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

REFERENCE: U-2579AB

PROJECT: 34839

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

CONTENTS

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.

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11/14/2019
DATE

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PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	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	UNSUITABLE

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 RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	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 (COHESIVE)	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	4	10	40	60	200	270
OPENING (MM)	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	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- 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-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC 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
- PW — 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
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW 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
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
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [X] DIEDRICH D-120
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] 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 YEILD 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 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 GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN 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.

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

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.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BL-49, ELEVATION: 882.83 FT.; BL-50, ELEVATION: 874.93 FT.; U-2579AB-5, ELEVATION: 897.13 FT

ELEVATION: VARIES FEET

NOTES:

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

BL-49 (N 847739.11 E 1663843.71)
BL-50 (N 847290.74 E1663706.27)
U-2579AB-5 (N 848190.87 E1664352.70)

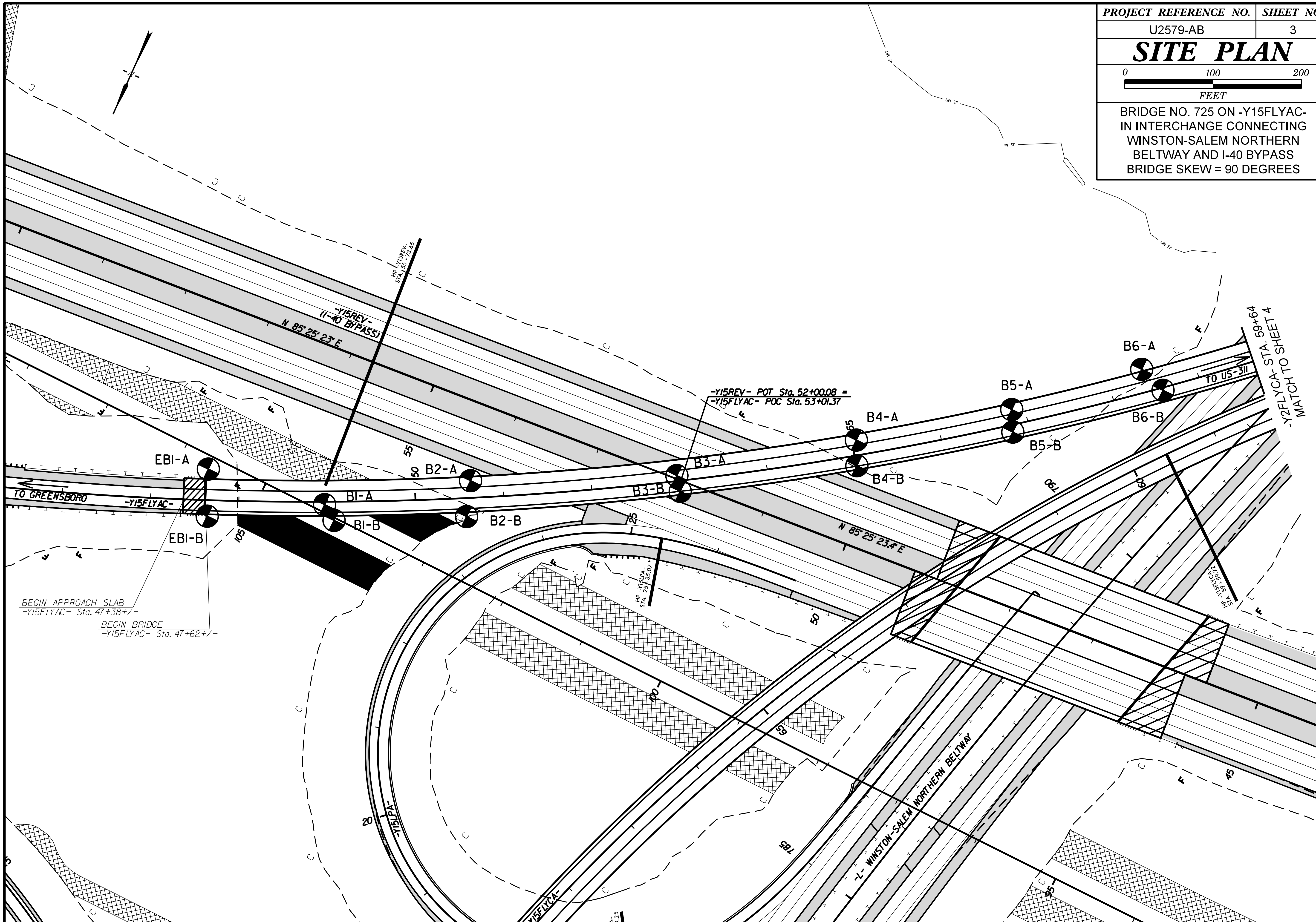
DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
U2579-AB	3

SITE PLAN

0 100 200
FEET

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



PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	4

SITE PLAN

0 100 200

FEET

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

-L- WINSTON-SALEM NORTHERN BELTWAY

HP -Y15FLYBD- STA. 50+54.27

EB2-A

EB2-B

B9-A

B9-B

-Y15FLYAC-

END APPROACH SLAB -Y15FLYAC- Sta.67+57+/-

END BRIDGE -Y15FLYAC- Sta.67+33+/-

B8-A

B8-B

-Y15FLYCA-

TO US-311

TO GREENSBORO

B7-A

B7-B

-Y2FLYCA- STA. 59+64 MATCH TO SHEET 3

-Y15FLYAC- POC Sta. 62+26.40 = -Y15FLYBD- POC Sta. 46+82.68

-Y15FLYCA- POC Sta. 55+76.63 = -Y15FLYBD- POC Sta. 46+27.33

-Y15FLYBD-

-Y15REV- (I-40 BYPASS)

50

55

60

65

45

795

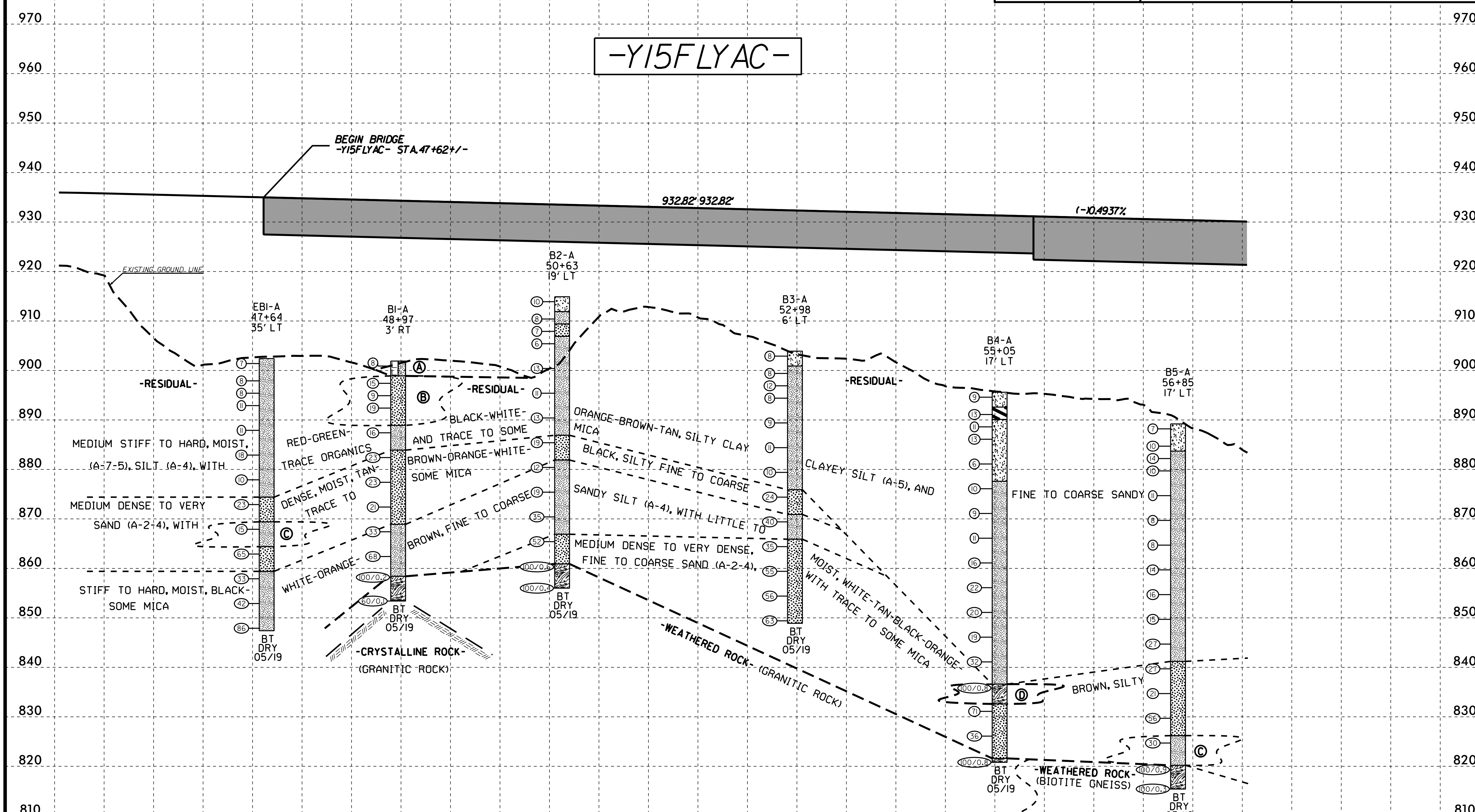
PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	5

PROFILE BORINGS PROJECTED ON -Y15FLYAC- ALONG BRIDGE 725

Prepared in the Office of: ECS SOUTHEAST, LLP

Scale: 0 50 100 VE=2:1

-Y15FLYAC-



BEGIN BRIDGE
-Y15FLYAC- STA.47+62+/-
932.82' 932.82'
(-)0.4937%
EXISTING GROUND LINE
EB1-A 47+64 35' LT
B1-A 48+97 3' RT
B2-A 50+63 19' LT
B3-A 52+98 6' LT
B4-A 55+05 17' LT
B5-A 56+85 17' LT
-RESIDUAL-
MEDIUM STIFF TO HARD, MOIST, RED-GREEN-BLACK-WHITE-ORANGE-BROWN-TAN, SILTY CLAY (A-7-5), SILT (A-4), WITH TRACE ORGANICS AND TRACE TO SOME MICA
MEDIUM DENSE TO VERY DENSE, MOIST, TAN-BROWN-ORANGE-WHITE-BLACK, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO SOME MICA
STIFF TO HARD, MOIST, BLACK-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE TO SOME MICA
CLAYEY SILT (A-5), AND FINE TO COARSE SANDY SILT (A-4), WITH LITTLE TO SOME MICA
MEDIUM DENSE TO VERY DENSE, MOIST, WHITE-TAN-BLACK-ORANGE-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO SOME MICA
-CRYSTALLINE ROCK- (GRANITIC ROCK)
-WEATHERED ROCK- (GRANITIC ROCK)
-WEATHERED ROCK- (BIOTITE GNEISS)
BT DRY 05/19
46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00 54+00 55+00 56+00 57+00 58+00

Ⓐ-**ROADWAY EMBANKMENT**- MEDIUM STIFF, MOIST, RED-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH SOME MICA AND TRACE GRAVEL

Ⓑ-**RESIDUAL**- LOOSE TO MEDIUM DENSE, MOIST, BLACK-TAN-WHITE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

Ⓒ-**RESIDUAL**- STIFF TO VERY STIFF, MOIST, BLACK-ORANGE-BROWN-WHITE, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE TO SOME MICA

Ⓓ-**WEATHERED ROCK**- (GRANITIC ROCK)

-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.

5/14/99

Bridge 725 on 1/2 Y15FLYAC\CADD_GEOTECH\Site&Sub\U-2579AB_GEO_pf1_bridge7254.dgn

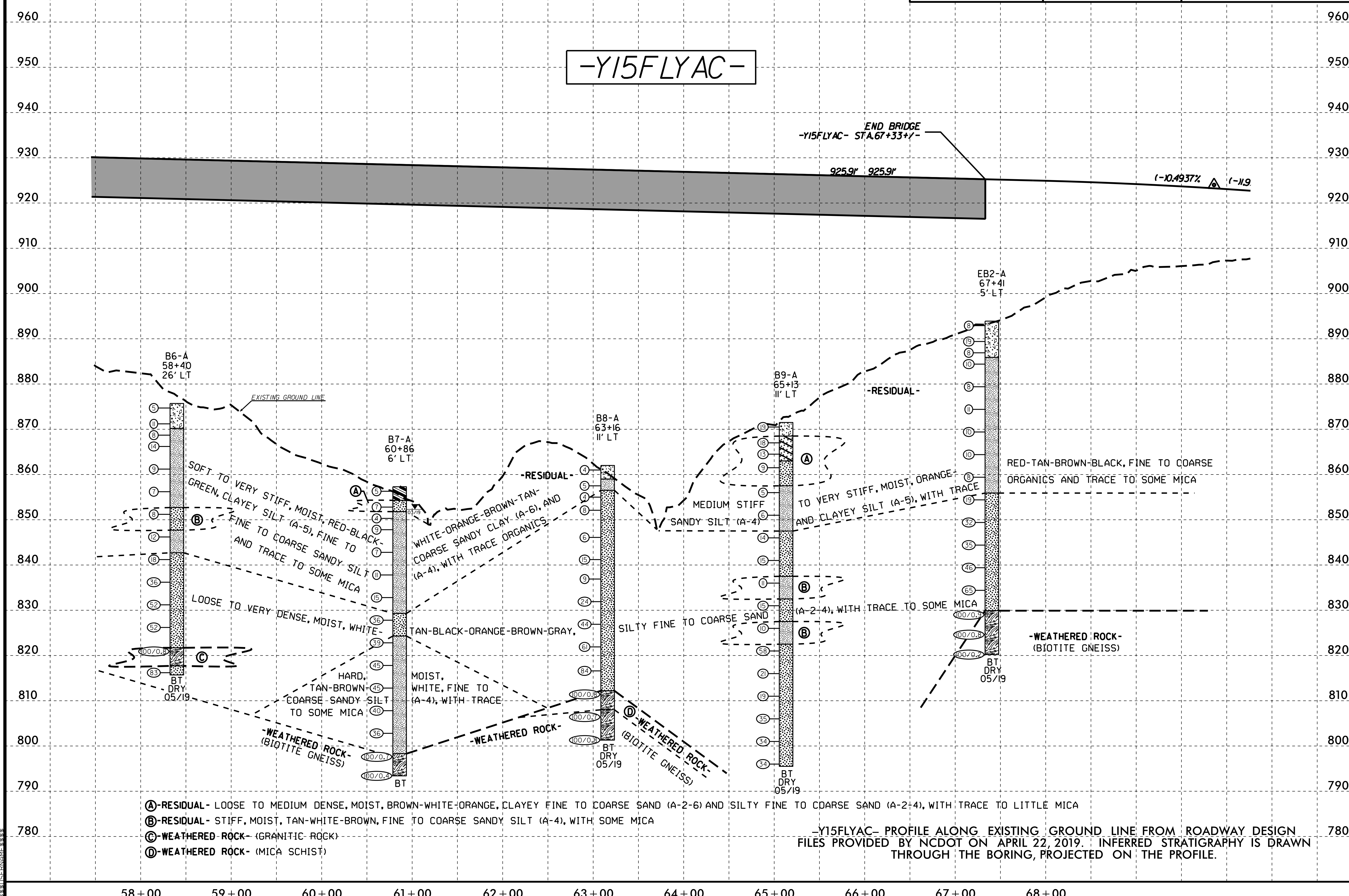
05-JUN-2019 08:53

Prepared in the Office of: ECS SOUTHEAST, LLP

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	6

PROFILE BORINGS PROJECTED ON -Y15FLYAC- ALONG BRIDGE 725

Scale: 0 50 100, VE=2:1



-Y15FLYAC-
END BRIDGE
-Y15FLYAC- STA.67+33+/-
925.91' 925.91'
(-)0.4937%
(-)1.9
EXISTING GROUND LINE
B6-A
58+40
26' LT
B7-A
60+86
6' LT
B8-A
63+16
11' LT
B9-A
65+13
11' LT
EB2-A
67+41
5' LT
-RESIDUAL-
SOFT TO VERY STIFF, MOIST, RED-BLACK-GREEN, CLAYEY SILT (A-5), FINE TO FINE TO COARSE SANDY SILT AND TRACE TO SOME MICA
WHITE-ORANGE-BROWN-TAN-COARSE SANDY CLAY (A-6), AND (A-4), WITH TRACE ORGANICS
MEDIUM STIFF SANDY SILT (A-4)
TO VERY STIFF, MOIST, ORANGE-AND CLAYEY SILT (A-5), WITH TRACE
RED-TAN-BROWN-BLACK, FINE TO COARSE ORGANICS AND TRACE TO SOME MICA
LOOSE TO VERY DENSE, MOIST, WHITE-TAN-BLACK-ORANGE-BROWN-GRAY, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO SOME MICA
HARD, TAN-BROWN-COARSE SANDY SILT TO SOME MICA
MOIST, WHITE, FINE TO (A-4), WITH TRACE
-WEATHERED ROCK- (BIOTITE GNEISS)
-WEATHERED ROCK-
BT
DRY
05/19
A-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
B-RESIDUAL- STIFF, MOIST, TAN-WHITE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH SOME MICA
C-WEATHERED ROCK- (GRANITIC ROCK)
D-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.
970 960 950 940 930 920 910 900 890 880 870 860 850 840 830 820 810 800 790 780
58+00 59+00 60+00 61+00 62+00 63+00 64+00 65+00 66+00 67+00 68+00

5/14/99

Bridge 725 on Y15FLYAC - U-2579AB

05-JUN-2019 08:54

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(704) 357-0023 [FAX]
NC REGISTERED ENGINEERING FIRM # P-1078

VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	7

BRIDGE NO. 725 END BENT 1 ON –Y15FLYAC–

EBI-A
47+64
35' LT

EBI-B
47+65
18' RT

EXISTING GROUND LINE

-RESIDUAL-

MEDIUM STIFF TO VERY STIFF, MOIST, BLACK-WHITE-ORANGE-BROWN-TAN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE TO SOME MICA

DENSE TO VERY DENSE, MOIST, TAN-BROWN-WHITE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO LITTLE MICA

HARD, MOIST, BLACK-ORANGE-BROWN-WHITE, FINE TO COARSE SANDY SILT (A-4), WITH SOME MICA

-WEATHERED ROCK-
(GRANITIC ROCK)

BT
DRY
05/19

BT
DRY
05/19

Ⓐ -ROADWAY EMBANKMENT- MEDIUM STIFF, MOIST, BLACK-RED-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE MICA AND GRAVEL

Ⓑ -RESIDUAL- MEDIUM DENSE, MOIST, TAN-BROWN-WHITE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

47+62.00
℄
–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.

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VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	8

BRIDGE NO. 725 BENT 1 ON –Y15FLYAC–

BI-A
48+97
3' RT

BI-B
49+08
21' RT

EXISTING GROUND LINE

Ⓐ -ROADWAY EMBANKMENT-

-RESIDUAL-

LOOSE TO MEDIUM DENSE, MOIST, BLACK-TAN-WHITE-BROWN, SILTY FINE TO COARSE

STIFF TO VERY STIFF, MOIST, BLACK-WHITE-ORANGE-BROWN-RED, FINE TO COARSE

MEDIUM DENSE, MOIST, TAN-BROWN-BLACK-WHITE, SILTY FINE TO COARSE

STIFF TO HARD, MOIST, BLACK-RED-WHITE-ORANGE-BROWN, FINE TO COARSE

-WEATHERED ROCK- (GRANITIC ROCK)

-CRYSTALLINE ROCK- (GRANITIC ROCK)

Ⓑ -ROADWAY EMBANKMENT-

TO COARSE SAND (A-2-4), WITH TRACE MICA

COARSE SANDY SILT (A-4), WITH LITTLE MICA

SAND (A-2-4), WITH TRACE TO SOME MICA

Ⓒ

SANDY SILT (A-4), WITH LITTLE TO SOME MICA

-WEATHERED ROCK- (GRANITIC ROCK)

BT DRY 05/19

BT DRY 05/19

Ⓐ -ROADWAY EMBANKMENT- MEDIUM STIFF, MOIST, RED-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH SOME MICA AND TRACE GRAVEL

Ⓑ -ROADWAY EMBANKMENT- LOOSE, MOIST, RED-BROWN-WHITE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

Ⓒ -RESIDUAL- MEDIUM DENSE, MOIST, BLACK-BROWN-WHITE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

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.

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	9

BRIDGE NO. 725 BENT 2 ON –Y15FLYAC–

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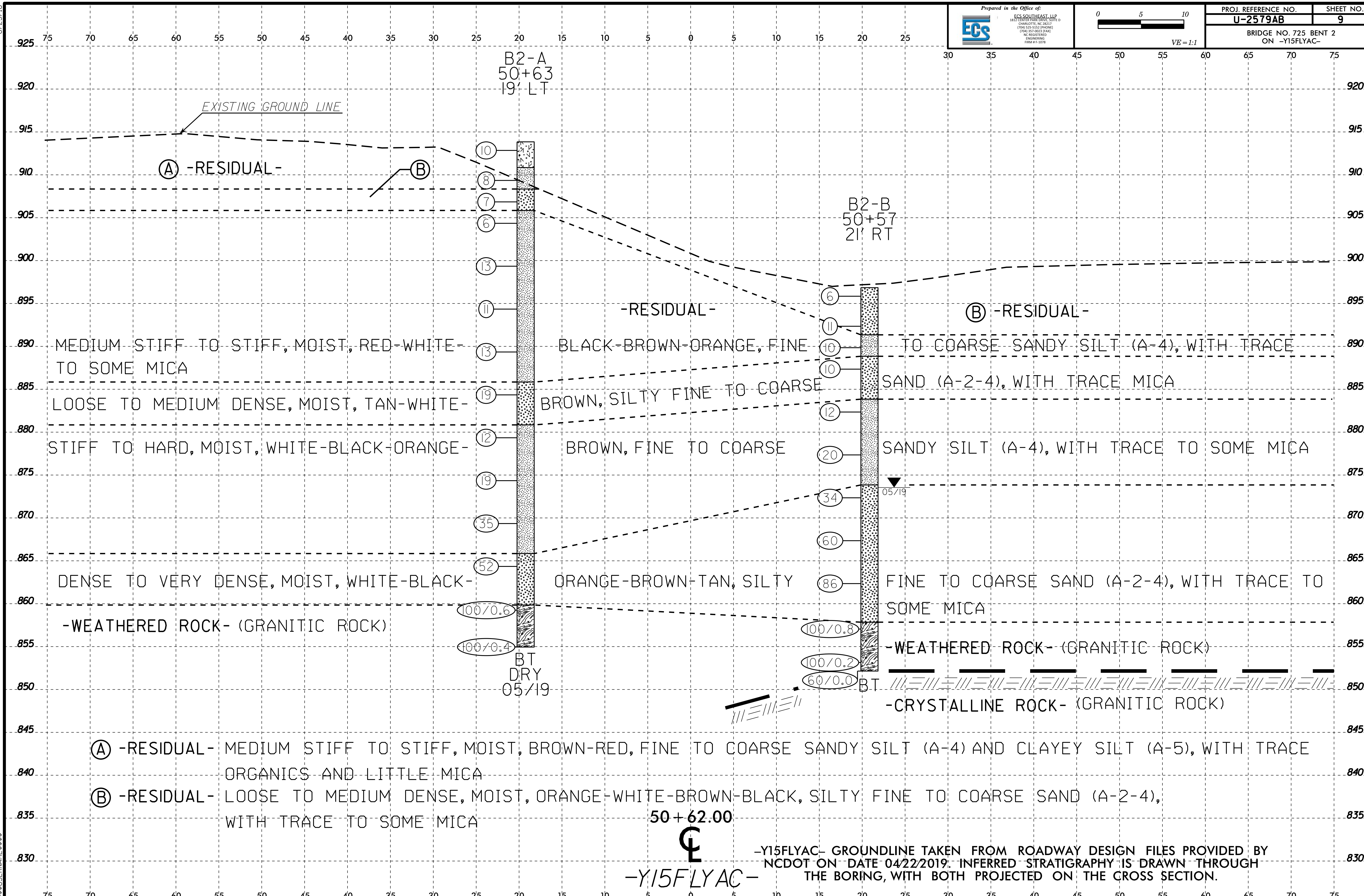

0 5 10
VE=1:1
B2-A
50+63
19' LT
EXISTING GROUND LINE
Ⓐ -RESIDUAL-
Ⓑ
B2-B
50+57
21' RT
-RESIDUAL-
Ⓑ -RESIDUAL-
MEDIUM STIFF TO STIFF, MOIST, RED-WHITE-BLACK-BROWN-ORANGE, FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO SOME MICA
LOOSE TO MEDIUM DENSE, MOIST, TAN-WHITE-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA
STIFF TO HARD, MOIST, WHITE-BLACK-ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO SOME MICA
DENSE TO VERY DENSE, MOIST, WHITE-BLACK-ORANGE-BROWN-TAN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO SOME MICA
-WEATHERED ROCK- (GRANITIC ROCK)
-CRYSTALLINE ROCK- (GRANITIC ROCK)
BT
DRY
05/19
05/19
BT
Ⓐ -RESIDUAL- MEDIUM STIFF TO STIFF, MOIST, BROWN-RED, FINE TO COARSE SANDY SILT (A-4) AND CLAYEY SILT (A-5), WITH TRACE ORGANICS AND LITTLE MICA
Ⓑ -RESIDUAL- LOOSE TO MEDIUM DENSE, MOIST, ORANGE-WHITE-BROWN-BLACK, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO SOME MICA
50+62.00
℄
-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 I:\GEOTECH\02-PROJECTS\13000-13999\13500\13520 - U-2579AB Bridge 725 on Y15FLYAC\CADD_GEOTECH\xsc\u2579ab_geo_xsi_y15flyac.dgn

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NC REGISTERED ENGINEERING FIRM # P-1078

VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	10

BRIDGE NO. 725 BENT 3
ON –Y15FLYAC–

B3-A
52+98
6' LT

B3-B
52+99
12' RT

EXISTING GROUND LINE

-RESIDUAL-

MEDIUM STIFF TO STIFF, MOIST, RED-BROWN-TAN-BLACK-
CLAYEY SILT (A-5), WITH TRACE ORGANICS AND

MEDIUM DENSE, MOIST, ORANGE-WHITE-BROWN-
HARD, MOIST, BROWN-BLACK-WHITE, FINE TO

DENSE TO VERY DENSE, MOIST, BLACK-WHITE-BROWN-
MICA

B3-A: 8, 8, 12, 8, 9, 11, 10, 24, 40, 35, 55, 56, 63

BT
DRY
05/19

ORANGE-
TRACE

TAN, SILTY
COARSE

ORANGE-

B3-B: 10, 12, 7, 9, 16, 12, 13, 14, 29, 16, 28, 32, 73, 31, 100/1.0

BT
DRY
05/19

-RESIDUAL-

WHITE, FINE TO COARSE SANDY SILT (A-4) AND
TO SOME MICA

FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

SANDY SILT (A-4), WITH SOME MICA

TAN, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE

HARD, MOIST, ORANGE-WHITE-BLACK, FINE TO COARSE
SANDY SILT (A-4), WITH SOME MICA

-WEATHERED ROCK- (BIOTITE GNEISS)

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

53+01.00

℄
–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.

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VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	11

BRIDGE NO. 725 BENT 4
ON –Y15FLYAC–

B4-A
55+05
17' LT

B4-B
55+00
11' RT

EXISTING GROUND LINE

SOFT TO HARD, MOIST, RED-BROWN-ORANGE-AND FINE TO COARSE SANDY SILT (A-4), WITH

-RESIDUAL-
GRAY-TAN-BLACK-
TRACE ORGANICS

GREEN-WHITE, SILTY CLAY (A-7-5), CLAYEY SILT (A-5),
AND TRACE MICA

Ⓐ -RESIDUAL-

Ⓐ

Ⓑ

DENSE TO VERY DENSE, MOIST, BLACK-WHITE-BROWN-ORANGE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

-WEATHERED ROCK- (GRANITIC ROCK)

HARD, MOIST, BLACK-WHITE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA

BT
DRY
05/19

BT
DRY
05/19

Ⓐ -RESIDUAL- LOOSE TO DENSE, MOIST, WHITE-ORANGE-BROWN-TAN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

Ⓑ -WEATHERED ROCK- (GRANITIC ROCK)

54+98.00
℄
–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.

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VE = 1:1

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

BRIDGE NO. 725 BENT 5
ON –Y15FLYAC–

B5-A
56+85
17' LT

B5-B
56+81
8' RT

EXISTING GROUND LINE

-RESIDUAL-

MEDIUM STIFF TO VERY STIFF, MOIST, BROWN-RED-BLACK-WHITE-ORANGE-TAN, CLAYEY SILT (A-5) AND FINE TO COARSE SANDY SILT (A-4), WITH TRACE ORGANICS AND TRACE TO SOME MICA

Ⓐ -RESIDUAL-

MEDIUM DENSE TO VERY DENSE, MOIST, TAN-WHITE-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO LITTLE MICA

SANDY SILT (A-4), WITH LITTLE TO SOME MICA

DENSE TO VERY DENSE, MOIST, TAN-WHITE-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE MICA

VERY STIFF, MOIST, BLACK-WHITE-BROWN-ORANGE, -WEATHERED ROCK- (BIOTITE GNEISS)

BT
DRY
05/19

BT
DRY
05/19

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

56+74.00
℄
–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.

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VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	13

BRIDGE NO. 725 BENT 6 ON –Y15FLYAC–

B6-A
58+40
26' LT

B6-B
58+57
3' RT

EXISTING GROUND LINE

-RESIDUAL-

BLACK-GREEN-BROWN TO SOME MICA

MEDIUM STIFF TO STIFF, MOIST, WHITE- AND CLAYEY SILT (A-5), WITH TRACE

LOOSE TO MEDIUM DENSE, MOIST, TAN- TO LITTLE MICA

STIFF TO HARD, MOIST, BLACK-TAN-

MEDIUM DENSE TO VERY DENSE, MOIST, (A-2-4), WITH TRACE TO LITTLE MICA

-WEATHERED ROCK- (GRANITIC ROCK)

VERY DENSE, MOIST, TAN-WHITE-BLACK-

BT DRY 05/19

-RESIDUAL-

BROWN-ORANGE-

BROWN-WHITE, FINE TO

TAN-GRAY-WHITE-

BT GRAY-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO SOME MICA

TAN-ORANGE, FINE TO COARSE SANDY SILT (A-4)

WHITE-GRAY, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE

COARSE SANDY SILT (A-4), WITH SOME MICA

BLACK-BROWN, SILTY FINE TO COARSE SAND

-WEATHERED ROCK-
(GRANITIC ROCK)

BT DRY 05/19

58+50.00

–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.

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NC REGISTERED ENGINEERING FIRM # P-1078

VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	14

BRIDGE NO. 725 BENT 7 ON –Y15FLYAC–

B7-A
60+86
6' LT

B7-B
60+72
19' RT

EXISTING GROUND LINE

Ⓐ -RESIDUAL- VERY LOOSE TO LOOSE, MOIST TO WET, BROWN-TAN-BLACK-WHITE-GRAY, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

SOFT TO VERY STIFF, MOIST TO WET, WHITE-TAN-BROWN-BLACK, FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO SOME MICA

DENSE TO VERY DENSE, MOIST, GRAY-BROWN-WHITE-TAN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

VERY STIFF TO HARD, MOIST, TAN-BROWN-WHITE, SANDY SILT (A-4), WITH TRACE TO SOME MICA

MEDIUM DENSE TO VERY DENSE, MOIST, BLACK-ORANGE-BROWN-TAN-GRAY, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

-WEATHERED ROCK- (BIOTITE GNEISS)

Ⓐ -RESIDUAL- MEDIUM STIFF, MOIST, ORANGE-BROWN, FINE TO COARSE SANDY CLAY (A-6) AND SANDY SILT (A-4), WITH TRACE ORGANICS AND MICA

60+74.00

–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.

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VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	15

BRIDGE NO. 725 BENT 8
ON –Y15FLYAC–

EXISTING GROUND LINE

B8-A
63+16
11' LT

B8-B
63+19
8' RT

-RESIDUAL-
SOFT TO STIFF, MOIST, RED-BROWN-TAN-
(A-4), WITH TRACE ORGANICS AND TRACE TO SOME

WHITE-GRAY-
MICA

-RESIDUAL-
BLACK, CLAYEY SILT (A-5) AND FINE TO COARSE SANDY SILT

05/19

LOOSE TO VERY DENSE, MOIST, TAN-ORANGE-WHITE-
SOME MICA

BROWN-BLACK, SILTY FINE TO COARSE SAND (A-2-4), WITH LITTLE TO

-WEATHERED ROCK- (MICA SCHIST)
(BIOTITE GNEISS)

-WEATHERED ROCK- (BIOTITE GNEISS)
(MICA SCHIST)
(BIOTITE GNEISS)

BT
DRY
05/19

BT

63+17.00
℄
–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.

Prepared in the Office of:
ECS SOUTHEAST, LLP
1420 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 357-0023 [FAX]
NC REGISTERED ENGINEERING FIRM # P-1078

VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	16

BRIDGE NO. 725 BENT 9
ON –Y15FLYAC–

B9-A
65+13
11' LT

B9-B
65+17
13' RT

EXISTING GROUND LINE

-RESIDUAL-

LOOSE TO MEDIUM DENSE, MOIST, TAN-ORANGE-WHITE, SOFT TO VERY STIFF, MOIST, ORANGE-TAN-BROWN- SOME MICA

CLAYEY, FINE TO -BLACK-WHITE, MEDIUM DENSE, MOIST, TAN-BROWN- MEDIUM STIFF TO VERY STIFF, MOIST, TAN- MEDIUM DENSE TO VERY DENSE, MOIST, TAN-BROWN-BLACK-WHITE-ORANGE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO LITTLE MICA

WHITE, SILTY WHITE-BROWN,

-RESIDUAL-

VERY SOFT TO VERY STIFF, MOIST, RED-BROWN-BLACK, FINE TO COARSE SANDY SILT (A-4) AND CLAYEY SILT (A-5), WITH TRACE ORGANICS AND MICA

COARSE SAND (A-2-6) AND SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

FINE TO COARSE SANDY SILT (A-4), WITH LITTLE TO

FINE TO COARSE SAND (A-2-4), WITH SOME MICA

FINE TO COARSE SANDY SILT (A-4), WITH SOME MICA

B9-A: 19, 18, 13, 9, 5, 6, 14, 15, 11, 15, 10, 58, 21, 19, 35, 34, 34 — BT DRY 05/19

B9-B: 8, 26, 2, 11, 13, 8, 4, 16, 8, 23, 8, 18, 30, 23, 23, 29, 26 — BT DRY 05/19

65+02.00

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

℄ –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.

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NC REGISTERED ENGINEERING FIRM # P-1078

VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	17

BRIDGE NO. 725 END BENT 2 ON –Y15FLYAC–

EB2-A
67+41
5' LT

EB2-B
67+35
10' RT

EXISTING GROUND LINE

-RESIDUAL-

MEDIUM STIFF TO VERY STIFF, MOIST, RED-BROWN-ORANGE-CLAYEY SILT (A-5), WITH TRACE ORGANICS AND TRACE

-RESIDUAL-

BLACK-TAN, FINE TO CORASE SANDY SILT (A-4) AND TO LITTLE MICA

05/19

MEDIUM DENSE TO VERY DENSE, MOIST, TAN-BROWN-WHITE, SILTY MICA

FINE TO COARSE SAND (A-2-4), WITH TRACE TO LITTLE

VERY STIFF TO HARD, MOIST, GRAY-WHITE-BROWN, FINE TO CORASE SANDY SILT (A-4), WITH LITTLE MICA

-WEATHERED ROCK- (BIOTITE GNEISS)

-WEATHERED ROCK- (BIOTITE GNEISS)

BT
DRY
05/19

BT

-RESIDUAL-
HARD, MOIST, GRAY-WHITE-TAN, FINE TO CORASE SANDY SILT (A-4)

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

67+33.00
℄
–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.

