

REFERENCE: U-2579AB

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 BELTWAY
FROM US 421 /I-40 BUS TO I-40
SITE DESCRIPTION BRIDGE NO. 725 ON -Y15FLYAC- IN
INTERCHANGE CONNECTING WINSTON-SALEM
NORTHERN BELTWAY AND I-40 BYPASS
INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	32

CAUTION NOTICE

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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.

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11/14/2019

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

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, *VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6*

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)							ORGANIC MATERIALS			
	A-1	A-1-b	A-2	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7			
GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7				
SYMBOL																		
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MX	51 MN 35 MX 35 MX	40 MX 35 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX	41 MN 40 MX 35 MX
MATERIAL PASSING #40 LL PI	-	6 MX	NP	40 MX 10 MX	41 MN 10 MX	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN	41 MN 11 MN
GROUP INDEX	0	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX									
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS													
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR							FAIR TO POOR	POOR	UNSATURABLE	
	PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30																	

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)
GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESSIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270
	4.76	2.00	0.42	0.25	0.075	0.053
BOULDER (BLDR.)						
COBBLE (COB.)						
GRAVEL (GR.)						
COARSE SAND (CSE. SD.)						
FINE SAND (F. SD.)						
SILT (SL.)						
CLAY (CL.)						
GRAIN SIZE	MM 12	75	2.0	0.25	0.05	0.005

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
LL - LIQUID LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
PLASTIC RANGE (PI)	- WET - (W)	SEMI-SOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
OM - OPTIMUM MOISTURE SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL - SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: **ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.**

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE LL < 31
 MODERATELY COMPRESSIBLE LL = 31 - 50
 HIGHLY COMPRESSIBLE LL > 50

PERCENTAGE OF MATERIAL

	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY 35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- DIP & DIP DIRECTION OF ROCK STRUCTURES
- TEST BORING
- AUGER BORING
- CORE BORING
- MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

- AR - AUGER REFUSAL
- BT - BORING TERMINATED
- CL - CLAY
- CPT - CONE PENETRATION TEST
- CSE - COARSE
- DMT - DILATOMETER TEST
- DPT - DYNAMIC PENETRATION TEST
- e - VOID RATIO
- F - FINE
- FOSS. - FOSSILIFEROUS
- FRAC. - FRACTURED, FRACTURES
- FRAGS. - FRAGMENTS
- HL - 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
- γ_u - UNIT WEIGHT
- γ_d - DRY UNIT WEIGHT
- S - BULK
- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RS - ROCK
- RT - RECOMPACTED TRIAXIAL
- CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

- DRILL UNITS:
 - CME-45C
 - CME-55
 - CME-550
 - VANE SHEAR TEST
 - PORTABLE HOIST
 - DIEDRICH D-120
- ADVANCING TOOLS:
 - CLAY BITS
 - 6" CONTINUOUS FLIGHT AUGER
 - 8" HOLLOW AUGERS
 - HARD FACED FINGER BITS
 - TUNG-CARBIDE INSERTS
 - CASING w/ ADVANCER
 - TRICONE *STEEL TEETH
 - TRICONE *TUNG-CARB.
 - CORE BIT
- HAMMER TYPE:
 - AUTOMATIC MANUAL
- CORE SIZE:
 - B
 - H
 - N
- HAND TOOLS:
 - POST HOLE DIGGER
 - HAND AUGER
 - SOUNDING ROD
 - VANE SHEAR TEST

ROCK DESCRIPTION

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:

- WEATHERED ROCK (WR)
NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
- 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.
- 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.
- 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.

WEATHERING

- FRESH** ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
- VERY SLIGHT (V 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 (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. *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.

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 GROUDED 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 GROUDED 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.

FRACTURE SPACING

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

BEDDING

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

INDURATION

- 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.

TERMS AND DEFINITIONS

- ALLUVIUM (ALLUV.)** - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
- AQUIFER** - A WATER BEARING FORMATION OR STRATA.
- ARENACEOUS** - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
- ARGILLACEOUS** - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
- ARTESIAN** - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
- CALCAREOUS (CALC.)** - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
- COLLUVIUM** - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
- CORE RECOVERY (REC.)** - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
- DIKE** - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
- DIP** - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
- DIP DIRECTION (DIP AZIMUTH)** - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
- FAULT** - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
- FISSILE** - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
- FLOAT** - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND 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 (ROD)** - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
- SAPROLITE (SAP.)** - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
- SILL** - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
- SLICKENSIDE** - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
- STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)** - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
- STRATA CORE RECOVERY (SREC.)** - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- STRATA ROCK QUALITY DESIGNATION (SROD)** - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
- TOPSOIL (TS.)** - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

NOTES:

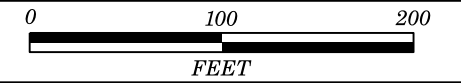
EXISTING GROUND SURFACE INFORMATION PROVIDED BY NCDOT ON APRIL 22, 2019

BL-49 (N 847739.11E 1663843.71)
 BL-50 (N 847290.74 E 1663706.27)
 U-2579AB-5 (N 848190.87 E 1664352.70)

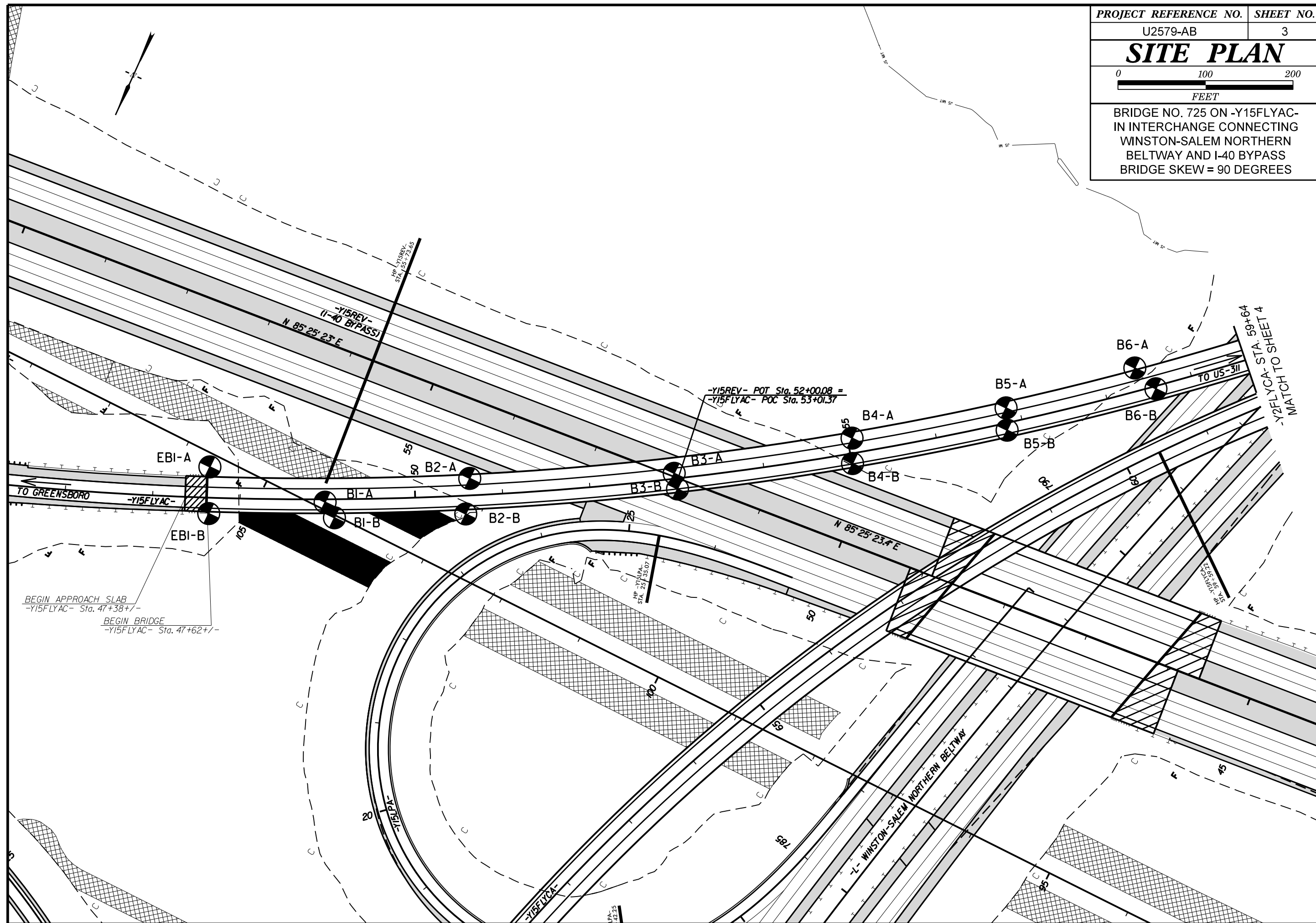
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DATE: 8-15-14

