close Fracture Spacing (GSI: 65-75) Boring Terminated at Elevation 782.0 ft in CRYSTALLINE ROCK: QUARTZ DIORITE	41.2
NOTE: Auger Probe From 0.0 - 18.5' bgs (See Boring B2-B for SPT Sampling)												

CORE PHOTOGRAPHS

B2-B2

BOX 1 & 2: 26.2 to 41.2 FEET



GEOTECHNICAL BORING REPORT

BORE LOG

GEOTECHNICAL BORING REPORT

CORE LOG

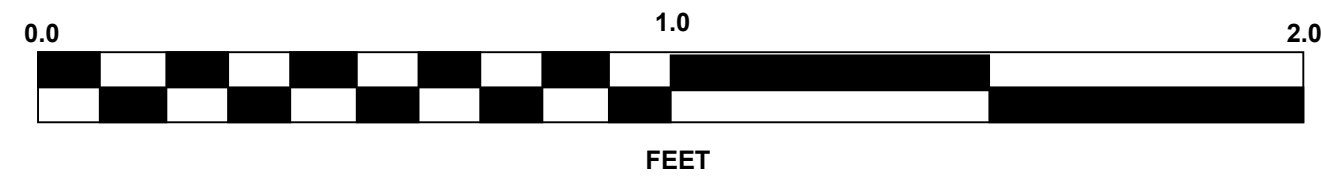
WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke										
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)									
BORING NO. B3-B		STATION 26+39		OFFSET 10 ft RT		ALIGNMENT -Y2FLYAB-										
COLLAR ELEV. 842.0 ft		TOTAL DEPTH 37.6 ft		NORTHING 841,086		EASTING 1,661,862										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary/Core		HAMMER TYPE Automatic										
DRILLER R. Toothman		START DATE 03/19/19		COMP. DATE 03/20/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
845																
	842.0	0.0	1	2	2									842.0	0.0	GROUND SURFACE
840	839.2	2.8	4	7	12									839.5	2.5	RESIDUAL Orange, Coarse to Fine Sandy CLAY with Trace Rock Fragments
																Orange and Brown, Clayey Coarse to Fine SAND
835	834.2	7.8	7	10	42									834.5	7.5	Orange, Black and White, Silty Coarse to Fine SAND with Trace Mica
830	829.4	12.6	60/0.0											829.4	12.6	CRYSTALLINE ROCK White GRANITE
														827.7	14.3	Black and White QUARTZ DIORITE
825														825.0	17.0	White GRANITE
820																White GRANITE
																White GRANITE
815														818.3	23.7	WEATHERED ROCK GRANITE
														816.5	25.5	CRYSTALLINE ROCK White GRANITE
810														810.6	31.4	RESIDUAL White and Brown, Silty Coarse to Fine SAND
	806.5	35.5	3	55	45/0.1									806.0	36.0	WEATHERED ROCK GRANITE
805	804.4	37.6	60/0.0											804.4	37.6	WEATHERED ROCK GRANITE
																Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 804.4 ft on CRYSTALLINE ROCK: GRANITE

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke						
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)					
BORING NO. B3-B		STATION 26+39		OFFSET 10 ft RT		ALIGNMENT -Y2FLYAB-						
COLLAR ELEV. 842.0 ft		TOTAL DEPTH 37.6 ft		NORTHING 841,086		EASTING 1,661,862						
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary/Core		HAMMER TYPE Automatic						
DRILLER R. Toothman		START DATE 03/19/19		COMP. DATE 03/20/19		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		ELEV. (ft)	DEPTH (ft)
829.4	829.4	12.6	2.9	N=60/0.0	(2.3)	(0.9)		(1.7)	(0.9)			Begin Coring @ 12.6 ft
	826.5	15.5		1:55/0.9 2:28/1.0 2:45/1.0	79%	31%		100%	53%			CRYSTALLINE ROCK
825			5.0	1:43/1.0 3:54/1.0 2:23/1.0 4:00/1.0 3:45/1.0	(4.0)	(3.4)		(1.2)	(0.0)			Slight Weathering, Moderately Hard, White GRANITE with Close Fracture Spacing (GSI: 55-65)
	821.5	20.5			80%	68%		(6.6)	(5.4)			Severe Weathering, Medium to Moderately Hard, Black and White QUARTZ DIORITE with Close Fracture Spacing (GSI: 25-35)
820			5.0		(3.2)	(2.8)	RS-3					Moderate Weathering, Moderately Hard, White GRANITE with Close to Moderately Close Fracture Spacing (GSI: 60-70)
	816.5	25.5		3:16/1.0 3:35/1.0 3:07/1.0 1:31/1.0 1:19/1.0	64%	56%		(0.0)	(0.0)			WEATHERED ROCK GRANITE
815			5.0	3:21/1.0 3:14/1.0 3:10/1.0 3:09/1.0 2:41/1.0	(4.3)	(3.3)		(5.2)	(3.3)			CRYSTALLINE ROCK
	811.5	30.5			86%	66%		(0.0)	(0.0)			Severe to Moderate Weathering, Hard to Moderately Hard, White GRANITE with Very Close to Close Fracture Spacing (GSI: 40-50)
810			5.0	1:25/1.0 1:56/1.0 2:19/1.0 1:22/1.0 1:16/1.0	(0.9)	(0.0)		(0.0)	(0.0)			RESIDUAL White and Brown, Silty Coarse to Fine SAND
	806.5	35.5			18%	0%						WEATHERED ROCK
805				N=100/0.6								Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 804.4 ft on CRYSTALLINE ROCK: GRANITE
				N=60/0.0								

CORE PHOTOGRAPHS

B3-B

BOX 1 & 2: 12.6 to 35.5 FEET



GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke										
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)									
BORING NO. B4-A		STATION 28+30		OFFSET 13 ft LT		ALIGNMENT -Y2FLYAB-										
COLLAR ELEV. 836.8 ft		TOTAL DEPTH 65.0 ft		NORTHING 841,056		EASTING 1,661,674										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary/Core		HAMMER TYPE Automatic										
DRILLER R. Toothman		START DATE 03/27/19		COMP. DATE 03/29/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
840																
	836.8	0.0	2	3	5									836.8	0.0	GROUND SURFACE
835																RESIDUAL Orange, Silty Coarse to Fine SAND
	833.3	3.5	15	65	35/0.2									832.8	4.0	WEATHERED ROCK White GRANITE
830																
	828.3	8.5	100/0.4													
825																
	823.3	13.5	35	32	47									824.3	12.5	RESIDUAL White, Brown, and Black, Silty Fine to Coarse SAND
820																
	818.3	18.5	11	8	6											
815																
	813.3	23.5	20	13	13											
810																
	808.3	28.5	9	5	11											
805																
	803.3	33.5	8	10	13											
800																
	798.3	38.5	100/0.5											798.8	38.0	WEATHERED ROCK White and Black GRANITE
795																
	793.3	43.5	60/0.1											793.3	43.5	CRYSTALLINE ROCK QUARTZ DIORITE
790														793.2	43.6	Black and White QUARTZ DIORITE
														789.8	47.0	WEATHERED ROCK QUARTZ DIORITE
785														786.1	50.7	CRYSTALLINE ROCK Black and White QUARTZ DIORITE
														781.8	55.0	White GRANITE
780																
775																
														771.8	65.0	Boring Terminated at Elevation 771.8 ft in CRYSTALLINE ROCK: GRANITE

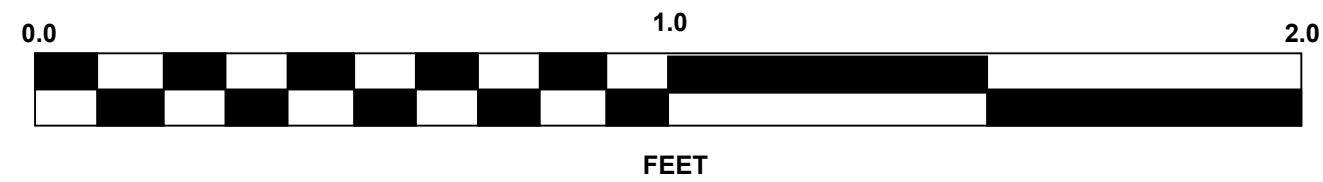
WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST S. Papke						
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)							GROUND WTR (ft)					
BORING NO. B4-A		STATION 28+30		OFFSET 13 ft LT		ALIGNMENT -Y2FLYAB-						
COLLAR ELEV. 836.8 ft		TOTAL DEPTH 65.0 ft		NORTHING 841,056		EASTING 1,661,674						
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019				DRILL METHOD Mud Rotary/Core		HAMMER TYPE Automatic						
DRILLER R. Toothman		START DATE 03/27/19		COMP. DATE 03/29/19		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		ELEV. (ft)	DEPTH (ft)
793.2	791.8	43.6	1.4	0:38/0.4	(0.6)	(0.6)		(1.6)	(0.6)			Begin Coring @ 43.6 ft
		45.0	5.0	1:58/1.0	43%	43%		47%	18%			Moderately Severe Weathering, Medium Hard, Black and White QUARTZ DIORITE with Close to Moderately Close Fracture Spacing (GSI: 20-30)
790				1:34/1.0	(1.0)	(0.0)		(0.0)	(0.0)			WEATHERED ROCK QUARTZ DIORITE
		50.0		1:18/1.0	20%	0%		0%	0%			
785				0:48/1.0								
				1:28/1.0								
780				5:23/1.0	(4.3)	(2.5)		(4.3)	(2.5)			CRYSTALLINE ROCK Moderate to Slight Weathering, Hard, Black and White QUARTZ DIORITE with Moderately Close to Close Fracture Spacing (GSI: 60-70)
				3:53/1.0	86%	50%		100%	58%			
775				3:19/1.0								
				3:28/1.0								
				2:40/1.0								
				4:45/1.0	(4.9)	(3.7)		(9.9)	(8.7)			Moderate to Slight Weathering, Hard, White GRANITE with Close to Moderately Close Fracture Spacing (GSI: 70-80)
				4:49/1.0	98%	74%		99%	87%			
				4:38/1.0								
				3:26/1.0								
				3:11/1.0								
				4:30/1.0	(5.0)	(5.0)						
				4:12/1.0	100%	100%						
				4:37/1.0								
				4:40/1.0								
				4:34/1.0								
												Boring Terminated at Elevation 771.8 ft in CRYSTALLINE ROCK: GRANITE

NCDOT BORE DOUBLE U2579AA_GEO_BRDG_GINT.GPJ NC_DOT.GDT 4/26/19

CORE PHOTOGRAPHS

B4-A

BOXES 1 & 2: 43.6 to 65.0 FEET



**GEOTECHNICAL BORING REPORT
BORE LOG**

**GEOTECHNICAL BORING REPORT
CORE LOG**

WBS 34839.1.7			TIP U-2579AA			COUNTY FORSYTH			GEOLOGIST S. Papke/ C. Driscoll							
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)								GROUND WTR (ft)								
BORING NO. B4-B			STATION 28+12			OFFSET 39 ft RT			ALIGNMENT -Y2FLYAB-			0 HR. N/A				
COLLAR ELEV. 818.8 ft			TOTAL DEPTH 55.5 ft			NORTHING 841,110			EASTING 1,661,686			24 HR. 2.5				
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019						DRILL METHOD Mud Rotary/Core			HAMMER TYPE Automatic							
DRILLER R. Toothman			START DATE 03/29/19			COMP. DATE 04/01/19			SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
820																
	818.8	0.0	WOH	0	1									818.8	GROUND SURFACE	0.0
	816.0	2.8												816.3	ALLUVIAL Red and Orange, Coarse to Fine Sandy CLAY Orange to Gray, Silty Coarse to Fine SAND	2.5
815				1	0											
	811.0	7.8												811.3	RESIDUAL Black, White, and Brown, Silty Coarse to Fine SAND with Trace Rock Fragments	7.5
810				1	5											
	806.0	12.8		14	42											
805																
	801.0	17.8		25	20											
800																
	796.0	22.8		10	9											
795																
	791.0	27.8		75	25/0.1											
790																
	786.0	32.8		25	75/0.4											
785																
	781.0	37.8			100/0.3											
780																
	776.0	42.8			60/0.1											
775																
	771.3	47.5			60/0.0											
770																
765																

NCDOT BORE DOUBLE U2579AA_GEO_BRDG_GINT.GPJ NC_DOT.GDT 4/26/19

WBS 34839.1.7			TIP U-2579AA			COUNTY FORSYTH			GEOLOGIST S. Papke/ C. Driscoll							
SITE DESCRIPTION Bridge No. 733 on US-311 Flyover (-Y2FLYAB-) over Winston-Salem Northern Beltway (-L-)								GROUND WTR (ft)								
BORING NO. B4-B			STATION 28+12			OFFSET 39 ft RT			ALIGNMENT -Y2FLYAB-			0 HR. N/A				
COLLAR ELEV. 818.8 ft			TOTAL DEPTH 55.5 ft			NORTHING 841,110			EASTING 1,661,686			24 HR. 2.5				
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 87% 03/21/2019						DRILL METHOD Mud Rotary/Core			HAMMER TYPE Automatic							
DRILLER R. Toothman			START DATE 03/29/19			COMP. DATE 04/01/19			SURFACE WATER DEPTH N/A							
CORE SIZE N/A		TOTAL RUN 8.0 ft														
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)				
					REC. (%)	RQD (%)		REC. (%)	RQD (%)							
771.3																
	771.3	47.5	3.0	N=60/0.0 4:00/1.0 3:30/1.0 2:00/1.0	(2.7)	(2.2)		(7.7)	(7.2)							
770																
	768.3	50.5	5.0	4:30/1.0 5:00/1.0 4:15/1.0 4:45/1.0 5:00/1.0	(5.0)	(5.0)										
765																
	763.3	55.5					RS-5									

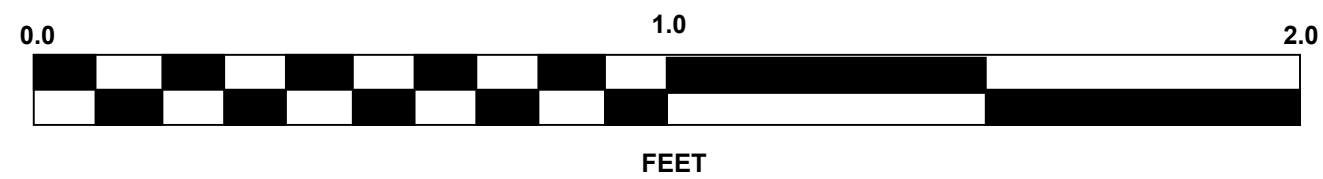
Begin Coring @ 47.5 ft
Slight Weathering, Hard, Gray, Black, and White QUARTZ DIORITE with Wide to Close Fracture Spacing (GSI: 85-95)

Boring Terminated at Elevation 763.3 ft in CRYSTALLINE ROCK: QUARTZ DIORITE

CORE PHOTOGRAPHS

B4-B

BOX 1 & 2: 47.5 to 55.5 FEET



LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

SHEET 29

PROJECT NO.: 34839.1.7 (U-2579AA)

COUNTY: FORSYTH

BRIDGE NO. 733 ON US 311 FLYOVER (-Y2FLYAB-) OVER WINSTON-SALEM NORTHERN BELTWAY (-L-)

Sample No.	Boring No.	Depth (ft)	Rock Type	Geologic Map Unit	Run RQD (%)	Length (in)	Diameter (in)	Wet Unit Weight (pcf)	Unconfined Compressive Strength (psi)	Young's Modulus (psi)	Splitting Tensile Strength (psi)	Remarks
RS-1	B2-A	54.1 - 54.4	Quartz Diorite	PPg	90	4.01	1.96	179.3	16,870	N/A	N/A	GSI - 65 to 75
RS-2	B2-B2	36.3 - 36.6	Granite	PPg	90	4.03	1.96	160.9	10,520	N/A	N/A	GSI - 65 to 75
RS-3	B3-B	20.6 - 20.9	Granite	PPg	56	4.00	1.96	159.8	8,410	N/A	N/A	GSI - 60 to 70
RS-4	B4-A	54.0 - 54.3	Quartz Diorite	PPg	50	4.03	1.96	177.2	17,770	N/A	N/A	GSI - 60 to 70
RS-5	B4-B	53.0 - 53.3	Quartz Diorite	PPg	100	4.05	1.96	179.2	16,570	N/A	N/A	GSI - 85 to 95

WBS NO.: 34839.1.7 - TIP NO.: U-2579AA
BRIDGE NO. 733 ON US 311 FLYOVER (-Y2FLYAB-) OVER WINSTON-SALEM NORTHERN BELTWAY (-L-)
SITE PHOTOGRAPHS



View Looking South at -Y2FLYAB- from the North



View From EB2 looking downstation along -Y2FLYAB-



View from EB1 Looking Upstation Along -Y2FLYAB-

REFERENCE: U-2579AA

PROJECT: 34839

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY FORSYTH
PROJECT DESCRIPTION WINSTON-SALEM NORTHERN
BELTWAY EASTERN SECTION (FUTURE I-74)
FROM US 311 TO I-40
SITE DESCRIPTION NOISE WALL NO. 7 FROM -NW7-
STA. 10+00 TO 32+50

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3-4	SITE PLAN AND WALL PROFILE
5-14	BORE LOGS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AA	1	14

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 1919 TOTT-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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- NOTES:
- THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 - BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

J. K. STICKNEY
C. L. SMITH
B. E. FOSTER

INVESTIGATED BY C. R. LAVENDER, III
CAROLINAS
DRAWN BY GEOTECHNICAL GROUP
CHECKED BY K. B. MILLER
SUBMITTED BY K. B. MILLER
DATE MARCH 2021

CADD Work Prepared in the Office of:



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CHARLOTTE, NC 28227
(980) 339-8684



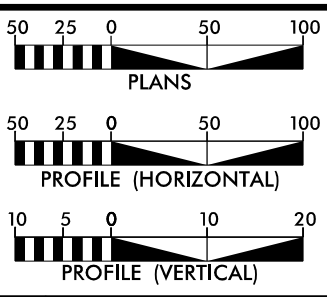
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
 SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