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. EB1-A	**STATION** 47+64	**OFFSET** 35 ft LT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 902.4 ft	**TOTAL DEPTH** 55.0 ft	**NORTHING** 848,206	**EASTING** 1,664,872	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
905											
	902.4	0.0	2	3	4	7		M		902.4 GROUND SURFACE	0.0
900	898.9	3.5	4	3	3	6		M		**RESIDUAL** Medium Stiff to Very Stiff, Black-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	
	896.4	6.0	3	3	5	8		M			
895	893.9	8.5	5	5	6	11		M			
890	888.9	13.5	6	5	6	11		M			
885	883.9	18.5	8	7	11	18		M			
880	878.9	23.5	3	3	7	10		M			
875	873.9	28.5	3	10	13	23		M		874.4 Medium Dense, Tan-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	28.0
870	868.9	33.5	3	6	9	15		M		869.4 Stiff, Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little mica	33.0
865	863.9	38.5	14	28	37	65		M		864.4 Very Dense, Tan-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	38.0
860	858.9	43.5	10	12	21	33		M		859.4 Hard, Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	43.0
855	853.9	48.5	13	18	24	42		M			
850	848.9	53.5	18	36	50	86		M		847.4 Boring Terminated at Elevation 847.4 ft In Residual Sandy SILT (A-4)	55.0

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. EB1-B	**STATION** 47+65	**OFFSET** 18 ft RT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 902.2 ft	**TOTAL DEPTH** 59.2 ft	**NORTHING** 848,255	**EASTING** 1,664,850	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
905											
	902.2	0.0	5	2	4	6		M		902.2 GROUND SURFACE	0.0
900	898.7	3.5	3	3	6	9		M		**ROADWAY EMBANKMENT** Medium Stiff, Black-Red-Brown, Fine to Coarse Sandy SILT (A-4), with little mica and gravel	
	896.2	6.0	2	3	4	7		M		899.2	3.0
895	893.7	8.5	3	4	5	9		M		**RESIDUAL** Medium Stiff to Stiff, Black-Tan-Orange-Brown-White, Fine to Coarse Sandy SILT (A-4), with some mica	
890	888.7	13.5	4	4	6	10		M			
885	883.7	18.5	4	6	9	15		M			
880	878.7	23.5	3	3	5	8		M			
875	873.7	28.5	3	5	7	12		M			
870	868.7	33.5	3	4	7	11		M			
865	863.7	38.5	4	4	7	11		M			
860	858.7	43.5	7	17	26	43		M		859.2 Dense, Tan-White-Brown, Silty Fine to Coarse SAND (A-2-4), with little mica	43.0
855	853.7	48.5	19	24	31	55		M		854.2 Hard, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	48.0
850	848.7	53.5	63	37/0.1		100/0.6				848.7 **WEATHERED ROCK** Tan-Brown-White (GRANITIC ROCK)	53.5
845	843.7	58.5	67	33/0.2		100/0.7				843.0 Boring Terminated at Elevation 843.0 ft In Weathered Rock (GRANITIC ROCK)	59.2

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-	**0 HR.** N/A
COLLAR ELEV. 901.9 ft	**TOTAL DEPTH** 48.5 ft	**NORTHING** 848,185	**EASTING** 1,664,736	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
905										
	901.9	0.0								901.9 / 0.0 GROUND SURFACE
900			2	4	4	8		M		**ROADWAY EMBANKMENT** Medium Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4), with some mica and trace gravel
	898.4	3.5								898.9 / 3.0
	895.9	6.0	8	8	7	15		M		**RESIDUAL** Loose to Medium Dense, Black-Tan-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
895			4	4	5	9		M		
	893.4	8.5								
			24	11	8	19		M		
890										
	888.4	13.5								888.9 / 13.0
			19	8	8	16		M		Very Stiff, Black-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
885										
	883.4	18.5								883.9 / 18.0
			17	11	12	23		M		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	23		M		
875										
	873.4	28.5								
			5	8	13	21		M		
870										
	868.4	33.5								868.9 / 33.0
			5	12	21	33		M		Hard, Black-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with some mica
865										
	863.4	38.5								
			7	16	52	68		M		
860										
	858.4	43.5	100/0.2			100/0.2				858.4 / 43.5 **WEATHERED ROCK** Tan-Brown-White (GRANITIC ROCK)
855										
	853.5	48.4	60/0.1			60/0.1				853.5 / 48.4 **CRYSTALLINE ROCK** Black-White-Brown (GRANITIC ROCK)
										853.4 / 48.5 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-	**0 HR.** N/A
COLLAR ELEV. 900.2 ft	**TOTAL DEPTH** 48.8 ft	**NORTHING** 848,197	**EASTING** 1,664,718	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
905										
	900.2	0.0								900.2 / 0.0 GROUND SURFACE
900			2	2	4	6		M		**ROADWAY EMBANKMENT** Loose, Red-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
	896.7	3.5								897.2 / 3.0
			8	6	6	12		M		**RESIDUAL** Medium Dense, Tan-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
895										
	893.2	7.0								893.7 / 6.5
	891.7	8.5	5	6	7	13		M		Stiff, Black-Brown-Red, Fine to Coarse Sandy SILT (A-4), with little mica
			5	10	15	25		M		891.2 / 9.0
890										Medium Dense, Tan-Brown-Black-White, Silty Fine to Coarse SAND (A-2-4), with trace to little mica
	886.7	13.5								
			5	6	7	13		M		
885										
	881.7	18.5								
			4	5	6	11		M		
880										
	876.7	23.5								
			3	7	8	15		M		
875										
	871.7	28.5								
			4	8	11	19		M		
870										
	866.7	33.5								
			9	16	24	40		M		
865										
	861.7	38.5								861.2 / 39.0
			8	41	59/0.3	100/0.8				**WEATHERED ROCK** Black-White-Brown (GRANITIC ROCK)
860										
	856.7	43.5	51	49/0.2		100/0.7				
855										
	851.7	48.5	100/0.3			100/0.3				851.4 / 48.8 Boring Terminated at Elevation 851.4 ft In Weathered Rock (GRANITIC ROCK)

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-	**0 HR.** N/A
COLLAR ELEV. 914.9 ft	**TOTAL DEPTH** 58.9 ft	**NORTHING** 848,090	**EASTING** 1,664,599	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
915											
	914.9	0.0	3	4	6	10		M		914.9 GROUND SURFACE	0.0
	911.4	3.5								**RESIDUAL** Stiff, Brown-Red, Clayey SILT (A-5), with trace organics and little mica	
910			4	4	4	8		M		911.9	3.0
	908.9	6.0								Medium Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4), with little mica	
			3	4	3	7		M		909.4	5.5
	906.4	8.5								Loose, Orange-White-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	
905			4	3	3	6		M		906.9	8.0
										Medium Stiff to Stiff, Red-White-Black-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	
	901.4	13.5									
900			6	6	7	13		M			
	896.4	18.5									
895			5	4	7	11		M			
	891.4	23.5									
890			6	6	7	13		M			
	886.4	28.5									
885			8	9	10	19		M		886.9 Medium Dense, Tan-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	28.0
	881.4	33.5								881.9	33.0
880			4	6	6	12		M		Stiff to Hard, White-Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little to some mica	
	876.4	38.5									
875			6	8	11	19		M			
	871.4	43.5									
870			11	11	24	35		M			
	866.4	48.5								866.9 Very Dense, White-Black-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with some mica	48.0
865			20	20	32	52		M			
	861.4	53.5								860.9 **WEATHERED ROCK** White-Black-Orange-Brown (GRANITIC ROCK)	54.0
860			23	75	25/0.1	100/0.6					
	856.4	58.5	100/0.4			100/0.4				856.0 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-	**0 HR.** N/A
COLLAR ELEV. 897.9 ft	**TOTAL DEPTH** 44.7 ft	**NORTHING** 848,128	**EASTING** 1,664,585	**24 HR.** 23.3
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
900											
	897.9	0.0	1	2	4	6		M		897.9 GROUND SURFACE	0.0
895										**RESIDUAL** Loose to Medium Dense, Black-White-Brown, Silty Fine to Coarse SAND (A-2-4), with some mica	
	894.4	3.5	3	4	7	11		M		892.4	5.5
890	891.9	6.0	3	5	5	10		M		Stiff, Orange-Black-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	
	889.4	8.5								889.9	8.0
			3	5	5	10		M		Loose, White-Tan-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	
885	884.4	13.5								884.9	13.0
			5	5	7	12		M		Stiff to Very Stiff, Orange-Black-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	
880	879.4	18.5									
			6	9	11	20		M			
875	874.4	23.5						▼		874.9	23.0
			11	15	19	34		M		Dense to Very Dense, White-Tan-Black-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace to little mica	
870	869.4	28.5									
			14	23	37	60		M			
865	864.4	33.5									
			12	36	50	86		M			
860	859.4	38.5								858.9 **WEATHERED ROCK** Black-White-Brown (GRANITIC ROCK)	39.0
			12	42	58/0.3	100/0.8					
855	854.4	43.5									
	853.2	44.7	100/0.2			100/0.2				853.2 Boring Terminated with Standard Penetration Test Refusal at Elevation 853.2 ft On Crystalline Rock (GRANITIC ROCK)	44.7
			60/0.0			60/0.0					

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. B3-A	**STATION** 52+98	**OFFSET** 6 ft LT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 903.9 ft	**TOTAL DEPTH** 55.0 ft	**NORTHING** 847,983	**EASTING** 1,664,390	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
905											
	903.9	0.0	2	3	5	8		M		903.9 GROUND SURFACE	0.0
900	900.4	3.5	4	4	4	8		M		**RESIDUAL** Medium Stiff, Red-Brown, Clayey SILT (A-5), with trace mica	
	897.9	6.0	3	5	7	12		M		900.9 Medium Stiff to Stiff, Black-Orange-Brown-Red, Fine to Coarse Sandy SILT (A-4), with little to some mica	3.0
895	895.4	8.5	3	3	5	8		M			
890	890.4	13.5	4	4	5	9		M			
885	885.4	18.5	4	4	7	11		M			
880	880.4	23.5	4	4	6	10		M			
875	875.4	28.5	7	11	13	24		M		875.9 Medium Dense, Orange-White-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	28.0
870	870.4	33.5	9	17	23	40		M		870.9 Hard, Brown, Fine to Coarse Sandy SILT (A-4), with some mica	33.0
865	865.4	38.5	6	14	21	35		M		865.9 Dense to Very Dense, Black-White-Brown-Orange, Silty Fine to Coarse SAND (A-2-4), with little mica	38.0
860	860.4	43.5	19	21	34	55		M			
855	855.4	48.5	16	26	30	56		M			
850	850.4	53.5	18	25	38	63		M		848.9 Boring Terminated at Elevation 848.9 ft In Residual Silty SAND (A-2-4)	55.0

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. B3-B	**STATION** 52+99	**OFFSET** 12 ft RT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 904.3 ft	**TOTAL DEPTH** 65.0 ft	**NORTHING** 847,998	**EASTING** 1,664,379	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
905										
	904.3	0.0	3	4	6	10		M		904.3 GROUND SURFACE 0.0
900	900.8	3.5	6	5	7	12		M		**RESIDUAL** Stiff, Brown-Red, Clayey SILT (A-5), with trace organics and little mica
	898.3	6.0	2	4	3	7		M		898.8 5.5
895	895.8	8.5	3	4	5	9		M		Medium Stiff to Stiff, White-Orange-Brown-Black, Fine to Coarse Sandy SILT (A-4), with little mica
890	890.8	13.5	8	8	8	16		M		891.3 13.0
885	885.8	18.5	5	5	7	12		M		Medium Dense, Orange-Tan-White, Silty Fine to Coarse SAND (A-2-4), with little mica
880	880.8	23.5	4	6	7	13		M		886.3 18.0
875	875.8	28.5	3	6	8	14		M		Stiff, Black-Tan-Orange-White, Fine to Coarse Sandy SILT (A-4), with trace to some mica
870	870.8	33.5	11	13	16	29		M		871.3 33.0
865	865.8	38.5	7	7	9	16		M		Medium Dense, Orange-Tan-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
860	860.8	43.5	9	11	17	28		M		866.3 38.0
855	855.8	48.5	11	10	22	32		M		Very Stiff, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica
850	850.8	53.5	16	31	42	73		M		856.3 48.0
845	845.8	58.5	11	15	16	31		M		Dense, White-Tan-Brown, Silty Fine to Coarse SAND (A-2-4), with little mica
840	840.8	63.5	25	34	66/0.5	100/1.0		M		851.3 53.0
										Hard, Orange-White-Black, Fine to Coarse Sandy SILT (A-4), with some mica
										840.3 64.0
										839.3 **WEATHERED ROCK** 65.0 Orange-White-Black (BIOTITE GNEISS)
										Boring Terminated at Elevation 839.3 ft In Weathered Rock (BIOTITE GNEISS)

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-A	**STATION** 55+05	**OFFSET** 17 ft LT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 895.6 ft	**TOTAL DEPTH** 74.8 ft	**NORTHING** 847,859	**EASTING** 1,664,225	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
900										
895	895.6	0.0	2	4	5	9		M		895.6 GROUND SURFACE 0.0 **RESIDUAL** Stiff, Red-Brown, Clayey SILT (A-5), with trace organics and mica
	892.1	3.5	4	6	7	13		M		892.6 3.0 Stiff, Red-Brown, Silty CLAY (A-7-5), with trace mica
890	889.6	6.0	3	4	7	11		M		890.1 5.5 Medium Stiff to Stiff, Orange-Red-Brown, Clayey SILT (A-5), with trace mica
	887.1	8.5	4	6	7	13		M		
885	882.1	13.5	2	3	3	6		M		
880	877.1	18.5	2	4	6	10		M		877.6 18.0 Stiff to Hard, Orange-White-Brown-Black-Green, Fine to Coarse Sandy SILT (A-4), with trace mica
875	872.1	23.5	3	4	5	9		M		
870	867.1	28.5	3	4	7	11		M		
865	862.1	33.5	4	6	10	16		M		
860	857.1	38.5	6	9	13	22		M		
855	852.1	43.5	6	8	12	20		M		
850	847.1	48.5	3	7	12	19		M		
845	842.1	53.5	12	15	17	32		M		
840	837.1	58.5	36	60	40/0.3	100/0.8		M		836.6 59.0 **WEATHERED ROCK** Orange-Gray-White (GRANITIC ROCK)
835	832.1	63.5	37	38	33	71		M		832.6 63.0 **RESIDUAL** Dense to Very Dense, White-Black-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica
830	827.1	68.5	38	18	18	36		M		
825	822.1	73.5	25	60	40/0.3	100/0.8		M		821.6 74.0 820.8 74.8 **WEATHERED 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. B4-A	**STATION** 55+05	**OFFSET** 17 ft LT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 895.6 ft	**TOTAL DEPTH** 74.8 ft	**NORTHING** 847,859	**EASTING** 1,664,225	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
820						Match Line				White-Orange-Brown (GRANITIC ROCK) Boring Terminated at Elevation 820.8 ft In Weathered Rock (GRANITIC ROCK)

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-	**0 HR.** N/A
COLLAR ELEV. 896.6 ft	**TOTAL DEPTH** 75.0 ft	**NORTHING** 847,885	**EASTING** 1,664,212	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) — DEPTH (ft)
900										
	896.6	0.0								896.6 — GROUND SURFACE — 0.0
895			2	4	6	10		M		**RESIDUAL** Stiff, Red-Brown, Clayey SILT (A-5), with trace organics and mica
	893.1	3.5								893.6 — 3.0
			5	6	9	15		M		Soft to Stiff, Red-Gray-Brown, Silty CLAY (A-7-5), with trace mica
890	890.6	6.0								
			1	1	3	4		M		
	888.1	8.5								888.6 — 8.0
			5	5	8	13		M		Stiff, Tan-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica
885										
	883.1	13.5								883.6 — 13.0
			2	5	6	11		M		Loose to Medium Dense, White-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica
880										
	878.1	18.5								
			7	7	7	14		M		
875										
	873.1	23.5								
			5	5	5	10		M		
870										
	868.1	28.5								
			4	6	12	18		M		
865										
	863.1	33.5								863.6 — 33.0
			3	6	9	15		M		Stiff to Very Stiff, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica
860										
	858.1	38.5								
			5	6	11	17		M		
855										
	853.1	43.5								853.6 — 43.0
			11	12	22	34		M		Dense, Brown-White-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica
850										
	848.1	48.5								848.6 — 48.0
			12	16	22	38		M		Hard, Orange-Brown-White, Fine to Coarse Sandy SILT (A-4), with trace mica
845										
	843.1	53.5								
			6	12	20	32		M		
840										
	838.1	58.5								838.6 — 58.0
			19	21	28	49		M		Dense, Black-White-Brown-Orange, Silty Fine to Coarse SAND (A-2-4), with trace mica
835										
	833.1	63.5								
			6	17	19	36		M		
830										
	828.1	68.5								
			15	21	25	46		M		
825										
	823.1	73.5								823.6 — 73.0
			14	21	28	49		M		Hard, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica
										821.6 — 75.0
										Boring Terminated at Elevation 821.6 ft In

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-	**0 HR.** N/A
COLLAR ELEV. 896.6 ft	**TOTAL DEPTH** 75.0 ft	**NORTHING** 847,885	**EASTING** 1,664,212	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
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. B5-A	**STATION** 56+85	**OFFSET** 17 ft LT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 889.2 ft	**TOTAL DEPTH** 73.8 ft	**NORTHING** 847,752	**EASTING** 1,664,081	**24 HR.** Dry
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** 05/13/19	**COMP. DATE** 05/13/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
890	889.2	0.0								889.2 GROUND SURFACE 0.0
			2	2	5	7		M		**RESIDUAL** Medium Stiff to Stiff, Red-Brown-Black, Clayey SILT (A-5), with trace organics and trace to little mica
885	885.7	3.5	4	4	6	10		M		883.7 5.5
	883.2	6.0	4	5	9	14		M		Medium Stiff to Very Stiff, Black-Tan-Red-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little to some mica
880	880.7	8.5	3	3	7	10		M		
875	875.7	13.5	3	4	7	11		M		
870	870.7	18.5	3	3	5	8		M		
865	865.7	23.5	2	3	5	8		M		
860	860.7	28.5	3	5	9	14		M		
855	855.7	33.5	3	6	10	16		M		
850	850.7	38.5	5	6	9	15		M		
845	845.7	43.5	9	9	18	27		M		
840	840.7	48.5	10	13	14	27		M		841.2 48.0 Medium Dense to Very Dense, Tan-White-Brown, Silty Fine to Coarse SAND (A-2-4) with trace mica
835	835.7	53.5	5	9	12	21		M		
830	830.7	58.5	25	30	26	56		M		
825	825.7	63.5	7	11	19	30		M		826.2 63.0 Very Stiff, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica
820	820.7	68.5	28	45	55/0.4	100/0.9				820.2 69.0 **WEATHERED ROCK** Black-White-Gray (BIOTITE GNEISS)
	815.7	73.5	100/0.3			100/0.3				815.4 73.8 Boring Terminated at Elevation 815.4 ft In Weathered Rock (BIOTITE GNEISS)

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. B5-B	**STATION** 56+81	**OFFSET** 8 ft RT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 891.8 ft	**TOTAL DEPTH** 75.0 ft	**NORTHING** 847,774	**EASTING** 1,664,069	**24 HR.** Dry
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** 05/13/19	**COMP. DATE** 05/13/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
895										
	891.8	0.0								891.8 — GROUND SURFACE — 0.0
890			2	2	4	6		M		**RESIDUAL** Medium Stiff, Brown-Red, Clayey SILT (A-5), with trace mica
	888.3	3.5								888.8 — 3.0
			5	5	6	11		M		Stiff, Black-Brown-Red-Tan, Fine to Coarse Sandy SILT (A-4), with trace to little mica
885	885.8	6.0								
			3	4	5	9		M		
	883.3	8.5								
			3	5	7	12		M		
880										
	878.3	13.5								878.8 — 13.0
			3	4	5	9		M		Loose to Medium Dense, Tan-White-Brown-Black, Silty Fine to Coarse SAND (A-2-4), with little mica
875										
	873.3	18.5								
			6	5	5	10		M		
870										
	868.3	23.5								
			10	8	10	18		M		
865										
	863.3	28.5								
			6	6	6	12		M		
860										
	858.3	33.5								
			3	5	8	13		M		
855										
	853.3	38.5								853.8 — 38.0
			5	7	12	19		M		Very Stiff, Black-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
850										
	848.3	43.5								
			6	10	11	21		M		
845										
	843.3	48.5								
			6	6	10	16		M		
840										
	838.3	53.5								838.8 — 53.0
			6	9	11	20		M		Medium Dense, Tan-Brown-White, Silty Fine to Coarse SAND (A-2-4), with little mica
835										
	833.3	58.5								833.8 — 58.0
			7	11	14	25		M		Very Stiff, Black-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
830										
	828.3	63.5								
			7	10	13	23		M		
825										
	823.3	68.5								823.8 — 68.0
			20	47	46	93		M		Dense to Very Dense, Tan-White-Brown, Silty Fine to Coarse SAND (A-2-4), with little mica
820										
	818.3	73.5								816.8 — 75.0
			11	16	23	39		M		Boring Terminated at Elevation 816.8 ft In

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. B5-B	**STATION** 56+81	**OFFSET** 8 ft RT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 891.8 ft	**TOTAL DEPTH** 75.0 ft	**NORTHING** 847,774	**EASTING** 1,664,069	**24 HR.** Dry
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** 05/13/19	**COMP. DATE** 05/13/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
815						Match Line				Residual Silty SAND (A-2-4)

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-	**0 HR.** N/A
COLLAR ELEV. 875.7 ft	**TOTAL DEPTH** 60.0 ft	**NORTHING** 847,647	**EASTING** 1,663,968	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
880											
875	875.7	0.0	2	2	3	5		M		875.7 GROUND SURFACE	0.0
										RESIDUAL Medium Stiff to Stiff, White-Black-Green-Brown, Clayey SILT (A-5), with trace mica	
	872.2	3.5	4	4	7	11		M			
870	869.7	6.0								870.2	5.5
			1	2	6	8		M		Medium Stiff to Stiff, Tan-Black-Brown-White-Green, Fine to Coarse Sandy SILT (A-4), with little to some mica	
	867.2	8.5	4	5	9	14		M			
865											
	862.2	13.5	5	4	5	9		M			
860											
	857.2	18.5	4	3	4	7		M			
855											
	852.2	23.5	2	2	6	8		M		852.7 Loose, Brown-White, Silty Fine to Coarse SAND (A-2-4), with little mica	23.0
850											
	847.2	28.5								847.7	28.0
			3	5	7	12		M		Stiff, Black-Tan-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	
845											
	842.2	33.5	4	6	12	18		M		842.7 Medium Dense to Very Dense, Tan-Gray-White-Black, Silty Fine to Coarse SAND (A-2-4), with trace to little mica	33.0
840											
	837.2	38.5	14	19	17	36		M			
835											
	832.2	43.5	10	24	28	52		M			
830											
	827.2	48.5	8	18	34	52		M			
825											
	822.2	53.5	26	66	34/0.3	100/0.8		M		821.7 **WEATHERED ROCK** White-Gray-Orange-Brown (GRANITIC ROCK)	54.0
820										817.7	58.0
	817.2	58.5	16	36	47	83		M		815.7 **RESIDUAL** Very Dense, Black-White-Gray, Silty Fine to Coarse SAND (A-2-4), with trace mica	60.0
										Boring Terminated at Elevation 815.7 ft In Residual Silty SAND (A-2-4)	

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-	**0 HR.** N/A
COLLAR ELEV. 876.4 ft	**TOTAL DEPTH** 55.0 ft	**NORTHING** 847,658	**EASTING** 1,663,936	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
880											
875	876.4	0.0	6	3	4	7		M		876.4 GROUND SURFACE	0.0
										RESIDUAL Medium Stiff, Orange-Brown, Clayey SILT (A-5), with trace mica	
	872.9	3.5	3	4	6	10		M		873.4	3.0
870	870.4	6.0								Loose to Medium Dense, Tan-Brown-Orange-White-Gray, Silty Fine to Coarse SAND (A-2-4), with trace to little mica	
			4	7	10	17		M			
	867.9	8.5	4	5	8	13		M			
865											
	862.9	13.5	5	7	12	19		M			
860											
	857.9	18.5	7	6	7	13		M			
855											
	852.9	23.5	9	15	15	30		M			
850											
	847.9	28.5	7	18	22	40		M		848.4 Hard, White-Brown-Black, Fine to Coarse Sandy SILT (A-4), with some mica	28.0
845											
	842.9	33.5	5	12	18	30		M		843.4 Mediumn Dense to Very Dense, Brown-White, Silty Fine to Coarse SAND (A-2-4), with little mica	33.0
840											
	837.9	38.5	20	24	28	52		M			
835											
	832.9	43.5	7	44	56/0.4	100/0.9		M		832.4 **WEATHERED ROCK** Tan-White-Brown (GRANITIC ROCK)	44.0
830											
	827.9	48.5	72	28/0.1		100/0.6		M		823.4	53.0
825										**RESIDUAL**	
	822.9	53.5	24	30	30	60		M		821.4 Very Dense, Tan-White-Brown, Silty Fine to Coarse SAND (A-2-4), with some mica	55.0
										Boring Terminated at Elevation 821.4 ft In Residual Silty SAND (A-2-4)	

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.7	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** M. Magno	
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40				**GROUND WTR (ft)**
BORING NO. B7-A	**STATION** 60+86	**OFFSET** 6 ft LT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 857.6 ft	**TOTAL DEPTH** 63.9 ft	**NORTHING** 847,496	**EASTING** 1,663,774	**24 HR.** 5.0
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** 05/18/19	**COMP. DATE** 05/18/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
860											
	857.6	0.0	2	2	3	5		M		857.6 GROUND SURFACE	0.0
855										**RESIDUAL** Medium Stiff, Orange-Brown, Fine to Coarse Sandy CLAY (A-6), with trace organics and mica	
	854.1	3.5	3	3	4	7				854.6	3.0
	851.6	6.0	1	1	3	4				Loose, Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	
850								M		852.1	5.5
	849.1	8.5	2	3	6	9				Soft to Stiff, White-Tan-Brown-Black, Fine to Coarse Sandy SILT (A-4), with trace to some mica	
845											
	844.1	13.5	2	2	5	7		M			
840											
	839.1	18.5	3	4	7	11		M			
835											
	834.1	23.5	3	6	9	15		M			
830											
	829.1	28.5	11	16	20	36		M		829.6 Dense, Gray-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	28.0
825											
	824.1	33.5	6	13	26	39		M		824.6 Hard, Tan-Brown-White, Fine to Coarse Sandy SILT (A-4), with trace to some mica	33.0
820											
	819.1	38.5	5	10	35	45		M			
815											
	814.1	43.5	13	18	27	45		M			
810											
	809.1	48.5	12	18	22	40		M			
805											
	804.1	53.5	13	16	20	36		M			
800											
	799.1	58.5	29	67	33/0.2	100/0.7		M		798.6 **WEATHERED ROCK** Black-Tan-Brown (BIOTITE GNEISS)	59.0
795											
	794.1	63.5	100/0.4			100/0.4		M		793.7 Boring Terminated at Elevation 793.7 ft In Weathered Rock (BIOTITE GNEISS)	63.9

WBS 34839.1.7	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** M. Magno	
SITE DESCRIPTION Bridge No. 725 on -Y15FLYAC- from US 311 to I-40				**GROUND WTR (ft)**
BORING NO. B7-B	**STATION** 60+72	**OFFSET** 19 ft RT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 857.5 ft	**TOTAL DEPTH** 55.0 ft	**NORTHING** 847,524	**EASTING** 1,663,767	**24 HR.** 4.6
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** 05/18/19	**COMP. DATE** 05/18/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
860										
	857.5	0.0	1	2	4	6		M		857.5 GROUND SURFACE 0.0
855										**RESIDUAL** Medium Stiff, Orange-Brown, Fine to Coarse Sandy SILT (A-4), with trace organics and mica
	854.0	3.5	3	4	4	8				854.5 3.0
	851.5	6.0	1	1	2	3				Very Loose to Loose, Brown-Tan-Black-White-Gray, Silty Fine to Coarse SAND (A-2-4), with trace mica
850								M		
	849.0	8.5	2	3	3	6				
845										
	844.0	13.5	1	3	7	10		M		
840										
	839.0	18.5	7	10	15	25		W		839.5 Very Stiff, White-Tan-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica 18.0
835										
	834.0	23.5	17	33	38	71		W		834.5 Very Dense, White-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica 23.0
830										
	829.0	28.5	5	9	16	25		M		829.5 Very Stiff to Hard, Tan-Brown-White, Fine to Coarse Sandy SILT (A-4), with some mica 28.0
825										
	824.0	33.5	7	12	21	33		M		
820										
	819.0	38.5	3	4	10	14		M		819.5 Medium Dense to Very Dense, Black-Orange-Brown-Tan-Gray, Silty Fine to Coarse SAND (A-2-4), with trace mica 38.0
815										
	814.0	43.5	12	17	25	42		M		
810										
	809.0	48.5	18	22	25	47		M		
805										
	804.0	53.5	26	34	44	78		M		802.5 Boring Terminated at Elevation 802.5 ft In Residual Silty SAND (A-2-4) 55.0

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. B8-A	**STATION** 63+16	**OFFSET** 11 ft LT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 862.0 ft	**TOTAL DEPTH** 60.7 ft	**NORTHING** 847,327	**EASTING** 1,663,619	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
865										
	862.0	0.0	1	1	3	4		M		862.0 / 0.0 GROUND SURFACE
860										**RESIDUAL** Soft, Red-Brown, Clayey SILT (A-5), with trace organics and mica
	858.5	3.5	2	2	3	5		M		859.0 / 3.0 Medium Stiff, Red-Brown-Tan-White, Fine to Coarse Sandy SILT (A-4), with trace organics and mica
	856.0	6.0	2	1	3	4		M		856.5 / 5.5 Loose to Very Dense, Tan-Orange-White-Brown-Black, Silty Fine to Coarse SAND (A-2-4), with little to some mica
855										
	853.1	8.9	3	3	4	7		M		
850										
	847.1	14.9	2	2	4	6		M		
845										
	842.2	19.8	3	7	8	15		M		
840										
	837.9	24.1	4	3	6	9		M		
835										
	832.9	29.1	4	11	13	24		M		
830										
	827.9	34.1	13	19	25	44		M		
825										
	822.9	39.1	28	28	33	61		M		
820										
	817.6	44.4	12	50	34	84		M		
815										
	812.7	49.3	24	64	36/0.3	100/0.8		M		812.2 / 49.8 **WEATHERED ROCK** Tan-White-Brown (MICA SCHIST)
810										
	807.6	54.4	29	65	35/0.2	100/0.7		M		808.0 / 54.0 Orange-Black-White (BIOTITE GNEISS)
805										
	802.6	59.4	20	64	36/0.3	100/0.8		M		801.3 / 60.7 Boring Terminated at Elevation 801.3 ft In Weathered Rock (BIOTITE GNEISS)

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. B8-B	**STATION** 63+19	**OFFSET** 8 ft RT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 858.7 ft	**TOTAL DEPTH** 54.5 ft	**NORTHING** 847,337	**EASTING** 1,663,603	**24 HR.** 8.8
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** 05/08/19	**COMP. DATE** 05/08/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
860										
	858.7	0.0	1	2	3	5		M		858.7 / 0.0 GROUND SURFACE
855	855.2	3.5	3	4	5	9		M		**RESIDUAL** Medium Stiff to Stiff, Red-Brown, Clayey SILT (A-5), with trace organics and mica
	852.7	6.0	3	2	5	7		M		853.2 / 5.5 Soft to Stiff, Red-Gray-Brown-Black-White, Fine to Coarse Sandy SILT (A-4), with trace to some mica
850	850.2	8.5	2	2	2	4		M		
845	845.2	13.5	3	4	6	10		M		
840	840.2	18.5	8	9	10	19		M		840.7 / 18.0 Medium Dense to Very Dense, Brown-Tan-White-Black, Silty Fine to Coarse SAND (A-2-4), with little mica
835	835.2	23.5	4	7	9	16		M		
830	830.2	28.5	12	18	24	42		M		
825	825.2	33.5	8	22	29	51		M		
820	820.2	38.5	18	14	22	36		M		
815	815.2	43.5	42	44	56/0.3	100/0.8		M		814.7 / 44.0 **WEATHERED ROCK** Brown-Black-White (BIOTITE GNEISS)
810	810.2	48.5	44	56/0.4		100/0.9		M		810.7 / 48.0 White-Tan-Brown (MICA SCHIST)
805	805.2	53.5	30	70/0.5		100/1.0		M		805.7 / 53.0 Brown-Black-White (BIOTITE GNEISS) 804.2 / 54.5 Boring Terminated at Elevation 804.2 ft In Weathered Rock (BIOTITE GNEISS)

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-	**0 HR.** N/A
COLLAR ELEV. 871.5 ft	**TOTAL DEPTH** 76.0 ft	**NORTHING** 847,177	**EASTING** 1,663,492	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
875											
	871.5	0.0								871.5 GROUND SURFACE	0.0
870			3	7	12	19		M		**RESIDUAL** Very Stiff, Red-Brown-Black, Clayey SILT (A-5), with trace organics and mica	
	868.0	3.5								868.5 Medium Dense, Tan-Orange, Clayey Fine to Coarse SAND (A-2-6)	3.0
			5	8	10	18		M			
865	865.5	6.0									
			WOH	5	8	13		M			
	862.5	9.0								863.0 Loose, Tan-Orange, Silty Fine to Coarse SAND (A-2-4), with trace mica	8.5
			4	4	5	9		M			
860											
	857.0	14.5								857.5 Medium Stiff, Orange-Tan-Brown-Black, Fine to Coarse Sandy SILT (A-4), with some mica	14.0
			3	2	3	5		M			
855											
	852.0	19.5									
			2	2	4	6		M			
850											
	847.0	24.5								847.5 Medium Dense, Brown-Black-White, Silty Fine to Coarse SAND (A-2-4), with some mica	24.0
			5	7	7	14		M			
845											
	842.0	29.5									
			4	6	9	15		M			
840											
	837.0	34.5								837.5 Stiff, Tan-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	34.0
			13	8	3	11		M			
835											
	832.0	39.5								832.5 Medium Dense, Tan-Brown-White, Silty Fine to Coarse SAND (A-2-4), with some mica	39.0
			4	7	8	15		M			
830											
	827.0	44.5								827.5 Stiff, Tan-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	44.0
			4	3	7	10		M			
825											
	822.0	49.5								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
			22	24	34	58		M			
820											
	817.0	54.5									
			10	8	13	21		M			
815											
	812.0	59.5									
			7	5	14	19		M			
810											
	807.0	64.5									
			23	20	15	35		M			
805											
	802.0	69.5									
			16	16	18	34		M			
800											
	797.0	74.5									
			12	16	18	34		M		795.5	76.0

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-	**0 HR.** N/A
COLLAR ELEV. 871.5 ft	**TOTAL DEPTH** 76.0 ft	**NORTHING** 847,177	**EASTING** 1,663,492	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
795						Match Line				Boring Terminated at Elevation 795.5 ft In Residual Silty SAND (A-2-4)

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** 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-	**0 HR.** N/A
COLLAR ELEV. 873.7 ft	**TOTAL DEPTH** 75.0 ft	**NORTHING** 847,189	**EASTING** 1,663,471	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
875										
	873.7	0.0								873.7 GROUND SURFACE 0.0
			2	3	5	8		M		**RESIDUAL** Medium Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace organics
870	870.2	3.5								870.7 3.0
			7	10	16	26		M		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								865.7 8.0
			5	4	7	11		M		Stiff, Red-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica
860	860.2	13.5								860.7 13.0
			4	6	7	13		M		Loose to Medium Dense, Tan-White, Silty Fine to Coarse SAND (A-2-4)
855	855.2	18.5								
			4	3	5	8		M		
850	850.2	23.5								850.7 23.0
			1	2	2	4		M		Soft to Very Stiff, Tan-Brown-White, Fine to Coarse Sandy SILT (A-4), with little mica
845	845.2	28.5								
			4	6	10	16		M		
840	840.2	33.5								
			3	3	5	8		M		
835	835.2	38.5								835.7 38.0
			11	12	11	23		M		Medium Dense, White-Tan, Silty Fine to Coarse SAND (A-2-4)
830	830.2	43.5								830.7 43.0
			4	3	5	8		M		Medium Stiff to Very Stiff, Tan-Brown-White, Fine to Coarse Sandy SILT (A-4)
825	825.2	48.5								
			6	7	11	18		M		
820	820.2	53.5								
			8	12	18	30		M		
815	815.2	58.5								
			5	9	14	23		M		
810	810.2	63.5								
			8	11	12	23		M		
805	805.2	68.5								
			7	11	18	29		M		
800	800.2	73.5								
			6	11	15	26		M		798.7 75.0 Boring Terminated at Elevation 798.7 ft In 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. EB2-A	**STATION** 67+41	**OFFSET** 5 ft LT	**ALIGNMENT** -Y15FLYAC-	**0 HR.** N/A
COLLAR ELEV. 893.9 ft	**TOTAL DEPTH** 73.7 ft	**NORTHING** 847,000	**EASTING** 1,663,350	**24 HR.** Dry
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
895											
	893.9	0.0	3	3	5	8		M		893.9 GROUND SURFACE	0.0
890	890.4	3.5	6	8	11	19		M		**RESIDUAL** Medium Stiff to Very Stiff, Red-Brown, Clayey SILT (A-5), with trace organics and trace to little mica	
	887.9	6.0	2	4	4	8		M			
885	885.4	8.5	3	3	7	10		M		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	8		M			
875	875.4	18.5	3	5	6	11		M			
870	870.4	23.5	4	4	6	10		M			
865	865.4	28.5	3	4	6	10		M			
860	860.4	33.5	4	4	4	8		M			
855	855.4	38.5	6	9	10	19		M		855.9 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	32		M			
845	845.4	48.5	11	16	19	35		M			
840	840.4	53.5	14	20	26	46		M			
835	835.4	58.5	21	25	40	65		M			
830	830.4	63.5	48	48	52/0.4	100/0.9		M		829.9 **WEATHERED ROCK** Orange-White-Black (BIOTITE GNEISS)	64.0
825	825.4	68.5	67	33/0.3		100/0.8		M			
820	820.4	73.5	100/0.2			100/0.2		M		820.2 Boring Terminated at Elevation 820.2 ft In Weathered Rock (BIOTITE GNEISS)	73.7

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-	**0 HR.** N/A
COLLAR ELEV. 894.1 ft	**TOTAL DEPTH** 75.0 ft	**NORTHING** 847,013	**EASTING** 1,663,341	**24 HR.** 29.6
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 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
895										
	894.1	0.0	2	4	6	10		M		894.1 GROUND SURFACE 0.0
890	890.6	3.5	4	6	9	15		M		**RESIDUAL** Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4) 891.1 3.0
	888.1	6.0	3	5	6	11		M		Stiff, Red-Brown, Clayey SILT (A-5), with trace mica
885	885.6	8.5	2	3	3	6		M		886.1 8.0
880	880.6	13.5	3	4	5	9		M		Medium Stiff, Brown-Tan-Orange, Fine to Coarse Sandy SILT (A-4), with little mica
875	875.6	18.5	3	3	5	8		M		881.1 13.0
870	870.6	23.5	3	4	5	9		M		Loose, Brown-White-Tan, Silty Fine to Coarse SAND (A-2-4), with little mica
865	865.6	28.5	2	4	7	11		M		876.1 18.0
860	860.6	33.5	3	6	8	14		M		Medium Stiff to Very Stiff, Brown-White-Orange-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica
855	855.6	38.5	5	7	10	17		M		
850	850.6	43.5	5	8	11	19		M		
845	845.6	48.5	10	11	20	31		M		846.1 48.0
840	840.6	53.5	15	13	13	26		M		Dense, Tan-White, Silty Fine to Coarse SAND (A-2-4), with little mica
835	835.6	58.5	8	29	64	93		M		841.1 53.0
830	830.6	63.5	8	21	27	48		M		Very Stiff to Hard, Gray-White-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
825	825.6	68.5	6	94/0.4		100/0.9		M		825.1 69.0
820	820.6	73.5	10	25	71	96		M		**WEATHERED ROCK** Tan-White-Gray (BIOTITE GNEISS)
										821.1 73.0
										RESIDUAL Hard, Tan-White-Gray, Fine to Coarse Sandy SILT (A-4) 819.1 75.0
										Boring Terminated at Elevation 819.1 ft In Residual Sandy SILT (A-4)

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	32

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.