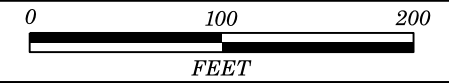
SITE PLAN



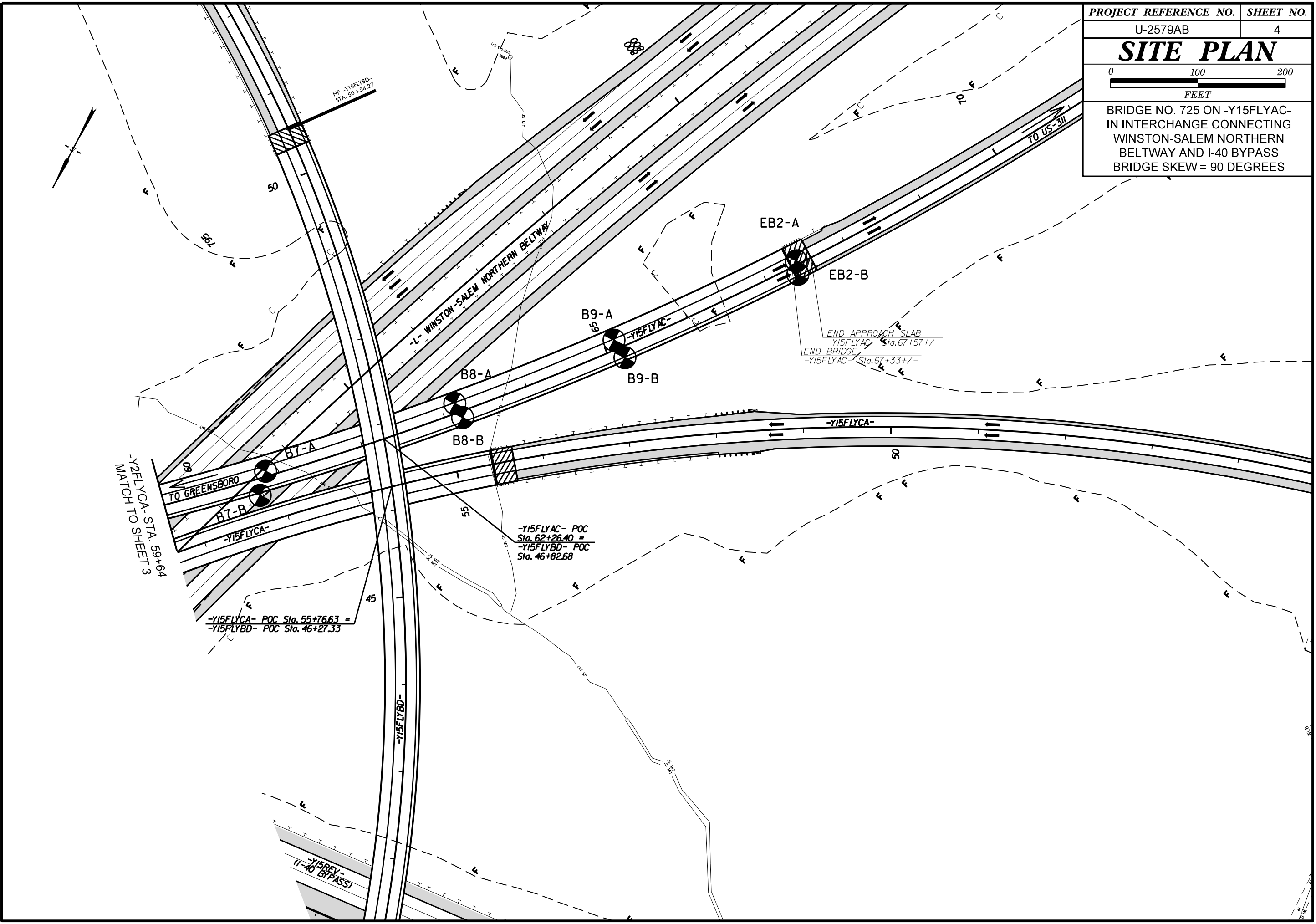
BRIDGE NO. 725 ON -Y15FLYAC-
IN INTERCHANGE CONNECTING
WINSTON-SALEM NORTHERN
BELTWAY AND I-40 BYPASS
BRIDGE SKEW = 90 DEGREES



SITE PLAN

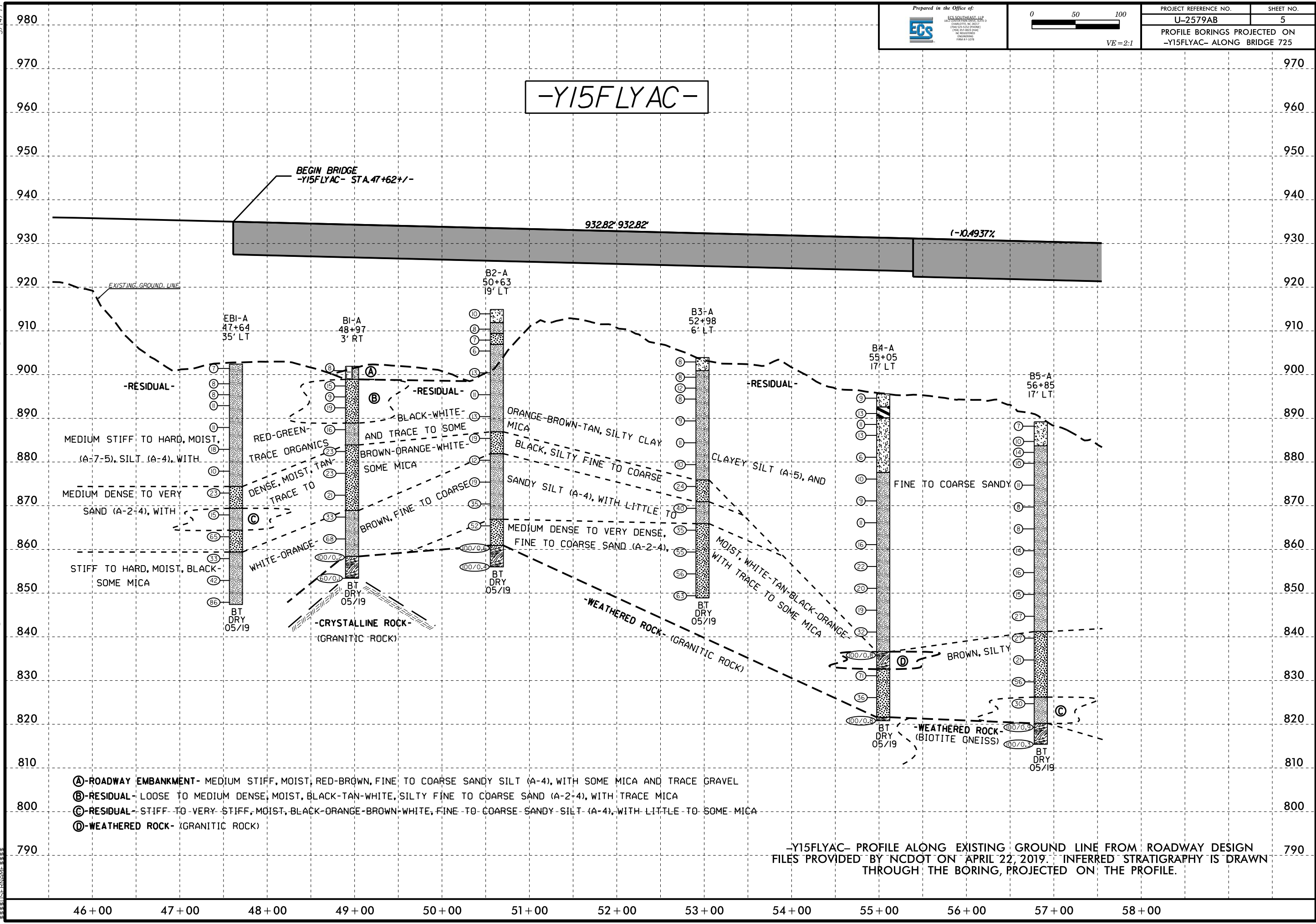


BRIDGE NO. 725 ON -Y15FLYAC-
IN INTERCHANGE CONNECTING
WINSTON-SALEM NORTHERN
BELTWAY AND I-40 BYPASS
BRIDGE SKEW = 90 DEGREES