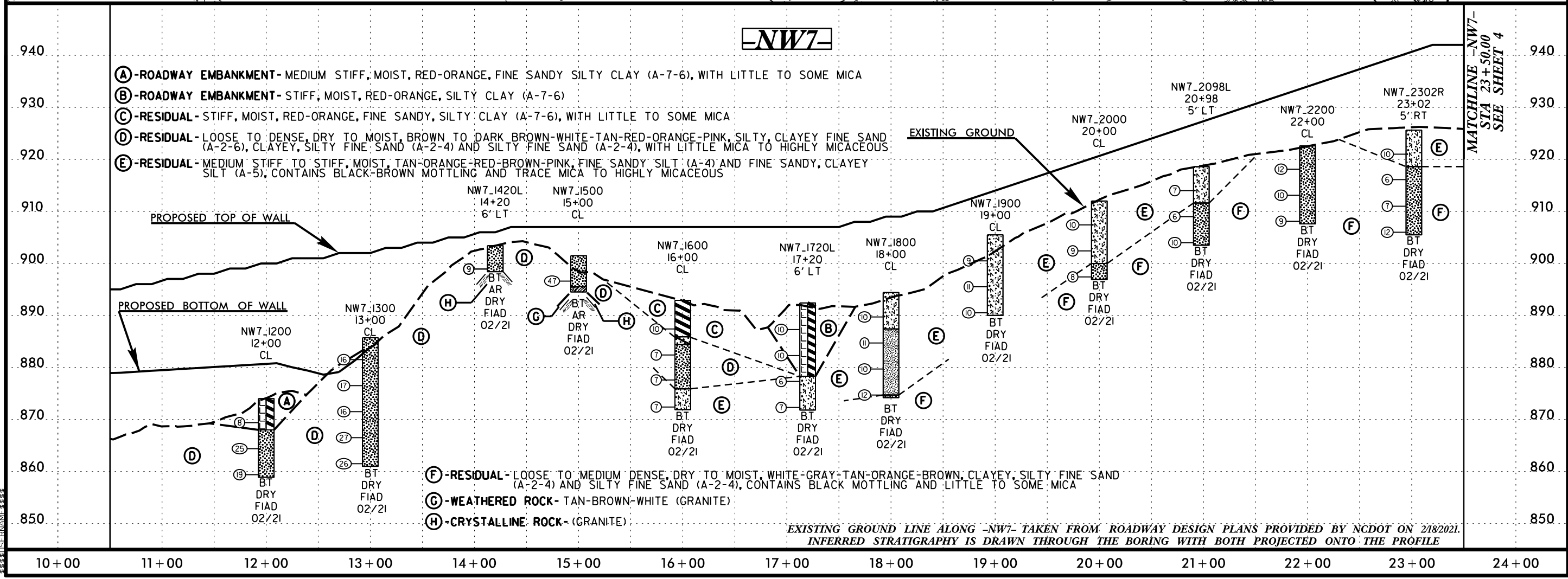
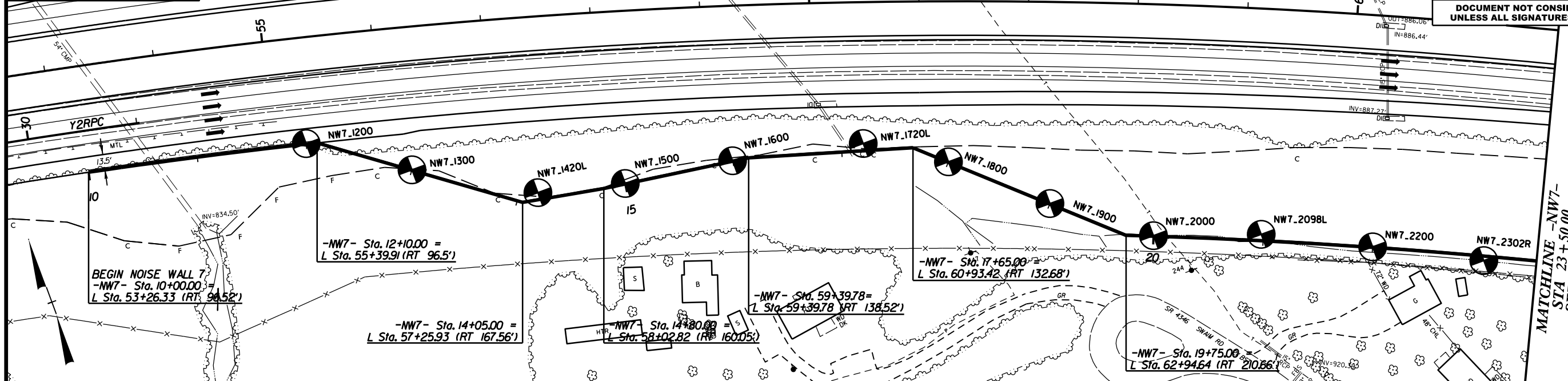
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 208, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)										CRYSTALLINE ROCK (CR)									
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.										FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.									
MINERALOGICAL COMPOSITION										NON-CRYSTALLINE ROCK (NCR)										COASTAL PLAIN SEDIMENTARY ROCK (CP)										WEATHERING									
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLITE, SLATE, SANDSTONE, ETC.										COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.										FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (IV SLI) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SLI) - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL SEVERE (SEV.) - 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 TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY SEVERE (IV SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF COMPLETE - ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.									
COMPRESSION										PERCENTAGE OF MATERIAL										GROUND WATER										MISCELLANEOUS SYMBOLS									
SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50										ORGANIC MATERIAL GRANULAR SOILS SILT - CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE LITTLE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% SOME 20 - 35% MODERATELY ORGANIC 5 - 10% 12 - 20% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SPT DMT TEST BORING VST PMT AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE									
CONSISTENCY OR DENSENESS										RECOMMENDATION SYMBOLS										ABBREVIATIONS										ROCK HARDNESS									
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)										UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - COPE PENETRATION TEST CSE - COARSE DPT - DILATOMETER TEST DMT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED UNIT WEIGHT DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO										VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD 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 BY MODERATE BLOWS. MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROOVED 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 PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.									
TEXTURE OR GRAIN SIZE										SOIL MOISTURE - CORRELATION OF TERMS										FRACTURE SPACING										BEDDING									
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.75 2.00 0.42 0.25 0.075 0.053										SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										TERM SPACING MORE THAN 10 FEET 3 TO 10 FEET 1 TO 3 FEET 0.16 TO 1 FOOT LESS THAN 0.16 FEET										TERM THICKNESS 4 FEET 1.5 - 4 FEET 0.16 - 1.5 FEET 0.03 - 0.16 FEET 0.008 - 0.03 FEET < 0.008 FEET									
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)										LL - LIQUID LIMIT - SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE PL - PLASTIC LIMIT - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE OM - OPTIMUM MOISTURE SHRINKAGE LIMIT - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE										VERY WIDE MODERATELY CLOSE CLOSE VERY CLOSE										VERY THICKLY BEDDED THICKLY BEDDED THINLY BEDDED VERY THINLY BEDDED THICKLY LAMINATED THINLY LAMINATED									
PLASTICITY										EQUIPMENT USED ON SUBJECT PROJECT										INDURATION										NOTES:									
NON PLASTIC SLIGHTLY PLASTIC MODERATELY PLASTIC HIGHLY PLASTIC PLASTICITY INDEX (PI) 0-5 6-15 16-25 26 OR MORE DRY STRENGTH VERY LOW SLIGHT MEDIUM HIGH										DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CORE SIZE: HAND TOOLS:										FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.										BENCH MARK: N/A ELEVATION: FEET									
COLOR										DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																				THE DIVISION 9 LOCATION AND SURVEYS OFFICE PROVIDED BORING LOCATIONS AND ELEVATIONS. FOR BORINGS THAT WERE OFFSET DURING DRILLING, LOCATIONS AND ELEVATIONS WERE EXTRACTED FROM THE GPK AND TIN FILES DATED MARCH 17, 2020.									

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 Carolinas Geotechnical Group, PLLC\Projects\0085 - U-2579AA SWAL Clearing_NCDOT_ON_CALL\U-2579AA_NW7_psh01.dgn



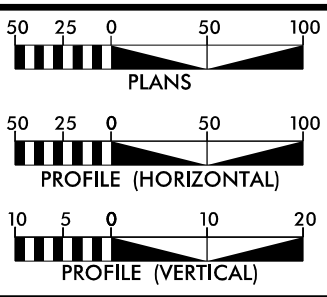
PLAN AND PROFILE OF NOISE WALL 7

PROJECT REFERENCE NO. U-2579AA	SHEET NO. 3
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



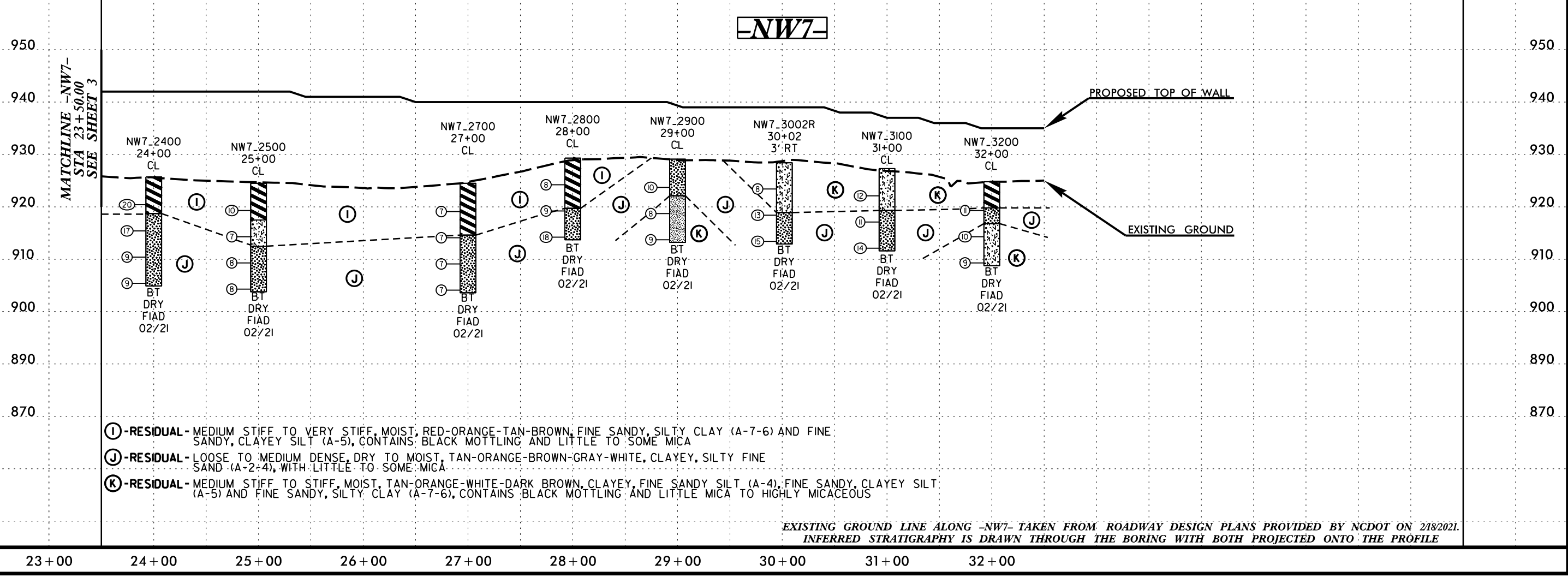
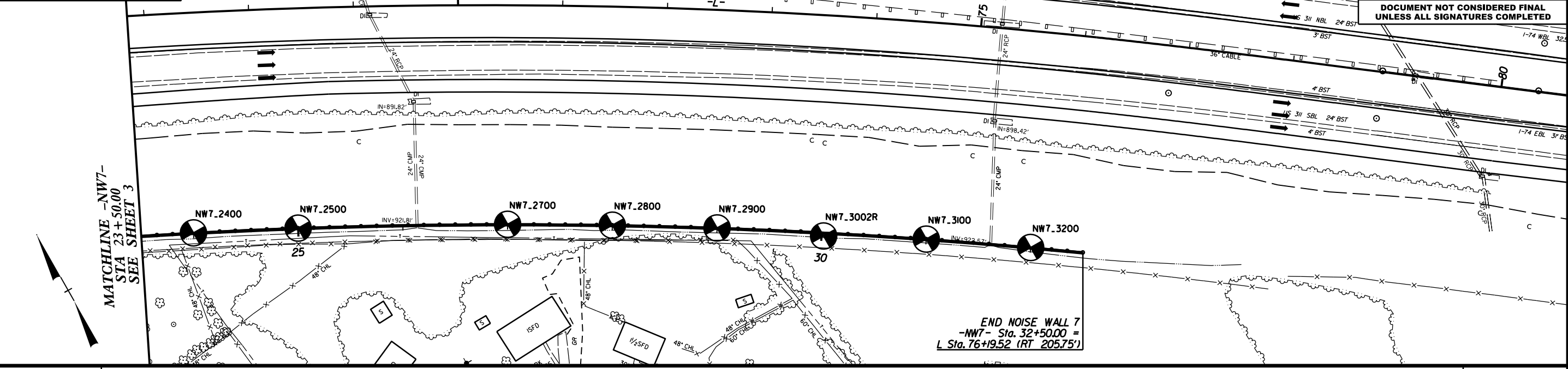
MATCHLINE -NW7- STA 23+50.00 SEE SHEET 4

8/17/99
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PLAN AND PROFILE OF NOISE WALL 7

PROJECT REFERENCE NO. U-2579AA	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_1200		STATION 12+00		OFFSET CL		ALIGNMENT -NW7-										
COLLAR ELEV. 874.0 ft		TOTAL DEPTH 15.1 ft		NORTHING 840,469		EASTING 1,662,954										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/03/21		COMP. DATE 02/03/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
875														874.0	0.0	GROUND SURFACE
870	870.4	3.6	2	3	5								M	868.0	6.0	ROADWAY EMBANKMENT Medium Stiff, Red-Orange, Fine Sandy Silty CLAY (A-7-6), with little to some mica
865	865.4	8.6	7	11	14								D			RESIDUAL Medium Dense, Brown-White, Clayey, Silty Fine SAND (A-2-4), with little mica to highly micaceous
860	860.4	13.6	5	8	11								D			Boring Terminated at Elevation 858.9 ft In Residual Clayey, Silty Fine Sand (A-2-4)

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_1300		STATION 13+00		OFFSET CL		ALIGNMENT -NW7-										
COLLAR ELEV. 885.7 ft		TOTAL DEPTH 24.7 ft		NORTHING 840,413		EASTING 1,663,037										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/03/21		COMP. DATE 02/03/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
890														885.7	0.0	GROUND SURFACE
885													D			RESIDUAL Medium Dense, Tan-Brown, Clayey, Silty Fine SAND (A-2-4), with little to some mica
880	882.5	3.2	5	4	12								D			
875	877.5	8.2	6	7	10								D			
870	872.5	13.2	8	7	9								D			
865	867.5	18.2	15	15	12								D			
	862.5	23.2	7	11	15								D			
														861.0	24.7	Boring Terminated at Elevation 861.0 ft In Residual Silty Fine Sand (A-2-4)

NCDOT BORE DOUBLE U-2579AA GEO_NW7_BORINGS.GPJ NC_DOT_GDT 3/4/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_1420L		STATION 14+20		OFFSET 6 ft LT		ALIGNMENT -NW7-										
COLLAR ELEV. 903.4 ft		TOTAL DEPTH 5.0 ft		NORTHING 840,354		EASTING 1,663,137										
DRILL RIGHAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/03/21		COMP. DATE 02/03/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
905															903.4	0.0
900	899.9	3.5	3	4	5	●	●	●	●	●	●		M	●	898.4	5.0
Boring Terminated by Auger Refusal at Elevation 898.4 ft On Crystalline Rock (GRANITE)																

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_1500		STATION 15+00		OFFSET CL		ALIGNMENT -NW7-										
COLLAR ELEV. 901.5 ft		TOTAL DEPTH 7.0 ft		NORTHING 840,334		EASTING 1,663,214										
DRILL RIGHAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/03/21		COMP. DATE 02/03/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
905															901.5	0.0
900													M	●		
	897.6	3.9												●		
895														●	894.5	7.0
WEATHERED ROCK Tan-Brown-White (GRANITE) Boring Terminated by Auger Refusal at Elevation 894.5 ft On Crystalline Rock (GRANITE)																

NCDOT BORE DOUBLE U-2579AA GEO_NW7_BORINGS.GPJ NC_DOT_GDT 3/4/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_1600		STATION 16+00		OFFSET CL		ALIGNMENT -NW7-										
COLLAR ELEV. 892.9 ft		TOTAL DEPTH 21.0 ft		NORTHING 840,320		EASTING 1,663,313										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/03/21		COMP. DATE 02/03/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
895														892.9	0.0	GROUND SURFACE
890	888.4	4.5	3	4	6								M	885.9	7.0	RESIDUAL Stiff, Red-Orange, Fine Sandy, Silty CLAY (A-7-6), with little to some mica
885	883.4	9.5	3	3	4								M	884.4	8.5	Loose, Red-Orange-Pink, Silty, Clayey Fine Sand (A-2-6), with little to some mica
880	878.6	14.3	2	3	4								M	875.9	17.0	Loose, Brown-White, Clayey, Silty Fine SAND (A-2-4), with little to some mica
875	873.4	19.5	2	3	4								M	871.9	21.0	Medium Stiff, Tan-Orange, Fine Sandy, Clayey SILT (A-5), contains brown mottling and little to some mica
Boring Terminated at Elevation 871.9 ft In Residual Fine Sandy, Clayey Silt (A-5)																

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_1720L		STATION 17+20		OFFSET 6 ft LT		ALIGNMENT -NW7-										
COLLAR ELEV. 892.4 ft		TOTAL DEPTH 20.6 ft		NORTHING 840,293		EASTING 1,663,430										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/03/21		COMP. DATE 02/03/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
895														892.4	0.0	GROUND SURFACE
890	888.3	4.1	3	4	6								M	885.9	7.0	ROADWAY EMBANKMENT Stiff, Red-Orange, Silty CLAY (A-7-6)
885	883.3	9.1	3	4	6								M	884.4	8.5	Loose, Red-Orange-Pink, Silty, Clayey Fine Sand (A-2-6), with little to some mica
880	878.3	14.1	2	2	4								M	875.9	17.0	Loose, Brown-White, Clayey, Silty Fine SAND (A-2-4), with little to some mica
875	873.3	19.1	2	3	4								M	871.8	20.6	Medium Stiff, Tan-Orange, Fine Sandy, Clayey SILT (A-5), contains black mottling and little to some mica
Boring Terminated at Elevation 871.8 ft In Residual Fine Sandy, Clayey Silt (A-5)																