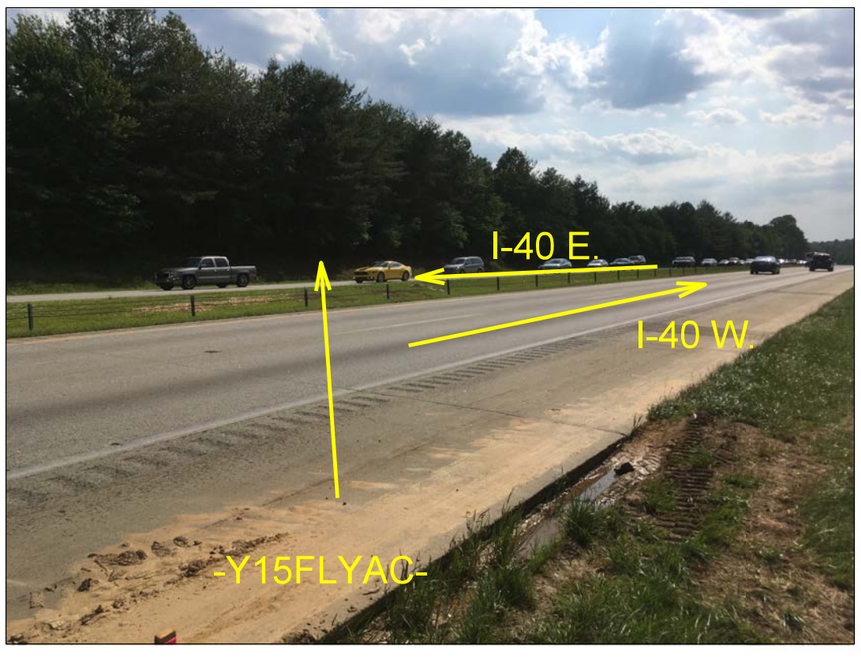

PHOTO 3: VIEW FROM END BENT 1 FACING UPSTATION.

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	15

REFERENCE: U-2579AB

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 I-40 TO I-40 BUSINESS*

SITE DESCRIPTION *BRIDGE NO. 728 ON SR 2679 (GLENN HI RD.) OVER WINSTON-SALEM NORTHERN BELTWAY*

CONTENTS

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PERSONNEL

P. CARY

TERRACON PERSONNEL

P. NEUMANN

SUMMIT PERSONNEL

INVESTIGATED BY *RK&K, LLP*

DRAWN BY *P. CARY/P. NEUMANN*

CHECKED BY *G. GOINS*

SUBMITTED BY *RK&K, LLP*

DATE *DECEMBER 2019*

Prepared in the Office of:

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NORTH CAROLINA PROFESSIONAL SEAL 041709 ENGINEER GREGORY K. GOINS

DocuSigned by:
Gregory K. Goins
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SIGNATURE

12/10/2019
DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	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	UNSUITABLE

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 RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	< 4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	> 50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	< 2	< 0.25
	SOFT	2 TO 4	0.25 TO 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	> 30	> 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- 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-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

	GRANULAR SOILS	SILT - CLAY SOILS
ORGANIC MATERIAL		
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	> 10%	> 20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — 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
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT / DPT / DMT / VST / PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW 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
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
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-55
- [X] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [X] DIEDRICH D-50
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [X] CORE BIT
- [X] 3¼" HOLLOW AUGERS

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [X] -N NQ

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 YEILD 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 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 GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN 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.

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

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.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: N/A

ELEVATION: N/A FEET

NOTES:

FIAD = FILLED IMMEDIATELY AFTER DRILLING

BORING COLLAR ELEVATIONS DETERMINED USING SURVEY-GRADE GPS

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	2A

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

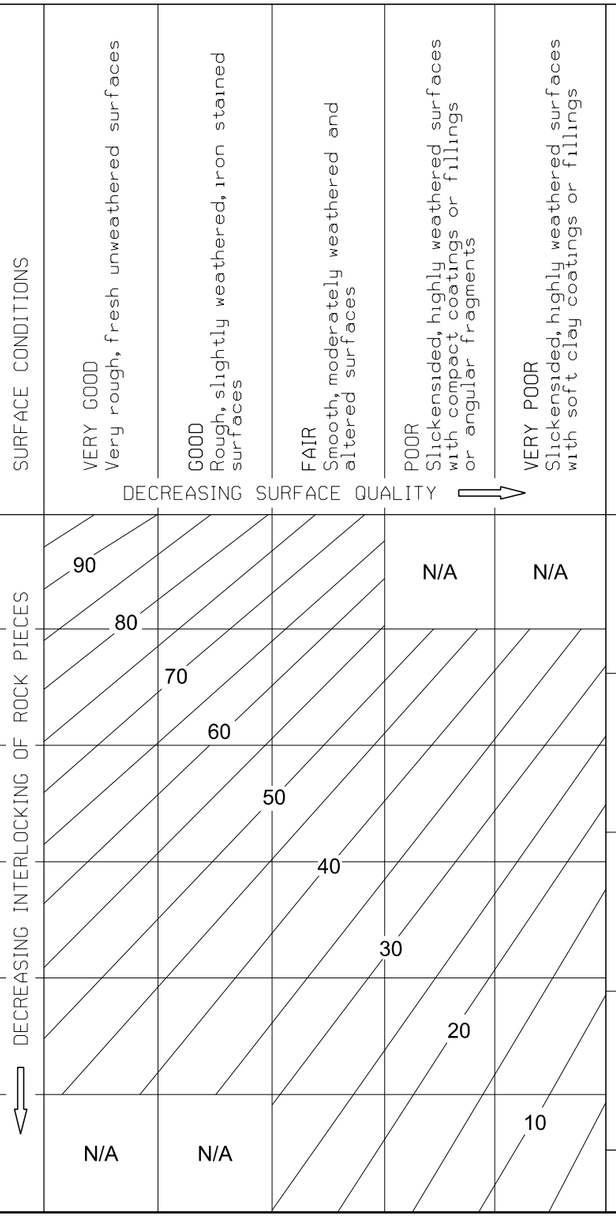
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)

From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.

STRUCTURE

- INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities
- BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets
- VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets
- BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity
- DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces
- LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes

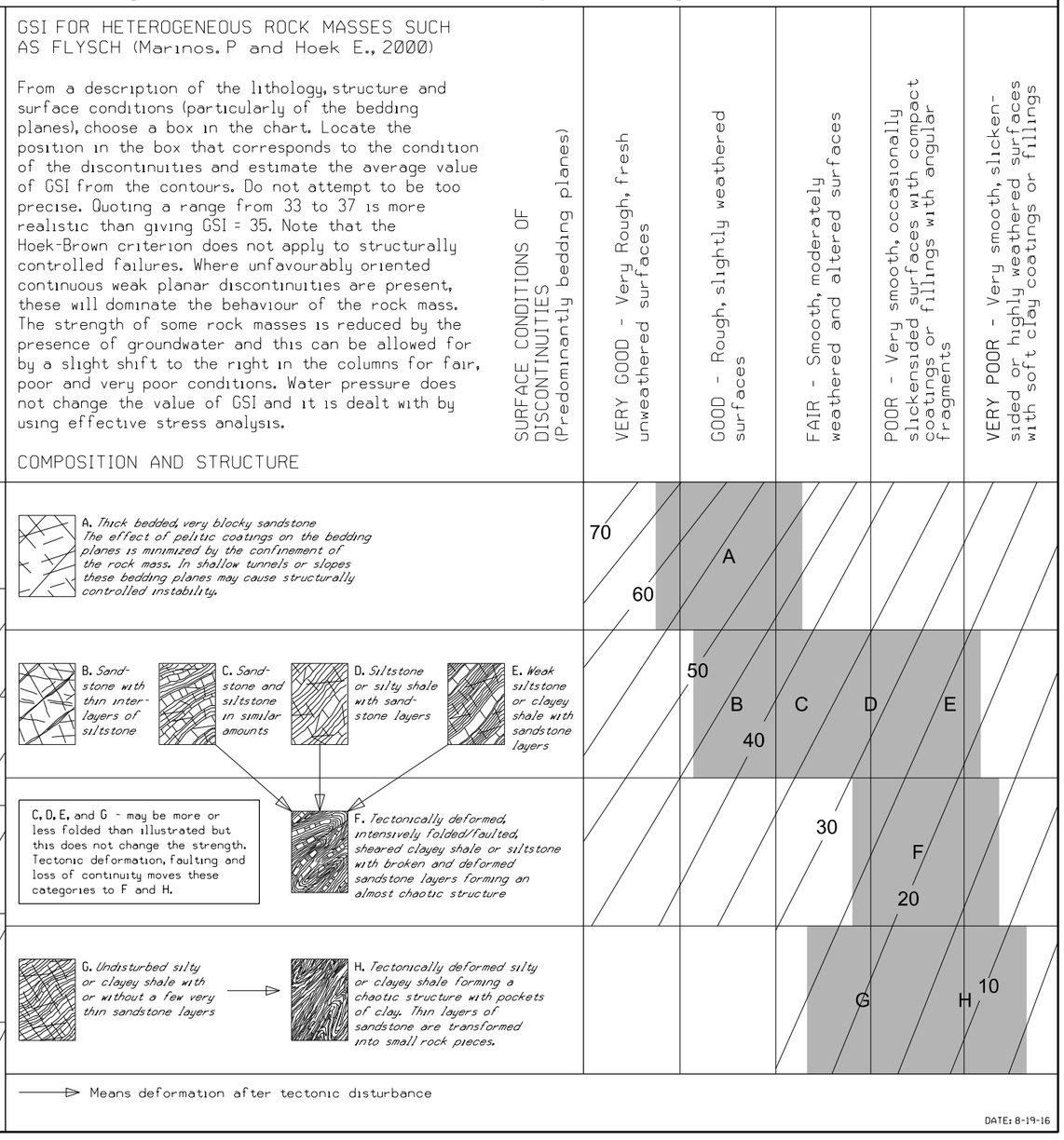


AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000)

From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.

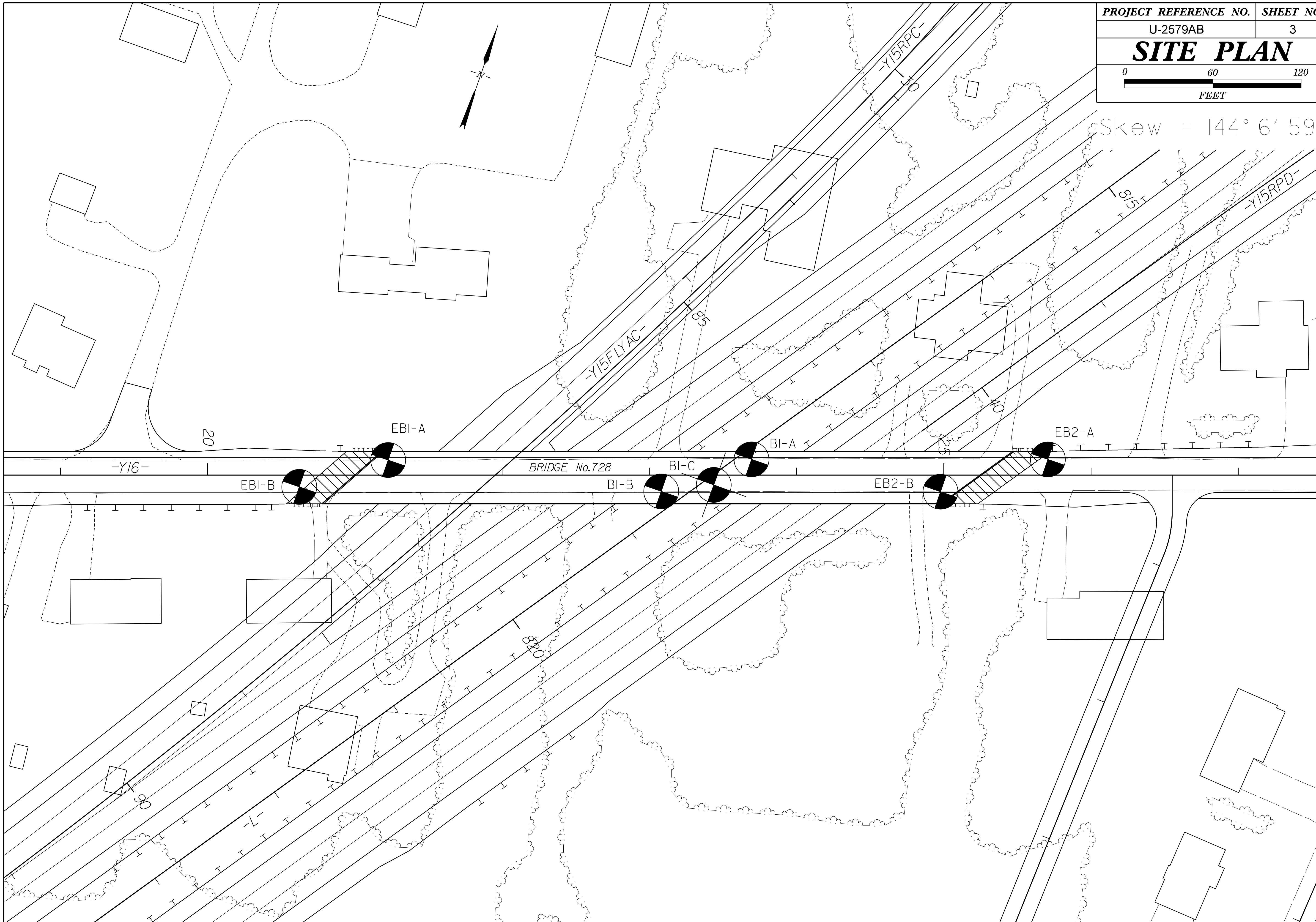
COMPOSITION AND STRUCTURE



DATE: 8-19-16

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	3

SITE PLAN



0	100	200

FEET

VE = 5:1

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	4

PROFILE ALONG -Y16-

(A) RESIDUAL: Red to red-brown, stiff to very stiff, silty sandy CLAY, trace mica

(B) RESIDUAL: Red to brown to orange to red-purple, medium stiff to stiff, clayey fine sandy SILT and fine sandy SILT, trace mica, saprolitic

(C) RESIDUAL: Orange to white-tan-brown to red to dark grey to black, loose to very dense, silty fine to coarse SAND, trace to little mice, saprolitic

(D) WEATHERED ROCK: GRANITE

960
950
940
930
920
910
900
890
880
870
860
850
840

EB1-A
21+23
10' LT

B1-A
23+70
11' LT

EB2-A
25+71
10' LT

PROPOSED GRADE

EXISTING GROUND

A
B
C
D

12 15 13 12 5 9 10 6 12 20 79 26
60/0.0
FIAD
05/19
BT

14 12 10 9 7 5 10 8 9 100/0.2 38 100/0.4
60/0.0
FIAD
05/19
BT

17 11 11 9 7 9 10 8 10 10 10 20 100/0.1 100/0.2
60/0.0
FIAD
05/19
BT

CRYSTALLINE ROCK: GRANITE

17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	5
PROFILE ALONG -Y16-	

0 100 200
FEET
VE = 5:1

(A) RESIDUAL: Red-orange, medium stiff to very stiff, silty CLAY and silty fine sandy CLAY, trace to little mica
(B) RESIDUAL: Red-pink, orange-black, grey-brown, soft to very stiff, sandy, clayey fine sandy SILT and fine sandy SILT, trace to little mica, saprolitic.
(C) RESIDUAL: Tan, orange, brown-white, grey-brown, black, loose to dense, silty fine to coarse SAND, trace to little mica, trace rock fragments, saprolitic, trace organics
(D) WEATHERED ROCK: GRANITE

EB1-B
20+62
8' RT

B1-B
23+08
11' RT

B1-C
23+44
7' RT

EB2-B
24+98
11' RT

PROPOSED GRADE

EXISTING GROUND

FIAD
05/19
BT

DRY
05/19
BT

FIAD
10/19
BT

DRY
05/19
BT

CRYSTALLINE ROCK: GRANITE

CRYSTALLINE ROCK: BIOTITE SCHIST AND GNEISS

960 950 940 930 920 910 900 890 880 870 860 850 840

16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2579AB	6

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

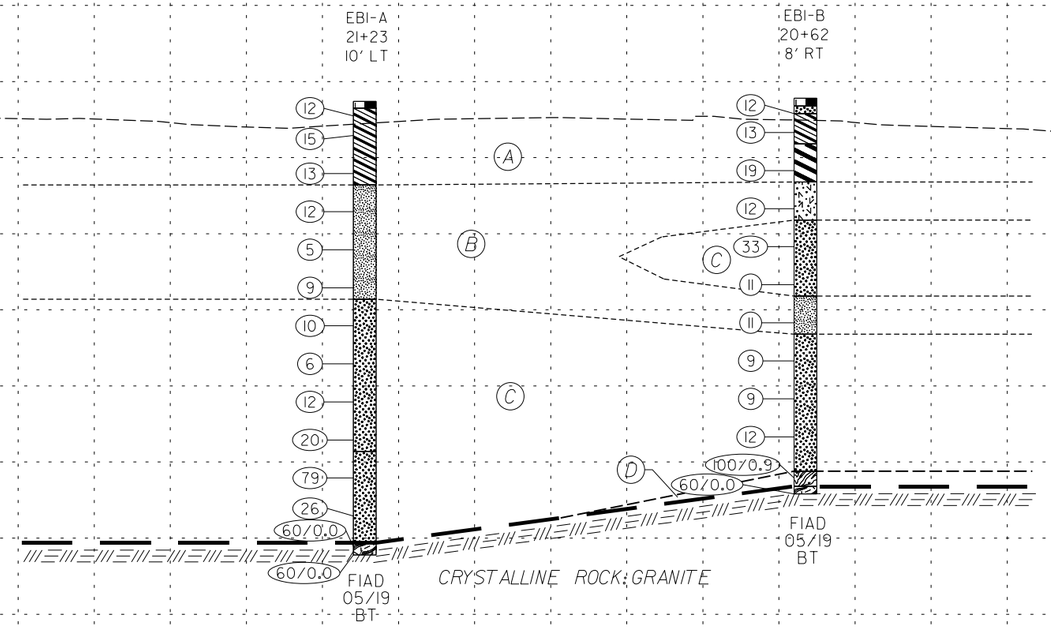
970 960 950 940 930 920 910 900 890 880 870 860

(A) RESIDUAL: Red, stiff to very stiff, silty fine sandy CLAY, trace mica

(B) RESIDUAL: Red, to orange to red-brown to grey-brown, medium stiff to stiff, sandy SILT and clayey fine sandy SILT, trace mica, saprolitic

(C) RESIDUAL: White to grey to brown to black, loose to very dense, silty fine to coarse SAND, trace to little mica, saprolitic

(D) WEATHERED ROCK: GRANITE



NOTE: GROUNDLINE PROFILE TAKEN FROM TIN FILE ALONG LINE OF BENT, SKEW APPROXIMATELY 144°

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

CROSS SECTION ALONG END BENT 1 (STA. 21+00)

-Y16-

12/2/2019
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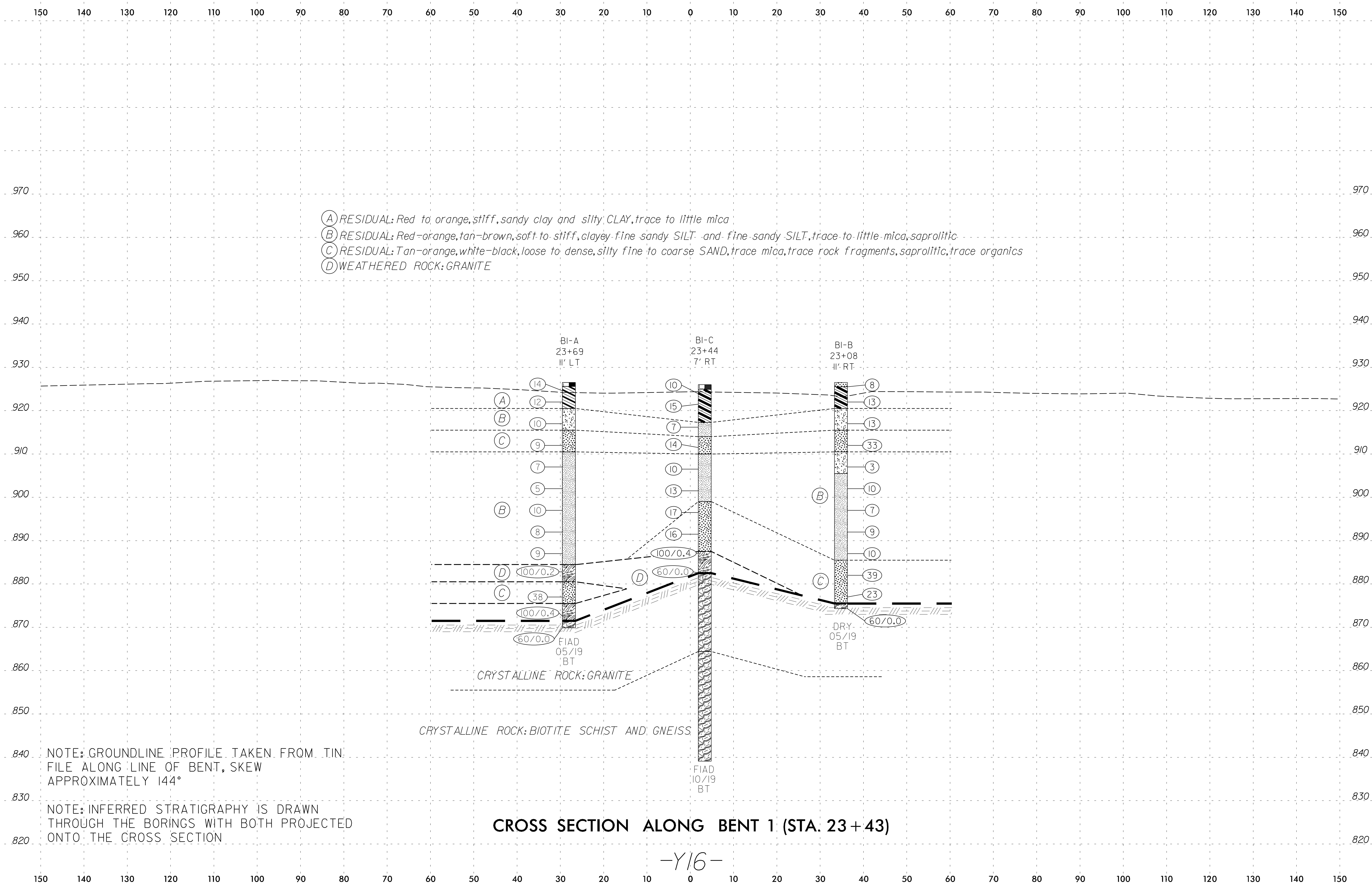
PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	7



A RESIDUAL: Red to orange, stiff, sandy clay and silty CLAY, trace to little mica
B RESIDUAL: Red-orange, tan-brown, soft to stiff, clayey fine sandy SILT and fine sandy SILT, trace to little mica, saprolitic
C RESIDUAL: Tan-orange, white-black, loose to dense, silty fine to coarse SAND, trace mica, trace rock fragments, saprolitic, trace organics
D WEATHERED ROCK: GRANITE
BI-A 23+69 11' LT
BI-C 23+44 7' RT
BI-B 23+08 11' RT
FIAD 05/19 BT
FIAD 10/19 BT
DRY 05/19 BT
CRYSTALLINE ROCK: GRANITE
CRYSTALLINE ROCK: BIOTITE SCHIST AND GNEISS

NOTE: GROUNDLINE PROFILE TAKEN FROM TIN FILE ALONG LINE OF BENT, SKEW APPROXIMATELY 144°

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

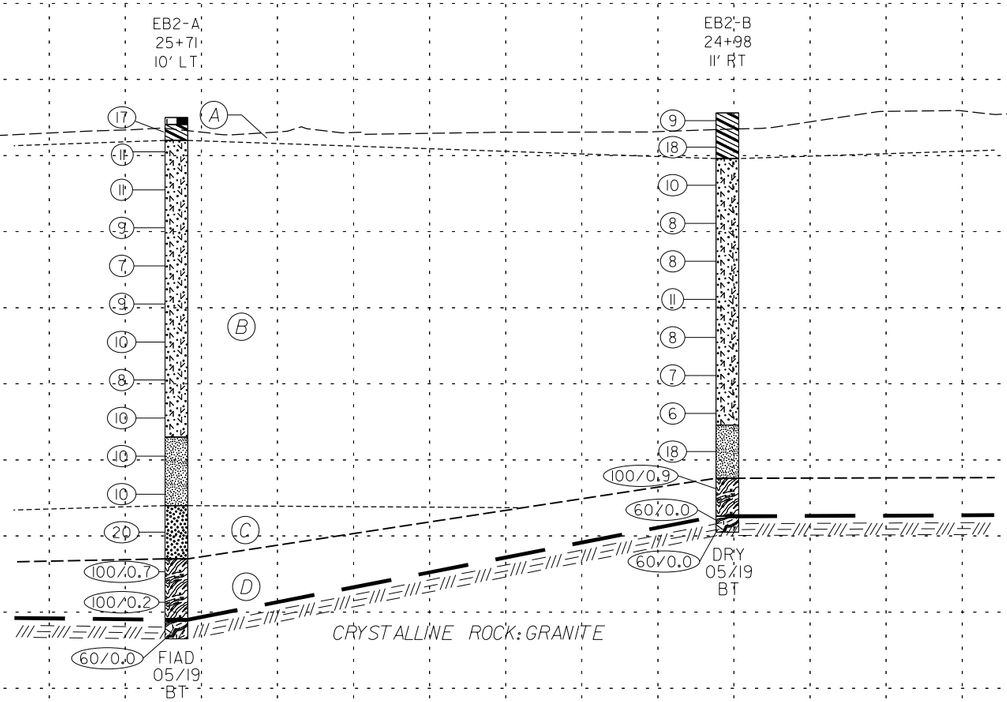
CROSS SECTION ALONG BENT 1 (STA. 23+43)

-Y16-

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-2579AB	8

(A) RESIDUAL: Red, medium stiff to very stiff, silty CLAY, trace mica
(B) RESIDUAL: Red to red-purple to orange to brown to grey, medium stiff to very stiff, clayey fine sandy SILT and fine sandy SILT, trace to little mica, saprolitic
(C) RESIDUAL: Brown-white, medium dense, silty SAND, trace mica, saprolitic
(D) WEATHERED ROCK: GRANITE



NOTE: GROUNDLINE PROFILE TAKEN FROM TIN FILE ALONG LINE OF BENT, SKEW APPROXIMATELY 144°

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

CROSS SECTION ALONG END BENT 2 (STA. 25+25)

12/2/2019
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FLeigh

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** P. Cary	
SITE DESCRIPTION Bridge No. 330728 on SR 2679 (Glenn Hi Rd) over Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 21+23	**OFFSET** 11 ft LT	**ALIGNMENT** Y16	**0 HR.** N/A
COLLAR ELEV. 927.4 ft	**TOTAL DEPTH** 59.6 ft	**NORTHING** 845,256	**EASTING** 1,662,428	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 99% 03/24/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER J. Turney	**START DATE** 05/13/19	**COMP. DATE** 05/13/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) — DEPTH (ft)
930										
	926.5	0.9								927.4 — GROUND SURFACE — 0.0 926.5 — **ROADWAY EMBANKMENT** 0.4' Asphalt and 0.5' ABC Stone — 0.9
925	923.9	3.5	4	5	7	12		M		**RESIDUAL** Red-brown to red, silty sandy CLAY, trace mica
			4	6	9	15		M		
920	918.9	8.5	4	6	7	13				
915	913.9	13.5	4	6	6	12				916.4 — 11.0 Orange to red-brown, sandy SILT, trace mica, saprolitic
910	908.9	18.5	2	2	3	5				
905	903.9	23.5	3	4	5	9				901.4 — 26.0 White-tan-brown to red to brown-white, silty fine to coarse SAND, trace to little mica, saprolitic
900	898.9	28.5	3	5	5	10				
895	893.9	33.5	3	3	3	6				
890	888.9	38.5	4	6	6	12				
885	883.9	43.5	5	8	12	20				881.4 — 46.0 Black-white to dark grey, silty fine to coarse SAND, trace mica
880	878.9	48.5	11	16	63	79				
875	873.9	53.5	11	12	14	26				
870	868.9	58.5	60/0.0			60/0.0				869.4 — 58.0 867.8 — 59.6 — **CRYSTALLINE ROCK** GRANITE Boring Terminated with Standard Penetration Test Refusal at Elevation 867.8 ft in GRANITE
	867.8	59.6	60/0.0			60/0.0				

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** P. Cary	
SITE DESCRIPTION Bridge No. 330728 on SR 2679 (Glenn Hi Rd) over Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 20+62	**OFFSET** 7 ft RT	**ALIGNMENT** Y16	**0 HR.** N/A
COLLAR ELEV. 927.8 ft	**TOTAL DEPTH** 52.0 ft	**NORTHING** 845,219	**EASTING** 1,662,376	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 99% 03/24/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER J. Turney	**START DATE** 05/15/19	**COMP. DATE** 05/15/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
930										
	926.8	1.0								927.8 — GROUND SURFACE — 0.0 926.8 — **ROADWAY EMBANKMENT** — 1.0 925.8 — 0.5' Asphalt, 0.5' ABC stone — 2.0
925	924.3	3.5	8	8	4	12		M		**RESIDUAL** Orange, silty SAND
			3	5	8	13		M		Red, silty CLAY 921.8 — 6.0 Red, silty fine sandy CLAY, trace mica
920	919.3	8.5	6	8	11	19				
915	914.3	13.5	4	5	7	12				916.8 — 11.0 Red, clayey fine sandy SILT, trace mica
910	909.3	18.5	9	16	17	33				911.8 — 16.0 White to light grey, silty fine to coarse SAND, little mica, trace rock fragments
905	904.3	23.5	3	4	7	11				
900	899.3	28.5	3	4	7	11				901.8 — 26.0 Grey-brown, fine sandy SILT, little mica
895	894.3	33.5	5	5	4	9				
890	889.3	38.5	4	4	5	9				896.8 — 31.0 Brown-white, silty fine to coarse SAND, trace mica, saprolitic
885	884.3	43.5	8	7	5	12				
880	879.3	48.5	8	15	85/0.4	100/0.9				878.8 — 49.0 **WEATHERED ROCK** GRANITE 876.8 — 51.0 875.8 — 52.0 — **CRYSTALLINE ROCK** GRANITE Boring Terminated with Standard Penetration Test Refusal at Elevation 875.8 ft in GRANITE
	875.8	52.0	60/0.0			60/0.0				

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** P. Cary	
SITE DESCRIPTION Bridge No. 330728 on SR 2679 (Glenn Hi Rd) over Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 23+70	**OFFSET** 11 ft LT	**ALIGNMENT** Y16	**0 HR.** N/A
COLLAR ELEV. 926.5 ft	**TOTAL DEPTH** 56.6 ft	**NORTHING** 845,337	**EASTING** 1,662,661	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 99% 03/24/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER J. Turney	**START DATE** 05/13/19	**COMP. DATE** 05/13/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
930										
	926.5	0.0								926.5 GROUND SURFACE 0.0
	925.6	0.9								925.6 **ROADWAY EMBANKMENT** 0.9
925			4	6	8	14		M		0.4' Asphalt, 0.5' ABC Stone
	923.0	3.5								**RESIDUAL**
			6	5	7	12		M		Red, sandy CLAY, trace mica
920										920.5 6.0
	918.0	8.5								Red, clayey fine sandy SILT, trace mica
			3	4	6	10				915.5 11.0
915										Orange, silty SAND, trace mica
	913.0	13.5								
			2	4	5	9				910.5 16.0
910										Brown-orange to brown to red-brown, sandy SILT, trace to little mica, saprolitic
	908.0	18.5								
			2	3	4	7				
905										
	903.0	23.5								
			2	2	3	5				
900										
	898.0	28.5								
			3	4	6	10				
895										
	893.0	33.5								
			3	4	4	8				
890										
	888.0	38.5								
			4	4	5	9				
885										
	883.0	43.5								884.5 42.0
			100/0.2			100/0.2				**WEATHERED ROCK**
880										GRANITE
	878.0	48.5								880.5 46.0
			8	13	25	38				**RESIDUAL**
875										Dark grey, silty fine to coarse SAND, saprolitic
	873.0	53.5								875.5 51.0
			100/0.4			100/0.4				**WEATHERED ROCK**
870										GRANITE
	869.9	56.6	60/0.0			60/0.0				871.5 55.0
										CRYSTALLINE ROCK
										GRANITE 869.9 56.6
										Boring Terminated with Standard Penetration Test Refusal at Elevation 869.9 ft in GRANITE

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** P. Cary	
SITE DESCRIPTION Bridge No. 330728 on SR 2679 (Glenn Hi Rd) over Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 23+08	**OFFSET** 11 ft RT	**ALIGNMENT** Y16	**0 HR.** 37.0
COLLAR ELEV. 926.5 ft	**TOTAL DEPTH** 52.2 ft	**NORTHING** 845,296	**EASTING** 1,662,610	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 99% 03/24/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER J. Turney	**START DATE** 05/15/19	**COMP. DATE** 05/15/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
930										
	926.5	0.0								926.5 GROUND SURFACE 0.0
			4	5	3	8		M		925.5 **RESIDUAL** 1.0
925										Orange, silty SAND
	923.0	3.5								Orange to red, silty CLAY, trace mica
			4	5	8	13		M		
920										920.5 6.0
	918.0	8.5								Red, clayey fine sandy SILT, little mica
			4	6	7	13				915.5 11.0
915										White, silty fine to coarse SAND, trace rock fragments
	913.0	13.5								
			10	20	13	33				910.5 16.0
910										Orange-black, clayey fine sandy SILT, saprolitic
	908.0	18.5								
			2	1	2	3				905.5 21.0
905										Orange-black to orange, sandy SILT, trace mica, saprolitic
	903.0	23.5								
			3	4	6	10				
900										
	898.0	28.5								
			3	3	4	7				
895										
	893.0	33.5								
			3	4	5	9				
890										
	888.0	38.5								
			3	4	6	10				
885										
	883.0	43.5								885.5 41.0
			4	7	32	39				Grey-brown to white, silty fine SAND
880										
	878.0	48.5								
			35	14	9	23				875.5 51.0
875										874.3 **CRYSTALLINE ROCK** 52.2
	874.3	52.2	60/0.0			60/0.0				GRANITE
										Boring Terminated with Standard Penetration Test Refusal at Elevation 874.3 ft in GRANITE

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** P. Neumann	
SITE DESCRIPTION Bridge No. 330728 on SR 2679 (Glenn Hi Rd) over Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. B1-C	**STATION** 23+44	**OFFSET** 7 ft RT	**ALIGNMENT** Y16	**0 HR.** N/A
COLLAR ELEV. 926.0 ft	**TOTAL DEPTH** 86.9 ft	**NORTHING** 845,312	**EASTING** 1,662,642	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER M. Mosely	**START DATE** 10/14/19	**COMP. DATE** 10/15/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
930										
925	924.9	1.1	3	4	6	10		M		926.0 GROUND SURFACE 0.0 924.9 **ROADWAY EMBANKMENT** 1.1 0.9' Asphalt, 0.2' ABC
	922.5	3.5	5	6	9	15		M		**RESIDUAL** Red, sandy CLAY, trace to little mica
920	917.5	8.5	3	4	3	7		M		917.3 8.7 **RESIDUAL** Tan-pink, sandy SILT, little mica, saprolitic
915	912.5	13.5	6	7	7	14		M		914.0 12.0 **RESIDUAL** Tan-orange, silty fine to medium SAND, trace organics
910	907.5	18.5	4	5	5	10		M		910.0 16.0 **RESIDUAL** Tan-orange, sandy SILT, little mica, saprolitic
905	902.5	23.5	6	6	7	13		M		
900	897.5	28.5	9	9	8	17		M		899.0 27.0 **RESIDUAL** Tan-orange-black, silty fine to medium SAND, trace mica, saprolitic
895	892.5	33.5	8	6	10	16		M		
890	887.5	38.5	100/0.4			100/0.4				887.5 38.5 **WEATHERED ROCK** GRANITE
885	882.5	43.5	60/0.0			60/0.0				882.5 43.5 **CRYSTALLINE ROCK** GRANITE
880										
875										
870										
865										864.4 61.6 **CRYSTALLINE ROCK** BIOTITE SCHIST AND GNEISS
860										
855										
850										

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** P. Neumann	
SITE DESCRIPTION Bridge No. 330728 on SR 2679 (Glenn Hi Rd) over Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. B1-C	**STATION** 23+44	**OFFSET** 7 ft RT	**ALIGNMENT** Y16	**0 HR.** N/A
COLLAR ELEV. 926.0 ft	**TOTAL DEPTH** 86.9 ft	**NORTHING** 845,312	**EASTING** 1,662,642	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER M. Mosely	**START DATE** 10/14/19	**COMP. DATE** 10/15/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
850						Match Line				**CRYSTALLINE ROCK** BIOTITE SCHIST AND GNEISS *(continued)*
845										
840										839.1 86.9 Boring Terminated at Elevation 839.1 ft in Crystalline Rock (BIOTITE SCHIST AND GNEISS)