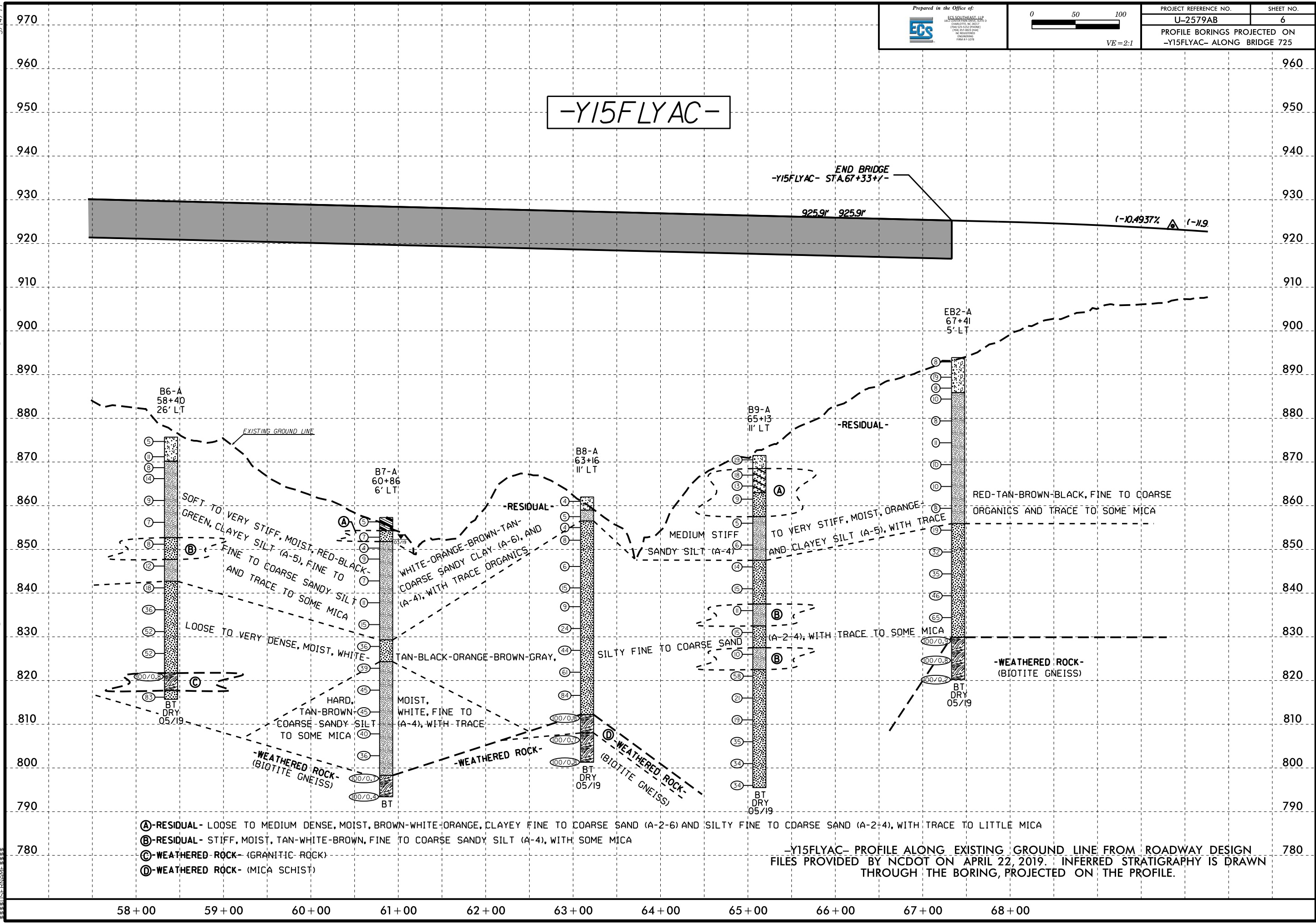


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 5/14/19

-Y15FLYAC-



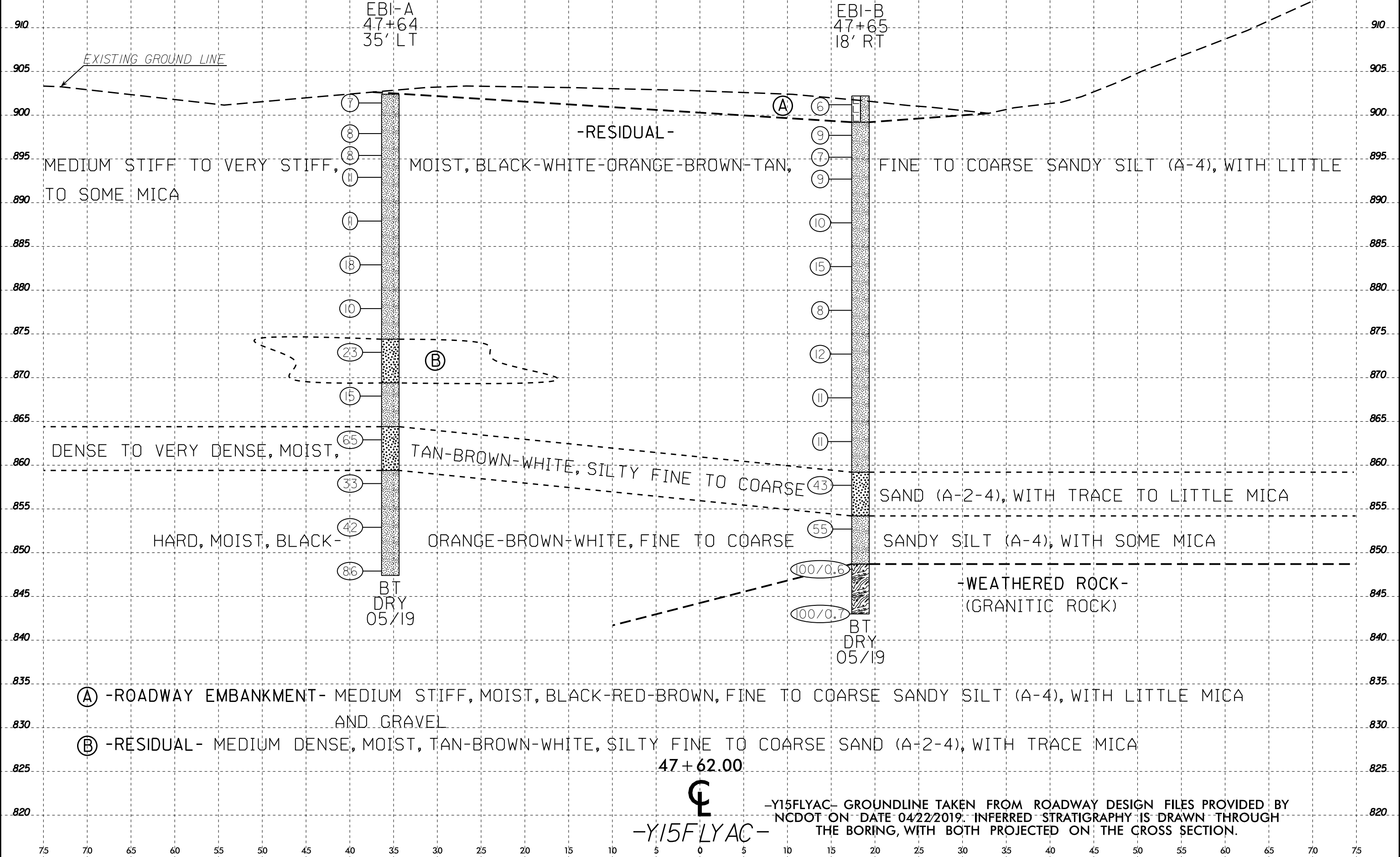
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 5/14/19



- Ⓐ-RESIDUAL- LOOSE TO MEDIUM DENSE, MOIST, BROWN-WHITE-ORANGE, CLAYEY FINE TO COARSE SAND (A-2-6) AND SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO LITTLE MICA
- Ⓑ-RESIDUAL- STIFF, MOIST, TAN-WHITE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH SOME MICA
- Ⓒ-WEATHERED ROCK- (GRANITIC ROCK)
- Ⓓ-WEATHERED ROCK- (MICA SCHIST)

-Y15FLYAC- PROFILE ALONG EXISTING GROUND LINE FROM ROADWAY DESIGN
 FILES PROVIDED BY NCDOT ON APRIL 22, 2019. INFERRED STRATIGRAPHY IS DRAWN
 THROUGH THE BORING, PROJECTED ON THE PROFILE.

6/23/16
05-JUN-2019 08:54
C:\PROJECTS\13000-13900\13520 - U-2579AB %
Bridge 725 on %
Y15FLYAC\CADD\DEOTECH\ssc\2579ab-geo-ssi-j15fljgcd.dgn

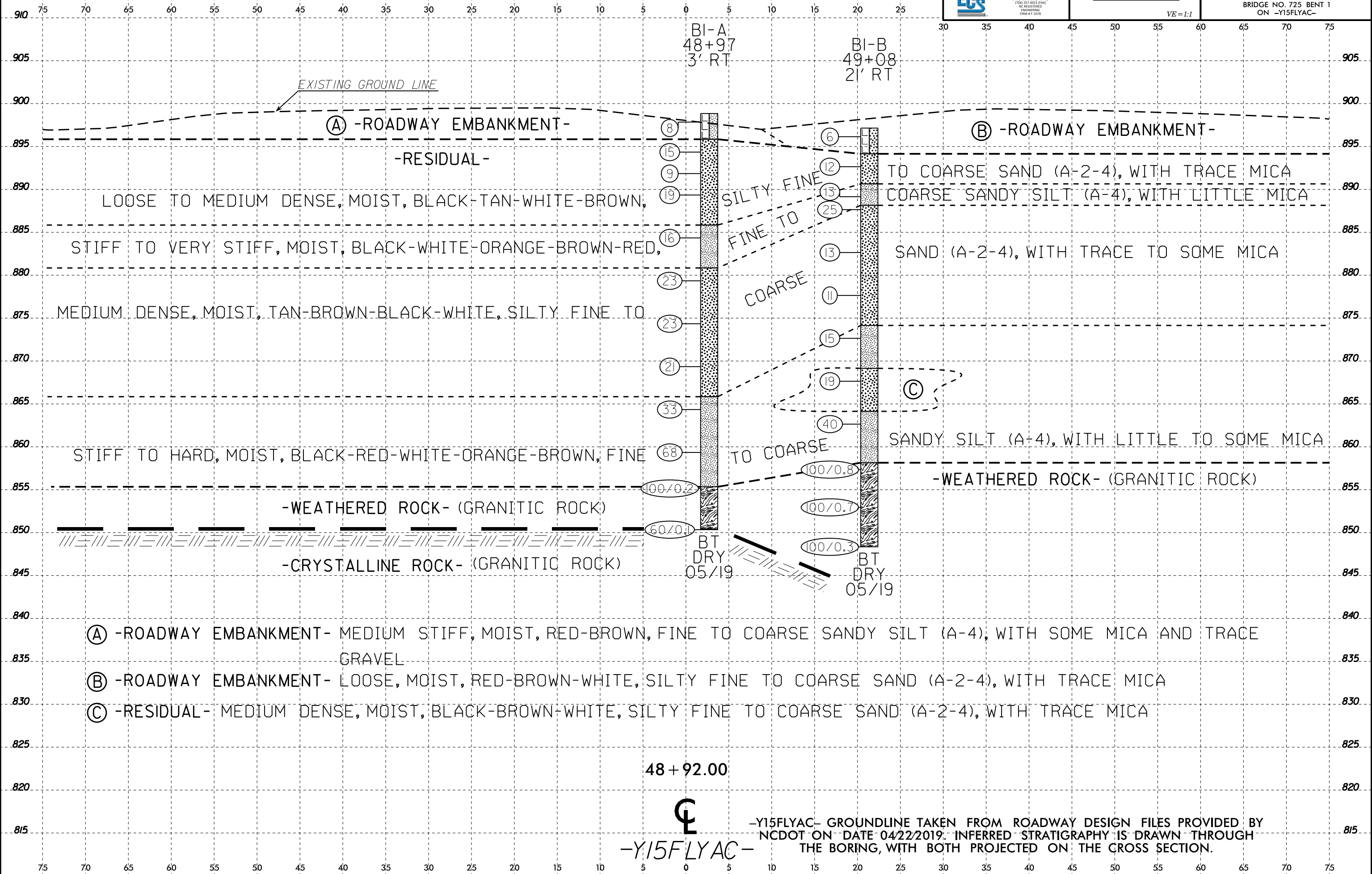


05-JUN-2019 08:54
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1:3000
1:3500
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U-2579AB
Bridge 725 on %
Y15FLYAC\CADD\DEOTECH\ssc\2579ab-geo-ssi-j15f1ygc.dgn