NCDOT BORE DOUBLE U-2579AA GEO_NW7_BORINGS.GPJ NC_DOT_GDT 3/4/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_1800		STATION 18+00		OFFSET CL		ALIGNMENT -NW7-										
COLLAR ELEV. 894.4 ft		TOTAL DEPTH 20.2 ft		NORTHING 840,250		EASTING 1,663,498										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/03/21		COMP. DATE 02/03/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
895														894.4	0.0	GROUND SURFACE
890	890.7	3.7	2	3	7								M	887.4	7.0	RESIDUAL Stiff, Tan-Orange, Fine Sandy, Clayey SILT (A-5), with little to some mica
885	885.7	8.7	4	4	7								M			Stiff, Tan-Red-Brown-Pink, Fine Sandy SILT (A-4), with trace to little mica
880	880.7	13.7	3	4	6								M			
875	875.7	18.7	3	4	8								D	874.7	19.7	Medium Dense, White, Silty Fine SAND (A-2-4)
														874.2	20.2	Boring Terminated at Elevation 874.2 ft In Residual Silty Fine Sand (A-2-4)

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_1900		STATION 19+00		OFFSET CL		ALIGNMENT -NW7-										
COLLAR ELEV. 905.5 ft		TOTAL DEPTH 15.5 ft		NORTHING 840,182		EASTING 1,663,571										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/03/21		COMP. DATE 02/03/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
910														905.5	0.0	GROUND SURFACE
905													M			RESIDUAL Stiff, Tan-Orange-Brown, Fine Sandy, Clayey SILT (A-5), with little to some mica
900	901.5	4.0	3	4	5								M			
895	896.5	9.0	3	5	6								M			
	891.5	14.0	4	4	6								M			
																Boring Terminated at Elevation 890.0 ft In Residual Fine Sandy, Clayey Silt (A-5)

NCDOT BORE DOUBLE U-2579AA GEO_NW7_BORINGS.GPJ NC_DOT.GDT 3/4/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)								
BORING NO. NW7_2000		STATION 20+00		OFFSET CL		ALIGNMENT -NW7-									
COLLAR ELEV. 912.0 ft		TOTAL DEPTH 15.1 ft		NORTHING 840,122		EASTING 1,663,649									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 02/04/21		COMP. DATE 02/04/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
915															
														912.0	0.0
910	908.4	3.6	4	4	6							M	RESIDUAL Stiff, Tan-Orange-Brown-Pink, Fine Sandy, Clayey SILT (A-5), with little to some mica		
905	903.4	8.6	3	4	5							M			
900	898.4	13.6	3	3	5							M	Loose, Gray-White, Clayey, Silty Fine SAND (A-2-4), with little to some mica	12.0	
														896.9	15.1
Boring Terminated at Elevation 896.9 ft In Residual Clayey, Silty Fine Sand (A-2-4)															

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)								
BORING NO. NW7_2098L		STATION 20+98		OFFSET 5 ft LT		ALIGNMENT -NW7-									
COLLAR ELEV. 918.6 ft		TOTAL DEPTH 15.1 ft		NORTHING 840,089		EASTING 1,663,742									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 02/04/21		COMP. DATE 02/04/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
920															
														918.6	0.0
915	915.0	3.6	3	3	4							M	RESIDUAL Medium Stiff, Tan-Brown-Pink-Orange, Fine Sandy, Clayey SILT (A-5), with little to some mica		
910	910.0	8.6	4	3	3							D	Loose, Gray-White, Clayey, Silty Fine SAND (A-2-4), with little to some mica	7.0	
905	905.0	13.6	3	4	6							D			
														903.5	15.1
Boring Terminated at Elevation 903.5 ft In Residual Clayey, Silty Fine Sand (A-2-4)															

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GEOTECHNICAL BORING REPORT BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_2200		STATION 22+00		OFFSET CL		ALIGNMENT -NW7-										
COLLAR ELEV. 922.6 ft		TOTAL DEPTH 15.0 ft		NORTHING 840,043		EASTING 1,663,833										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/04/21		COMP. DATE 02/04/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
925																
920	919.1	3.5	3	4	8	12							D		922.6	GROUND SURFACE 0.0
915	914.1	8.5	4	5	5	10							D			
910	909.1	13.5	4	4	5	9							D		907.6	15.0
															Boring Terminated at Elevation 907.6 ft In Residual Clayey, Silty Fine Sand (A-2-4)	

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_2302R		STATION 23+02		OFFSET 5 ft RT		ALIGNMENT -NW7-										
COLLAR ELEV. 925.6 ft		TOTAL DEPTH 20.1 ft		NORTHING 839,996		EASTING 1,663,924										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/04/21		COMP. DATE 02/04/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
930																
925															925.6	GROUND SURFACE 0.0
920	922.0	3.6	3	4	6	10							M			
915	917.1	8.5	3	3	3	6							D		918.6	7.0
910	912.0	13.6	4	3	4	7							M			
	907.0	18.6	5	6	6	12							D		905.5	20.1
															Boring Terminated at Elevation 905.5 ft In Residual Clayey, Silty Fine Sand (A-2-4)	

NCDOT BORE DOUBLE U-2579AA_GEO_NW7_BORINGS.GPJ NC_DOT_GDT_3/4/21

GEOTECHNICAL BORING REPORT BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50						GROUND WTR (ft)										
BORING NO. NW7_2400		STATION 24+00		OFFSET CL		ALIGNMENT -NW7-										
COLLAR ELEV. 925.7 ft		TOTAL DEPTH 20.8 ft		NORTHING 839,958		EASTING 1,664,014										
DRILL RIGHAMMER EFF/DATE HFC0072 CME-550X 89% 12/16/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/04/21		COMP. DATE 02/04/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
930																
925																
920	921.4	4.3	6	9	11	RESIDUAL Very Stiff, Red-Orange, Fine Sandy, Silty Clay (A-7-6), with little to some mica					M	LOG				
915	916.4	9.3	7	8	9	Loose to Medium Dense, Tan-Orange-Gray-White, Clayey, Silty Fine SAND (A-2-4)					D					
910	911.4	14.3	5	4	5						D					
	906.4	19.3	6	4	5						D					
905											D					
Boring Terminated at Elevation 904.9 ft In Residual Clayey, Silty Fine Sand (A-2-4)																

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50						GROUND WTR (ft)										
BORING NO. NW7_2500		STATION 25+00		OFFSET CL		ALIGNMENT -NW7-										
COLLAR ELEV. 924.5 ft		TOTAL DEPTH 20.7 ft		NORTHING 839,912		EASTING 1,664,103										
DRILL RIGHAMMER EFF/DATE HFC0072 CME-550X 89% 12/16/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/04/21		COMP. DATE 02/04/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
925																
920	920.3	4.2	3	4	6	RESIDUAL Stiff, Red-Orange, Fine Sandy, Silty CLAY (A-7-6), with little to some mica					M	LOG				
915	915.3	9.2	3	3	4	Medium Stiff, Tan-Orange-Brown, Fine Sandy, Clayey SILT (A-5), contains black mottling					M					
910	910.3	14.2	5	4	4	Loose, Gray-White-Tan-Brown, Clayey, Silty Fine SAND (A-2-4), with little to some mica					D					
	905.3	19.2	3	4	4						D					
905											D					
Boring Terminated at Elevation 903.8 ft In Residual Clayey, Silty Fine Sand (A-2-4)																

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.											
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)										
BORING NO. NW7_2700		STATION 27+00		OFFSET CL		ALIGNMENT -NW7-											
COLLAR ELEV. 924.5 ft		TOTAL DEPTH 20.9 ft		NORTHING 839,817		EASTING 1,664,279											
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Smith, C. L.		START DATE 02/09/21		COMP. DATE 02/09/21		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
925															924.5	GROUND SURFACE	0.0
920	920.1	4.4	3	3	4	7						M		RESIDUAL Medium Stiff, Tan-Orange, Fine Sandy, Silty CLAY (A-7-6), with little to some mica			
915	915.1	9.4	3	3	4	7						M		914.6	Loose, Gray-White, Clayey, Silty Fine SAND (A-2-4), with little to some mica	9.9	
910	910.1	14.4	3	3	4	7						M					
905	905.1	19.4	2	3	4	7						M				903.6	20.9
Boring Terminated at Elevation 903.6 ft In Residual Clayey, Silty Fine Sand (A-2-4)																	

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.											
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)										
BORING NO. NW7_2800		STATION 28+00		OFFSET CL		ALIGNMENT -NW7-											
COLLAR ELEV. 929.3 ft		TOTAL DEPTH 15.6 ft		NORTHING 839,767		EASTING 1,664,365											
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Smith, C. L.		START DATE 02/09/21		COMP. DATE 02/09/21		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
930															929.3	GROUND SURFACE	0.0
925	925.2	4.1	2	4	4	8						M		RESIDUAL Medium Stiff to Stiff, Red-Orange, Fine Sandy, Silty CLAY (A-7-6), little to some mica			
920	920.2	9.1	3	5	4	9						M		919.7	Loose to Medium Dense, Tan-Orange-Gray-White, Clayey, Silty Fine SAND (A-2-4), with little to some mica	9.6	
915	915.2	14.1	6	10	8	18						D		913.7	15.6		
Boring Terminated at Elevation 913.7 ft In Residual Clayey, Silty Fine Sand (A-2-4)																	

NCDOT BORE DOUBLE U-2579AA GEO_NW7_BORINGS.GPJ NC_DOT_GDT 3/4/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_2900		STATION 29+00		OFFSET CL		ALIGNMENT -NW7-										
COLLAR ELEV. 929.1 ft		TOTAL DEPTH 15.9 ft		NORTHING 839,716		EASTING 1,664,451										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/09/21		COMP. DATE 02/09/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
930															929.1	0.0
925	924.7	4.4	3	5	5								M		922.1	7.0
920	919.7	9.4	3	3	5								M			
915	914.7	14.4	3	4	5								M		913.2	15.9
															Boring Terminated at Elevation 913.2 ft In Residual Clayey, Fine Sandy Silt (A-4)	

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)									
BORING NO. NW7_3002R		STATION 30+02		OFFSET 3 ft RT		ALIGNMENT -NW7-										
COLLAR ELEV. 928.4 ft		TOTAL DEPTH 15.5 ft		NORTHING 839,659		EASTING 1,664,536										
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Smith, C. L.		START DATE 02/09/21		COMP. DATE 02/09/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
930															928.4	0.0
925	924.4	4.0	3	3	5								M			
920	919.4	9.0	6	6	7								D		918.9	9.5
915	914.4	14.0	7	7	8								D		912.9	15.5
															Boring Terminated at Elevation 912.9 ft In Residual Clayey, Silty Fine Sand (A-2-4)	

NCDOT BORE DOUBLE U-2579AA GEO_NW7_BORINGS.GPJ NC_DOT_GDT 3/4/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)								
BORING NO. NW7_3100		STATION 31+00		OFFSET CL		ALIGNMENT -NW7-									
COLLAR ELEV. 927.3 ft		TOTAL DEPTH 15.7 ft		NORTHING 839,608		EASTING 1,664,620									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 02/09/21		COMP. DATE 02/09/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
930															
														927.3	0.0
925															
	923.1	4.2	3	5	7								M	Stiff, Tan-Orange, Fine Sandy, Clayey SILT (A-5), with little to some mica	
920															
	918.1	9.2	4	5	6								M	Medium Dense, Tan-Gray-White, Clayey, Silty Fine SAND (A-2-4), with some mica	8.0
915															
	913.1	14.2	5	6	8								D	Boring Terminated at Elevation 911.6 ft In Residual Clayey, Silty Fine Sand (A-2-4)	15.7

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Noise Wall No. 7 from -NW7- Sta. 10+00 to Sta. 32+50							GROUND WTR (ft)								
BORING NO. NW7_3200		STATION 32+00		OFFSET CL		ALIGNMENT -NW7-									
COLLAR ELEV. 924.8 ft		TOTAL DEPTH 16.0 ft		NORTHING 839,552		EASTING 1,664,703									
DRILL RIG/HAMMER EFF./DATE HFC0072 CME-550X 89% 12/16/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Smith, C. L.		START DATE 02/09/21		COMP. DATE 02/09/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
925															
														924.8	0.0
920	920.3	4.5	4	5	6								M	RESIDUAL Stiff, Tan-Orange, Fine Sandy, Silty CLAY (A-7-6), with little to some mica	5.0
915	915.3	9.5	4	4	6								M	Medium Dense, Gray-White, Clayey, Silty Fine SAND (A-2-4), with little to some mica	8.0
910	910.3	14.5	2	3	6								M	Stiff, Tan-Orange, Fine Sandy, Clayey SILT (A-5), contains black mottling and some mica	16.0
														908.8	16.0
															Boring Terminated at Elevation 908.8 ft In Residual Fine Sandy, Clayey Silt (A-5)

NCDOT BORE DOUBLE U-2579AA GEO_NW7_BORINGS.GPJ NC_DOT_GDT 3/4/21

REFERENCE: U-2579AA

PROJECT: 34839

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5-II	CROSS SECTIONS
12-30	BORE LOGS
31	SITE PHOTOGRAPHS

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY FORSYTH
 PROJECT DESCRIPTION WINSTON-SALEM NORTHERN
BELTWAY EASTERN SECTION (FUTURE I-74)
FROM US 311 TO I-40
 SITE DESCRIPTION BRIDGE NO. 729 ON -Y2FLYCA- OVER
FUTURE I-74

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AA	1	31

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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

- NOTES:
- THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 - BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

A. SUTTLE

P. DONNELLY

M. MAGNO

J. GARRICK

M&W

HPC

INVESTIGATED BY ECS SOUTHEAST, LLP

DRAWN BY K. DE MONTBRUN, P.E.

CHECKED BY M. WALKO, P.E.

SUBMITTED BY ECS SOUTHEAST, LLP

DATE NOVEMBER 2019

Prepared in the Office of:



ECS SOUTHEAST, LLP
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 CHARLOTTE, NC 28217
 (704) 525-5152 (PHONE)
 (704) 357-0023 (FAX)
 NC REGISTERED
 ENGINEERING
 FIRM # F-1078



DocuSigned by:

Michael J. Walko

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1/14/2020

SIGNATURE

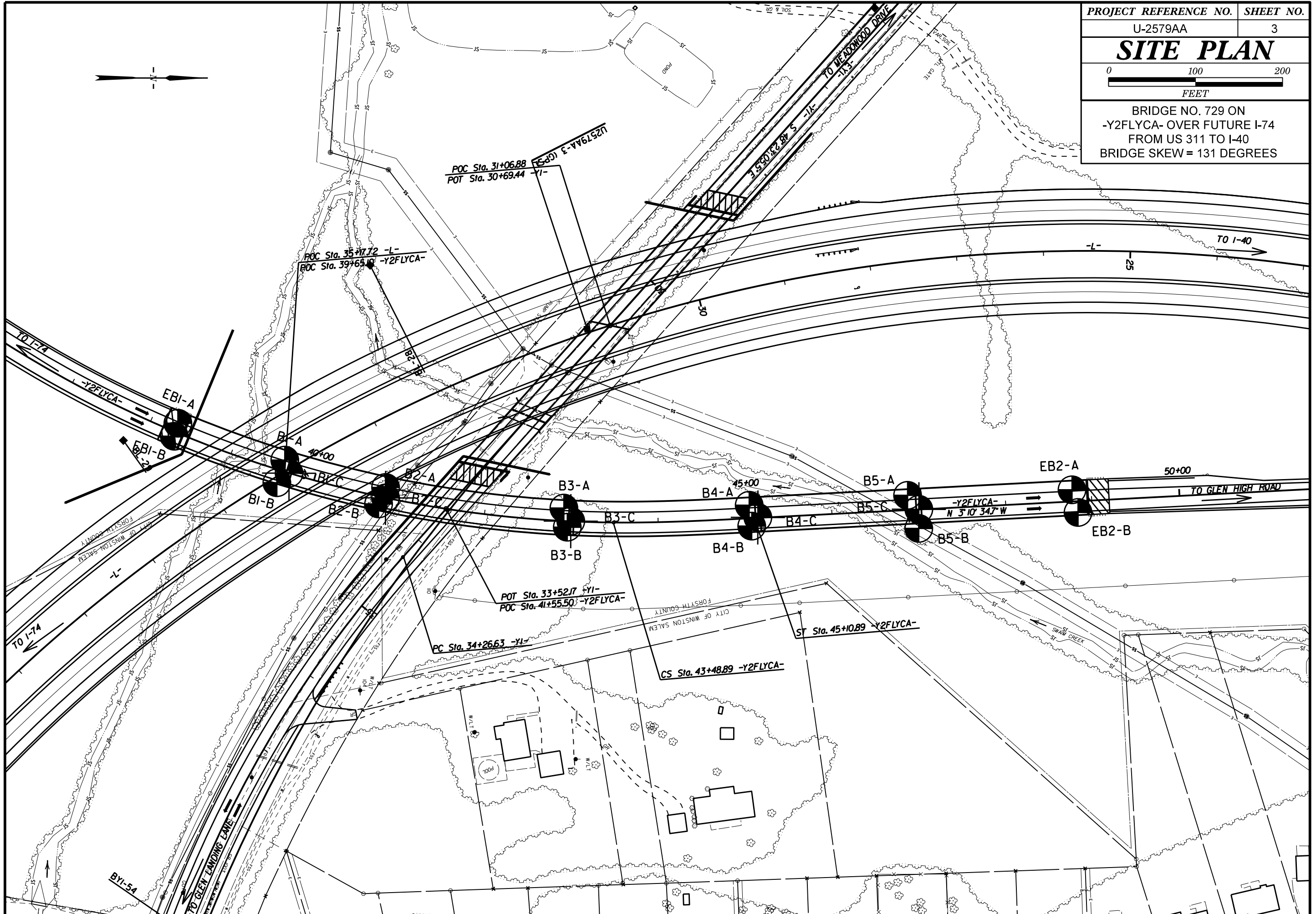
DATE

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

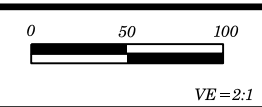
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with multiple sections: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, MINERALOGICAL COMPOSITION, COMPRESSIBILITY, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, INDURATION.

PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	3
SITE PLAN	
BRIDGE NO. 729 ON -Y2FLYCA- OVER FUTURE I-74 FROM US 311 TO I-40 BRIDGE SKEW = 131 DEGREES	



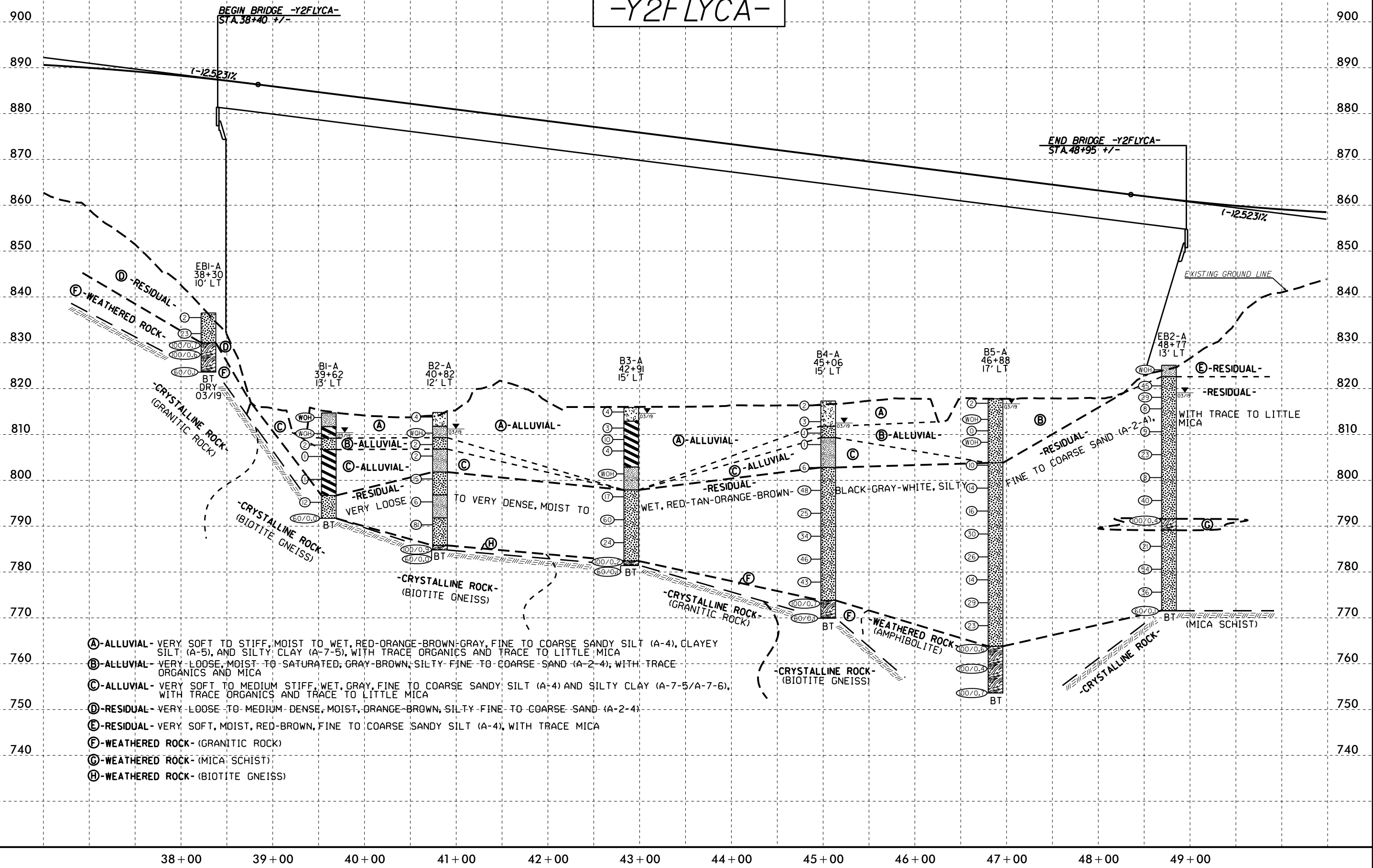
5/14/19
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 PC: NOV 2018 09:29
 PLOT: 03/22/2019 10:58:38 AM
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PROJECT REFERENCE NO.	SHEET NO.
U-2579AA	4
PROFILE BORINGS PROJECTED ON -Y2FLYCA- ALONG BRIDGE 729	

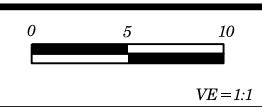
-Y2FLYCA- PROFILE ALONG EXISTING GROUND LINE FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON FEBRUARY 18, 2019. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE PROFILE.

-Y2FLYCA-

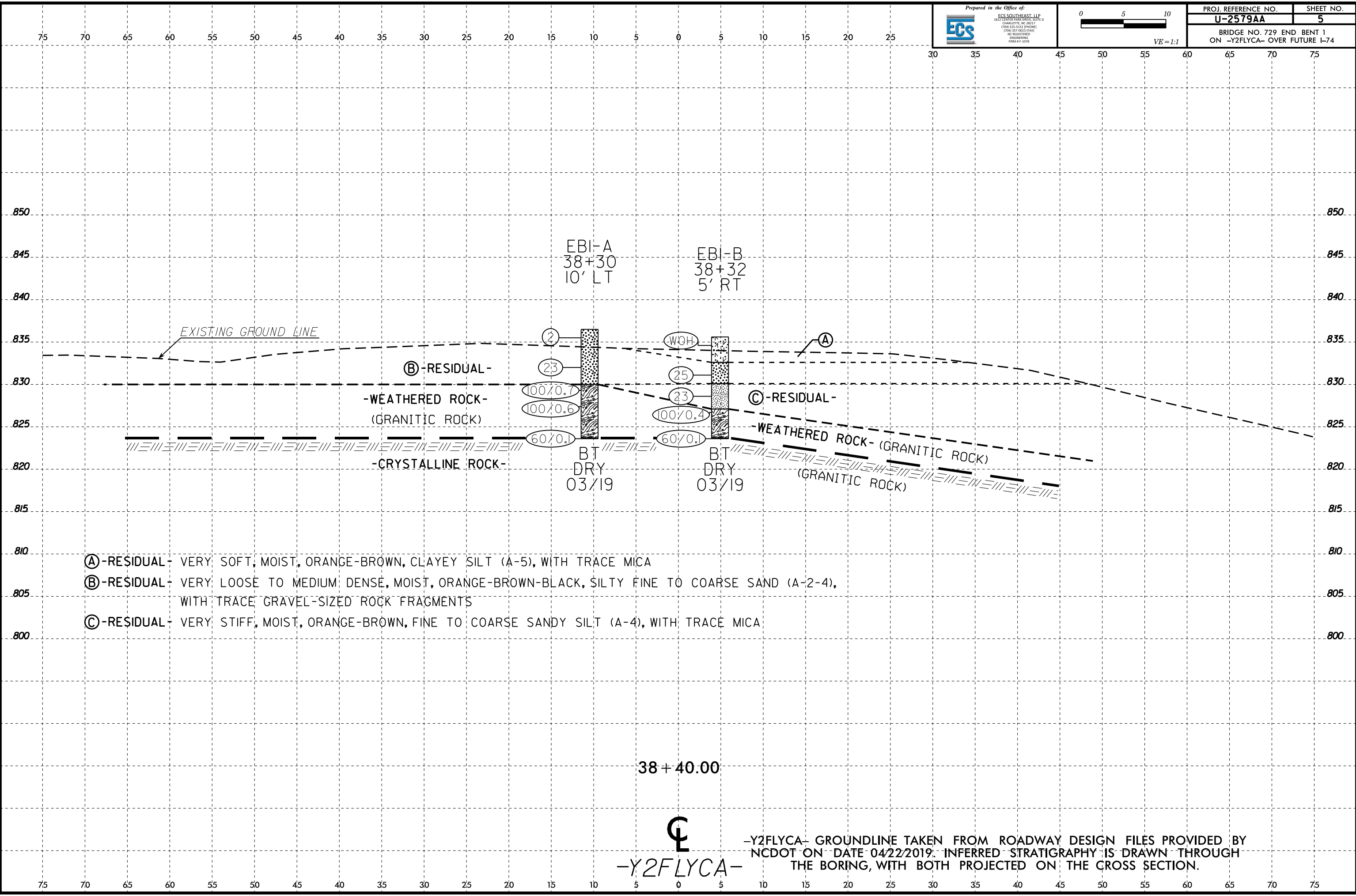


- (A)-ALLUVIAL - VERY SOFT TO STIFF, MOIST TO WET, RED-ORANGE-BROWN-GRAY, FINE TO COARSE SANDY SILT (A-4), CLAYEY SILT (A-5), AND SILTY CLAY (A-7-5), WITH TRACE ORGANICS AND TRACE TO LITTLE MICA
- (B)-ALLUVIAL - VERY LOOSE, MOIST TO SATURATED, GRAY-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE ORGANICS AND MICA
- (C)-ALLUVIAL - VERY SOFT TO MEDIUM STIFF, WET, GRAY, FINE TO COARSE SANDY SILT (A-4) AND SILTY CLAY (A-7-5/A-7-6), WITH TRACE ORGANICS AND TRACE TO LITTLE MICA
- (D)-RESIDUAL - VERY LOOSE TO MEDIUM DENSE, MOIST, ORANGE-BROWN, SILTY FINE TO COARSE SAND (A-2-4)
- (E)-RESIDUAL - VERY SOFT, MOIST, RED-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA
- (F)-WEATHERED ROCK - (GRANITIC ROCK)
- (G)-WEATHERED ROCK - (MICA SCHIST)
- (H)-WEATHERED ROCK - (BIOTITE GNEISS)

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 Bridge 729 (Future I-74) from US 311 to I-40\CADD\GEOTECH\U-2579AA_Geo_xpl_brdge729.dgn
 6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-2579AA	5
BRIDGE NO. 729 END BENT 1 ON -Y2FLYCA- OVER FUTURE I-74	



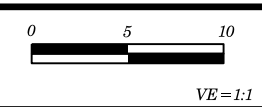
- Ⓐ-RESIDUAL - VERY SOFT, MOIST, ORANGE-BROWN, CLAYEY SILT (A-5), WITH TRACE MICA
- Ⓑ-RESIDUAL - VERY LOOSE TO MEDIUM DENSE, MOIST, ORANGE-BROWN-BLACK, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE GRAVEL-SIZED ROCK FRAGMENTS
- Ⓒ-RESIDUAL - VERY STIFF, MOIST, ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA

38 + 40.00

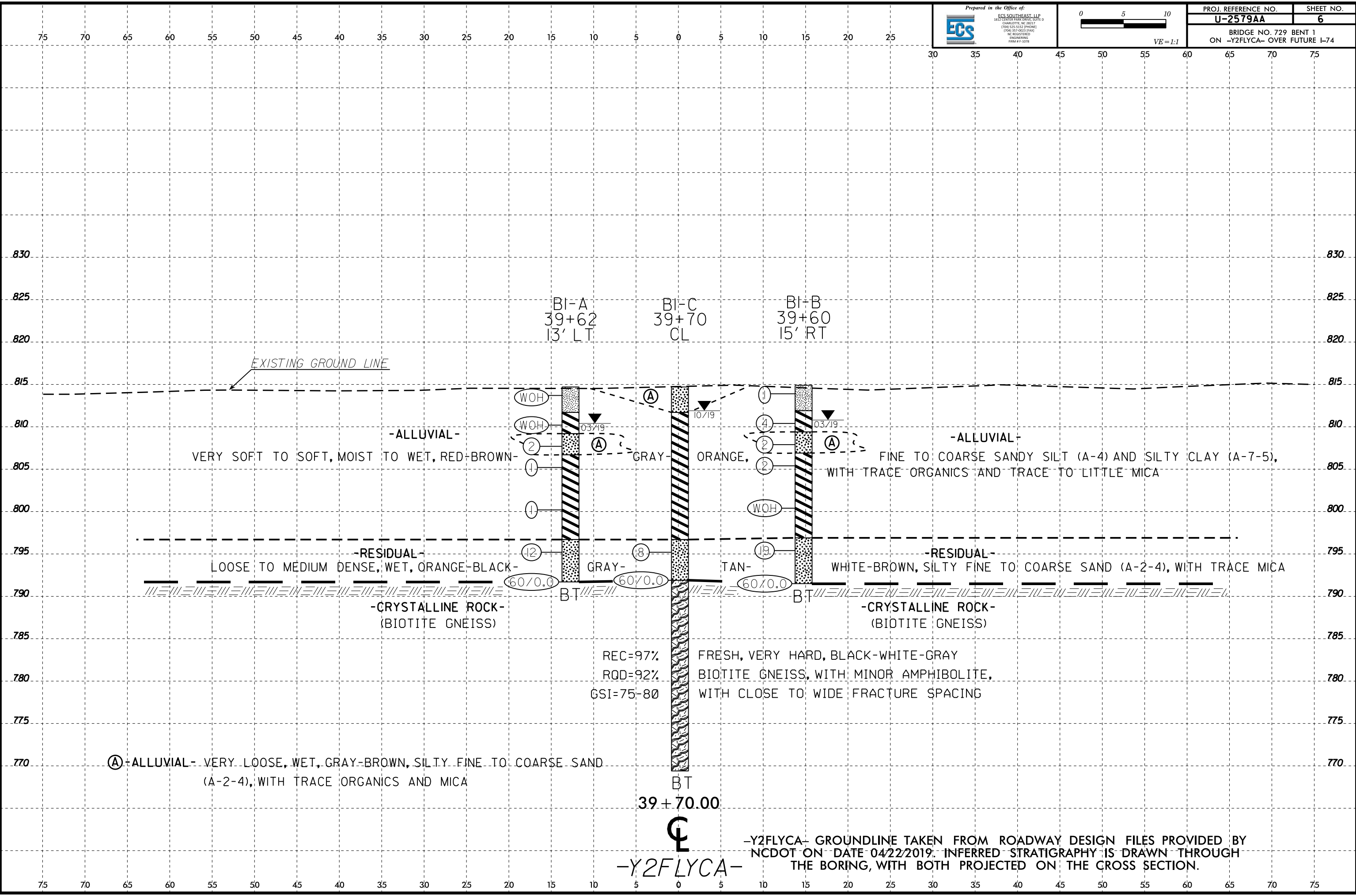
-Y2FLYCA-

-Y2FLYCA- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 04/22/2019. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

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\$\$\$\$SUBSERIAL\$\$\$\$

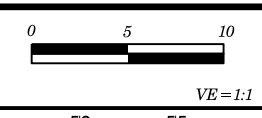


PROJ. REFERENCE NO.	SHEET NO.
U-2579AA	6
BRIDGE NO. 729 BENT 1 ON -Y2FLYCA- OVER FUTURE I-74	

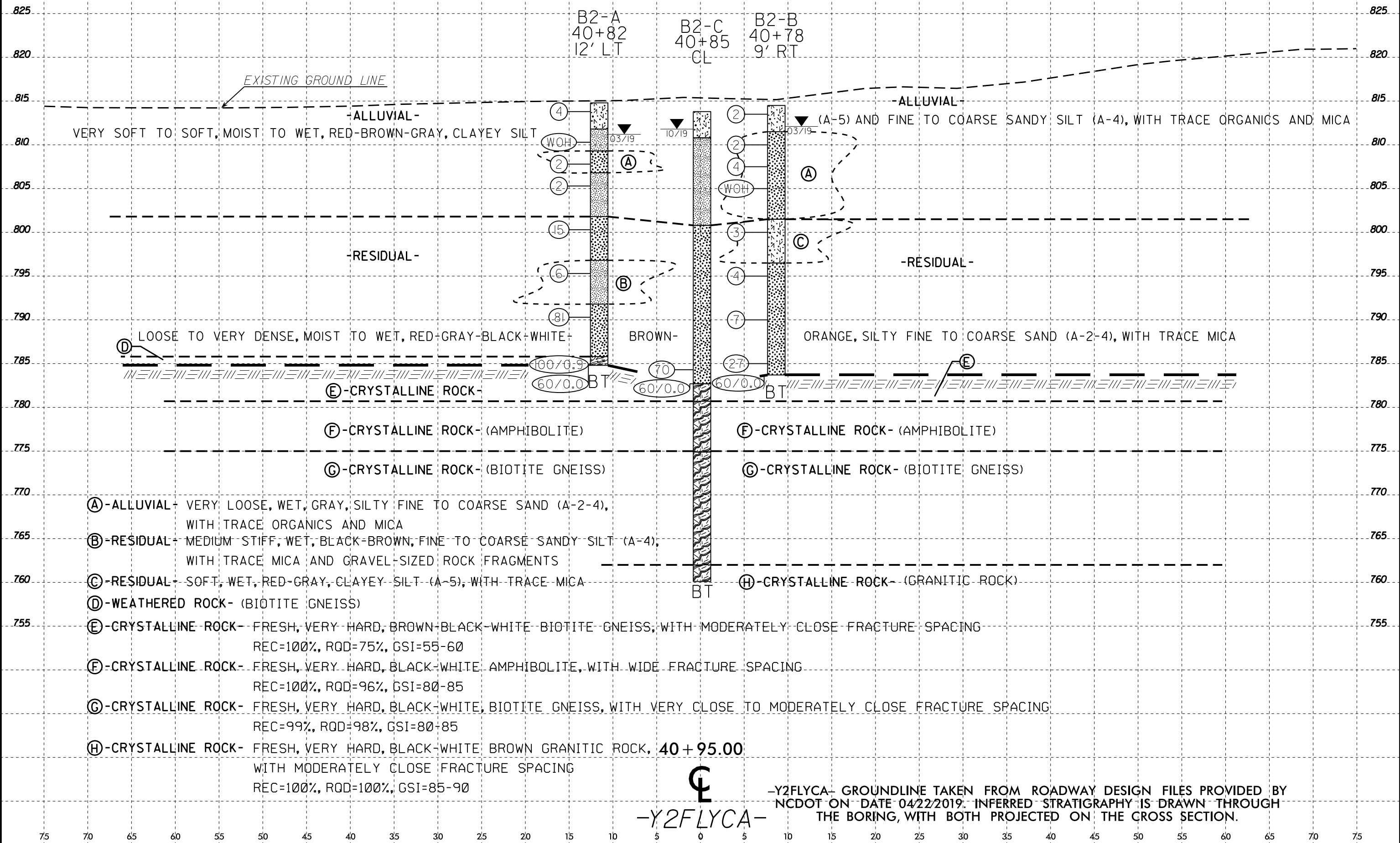


-Y2FLYCA- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 04/22/2019. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