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** P. Neumann
SITE DESCRIPTION Bridge No. 330728 on SR 2679 (Glenn Hi Rd) over Winston-Salem Northern Beltway			**GROUND WTR (ft)**
BORING NO. B1-C	**STATION** 23+44	**OFFSET** 7 ft RT	**ALIGNMENT** Y16	**0 HR.** N/A
COLLAR ELEV. 926.0 ft	**TOTAL DEPTH** 86.9 ft	**NORTHING** 845,312	**EASTING** 1,662,642	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE SUM2603 CME-550X 81% 04/23/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER M. Mosely	**START DATE** 10/14/19	**COMP. DATE** 10/15/19	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 43.4 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) / DEPTH (ft)
882.5											Begin Coring @ 43.5 ft
880	882.5	43.5	4.0	*N=60/0.0* 2:14/1.0 2:41/1.0 3:51/1.0 2:26/1.0	(3.9) 98%	(2.9) 73%		(17.2) 95%	(14.1) 78%		882.5 / 43.5 **CRYSTALLINE ROCK** Black-white, moderate to very slight to severe weathering, hard to moderately hard, close to moderately close fracture spacing, GRANITE
875	878.5	47.5	4.4	2:36/1.0 3:07/1.0 2:40/1.0 2:12/1.0 0:43/0.4	(4.4) 100%	(4.4) 100%					
870	874.1	51.9	5.0	3:11/1.0 3:48/1.0 2:27/1.0 2:22/1.0 3:09/1.0	(5.0) 100%	(4.6) 92%					
865	869.1	56.9	5.0	1:56/1.0 1:42/1.0 3:04/1.0 2:58/1.0 3:34/1.0	(4.2) 84%	(2.2) 44%					864.4 / 61.6
860	864.1	61.9	5.0	3:26/1.0 3:03/1.0 3:31/1.0 3:21/1.0 4:50/1.0	(3.3) 66%	(2.9) 58%		(21.9) 87%	(19.0) 75%		**CRYSTALLINE ROCK** Black-green-white, very slight to moderate weathering, hard to moderately hard, close to wide fracture spacing, BIOTITE SCHIST AND GNEISS
855	859.1	66.9	5.0	3:61/1.0 3:14/1.0 3:92/1.0 3:02/1.0 3:81/1.0	(4.8) 96%	(4.1) 82%					
850	854.1	71.9	5.0	3:24/1.0 3:38/1.0 4:15/1.0 6:17/1.0 4:19/1.0	(5.0) 100%	(4.6) 92%					
845	849.1	76.9	5.0	4:08/1.0 3:52/1.0 3:09/1.0 3:19/1.0 4:14/1.0	(3.5) 70%	(2.4) 48%					
840	844.1	81.9	5.0	3:55/1.0 3:45/1.0 3:24/1.0 5:19/1.0 5:07/1.0	(5.0) 100%	(5.0) 100%					839.1 / 86.9
	839.1	86.9									Boring Terminated at Elevation 839.1 ft in Crystalline Rock (BIOTITE SCHIST AND GNEISS)

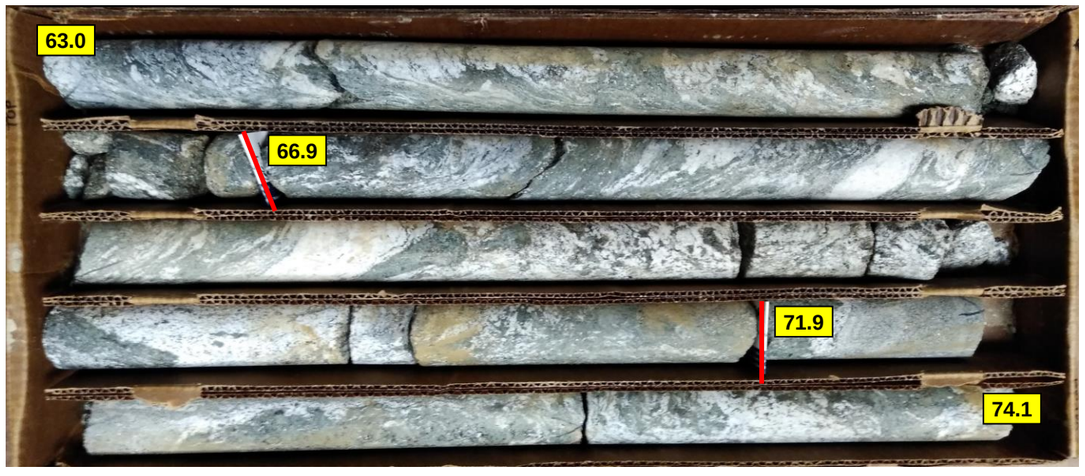
CORE PHOTOGRAPHS

B1-C

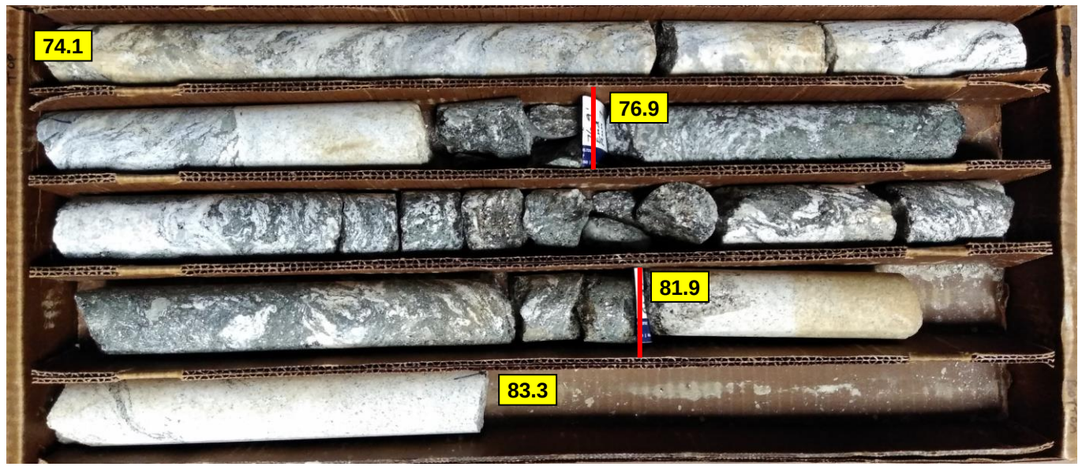
BOX 1: 43.5-52.9 FEET

BOX 2: 52.9-63.0 FEET

BOX 3: 63.0-74.1 FEET



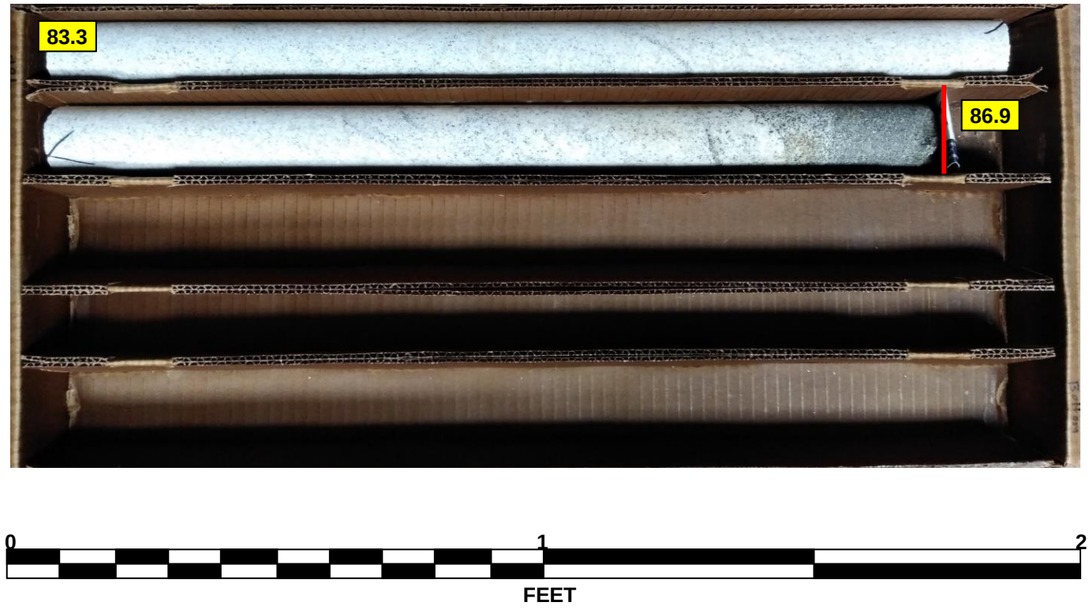
BOX 4: 74.1-83.3 FEET



CORE PHOTOGRAPHS

B1-C

BOX 1: 83.3-86.9 FEET



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** P. Cary	
SITE DESCRIPTION Bridge No. 330728 on SR 2679 (Glenn Hi Rd) over Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 25+71	**OFFSET** 11 ft LT	**ALIGNMENT** Y16	**0 HR.** N/A
COLLAR ELEV. 925.0 ft	**TOTAL DEPTH** 68.5 ft	**NORTHING** 845,403	**EASTING** 1,662,851	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 99% 03/24/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER J. Turney	**START DATE** 05/14/19	**COMP. DATE** 05/14/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
925										925.0 GROUND SURFACE 0.0
	924.1	0.9	4	6	11	17		M		924.1 **ROADWAY EMBANKMENT** 0.9 0.7' Asphalt, 0.2' ABC stone
	921.5	3.5								922.0 **RESIDUAL** 3.0 Red, silty CLAY
920			7	5	6	11		M		Red to red-purple to orange to brown, clayey fine sandy SILT, trace mica, saprolitic
	916.5	8.5								
915			4	4	7	11				
	911.5	13.5								
910			3	3	6	9				
	906.5	18.5								
905			3	4	3	7				
	901.5	23.5								
900			3	3	6	9				
	896.5	28.5								
895			3	5	5	10				
	891.5	33.5								
890			3	3	5	8				
	886.5	38.5								
885			3	4	6	10				
	881.5	43.5								
880			3	4	6	10				
	876.5	48.5								
875			3	4	6	10				
	871.5	53.5								
870			11	9	11	20				883.0 Brown to brown-grey, fine sandy SILT, trace to little mica, saprolitic 42.0
	866.5	58.5								874.0 Brown-white, silty SAND, trace mica, saprolitic 51.0
865			18	36	64/0.2	100/0.7				867.0 **WEATHERED ROCK** GRANITE 58.0
	861.5	63.5	100/0.2			100/0.2				859.0 **CRYSTALLINE ROCK** GRANITE 66.0
860										856.5 Boring Terminated with Standard Penetration Test Refusal at Elevation 856.5 ft in GRANITE 68.5
	856.5	68.5	60/0.0			60/0.0				

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** P. Cary	
SITE DESCRIPTION Bridge No. 330728 on SR 2679 (Glenn Hi Rd) over Winston-Salem Northern Beltway				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 24+98	**OFFSET** 11 ft RT	**ALIGNMENT** Y16	**0 HR.** N/A
COLLAR ELEV. 925.6 ft	**TOTAL DEPTH** 55.1 ft	**NORTHING** 845,358	**EASTING** 1,662,789	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 99% 03/24/2018		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER J. Turney	**START DATE** 05/14/19	**COMP. DATE** 05/14/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
930										
	925.6	0.0	5	4	5	9		M		925.6 GROUND SURFACE 0.0
925										**RESIDUAL** Red, silty CLAY, trace mica
	922.1	3.5	7	8	10	18		M		919.6 6.0
920										Red to orange to brown to orange-brown, fine sandy clayey SILT, trace mica, saprolitic
	917.1	8.5	3	4	6	10				
915										
	912.1	13.5	2	4	4	8				
910										
	907.1	18.5	3	3	5	8				
905										
	902.1	23.5	3	4	7	11				
900										
	897.1	28.5	3	4	4	8				
895										
	892.1	33.5	3	3	4	7				
890										
	887.1	38.5	3	3	3	6				
885										
	882.1	43.5	8	8	10	18				
880										
	877.1	48.5	10	90/0.4		100/0.9				877.6 **WEATHERED ROCK** GRANITE 48.0
875										872.6 **CRYSTALLINE ROCK** GRANITE 53.0
	872.1	53.5	60/0.0			60/0.0				870.5 55.1
	870.5	55.1	60/0.0			60/0.0				Boring Terminated with Standard Penetration Test Refusal at Elevation 870.5 ft in GRANITE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	26

REFERENCE: U-2579AB

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 OF FUTURE I-74) FROM I-40 BUS /US 421 TO I-40*

SITE DESCRIPTION *BRIDGE NO. 726 ON -Y15FLYBD- (STA. 47+63.62) INTERCHANGE CONNECTING WINSTON-SALEM NORTHERN BELTWAY AND I-40 BYPASS*

CONTENTS

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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.

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PERSONNEL

HPC

GOODNIGHT, D.J.

WEIS, J. M.

INVESTIGATED BY *GOODNIGHT, D.J.*

DRAWN BY *CROCKETT, S.C.*

CHECKED BY *HAMM, J.R.*

SUBMITTED BY *FALCON ENG.*

DATE *NOVEMBER 2019*

NORTH CAROLINA PROFESSIONAL SEAL 48207 ENGINEER STEPHEN C CROCKETT

DocuSigned by:
Stephen C. Crockett
C5CA5FED48E0435...

12/2/2019

SIGNATURE DATE

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	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	UNSUITABLE

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 RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	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 (COHESIVE)	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	4	10	40	60	200	270
OPENING (MM)	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	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC 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
- PW — 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
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT EXCAVATION
- SHALLOW 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
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
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [X] CME-45C
- [ ] CME-55
- [ ] CME-550X
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [X] DIEDRICH D-50
- [ ] _____

ADVANCING TOOLS:
- [X] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [X] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [X] -N Q2

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 YEILD 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 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 GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN 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.

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

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.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BL-50, -L- STA. 795+82, CL, N: 847291 E: 1663706

ELEVATION: 874.92 FEET

NOTES:

FIAD - FILLED IMMEDIATELY AFTER DRILLING
CV - CAVED

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
U–2579AB	3

0 60 120
FEET

BRIDGE SKEW: 90°0'0"

NC GRID
NAD 83/NSRS 2007

EB1-A
EB1-B
B1-A
B1-B
B2-A
B2-B
B3-A
B3-B

BENT #2
STA. 42+76.31 -Y15FLYBD-

BRIDGE NO.726
-Y15FLYBD-

BENT #1
STA. 41+07.31 -Y15FLYBD-

BENT #3
STA. 44+45.31 -Y15FLYBD-

END BENT #1
STA. 39+40.31 -Y15FLYBD-

-Y15REV-
(I-40 BYPASS)

-Y15- I-40

MATCHLINE -Y15FLYBD- STA 45+00.00 SEE SHEET 04

92+00
91+00
90+00
89+00
88+00
37+00
38+00
39+00
40+00
41+00
42+00
43+00
44+00
45+00

24" RCP
EXISTING CMP
CABLE
SBW
WARNING
MTL
EIP
VB CMP
OUTLET NOT FOUND
(N) 865.24'
(S) 865.14'
JS

PROJECT REFERENCE NO.	SHEET NO.
U–2579AB	4

0 60 120
FEET

BRIDGE SKEW: 90°0'0"

BENT #5
STA. 47+61.31 -Y15FLYBD-

END BENT #2
STA. 51+59.31 -Y15FLYBD-

BENT #6
STA. 49+71.31 -Y15FLYBD-

BENT #4
STA. 45+90.31 -Y15FLYBD-

BRIDGE NO. 726
-Y15FLYBD-

-L- WINSTON-SALEM NORTHERN BELTWAY

MATCHLINE -Y15FLYBD- STA 45+00.00 SEE SHEET 03

B5-A
B6-A
EB2-A
EB2-B
B6-B
B5-B
B4-A
B4-B

-Y15FLYAC-
-Y15FLYCA-
-Y15RPDREV-

15" RCP
NV=856.98
NV=856.99

NC GRID
NAD 83/NSRS 2007

0	100	200

FEET

VE = 5

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	5

BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-

SOIL TEST RESULTS

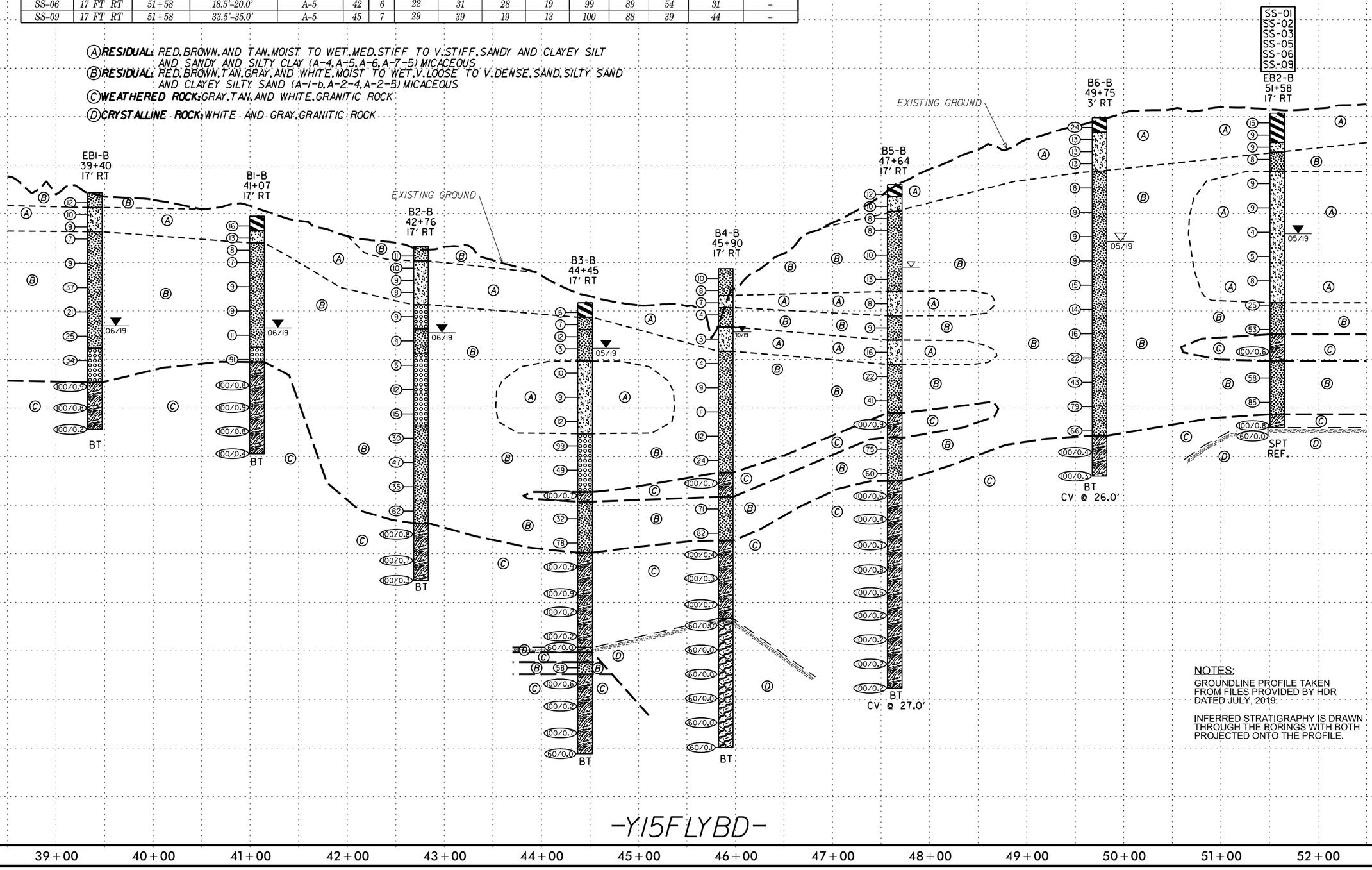
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-01	17 FT RT	51+58	1.0'-2.5'	A-7-5	69	30	13	21	16	50	100	94	70	32	-
SS-02	17 FT RT	51+58	3.5'-5.0'	A-7-5	66	14	14	27	17	42	100	94	64	33	-
SS-03	17 FT RT	51+58	6.0'-7.5'	A-5	51	6	30	39	5	26	100	88	37	24	-
SS-05	17 FT RT	51+58	13.5'-15.0'	A-5	44	6	24	38	25	13	99	88	47	32	-
SS-06	17 FT RT	51+58	18.5'-20.0'	A-5	42	6	22	31	28	19	99	89	54	31	-
SS-09	17 FT RT	51+58	33.5'-35.0'	A-5	45	7	29	39	19	13	100	88	39	44	-

(A) **RESIDUAL:** RED, BROWN, AND TAN, MOIST TO WET, MED. STIFF TO V. STIFF, SANDY AND CLAYEY SILT AND SANDY AND SILTY CLAY (A-4, A-5, A-6, A-7-5) MICACEOUS

(B) **RESIDUAL:** RED, BROWN, TAN, GRAY, AND WHITE, MOIST TO WET, V. LOOSE TO V. DENSE, SAND, SILTY SAND AND CLAYEY SILTY SAND (A-1-b, A-2-4, A-2-5) MICACEOUS

(C) **WEATHERED ROCK:** GRAY, TAN, AND WHITE, GRANITIC ROCK

(D) **CRYSTALLINE ROCK:** WHITE AND GRAY, GRANITIC ROCK



NOTES:

GROUNDLINE PROFILE TAKEN FROM FILES PROVIDED BY HDR DATED JULY, 2019.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-2579AB	6

0 10 20
FEET
VE = 2

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-176	25 FT LT	39+40	1.0'-2.5'	A-7-5	60	25	18	17	17	48	100	89	68	27	-
SS-178	25 FT LT	39+40	6.0'-7.5'	A-5	52	7	20	38	22	20	100	94	49	29	-
SS-183	25 FT LT	39+40	28.5'-30.0'	A-7-5	50	13	32	22	19	27	99	74	50	46	-
SS-184	25 FT LT	39+40	33.5'-35.0'	A-7-5	54	18	32	21	22	25	100	76	52	46	-

Ⓐ **RESIDUAL:** BROWN AND TAN, MOIST TO WET, STIFF TO V.STIFF, CLAYEY SILT AND SILTY CLAY (A-5, A-7-5) WITH TRACE ROOTS AND LITTLE MICA
Ⓑ **RESIDUAL:** TAN, BROWN, AND RED, MOIST TO WET, LOOSE TO V.DENSE, SAND AND SILTY SAND (A-1-b, A-2-4) WITH LITTLE MICA
Ⓒ **WEATHERED ROCK:** TAN AND WHITE, GRANITIC ROCK

SS-176
SS-178
SS-183
SS-184

EBI-A
39+40
25' LT

EBI-B
39+40
17' RT

06/19

BT

END BENT #1
39+40.31

-Y15FLYBD-

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM HDR DATED JULY 2019.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

BRIDGE SKEW: 90°

$DATE$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	7

0 2.5 5

0 10 20
FEET
VE = 2

Ⓐ **RESIDUAL:** RED, BROWN, AND TAN, MOIST, STIFF TO V.STIFF, SANDY SILT AND SILTY CLAY (A-4, A-6) WITH TRACE ROCK FRAGS. AND LITTLE MICA
Ⓑ **RESIDUAL:** TAN, RED, BROWN, AND WHITE, DRY TO MOIST, LOOSE TO V.DENSE, SAND, SILTY SAND, AND CLAYEY SILTY SAND (A-1-b, A-2-4, A-2-5) WITH TRACE TO LITTLE MICA
Ⓒ **WEATHERED ROCK:** TAN, GRANITIC ROCK

BI-A
41+07
25' LT

BI-B
41+07
17' RT

06/19

BT

BENT #1
41+07.31

-Y15FLYBD-

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM HDR DATED JULY 2019.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

BRIDGE SKEW: 90°

$DATE$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	8

0 2.5 5

0 10 20
FEET
VE = 2

Ⓐ **RESIDUAL:** RED, TAN, AND BROWN, MOIST, STIFF, CLAYEY SILT AND SILTY CLAY (A-5, A-7)
Ⓑ **RESIDUAL:** TAN, RED, BROWN, AND WHITE, MOIST TO WET, LOOSE TO V. DENSE, SAND, SILTY SAND, AND CLAYEY SILTY SAND (A-1-b, A-2-4, A-2-5) WITH LITTLE MICA
Ⓒ **WEATHERED ROCK:** TAN AND WHITE, GRANITIC ROCK

B2-A
42+76
25' LT

B2-B
42+76
17' RT

BT

BENT #2
42 + 76.31

-Y15FLYBD-

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM HDR DATED JULY 2019.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

BRIDGE SKEW: 90°

$DATE$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	9

0 2.5 5

0 10 20
FEET
VE = 2

Ⓐ **RESIDUAL:** TAN AND BROWN, MOIST TO WET, MED. STIFF TO STIFF, CLAYEY SILT AND SILTY CLAY (A-5, A-7) WITH LITTLE MICA
Ⓑ **RESIDUAL:** TAN, GRAY, BROWN, AND WHITE, MOIST TO WET, V. LOOSE TO V. DENSE, SAND, SILTY SAND, AND CLAYEY SILTY SAND (A-1-b, A-2-4, A-2-5) WITH LITTLE MICA
Ⓒ **WEATHERED ROCK:** TAN, GRAY, AND WHITE, GRANITIC ROCK
Ⓓ **CRYSTALLINE ROCK:** WHITE AND GRAY, GRANITIC ROCK

B3-A
44+45
25' LT

B3-B
44+45
17' RT

SPT REF.

SPT REF.

BENT #3
44+45.31

-Y15FLYBD-

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM HDR DATED JULY 2019.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

BRIDGE SKEW: 90°

$DATE$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-2579AB	10

0 10 20
FEET
VE = 2

Ⓐ **RESIDUAL:** TAN, MOIST TO WET, SOFT TO MED. STIFF, SANDY CLAYEY SILT (A-5) WITH LITTLE MICA
Ⓑ **RESIDUAL:** TAN, GRAY, BLACK, AND WHITE, MOIST TO WET, V. LOOSE TO V. DENSE, SAND AND SILTY SAND, (A-1-b, A-2-4) WITH LITTLE MICA
Ⓒ **WEATHERED ROCK:** TAN, GRAY, BROWN, AND WHITE, GRANITIC ROCK
Ⓓ **CRYSTALLINE ROCK:** WHITE AND GRAY, GRANITIC ROCK

B4-A
46+15
4' RT

B4-B

B4-B
45+90
17' RT

BENT #4
45+90.31

-Y15FLYBD-

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM HDR DATED JULY 2019.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

BRIDGE SKEW: 90°

$DATE$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	11

0 2.5 5

0 10 20
FEET
VE = 2

Ⓐ **RESIDUAL:** RED, TAN, AND BROWN, MOIST TO WET, STIFF, SANDY CLAYEY SILT AND SILTY CLAY (A-5, A-7) WITH LITTLE MICA
Ⓑ **RESIDUAL:** TAN, BROWN, GRAY, RED, AND WHITE, MOIST TO WET, LOOSE TO V. DENSE, SAND AND SILTY SAND (A-1-b, A-2-4) WITH LITTLE MICA
Ⓒ **WEATHERED ROCK:** TAN, GRAY, AND WHITE, GRANITIC ROCK
Ⓓ **CRYSTALLINE ROCK:** TAN AND GRAY, GRANITIC ROCK

B5-A
47+64
25' LT

B5-B
47+64
17' RT

12 17 8 10 9 12 9 10 10 9 10 19 100/0.5 50/0.1 BT

12 10 8 8 10 13 8 9 16 22 41 100/0.9 75 60 100/0.6 100/0.4 100/0.1 100/0.8 100/0.5 100/0.2 100/0.2 100/0.2 100/0.2 BT
CV @ 27.0'

05/19

05/19

BENT #5
47 + 61.31

-Y15FLYBD-

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM HDR DATED JULY 2019.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

BRIDGE SKEW: 90°

$DATE$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-2579AB	12

0 10 20
FEET
VE = 2

Ⓐ **RESIDUAL:** TAN, RED, AND BROWN, MOIST, STIFF TO V.STIFF, SANDY CLAYEY SILT AND SANDY SILTY CLAY (A-5, A-7) WITH LITTLE MICA
Ⓑ **RESIDUAL:** TAN, GRAY, AND WHITE, MOIST TO WET, LOOSE TO V.DENSE, SAND AND SILTY SAND (A-1-b, A-2-4) WITH LITTLE MICA
Ⓒ **WEATHERED ROCK:** TAN, GRAY, AND WHITE, GRANITIC ROCK

B6-A
49+71
25' LT

B6-B
49+75
3' RT

BT

BT
CV @ 26.0'

BENT #6
49+71.31

-Y15FLYBD-

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM HDR DATED JULY 2019.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

BRIDGE SKEW: 90°

$DATE$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	13

0 2.5 5

0 10 20
FEET
VE = 2

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-01	17 FT RT	51+58	1.0'-2.5'	A-7-5	69	30	13	21	16	50	100	94	70	32	–
SS-02	17 FT RT	51+58	3.5'-5.0'	A-7-5	66	14	14	27	17	42	100	94	64	33	–
SS-03	17 FT RT	51+58	6.0'-7.5'	A-5	51	6	30	39	5	26	100	88	37	24	–
SS-05	17 FT RT	51+58	13.5'-15.0'	A-5	44	6	24	38	25	13	99	88	47	32	–
SS-06	17 FT RT	51+58	18.5'-20.0'	A-5	42	6	22	31	28	19	99	89	54	31	–
SS-09	17 FT RT	51+58	33.5'-35.0'	A-5	45	7	29	39	19	13	100	88	39	44	–

(A) **RESIDUAL:** RED, TAN, AND BROWN, MOIST TO WET, MED. STIFF TO v. STIFF, SANDY CLAYEY SILT AND SILTY CLAY (A-5, A-7) WITH TRACE TO LITTLE MICA
(B) **RESIDUAL:** TAN, RED, GRAY, AND WHITE, MOIST TO WET, LOOSE TO V. DENSE, SILTY SAND (A-2-4) MICACEOUS
(C) **WEATHERED ROCK:** TAN AND WHITE, GRANITIC ROCK
(D) **CRYSTALLINE ROCK:** GRANITIC ROCK

SS-01
SS-02
SS-03
SS-05
SS-06
SS-09

EB2-A
51+58
25' LT

EB2-B
51+58
17' RT

16 11 13 9 8 12 6 12 17 22 20 28 100/0.8 100/0.2 57 60/0.0

15 9 9 8 9 9 4 5 8 25 53 100/0.6 58 85 100/0.8 60/0.0

05/19

SPT REF.

SPT REF.

960 950 940 930 920 910 900 890 880 870 860 850 840 830 820 810 800 790 780

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

END BENT #2
51+59.31

-Y15FLYBD-

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM HDR DATED JULY 2019.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

BRIDGE SKEW: 90°

$DATE$

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 39+40	**OFFSET** 25 ft LT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 31.3
COLLAR ELEV. 878.0 ft	**TOTAL DEPTH** 59.1 ft	**NORTHING** 848,074	**EASTING** 1,663,391	**24 HR.** 26.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 06/03/19	**COMP. DATE** 06/03/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
880										878.0 GROUND SURFACE 0.0
	877.0	1.0	5	5	5	10	SS-176	27%		**RESIDUAL** BROWN, F. SILTY CLAY (A-7-5) TRACE ROOTS
875	874.5	3.5	4	5	5	10				875.0 3.0 TAN, SILTY SAND (A-2-4)
	872.0	6.0	3	3	4	7	SS-178	29%	M	872.5 5.5 TAN-BROWN, F. SANDY CLAYEY SILT (A-5) LITTLE MICA
870	869.5	8.5	3	4	5	9				
865	864.5	13.5	5	6	6	12			M	866.0 12.0 TAN, SILTY F. TO CSE SAND (A-2-4) TRACE MICA
860	859.5	18.5	5	5	4	9			M	
855	854.5	23.5	5	11	11	22				856.0 22.0 TAN-BROWN, SILTY CLAY (A-7-5)
850	849.5	28.5	10	7	10	17	SS-183	46%		
845	844.5	33.5	6	9	10	19	SS-184	46%		
840	839.5	38.5	8	7	9	16			W	841.0 37.0 TAN-BROWN, CLAYEY SANDY SILT (A-5) WITH DIABASE ROCK FRAGS.
835	834.5	43.5	21	31	48	79			W	837.0 41.0 TAN, SILTY CSE. TO F. SAND (A-2-4)
830	829.5	48.5	100/0.5			100/0.5				831.0 47.0 **WEATHERED ROCK** TAN AND GRAY, GRANITIC ROCK
825	824.5	53.5	75	25/0.1		100/0.6				
820	819.5	58.5	75	25/0.1		100/0.6				818.9 59.1 Boring Terminated at Elevation 818.9 ft IN WR: GRANITIC ROCK

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 39+40	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 26.0
COLLAR ELEV. 874.3 ft	**TOTAL DEPTH** 48.7 ft	**NORTHING** 848,066	**EASTING** 1,663,349	**24 HR.** 27.4
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 06/03/19	**COMP. DATE** 06/03/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
875										874.3 GROUND SURFACE 0.0
	873.3	1.0	7	7	5	12		M		**RESIDUAL** BROWN, SILTY SAND (A-2-4) WITH TRACE ROCK FRAGS.
870	870.8	3.5	4	5	5	10		M		871.3 3.0 RED-BROWN, SANDY CLAYEY SILT (A-5) WITH LITTLE MICA
	868.3	6.0	4	5	4	9		M		866.3 8.0 BROWN RED AND TAN, SILTY SAND (A-2-4) LITTLE MICA
865	865.8	8.5	4	4	3	7		M		
860	860.8	13.5	4	5	4	9		M		
855	855.8	18.5	26	24	13	37		M		
850	850.8	23.5	13	12	9	21		M		
845	845.8	28.5	17	14	11	25		M		
840	840.8	33.5	11	16	18	34		M		842.3 32.0 TAN-WHITE, SILTY F. TO CSE. SAND (A-1-b)
835	835.8	38.5	26	35	65/0.4	100/0.9		M		835.3 39.0 **WEATHERED ROCK** TAN AND WHITE, GRANITIC ROCK
830	830.8	43.5	55	45/0.3		100/0.8				
	825.8	48.5	100/0.2			100/0.2				825.6 48.7 Boring Terminated at Elevation 825.6 ft IN WR: GRANITIC ROCK

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 41+07	**OFFSET** 25 ft LT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 25.8
COLLAR ELEV. 872.5 ft	**TOTAL DEPTH** 78.7 ft	**NORTHING** 847,915	**EASTING** 1,663,430	**24 HR.** 25.6
DRILL RIG/HAMMER EFF./DATE BRI5184 CME-45C 96% 03/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Ester, G.	**START DATE** 06/04/19	**COMP. DATE** 10/14/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
875										872.5	0.0
										GROUND SURFACE	
	871.5	1.0								**RESIDUAL**	
870			4	5	6	11		M		BROWN, SILTY CLAY (A-7) WITH SAND	
	869.0	3.5								869.5	3.0
			5	7	9	16		M		RED, BROWN, AND TAN, SANDY CLAYEY SILT (A-5) WITH LITTLE MICA AND TRACE ROCK FRAGS.	
	866.5	6.0									
865			6	3	6	9		M			
	864.0	8.5									
			4	4	4	8		M			
860										860.5	12.0
	859.0	13.5								TAN, SILTY F. TO CSE. SAND (A-2-4) WITH TRACE MICA	
			4	3	5	8		M			
855											
	854.0	18.5									
			6	5	6	11		D			
850											
	849.0	23.5									
			5	9	9	18					
845											
	844.0	28.5									
			8	10	10	20		M			
840											
	839.0	33.5								838.5	34.0
			27	50	50/0.3	100/0.8				**WEATHERED ROCK**	
835										TAN, GRANITIC ROCK	
	834.0	38.5									
			13	30	70/0.4	100/0.9					
830											
	829.0	43.5									
			48	52/0.4		100/0.9					
825											
	824.0	48.5									
			43	57	43/0.2	100/0.7					
820											
	819.0	53.5									
			100/0.4			100/0.4					
815											
	814.0	58.5									
			100/0.4			100/0.4					
810											
	809.0	63.5									
			100/0.4			100/0.4					
805											
	804.0	68.5									
			70	30/0.2		100/0.7					
800											
	799.0	73.5									
			100/0.4			100/0.4					
795											

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 41+07	**OFFSET** 25 ft LT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 25.8
COLLAR ELEV. 872.5 ft	**TOTAL DEPTH** 78.7 ft	**NORTHING** 847,915	**EASTING** 1,663,430	**24 HR.** 25.6
DRILL RIG/HAMMER EFF./DATE BRI5184 CME-45C 96% 03/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Ester, G.	**START DATE** 06/04/19	**COMP. DATE** 10/14/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
795						Match Line				
	794.0	78.5	100/0.2			100/0.2				793.8 78.7
										Boring Terminated at Elevation 793.8 ft IN WR: GRANITIC ROCK
										NOTE: BORING ORIGINALLY DRILLED TO A DEPTH OF 49.7 FT. ON 6/4/19.