915



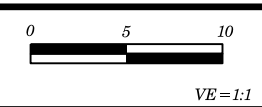
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U-2579AB	8
BRIDGE NO. 725 BENT 1 ON -Y15FLYAC-	



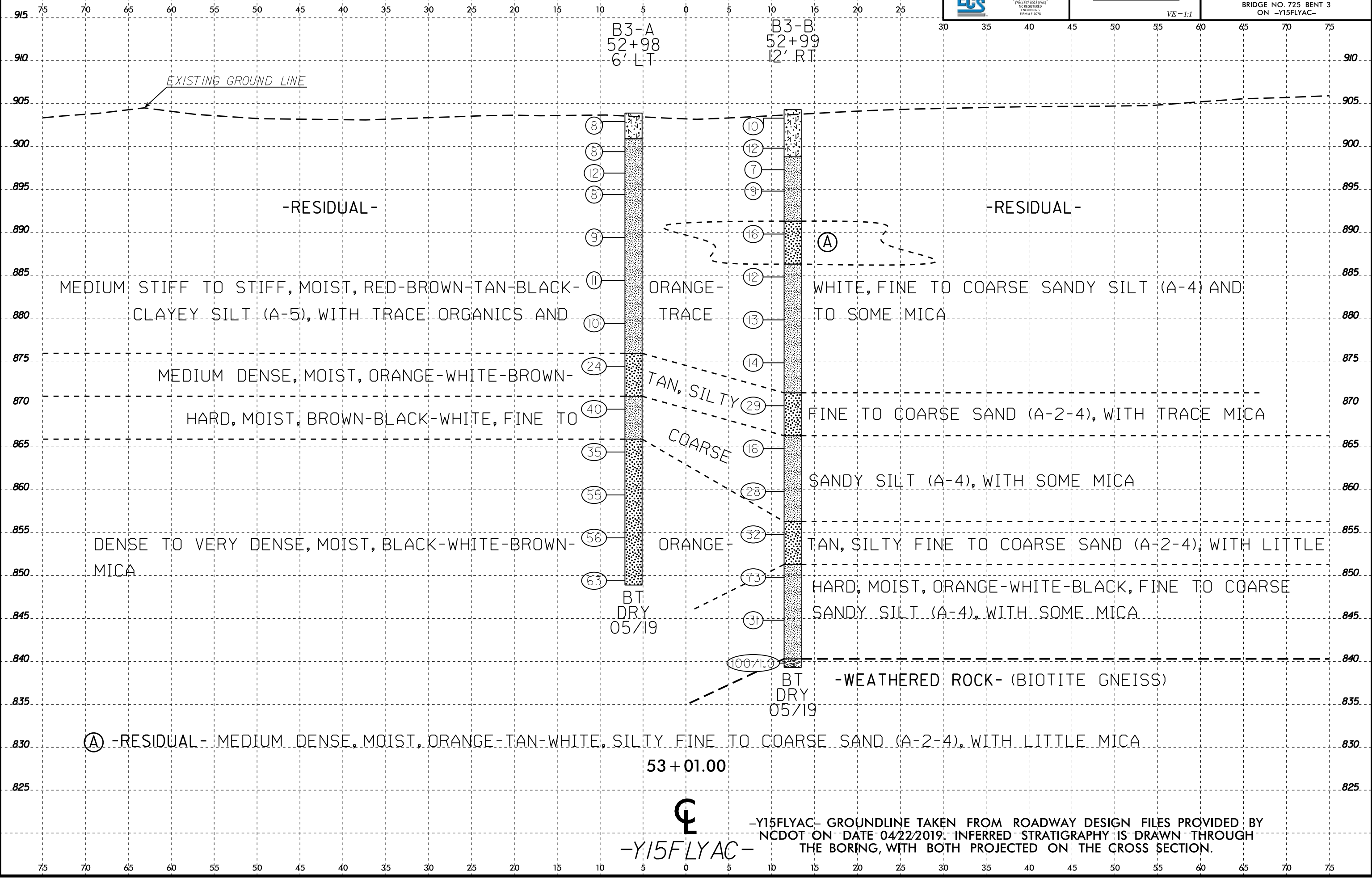
48 + 92.00
Y15FLYAC

-Y15FLYAC- 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.

6/23/16
05-JUN-2019 08:54
C:\PROJECTS\130000\13520 - U-2579AB\B\%
Bridge 725 on %
Y15FLYAC\CADD\DEOTECH\ssc\2579ab-geo-ssi-j15fljgac.dgn

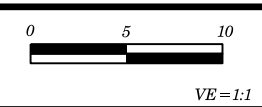


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U-2579AB	10
BRIDGE NO. 725 BENT 3 ON -Y15FLYAC-	

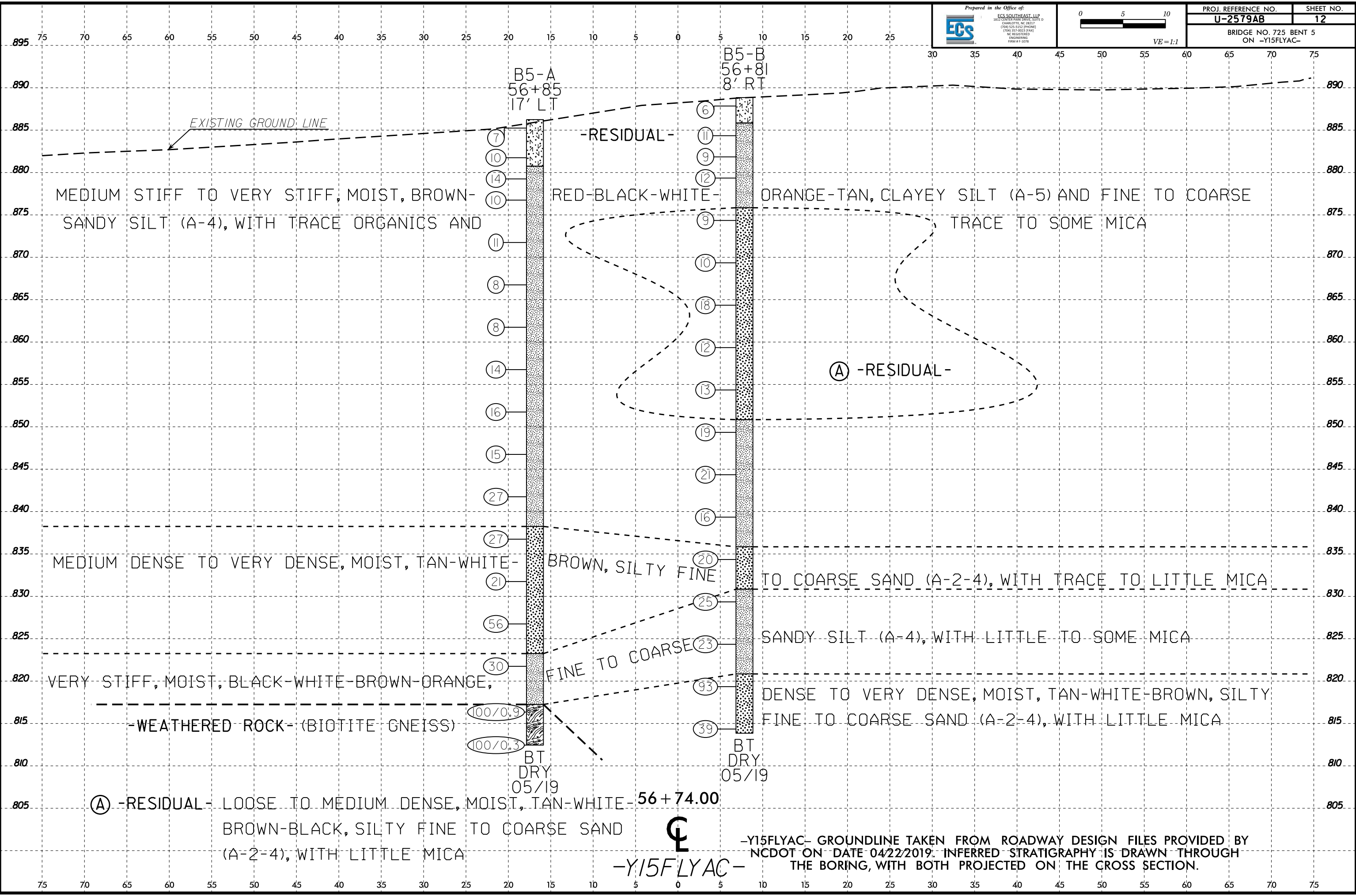


-Y15FLYAC- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY NCDOT ON DATE 04/22/2019. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

6/23/16
05-JUN-2019 08:54
1:20:00
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Bridge 725 on %
Y15FLYAC\CADD_GEO\TECH\ssc\2579ab-geo_xsi-115fljgac.dgn



PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	12
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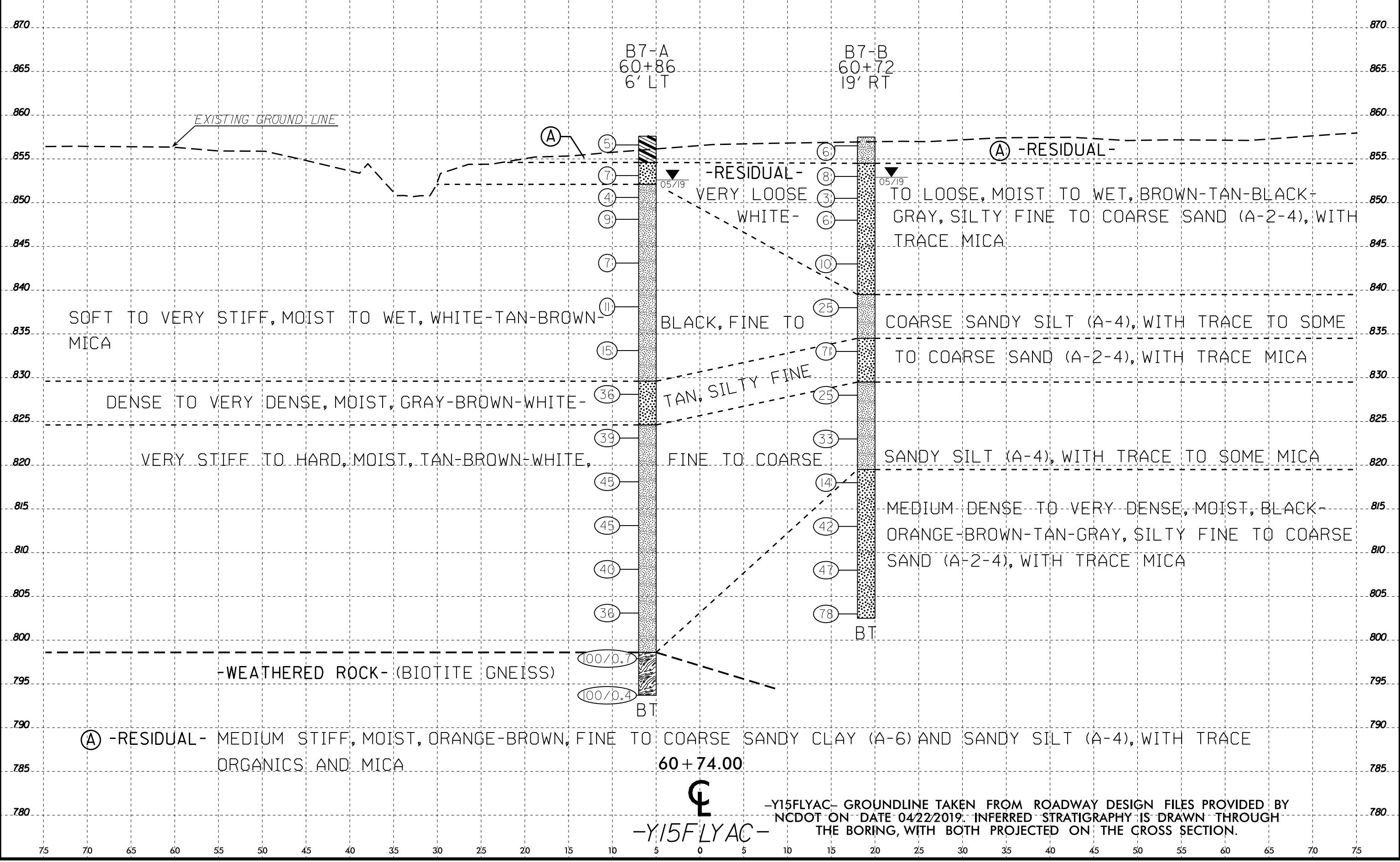


① -RESIDUAL- LOOSE TO MEDIUM DENSE, MOIST, TAN-WHITE-
BROWN-BLACK, SILTY FINE TO COARSE SAND
(A-2-4), WITH LITTLE MICA

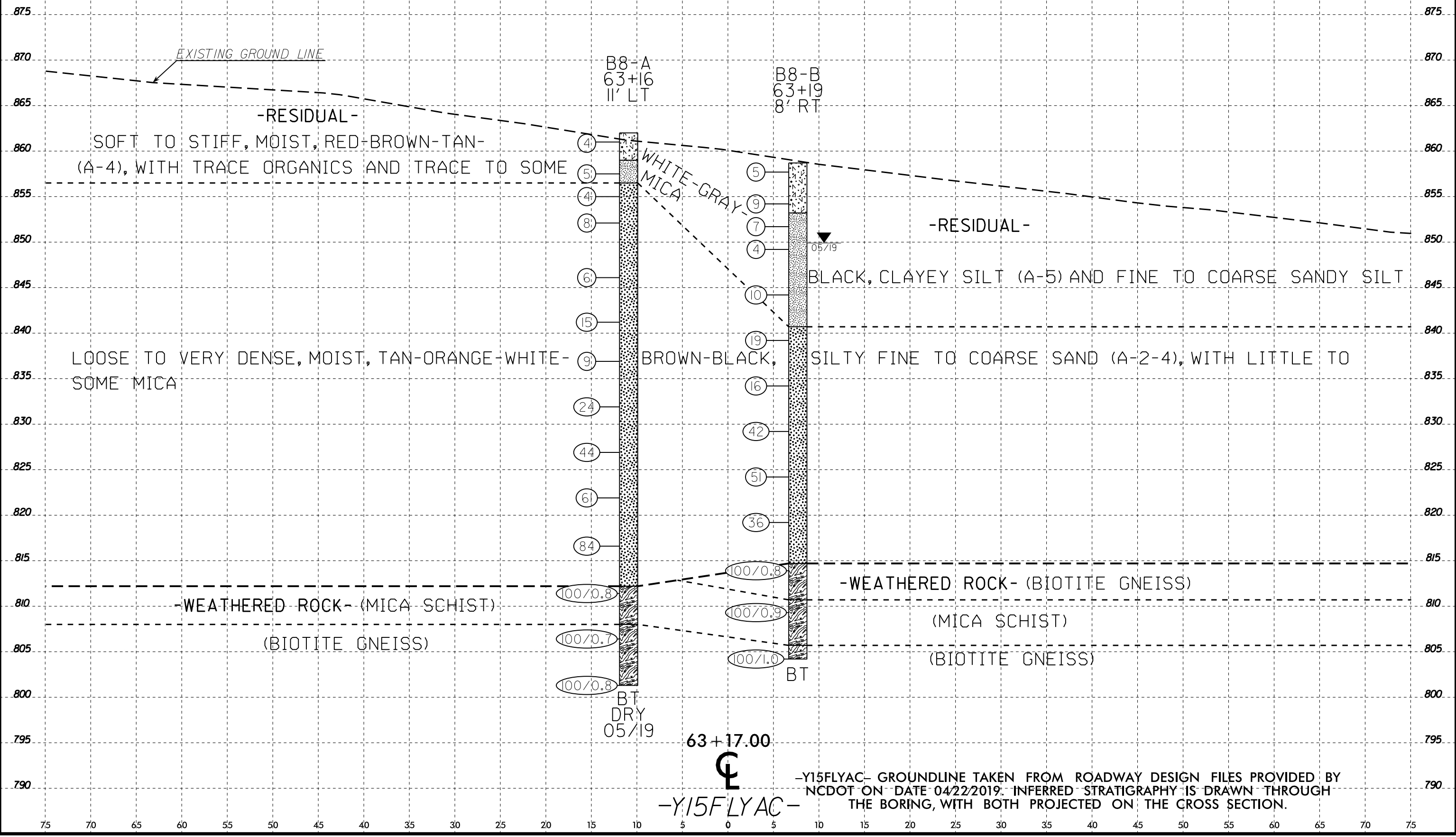
-Y15FLYAC- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY
NCDOT ON DATE 04/22/2019. INFERRED STRATIGRAPHY IS DRAWN THROUGH
THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.

Y15FLYAC

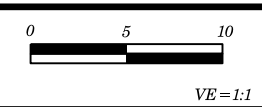
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Bridge 725 on %
Y15FLYAC\CADD\DEOTECH\asc\2579ab-geo_xsi-1151\gac.dgn



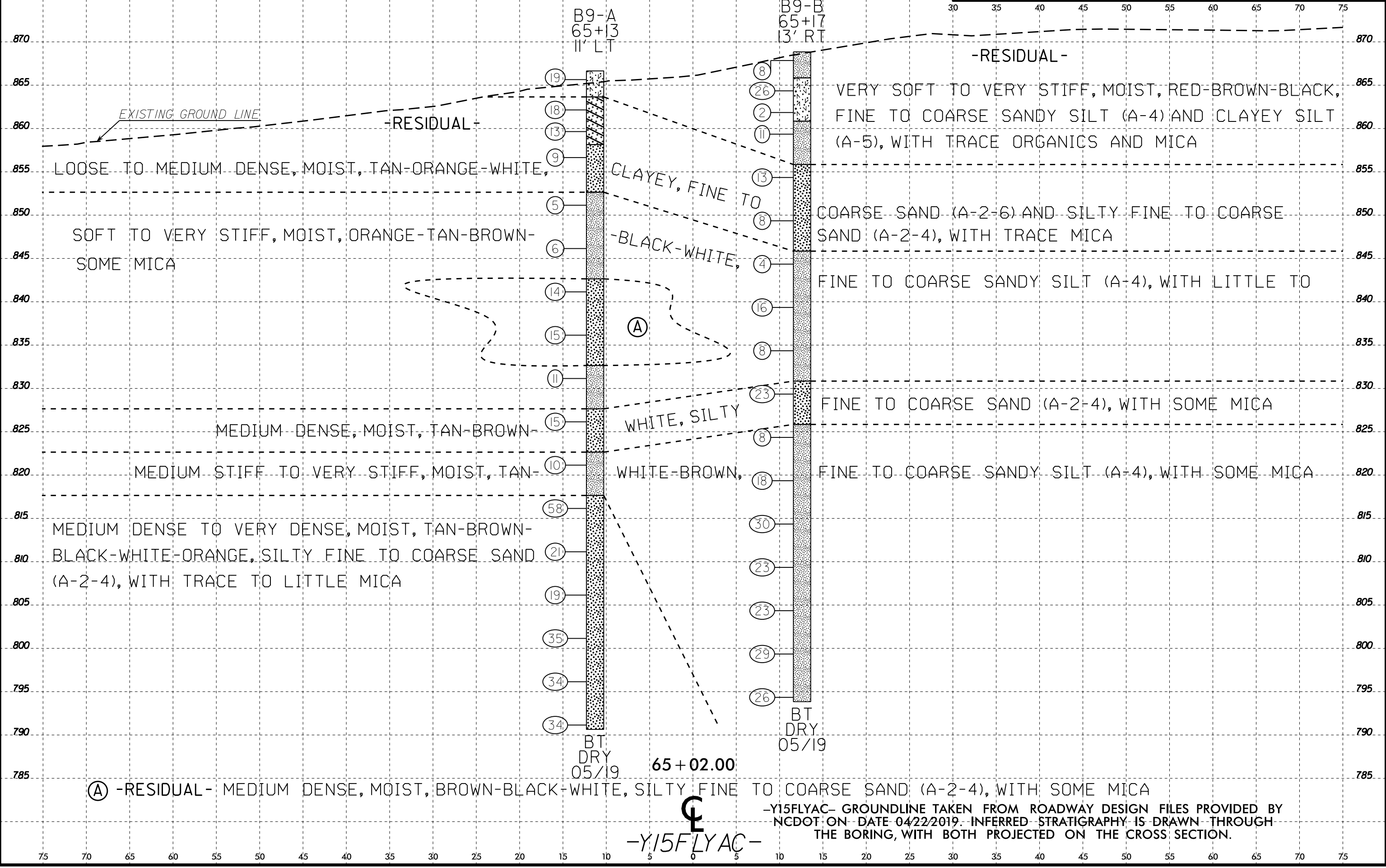
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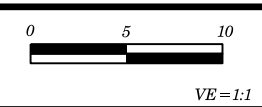
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Bridge 725 on 1/2 Y15FLYAC\CADD\DEOTECH\asc\2579ab_geo_xsi-j15f1\gac.dgn