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 6/23/16




PROJ. REFERENCE NO.	SHEET NO.
U-2579AA	7
BRIDGE NO. 729 BENT 2	
ON -Y2FLYCA- OVER FUTURE I-74	



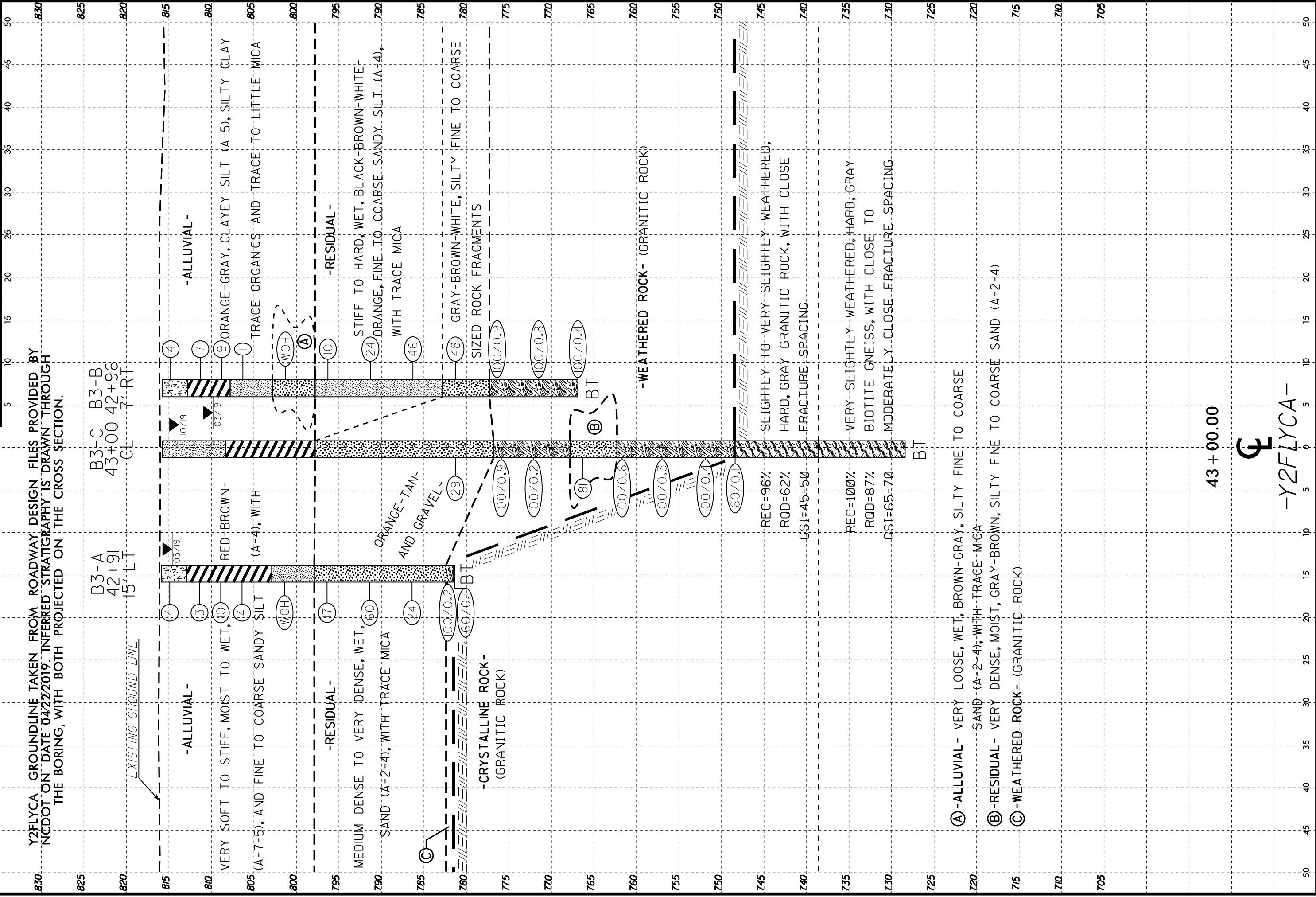
- (A) - ALLUVIAL - VERY LOOSE, WET, GRAY, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE ORGANICS AND MICA
- (B) - RESIDUAL - MEDIUM STIFF, WET, BLACK-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA AND GRAVEL-SIZED ROCK FRAGMENTS
- (C) - RESIDUAL - SOFT, WET, RED-GRAY, CLAYEY SILT (A-5), WITH TRACE MICA
- (D) - WEATHERED ROCK - (BIOTITE GNEISS)
- (E) - CRYSTALLINE ROCK - FRESH, VERY HARD, BROWN-BLACK-WHITE BIOTITE GNEISS, WITH MODERATELY CLOSE FRACTURE SPACING
REC=100%, RQD=75%, GSI=55-60
- (F) - CRYSTALLINE ROCK - FRESH, VERY HARD, BLACK-WHITE AMPHIBOLITE, WITH WIDE FRACTURE SPACING
REC=100%, RQD=96%, GSI=80-85
- (G) - CRYSTALLINE ROCK - FRESH, VERY HARD, BLACK-WHITE, BIOTITE GNEISS, WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING
REC=99%, RQD=98%, GSI=80-85
- (H) - CRYSTALLINE ROCK - FRESH, VERY HARD, BLACK-WHITE BROWN GRANITIC ROCK, 40 + 95.00
WITH MODERATELY CLOSE FRACTURE SPACING
REC=100%, RQD=100%, GSI=85-90

-Y2FLYCA- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY
 NCDOT ON DATE 04/22/2019. INFERRED STRATIGRAPHY IS DRAWN THROUGH
 THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

-Y2FLYCA-


Prepared in the Office of:
 **EGS** SOUTH-EAST MISSISSIPPI
 CONSULTING ENGINEERS
 1000 N. GULF BLVD., SUITE 100
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 WWW.EGS-SEMI.COM

PROJ. REFERENCE NO. **U-2579AA** SHEET NO. **8**
 BRIDGE NO. 729 BENT 3
 ON -Y2FLYCA- OVER FUTURE I-74
 V/B = 1:1



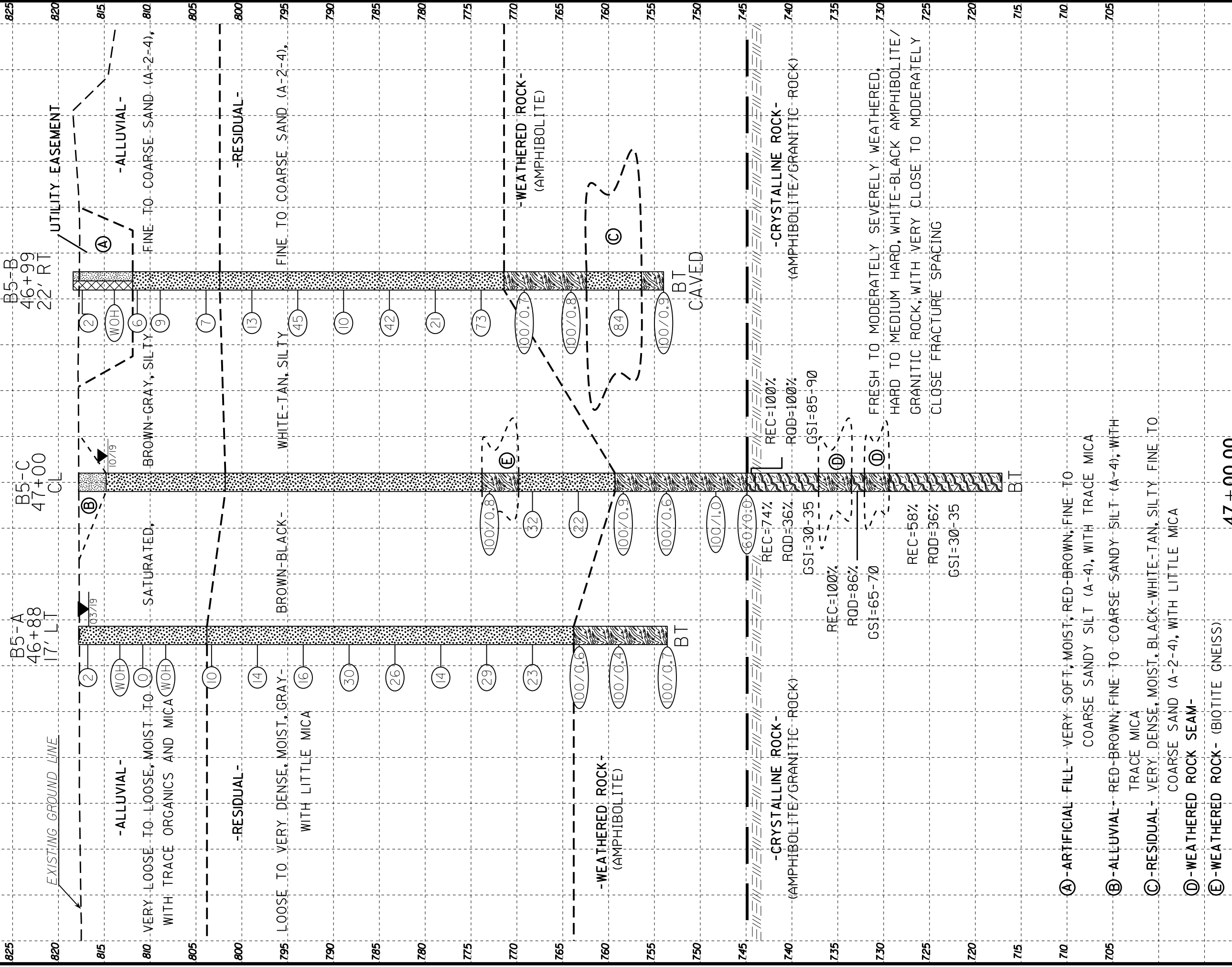
43+00.00

Y2FLYCA-

Prepared in the Office of:

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 10000 W. STATE STREET
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 TEL: 904.725.1100
 FAX: 904.725.1101

PROJ. REFERENCE NO. **U-2579AA** SHEET NO. **10**
 BRIDGE NO. 729 BENT 4
 ON -Y2FLYCA- OVER FUTURE I-74
 V/B=1:1

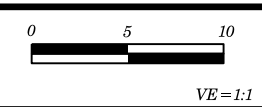
-Y2FLYCA- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 04/22/2019. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.



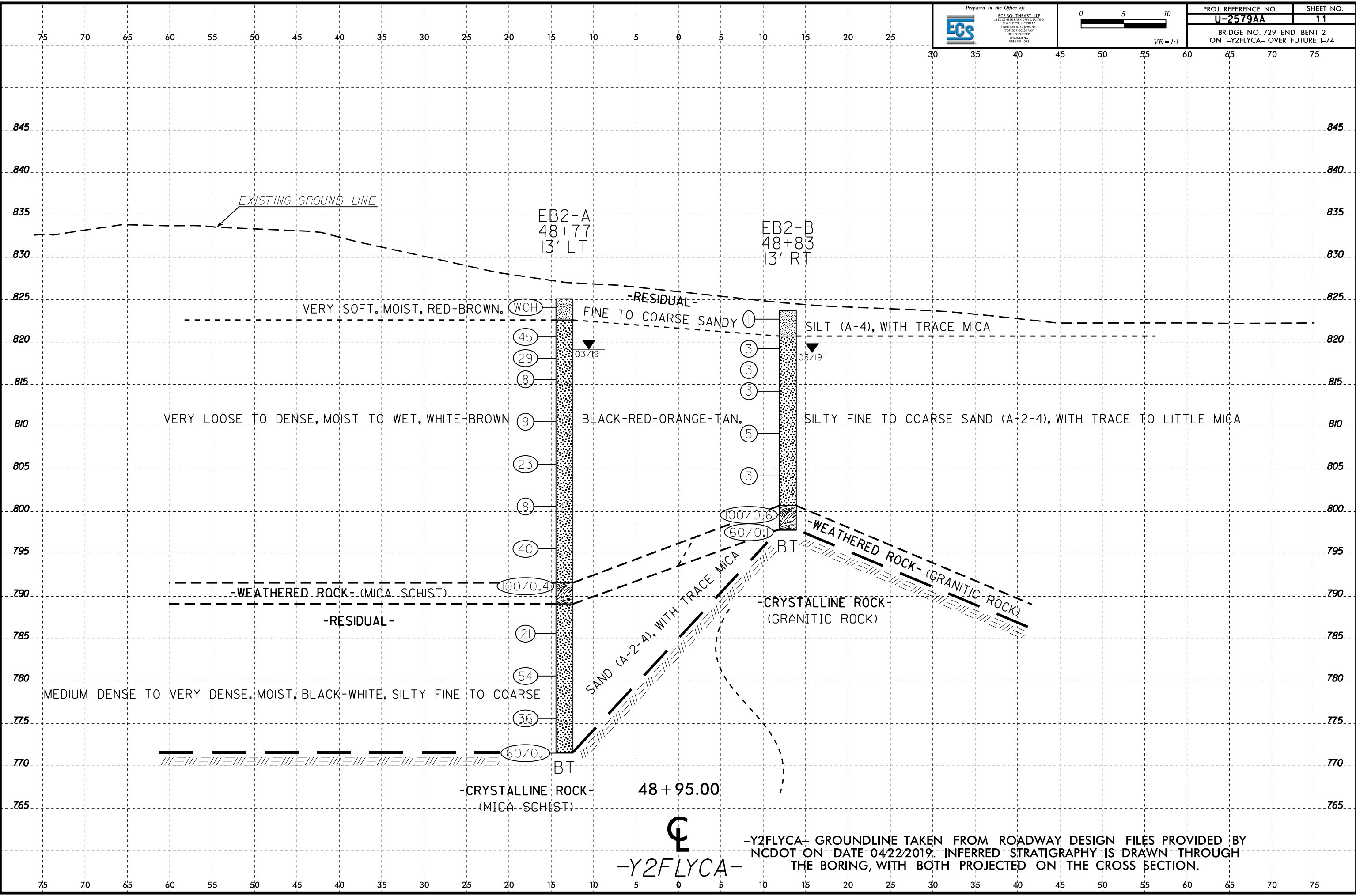
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-Y2FLYCA-

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\$\$\$SUBSERIAL\$\$\$
Bridge 729 (Future I-74) from US 311 to I-40\CADD\GEOTECH\U-2579AA_Geo_xpl_brdge729.dgn



PROJ. REFERENCE NO.	SHEET NO.
U-2579AA	11
BRIDGE NO. 729 END BENT 2 ON -Y2FLYCA- OVER FUTURE I-74	




-Y2FLYCA-

-Y2FLYCA- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 04/22/2019. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle									
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)								
BORING NO. B1-A		STATION 39+62		OFFSET 13 ft LT		ALIGNMENT -Y2FLYCA-									
COLLAR ELEV. 814.7 ft		TOTAL DEPTH 23.0 ft		NORTHING 841,517		EASTING 1,661,276									
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER G. Akins		START DATE 03/10/19		COMP. DATE 03/11/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
815	814.7	0.0	WOH	WOH	WOH								M	GROUND SURFACE	0.0
														ALLUVIAL	
														Very Soft, Red-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	3.0
810	811.2	3.5	WOH	WOH	WOH								W	Very Soft, Red-Brown-Gray, Silty CLAY (A-7-5)	5.5
														Very Loose, Gray-Brown, Silty Fine to Coarse SAND (A-2-4), with trace organics	8.0
	808.7	6.0	WOH	WOH	2								W	Very Soft, Gray, Silty CLAY (A-7-6), with trace organics and mica	8.0
	806.2	8.5	WOH	WOH	1								W	Very Soft, Gray, Silty CLAY (A-7-6), with trace organics and mica	8.0
805															
	801.2	13.5	WOH	WOH	1								W	Very Soft, Gray, Silty CLAY (A-7-5), with trace organics and mica	13.0
800															
	796.2	18.5	9	4	8								W	RESIDUAL	18.0
														Medium Dense, Orange-Black-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	18.0
795	791.7	23.0											W	Boring Terminated with Standard Penetration Test Refusal at Elevation 791.7 ft On Crystalline Rock (BIOTITE GNEISS)	23.0

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle									
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)								
BORING NO. B1-B		STATION 39+60		OFFSET 15 ft RT		ALIGNMENT -Y2FLYCA-									
COLLAR ELEV. 814.9 ft		TOTAL DEPTH 23.4 ft		NORTHING 841,508		EASTING 1,661,302									
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER G. Akins		START DATE 03/10/19		COMP. DATE 03/10/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
815	814.9	0.0	WOH	WOH	1								M	GROUND SURFACE	0.0
														ALLUVIAL	
														Very Soft, Red-Brown, Fine to Coarse Sandy SILT (A-4), with little mica	3.0
810	811.4	3.5	WOH	WOH	4								W	Soft, Orange-Gray, Silty CLAY (A-7-5), with trace organics and mica	5.5
														Very Loose, Gray, Silty Fine to Coarse SAND (A-2-4), with trace organics and mica	8.0
	808.9	6.0	WOH	WOH	2								W	Very Soft, Gray, Silty CLAY (A-7-6), with trace organics and mica	8.0
	806.4	8.5	WOH	WOH	2								W	Very Soft, Gray, Silty CLAY (A-7-6), with trace organics and mica	8.0
805															
	801.4	13.5	WOH	WOH	WOH								W	Very Soft, Gray, Silty CLAY (A-7-5), with trace organics and mica	13.0
800															
	796.4	18.5	10	13	6								W	RESIDUAL	18.0
														Medium Dense, Orange-White-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	18.0
795	791.5	23.4											W	Boring Terminated with Standard Penetration Test Refusal at Elevation 791.5 ft On Crystalline Rock (BIOTITE GNEISS)	23.4

NCDOT BORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC_DOT.GDT 11/4/19

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B1-C		STATION 39+70		OFFSET CL		ALIGNMENT -Y2FLYCA-										
COLLAR ELEV. 814.7 ft		TOTAL DEPTH 45.3 ft		NORTHING 841,522		EASTING 1,661,291										
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 85% 02/06/2019				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic										
DRILLER J. Cain		START DATE 10/29/19		COMP. DATE 10/29/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
815														814.7	GROUND SURFACE	0.0
														811.7	ALLUVIAL Brown, Silty Fine to Coarse SAND (A-2-4) Gray, Silty CLAY (A-7-5)	3.0
810																
805																
800																
795	796.2	18.5	9	5	3									796.7	RESIDUAL Loose, Orange-Gray-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica	18.0
790	791.9	22.8	60/0.0											791.9	CRYSTALLINE ROCK Fresh, Very Hard, Black-White-Gray BIOTITE GNEISS, with minor AMPHIBOLITE, with Close to Wide Fracture Spacing REC = 97%, RQD = 92%, GSI = 75 - 80	22.8
785																
780																
775																
770														769.4	Boring Terminated at Elevation 769.4 ft In Crystalline Rock (BIOTITE GNEISS) Notes: 1) Auger Probe to 18.5 Feet	45.3

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle						
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)					
BORING NO. B1-C		STATION 39+70		OFFSET CL		ALIGNMENT -Y2FLYCA-						
COLLAR ELEV. 814.7 ft		TOTAL DEPTH 45.3 ft		NORTHING 841,522		EASTING 1,661,291						
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 85% 02/06/2019				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic						
DRILLER J. Cain		START DATE 10/29/19		COMP. DATE 10/29/19		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
791.9	791.9	22.8	2.5	N=60/0.0 3:52/1.0 1:08/1.0 0:41/0.5	(2.0) 80%	(1.2) 48%		(21.9) 97%	(20.8) 92%		Begin Coring @ 22.8 ft CRYSTALLINE ROCK Fresh, Very Hard, Black-White-Gray BIOTITE GNEISS, with minor AMPHIBOLITE, with Close to Wide Fracture Spacing REC = 97%, RQD = 92%, GSI = 75 - 80	22.8
790	789.4	25.3	5.0	1:27/1.0 1:27/1.0 1:26/1.0 1:38/1.0 1:26/1.0	(5.0) 100%	(5.0) 100%						
785	784.4	30.3	5.0	1:33/1.0 1:38/1.0 1:21/1.0 1:35/1.0 1:42/1.0	(4.9) 98%	(4.7) 94%						
780	779.4	35.3	5.0	2:12/1.0 2:50/1.0 4:48/1.0 3:56/1.0 4:55/1.0	(5.0) 100%	(4.9) 98%						
775	774.4	40.3	5.0	1:06/1.0 1:10/1.0 1:15/1.0 1:24/1.0 1:28/1.0	(5.0) 100%	(5.0) 100%						
770	769.4	45.3									Boring Terminated at Elevation 769.4 ft In Crystalline Rock (BIOTITE GNEISS) Notes: 1) Auger Probe to 18.5 Feet	45.3