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 41+07	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 24.4
COLLAR ELEV. 869.5 ft	**TOTAL DEPTH** 48.9 ft	**NORTHING** 847,902	**EASTING** 1,663,390	**24 HR.** 23.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 06/04/19	**COMP. DATE** 06/04/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
870										ELEV. (ft) DEPTH (ft)
	868.5	1.0						M		869.5 GROUND SURFACE 0.0
			4	7	9	16				**RESIDUAL**
	866.0	3.5						M		RED-BROWN, SANDY SILTY CLAY (A-7)
865			7	6	7	13				866.5 3.0
	863.5	6.0						M		RED-BROWN, SANDY CLAYEY SILT
			4	3	5	8				(A-5) WITH LITTLE MICA
	861.0	8.5						M		864.0 5.5
860			4	3	4	7				TAN, SILTY SAND (A-2-4) TRACE MICA
	856.0	13.5						M		
855			4	4	5	9				
	851.0	18.5						M		
850			4	4	5	9				
	846.0	23.5						M		
845			6	6	5	11				
	841.0	28.5						M		842.5 27.0
			15	34	57	91				TAN AND WHITE, SILTY F. TO CSE.
840										SAND (A-1-b) TRACE MICA
	836.0	33.5	36	43	57/0.3	100/0.8		M		839.5 30.0
835										TAN, GRANITIC ROCK
	831.0	38.5	39	61/0.4		100/0.9				
830										
	826.0	43.5	47	53/0.3		100/0.8				
825										
	821.0	48.5	100/0.4			100/0.4				820.6 48.9
										Boring Terminated at Elevation 820.6 ft IN
										WR: GRANITIC ROCK

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 42+76	**OFFSET** 25 ft LT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 18.6
COLLAR ELEV. 864.3 ft	**TOTAL DEPTH** 69.1 ft	**NORTHING** 847,759	**EASTING** 1,663,487	**24 HR.** 16.9
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/31/19	**COMP. DATE** 05/31/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
865										
	863.3	1.0						M		864.3 GROUND SURFACE 0.0
			4	5	6	11				**RESIDUAL**
	860.8	3.5						M		RED-TAN, SANDY CLAYEY SILT (A-5)
860			4	4	4	8				WITH TRACE MICA
	858.3	6.0						M		858.8 5.5
			2	3	4	7				TAN, SILTY F. SAND (A-2-4)
855	855.8	8.5						M		
			2	3	3	6				
850	850.8	13.5						M		
			3	4	4	8				
845	845.8	18.5						M		
			3	3	4	7				
840	840.8	23.5						W		
			3	3	4	7				
835	835.8	28.5						W		
			4	5	7	12				
830	830.8	33.5						W		
			2	5	9	14				
825	825.8	38.5						W		
			4	8	11	19				
820	820.8	43.5						W		
			8	11	16	27				
815	815.8	48.5						W		
			13	19	22	41				
810	810.8	53.5						W		
			15	21	25	46				
805	805.8	58.5								805.3 59.0
			32	63	37/0.2					**WEATHERED ROCK**
800	800.8	63.5				100/0.7				TAN AND WHITE, GRANITIC ROCK
			63	37/0.4		100/0.9				
	795.8	68.5								795.2 69.1
			72	28/0.1		100/0.6				Boring Terminated at Elevation 795.2 ft IN
										WR: GRANITIC ROCK

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 42+76	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 20.0
COLLAR ELEV. 863.3 ft	**TOTAL DEPTH** 68.8 ft	**NORTHING** 847,743	**EASTING** 1,663,449	**24 HR.** 17.8
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 06/04/19	**COMP. DATE** 06/04/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
865										
	862.3	1.0	6	6	5	11		M		863.3 / 0.0 GROUND SURFACE **RESIDUAL** RED-BROWN, SANDY SILTY CLAY (A-7)
860	859.8	3.5	5	6	4	10		M		860.3 / 3.0 TAN, SANDY CLAYEY SILT (A-5)
	857.3	6.0	2	4	5	9		M		
855	854.8	8.5	3	4	4	8		M		
850	849.8	13.5	3	4	5	9		M		851.3 / 12.0 TAN-WHITE, SILTY F. TO CSE. SAND (A-1-b)
845	844.8	18.5	1	2	2	4		W		846.3 / 17.0 WHITE-TAN, SILTY SAND (A-2-4)
840	839.8	23.5	1	2	3	5		W		841.3 / 22.0 TAN-WHITE, SILTY F. TO CSE. SAND (A-1-b)
835	834.8	28.5	4	5	7	12		W		
830	829.8	33.5	3	7	8	15		W		
825	824.8	38.5	11	13	17	30		M		826.3 / 37.0 TAN-WHITE, SILTY F. TO CSE. SAND (A-2-4) LITTLE MICA
820	819.8	43.5	15	20	27	47		M		
815	814.8	48.5	12	16	19	35		M		
810	809.8	53.5	25	34	28	62		M		
805	804.8	58.5	43	57/0.3		100/0.8		M		806.3 / 57.0 **WEATHERED ROCK** TAN, GRANITIC ROCK
800	799.8	63.5	38	58	42/0.2	100/0.7				
795	794.8	68.5	100/0.3			100/0.3				794.5 / 68.8 Boring Terminated at Elevation 794.5 ft IN WR: GRANITIC ROCK

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B3-A	**STATION** 44+45	**OFFSET** 25 ft LT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 14.5
COLLAR ELEV. 855.9 ft	**TOTAL DEPTH** 83.5 ft	**NORTHING** 847,610	**EASTING** 1,663,561	**24 HR.** 11.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/31/19	**COMP. DATE** 05/31/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
860										
	854.9	1.0	6	7	8	15		M		855.9 / 0.0 GROUND SURFACE **RESIDUAL** TAN, SANDY SILTY CLAY (A-7)
855	852.4	3.5	4	5	6	11		M		
850	849.9	6.0	2	2	2	4		W		850.4 / 5.5 TAN AND GRAY, CLAYEY SILT (A-5) WITH SAND AND MICA
	847.4	8.5	1	1	2	3				
845	842.4	13.5	3	4	5	9		W		
840	837.4	18.5	2	3	3	6				838.9 / 17.0 GRAY TAN AND WHITE, SILTY CSE. TO F. SAND (A-2-4) LITTLE MICA
835	832.4	23.5	4	9	13	22		W		
830	827.4	28.5	56	44/0.2		100/0.7				828.9 / 27.0 **WEATHERED ROCK** TAN AND WHITE, GRANITIC ROCK
825	822.4	33.5	49	51/0.4		100/0.9				
820	817.4	38.5	9	14	19	33		W		819.4 / 36.5 **RESIDUAL** TAN-BROWN, SILTY SAND (A-2-4) LITTLE MICA
815	812.4	43.5	21	50	50/0.3	100/0.8				813.9 / 42.0 **WEATHERED ROCK** TAN AND WHITE, GRANITIC ROCK
810	807.4	48.5	31	39	59	98		M		809.9 / 46.0 **RESIDUAL** TAN AND GRAY, SILTY SAND (A-2-4)
805	802.1	53.8	55	45/0.3		100/0.8				805.9 / 50.0 **WEATHERED ROCK** TAN AND GRAY, GRANITIC ROCK
800	797.4	58.5	20	40	60/0.4	100/0.9				
795	792.4	63.5	23	44	56/0.3	100/0.8				
790	787.4	68.5	100/0.4			100/0.4				
785	782.4	73.5	40	60/0.2		100/0.7				
780										

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B3-A	**STATION** 44+45	**OFFSET** 25 ft LT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 14.5
COLLAR ELEV. 855.9 ft	**TOTAL DEPTH** 83.5 ft	**NORTHING** 847,610	**EASTING** 1,663,561	**24 HR.** 11.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/31/19	**COMP. DATE** 05/31/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
780						Match Line				
	777.4	78.5	9	10	17	27		M		777.9 / 78.0 **RESIDUAL** ORANGE TO BLACK, SILTY SAND (A-2-4) 774.4 / 81.5 **CRYSTALLINE ROCK** BLACK, DIABASE 772.4 / 83.5 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 772.4 ft IN CR: DIABASE
775	772.4	83.5	60/0.0			60/0.0				NOTE: BORING ORIGINALLY DRILLED TO A DEPTH OF 50.0 FT ON 5/31/19. OFFSET BORING PERFORMED AT -Y15FLYBD- STA. 44+56, 32' LT. PROBED TO 50' AND RESUMED SPT TESTING.

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B3-B	**STATION** 44+45	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** N/A
COLLAR ELEV. 851.7 ft	**TOTAL DEPTH** 92.9 ft	**NORTHING** 847,589	**EASTING** 1,663,525	**24 HR.** 9.4
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/30/19	**COMP. DATE** 10/10/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
855										851.7 / 0.0 GROUND SURFACE
	850.7	1.0	5	3	3	6		M		**RESIDUAL** TAN-BROWN, SANDY SILTY CLAY (A-7) 848.7 / 3.0 TAN, SILTY SAND (A-2-4)
850	848.2	3.5	3	3	4	7		M		846.2 / 5.5 GRAY-TAN, CLAYEY SILTY SAND (A-2-5)
	845.7	6.0	4	6	6	12		M		
845	843.2	8.5	2	1	2	3				839.7 / 12.0 TAN-BROWN, SANDY CLAYEY SILT (A-5) LITTLE MICA
	838.2	13.5	3	4	6	10		M		
840	833.2	18.5	2	4	5	9		W		
835	828.2	23.5	3	5	7	12		W		824.7 / 27.0 WHITE-TAN, SILTY F. TO CSE. SAND (A-1-B)
830	823.2	28.5	26	47	52	99		W		
825	818.2	33.5	35	31	18	49		W		812.7 / 39.0 **WEATHERED ROCK** WHITE, GRANITIC ROCK 810.7 / 41.0
820	813.2	38.5	16	79	21/0.2	100/0.7				**RESIDUAL** TAN WHITE AND GRAY, SILTY SAND (A-2-4) LITTLE MICA
815	808.2	43.5	8	14	18	32		M		
810	803.2	48.5	26	29	49	78		M		800.2 / 51.5 **WEATHERED ROCK** TAN WHITE AND GRAY, GRANITIC ROCK
805	798.2	53.5	38	62/0.4		100/0.9				
800	793.2	58.5	25	53	47/0.4	100/0.9				
795	788.2	63.5	100/0.2			100/0.2				
790	783.2	68.5	100/0.2			100/0.2				780.7 / 71.0
785	781.7	70.0	60/0.0			60/0.0				779.7 / 72.0 **CRYSTALLINE ROCK** WHITE AND GRAY, GRANITIC ROCK (NO RECOVERY) 777.7 / 74.0
780	777.5	74.2	25	29	29	58				**WEATHERED ROCK** WHITE AND GRAY, GRANITIC ROCK 775.2 / 76.5
775										

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B3-B	**STATION** 44+45	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** N/A
COLLAR ELEV. 851.7 ft	**TOTAL DEPTH** 92.9 ft	**NORTHING** 847,589	**EASTING** 1,663,525	**24 HR.** 9.4
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/30/19	**COMP. DATE** 10/10/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
775						Match Line				
	773.8	77.9	75	25/0.1		100/0.6				(NO RECOVERY) **RESIDUAL** TAN AND GRAY, SILTY SAND (A-2-4) **WEATHERED ROCK** GRAY WHITE AND TAN, GRANITIC ROCK *(continued)*
770	768.8	82.9	100/0.2			100/0.2				
765	763.8	87.9	63	37/0.2		100/0.7				
760	758.8	92.9	60/0.0			60/0.0				758.8 / 92.9 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 758.8 ft ON CR: GRANITIC ROCK NOTE: BORING ORIGINALLY DRILLED TO A DEPTH OF 59.9 FT ON 5/30/19. OFFSET BORING PERFORMED AT -Y15FLYBD- STA. 44+59, 15' RT. PROBED TO 60' AND RESUMED SPT TESTING.

NCDOT BORE DOUBLE U2579AB_GEO_BORINGS.GPJ NC_DOT.GDT 11/5/19

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B3-B	**STATION** 44+45	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** N/A
COLLAR ELEV. 851.7 ft	**TOTAL DEPTH** 92.9 ft	**NORTHING** 847,589	**EASTING** 1,663,525	**24 HR.** 9.4
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 10/10/19	**COMP. DATE** 10/10/19	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 3.2 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft) / DEPTH (ft)
780.7											Begin Coring @ 71.0 ft
780	780.7	71.0	3.2	1:15/1.0 0:28/1.0 0:26/1.0 0:02/0.2	(0.0) 0%	(0.0) 0%		(0.0) 0%	(0.0) 0%		780.7 **CRYSTALLINE ROCK** 71.0 779.7 WHITE AND GRAY, GRANITIC ROCK (NO RECOVERY) 72.0
	777.5	74.2		*N=58*							777.7 **WEATHERED ROCK** 74.0 WHITE AND GRAY, GRANITIC ROCK (NO RECOVERY)
775				*N=100/0.6*							775.2 **RESIDUAL** 76.5 TAN AND GRAY, SILTY SAND (A-2-4) **WEATHERED ROCK** GRAY WHITE AND TAN, GRANITIC ROCK
770				*N=100/0.2*							
765				*N=100/0.7*							
760				*N=60/0.0*							758.8 / 92.9 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 758.8 ft ON CR: GRANITIC ROCK NOTE: BORING ORIGINALLY DRILLED TO A DEPTH OF 59.9 FT ON 5/30/19. OFFSET BORING PERFORMED AT -Y15FLYBD- STA. 44+59, 15' RT. PROBED TO 60' AND RESUMED SPT TESTING.

NCDOT CORE SINGLE U2579AB_GEO_BORINGS.GPJ NC_DOT.GDT 11/5/19

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B4-A	**STATION** 46+15	**OFFSET** 4 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 10.0
COLLAR ELEV. 855.1 ft	**TOTAL DEPTH** 63.2 ft	**NORTHING** 847,452	**EASTING** 1,663,627	**24 HR.** 9.3
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/29/19	**COMP. DATE** 05/29/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
860										
855										855.1 GROUND SURFACE 0.0
	854.1	1.0	2	2	2	4 3		M		**RESIDUAL** TAN, SANDY CLAYEY SILT (A-5) LITTLE MICA
	852.1	3.0	2	1	2			M		
850	849.1	6.0	3	2	3	5 8		M		850.1 5.0 TAN AND WHITE, SILTY SAND (A-2-4)
	847.1	8.0	4	4	4			▼		
845	842.1	13.0	2	2	2	4 7		W		843.1 12.0 TAN, SANDY CLAYEY SILT (A-5) LITTLE MICA
840	837.1	18.0	2	3	4			W		838.1 17.0 TAN WHITE GRAY AND BROWN, SILTY SAND (A-2-4) LITTLE MICA
835	832.1	23.0	6	6	4	10		W		
830	827.1	28.0	6	9	10	19		W		
825	822.1	33.0	8	10	11	21		W		
820	817.1	38.0	12	14	14	28		M		
815	812.1	43.0	15	14	14	28		M		
810	807.1	48.0	15	26	27	53		M		
805	802.1	53.0	100/0.3			100/0.3				804.1 51.0 **WEATHERED ROCK** TAN WHITE GRAY AND BROWN, GRANITIC ROCK
800	797.1	58.0	58	42/0.2		100/0.7				
795	792.1	63.0	100/0.2			100/0.2				791.9 63.2 Boring Terminated at Elevation 791.9 ft IN WR: GRANITIC ROCK

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B4-B	**STATION** 45+90	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 13.2
COLLAR ELEV. 858.7 ft	**TOTAL DEPTH** 98.6 ft	**NORTHING** 847,465	**EASTING** 1,663,603	**24 HR.** 13.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/29/19	**COMP. DATE** 10/10/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
860										
	857.7	1.0								858.7 GROUND SURFACE 0.0
855	855.2	3.5	4	4	6	10		M		**RESIDUAL** TAN AND GRAY, SILTY SAND (A-2-4) TRACE MICA
	852.7	6.0	5	4	4	8		M		853.2 5.5 TAN, SANDY CLAYEY SILT (A-5) TRACE MICA
850	850.2	8.5	3	3	4	7		M		850.7 8.0 TAN AND WHITE, SILTY SAND (A-2-4) TRACE MICA
			3	1	3	4		▼		
845	845.2	13.5	1	2	1	3		W		846.7 12.0 TAN, SANDY CLAYEY SILT (A-5) TRACE MICA
840	840.2	18.5	1	2	2	4		W		841.7 17.0 BLACK TAN AND WHITE, SILTY SAND (A-2-4) LITTLE MICA
835	835.2	23.5	3	5	4	9		W		
830	830.2	28.5	3	5	6	11		W		
825	825.2	33.5	3	5	7	12		W		
820	820.2	38.5	12	9	15	24		M		
815	815.2	43.5	52	48/0.2		100/0.7				816.7 42.0 **WEATHERED ROCK** TAN AND WHITE, GRANITIC ROCK
810	810.2	48.5	11	23	48	71		M		811.7 47.0 **RESIDUAL** TAN WHITE AND GRAY, F. TO CSE. SILTY SAND (A-2-4)
805	805.2	53.5	42	40	42	82		M		
800	800.2	58.5	100/0.4			100/0.4				802.7 56.0 **WEATHERED ROCK** TAN WHITE AND GRAY, GRANITIC ROCK
795	795.2	63.5	100/0.3			100/0.3				
790	790.2	68.5	85	15/0.2		100/0.7				
785	785.2	73.5	60/0.0			60/0.0				786.7 72.0
780	780.2	78.5				60/0.0				

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B4-B	**STATION** 45+90	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 13.2
COLLAR ELEV. 858.7 ft	**TOTAL DEPTH** 98.6 ft	**NORTHING** 847,465	**EASTING** 1,663,603	**24 HR.** 13.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/29/19	**COMP. DATE** 10/10/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
780						Match Line				
			60/0.0							**CRYSTALLINE ROCK** GRANITE ROCK
775	775.2	83.5	60/0.0			60/0.0				SOFT LAYER FROM 77' TO 78'
770	770.2	88.5	60/0.0			60/0.0				SOFT LAYER FROM 82' TO 83'
765	765.2	93.5	60/0.0			60/0.0				SOFT LAYER FROM 87' TO 87.3'
										SOFT LAYER FROM 89' TO 92.5' *(continued)*
	760.2	98.5	60/0.1			60/0.1				760.1 / 98.6 Boring Terminated at Elevation 760.1 ft IN CR: GRANITIC ROCK
										NOTE: BORING ORIGINALLY DRILLED TO A DEPTH OF 63.8 FT ON 5/19/19.

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B5-A	**STATION** 47+64	**OFFSET** 25 ft LT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 21.2
COLLAR ELEV. 877.2 ft	**TOTAL DEPTH** 63.5 ft	**NORTHING** 847,354	**EASTING** 1,663,742	**24 HR.** 28.8
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/28/19	**COMP. DATE** 05/28/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
880										
	876.2	1.0	4	5	7	12		M		877.2 / 0.0 GROUND SURFACE
875	873.7	3.5	7	8	9	17		M		**RESIDUAL** RED-TAN, SANDY SILTY CLAY (A-7)
870	871.2	6.0	5	4	4	8		M		874.7 / 2.5 RED-TAN, SILTY SAND (A-2-4)
	868.7	8.5	4	4	6	10		M		869.2 / 8.0 TAN AND BROWN, SANDY CLAYEY SILT (A-5) LITTLE MICA
865	863.7	13.5	4	4	5	9		M		
860	858.7	18.5	6	6	6	12		M		
855	853.7	23.5	4	4	5	9		M		
850	848.7	28.5	4	4	6	10		M		
845	843.7	33.5	4	4	6	10		M		
840	838.7	38.5	3	3	6	9		W		840.2 / 37.0 TAN BROWN GRAY AND WHITE, SILTY SAND (A-2-4) LITTLE MICA
835	833.7	43.5	2	4	6	10				
830	828.7	48.5	6	9	10	19				
825	823.7	53.5	16	29	71/0.4	100/0.9				823.2 / 54.0 **WEATHERED ROCK** TAN GRAY AND WHITE, GRANITIC ROCK
820	818.7	58.5	60/0.1			60/0.1				818.7 / 58.5 **CRYSTALLINE ROCK** TAN AND GRAY, GRANITIC ROCK
815										813.7 / 63.5 Boring Terminated at Elevation 813.7 ft IN CR: GRANITIC ROCK
										AUGERS DEFLECTED IN CRYSTALLINE ROCK MATERIAL UNABLE TO GET SPOON TO 63.5' SAMPLE

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B5-B	**STATION** 47+64	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 17.0
COLLAR ELEV. 876.0 ft	**TOTAL DEPTH** 103.7 ft	**NORTHING** 847,327	**EASTING** 1,663,711	**24 HR.** 27.0' Caved
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/28/19	**COMP. DATE** 10/11/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
880										
	876.0	0.0								GROUND SURFACE
875	875.0	1.0								**RESIDUAL**
	873.5	2.5	4	6	6	12		M		TAN-BROWN, SANDY SILTY CLAY (A-7) LITTLE MICA
	872.5	3.5	4	5	5	10		M		TAN, SANDY CLAYEY SILT (A-5) TRACE MICA
870	870.5	5.5	3	4	4	8		M		TAN-WHITE, SILTY SAND (A-2-4) TRACE TO LITTLE MICA
	870.0	6.0	4	4	4	8		M		
	867.5	8.5								
865										
	862.5	13.5	4	5	5	10		M		
860										
	857.5	18.5	5	6	7	13		M		
855										
	854.0	22.0								TAN, SANDY CLAYEY SILT (A-5) LITTLE MICA
	852.5	23.5	3	4	4	8		M		
850	849.0	27.0								TAN, SILTY SAND (A-2-4) LITTLE MICA
	847.5	28.5	2	3	6	9		M		
845										
	844.0	32.0								TAN, SANDY CLAYEY SILT (A-5) LITTLE MICA
	842.5	33.5	5	6	10	16		W		
840										
	839.0	37.0								TAN AND WHITE, SILTY SAND (A-2-4) LITTLE MICA
	837.5	38.5	6	10	12	22		M		
835										
	832.5	43.5	11	17	24	41		M		
830										
	829.0	47.0								**WEATHERED ROCK** GRAY AND TAN, GRANITIC ROCK
	827.5	48.5	46	54/0.4		100/0.9		M		
825										
	824.0	52.0								**RESIDUAL**
	822.5	53.5	22	22	53	75		M		TAN, SILTY SAND (A-2-4) LITTLE MICA
820										
	817.5	58.5	16	25	35	60		M		
815										
	815.0	61.0								**WEATHERED ROCK** GRAY AND TAN, GRANITIC ROCK
	812.5	63.5	72	28/0.1		100/0.6				
810										
	807.5	68.5	100/0.4			100/0.4				BLACK AND WHITE STARTING AT 78.5
805										
	802.5	73.5	78	22/0.2		100/0.7				WHITE AND BROWN STARTING AT 88.5
800										

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B5-B	**STATION** 47+64	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 17.0
COLLAR ELEV. 876.0 ft	**TOTAL DEPTH** 103.7 ft	**NORTHING** 847,327	**EASTING** 1,663,711	**24 HR.** 27.0' Caved
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/28/19	**COMP. DATE** 10/11/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
800						Match Line				
	797.5	78.5	23	77/0.3		100/0.8				**WEATHERED ROCK** GRAY AND TAN, GRANITIC ROCK
795										
	792.5	83.5	87	13/0.0		100/0.5				BLACK AND WHITE STARTING AT 78.5
790										
	787.5	88.5	100/0.2			100/0.2				WHITE AND BROWN STARTING AT 88.5 *(continued)*
785										
	782.5	93.5	100/0.2			100/0.2				
780										
	777.5	98.5	100/0.2			100/0.2				
775										
	772.5	103.5	100/0.2			100/0.2				772.3 / 103.7 Boring Terminated at Elevation 772.3 ft IN WR: GRANITIC ROCK

NOTE: BORING ORIGINALLY DRILLED TO A DEPTH OF 68.9 FT ON 5/28/29

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B6-A	**STATION** 49+71	**OFFSET** 25 ft LT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 30.0
COLLAR ELEV. 890.4 ft	**TOTAL DEPTH** 69.8 ft	**NORTHING** 847,210	**EASTING** 1,663,886	**24 HR.** 27.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/30/19	**COMP. DATE** 05/30/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
895										
890	889.4	1.0	5	10	15	25		M		890.4 / 0.0 GROUND SURFACE **RESIDUAL** RED-TAN, SANDY SILTY CLAY (A-7)
	886.9	3.5	6	6	6	12		M		887.4 / 3.0 RED-TAN, SILTY SAND (A-2-4) LITTLE MICA
885	884.4	6.0	6	6	7	13		M		884.9 / 5.5 TAN, SANDY CLAYEY SILT (A-5) LITTLE MICA
	881.9	8.5	4	5	7	12		M		
880										
	876.9	13.5	3	4	5	9		M		878.4 / 12.0 TAN AND WHITE, SILTY SAND (A-2-4) LITTLE MICA
875	871.9	18.5	4	4	4	8		M		
870										
	866.9	23.5	4	5	4	9		M		
865	861.9	28.5	4	4	3	7		M		
860										
	856.9	33.5	3	4	7	11		M		858.4 / 32.0 TAN AND WHITE, SILTY F. TO CSE. SAND (A-1-b)
855	851.9	38.5	5	6	12	18		M		853.4 / 37.0 TAN, SILTY F. TO CSE. SAND (A-2-4) LITTLE MICA
850										
	846.9	43.5	9	13	13	26		W		848.4 / 42.0 TAN, SILTY F. TO CSE. SAND (A-1-b) LITTLE MICA
845	841.9	48.5	10	10	19	29		W		843.4 / 47.0 TAN GRAY AND WHITE, SILTY F. TO CSE. SAND (A-2-4) LITTLE MICA
840										
	836.9	53.5	22	35	51	86		M		835.4 / 55.0 **WEATHERED ROCK** TAN WHITE AND GRAY, GRANITIC ROCK
835										
	831.9	58.5	40	60/0.3		100/0.8				
830										
	826.9	63.5	100/0.5			100/0.5				
825										
	821.9	68.5	20	38	62/0.3	100/0.8				820.6 / 69.8 Boring Terminated at Elevation 820.6 ft IN WR: GRANITIC ROCK

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. B6-B	**STATION** 49+75	**OFFSET** 3 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 25.5
COLLAR ELEV. 889.8 ft	**TOTAL DEPTH** 73.8 ft	**NORTHING** 847,186	**EASTING** 1,663,870	**24 HR.** 26.0' Caved
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/24/19	**COMP. DATE** 05/24/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
890										
	888.8	1.0	3	6	18	24		M		889.8 / 0.0 GROUND SURFACE **RESIDUAL** RED-BROWN, SANDY SILTY CLAY (A-7)
885	886.3	3.5	11	5	8	13		M		886.8 / 3.0 TAN, SANDY CLAYEY SILT (A-5)
	883.8	6.0	9	6	7	13		M		
880	881.3	8.5	4	4	9	13		M		878.8 / 11.0 TAN AND WHITE, SILTY F. TO CSE. SAND (A-2-4)
	876.3	13.5	4	4	4	8		M		
875										
	871.3	18.5	3	5	4	9		M		
870	866.3	23.5	3	5	4	9		M		
865										
	861.3	28.5	3	4	5	9		M		
860	856.3	33.5	4	7	8	15		M		
855										
	851.3	38.5	6	7	7	14		W		
850	846.3	43.5	8	7	9	16		W		
845										
	841.3	48.5	7	10	12	22		W		
840	836.3	53.5	14	17	26	43		W		
835										
	831.3	58.5	29	43	36	79		M		
830	826.3	63.5	23	31	35	66		M		824.3 / 65.5 **WEATHERED ROCK** TAN-WHITE, GRANITIC ROCK
825										
	821.3	68.5	100/0.4			100/0.4				
820	816.3	73.5	100/0.3			100/0.3				816.0 / 73.8 Boring Terminated at Elevation 816.0 ft IN WR: GRANITIC ROCK

NCDOT BORE DOUBLE U2579AB_GEO_BORINGS.GPJ NC_DOT.GDT 11/5/19

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 51+58	**OFFSET** 25 ft LT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** N/A
COLLAR ELEV. 892.6 ft	**TOTAL DEPTH** 68.5 ft	**NORTHING** 847,097	**EASTING** 1,664,032	**24 HR.** 24.4
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/23/19	**COMP. DATE** 05/23/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
895										
	892.6	0.0								892.6 GROUND SURFACE 0.0
	891.6	1.0	5	8	8	16		M		**RESIDUAL** RED AND TAN, SANDY SILTY CLAY (A-7) TRACE MICA
890	889.6	3.0								889.6 TAN, SILTY SAND (A-2-4) LITTLE MICA 3.0
	889.1	3.5	4	5	6	11		M		
	886.6	6.0	5	6	7	13		M		
885	884.1	8.5	4	4	5	9		M		
	880.6	12.0								880.6 TAN, SANDY CLAYEY SILT (A-5) LITTE MICA 12.0
880	879.1	13.5	3	4	4	8		M		
	874.1	18.5	6	6	6	12		W		
875	869.1	23.5	3	2	4	6				
	865.6	27.0								865.6 TAN AND WHITE, SILTY SAND (A-2-4) LITTLE MICA 27.0
	864.1	28.5	4	5	7	12		W		
860	859.1	33.5	3	7	10	17		W		
	854.1	38.5	14	11	11	22		W		
855	850.6	42.0								850.6 TAN, SANDY CLAYEY SILT (A-5) LITTLE MICA 42.0
	849.1	43.5	5	7	13	20		W		
850	845.6	47.0								845.6 TAN AND GRAY, SILTY SAND (A-2-4) LITTLE MICA 47.0
	844.1	48.5	10	12	16	28		W		
845	840.6	52.0								840.6 **WEATHERED ROCK** TAN AND GRAY, GRANITIC ROCK 52.0
	839.1	53.5	40	60/0.3		100/0.8				
840	834.1	58.5	100/0.2			100/0.2				
	830.6	62.0								830.6 **RESIDUAL** TAN AND WHITE, SILTY SAND (A-2-4) 62.0
835	829.1	63.5	27	22	35	57		M		
	825.6	67.0								825.6 **WEATHERED ROCK** TAN AND WHITE, GRANITIC ROCK 67.0
830	824.1	68.5	60/0.0			60/0.0				824.1 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 824.1 ft ON CR: GRANITIC ROCK 68.5
825										

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Goodnight, D.	
SITE DESCRIPTION BRIDGE NO. 726 ON -Y15FLYBD- OVER -Y15REV-, -Y15FLYCA-, -Y15FLYAC-, -L-, AND -Y15RPDREV-				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 51+58	**OFFSET** 17 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** 27.0
COLLAR ELEV. 890.7 ft	**TOTAL DEPTH** 64.7 ft	**NORTHING** 847,062	**EASTING** 1,664,008	**24 HR.** 24.8
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 84% 01/10/2018		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Kiker, Z.	**START DATE** 05/23/19	**COMP. DATE** 05/23/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
895										
	890.7	0.0								890.7 GROUND SURFACE 0.0
	889.7	1.0	6	7	8	15	SS-01	32%		**RESIDUAL** RED BROWN, SILTY CLAY (A-7-5) LITTLE MICA
890	887.2	3.5	4	4	5	9	SS-02	33%		
	884.7	6.0	5	4	5	9	SS-03	24%		884.7 RED-TAN, SANDY CLAYEY SILT (A-5) TRACE MICA 6.0
885	882.2	8.5	4	4	4	8		M		882.7 WHITE-TAN, SILTY CSE. TO F. SILTY SAND (A-2-4) 8.0
	877.2	13.5	3	4	5	9	SS-05	32%		878.7 RED-TAN, SANDY CLAYEY SILT (A-5) LITTLE MICA 12.0
880	872.2	18.5	3	4	5	9	SS-06	31%		
	867.2	23.5	2	2	2	4				
875	862.2	28.5	2	2	3	5		W		
	857.2	33.5	2	3	5	8	SS-09	44%		
870	852.2	38.5	7	14	11	25		W		851.7 WHITE-TAN, SILTY CSE. TO F. SILTY SAND (A-2-4) 39.0
	847.2	43.5	13	11	42	53		W		845.2 **WEATHERED ROCK** WHITE-TAN, GRANITIC ROCK 45.5
865	842.2	48.5	79	21/0.1		100/0.6				839.7 **RESIDUAL** WHITE-TAN, SILTY CSE. TO F. SILTY SAND (A-2-4) 51.0
	837.2	53.5	28	25	33	58		M		
860	832.2	58.5	40	35	50	85		M		828.7 **WEATHERED ROCK** WHITE-TAN, GRANITIC ROCK 62.0
	827.2	63.5	27	73/0.3		100/0.8				826.0 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 826.0 ft ON CR: GRANITIC ROCK 64.7
855	826.0	64.7	60/0.0							

LOOKING UPSTATION FROM END BENT 1

BENT 3 CROSS SECTION, LOOKING FROM LEFT TO RIGHT

LOOKING DOWN STATION FROM BENT 4

BENT 4 CROSS SECTION, LOOKING FROM LEFT TO RIGHT

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SITE PHOTOGRAPHS

BRIDGE NO. 726 ON -Y15FLYBD- (STA. 47+63.62)
INTERCHANGE CONNECTING WINSTON-SALEM
NORTHERN BELTWAY AND I-40 BYPASS
FORSYTH COUNTY, NC
WBS: 34839 | TIP NO.: U-2579AB

LABORATORY TEST RESULTS

U-2579AB | Bridge No. 726 on Y15FLYBD

Winston Salem, NC

Falcon Engineering Project No: G19025.00

SAMPLE		DEPTH	AASHTO	ATTERBERG LIMITS		PERCENT BY WEIGHT				PERCENT PASSING SIEVE			MOISTURE	BULK DENSITY	ORGANICS
NO.	LOCATION	INTERVAL	CLASS.	LL	PI	C.SAND	F.SAND	SILT	CLAY	#10	#40	#200	(%)	(pcf)	(%)
SS-176	EB1-A	1.0-2.5	A-7-5(18)	60	25	18	17	17	48	100	89	68	27	N/A	N/A
SS-178	EB1-A	6.0-7.5	A-5(3)	52	7	20	38	22	20	100	94	49	29	N/A	N/A
SS-183	EB1-A	28.5-30.0	A-7-5(5)	50	13	32	22	19	27	99	74	50	46	N/A	N/A
SS-184	EB1-A	33.5-35.0	A-7-5(7)	54	18	32	21	22	25	100	76	52	46	N/A	N/A
SS-01	EB2-B	1.0-2.5	A-7-5(23)	69	30	13	21	16	50	100	94	70	32	N/A	N/A
SS-02	EB2-B	3.5-5.0	A-7-5(12)	66	14	14	27	17	42	100	94	64	33	N/A	N/A
SS-03	EB2-B	6.0-7.5	A-5(0)	51	6	30	39	5	26	100	88	37	24	N/A	N/A
SS-05	EB2-B	13.5-15.0	A-5(1)	44	6	24	38	25	13	99	88	47	32	N/A	N/A
SS-06	EB2-B	18.5-20.0	A-5(2)	42	6	22	31	28	19	99	89	54	31	N/A	N/A
SS-09	EB2-B	33.5-35.0	A-5(0)	45	7	29	39	19	13	100	88	39	44	N/A	N/A

Reviewed By

Patrick Clark

Certification: 105-01-0803

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	28

REFERENCE: U-2579AB

PROJECT: 34839

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. 727 ON -Y15FLYCA- IN INTERCHANGE CONNECTING WINSTON-SALEM NORTHERN BELTWAY AND I-40 BYPASS BETWEEN SR 4315 AND SR 2679*

CONTENTS

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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.

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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

A. SUTTLE

HPC

TOTAL DEPTH DRILLING

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SIGNATURE

10/28/2019
DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	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	UNSUITABLE

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 RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	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 (COHESIVE)	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	4	10	40	60	200	270
OPENING (MM)	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	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- 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-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC 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
- PW — 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
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, CPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW 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
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
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-55
- [X] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [X] DIEDRICH D50
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [X] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B _____
- [ ] -H _____
- [X] -N Q2

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 YEILD 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 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 GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN 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.