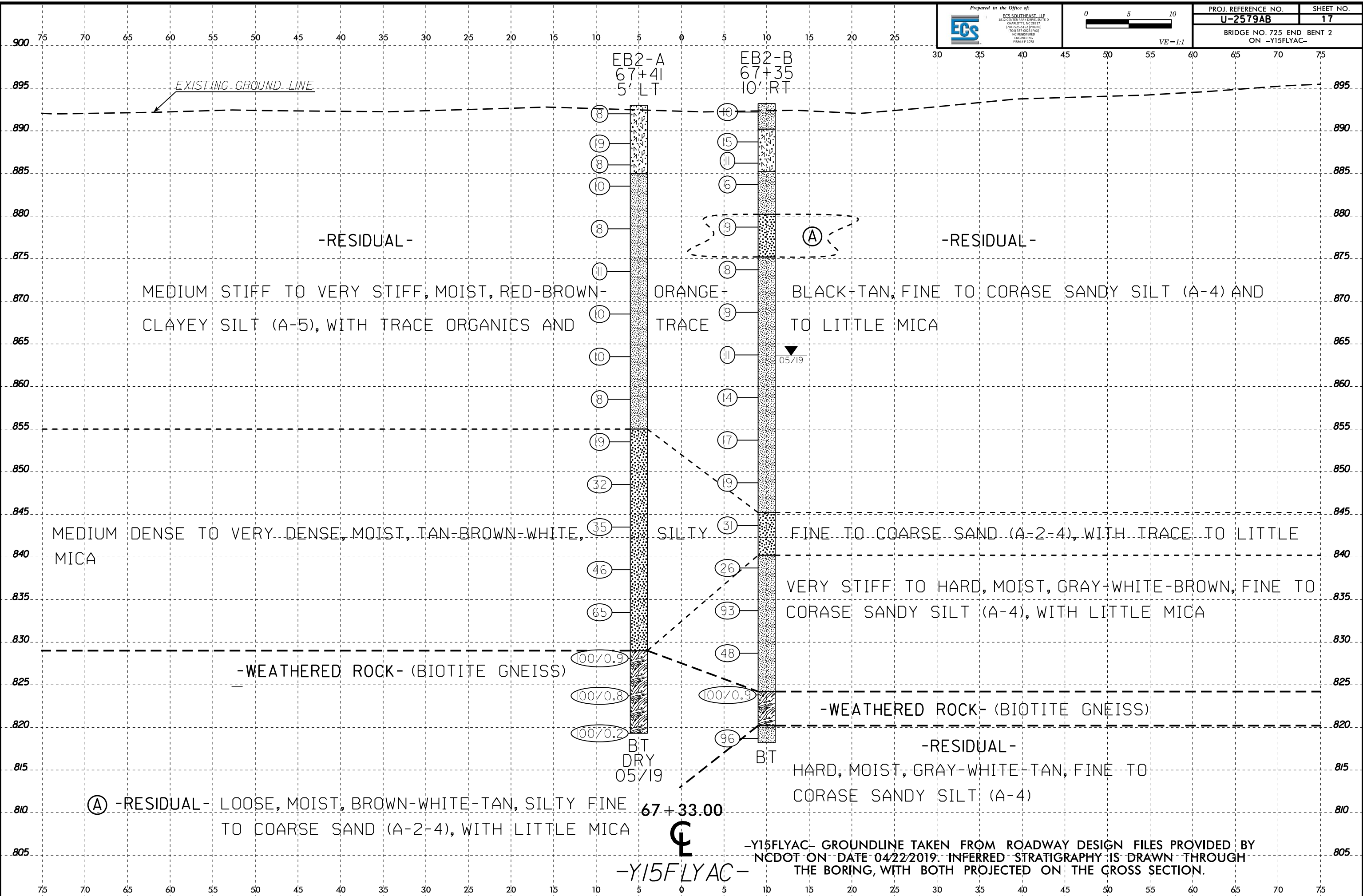
PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	16
BRIDGE NO. 725 BENT 9 ON -Y15FLYAC-	



6/23/16
05-JUN-2019 08:55
C:\PROJECTS\130000\13500\13520 - U-2579AB %
Bridge 725 on %
Y15FLYAC\CADD\GEO\TECH\ssc\2579ab-geo-ssi-j15f\gac.dgn



PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	17
BRIDGE NO. 725 END BENT 2 ON -Y15FLYAC-	



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B1-A		STATION 48+97		OFFSET 3 ft RT		ALIGNMENT -Y15FLYAC-										
COLLAR ELEV. 901.9 ft		TOTAL DEPTH 48.5 ft		NORTHING 848,185		EASTING 1,664,736										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER R. Brock		START DATE 05/15/19		COMP. DATE 05/15/19		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						
905																
	901.9	0.0	2	4	4									901.9	0.0	GROUND SURFACE
900	898.4	3.5	8	8	7								M	898.9	3.0	ROADWAY EMBANKMENT Medium Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4), with some mica and trace gravel
895	895.9	6.0	4	4	5								M			RESIDUAL Loose to Medium Dense, Black-Tan-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
	893.4	8.5	24	11	8								M			
890	888.4	13.5	19	8	8								M	888.9	13.0	Very Stiff, Black-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
885	883.4	18.5	17	11	12								M	883.9	18.0	Medium Dense, Tan-Brown-Black-White, Silty Fine to Coarse SAND (A-2-4), with little to some mica
880	878.4	23.5	7	7	16								M			
875	873.4	28.5	5	8	13								M			
870	868.4	33.5	5	12	21								M	868.9	33.0	Hard, Black-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with some mica
865	863.4	38.5	7	16	52								M			
860	858.4	43.5	100/0.2										M	858.4	43.5	WEATHERED ROCK Tan-Brown-White (GRANITIC ROCK)
855	853.5	48.4	60/0.1										M	853.5	48.4	CRYSTALLINE ROCK Black-White-Brown (GRANITIC ROCK) Boring Terminated with Standard Penetration Test Refusal at Elevation 853.4 ft In Crystalline Rock (GRANITIC ROCK)

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B1-B		STATION 49+08		OFFSET 21 ft RT		ALIGNMENT -Y15FLYAC-										
COLLAR ELEV. 900.2 ft		TOTAL DEPTH 48.8 ft		NORTHING 848,197		EASTING 1,664,718										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER R. Brock		START DATE 05/16/19		COMP. DATE 05/16/19		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						
905																
	900.2	0.0	2	2	4									900.2	0.0	GROUND SURFACE
900	897.2	3.0	8	6	6								M	897.2	3.0	ROADWAY EMBANKMENT Loose, Red-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
895	893.2	7.0	5	6	7								M	893.7	6.5	RESIDUAL Medium Dense, Tan-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
	891.7	8.5	5	10	15								M	891.2	9.0	Stiff, Black-Brown-Red, Fine to Coarse Sandy SILT (A-4), with little mica
890	886.7	13.5	5	6	7								M			Medium Dense, Tan-Brown-Black-White, Silty Fine to Coarse SAND (A-2-4), with trace to little mica
885	881.7	18.5	4	5	6								M			
880	876.7	23.5	3	7	8								M	877.2	23.0	Stiff, Red-Black-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
875	871.7	28.5	4	8	11								M	872.2	28.0	Medium Dense, Black-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
870	866.7	33.5	9	16	24								M	867.2	33.0	Hard, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
865	861.7	38.5	8	41	59/0.3								M	861.2	39.0	WEATHERED ROCK Black-White-Brown (GRANITIC ROCK)
860	856.7	43.5	51	49/0.2									M			
855	851.7	48.5	100/0.3										M	851.4	48.8	Boring Terminated at Elevation 851.4 ft In Weathered Rock (GRANITIC ROCK)

NCDOT BORE DOUBLE U-2579AB - BRIDGE 275.GPJ NC_DOT.GDT 6/4/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B2-A		STATION 50+63		OFFSET 19 ft LT		ALIGNMENT -Y15FLYAC-										
COLLAR ELEV. 914.9 ft		TOTAL DEPTH 58.9 ft		NORTHING 848,090		EASTING 1,664,599										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER R. Brock		START DATE 05/14/19		COMP. DATE 05/14/19		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						
915	914.9	0.0	3	4	6									914.9	GROUND SURFACE	0.0
910	911.4	3.5	4	4	4									911.9	RESIDUAL Stiff, Brown-Red, Clayey SILT (A-5), with trace organics and little mica	3.0
	908.9	6.0	3	4	3									909.4	Medium Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4), with little mica	5.5
	906.4	8.5	4	3	3									906.9	Loose, Orange-White-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	8.0
905	901.4	13.5	6	6	7										Medium Stiff to Stiff, Red-White-Black-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	
	896.4	18.5	5	4	7											
890	891.4	23.5	6	6	7											
	886.4	28.5	8	9	10										Medium Dense, Tan-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	28.0
885	881.4	33.5	4	6	6										Stiff to Hard, White-Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little to some mica	33.0
	876.4	38.5	6	8	11											
870	871.4	43.5	11	11	24											
	866.4	48.5	20	20	32											
860	861.4	53.5	23	75	25/0.1											
	856.4	58.5	100/0.4												WEATHERED ROCK White-Black-Orange-Brown (GRANITIC ROCK)	54.0
															Boring Terminated at Elevation 856.0 ft In Weathered Rock (GRANITIC ROCK)	58.9