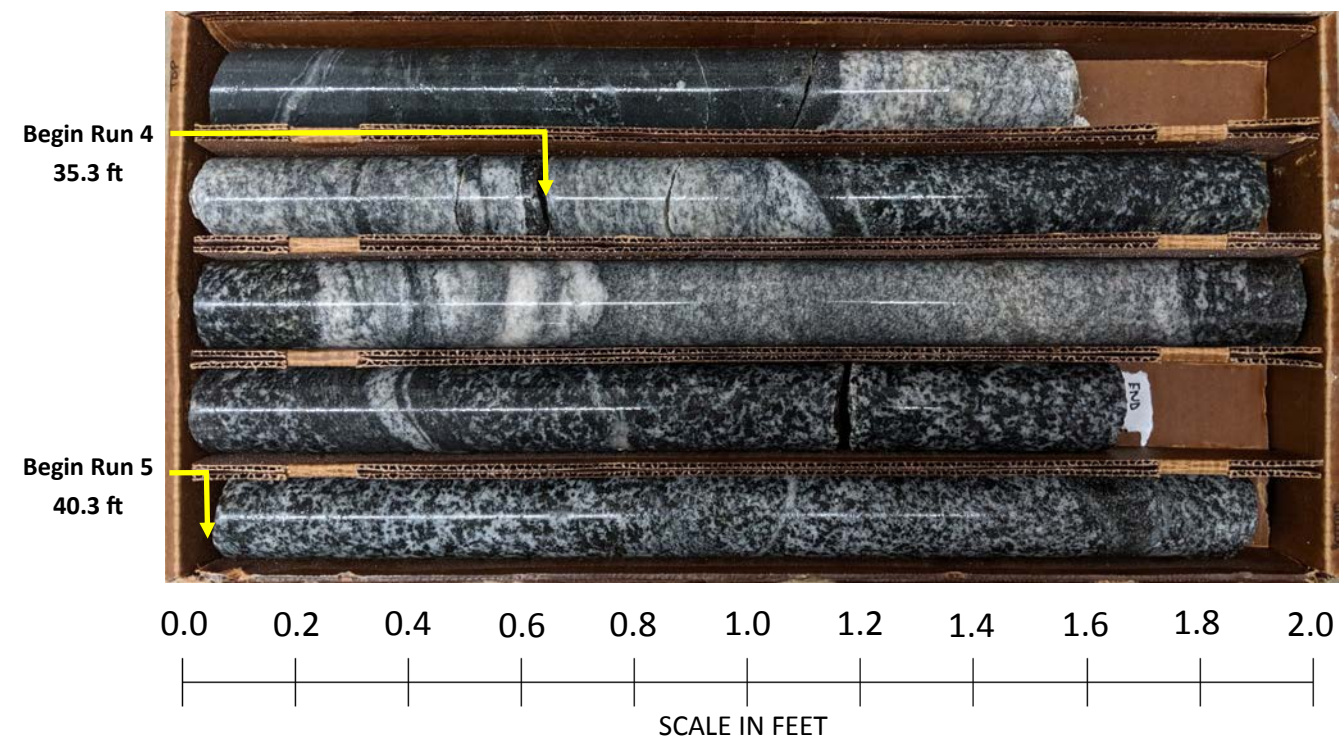
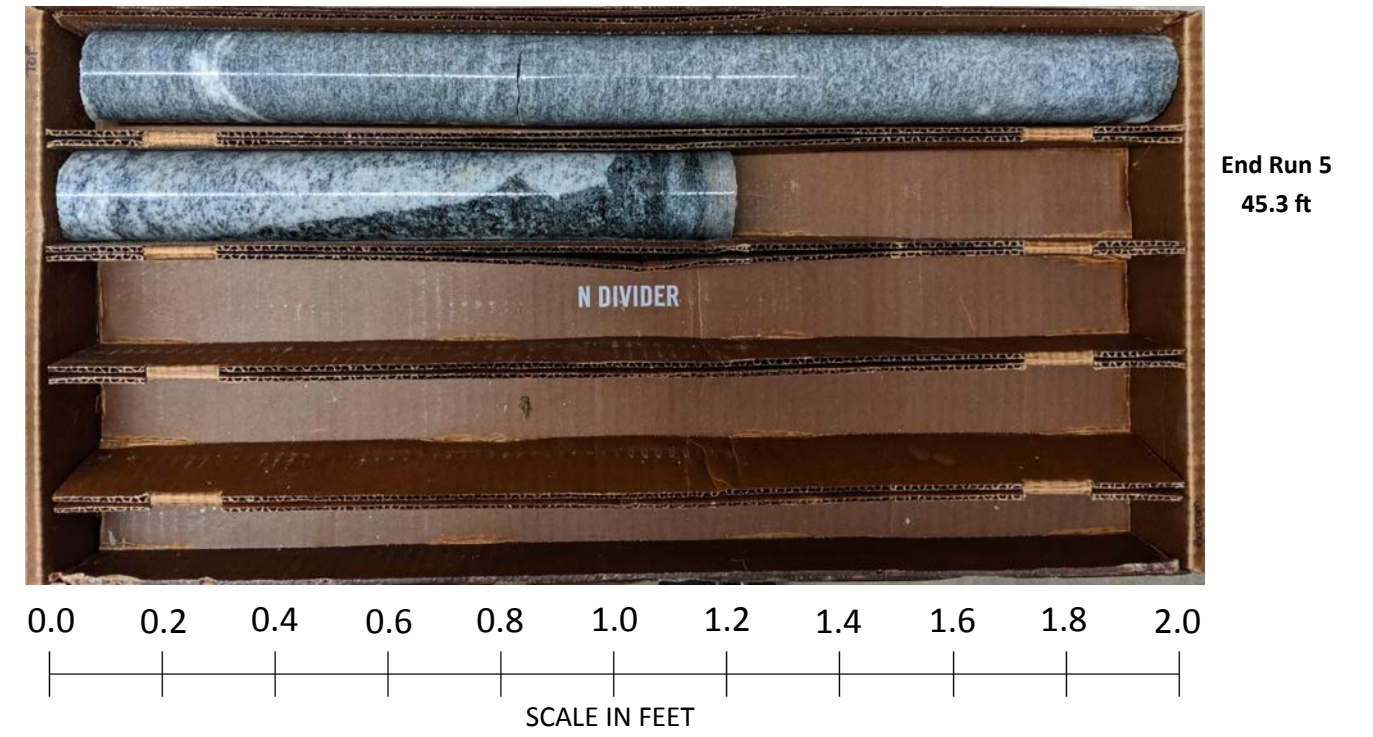
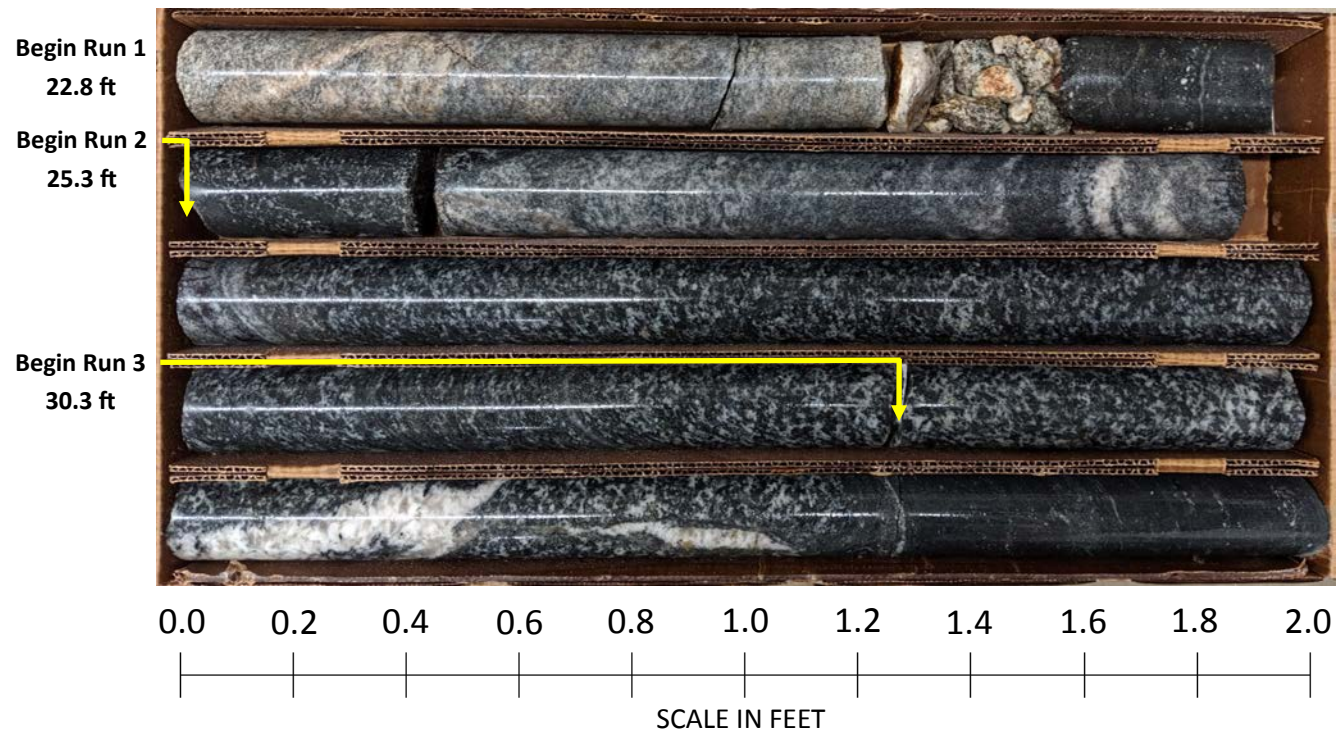


Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40

WBS: 34839.1.7 Tip No.: U-2579AA

Rock Core Photographs: Boring: B1-C

Station: 39+70 Offset: CL



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle									
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)								
BORING NO. B2-A		STATION 40+82		OFFSET 12 ft LT		ALIGNMENT -Y2FLYCA-									
COLLAR ELEV. 814.8 ft		TOTAL DEPTH 30.0 ft		NORTHING 841,633		EASTING 1,661,307									
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER G. Akins		START DATE 03/11/19		COMP. DATE 03/11/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
815	814.8	0.0	WOH	1	3								M	GROUND SURFACE	0.0
														ALLUVIAL Soft, Red-Brown, Clayey SILT (A-5), with trace mica	3.0
810	811.3	3.5	WOH	WOH	WOH								W	Very Soft, Red-Gray, Fine to Coarse Sandy SILT (A-4), with trace organics and mica	5.5
	808.8	6.0	WOH	2	0								W	Very Loose, Gray, Silty Fine to Coarse SAND (A-2-4), with trace organics and mica	8.0
805	806.3	8.5	WOH	1	1								W	Very Soft, Gray, Fine to Coarse Sandy SILT (A-4), with trace organics and mica	13.0
	801.3	13.5		7	9	6							W	RESIDUAL Medium Dense, Red-Gray, Silty Fine to Coarse SAND (A-2-4), with trace mica	18.0
795	796.3	18.5	4	3	3								W	Medium Stiff, Black-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel-sized rock fragments	23.0
790	791.3	23.5	31	42	39								W	Very Dense, Black-White-Brown, Silty Fine to Coarse SAND (A-2-4)	29.0
785	786.3	28.5	10	12	88/0.4									WEATHERED ROCK Black-White-Brown (BIOTITE GNEISS)	30.0
	784.8	30.0												Boring Terminated with Standard Penetration Test Refusal at Elevation 784.8 ft On Crystalline Rock (BIOTITE GNEISS)	

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle									
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)								
BORING NO. B2-B		STATION 40+78		OFFSET 9 ft RT		ALIGNMENT -Y2FLYCA-									
COLLAR ELEV. 814.5 ft		TOTAL DEPTH 30.8 ft		NORTHING 841,625		EASTING 1,661,326									
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER G. Akins		START DATE 03/11/19		COMP. DATE 03/11/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
815	814.5	0.0	WOH	WOH	2								M	GROUND SURFACE	0.0
														ALLUVIAL Very Soft, Red-Brown, Clayey SILT (A-5), with trace mica	3.0
810	811.0	3.5	WOH	1	1								W	Very Loose, Gray, Silty Fine to Coarse SAND (A-2-4), with trace organics	8.0
	808.5	6.0	WOH	1	3								W		
805	806.0	8.5	WOH	WOH	WOH								W		
	801.0	13.5		1	3	0							W	RESIDUAL Soft, Red-Gray, Clayey SILT (A-5), with trace mica	18.0
795	796.0	18.5	3	1	3								W	Loose to Medium Dense, Red-Brown-White-Black, Silty Fine to Coarse SAND (A-2-4), with trace mica	23.0
790	791.0	23.5	1	3	4								W		
785	786.0	28.5	7	11	16										
	783.7	30.8												Boring Terminated with Standard Penetration Test Refusal at Elevation 783.7 ft On Crystalline Rock (BIOTITE GNEISS)	

NCDOT BORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC_DOT.GDT 11/5/19

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B2-C		STATION 40+85		OFFSET CL		ALIGNMENT -Y2FLYCA-										
COLLAR ELEV. 813.8 ft		TOTAL DEPTH 53.7 ft		NORTHING 841,633		EASTING 1,661,319										
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 85% 02/06/2019			DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic										
DRILLER J. Cain		START DATE 10/29/19		COMP. DATE 10/29/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
815														813.8	GROUND SURFACE	0.0
														810.8	ALLUVIAL Brown, Clayey SILT (A-5)	3.0
810															Gray, Fine to Coarse Sandy SILT (A-4)	
805																
800														800.8	RESIDUAL Very Dense, Gray-Brown-Orange-White, Silty Fine to Coarse SAND (A-2.4)	13.0
795																
790																
785	785.3	28.5	30	23	47											
	782.7	31.1	60/0.0											782.7		31.1
780														780.7	CRYSTALLINE ROCK Fresh, Very Hard, Brown-Black-White BIOTITE GNEISS, with Moderately Close Fracture Spacing	33.1
															REC = 100%, RQD = 75%, GSI = 55 - 60	
775														774.9	Fresh, Very Hard, Black-White AMPHIBOLITE, with Wide Fracture Spacing	38.9
															REC = 100%, RQD = 96%, GSI = 80 - 85	
770															Fresh, Very Hard, Black-White BIOTITE GNEISS, with Very Close to Moderately Close Fracture Spacing	
															REC = 99%, RQD = 98%, GSI = 80 - 85	
765														762.0	Fresh, Very Hard, Black-White-Brown GRANITIC ROCK, with Moderately Close Fracture Spacing	51.8
														760.1	Fresh, Very Hard, Black-White-Brown GRANITIC ROCK, with Moderately Close Fracture Spacing	53.7
															REC = 100%, RQD = 100%, GSI = 85 - 90 Boring Terminated at Elevation 760.1 ft in Crystalline Rock (GRANITIC ROCK)	
															Notes: 1) Auger Probe to 28.5 Feet	

NCDOT BORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC_DOT.GDT 11/5/19

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle					
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)				
BORING NO. B2-C		STATION 40+85		OFFSET CL		ALIGNMENT -Y2FLYCA-					
COLLAR ELEV. 813.8 ft		TOTAL DEPTH 53.7 ft		NORTHING 841,633		EASTING 1,661,319					
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 85% 02/06/2019			DRILL METHOD SPT Core Boring			HAMMER TYPE Automatic					
DRILLER J. Cain		START DATE 10/29/19		COMP. DATE 10/29/19		SURFACE WATER DEPTH N/A					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC (ft) %	RQD (ft) %	REC (ft) %	RQD (ft) %			
782.7	782.7	31.1	4.4	N=60/0.0 1:38/1.0 1:22/1.0 1:10/1.0 1:06/1.0 0:28/0.4	(4.4) 100%	(3.8) 86%	(2.0) 100%	(1.5) 75%		Begin Coring @ 31.1 ft	31.1
780										CRYSTALLINE ROCK	33.1
										Fresh, Very Hard, Brown-Black-White BIOTITE GNEISS, with Moderately Close Fracture Spacing	
										REC = 100%, RQD = 75%, GSI = 55 - 60	
775										Fresh, Very Hard, Black-White AMPHIBOLITE, with Wide Fracture Spacing	38.9
										REC = 100%, RQD = 96%, GSI = 80 - 85	
770										Fresh, Very Hard, Black-White BIOTITE GNEISS, with Very Close to Moderately Close Fracture Spacing	
										REC = 99%, RQD = 98%, GSI = 80 - 85	
765										Fresh, Very Hard, Black-White-Brown GRANITIC ROCK, with Moderately Close Fracture Spacing	51.8
										REC = 100%, RQD = 100%, GSI = 85 - 90 Boring Terminated at Elevation 760.1 ft in Crystalline Rock (GRANITIC ROCK)	53.7
										Notes: 1) Auger Probe to 28.5 Feet	