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

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.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BL-50, ELEVATION: 874.93 FT.; BL-49, ELEVATION: 882.83 FT.; BL-47, ELEVATION: 904.39 FT.; U-2579AB-5, ELEVATION: 897.13
ELEVATION: VARIES FEET

NOTES:

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

BL-50 (N 847291 E 1663706)
BL-49 (N 847739 E 1663844)
BL-47 (N 848320 E 1664034)
U-2579AB-5 (N 848191 E 1664353)

DATE: 8-15-14

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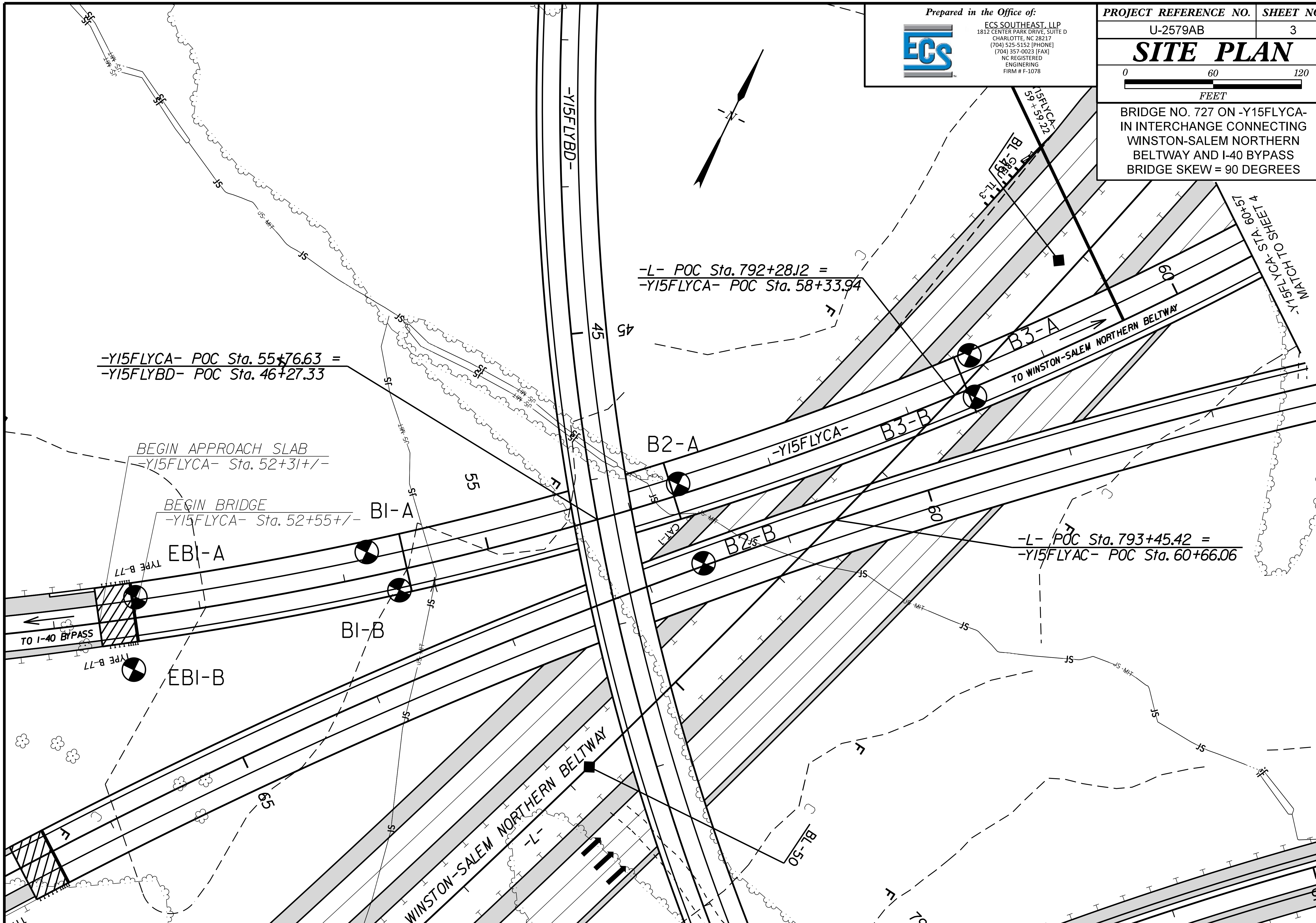
NC REGISTERED
ENGINEERING
FIRM # F-1078

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	3

SITE PLAN

0 60 120
FEET

BRIDGE NO. 727 ON -Y15FLYCA-
IN INTERCHANGE CONNECTING
WINSTON-SALEM NORTHERN
BELTWAY AND I-40 BYPASS
BRIDGE SKEW = 90 DEGREES



-Y15FLYBD-
-L- POC Sta. 792+28.12 =
-Y15FLYCA- POC Sta. 58+33.94
-Y15FLYCA- POC Sta. 55+76.63 =
-Y15FLYBD- POC Sta. 46+27.33
BEGIN APPROACH SLAB
-Y15FLYCA- Sta. 52+31+/-
BEGIN BRIDGE
-Y15FLYCA- Sta. 52+55+/-
B1-A
B1-B
EB1-A
EB1-B
B2-A
B2-B
B3-A
B3-B
-Y15FLYCA-
TO WINSTON-SALEM NORTHERN BELTWAY
TO I-40 BYPASS
TYPE B-77
-L- POC Sta. 793+45.42 =
-Y15FLYAC- POC Sta. 60+66.06
-Y15FLYCA- STA. 60+57
MATCH TO SHEET 4
WINSTON-SALEM NORTHERN BELTWAY
-L-
BL-50
BL-49
N
45
55
60
65

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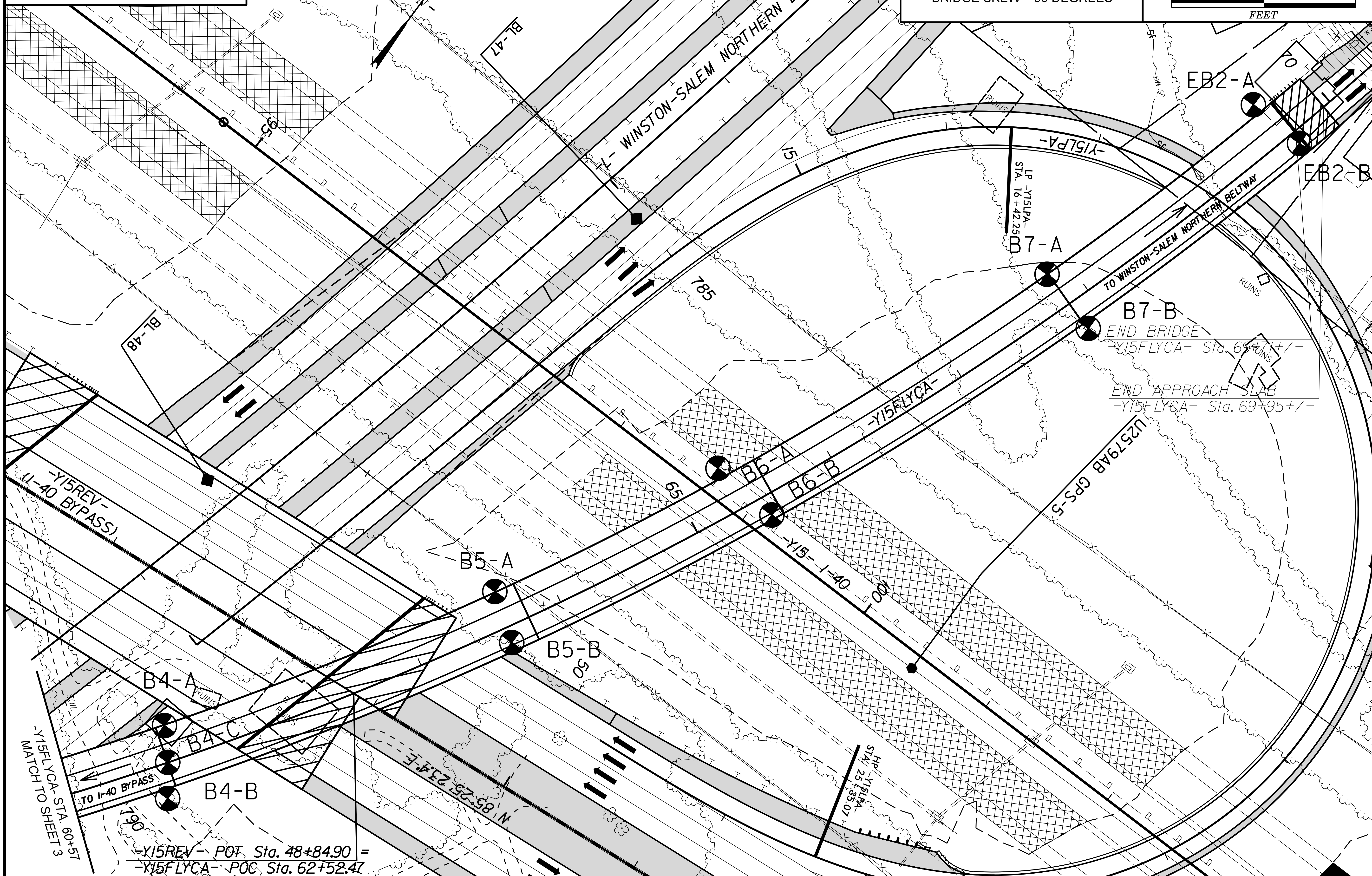
NC REGISTERED
ENGINEERING
FIRM # F-1078

BRIDGE NO. 727 ON -Y15FLYCA-
IN INTERCHANGE CONNECTING
WINSTON-SALEM NORTHERN
BELTWAY AND I-40 BYPASS
BRIDGE SKEW = 90 DEGREES

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	4

SITE PLAN

0 60 120
FEET



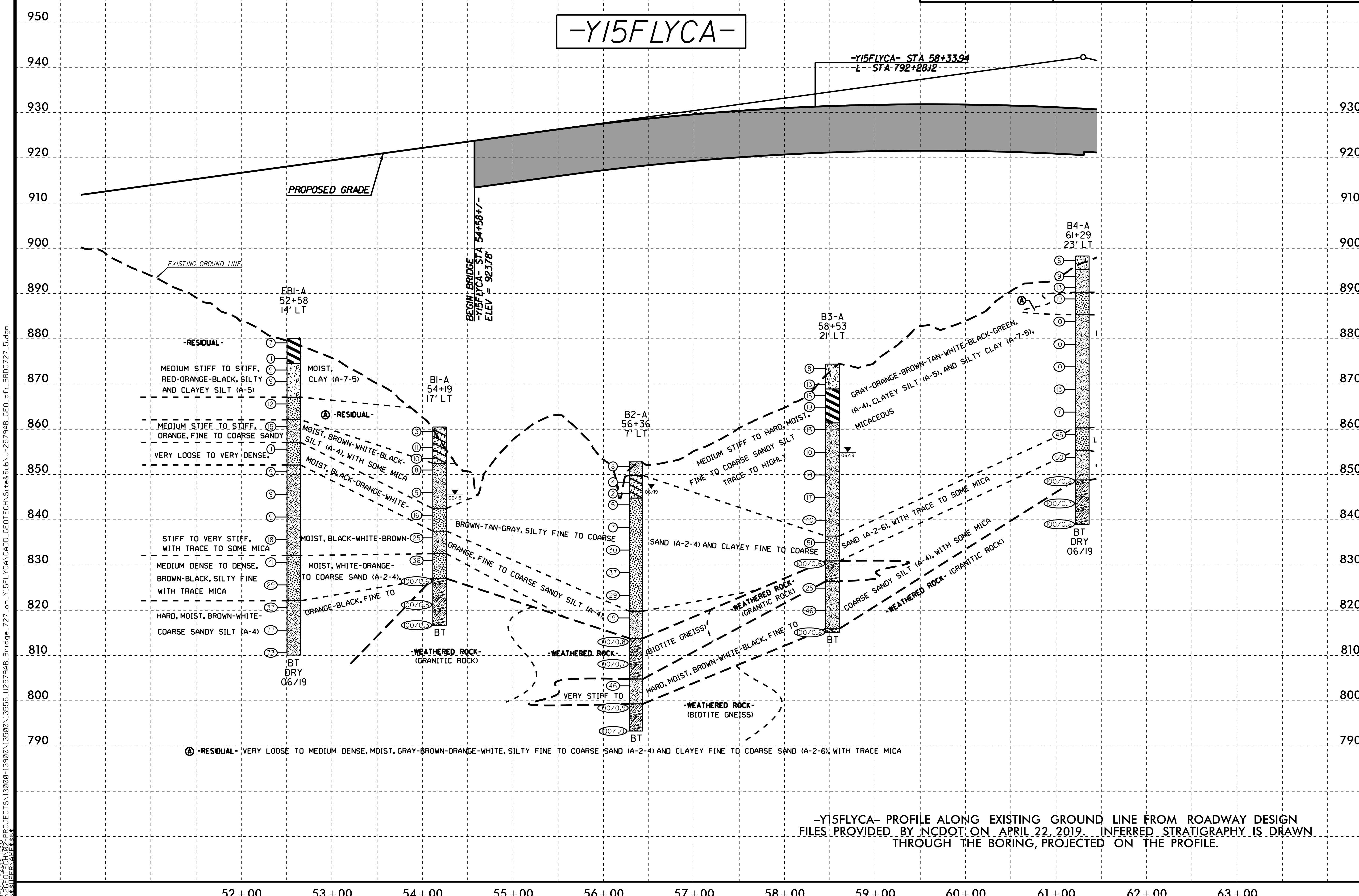
-L- WINSTON-SALEM NORTHERN BELTWAY
BL-47
BL-48
95
15
785
LP -Y15LPA- STA. 16+42.25
-Y15LPA-
EB2-A
EB2-B
B7-A
B7-B
END BRIDGE
-Y15FLYCA- Sta. 69+77+/-
END APPROACH SLAB
-Y15FLYCA- Sta. 69+95+/-
TO WINSTON-SALEM NORTHERN BELTWAY
RUINS
-Y15FLYCA-
U2579AB GPS-5
B6-A
B6-B
65
-Y15- I-40
100
-Y15REV-
(I-40 BYPASS)
B5-A
B5-B
50
B4-A
B4-C
B4-B
TO I-40 BYPASS
790
N 85°25'23.4"E
HIP -Y15LPA- STA. 21+35.07
-Y15FLYCA- STA. 60+57
MATCH TO SHEET 3
-Y15REV- POT Sta. 48+84.90 =
-Y15FLYCA- POC Sta. 62+52.47

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	5

PROFILE BORINGS PROJECTED ON -Y15FLYCA- ALONG BRIDGE 727

Prepared in the Office of: ECS SOUTHEAST, LLP

0 50 100 VE=5:1



-Y15FLYCA-
-Y15FLYCA- STA 58+33.94
-L- STA 792+28.12
PROPOSED GRADE
EXISTING GROUND LINE
BEGIN BRIDGE -Y15FLYCA- STA 54+58+/- ELEV = 923.78'
EB1-A 52+58 14' LT
B1-A 54+19 17' LT
B2-A 56+36 7' LT
B3-A 58+53 21' LT
B4-A 61+29 23' LT
-RESIDUAL-
MEDIUM STIFF TO STIFF, RED-ORANGE-BLACK, SILTY AND CLAYEY SILT (A-5)
MOIST, CLAY (A-7-5)
Ⓐ -RESIDUAL-
MEDIUM STIFF TO STIFF, ORANGE, FINE TO COARSE SANDY
VERY LOOSE TO VERY DENSE,
MOIST, BROWN-WHITE-BLACK-SILT (A-4), WITH SOME MICA
MOIST, BLACK-ORANGE-WHITE-
BROWN-TAN-GRAY, SILTY FINE TO COARSE
SAND (A-2-4) AND CLAYEY FINE TO COARSE
STIFF TO VERY STIFF, WITH TRACE TO SOME MICA
MOIST, BLACK-WHITE-BROWN-
MEDIUM DENSE TO DENSE, BROWN-BLACK, SILTY FINE WITH TRACE MICA
MOIST, WHITE-ORANGE-TO COARSE SAND (A-2-4)
ORANGE, FINE TO COARSE SANDY SILT (A-4)
ORANGE-BLACK, FINE TO
HARD, MOIST, BROWN-WHITE-COARSE SANDY SILT (A-4)
BT DRY 06/19
-WEATHERED ROCK- (GRANITIC ROCK)
-WEATHERED ROCK-
(BIOTITE GNEISS)
VERY STIFF TO
HARD, MOIST, BROWN-WHITE-BLACK, FINE TO
COARSE SANDY SILT (A-4), WITH SOME MICA
-WEATHERED ROCK- (GRANITIC ROCK)
-WEATHERED ROCK- (BIOTITE GNEISS)
MEDIUM STIFF TO HARD, MOIST, FINE TO COARSE SANDY SILT TRACE TO HIGHLY
GRAY-ORANGE-BROWN-TAN-WHITE-BLACK-GREEN, (A-4), CLAYEY SILT (A-5), AND SILTY CLAY (A-7-5), MICACEOUS
SAND (A-2-6), WITH TRACE TO SOME MICA
-WEATHERED ROCK- (GRANITIC ROCK)
BT DRY 06/19
Ⓐ -RESIDUAL- VERY LOOSE TO MEDIUM DENSE, MOIST, GRAY-BROWN-ORANGE-WHITE, SILTY FINE TO COARSE SAND (A-2-4) AND CLAYEY FINE TO COARSE SAND (A-2-6), WITH TRACE MICA
960 950 940 930 920 910 900 890 880 870 860 850 840 830 820 810 800 790
52+00 53+00 54+00 55+00 56+00 57+00 58+00 59+00 60+00 61+00 62+00 63+00

-Y15FLYCA- 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.

5/14/99

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$$$$USERNAME$$$$

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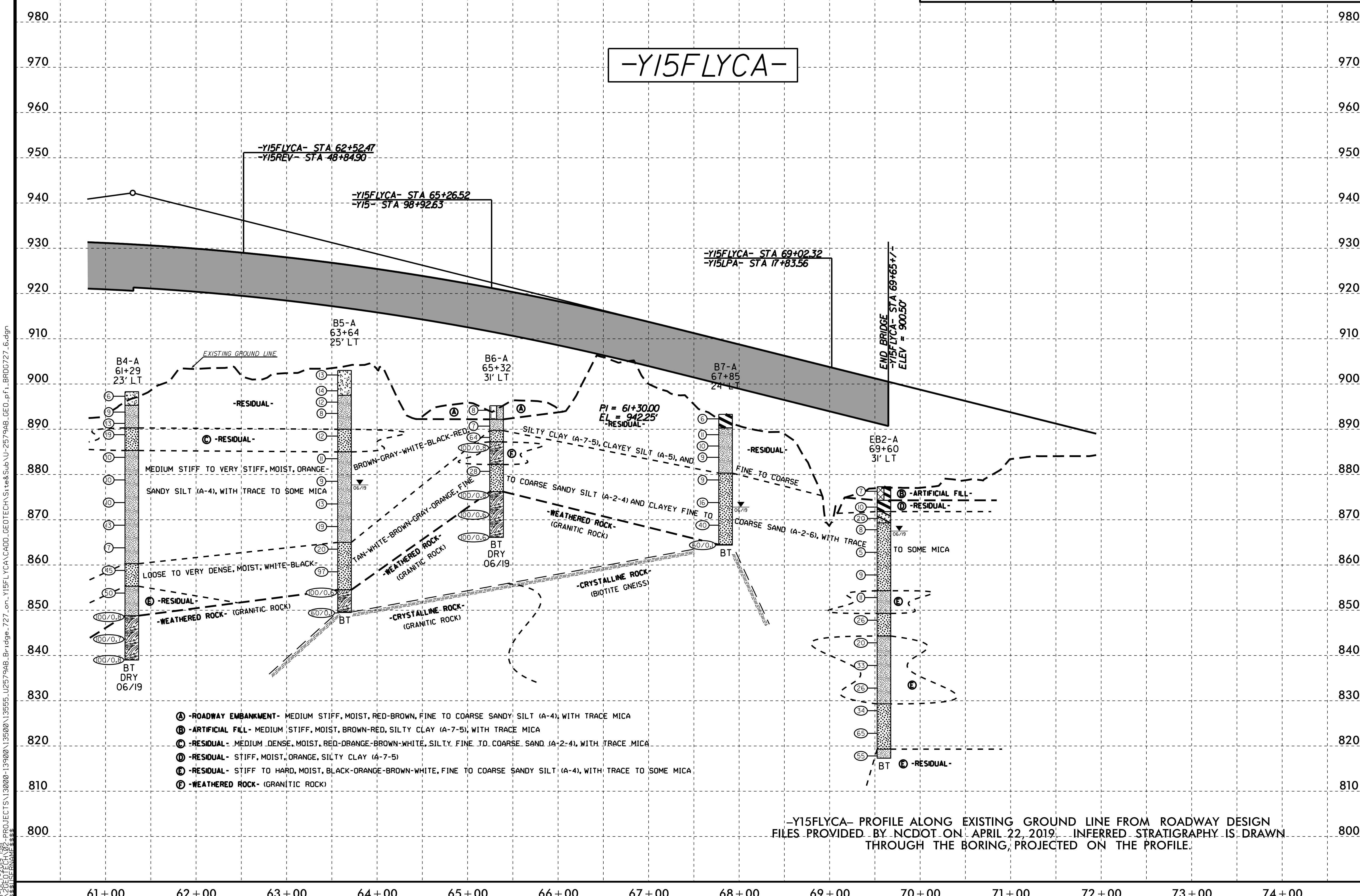
NC REGISTERED
ENGINERING
FIRM # F-1078

PROJECT REFERENCE NO.	SHEET NO.
U–2579AB	6

PROFILE BORINGS PROJECTED ON –Y15FLYCA– ALONG BRIDGE 727

0 50 100
VE=5:1



-Y15FLYCA-
-Y15FLYCA- STA 62+52.47
-Y15REV- STA 48+84.90
-Y15FLYCA- STA 65+26.52
-Y15- STA 98+92.63
-Y15FLYCA- STA 69+02.32
-Y15LPA- STA 17+83.56
END BRIDGE
-Y15FLYCA- STA 69+65+/-
ELEV = 900.50'
PI = 61+30.00
EL = 942.25'
EXISTING GROUND LINE
B4-A
61+29
23' LT
B5-A
63+64
25' LT
B6-A
65+32
31' LT
B7-A
67+85
24' LT
EB2-A
69+60
31' LT
BT
DRY
06/19
-RESIDUAL-
MEDIUM STIFF TO VERY STIFF, MOIST, ORANGE-
SANDY SILT (A-4), WITH TRACE TO SOME MICA
BROWN-GRAY-WHITE-BLACK-RED
SILTY CLAY (A-7-5), CLAYEY SILT (A-5), AND
FINE TO COARSE
TO COARSE SANDY SILT (A-2-4) AND CLAYEY FINE TO
COARSE SAND (A-2-6), WITH TRACE
TO SOME MICA
TAN-WHITE-BROWN-GRAY-ORANGE FINE
LOOSE TO VERY DENSE, MOIST, WHITE-BLACK-
-WEATHERED ROCK- (GRANITIC ROCK)
-CRYSTALLINE ROCK- (GRANITIC ROCK)
-CRYSTALLINE ROCK- (BIOTITE GNEISS)
-ARTIFICIAL FILL-
Ⓐ -ROADWAY EMBANKMENT- MEDIUM STIFF, MOIST, RED-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA
Ⓑ -ARTIFICIAL FILL- MEDIUM STIFF, MOIST, BROWN-RED, SILTY CLAY (A-7-5), WITH TRACE MICA
Ⓒ -RESIDUAL- MEDIUM DENSE, MOIST, RED-ORANGE-BROWN-WHITE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA
Ⓓ -RESIDUAL- STIFF, MOIST, ORANGE, SILTY CLAY (A-7-5)
Ⓔ -RESIDUAL- STIFF TO HARD, MOIST, BLACK-ORANGE-BROWN-WHITE, FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO SOME MICA
Ⓕ -WEATHERED ROCK- (GRANITIC ROCK)
-Y15FLYCA- 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.
990
980
970
960
950
940
930
920
910
900
890
880
870
860
850
840
830
820
810
800
61+00
62+00
63+00
64+00
65+00
66+00
67+00
68+00
69+00
70+00
71+00
72+00
73+00
74+00

5/14/99
$$$$USERNAME$$$$
25-OCT-2019 15:11

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NC REGISTERED ENGINEERING FIRM # P-1078

VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	7

BRIDGE NO. 727 CROSS SECTION ALONG END BENT 1 ON –Y15FLYCA–

EBI-A
52+58
14' LT

EBI-B
52+50
36' RT

EXISTING GROUND LINE

MEDIUM STIFF TO STIFF, MOIST, RED-ORANGE-SANDY SILT (A-4), WITH TRACE MICA

LOOSE TO MEDIUM DENSE, STIFF, MOIST, WHITE-ORANGE-MEDIUM DENSE,

STIFF TO HARD, MOIST, BLACK-WHITE-BROWN-

-RESIDUAL-

BLACK, SILTY CLAY (A-7-5), CLAYEY SILT (A-5), AND FINE TO COARSE

MOIST, WHITE-ORANGE-TAN, SILTY FINE TO COARSE SAND (A-2-4)

BROWN-BLACK, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA

MOIST, ORANGE-WHITE-TAN, SILTY FINE TO COARSE SAND (A-2-4)

ORANGE, FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO LITTLE MICA

EBI-A		EBI-B	
7		7	
11		10	
9		13	
9		6	
12		7	
15		9	
11		9	
9		11	
9		14	
9		11	
18		30	
41		19	
29		100/0.9	
37		33	
77		52	
73			

Ⓐ -RESIDUAL-

Ⓑ -WEATHERED ROCK-

BT
DRY
06/19

BT
DRY
06/19

52+55.00

Ⓐ -RESIDUAL- MEDIUM DENSE TO DENSE, MOIST, WHITE-ORANGE-BROWN, SILTY FINE TO COARSE SAND (A-2-4)

Ⓑ -WEATHERED ROCK- (GRANITIC ROCK)

℄
–Y15FLYCA–

–Y15FLYCA– 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

25-OCT-2019 15:11
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$$$$USERNAME$$$$

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NC REGISTERED ENGINEERING FIRM # P-1078

VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	8

BRIDGE NO. 727 CROSS SECTION ALONG BENT 1 ON -Y15FLYCA-

BI-A
54+19
17' LT

BI-B
54+35
13' RT

EXISTING GROUND LINE

SOFT TO STIFF, MOIST, ORANGE-BROWN- SANDY CLAY (A-6) AND FINE TO COARSE SANDY

MEDIUM DENSE TO VERY DENSE, MOIST, ORANGE-

VERY STIFF TO HARD, MOIST, BLACK-WHITE-

MEDIUM DENSE TO DENSE, MOIST, BLACK-BROWN-

-WEATHERED ROCK- (GRANITIC ROCK)

-RESIDUAL-

SILT (A-4), WITH TRACE BROWN-WHITE, SILTY FINE

GRAY-BLACK-

BROWN-ORANGE, FINE TO

WHITE, SILTY FINE TO COARSE

WHITE, CLAYEY SILT (A-5), FINE TO COARSE ORGANICS AND TRACE TO HIGHLY MICACEOUS

TO COARSE SAND (A-2-4), WITH TRACE TO LITTLE MICA

COARSE SANDY SILT (A-4), WITH SOME MICA

SAND (A-2-4), WITH TRACE MICA

-WEATHERED ROCK- (GRANITIC ROCK)

BI-A		BI-B	
3		4	
11		7	
10		3	
8		5	
9	06/19	3	06/19
16		13	
25		59	
36		25	
100/0.6		29	
100/0.8		29	
100/0.3	BT	38	
		25	
		100/0.8	
		100/0.5	BT

54 + 43.00

-Y15FLYCA-

-Y15FLYCA- 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

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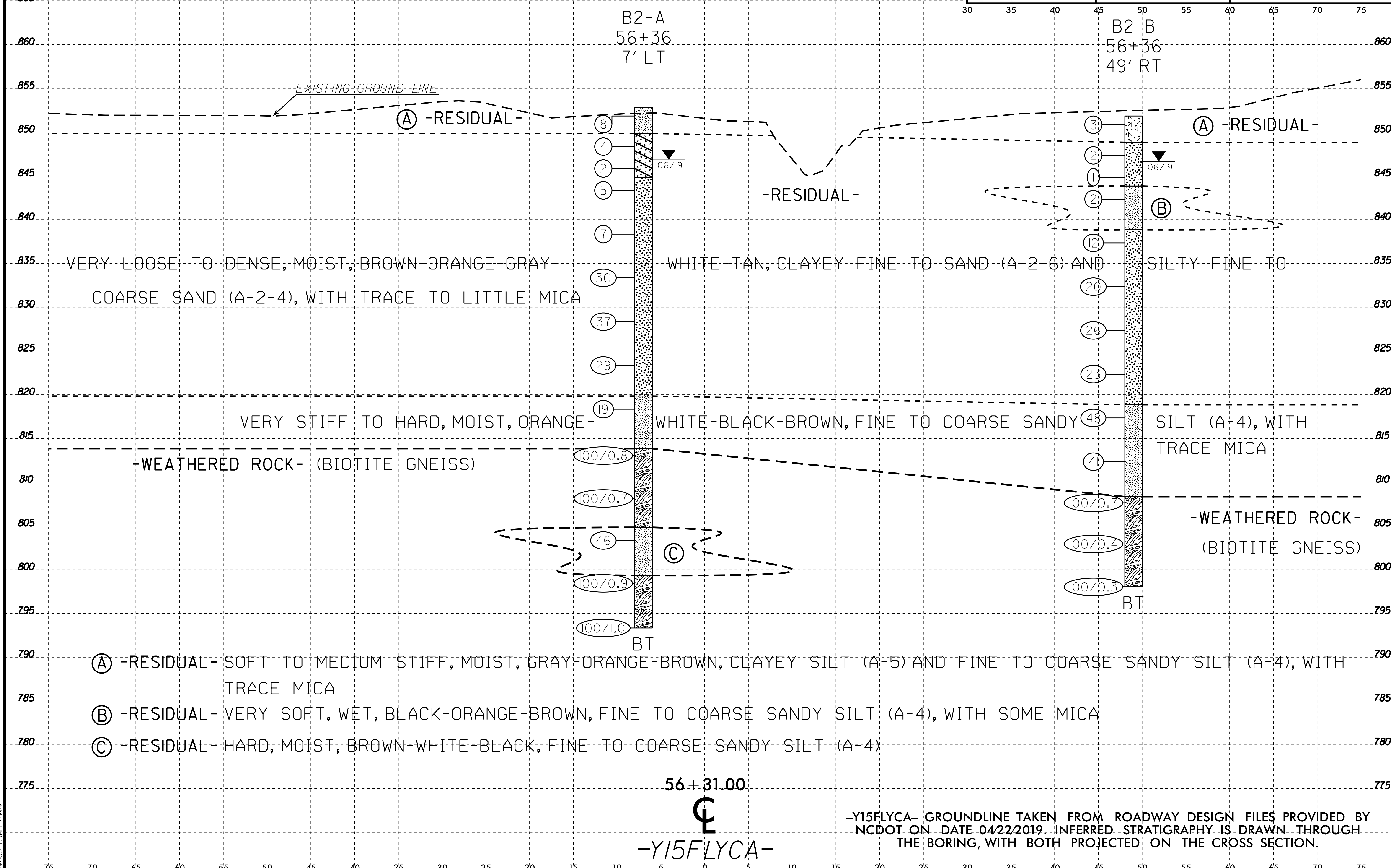
ENGINERING
FIRM # F-1078

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	9

BRIDGE NO. 727 CROSS SECTION ALONG BENT 2 ON –Y15FLYCA–



0 5 10
VE=1:1
B2-A
56+36
7' LT
B2-B
56+36
49' RT
EXISTING GROUND LINE
Ⓐ -RESIDUAL-
-RESIDUAL-
Ⓑ
06/19
VERY LOOSE TO DENSE, MOIST, BROWN-ORANGE-GRAY-WHITE-TAN, CLAYEY FINE TO SAND (A-2-6) AND SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO LITTLE MICA
VERY STIFF TO HARD, MOIST, ORANGE-WHITE-BLACK-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA
-WEATHERED ROCK- (BIOTITE GNEISS)
Ⓒ
BT
Ⓐ -RESIDUAL- SOFT TO MEDIUM STIFF, MOIST, GRAY-ORANGE-BROWN, CLAYEY SILT (A-5) AND FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA
Ⓑ -RESIDUAL- VERY SOFT, WET, BLACK-ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH SOME MICA
Ⓒ -RESIDUAL- HARD, MOIST, BROWN-WHITE-BLACK, FINE TO COARSE SANDY SILT (A-4)
56+31.00
℄
-Y15FLYCA-
–Y15FLYCA– 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

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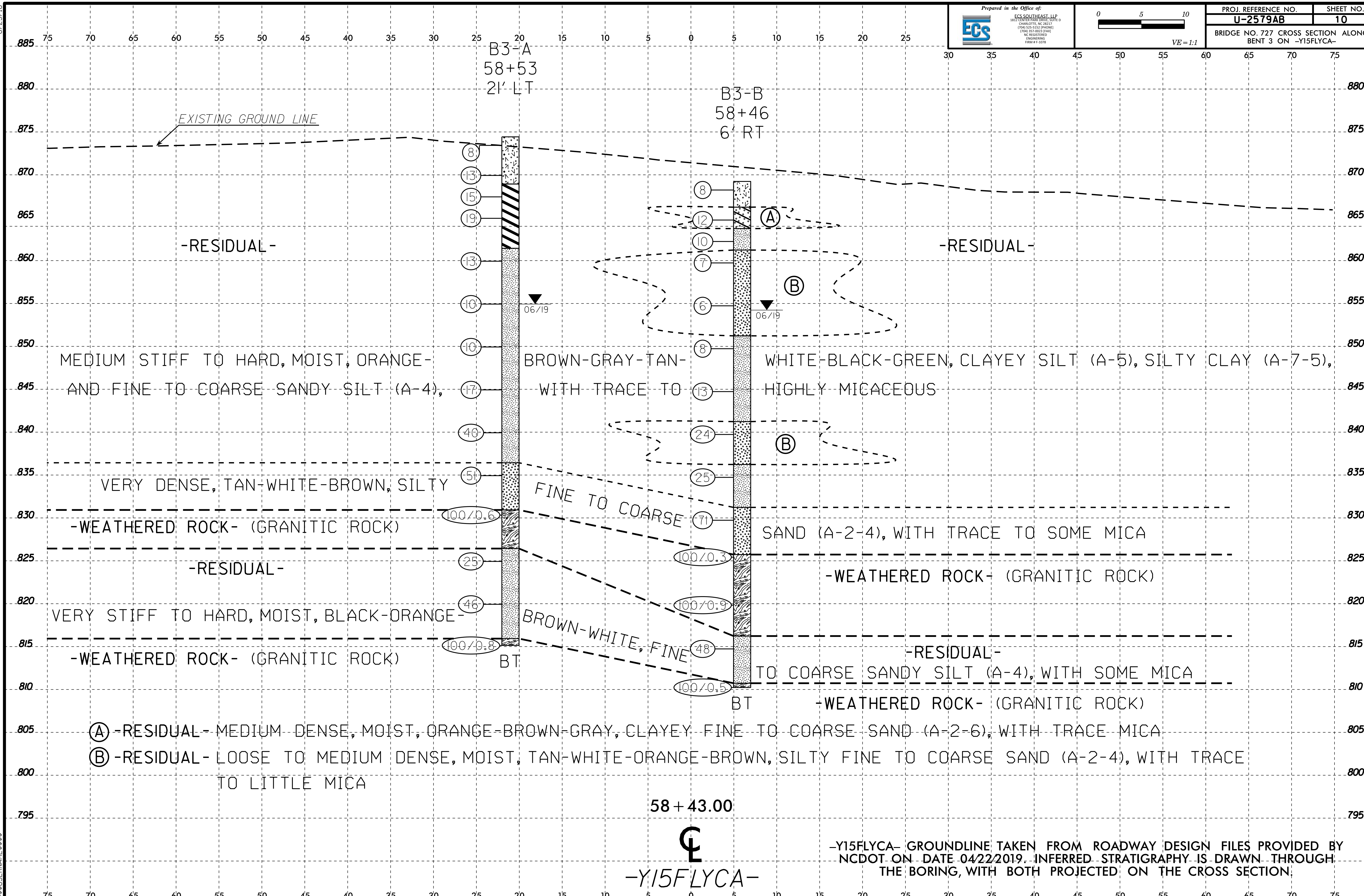
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	10

BRIDGE NO. 727 CROSS SECTION ALONG BENT 3 ON -Y15FLYCA-

Prepared in the Office of: ECS SOUTHEAST, LLP



VE=1:1
EXISTING GROUND LINE
B3-A
58+53
21' LT
B3-B
58+46
6' RT
-RESIDUAL-
MEDIUM STIFF TO HARD, MOIST, ORANGE-BROWN-GRAY-TAN-WHITE-BLACK-GREEN, CLAYEY SILT (A-5), SILTY CLAY (A-7-5),
AND FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO HIGHLY MICACEOUS
VERY DENSE, TAN-WHITE-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO SOME MICA
-WEATHERED ROCK- (GRANITIC ROCK)
-RESIDUAL-
VERY STIFF TO HARD, MOIST, BLACK-ORANGE-BROWN-WHITE, FINE TO COARSE SANDY SILT (A-4), WITH SOME MICA
-WEATHERED ROCK- (GRANITIC ROCK)
BT
06/19
(A) -RESIDUAL- MEDIUM DENSE, MOIST, ORANGE-BROWN-GRAY, CLAYEY FINE TO COARSE SAND (A-2-6), WITH TRACE MICA
(B) -RESIDUAL- LOOSE TO MEDIUM DENSE, MOIST, TAN-WHITE-ORANGE-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO LITTLE MICA
58+43.00
-Y15FLYCA-

-Y15FLYCA- 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

25-OCT-2019 15:11

25-OCT-2019 15:11
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$$$$USERNAME$$$$
6/23/16

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NC REGISTERED ENGINEERING FIRM # P-1078

0 5 10
VE=1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	11

BRIDGE NO. 727 CROSS SECTION ALONG BENT 4 ON -Y15FLYCA-

-Y15FLYCA- 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.

B4-A
61+29
23' LT

B4-C
61+23
CL

B4-B
61+16
22' RT

EXISTING GROUND LINE

Ⓐ -RESIDUAL- LOOSE TO MEDIUM SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

Ⓑ -RESIDUAL- MEDIUM DENSE, MOIST, TAN-BROWN-ORANGE-BLACK-WHITE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

MEDIUM STIFF TO VERY STIFF, MOIST, ORANGE-BROWN-GRAY, FINE TO COARSE (A-4), WITH TRACE TO SOME MICA

Ⓐ -RESIDUAL- MEDIUM DENSE TO VERY DENSE, MOIST, TAN-WHITE-BLACK, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO SOME MICA

Ⓑ -RESIDUAL- MEDIUM DENSE TO VERY DENSE, MOIST, ORANGE-TAN-WHITE-BROWN-BLACK, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE TO SOME MICA

-WEATHERED ROCK- (GRANITIC ROCK)

BT
DRY
06/19

10/19

-WEATHERED ROCK- (GRANITIC ROCK)

-WEATHERED ROCK- (BIOTITE GNEISS)

BT
DRY
06/19

-CRYSTALLINE ROCK- (BIOTITE GNEISS)

REC=88%
RQD=33%
GSI=30-35

SLIGHTLY TO VERY SLIGHTLY WEATHERED, HARD, WHITE-BLACK BIOTITE GNEISS, WITH MINOR GRANITIC ROCK, WITH VERY CLOSE TO CLOSE FRACTURE SPACING

BT

Ⓐ -RESIDUAL- MEDIUM STIFF TO HARD, MOIST, ORANGE-GRAY-BLACK-BROWN-WHITE, CLAYEY SILT (A-5) AND FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO SOME MICA

Ⓑ -RESIDUAL- MEDIUM DENSE, MOIST, TAN-ORANGE-BROWN-WHITE-GREEN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

61+23.00

℄

-Y15FLYCA-

Prepared in the Office of:
ECS SOUTHEAST, LLP
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 357-0023 [FAX]
NC REGISTERED ENGINEERING FIRM # P-1078

VE = 1:1

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

BRIDGE NO. 727 CROSS SECTION ALONG BENT 5 ON –Y15FLYCA–

B5-A
63+64
25' LT

B5-B
63+60
10' RT

EXISTING GROUND LINE

-RESIDUAL-

MEDIUM STIFF TO STIFF, MOIST, COARSE SANDY SILT (A-4), WITH TRACE

MEDIUM DENSE, MOIST, WHITE-ORANGE-

STIFF TO VERY STIFF, MOIST, BLACK-

ORANGE-RED-BROWN- TO SOME MICA

BROWN-RED, SILTY FINE TO

WHITE-ORANGE-BROWN-TAN,

06/19

MEDIUM DENSE TO VERY DENSE, MOIST,

ORANGE-BROWN-WHITE-TAN,

-WEATHERED ROCK- (GRANITIC ROCK)

100/0.6

60/0.1

BT

-CRYSTALLINE ROCK- (GRANITIC ROCK)

-RESIDUAL-

BLACK-PINK-WHITE, CLAYEY SILT (A-5) AND FINE TO

COARSE SAND (A-2-4), WITH TRACE MICA

FINE TO COARSE SANDY SILT (A-4), WITH SOME MICA

SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

-WEATHERED ROCK- (GRANITIC ROCK)

100/0.9

100/0.4

100/0.3

BT
DRY
06/19

Ⓐ -RESIDUAL- MEDIUM DENSE, MOIST, BLACK-WHITE-ORANGE-BROWN, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

63+77.00

℄

–Y15FLYCA–

–Y15FLYCA– 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.