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B2-B		STATION 50+57		OFFSET 21 ft RT		ALIGNMENT -Y15FLYAC-										
COLLAR ELEV. 897.9 ft		TOTAL DEPTH 44.7 ft		NORTHING 848,128		EASTING 1,664,585										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER R. Brock		START DATE 05/15/19		COMP. DATE 05/15/19		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						
900	897.9	0.0	1	2	4									897.9	GROUND SURFACE	0.0
895	894.4	3.5	3	4	7										RESIDUAL Loose to Medium Dense, Black-White-Brown, Silty Fine to Coarse SAND (A-2-4), with some mica	5.5
	891.9	6.0	3	5	5										Stiff, Orange-Black-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	8.0
890	889.4	8.5	3	5	5										Loose, White-Tan-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	
	884.4	13.5	5	5	7										Stiff to Very Stiff, Orange-Black-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	13.0
880	879.4	18.5	6	9	11											
	874.4	23.5	11	15	19										Dense to Very Dense, White-Tan-Black-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace to little mica	23.0
870	869.4	28.5	14	23	37											
	864.4	33.5	12	36	50											
860	859.4	38.5	12	42	58/0.3											
	854.4	43.5	100/0.2													
855	853.2	44.7	60/0.0													
															WEATHERED ROCK Black-White-Brown (GRANITIC ROCK)	39.0
															Boring Terminated with Standard Penetration Test Refusal at Elevation 853.2 ft On Crystalline Rock (GRANITIC ROCK)	44.7

NCDOT BORE DOUBLE U-2579AB - BRIDGE 275.GPJ NC_DOT.GDT 6/4/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B4-B		STATION 55+00		OFFSET 11 ft RT		ALIGNMENT -Y15FLYAC-										
COLLAR ELEV. 896.6 ft		TOTAL DEPTH 75.0 ft		NORTHING 847,885		EASTING 1,664,212										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER R. Brock		START DATE 05/12/19		COMP. DATE 05/12/19		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						
900																
895	896.6	0.0	2	4	6											896.6 GROUND SURFACE 0.0
	893.1	3.5	5	6	9											893.6 RESIDUAL Stiff, Red-Brown, Clayey SILT (A-5), with trace organics and mica 3.0
890	890.6	6.0	1	1	3											Soft to Stiff, Red-Gray-Brown, Silty CLAY (A-7-5), with trace mica
	888.1	8.5	5	5	8											888.6 Stiff, Tan-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica 8.0
885																
	883.1	13.5	2	5	6											883.6 Loose to Medium Dense, White-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica 13.0
880																
	878.1	18.5	7	7	7											
875																
	873.1	23.5	5	5	5											
870																
	868.1	28.5	4	6	12											
865																
	863.1	33.5	3	6	9											863.6 Stiff to Very Stiff, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica 33.0
860																
	858.1	38.5	5	6	11											
855																
	853.1	43.5	11	12	22											853.6 Dense, Brown-White-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica 43.0
850																
	848.1	48.5	12	16	22											848.6 Hard, Orange-Brown-White, Fine to Coarse Sandy SILT (A-4), with trace mica 48.0
845																
	843.1	53.5	6	12	20											
840																
	838.1	58.5	19	21	28											838.6 Dense, Black-White-Brown-Orange, Silty Fine to Coarse SAND (A-2-4), with trace mica 58.0
835																
	833.1	63.5	6	17	19											
830																
	828.1	68.5	15	21	25											
825																
	823.1	73.5	14	21	28											823.6 Hard, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica 73.0
																821.6 Boring Terminated at Elevation 821.6 ft In 75.0

NCDOT BORE DOUBLE U-2579AB - BRIDGE 275.GPJ NC_DOT.GDT 6/4/19

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B4-B		STATION 55+00		OFFSET 11 ft RT		ALIGNMENT -Y15FLYAC-										
COLLAR ELEV. 896.6 ft		TOTAL DEPTH 75.0 ft		NORTHING 847,885		EASTING 1,664,212										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER R. Brock		START DATE 05/12/19		COMP. DATE 05/12/19		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						
820																820 Match Line
																Residual Sandy SILT (A-4)

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B6-A		STATION 58+40		OFFSET 26 ft LT		ALIGNMENT -Y15FLYAC-										
COLLAR ELEV. 875.7 ft		TOTAL DEPTH 60.0 ft		NORTHING 847,647		EASTING 1,663,968										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER R. Brock		START DATE 05/17/19		COMP. DATE 05/17/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
880																
875	875.7	0.0	2	2	3										875.7	GROUND SURFACE
	872.2	3.5	4	4	7											
870	869.7	6.0	1	2	6										870.2	RESIDUAL Medium Stiff to Stiff, White-Black-Green-Brown, Clayey SILT (A-5), with trace mica
	867.2	8.5	4	5	9											
865	862.2	13.5	5	4	5											
860	857.2	18.5	4	3	4											
855	852.2	23.5	2	2	6											
850	847.2	28.5	3	5	7											
845	842.2	33.5	4	6	12											
840	837.2	38.5	14	19	17											
835	832.2	43.5	10	24	28											
830	827.2	48.5	8	18	34											
825	822.2	53.5	26	66	34/0.3											
820	817.2	58.5	16	36	47											

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B6-B		STATION 58+57		OFFSET 3 ft RT		ALIGNMENT -Y15FLYAC-										
COLLAR ELEV. 876.4 ft		TOTAL DEPTH 55.0 ft		NORTHING 847,658		EASTING 1,663,936										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER R. Brock		START DATE 05/17/19		COMP. DATE 05/17/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
880																
875	876.4	0.0	6	3	4										876.4	GROUND SURFACE
	872.9	3.5	3	4	6											
870	870.4	6.0	4	7	10											
	867.9	8.5	4	5	8											
865	862.9	13.5	5	7	12											
860	857.9	18.5	7	6	7											
855	852.9	23.5	9	15	15											
850	847.9	28.5	7	18	22											
845	842.9	33.5	5	12	18											
840	837.9	38.5	20	24	28											
835	832.9	43.5	7	44	56/0.4											
830	827.9	48.5	72	28/0.1												
825	822.9	53.5	24	30	30											

NCDOT BORE DOUBLE U-2579AB - BRIDGE 275.GPJ NC_DOT.GDT 6/4/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B9-A		STATION 65+13		OFFSET 11 ft LT		ALIGNMENT -Y15FLYAC-										
COLLAR ELEV. 871.5 ft		TOTAL DEPTH 76.0 ft		NORTHING 847,177		EASTING 1,663,492										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER R. Brock		START DATE 05/09/19		COMP. DATE 05/09/19		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						
875																
870	871.5	0.0	3	7	12											871.5 GROUND SURFACE 0.0
	868.0	3.5	5	8	10											868.5 RESIDUAL Very Stiff, Red-Brown-Black, Clayey SILT (A-5), with trace organics and mica 3.0
865	865.5	6.0	WOH	5	8											863.0 Medium Dense, Tan-Orange, Clayey Fine to Coarse SAND (A-2-6) 8.5
860	862.5	9.0	4	4	5											857.5 Loose, Tan-Orange, Silty Fine to Coarse SAND (A-2-4), with trace mica 14.0
855	857.0	14.5	3	2	3											857.5 Medium Stiff, Orange-Tan-Brown-Black, Fine to Coarse Sandy SILT (A-4), with some mica 14.0
850	852.0	19.5	2	2	4											847.5 Medium Dense, Brown-Black-White, Silty Fine to Coarse SAND (A-2-4), with some mica 24.0
845	847.0	24.5	5	7	7											837.5 Stiff, Tan-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica 34.0
840	842.0	29.5	4	6	9											832.5 Medium Dense, Tan-Brown-White, Silty Fine to Coarse SAND (A-2-4), with some mica 39.0
835	837.0	34.5	13	8	3											827.5 Stiff, Tan-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica 44.0
830	832.0	39.5	4	7	8											822.5 Medium Dense to Very Dense, Tan-Brown-White-Orange-Black, Silty Fine to Coarse SAND (A-2-4), with trace to little mica 49.0
825	827.0	44.5	4	3	7											
820	822.0	49.5	22	24	34											
815	817.0	54.5	10	8	13											
810	812.0	59.5	7	5	14											
805	807.0	64.5	23	20	15											
800	802.0	69.5	16	16	18											
	797.0	74.5	12	16	18											
																795.5 76.0

NCDOT BORE DOUBLE U-2579AB - BRIDGE 275.GPJ NC_DOT.GDT 6/4/19

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle										
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)									
BORING NO. B9-A		STATION 65+13		OFFSET 11 ft LT		ALIGNMENT -Y15FLYAC-										
COLLAR ELEV. 871.5 ft		TOTAL DEPTH 76.0 ft		NORTHING 847,177		EASTING 1,663,492										
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER R. Brock		START DATE 05/09/19		COMP. DATE 05/09/19		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						
795																795.5 Match Line
																Boring Terminated at Elevation 795.5 ft in Residual Silty SAND (A-2-4)