NCDOT BORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC_DOT.GDT 11/5/19

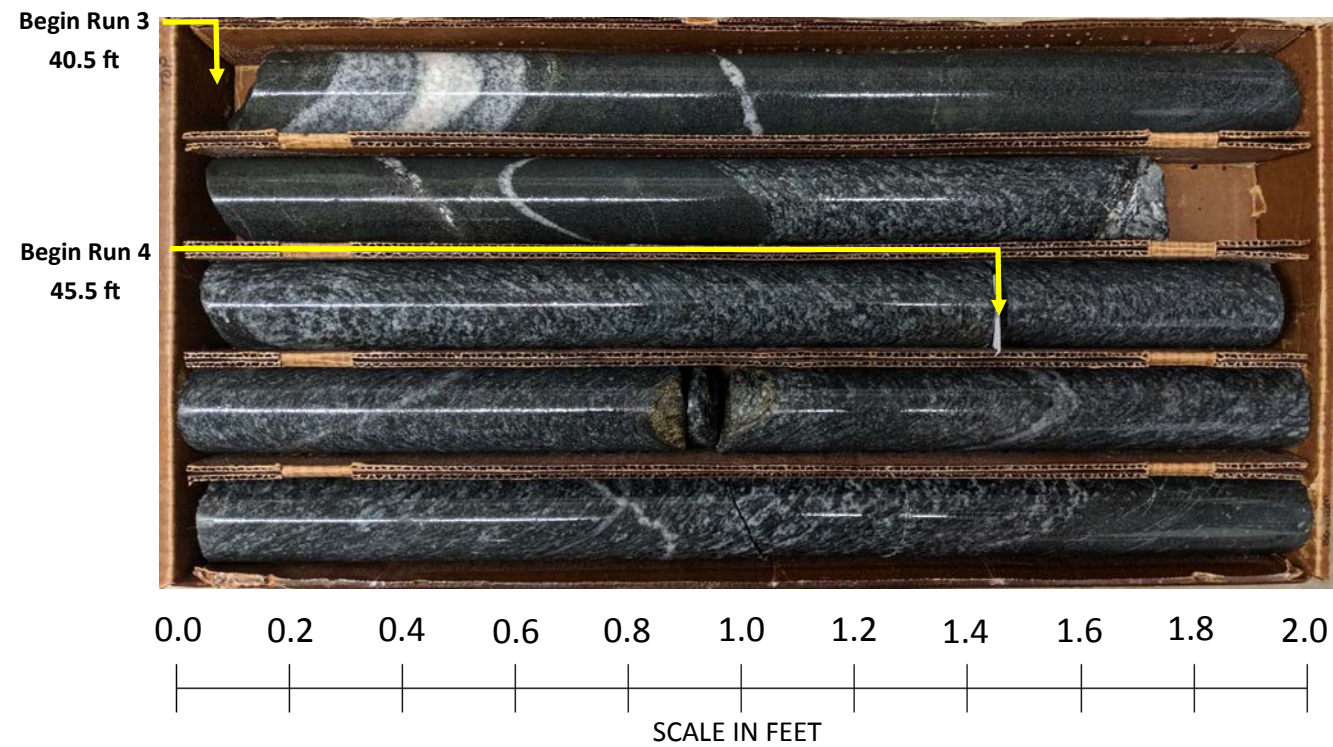
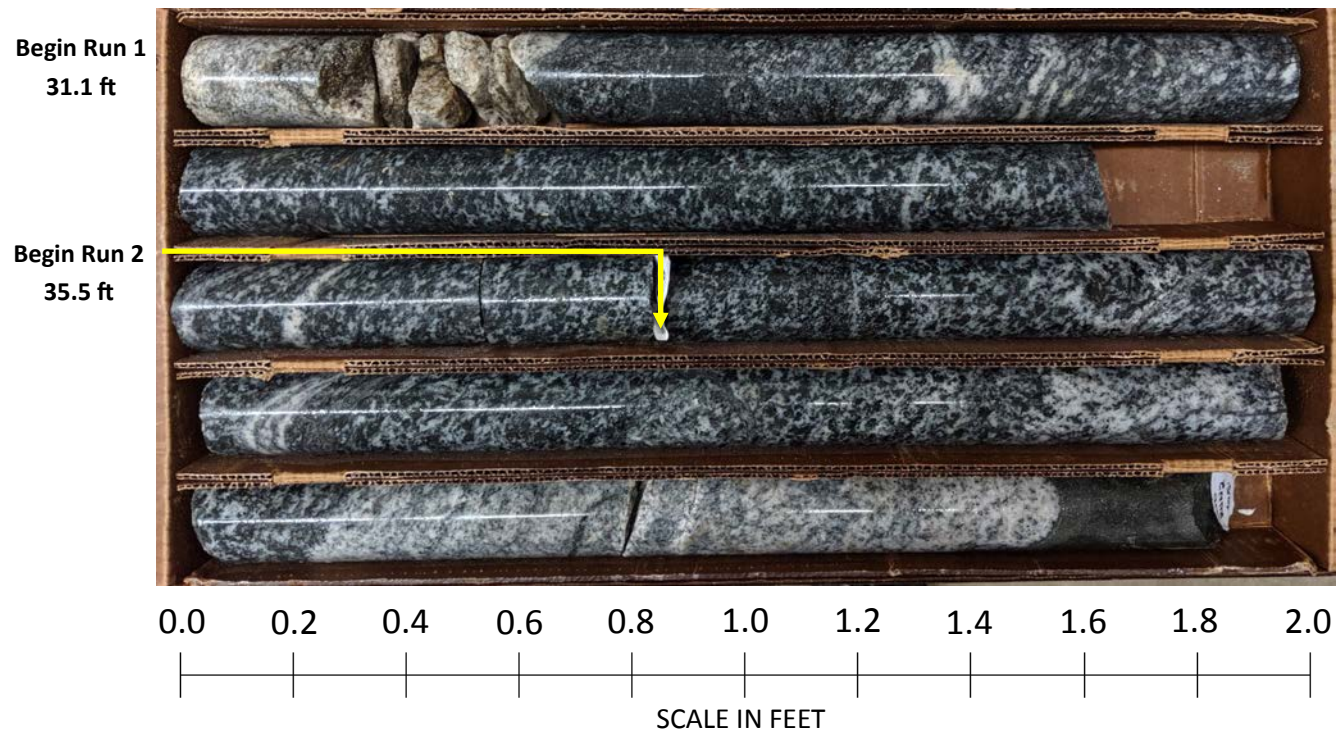


Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40

WBS: 34839.1.7 Tip No.: U-2579AA

Rock Core Photographs: Boring: B2-C

Station: 40+85 Offset: CL



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B3-A		STATION 42+91		OFFSET 15 ft LT		ALIGNMENT -Y2FLYCA-										
COLLAR ELEV. 815.9 ft		TOTAL DEPTH 34.5 ft		NORTHING 841,838		EASTING 1,661,330										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER G. Akins		START DATE 03/19/19		COMP. DATE 03/19/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
820																
815	815.9	0.0	WOH	2	2								M	815.9	GROUND SURFACE	0.0
	812.4	3.5	WOH	WOH	3								W	812.9	ALLUVIAL Soft, Red-Brown, Clayey SILT (A-5), with trace mica	3.0
810	809.9	6.0	WOH	4	6								W		Soft to Stiff, Orange-Brown-Gray, Silty CLAY (A-7-5), with trace mica	
	807.4	8.5	WOH	2	2								W			
805													W			
	802.4	13.5	WOH	WOH	WOH								W	802.9	Very Soft, Gray, Fine to Coarse Sandy SILT (A-4), with little mica	13.0
800													W			
	797.4	18.5	3	6	11								W	797.9	RESIDUAL Medium Dense to Very Dense, Tan-Orange-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	18.0
795													W			
	792.4	23.5	24	25	35								W			
790													W			
	787.4	28.5	21	9	15								W			
785													W			
	782.4	33.5											W	782.4	WEATHERED ROCK Tan-Orange-White (GRANITIC ROCK)	33.5
	781.5	34.4	100/0.2										W	781.5	CRYSTALLINE ROCK Tan-Orange-White (GRANITIC ROCK)	34.4
			60/0.1											781.4	Boring Terminated with Standard Penetration Test Refusal at Elevation 781.4 ft In Crystalline Rock (GRANITIC ROCK)	34.5

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B3-B		STATION 42+96		OFFSET 7 ft RT		ALIGNMENT -Y2FLYCA-										
COLLAR ELEV. 815.8 ft		TOTAL DEPTH 48.9 ft		NORTHING 841,842		EASTING 1,661,352										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER G. Akins		START DATE 03/19/19		COMP. DATE 03/19/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
820																
815	815.8	0.0	WOH	2	2								M	815.8	GROUND SURFACE	0.0
	812.3	3.5	WOH	2	5								M	812.8	ALLUVIAL Soft, Red-Brown, Clayey SILT (A-5), with trace mica	3.0
810	809.8	6.0	WOH	2	7								W		Medium Stiff to Stiff, Orange-Brown-Gray, Silty CLAY (A-7-5), with trace organics	
	807.3	8.5	WOH	WOH	1								W	807.8	Very Soft, Gray, Fine to Coarse Sandy SILT (A-4), with trace organics and little mica	8.0
805													W			
	802.3	13.5	WOH	WOH	WOH								W	802.8	Very Loose, Brown-Gray, Silty Fine to Coarse SAND (A-2-4), with trace mica	13.0
800													W			
	797.3	18.5	4	4	6								W	797.8	RESIDUAL Stiff to Hard, Black-Brown-White-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica	18.0
795													W			
	792.3	23.5	6	12	12								W			
790													W			
	787.3	28.5	14	22	24								W			
785													W			
	782.3	33.5	8	29	19								W	782.8	Dense, Tan-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	33.0
780													W			
	777.3	38.5	36	64/0.4									W	777.3	WEATHERED ROCK White-Brown-Black (GRANITIC ROCK)	38.5
775													W			
	772.3	43.5	12	88/0.3									W			
770													W			
	767.3	48.5	100/0.4										W	766.9	Boring Terminated at Elevation 766.9 ft In Weathered Rock (GRANITIC ROCK)	48.9

NCDOT BORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC_DOT.GDT 11/5/19

GEOTECHNICAL BORING REPORT CORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST J. Garrick					
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)				
BORING NO. B3-C		STATION 43+00		OFFSET CL		ALIGNMENT -Y2FLYCA-					
COLLAR ELEV. 815.8 ft		TOTAL DEPTH 87.4 ft		NORTHING 841,846		EASTING 1,661,345					
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 85% 02/06/2019				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER J. Cain		START DATE 10/23/19		COMP. DATE 10/23/19		SURFACE WATER DEPTH N/A					
CORE SIZE NQ-2		TOTAL RUN 20.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
748.4	748.4	67.4	3.0	0:46/1.0	(2.6)	(0.5)	(9.4)	(6.1)		Begin Coring @ 67.4 ft Slightly to Very Slightly Weathered, Hard, Gray GRANITIC ROCK, with Close Fracture Spacing REC = 96%, RQD = 62%, GSI = 45 - 50	67.4
745	745.4	70.4	3.0	1:34/1.0 2:04/1.0	87%	17%	96%	62%			748.4
	742.4	73.4	5.0	1:20/1.0 1:50/1.0 1:53/1.0	100%	77%					
740			5.0	2:07/1.0 1:52/1.0 1:28/1.0 2:13/1.0 1:41/1.0	(5.0)	(4.4)					738.6
	737.4	78.4	5.0	1:41/1.0 1:51/1.0 2:08/1.0 2:32/1.0 2:36/1.0	100%	100%	(10.2)	(8.9)			738.6
735			4.0	2:33/1.0 3:53/1.0 4:40/1.0 3:29/1.0	(4.0)	(2.8)	100%	70%			
	732.4	83.4	4.0								
730			4.0								
	728.4	87.4									728.4
Boring Terminated at Elevation 728.4 ft In Crystalline Rock (BIOTITE GNEISS)											
Notes: 1) Auger Probe to 33.0 Feet											

NCDOT CORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC_DOT.GDT 11/5/19

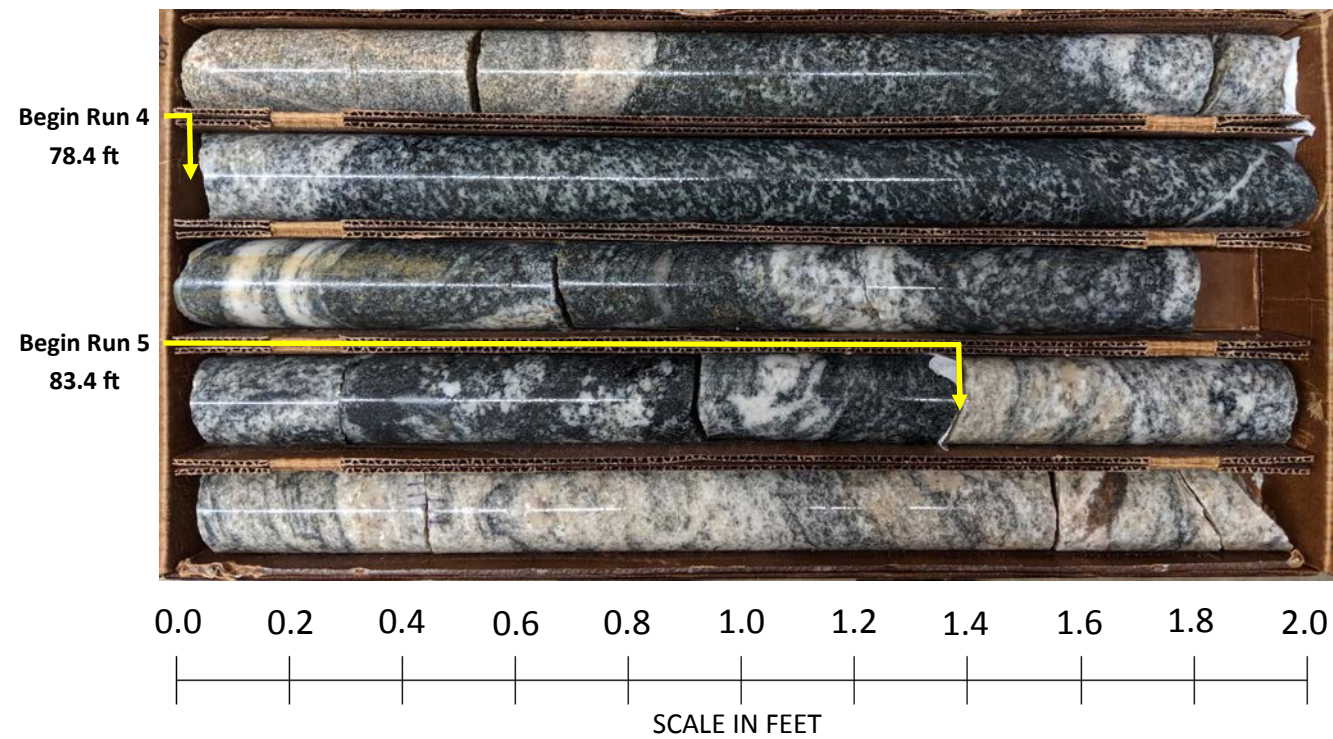
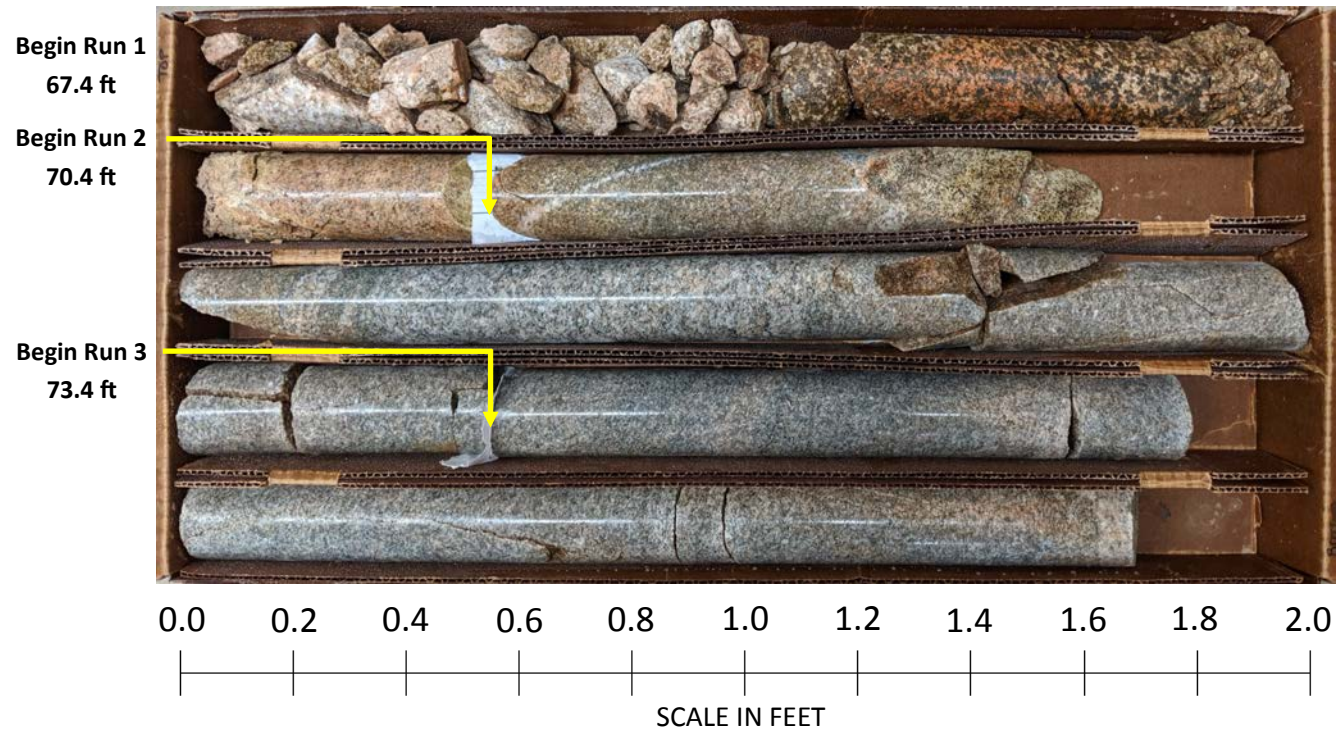


Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40

WBS: 34839.1.7 Tip No.: U-2579AA

Rock Core Photographs: Boring: B3-C

Station: 43+00 Offset: CL



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle									
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)								
BORING NO. B4-A		STATION 45+06		OFFSET 15 ft LT		ALIGNMENT -Y2FLYCA-									
COLLAR ELEV. 817.3 ft		TOTAL DEPTH 47.4 ft		NORTHING 842,051		EASTING 1,661,326									
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER G. Akins		START DATE 03/19/19		COMP. DATE 03/20/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
820														817.3	0.0
	817.3	0.0	WOH	WOH	2								M	GROUND SURFACE	
815	813.8	3.5	1	1	2									811.8	5.5
	811.3	6.0												809.3	8.0
810	808.8	8.5	1	1	0								W	Very Loose, Gray, Silty Fine to Coarse SAND (A-2-4), with trace organics and mica	
													W	Very Soft to Medium Stiff, Gray, Fine to Coarse Sandy SILT (A-4), with little mica	
805	803.8	13.5	WOH	2	4								W	802.8	14.5
800	798.8	18.5	11	27	21								W	RESIDUAL Loose to Dense, Red-Tan-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	
795	793.8	23.5	6	12	13								W		
790	788.8	28.5	14	18	16								W		
785	783.8	33.5	16	21	25								W		
780	778.8	38.5	7	18	25								W		
775	773.8	43.5	22	78/0.2									W		
														773.8	43.5
														770.0	47.3
770	770.0	47.3	60/0.1											769.9	47.4