Prepared in the Office of:
ECS SOUTHEAST, LLP
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 357-0023 [FAX]
NC REGISTERED ENGINEERING FIRM # P-0278

VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	13

BRIDGE NO. 727 CROSS SECTION ALONG BENT 6 ON –Y15FLYCA–

B6-A
65+32
31' LT

B6-B
65+51
12' RT

EXISTING GROUND LINE

Ⓐ -ROADWAY EMBANKMENT-

Ⓒ -RESIDUAL- LOOSE TO VERY DENSE, MOIST, BROWN-BLACK-WHITE, -WEATHERED ROCK- (GRANITIC ROCK)

Ⓑ -RESIDUAL- SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

Ⓒ -RESIDUAL- STIFF, MOIST, BLACK-ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE MICA

-WEATHERED ROCK- (GRANITIC ROCK)

-CRYSTALLINE ROCK- (GRANITIC ROCK)

B6-A: 8, 7, 64, 100/0.8, 28, Ⓑ, 100/0.8, 100/0.6, 100/0.6 — BT DRY 06/19

B6-B: 9, 26, 12, 9, 9, 100/0.9, 100/0.2, 60/0.1 — BT DRY 06/19

Ⓐ -ROADWAY EMBANKMENT- MEDIUM STIFF TO STIFF, MOIST, ORANGE-BROWN-RED, FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA

Ⓑ -RESIDUAL- MEDIUM DENSE, MOIST, BROWN-BLACK-WHITE, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA

Ⓒ -RESIDUAL- MEDIUM STIFF TO STIFF, MOIST, BLACK-WHITE-ORANGE-BROWN-RED, FINE TO COARSE SANDY SILT (A-4), WITH TRACE TO LITTLE MICA

65+55.00

℄ –Y15FLYCA–

–Y15FLYCA– 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.

Prepared in the Office of:
ECS SOUTHEAST, LLP
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 357-0023 [FAX]
NC REGISTERED ENGINEERING FIRM # P-1078

VE = 1:1

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	14

BRIDGE NO. 727 CROSS SECTION ALONG BENT 7 ON –Y15FLYCA–

B7-A
67+85
24' LT

B7-B
67+86
20' RT

EXISTING GROUND LINE

MEDIUM STIFF TO STIFF, MOIST, BROWN-
WITH TRACE TO LITTLE MICA

-RESIDUAL-
RED-ORANGE-BLACK, SILTY CLAY (A-7-5) AND FINE TO COARSE SANDY SILT (A-4),

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

B7-A: 6, 11, 10, 9, 9, 16, 40, 60/0.1
B7-B: 8, 14, 8, 9, 14, 15, 39, 100/0.5, 60/0.1

06/19 (B7-A)
06/19 (B7-B)

BT
-CRYSTALLINE ROCK- (BIOTITE GNEISS)

BT
-WEATHERED ROCK- (GRANITIC ROCK)
-CRYSTALLINE ROCK- (BIOTITE GNEISS)

915 910 905 900 895 890 885 880 875 870 865 860 855

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

67+85.00

–Y15FLYCA–

–Y15FLYCA– 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

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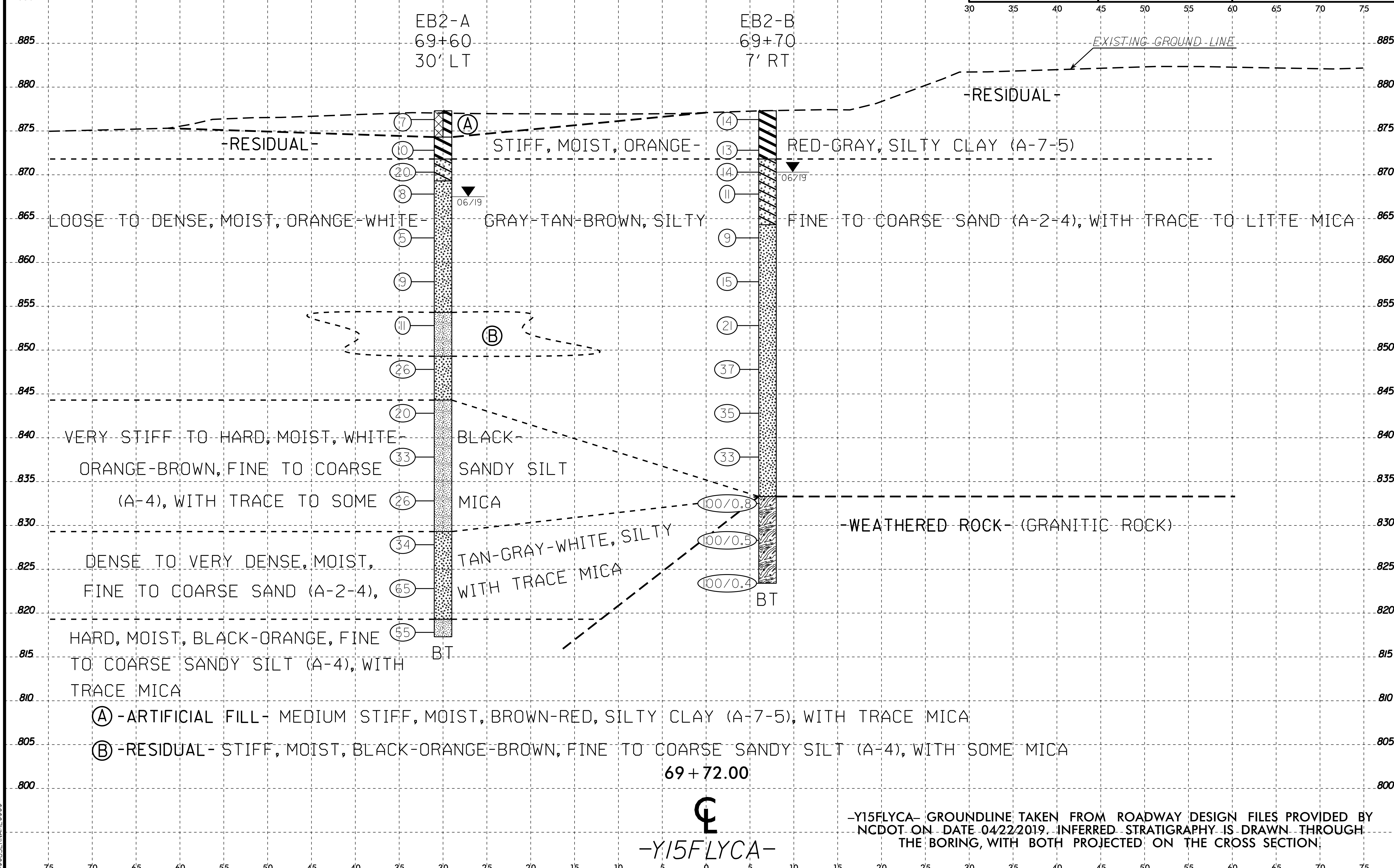
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.
U-2579AB	15

BRIDGE NO. 727 CROSS SECTION ALONG END BENT 2 ON –Y15FLYCA–

Prepared in the Office of: ECS SOUTHEAST, LLP, 1812 CENTER PARK DRIVE, SUITE D, CHARLOTTE, NC 28217, (704) 525-5152 [PHONE], (704) 357-0023 [FAX], NC REGISTERED ENGINERING FIRM # F-1078



Ⓐ -ARTIFICIAL FILL- MEDIUM STIFF, MOIST, BROWN-RED, SILTY CLAY (A-7-5), WITH TRACE MICA

Ⓑ -RESIDUAL- STIFF, MOIST, BLACK-ORANGE-BROWN, FINE TO COARSE SANDY SILT (A-4), WITH SOME MICA

69+72.00

℄ -Y15FLYCA-

–Y15FLYCA– 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

25-OCT-2019 15:12
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$$$$USERNAME$$$$

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 52+58	**OFFSET** 14 ft LT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 35.9
COLLAR ELEV. 880.1 ft	**TOTAL DEPTH** 70.0 ft	**NORTHING** 847,260	**EASTING** 1,663,379	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/12/19	**COMP. DATE** 06/12/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) — DEPTH (ft)
885										
880	880.1	0.0	2	3	4	7		M		880.1 — 0.0 GROUND SURFACE
	876.6	3.5						M		**RESIDUAL** Medium Stiff to Stiff, Red, Silty CLAY (A-7-5)
875	874.1	6.0	3	4	7	11		M		874.6 — 5.5 Stiff, Black-Orange-Red, Clayey SILT (A-5)
	871.6	8.5	3	4	5	9		M		
870			3	4	5	9		M		
	866.6	13.5						M		867.1 — 13.0 Medium Dense, Orange-White, Silty Fine to Coarse SAND (A-2-4)
865			4	6	6	12		M		
	861.6	18.5						M		862.1 — 18.0 Stiff, Black-Orange, Fine to Coarse Sandy SILT (A-4)
860			5	7	8	15		M		
	856.6	23.5						M		857.1 — 23.0 Medium Dense, Orange-White, Silty Fine to Coarse SAND (A-2-4)
855			3	5	6	11		M		
	851.6	28.5						M		852.1 — 28.0 Stiff to Very Stiff, Black-White-Brown-Orange, Fine to Coarse Sandy SILT (A-4), with little mica
850			3	4	5	9		M		
	846.6	33.5						M		
845			3	4	5	9		M		
	841.6	38.5						M		
840			3	4	5	9		M		
	836.6	43.5						M		
835			6	8	10	18		M		
	831.6	48.5						M		832.1 — 48.0 Medium Dense to Dense, White-Orange-Brown, Silty Fine to Coarse SAND (A-2-4)
830			6	18	23	41		M		
	826.6	53.5						M		
825			9	14	15	29		M		
	821.6	58.5						M		822.1 — 58.0 Hard, Brown-White-Orange-Black, Fine to Coarse Sandy SILT (A-4)
820			15	18	19	37		M		
	816.6	63.5						M		
815			11	16	61	77		M		
	811.6	68.5						M		810.1 — 70.0 Boring Terminated at Elevation 810.1 ft In Residual Sandy SILT (A-4)
			24	29	44	73				

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 52+50	**OFFSET** 36 ft RT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 35.5
COLLAR ELEV. 881.0 ft	**TOTAL DEPTH** 65.0 ft	**NORTHING** 847,216	**EASTING** 1,663,399	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/12/19	**COMP. DATE** 06/12/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
885										
880	881.0	0.0	5	4	3	7		M		881.0 — 0.0 GROUND SURFACE
	877.5	3.5						M		**RESIDUAL** Medium Stiff, Red, Silty CLAY (A-7-5)
875	875.0	6.0	3	4	6	10		M		878.0 — 3.0 Stiff, Orange-Red, Clayey SILT (A-5)
	872.5	8.5	4	5	8	13		M		875.5 — 5.5 Medium Stiff to Stiff, Orange-Red-Black, Fine to Coarse Sandy SILT (A-4), with trace mica
870			3	3	3	6		M		
	867.5	13.5						M		
865			3	3	4	7		M		
	862.5	18.5						M		863.0 — 18.0 Loose, White-Orange-Tan, Silty Fine to Coarse SAND (A-2-4)
860			2	3	6	9		M		
	857.5	23.5						M		858.0 — 23.0 Stiff, White-Brown-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica
855			3	4	5	9		M		
	852.5	28.5						M		
850			3	4	7	11		M		
	847.5	33.5						M		848.0 — 33.0 Medium Dense, Tan-Orange-White, Silty Fine to Coarse SAND (A-2-4)
845			5	8	6	14		M		
	842.5	38.5						M		843.0 — 38.0 Stiff to Very Stiff, White-Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with trace to little mica
840			4	4	7	11		M		
	837.5	43.5						M		
835			9	13	17	30		M		
	832.5	48.5						M		
830			7	9	10	19		M		
	827.5	53.5						M		827.5 — 53.5 **WEATHERED ROCK** White-Tan-Brown (GRANITIC ROCK)
825			41	59/0.4		100/0.9		M		
	822.5	58.5						M		823.0 — 58.0 **RESIDUAL** Hard, White-Black-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
820			13	14	19	33		M		
	817.5	63.5						M		816.0 — 65.0 Boring Terminated at Elevation 816.0 ft In Residual Sandy SILT (A-4)
			10	16	36	52				

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 54+19	**OFFSET** 17 ft LT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 15.1
COLLAR ELEV. 860.5 ft	**TOTAL DEPTH** 43.8 ft	**NORTHING** 847,356	**EASTING** 1,663,507	**24 HR.** 15.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/12/19	**COMP. DATE** 06/12/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
	860.5	0.0	2	1	2	3		M		860.5 GROUND SURFACE	0.0
										RESIDUAL Very Loose to Medium Dense, Gray-Brown-Orange, Clayey Fine to Coarse SAND (A-2-6)	
	857.0	3.5	4	5	6	11		M			
	854.5	6.0	4	5	5	10		M			
	852.0	8.5	4	4	4	8		M		852.5 Medium Stiff to Stiff, Brown-Orange-Black-White, Fine to Coarse Sandy SILT (A-4), with some mica	8.0
	847.0	13.5	5	4	5	9		M			
	842.0	18.5	5	8	8	16		M		842.5 Medium Dense, Orange-White-Brown, Silty Fine to Coarse SAND (A-2-4), with little mica	18.0
	837.0	23.5	7	11	14	25		M		837.5 Very Stiff, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	23.0
	832.0	28.5	13	19	17	36		M		832.5 Dense, White-Brown-Black, Silty Fine SAND (A-2-4), with trace mica	28.0
	827.0	33.5	85	15/0.1		100/0.6				827.0 **WEATHERED ROCK** Black-Brown-White (GRANITIC ROCK)	33.5
	822.0	38.5	50	50/0.3		100/0.8					
	817.0	43.5	100/0.3			100/0.3				816.7 Boring Terminated at Elevation 816.7 ft In Weathered Rock (GRANITIC ROCK)	43.8

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 54+35	**OFFSET** 13 ft RT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 7.8
COLLAR ELEV. 851.5 ft	**TOTAL DEPTH** 59.0 ft	**NORTHING** 847,343	**EASTING** 1,663,538	**24 HR.** 5.1
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/11/19	**COMP. DATE** 06/11/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
	851.5	0.0	1	1	3	4		M		851.5 GROUND SURFACE	0.0
	848.0	3.5	4	4	3	7		M		**RESIDUAL** Soft, Orange-Brown, Fine to Coarse Sandy CLAY (A-6), with trace organics and mica	
	845.5	6.0	2	2	1	3		M		848.5 Soft to Medium Stiff, Gray-Orange, Clayey SILT (A-5), with trace mica	3.0
	843.0	8.5	3	2	3	5		M		843.5 Soft to Stiff, White-Black, Fine to Coarse Sandy SILT (A-4), with some to highly micaceous	8.0
	838.0	13.5	1	1	2	3		M			
	833.0	18.5	6	7	6	13		M			
	828.0	23.5	17	36	23	59		M		828.5 Very Dense, Brown-Orange-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	23.0
	823.0	28.5	8	11	14	25		M		823.5 Very Stiff to Hard, Black-White-Brown-Orange, Fine to Coarse Sandy SILT (A-4), with some mica	28.0
	818.0	33.5	12	13	16	29		M			
	813.0	38.5	6	10	19	29		M			
	808.0	43.5	14	17	21	38		M			
	803.0	48.5	11	13	12	25		M		803.5 Medium Dense, Black-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	48.0
	798.0	53.5	52	48/0.3		100/0.8				798.0 **WEATHERED ROCK** Tan-Brown-White-Black (GRANITIC ROCK)	53.5
	793.0	58.5	100/0.5			100/0.5				792.5 Boring Terminated at Elevation 792.5 ft In Weathered Rock (GRANITIC ROCK)	59.0

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 56+36	**OFFSET** 7 ft LT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 8.0
COLLAR ELEV. 852.8 ft	**TOTAL DEPTH** 59.5 ft	**NORTHING** 847,490	**EASTING** 1,663,677	**24 HR.** 6.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/05/19	**COMP. DATE** 06/05/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
855											
	852.8	0.0								852.8 GROUND SURFACE	0.0
850	849.3	3.5	2	4	4	8		M		**RESIDUAL** Medium Stiff, Orange-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	
	846.8	6.0	3	2	2	4		M		849.8	3.0
845	844.3	8.5	1	1	1	2		M		Very Loose to Loose, Orange-Brown Clayey Fine to Coarse SAND (A-2-6), with trace mica	
	839.3	13.5	3	3	2	5		M		844.8	8.0
840										Loose to Dense, Gray-White-Orange-Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace to little mica	
835	834.3	18.5	3	3	4	7		M			
830	829.3	23.5	8	13	17	30		M			
825	824.3	28.5	9	18	19	37		M			
820	819.3	33.5	14	15	14	29		M		819.8 Very Stiff, White-Brown-Black, Fine to Coarse Sandy SILT (A-4), with trace mica	33.0
815	814.3	38.5	10	8	11	19		M		813.8 **WEATHERED ROCK** Black-White-Brown (BIOTITE GNEISS)	39.0
810	809.3	43.5	26	60	40/0.3	100/0.8					
805	804.3	48.5	24	54	46/0.2	100/0.7					
800	799.3	53.5	18	20	26	46		M		804.8 **RESIDUAL** Hard, Brown-White-Black, Fine to Coarse Sandy SILT (A-4)	48.0
795	794.3	58.5	23	77/0.4		100/0.9				799.3 **WEATHERED ROCK** Brown-White-Black (BIOTITE GNEISS)	53.5
			52	48/0.5		100/1.0				793.3 Boring Terminated at Elevation 793.3 ft In Weathered Rock (BIOTITE GNEISS)	59.5

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 56+36	**OFFSET** 49 ft RT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 10.2
COLLAR ELEV. 851.8 ft	**TOTAL DEPTH** 53.8 ft	**NORTHING** 847,449	**EASTING** 1,663,716	**24 HR.** 5.2
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/10/19	**COMP. DATE** 06/10/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
855										
	851.8	0.0								851.8 GROUND SURFACE 0.0
850	848.3	3.5	1	2	1	3		M		**RESIDUAL** Soft, Gray-Orange, Clayey SILT (A-5), with trace mica
	845.8	6.0	2	1	1	2		M		848.8 3.0
845	843.3	8.5	3	1	0	1		M		Very Loose, Brown-Orange-Gray, Silty Fine to Coarse SAND (A-2-4)
	838.3	13.5	1	1	1	2		W		843.8 8.0
840										Very Soft, Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with some mica
835	833.3	18.5	4	6	6	12		M		838.8 13.0
830	828.3	23.5	7	10	10	20		M		Medium Dense, Orange-Brown-White-Tan, Silty Fine to Coarse SAND (A-2-4), with little mica
825	823.3	28.5	7	10	16	26		M		
820	818.3	33.5	12	11	12	23		M		
815	813.3	38.5	11	18	30	48		M		818.8 33.0
810	808.3	43.5	15	18	23	41		M		Hard, Orange-White-Black-Brown, Fine to Coarse Sandy SILT (A-4)
805	803.3	48.5	61	39/0.2		100/0.7				808.3 43.5
800	798.3	53.5	100/0.4			100/0.4				**WEATHERED ROCK** White-Black-Brown (BIOTITE GNEISS)
			100/0.3			100/0.3				798.0 53.8
										Boring Terminated at Elevation 798.0 ft In Weathered Rock (BIOTITE GNEISS)

1) Boring B2-B was offset to the right due to an existing steep stream embankment.

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B3-A	**STATION** 58+53	**OFFSET** 21 ft LT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 21.4
COLLAR ELEV. 874.4 ft	**TOTAL DEPTH** 59.3 ft	**NORTHING** 847,655	**EASTING** 1,663,817	**24 HR.** 19.5
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/06/19	**COMP. DATE** 06/06/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
875											
	874.4	0.0	3	4	4	8		M		874.4 GROUND SURFACE	0.0
										RESIDUAL Medium Stiff to Stiff, Orange-Brown, Clayey SILT (A-5), with trace mica	
870	870.9	3.5	5	6	7	13 15		M			
	868.4	6.0	5	6	9			M		868.9 Stiff to Very Stiff, Gray-Orange-Brown, Silty CLAY (A-7-5)	5.5
865	865.9	8.5	5	10	9	19		M			
	860.9	13.5	4	6	7	13		M		861.4 Stiff to Hard, White-Tan-Brown-Black-Green, Fine to Coarse Sandy SILT (A-4), with little to highly micaceous	13.0
860											
855	855.9	18.5	4	5	5	10		M			
	850.9	23.5	2	4	6	10		M			
850											
845	845.9	28.5	6	8	9	17		M			
	840.9	33.5	6	12	28	40		M		836.4 Very Dense, Tan-White-Brown, Silty Fine to Coarse SAND (A-2-4), with some mica	38.0
840											
835	835.9	38.5	28	33	18	51		M			
	830.9	43.5	81	19/0.1		100/0.6		M		830.9 **WEATHERED ROCK** Black-Brown-White (GRANITIC ROCK)	43.5
830											
825	825.9	48.5	7	8	17	25		M		826.4 **RESIDUAL** Very Stiff to Hard, Black-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	48.0
	820.9	53.5	15	18	28	46		M			
820											
	815.9	58.5	33	67/0.3		100/0.8				815.9 **WEATHERED ROCK** Black-White-Brown (GRANITIC ROCK)	58.5
										815.1 Boring Terminated at Elevation 815.1 ft In Weathered Rock (GRANITIC ROCK)	59.3

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B3-B	**STATION** 58+46	**OFFSET** 6 ft RT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 17.2
COLLAR ELEV. 869.2 ft	**TOTAL DEPTH** 59.0 ft	**NORTHING** 847,631	**EASTING** 1,663,833	**24 HR.** 15.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/05/19	**COMP. DATE** 06/05/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
870										
	869.2	0.0	2	3	5	8		M		869.2 GROUND SURFACE 0.0
										RESIDUAL Medium Stiff, Orange-Brown, Clayey SILT (A-5), with trace mica
865	865.7	3.5	4	6	6	12		M		866.2 3.0
	863.2	6.0	3	4	6	10		M		Medium Dense, Orange-Brown-Gray, Clayey Fine to Coarse SAND (A-2-6), with trace mica 863.7 5.5
860	860.7	8.5	4	4	3	7		M		Stiff, Brown-Black-Orange, Fine to Coarse Sandy SILT (A-4), with little mica 861.2 8.0
	855.7	13.5	3	3	3	6				Loose, Tan-Orange-White, Silty Fine to Coarse SAND (A-2-4), with trace to little mica
855										
850	850.7	18.5	2	4	4	8		M		851.2 18.0
	845.7	23.5	5	5	8	13		M		Medium Stiff to Stiff, White-Orange-Black-Brown, Fine to Coarse Sandy SILT (A-4)
845										
840	840.7	28.5	12	11	13	24		M		841.2 28.0
	835.7	33.5	9	11	14	25		M		Medium Dense, White-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica
835										836.2 33.0
830	830.7	38.5	46	42	29	71		M		Very Stiff, White-Orange-Black-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
	825.7	43.5	100/0.3			100/0.3		M		831.2 38.0
825										Very Dense, Tan-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
820	820.7	48.5	14	86/0.4		100/0.9		M		825.7 43.5
										WEATHERED ROCK Tan-White-Black-Brown (GRANITIC ROCK)
	815.7	53.5	26	26	22	48		M		816.2 53.0
815										**RESIDUAL** Hard, Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with some mica
	810.7	58.5	100/0.5			100/0.5				810.7 58.5
										810.2 **WEATHERED ROCK** Black-White-Brown (GRANITIC ROCK) 59.0
										Boring Terminated at Elevation 810.2 ft In Weathered Rock (GRANITIC ROCK)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B4-A	**STATION** 61+29	**OFFSET** 23 ft LT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 37.1
COLLAR ELEV. 898.3 ft	**TOTAL DEPTH** 59.3 ft	**NORTHING** 847,871	**EASTING** 1,663,983	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/07/19	**COMP. DATE** 06/07/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
	898.3	0.0								898.3 GROUND SURFACE	0.0
			2	3	3	6		M		**RESIDUAL** Medium Stiff, Orange-Brown, Clayey SILT (A-5), with trace mica	
895	894.8	3.5	3	4	5	9		M		895.3 Stiff, Orange-Gray-Brown, Fine to Coarse Sandy SILT (A-4), with little mica	3.0
	892.3	6.0	5	6	7	13		M		890.3 Medium Dense, Orange-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	8.0
890	889.8	8.5	6	8	11	19		M			
885	884.8	13.5	4	4	6	10		M		885.3 Medium Stiff to Stiff, Black-Orange-Brown-White, Fine to Coarse Sandy SILT (A-4), with trace to some mica	13.0
880	879.8	18.5	4	4	6	10		M			
875	874.8	23.5	4	4	6	10		M			
870	869.8	28.5	4	6	7	13		M			
865	864.8	33.5	3	3	4	7		M			
860	859.8	38.5	9	15	30	45		M		860.3 Dense, Black-Orange-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	38.0
855	854.8	43.5	14	21	29	50		M		855.3 Hard, White-Black-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	43.0
850	849.8	48.5	29	53	47/0.3	100/0.8				848.8 **WEATHERED ROCK** Black-White-Brown (GRANITIC ROCK)	49.5
845	844.8	53.5	37	60	40/0.2	100/0.7					
840	839.8	58.5	40	60/0.3		100/0.8				839.0 Boring Terminated at Elevation 839.0 ft In Weathered Rock (GRANITIC ROCK)	59.3

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B4-B	**STATION** 61+16	**OFFSET** 22 ft RT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** Dry
COLLAR ELEV. 894.4 ft	**TOTAL DEPTH** 64.3 ft	**NORTHING** 847,834	**EASTING** 1,664,013	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/06/19	**COMP. DATE** 06/06/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
	894.4	0.0								894.4 GROUND SURFACE	0.0
			1	3	4	7		M		**RESIDUAL** Medium Stiff, Orange-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	
890	890.9	3.5	3	3	4	7		M		891.4 Loose, Tan-Orange-Black-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	3.0
	888.4	6.0	4	4	6	10		M		886.4 Stiff, Orange-White-Black-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	8.0
885	885.9	8.5	2	3	7	10		M			
880	880.9	13.5	7	6	10	16		M		881.4 Medium Dense, Green-White-Brown, Silty Fine to Coarse SAND (A-2-4), with little mica	13.0
875	875.9	18.5	3	5	7	12		M		876.4 Stiff, Orange-Gray-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	18.0
870	870.9	23.5	9	9	8	17		M		871.4 Medium Dense, Orange-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	23.0
865	865.9	28.5	9	11	12	23		M		866.4 Very Stiff, Orange-Brown-White, Fine to Coarse Sandy SILT (A-4) with some mica	28.0
860	860.9	33.5	9	13	14	27		M		861.4 Medium Dense, Orange-White-Brown, Silty Fine to Coarse SAND (A-2-4), with some mica	33.0
855	855.9	38.5	10	12	16	28		M			
850	850.9	43.5	10	14	16	30		M		851.4 Very Stiff, Black-White-Brown-Orange, Fine to Coarse Sandy SILT (A-4), with some mica	43.0
845	845.9	48.5	9	11	13	24		M			
840	840.9	53.5	7	15	17	32		M		841.4 Dense to Very Dense, Orange-White-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	53.0
835	835.9	58.5	39	37	35	72		M			
	830.9	63.5	44	56/0.3		100/0.8				830.9 **WEATHERED ROCK** White-Black-Brown (BIOTITE GNEISS)	63.5
										830.1 Boring Terminated at Elevation 830.1 ft In Weathered Rock (BIOTITE GNEISS)	64.3

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B4-C	**STATION** 61+23	**OFFSET** CL	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 38.6
COLLAR ELEV. 897.2 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 847,853	**EASTING** 1,663,999	**24 HR.** 34.0
DRILL RIG/HAMMER EFF./DATE TDD1893 CME-550X 88% 07/18/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Chambless	**START DATE** 10/07/19	**COMP. DATE** 10/08/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
900											
	897.2	0.0								897.2 GROUND SURFACE	0.0
895			2	3	4	7		M		**RESIDUAL** Medium Stiff, Black-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	
	893.7	3.5								894.2	3.0
			3	8	11	19		M		Medium Dense, Tan-Orange-Brown, Silty Fine to Coarse SAND (A-2-4)	
890											
	888.7	8.5	2	5	6	11		M		889.2	8.0
885										Stiff, Tan-White-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	
	883.7	13.5	2	4	5	9		M			
880											
	878.7	18.5	2	6	10	16		M		879.2	18.0
875										Medium Dense, Tan-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	
	873.7	23.5	6	10	10	20		M			
870											
	868.7	28.5	2	3	3	6		M		869.2	28.0
865										Medium Stiff, White-Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	
	863.7	33.5	3	5	8	13		M		864.2	33.0
860										Medium Dense to Very Dense, White-Tan-Brown, Silty Fine to Coarse SAND (A-2-4), with some mica	
	858.7	38.5	6	8	14	22		M			
855											
	853.7	43.5	3	7	11	18		M			
850											
	848.7	48.5	32	25	51	76		M			
845											
	843.7	53.5	82	18/0.2		100/0.7				843.7 **WEATHERED ROCK** Tan-Brown (GRANITIC ROCK)	53.5
840											
	838.7	58.5	100/0.2			100/0.2					
835											
	833.7	63.5	100/0.2			100/0.2					
830											
	828.7	68.5	100/0.2			100/0.2					
825											
	823.7	73.5	100/0.4			100/0.4					
820											

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B4-C	**STATION** 61+23	**OFFSET** CL	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 38.6
COLLAR ELEV. 897.2 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 847,853	**EASTING** 1,663,999	**24 HR.** 34.0
DRILL RIG/HAMMER EFF./DATE TDD1893 CME-550X 88% 07/18/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Chambless	**START DATE** 10/07/19	**COMP. DATE** 10/08/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
820						Match Line				
	818.7	78.5			100/0.4	100/0.4				819.2 78.0 White-Black (BIOTITE GNEISS)
815										
	814.4	82.8			60/0.1	60/0.1				814.4 82.8 814.3 82.9 **CRYSTALLINE ROCK** White-Black (BIOTITE GNEISS) Slightly to Very Slightly Weathered, Hard, White-Black BIOTITE GNEISS, with minor GRANITIC ROCK, with very close to close fracture spacing REC = 88%, RQD = 33%, GSI = 30 - 35
810										
805										803.0 94.2 Boring Terminated at Elevation 803.0 ft In Crystalline Rock (BIOTITE GNEISS)

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B4-C	**STATION** 61+23	**OFFSET** CL	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 38.6
COLLAR ELEV. 897.2 ft	**TOTAL DEPTH** 94.2 ft	**NORTHING** 847,853	**EASTING** 1,663,999	**24 HR.** 34.0
DRILL RIG/HAMMER EFF./DATE TDD1893 CME-550X 88% 07/18/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER J. Chambless	**START DATE** 10/07/19	**COMP. DATE** 10/08/19	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ-2	**TOTAL RUN** 11.3 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
814.3											Begin Coring @ 82.9 ft
	814.3	82.9	2.2	3:09/1.0	(1.8)	(0.4)		(9.9)	(3.7)		814.3 Slightly to Very Slightly Weathered, Hard, White-Black BIOTITE GNEISS, 82.9
	812.1	85.1		3:12/1.0	82%	18%		88%	33%		with minor GRANITIC ROCK, with very close to close fracture spacing
810			5.0	0:36/0.2 2:32/1.0 1:49/1.0 1:52/1.0 2:36/1.0 1:47/1.0	(4.0) 80%	(1.5) 30%					REC = 88%, RQD = 33%, GSI = 30 - 35
	807.1	90.1									
805			4.1	2:57/1.0 2:27/1.0 2:01/1.0 2:47/1.1	(4.1) 100%	(1.8) 44%					
	803.0	94.2									803.0 94.2
											Boring Terminated at Elevation 803.0 ft In Crystalline Rock (BIOTITE GNEISS)

Winston-Salem Beltway from US 421/I-40 BUS to I-40
Bridge No. 727 on -Y15FLYCA–
WBS: 34839.1.8 TIP NO.: U-2579AB
Rock Core Photograph： Boring: B4-C
Station: 61+23 Offset: CL

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B5-A	**STATION** 63+64	**OFFSET** 25 ft LT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 36.7
COLLAR ELEV. 903.0 ft	**TOTAL DEPTH** 53.5 ft	**NORTHING** 848,069	**EASTING** 1,664,104	**24 HR.** 25.3
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/07/19	**COMP. DATE** 06/07/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
905											
	903.0	0.0	2	6	7	13		M		903.0 GROUND SURFACE	0.0
900	899.5	3.5	5	6	8	14 12		M		**RESIDUAL** Stiff, Red, Clayey SILT (A-5), with trace mica	
	897.0	6.0	6	7	5			M		897.5 Medium Stiff to Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4), with little mica	5.5
895	894.5	8.5	3	3	5	8		M			
890	889.5	13.5	6	6	6	12		M		890.0 Medium Dense, Red-White-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica	13.0
885	884.5	18.5	4	5	6	11		M		885.0 Stiff to Very Stiff, Black-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	18.0
880	879.5	23.5	4	4	5	9		M			
875	874.5	28.5	5	5	8	13		M			
870	869.5	33.5	6	9	10	19		M			
865	864.5	38.5	8	10	10	20		M		865.0 Medium Dense to Very Dense, Tan-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	38.0
860	859.5	43.5	20	33	64	97		M			
855	854.5	48.5	43	57/0.1		100/0.6				854.5 **WEATHERED ROCK** Black-White-Brown (GRANITIC ROCK)	48.5
850	849.5	53.5	60/0.1			60/0.1				849.6 **CRYSTALLINE ROCK** Black-White-Brown (GRANITIC ROCK) 849.5 Boring Terminated with Standard Penetration Test Refusal at Elevation 849.5 ft In Crystalline Rock (GRANITIC ROCK)	53.4 53.5

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B5-B	**STATION** 63+60	**OFFSET** 10 ft RT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 29.3
COLLAR ELEV. 904.0 ft	**TOTAL DEPTH** 63.8 ft	**NORTHING** 848,049	**EASTING** 1,664,133	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/10/19	**COMP. DATE** 06/10/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
905										
	904.0	0.0	2	3	3	6		M		904.0 GROUND SURFACE 0.0
900	900.5	3.5	3	7	8	15		M		**RESIDUAL** Medium Stiff to Stiff, Orange-Red, Clayey SILT (A-5), with trace mica
	898.0	6.0	4	4	5	9		M		898.5 Stiff, Orange-Brown-Black-Pink-White, Fine to Coarse Sandy SILT (A-4), with little to some mica 5.5
895	895.5	8.5	3	4	6	10		M		
890	890.5	13.5	4	5	6	11		M		
885	885.5	18.5	3	6	7	13		M		
880	880.5	23.5	4	6	7	13		M		
875	875.5	28.5	4	8	8	16		M		876.0 Medium Dense, White-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica 28.0
870	870.5	33.5	4	4	6	10		M		871.0 Stiff, Black-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with some mica 33.0
865	865.5	38.5	5	8	10	18		M		866.0 Medium Dense, Black-White-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica 38.0
860	860.5	43.5	10	12	18	30		M		861.0 Very Stiff, White-Tan-Brown, Fine to Coarse Sandy SILT (A-4), with some mica 43.0
855	855.5	48.5	16	28	38	66		M		856.0 Very Dense, Orange-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica 48.0
850	850.5	53.5	46	54/0.4		100/0.9				850.5 **WEATHERED ROCK** Black-Brown-White (GRANITIC ROCK) 53.5
845	845.5	58.5	100/0.4			100/0.4				
	840.5	63.5	100/0.3			100/0.3				840.2 Boring Terminated at Elevation 840.2 ft In Weathered Rock (GRANITIC ROCK) 63.8

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B6-A	**STATION** 65+32	**OFFSET** 31 ft LT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** Dry
COLLAR ELEV. 895.2 ft	**TOTAL DEPTH** 29.1 ft	**NORTHING** 848,221	**EASTING** 1,664,173	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/11/19	**COMP. DATE** 06/11/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
	895.2	0.0								895.2 GROUND SURFACE	0.0
			2	3	5	8		M		**ROADWAY EMBANKMENT** Medium Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	
	891.7	3.5								892.2	3.0
			3	3	4	7		M		**RESIDUAL** Medium Stiff, Black-Red-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	
	889.2	6.0								889.7	5.5
			23	29	35	64		M		Very Dense, Black-Brown-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	
	886.7	8.5								887.2	8.0
			52	48/0.3		100/0.8				**WEATHERED ROCK** Black-White (GRANITIC ROCK)	
	881.7	13.5								882.2	13.0
			9	12	16	28		M		**RESIDUAL** Medium Dense, Black-Brown-White, Silty Fine to Coarse SAND (A-2-4)	
	876.7	18.5								876.2	19.0
			20	44	56/0.3	100/0.8				**WEATHERED ROCK** Orange-Brown-White-Black (GRANITIC ROCK)	
	871.7	23.5									
			85	15/0.1		100/0.6					
	866.7	28.5									
			57	43/0.1		100/0.6				866.1 Boring Terminated at Elevation 866.1 ft In Weathered Rock (GRANITIC ROCK)	29.1