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST J. Garrick	
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)
BORING NO. B9-B		STATION 65+17		OFFSET 13 ft RT		ALIGNMENT -Y15FLYAC-	
COLLAR ELEV. 873.7 ft		TOTAL DEPTH 75.0 ft		NORTHING 847,189		EASTING 1,663,471	
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER R. Brock		START DATE 05/10/19		COMP. DATE 05/10/19		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
875															873.7	GROUND SURFACE	0.0
	873.7	0.0	2	3	5	8								M	873.7	RESIDUAL Medium Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace organics	3.0
870	870.2	3.5	7	10	16	26								M	870.7	Very Soft to Very Stiff, Red-Brown, Clayey SILT (A-5)	
	867.7	6.0	1	1	1	2								M			
865	865.2	8.5	5	4	7	11								M	865.7	Stiff, Red-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica	8.0
														M			
860	860.2	13.5	4	6	7	13								M	860.7	Loose to Medium Dense, Tan-White, Silty Fine to Coarse SAND (A-2-4)	13.0
														M			
855	855.2	18.5	4	3	5	8								M			
														M			
850	850.2	23.5	1	2	2	4								M	850.7	Soft to Very Stiff, Tan-Brown-White, Fine to Coarse Sandy SILT (A-4), with little mica	23.0
														M			
845	845.2	28.5	4	6	10	16								M			
														M			
840	840.2	33.5	3	3	5	8								M			
														M			
835	835.2	38.5	11	12	11	23								M	835.7	Medium Dense, White-Tan, Silty Fine to Coarse SAND (A-2-4)	38.0
														M			
830	830.2	43.5	4	3	5	8								M	830.7	Medium Stiff to Very Stiff, Tan-Brown-White, Fine to Coarse Sandy SILT (A-4)	43.0
														M			
825	825.2	48.5	6	7	11	18								M			
														M			
820	820.2	53.5	8	12	18	30								M			
														M			
815	815.2	58.5	5	9	14	23								M			
														M			
810	810.2	63.5	8	11	12	23								M			
														M			
805	805.2	68.5	7	11	18	29								M			
														M			
800	800.2	73.5	6	11	15	26								M	798.7	Boring Terminated at Elevation 798.7 ft In Residual Sandy SILT (A-4)	75.0

NCDOT BORE DOUBLE U-2579AB - BRIDGE 275.GPJ NC_DOT.GDT 6/4/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST A. Suttle	
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)
BORING NO. EB2-A		STATION 67+41		OFFSET 5 ft LT		ALIGNMENT -Y15FLYAC-	
COLLAR ELEV. 893.9 ft		TOTAL DEPTH 73.7 ft		NORTHING 847,000		EASTING 1,663,350	
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic		
DRILLER R. Brock		START DATE 05/11/19		COMP. DATE 05/11/19		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						
895	893.9	0.0	3	3	5									893.9	GROUND SURFACE	0.0
890	890.4	3.5	6	8	11									891.1	RESIDUAL Medium Stiff to Very Stiff, Red-Brown, Clayey SILT (A-5), with trace organics and trace to little mica	3.0
885	885.4	8.5	3	3	7									885.9	Medium Stiff to Stiff, Orange-Black-Tan-Brown, Fine to Coarse Sandy SILT (A-4), with trace to little mica	8.0
880	880.4	13.5	3	3	5									881.1	Loose, Brown-White-Tan, Silty Fine to Coarse SAND (A-2-4), with little mica	13.0
875	875.4	18.5	3	5	6									876.1	Medium Stiff to Very Stiff, Brown-White-Orange-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica	18.0
870	870.4	23.5	4	4	6									870.6		
865	865.4	28.5	3	4	6									865.6		
860	860.4	33.5	4	4	4									860.6		
855	855.4	38.5	6	9	10									855.6	Medium Dense to Very Dense, Tan-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace to little mica	38.0
850	850.4	43.5	14	13	19									850.6		
845	845.4	48.5	11	16	19									845.6	Dense, Tan-White, Silty Fine to Coarse SAND (A-2-4), with little mica	48.0
840	840.4	53.5	14	20	26									840.6	Very Stiff to Hard, Gray-White-Brown, Fine to Coarse Sandy SILT (A-4), with little mica	53.0
835	835.4	58.5	21	25	40									835.6		
830	830.4	63.5	48	48	52/0.4									830.6		
825	825.4	68.5	67	33/0.3										825.6		
	820.4	73.5												820.6		
														829.9	WEATHERED ROCK Orange-White-Black (BIOTITE GNEISS)	64.0
														820.2	Boring Terminated at Elevation 820.2 ft In Weathered Rock (BIOTITE GNEISS)	73.7

NCDOT BORE DOUBLE U-2579AB - BRIDGE 275.GPJ NC_DOT.GDT 6/4/19

WBS 34839.1.7		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST J. Garrick	
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40							GROUND WTR (ft)
BORING NO. EB2-B		STATION 67+35		OFFSET 10 ft RT		ALIGNMENT -Y15FLYAC-	
COLLAR ELEV. 894.1 ft		TOTAL DEPTH 75.0 ft		NORTHING 847,013		EASTING 1,663,341	
DRILL RIG/HAMMER EFF./DATE M&W029 Diedrich D-120 89% 09/07/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic		
DRILLER R. Brock		START DATE 05/10/19		COMP. DATE 05/10/19		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						
895	894.1	0.0	2	4	6									894.1	GROUND SURFACE	0.0
890	890.6	3.5	4	6	9									891.1	RESIDUAL Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4)	3.0
885	885.6	8.5	3	5	6									886.1	Stiff, Red-Brown, Clayey SILT (A-5), with trace mica	8.0
880	880.6	13.5	3	4	5									881.1	Medium Stiff, Brown-Tan-Orange, Fine to Coarse Sandy SILT (A-4), with little mica	13.0
875	875.6	18.5	3	3	5									876.1	Loose, Brown-White-Tan, Silty Fine to Coarse SAND (A-2-4), with little mica	18.0
870	870.6	23.5	3	4	5									870.6		
865	865.6	28.5	2	4	7									865.6		
860	860.6	33.5	3	6	8									860.6		
855	855.6	38.5	5	7	10									855.6		
850	850.6	43.5	5	8	11									850.6		
845	845.6	48.5	10	11	20									845.6	Dense, Tan-White, Silty Fine to Coarse SAND (A-2-4), with little mica	48.0
840	840.6	53.5	15	13	13									840.6	Very Stiff to Hard, Gray-White-Brown, Fine to Coarse Sandy SILT (A-4), with little mica	53.0
835	835.6	58.5	8	29	64									835.6		
830	830.6	63.5	8	21	27									830.6		
825	825.6	68.5	6	94/0.4										825.6		
820	820.6	73.5	10	25	71									820.6		
														829.9	WEATHERED ROCK Tan-White-Gray (BIOTITE GNEISS)	69.0
														820.2	Boring Terminated at Elevation 819.1 ft In Residual Sandy SILT (A-4)	75.0

SITE PHOTOS

BRIDGE NO. 725
ON -Y15FLYAC-



PHOTO 1: VIEW NEAR BENT 7 OF UNNAMED TRIBUTARY OF FIDDLERS CREEK, FACING UPSTATION.



PHOTO 2: VIEW NEAR BENT 7 OF UNNAMED TRIBUTARY OF FIDDLERS CREEK, FACING DOWNSTATION.

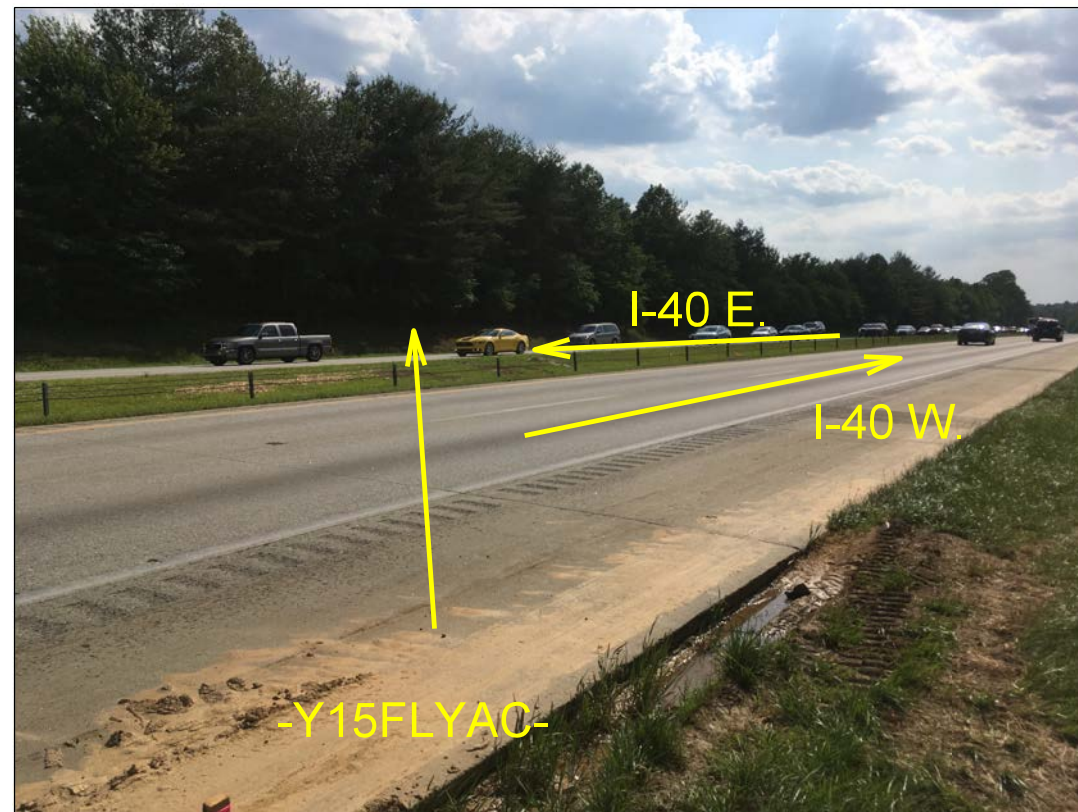


PHOTO 3: VIEW FROM END BENT 1 FACING UPSTATION.



PHOTO 4: VIEW FROM END BENT 2, FACING DOWNSTATION.