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle									
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)								
BORING NO. B4-B		STATION 45+07		OFFSET 9 ft RT		ALIGNMENT -Y2FLYCA-									
COLLAR ELEV. 816.5 ft		TOTAL DEPTH 42.5 ft		NORTHING 842,054		EASTING 1,661,350									
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER G. Akins		START DATE 03/19/19		COMP. DATE 03/19/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
820														816.5	0.0
	816.5	0.0	WOH	WOH	2								M	GROUND SURFACE	
815	813.0	3.5	WOH	WOH	WOH									811.0	5.5
810	810.5	6.0	1	1	2								W	Very Soft, Red-Brown-Gray, Clayey SILT (A-5), with trace mica	
	808.0	8.5											W	Very Loose, Gray, Silty Fine to Coarse SAND (A-2-4), with trace organics and mica	
805	803.0	13.5	4	5	8								W	RESIDUAL Loose to Medium Dense, Gray-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	
800	798.0	18.5	11	4	4								W	802.8	14.5
795	793.0	23.5	6	9	12								W	Medium Stiff to Very Stiff, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	
790	788.0	28.5	8	10	11								W		
785	783.0	33.5	18	27	13								W		
780	778.0	38.5	19	12	25								W		
775	774.0	42.5	60/0.0										W		
														774.0	42.5

NCDOT BORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC_DOT.GDT 11/6/19

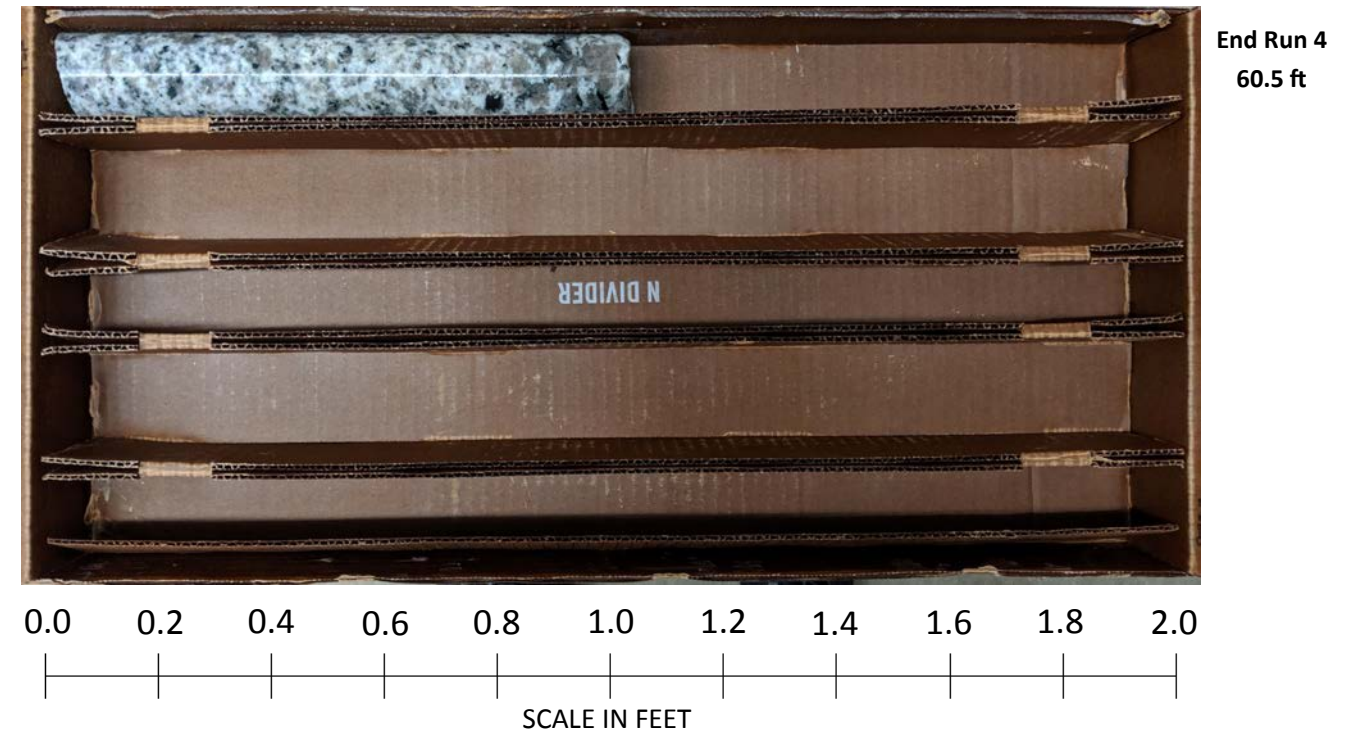
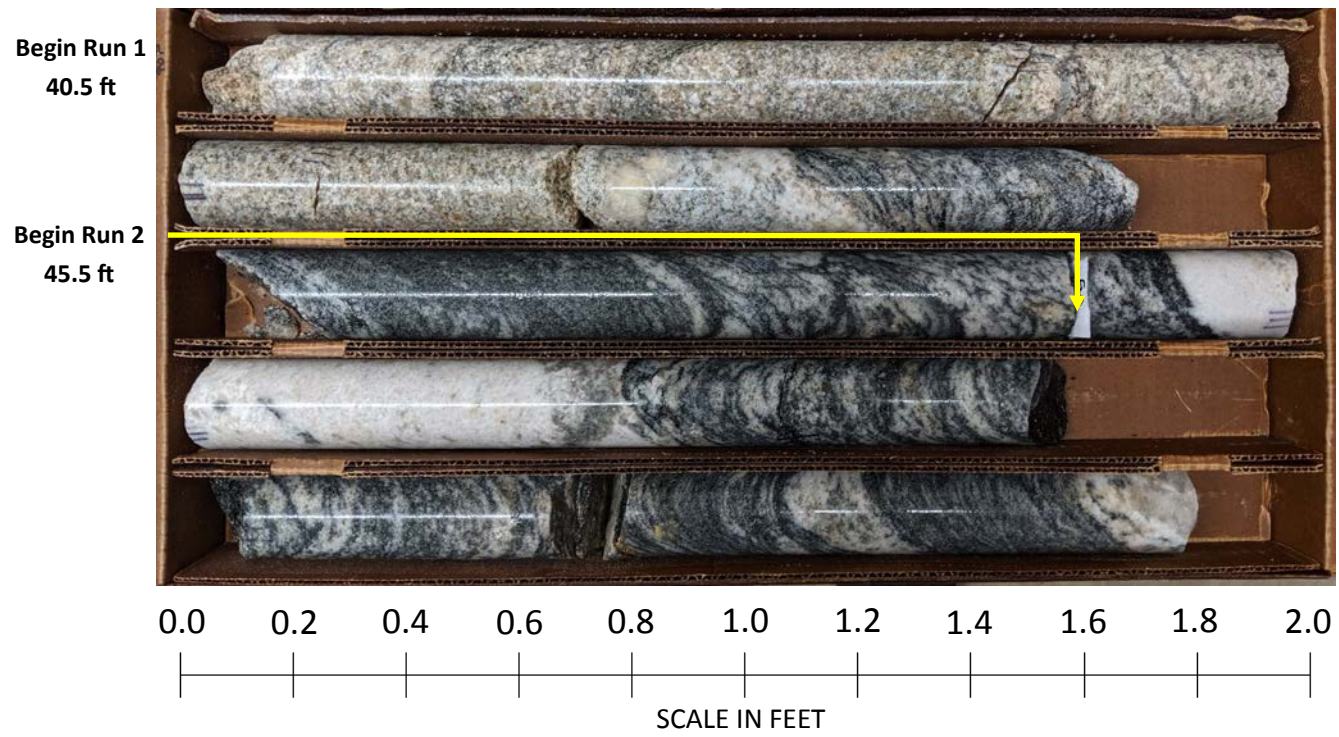


Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40

WBS: 34839.1.7 Tip No.: U-2579AA

Rock Core Photographs: Boring: B4-C

Station: 45+15 Offset: CL



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST P. Donnelly	
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)
BORING NO. B5-A		STATION 46+88		OFFSET 17 ft LT		ALIGNMENT -Y2FLYCA-	
COLLAR ELEV. 817.8 ft		TOTAL DEPTH 64.2 ft		NORTHING 842,233		EASTING 1,661,314	
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER G. Akins		START DATE 03/21/19		COMP. DATE 03/21/19		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
820	817.8	0.0											GROUND SURFACE	0.0
815	814.3	3.5	1	1	1							M	ALLUVIAL Very Loose, Brown-Gray, Silty Fine to Coarse SAND (A-2-4), with trace organics and mica	
810	809.3	8.5	WOH	WOH	WOH							M		
805	804.3	13.5	1	1	9							W		
800	799.3	18.5	8	7	7							Sat.	RESIDUAL Loose to Medium Dense, Gray-Black-White-Tan, Silty Fine to Coarse SAND (A-2-4), with little mica	14.0
795	794.3	23.5	4	7	9							M		
790	789.3	28.5	10	18	12							M		
785	784.3	33.5	15	17	9							M		
780	779.3	38.5	7	5	9							M		
775	774.3	43.5	11	15	14							M		
770	769.3	48.5	12	12	11							M		
765	764.3	53.5	9	80	20/0.1							M		
760	759.3	58.5	100/0.4									M	WEATHERED ROCK Black-White-Tan (AMPHIBOLITE)	54.0
755	754.3	63.5	53	47/0.2								M		
													Boring Terminated at Elevation 753.6 ft In Weathered Rock (AMPHIBOLITE)	64.2

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST P. Donnelly	
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)
BORING NO. B5-B		STATION 46+99		OFFSET 22 ft RT		ALIGNMENT -Y2FLYCA-	
COLLAR ELEV. 818.4 ft		TOTAL DEPTH 64.4 ft		NORTHING 842,246		EASTING 1,661,352	
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER G. Akins		START DATE 03/22/19		COMP. DATE 03/22/19		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
820	818.4	0.0											GROUND SURFACE	0.0
815	814.9	3.5	WOH	WOH	WOH							M	ARTIFICIAL FILL Very Soft, Red-Brown, Fine to Coarse SANDY SILT (A-4), with trace mica	
810	809.9	8.5	2	4	5							M		
805	804.9	13.5	3	3	4							W	ALLUVIAL Loose, Gray-Brown, Silty Fine to Coarse SAND (A-2-4),	6.5
800	799.9	18.5	9	5	8							Sat.	RESIDUAL Loose to Very Dense, Tan-Black-White, Silty Fine to Coarse SAND (A-2-4), with little mica	16.0
795	794.9	23.5	10	22	23							Sat.		
790	789.9	28.5	5	4	6							M		
785	784.9	33.5	11	21	21							M		
780	779.9	38.5	8	11	10							M		
775	774.9	43.5	17	29	44							M		
770	769.9	48.5	64	31/0.2								M	WEATHERED ROCK Black-White-Tan (AMPHIBOLITE)	47.0
765	764.9	53.5	60	40/0.3								M		
760	759.9	58.5	20	30	54							M	RESIDUAL Very Dense, Black-White-Tan, Silty Fine to Coarse SAND (A-2-4), with little mica	56.0
755	754.9	63.5	37	63/0.4								M	WEATHERED ROCK Black-White-Tan (AMPHIBOLITE)	62.0
													Boring Terminated at Elevation 754.0 ft In Weathered Rock (AMPHIBOLITE)	64.4

NCDOT BORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC_DOT.GDT 11/5/19

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST A. Suttle							
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)						
BORING NO. B5-C		STATION 47+00		OFFSET CL		ALIGNMENT -Y2FLYCA-							
COLLAR ELEV. 817.8 ft		TOTAL DEPTH 100.7 ft		NORTHING 842,246		EASTING 1,661,330							
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 85% 02/06/2019				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic							
DRILLER J. Cain		START DATE 10/21/19		COMP. DATE 10/21/19		SURFACE WATER DEPTH N/A							
CORE SIZE NQ-2		TOTAL RUN 27.8 ft											
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)		
					REC (%)	RQD (%)	REC (%)	RQD (%)					
744.9	744.9	72.9	2.8	N=60/0.0 1:06/1.0 0:58/1.0 0:26/0.8	(1.6) 57%	(0.9) 32%	(0.9) 100%	(0.9) 100%		Begin Coring @ 72.9 ft	72.9		
	742.1	75.7	5.0	0:43/1.0 0:49/1.0 0:37/1.0 0:38/1.0 0:30/1.0	(4.4) 88%	(2.5) 50%	(5.1) 74%	(2.5) 36%		744.0	CRISTALLINE ROCK Slightly Weathered, Hard, Black-Orange-White GRANITIC ROCK, with Close Fracture Spacing	73.8	
	737.1	80.7	5.0	0:39/1.0 0:26/1.0 0:27/1.0 0:27/1.0 0:34/1.0	(1.4) 28%	(1.2) 24%	(0.0) 0%	(0.0) 0%		737.1	REC = 100%, RQD = 100%, GSI = 85 - 90 Slightly to Moderately Severely Weathered, Medium Hard to Hard, White-Black AMPHIBOLITE, with Very Close to Close Fracture Spacing	80.7	
	732.1	85.7	5.0	0:36/1.0 0:39/1.0 0:28/1.0 0:28/1.0 0:27/1.0	(2.3) 46%	(1.7) 34%	(1.4) 100%	(1.2) 86%		733.5	REC = 74%, RQD = 36%, GSI = 30 - 35 No Recovery - Weathered Rock Seam	84.3	
	727.1	90.7	5.0	0:32/1.0 0:29/1.0 0:21/1.0 0:32/1.0 0:33/1.0	(2.1) 42%	(1.3) 26%	(7.1) 58%	(4.4) 36%		732.1	Moderately Severely Weathered, Moderately Hard, White-Black AMPHIBOLITE, with Close to Very Close Fracture Spacing	85.7	
	722.1	95.7	5.0	0:31/1.0 0:40/1.0 0:30/1.0 0:54/1.0 0:46/1.0	(2.7) 54%	(1.4) 28%				729.4	REC = 100%, RQD = 86%, GSI = 65 - 70 No Recovery - Weathered Rock Seam	88.4	
	717.1	100.7								717.1	Fresh to Moderately Severely Weathered, Hard to Medium Hard, Black-White AMPHIBOLITE with minor GRANITIC ROCK, with Very Close to Moderately Close Fracture Spacing		
												REC = 58%, RQD = 36%, GSI = 30 - 35	
												Boring Terminated at Elevation 717.1 ft In Crystalline Rock (AMPHIBOLITE)	100.7
Notes: 1) Auger Probe to 43.5 Feet													

NCDOT CORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC_DOT.GDT 11/4/19



Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40

WBS: 34839.1.7 Tip No.: U-2579AA

Rock Core Photographs: Boring: B5-C

Station: 47+00 Offset: CL



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST P. Donnelly										
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 48+77		OFFSET 13 ft LT		ALIGNMENT -Y2FLYCA-										
COLLAR ELEV. 825.1 ft		TOTAL DEPTH 53.6 ft		NORTHING 842,422		EASTING 1,661,307										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER G. Akins		START DATE 03/21/19		COMP. DATE 03/21/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
830																
825	825.1	0.0	WOH	WOH	WOH								M	825.1 GROUND SURFACE 0.0		
820	821.6	3.5	22	23	22								M	822.6 RESIDUAL Very Soft, Red-Brown, Fine to Coarse Sandy SILT (A-4)	2.5	
	819.1	6.0	6	13	16								M	Loose to Dense, White-Brown-Black-Red-Orange-Tan, Silty Fine to Coarse SAND (A-2-4), with little mica		
815	816.6	8.5	2	3	5								M			
810	811.6	13.5	1	2	7								M			
805	806.6	18.5	4	7	16								M			
800	801.6	23.5	3	3	5								M			
795	796.6	28.5	6	16	24								M			
790	791.6	33.5	100/0.4										M	791.6 WEATHERED ROCK Black-White (MICA SCHIST)	33.5	
785	786.6	38.5	18	9	12								M	789.1 RESIDUAL Medium Dense to Very Dense, Black-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	36.0	
780	781.6	43.5	24	27	27								M			
775	776.6	48.5	6	5	31								M			
	771.6	53.5	60/0.1										M	771.6 CRYSTALLINE ROCK Black-White (MICA SCHIST) Boring Terminated with Standard Penetration Test Refusal at Elevation 771.5 ft In Cystalline Rock (MICA SCHIST)	53.5	

WBS 34839.1.7		TIP U-2579AA		COUNTY FORSYTH		GEOLOGIST M. Magno										
SITE DESCRIPTION Bridge No. 729 on -Y2FLYCA- over Future I-74 from US 311 to I-40							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 48+83		OFFSET 13 ft RT		ALIGNMENT -Y2FLYCA-										
COLLAR ELEV. 823.7 ft		TOTAL DEPTH 25.9 ft		NORTHING 842,429		EASTING 1,661,333										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER G. Akins		START DATE 03/21/19		COMP. DATE 03/21/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
825																
	823.7	0.0	WOH	WOH	1								M	823.7 GROUND SURFACE 0.0		
820	820.2	3.5	2	1	2								W	820.7 RESIDUAL Very Soft, Red-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	3.0	
	817.7	6.0	1	2	1								W	Very Loose to Loose, Red-Brown-Black-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica		
815	815.2	8.5	WOH	1	2								W			
810	810.2	13.5	1	2	3								W			
805	805.2	18.5	1	1	2								W			
800	800.2	23.5	35	65/0.1									W	800.7 WEATHERED ROCK White-Orange-Tan (GRANITIC ROCK)	23.0	
	797.9	25.8	60/0.1											797.9 CRYSTALLINE ROCK (GRANITIC ROCK) Boring Terminated with Standard Penetration Test Refusal at Elevation 797.8 ft In Cystalline Rock (GRANITIC ROCK)	25.8	

NCDOT BORE DOUBLE U-2579AA-BRIDGE 729.GPJ NC_DOT.GDT 11/4/19

SITE PHOTOS

BRIDGE NO. 729 ON
-Y2FLYCA- OVER FUTURE I-74



PHOTO 1: VIEW AT END BENT 1 LOOKING UPSTATION ALONG -Y2FLYCA- TOWARD EB-2



PHOTO 2: VIEW AT END BENT 2 LOOKING DOWNSTATION ALONG -Y1- (EXISTING HIGH POINT ROAD)



PHOTO 3: VIEW AT BENT 3 LOOKING WEST TOWARD SWAIM CREEK



PHOTO 4: VIEW AT END BENT 2 LOOKING DOWNSTATION ALONG -Y2FLYCA- TOWARD EB-1