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B6-B	**STATION** 65+51	**OFFSET** 12 ft RT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** Dry
COLLAR ELEV. 895.8 ft	**TOTAL DEPTH** 23.9 ft	**NORTHING** 848,217	**EASTING** 1,664,220	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/11/19	**COMP. DATE** 06/11/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	895.8	0.0								895.8 GROUND SURFACE 0.0
			2	4	5	9		M		**ROADWAY EMBANKMENT** Stiff, Orange-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica
	892.3	3.5								892.8 3.0
			10	12	14	26		M		**RESIDUAL** Medium Dense, Brown-Black-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
	889.8	6.0								890.3 5.5
			4	6	6	12		M		Stiff, Black-White-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
	887.3	8.5								887.8 8.0
			4	5	4	9		M		Loose, Brown-Black-White, Silty Fine to Coarse SAND (A-2-4), with trace mica
	882.3	13.5								882.8 13.0
			3	4	5	9		M		Stiff, Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with little mica
	877.3	18.5								877.3 18.5
			26	74/0.4		100/0.9				**WEATHERED ROCK** Black-Brown-White (GRANITIC ROCK)
	872.3	23.5								872.0 23.8
	872.0	23.8	100/0.2			100/0.2				871.9 23.9
			60/0.1			60/0.1				**CRYSTALLINE ROCK** Black-White (GRANITIC ROCK) Boring Terminated with Standard Penetration Test Refusal at Elevation 871.9 ft In Crystalline Rock (GRANITIC ROCK)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B7-A	**STATION** 67+85	**OFFSET** 24 ft LT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** Dry
COLLAR ELEV. 893.3 ft	**TOTAL DEPTH** 28.9 ft	**NORTHING** 848,450	**EASTING** 1,664,271	**24 HR.** 20.5
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Z. Kiker	**START DATE** 06/13/19	**COMP. DATE** 06/13/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
895											
	893.3	0.0	2	3	3	6		M		893.3 GROUND SURFACE	0.0
890	889.8	3.5	5	6	5	11		M		**RESIDUAL** Medium Stiff, Brown-Red, Silty CLAY (A-7-5)	
	887.3	6.0	4	4	6	10		M		890.3 Stiff, Brown-Orange, Fine to Coarse Sandy SILT (A-4), with trace to little mica	3.0
885	884.8	8.5	6	4	5	9		M			
880	879.8	13.5	5	5	4	9		M		880.3 Loose to Dense, White-Tan-Brown, Silty Fine to Coarse SAND (A-2-4), with trace to little mica	13.0
875	874.8	18.5	5	8	8	16		M			
870	869.8	23.5	10	16	24	40		M			
865	864.5	28.8	60/0.1			60/0.1				864.5 CRYSTALLINE ROCK White-Black (BIOTITE GNEISS) 864.4	28.8 28.9
										Boring Terminated with Standard Penetration Test Refusal at Elevation 864.4 ft In Crystalline Rock (BIOTITE GNEISS)	

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. B7-B	**STATION** 67+86	**OFFSET** 20 ft RT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** Dry
COLLAR ELEV. 892.3 ft	**TOTAL DEPTH** 31.2 ft	**NORTHING** 848,437	**EASTING** 1,664,313	**24 HR.** 23.6
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Z. Kiker	**START DATE** 06/13/19	**COMP. DATE** 06/13/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
895										
	892.3	0.0	4	5	3	8		M		892.3 GROUND SURFACE 0.0
890	888.8	3.5	3	6	8	14		M		**RESIDUAL** Medium Stiff, Brown-Red, Silty CLAY (A-7-5) with trace mica
	886.3	6.0	4	3	5	8		M		889.3 3.0 Medium Stiff to Stiff, Brown-Orange-Black, Fine to Coarse Sandy SILT (A-4), with trace mica
885	883.8	8.5	4	4	5	9		M		
880	878.8	13.5	5	7	7	14		M		879.3 13.0 Medium Dense to Dense, Tan-White-Brown, Silty Fine to Coarse SAND (A-2-4), with trace mica
875	873.8	18.5	6	6	9	15		M		
870	868.8	23.5	18	18	21	39		M		
865	863.8	28.5	100/0.5			100/0.5				863.8 WEATHERED ROCK 28.5 Black-White-Brown (GRANITIC ROCK)
	861.2	31.1	60/0.1			60/0.1				861.2 CRYSTALLINE ROCK 31.1 861.1 31.2 Black-White (BIOTITE GNEISS)
										Boring Terminated with Standard Penetration Test Refusal at Elevation 861.1 ft In Crystalline Rock (BIOTITE GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 69+60	**OFFSET** 30 ft LT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 11.6
COLLAR ELEV. 877.3 ft	**TOTAL DEPTH** 60.0 ft	**NORTHING** 848,619	**EASTING** 1,664,313	**24 HR.** 9.8
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/13/19	**COMP. DATE** 06/13/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
880											
	877.3	0.0								877.3 GROUND SURFACE	0.0
875			2	3	4	7		M		**ARTIFICIAL FILL** Medium Stiff, Brown-Red, Silty CLAY (A-7-5), with trace mica	
	873.8	3.5								874.3	3.0
	871.3	6.0	3	4	6	10		M		**RESIDUAL** Stiff, Orange, Silty CLAY (A-7-5)	
870			3	7	13	20		M		871.8	5.5
	868.8	8.5								Medium Dense, Gray-Orange, Clayey Fine to Coarse SAND (A-2-6)	
			3	4	4	8				869.3	8.0
865										Loose, White-Tan-Orange-Brown, Silty Fine to Coarse SAND (A-2-4), with little mica	
	863.8	13.5									
			2	3	2	5		M			
860											
	858.8	18.5									
			2	3	6	9		M			
855											
	853.8	23.5									
			2	4	7	11		M		854.3	23.0
850										Stiff, Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with some mica	
	848.8	28.5								849.3	28.0
			7	12	14	26		M		Medium Dense, White-Tan-Brown, Silty Fine to Coarse SAND (A-2-4), with little mica	
845										844.3	33.0
	843.8	33.5								Very Stiff to Hard, White-Black-Orange-Brown, Fine to Coarse Sandy SILT (A-4), with trace to some mica	
			9	9	11	20		M			
840											
	838.8	38.5									
			9	12	21	33		M			
835											
	833.8	43.5									
			9	11	15	26		M			
830											
	828.8	48.5								829.3	48.0
			11	15	19	34		M		Dense to Very Dense, Tan-Gray-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	
825											
	823.8	53.5									
			24	26	39	65		M			
820											
	818.8	58.5								819.3	58.0
			19	25	30	55		M		Hard, Black-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica	
										817.3	60.0
										Boring Terminated at Elevation 817.3 ft In Residual Sandy SILT (A-4)	

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** A. Suttle	
SITE DESCRIPTION Bridge No. 727 on -Y15FLYCA- in Interchange Conncecting Winston-Salem Northern Beltway and I-40 Bypass				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 69+70	**OFFSET** 7 ft RT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 13.6
COLLAR ELEV. 877.3 ft	**TOTAL DEPTH** 53.9 ft	**NORTHING** 848,616	**EASTING** 1,664,352	**24 HR.** 7.0
DRILL RIG/HAMMER EFF./DATE HPC0279 Diedrich D50 82% 02/06/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Z. Kiker	**START DATE** 06/13/19	**COMP. DATE** 06/13/19	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
880										
	877.3	0.0								877.3 GROUND SURFACE 0.0
875			4	6	8	14		M		**RESIDUAL** Stiff, Orange-Red-Gray, Silty CLAY (A-7-5)
	873.8	3.5								
	871.3	6.0	5	5	8	13		M		871.8 5.5
870			5	6	8	14		M		Medium Dense, Orange-Gray, Clayey Fine to Coarse SAND (A-2-6)
	868.8	8.5								
			4	6	5	11				
865										
	863.8	13.5								
			3	4	5	9		M		
860										
	858.8	18.5								
			5	6	9	15		M		
855										
	853.8	23.5								
			7	9	12	21		M		
850										
	848.8	28.5								
			21	17	20	37		M		
845										
	843.8	33.5								
			15	20	15	35		M		
840										
	838.8	38.5								
			16	17	16	33		M		
835										
	833.8	43.5								833.3 44.0
			27	46	54/0.3	100/0.8				**WEATHERED ROCK** Gray-Pink-White-Orange (GRANITIC ROCK)
830										
	828.8	48.5	100/0.5			100/0.5				
825										
	823.8	53.5								823.4 53.9
			100/0.4			100/0.4				Boring Terminated at Elevation 823.4 ft In Weathered Rock (GRANITIC ROCK)

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	28

SITE PHOTOS

BRIDGE NO. 727
ON -Y15FLYCA-

PHOTO 1: VIEW AT BENT 1 FACING UPSTATION TOWARD B1-A AND AN UNNAMED TRIBUTARY OF FIDDLERS CREEK.

PHOTO 2: VIEW NEAR END BENT 1, FACING UPSTATION.

PHOTO 3: VIEW FROM END BENT 2 FACING DOWNSTATION.

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	8

REFERENCE: U-2579AB

PROJECT: 34839

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 *CULVERT NO. 0749 ON FUTURE I-74 RAMP AT -L- STA. 768+62.23 OVER FIDDLER'S CREEK*

CONTENTS

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.

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.

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SUBMITTED BY *K.B. MILLER* DS

DATE *NOVEMBER 2020*

NORTH CAROLINA LICENSED SEAL 1506 GEOLOGIST CHARLES R. LAVENDER III

DocuSigned by:
8EEA8D1BBA2E438...
SIGNATURE

11/10/2020
DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	6 MX		—	—	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	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	UNSUITABLE

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 RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	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 (COHESIVE)	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	4	10	40	60	200	270
OPENING (MM)	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	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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-GRAY), MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC 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
- PW — 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
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW 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
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
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-55
- [X] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] 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 YEILD 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 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 GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN 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.

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

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.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BORING LOCATIONS AND ELEVATIONS SURVEYED BY NCDOT LOCATIONS AND SURVEYS UNIT OR EXTRACTED FROM TIN FILE IN ROADWAY INVENTORY DATED 1/2011 ELEVATION: FEET

NOTES:

FIAD - Filled Immediately After Drilling

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	3

SITE PLAN

0 100 200
FEET

SKEW: 60 Degrees

NAD 83/95

OAK GROVE CHURCH RD (SR 2678)

OAK GARDEN DR

-L- WINSTON-SALEM NORTHERN BELTWAY

-Y15FLYCA- ST Sta. 90+39.94 = -L- POT Sta. 761+37.15 59.00' LT

-Y15FLYCA- CS Sta. 86+79.94

-Y15FLYCA- SC Sta. 84+83.27

-Y15RPA- POT Sta. 36+16.69 = -Y15FLYCA- POS Sta. 80+05.20 12.00' RT

-Y15FLYCA- SRS Sta. 81+23.27

-Y15RPA- ST Sta. 34+64.53

-Y15FLYBD- SC Sta. 13+60.00

-Y15FLYBD- ST Sta. 10+00.00 = -L- POT Sta. 759+92.00 71.00' RT

-L- TS Sta. 772+56.63

-Y15FLYBD- CS Sta. 22+00.63

Y15FLYCA_8440R

Y15FLYBD_2015

L 76818

L 76800

L 76911

L 76995

X7066

A

B

SEDGE GARDEN SWIM & RACQUET CLUB
DB 1010 PG 416

JORGE L. GONZALES
ROSA MARIE GONZALEZ
DB 2594 PG 3379

TERESA J. TUCKER
TIMOTHY E. TUCKER
DB 2438 PG 242
DB 1546 PG 618
DB 1636 PG 3540
DB 1597 PG 1229

TERRY W. MOTSINGER and wife
ELLEN R. MOTSINGER
DB 3096 PG 1843
DB 2039 PG 1029
DB 559 PG 154

LOREN A. LITTLE
MARGARET R. LITTLE
DB 1880 PG 3044
PB 30 PG 151

NCDOT
2953 PG 3836
PB 30 PG 151

JOSEPH K. COFFEY
YVONNE COFFEY
DB 1676 PG 574
PB 30 PG 151

THOMAS F. RILEY
CHERYL RILEY
DB 1671 PG 30
PB 30 PG 151

WALTER RAY FORTNEY, JR.
DB 2996 PG 4496
PB 46 PG 98

NCDOT
DB 3045 PG 1805
PB 46 PG 98

STEPHEN RAY NEEDHAM
SUSAN LYNN NEEDHAM
DB 2483 PG 2652
PB 46 PG 98

FIDDLERS WAY

WENDY R. HOLEMAN
DB 2482 PG 2864
PB 46 PG 98

NCDOT
DB 2877 PG 2510
PB 46 PG 98

NCDOT
DB 2848 PG 4204
PB 46 PG 98

BILLY DEAN FORD
DB 2964 PG 2639
PB 46 PG 98

-Y15FLYCA- (FLYOVER)

PIs Sta. 83+63.35	PI Sta. 85+81.66	PIs Sta. 88+00.01	PIs Sta. 78+83.34
Θs = 4° 26' 43.3"	Δ = 4° 51' 25.3" (RT)	Θs = 4° 26' 43.3"	Θs = 4° 26' 43.3"
Ls = 360.00'	D = 2° 28' 10.7"	Ls = 360.00'	Ls = 360.00'
LT = 240.08'	L = 196.67'	LT = 240.08'	LT = 240.08'
ST = 120.07'	T = 98.39'	ST = 120.07'	ST = 120.07'
INC = 60.00'	R = 2,320.00'	INC = 60.00'	INC = 60.00'
	SE = 06		

2 @ 12'X10' RCBC BURIED 1' W/ 2' SILL IN 1 BARREL 2, BACKFILLED WITH MIXTURE OF CLASS B RIP RAP AND NATIVE MATERIAL

10'-6" CLEARANCE FROM TOP OF BOX TO BOTTOM OF PIPE

16.3' CLEARANCE

GRADE TO DRAIN

ROADWAY DITCH CLASS 'B' RIP RAP EST. 70 TONS 209 SY GEOTEXTILE

2' BASE LATERAL DITCH W/CLASS 'I' RIP RAP EST. 258 TONS 332 SY GEOTEXTILE SEE SHEET '2D-1' DETAIL 'I'

SPECIAL CUT DITCH SEE SHEET '2D-1' DETAIL 'J'

2' BASE LATERAL DITCH SEE SHEET '2D-1' DETAIL 'S'

LATERAL 'V' DITCH SEE SHEET '2D-1' DETAIL 'Q'

TERESA J. TUCKER
TIMOTHY E. TUCKER
DB 2438 PG 242
DB 1546 PG 618
DB 1636 PG 3540
DB 1597 PG 1229

TERESA J. TUCKER
TIMOTHY E. TUCKER
DB 2438 PG 242
DB 1546 PG 618
DB 1636 PG 3540
DB 1597 PG 1229

TERRY W. MOTSINGER and wife
ELLEN R. MOTSINGER
DB 3096 PG 1843
DB 2039 PG 1029
DB 559 PG 154

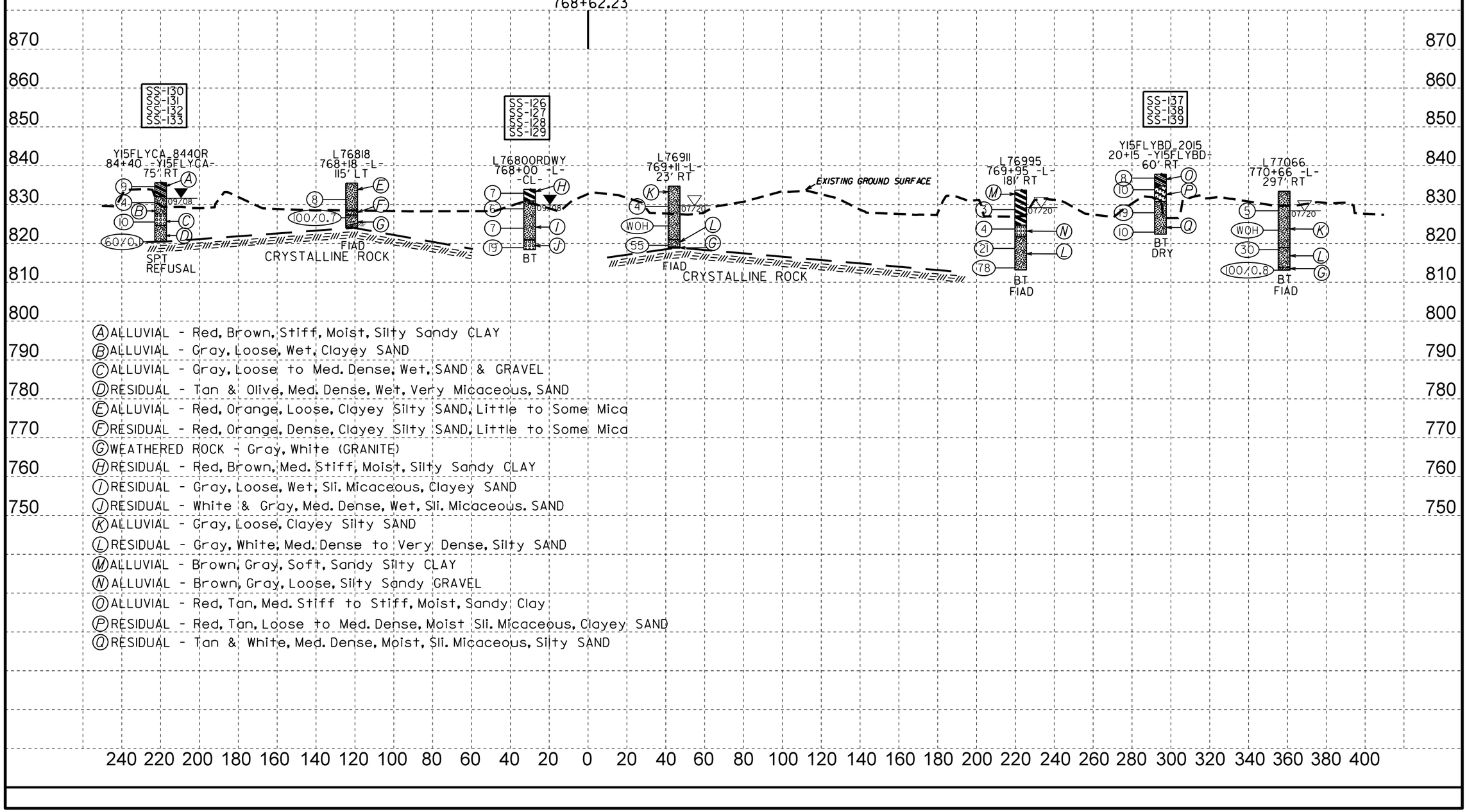
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-126	CL	768+00	0.00-1.50	A-7-6(4)	41	17	32.7	23.2	13.8	30.3	98	77	46		
SS-127	CL	768+00	4.00-5.50	A-2-4(0)	28	5	32.1	44.8	7.0	16.1	97	80	27		
SS-128	CL	768+00	9.00-10.50	A-2-4(0)	27	NP	27.6	50.1	6.2	16.1	100	90	27		
SS-129	CL	768+00	14.00-15.50	A-1-b(0)	20	NP	67.2	22.7	5.0	5.0	68	34	9		
SS-130	75 RT	84+40	0.00-1.50	A-6(6)	38	12	12.1	28.7	20.9	38.3	100	94	64		
SS-131	75 RT	84+40	4.10-5.60	A-2-4(0)	23	NP	24.4	52.5	7.0	16.1	100	95	28		
SS-132	75 RT	84+40	9.10-10.60	A-1-b(0)	23	NP	72.0	18.1	3.8	6.1	89	39	11		
SS-133	75 RT	84+40	14.10-15.60	A-2-4(0)	32	NP	30.9	52.7	8.4	8.1	98	89	22		
SS-137	60 RT	20+75	0.00-1.50	A-6(5)	36	18	30.9	22.2	6.6	40.4	99	80	49		
SS-138	60 RT	20+75	3.00-4.50	A-2-6(0)	35	12	41.8	29.5	4.5	24.2	98	72	31		
SS-139	60 RT	20+75	8.90-10.40	A-2-4(0)	36	NP	45.2	35.1	12.6	7.1	93	65	25		

0 50 100
FEET
VE = 2:1

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	4

SECTION ALONG CULVERT -CL- AT STA 768+62.23 -L-, SKEW: 60 DEGREES



Ⓐ ALLUVIAL - Red, Brown, Stiff, Moist, Silty Sandy CLAY
Ⓑ ALLUVIAL - Gray, Loose, Wet, Clayey SAND
Ⓒ ALLUVIAL - Gray, Loose to Med. Dense, Wet, SAND & GRAVEL
Ⓓ RESIDUAL - Tan & Olive, Med. Dense, Wet, Very Micaceous, SAND
Ⓔ ALLUVIAL - Red, Orange, Loose, Clayey Silty SAND, Little to Some Mica
Ⓕ RESIDUAL - Red, Orange, Dense, Clayey Silty SAND, Little to Some Mica
Ⓖ WEATHERED ROCK - Gray, White (GRANITE)
Ⓗ RESIDUAL - Red, Brown, Med. Stiff, Moist, Silty Sandy CLAY
Ⓘ RESIDUAL - Gray, Loose, Wet, Sli. Micaceous, Clayey SAND
Ⓙ RESIDUAL - White & Gray, Med. Dense, Wet, Sli. Micaceous. SAND
Ⓚ ALLUVIAL - Gray, Loose, Clayey Silty SAND
Ⓛ RESIDUAL - Gray, White, Med. Dense to Very Dense, Silty SAND
Ⓜ ALLUVIAL - Brown, Gray, Soft, Sandy Silty CLAY
Ⓝ ALLUVIAL - Brown, Gray, Loose, Silty Sandy GRAVEL
Ⓞ ALLUVIAL - Red, Tan, Med. Stiff to Stiff, Moist, Sandy Clay
Ⓟ RESIDUAL - Red, Tan, Loose to Med. Dense, Moist Sli. Micaceous, Clayey SAND
Ⓠ RESIDUAL - Tan & White, Med. Dense, Moist, Sli. Micaceous, Silty SAND

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION CULVERT NO. 0749 ON FUTURE WINSTON-SALEM NORTHERN BELTWAY OVER FIDDLER'S CREEK				**GROUND WTR (ft)**
BORING NO. L76800RDWY	**STATION** 768+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** 6.0
COLLAR ELEV. 833.9 ft	**TOTAL DEPTH** 15.5 ft	**NORTHING** 850,018	**EASTING** 1,664,192	**24 HR.** 4.0
DRILL RIG/HAMMER EFF./DATE CME-550X		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 09/25/08	**COMP. DATE** 09/25/08	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
835										ELEV. (ft) DEPTH (ft)
	833.9	0.0								833.9 0.0 GROUND SURFACE
			3	3	4	7	SS-126	M		**RESIDUAL** Red, Brown, Med. Stiff, Moist, Silty Sandy CLAY
830	829.9	4.0								830.9 3.0
			2	3	3	6	SS-127	W		Gray, Loose, Wet, Sli. Micaceous, Clayey SAND
825	824.9	9.0								
			2	3	4	7	SS-128	W		
820	819.9	14.0								820.9 13.0
			7	9	10	19	SS-129	W		White & Gray, Med. Dense, Wet, Sli. Micaceous SAND
										818.4 15.5
										Boring Terminated at Elevation 818.4 ft in MED. DENSE WET SAND (A-1-B)

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.	
SITE DESCRIPTION CULVERT NO. 0749 ON FUTURE WINSTON-SALEM NORTHERN BELTWAY OVER FIDDLER'S CREEK				**GROUND WTR (ft)**
BORING NO. L76818	**STATION** 768+18	**OFFSET** 115 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 835.5 ft	**TOTAL DEPTH** 11.5 ft	**NORTHING** 849,993	**EASTING** 1,664,306	**24 HR.** FIAD
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** 07/06/20	**COMP. DATE** 07/06/20	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
840										
835										835.5 0.0 GROUND SURFACE
	832.3	3.2	2	3	5	8		M		**ALLUVIAL** Red, Orange, Clayey Silty SAND, Little to Some Mica
830										828.6 6.9
	827.3	8.2								827.3 8.2 **RESIDUAL** Red, Orange, Clayey Silty SAND, Little to Some Mica
825			62	38/.02		100/0.7				824.0 11.5 **WEATHERED ROCK** Gray, White (GRANITE)
										Boring Terminated by Auger Refusal at Elevation 824.0 ft on CRYSTALLINE ROCK (GRANITE)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.	
SITE DESCRIPTION CULVERT NO. 0749 ON FUTURE WINSTON-SALEM NORTHERN BELTWAY OVER FIDDLER'S CREEK				**GROUND WTR (ft)**
BORING NO. L76911	**STATION** 769+11	**OFFSET** 23 ft RT	**ALIGNMENT** -L-	**0 HR.** 5.0
COLLAR ELEV. 834.7 ft	**TOTAL DEPTH** 15.9 ft	**NORTHING** 849,908	**EASTING** 1,664,163	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550X 89% 12/16/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Smith, C. L.	**START DATE** 07/06/20	**COMP. DATE** 07/06/20	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
835										834.7 GROUND SURFACE	0.0
										ALLUVIAL Gray, Clayey Silty SAND	
830	830.5	4.2	1	2	2	4		M			
825	825.5	9.2	WOH	WOH	WOH	0		W		821.0	13.7
820	820.5	14.2	7	13	42	55		D		819.1 **RESIDUAL** Gray, White, Silty SAND	15.6
										818.8 **WEATHERED ROCK** Gray, White (GRANITE)	15.9
										Boring Terminated by Auger Refusal at Elevation 818.8 ft on CRYSTALLINE ROCK (GRANITE)	

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.	
SITE DESCRIPTION CULVERT NO. 0749 ON FUTURE WINSTON-SALEM NORTHERN BELTWAY OVER FIDDLER'S CREEK				**GROUND WTR (ft)**
BORING NO. L76995	**STATION** 769+95	**OFFSET** 181 ft RT	**ALIGNMENT** -L-	**0 HR.** 4.5
COLLAR ELEV. 833.7 ft	**TOTAL DEPTH** 20.5 ft	**NORTHING** 849,834	**EASTING** 1,664,000	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550X 89% 12/16/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Smith, C. L.	**START DATE** 07/06/20	**COMP. DATE** 07/06/20	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
835										833.7 GROUND SURFACE	0.0
										ALLUVIAL Brown, Gray, Sandy Silty CLAY	
830	829.7	4.0	1	2	1	3		M			
825	824.7	9.0	4	2	2	4		W		824.7 Brown, Gray, Silty Sandy GRAVEL	9.0
820	819.7	14.0	8	9	12	21		M		821.7 **RESIDUAL** Gray, White, Silty SAND	12.0
815	814.7	19.0	34	38	40	78		M		813.2 Boring Terminated at Elevation 813.2 ft in RESIDUAL, Silty SAND	20.5

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.	
SITE DESCRIPTION CULVERT NO. 0749 ON FUTURE WINSTON-SALEM NORTHERN BELTWAY OVER FIDDLER'S CREEK				**GROUND WTR (ft)**
BORING NO. L77066	**STATION** 770+66	**OFFSET** 297 ft RT	**ALIGNMENT** -L-	**0 HR.** 5.0
COLLAR ELEV. 833.4 ft	**TOTAL DEPTH** 20.3 ft	**NORTHING** 849,770	**EASTING** 1,663,880	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550X 89% 12/16/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Smith, C. L.	**START DATE** 07/06/20	**COMP. DATE** 07/06/20	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
835										833.4	0.0
										GROUND SURFACE	
										ALLUVIAL	
830	829.4	4.0	1	3	2	5		M		Gray, Clayey Silty SAND	
825	824.4	9.0	WOH	WOH	WOH	0		W			
820	819.4	14.0	1	10	20	30		M		818.9	14.5
										RESIDUAL	
815	814.4	19.0	9	39	61/0.3	100/0.8				Gray, White, Silty SAND	
										813.9	19.5
										813.1	20.3
										WEATHERED ROCK	
										Tan, Gray and White (GRANITE)	
										Boring Terminated at Elevation 813.1 ft in WEATHERED ROCK (GRANITE)	

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION CULVERT NO. 0749 ON FUTURE WINSTON-SALEM NORTHERN BELTWAY OVER FIDDLER'S CREEK				**GROUND WTR (ft)**
BORING NO. Y15FLYBD_2015	**STATION** 20+15	**OFFSET** 60 ft RT	**ALIGNMENT** -Y15FLYBD-	**0 HR.** Dry
COLLAR ELEV. 837.8 ft	**TOTAL DEPTH** 15.4 ft	**NORTHING** 849,867	**EASTING** 1,663,904	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CME-550X		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Estep, J. E.	**START DATE** 09/25/08	**COMP. DATE** 09/25/08	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
840										
	837.8	0.0								837.8 GROUND SURFACE 0.0
			3	4	4	8	SS-137	M		**ALLUVIAL**
835	834.8	3.0								Red, Tan, Med. Stiff To Stiff, Moist, Sandy CLAY 834.8 3.0
			4	4	6	10	SS-138	M		**RESIDUAL**
830	828.9	8.9								Red, Tan, Loose To Med. Dense, Moist, Sli. Micaceous, Clayey SAND 830.8 7.0
			4	5	14	19	SS-139	M		Tan & White, Med. Dense, Moist, Sli. Micaceous, Silty SAND
825	823.9	13.9								
			4	5	5	10		M		822.4 15.4
										Boring Terminated at Elevation 822.4 ft in MED. DENSE MOIST SILTY SAND (A-2-4)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Murray, C. C.	
SITE DESCRIPTION CULVERT NO. 0749 ON FUTURE WINSTON-SALEM NORTHERN BELTWAY OVER FIDDLER'S CREEK				**GROUND WTR (ft)**
BORING NO. Y15FLYCA_8440R	**STATION** 84+40	**OFFSET** 75 ft RT	**ALIGNMENT** -Y15FLYCA-	**0 HR.** 6.0
COLLAR ELEV. 835.6 ft	**TOTAL DEPTH** 15.2 ft	**NORTHING** 850,086	**EASTING** 1,664,370	**24 HR.** 4.0
DRILL RIG/HAMMER EFF./DATE CME-550X		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Estep, J. E.	**START DATE** 09/25/08	**COMP. DATE** 09/25/08	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
840											
835	835.6	0.0	4	5	4	9	SS-130	M		835.6 GROUND SURFACE	0.0
										ALLUVIAL Red, Brown, Stiff, Moist, Silty Sandy CLAY	
	831.5	4.1								832.1	3.5
830			3	2	2	4	SS-131			Gray, Loose, Wet, Clayey SAND	
	826.5	9.1								827.6	8.0
825			4	4	6	10	SS-132	W		Gray, Loose To Med. Dense, Wet, SAND & GRAVEL	
										824.6	11.0
	821.5	14.1								**RESIDUAL** Tan & Olive, Med. Dense, Wet, Very Micaceous, SAND	
			8	19	60/0.1	60/0.1	SS-133	W		820.5	15.1
										820.4 **CRYSTALLINE ROCK**	15.2
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 820.4 ft in CRYSTALLINE ROCK	

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	6

REFERENCE: U-2579AB

PROJECT: 34839

CONTENTS

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 *CULVERT NO. 0750 AT STATION 18+22.67 -Y5B-*

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

INVESTIGATED BY *C.R. LAVENDER, III*

DRAWN BY *J.E. BEVERLY* JEB

CHECKED BY *K.B. MILLER*

SUBMITTED BY *K.B. MILLER*

DATE *FEBRUARY 2021*

NORTH CAROLINA LICENSED SEAL 1506 GEOLOGIST CHARLES R. LAVENDER III

DocuSigned by:
8EEA8D1BBA2E438...

2/3/2021

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	—	6 MX	—	NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	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	UNSUITABLE

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 RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	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 (COHESIVE)	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	4	10	40	60	200	270
OPENING (MM)	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	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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-GRAY), MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC 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
- PW — 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
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW 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
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
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- ☐ CME-45C
- ☐ CME-55
- ☐ CME-550
- ☐ VANE SHEAR TEST
- ☐ PORTABLE HOIST
- ☐ _____
- ☐ _____

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 YEILD 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 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 GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN 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.

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

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.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BORING ELEVATIONS AND COORDINATE LOCATIONS PROVIDED BY DIVISION 10 LOCATION AND SURVEYS UNIT IN JAN. 2021
ELEVATION: FEET

NOTES:

FIAD - FILLED IMMEDIATELY AFTER DRILLING

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	3

SITE PLAN

0 50 100
FEET

NAD 83/95

-Y5B- PC Sta. 20+00.34

-Y5B- PT Sta. 17+77.81

-Y20- PT Sta. 23+69.68

MEREDITH WAY

EMBARK DR

SPECIAL CUT DITCH
SEE SHEET '2D-1'
DETAIL 'B'

1 @ 7'X8' RCBC,
BURIED 1', BACKFILLED WITH
MIXTURE OF CLASS B RIP RAP
AND NATIVE MATERIAL

STANDARD 'V' DITCH
SEE SHEET '2D-1'
DETAIL 'Y'
SLOPE = 0.97%

3 @ 12'X7' RCBC,
BURIED 1' WITH
2' SILLS IN BARRELS
2 & 3, BACKFILLED WITH
MIXTURE OF CLASS B RIP RAP
AND NATIVE MATERIAL

B-1
B-2
B-3

RETAIN

WD FOOT BRIDGE

GAZEBO

JB w/MH

CB

ISFD

2SFD

BST

CONC

GREU TL-2

2GI

JS

48" CONC

72" WD

48" WD RAIL

15" RCP

15" HDPE

0	10	20

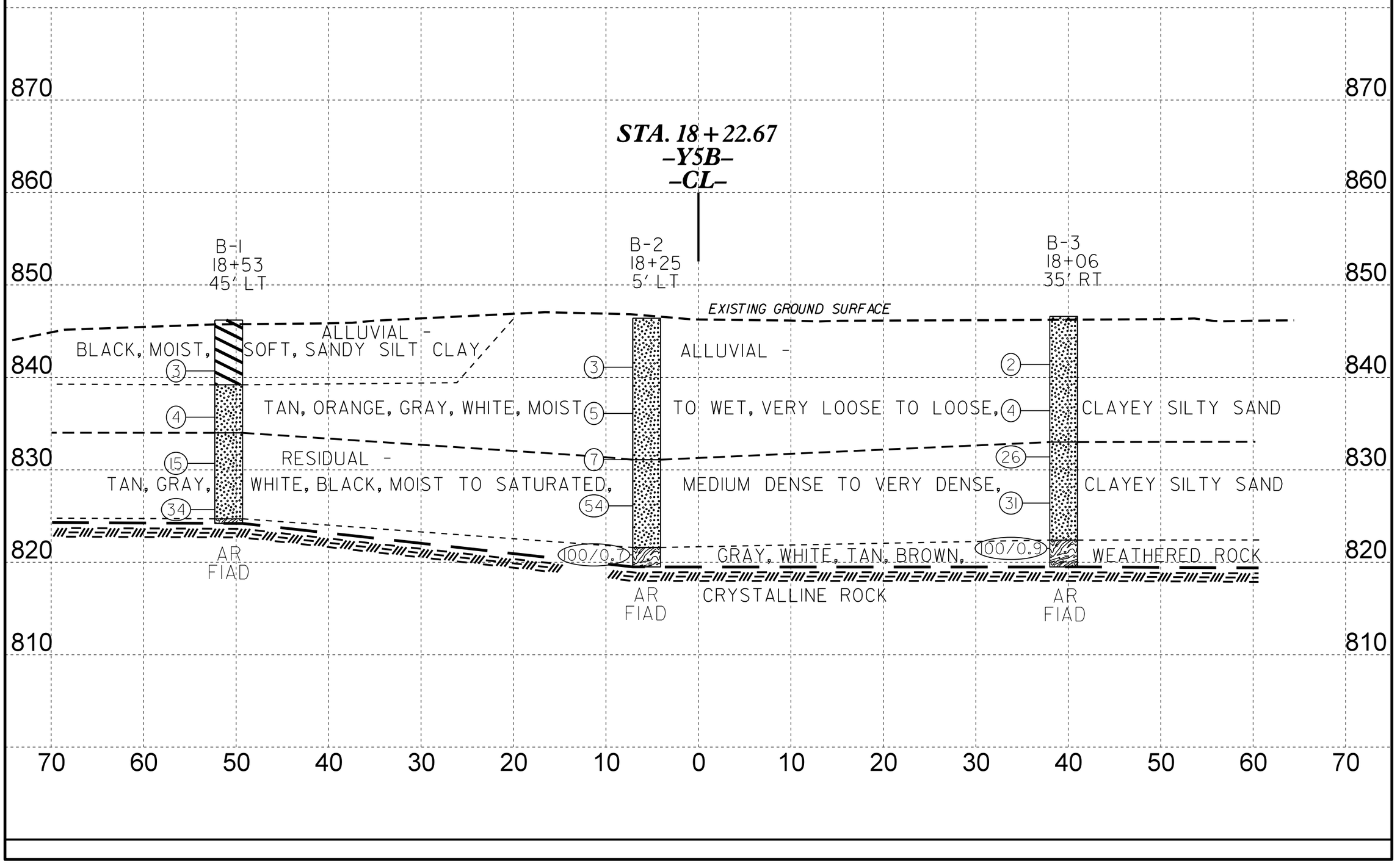
FEET

VE = 1:1

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	4

SECTION ALONG CULVERT –CL– AT STA. 18+22.67 –Y5B–, SKEW: 117 DEGREES

STRUCTURE NO. 0750



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.	
SITE DESCRIPTION Culvert No. 0750 on Meredith Way over Fiddler's Creek				**GROUND WTR (ft)**
BORING NO. B-1	**STATION** 18+53	**OFFSET** 45 ft LT	**ALIGNMENT** -Y5B-	**0 HR.** N/A
COLLAR ELEV. 846.2 ft	**TOTAL DEPTH** 22.0 ft	**NORTHING** 849,448	**EASTING** 1,666,213	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0070 CME-550X 79% 12/16/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Smith, C. L.	**START DATE** 01/22/21	**COMP. DATE** 01/22/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
850										
845										846.2 GROUND SURFACE 0.0 **ALLUVIAL** BLACK, MOIST, SOFT, SANDY SILTY CLAY
	841.7	4.5	1	1	2	3		M		
840										839.2 7.0 **ALLUVIAL** TAN, ORANGE, GRAY, WHITE, WET, LOOSE, CLAYEY SILTY SAND
	836.7	9.5	1	2	2	4		W		
835										834.0 12.2 **RESIDUAL** TAN, GRAY, WHITE, BLACK, MOIST TO SATURATED, MEDIUM DENSE TO DENSE, CLAYEY SILTY SAND
	831.7	14.5	3	6	9	15		Sat.		
830										
	826.7	19.5	7	13	21	34		M		824.7 21.5 824.2 22.0 **WEATHERED ROCK** TAN, GRAY, WHITE, WEATHERED ROCK Boring Terminated by Auger Refusal at Elevation 824.2 ft on Crystalline Rock
825										

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.	
SITE DESCRIPTION Culvert No. 0750 on Meredith Way over Fiddler's Creek				**GROUND WTR (ft)**
BORING NO. B-2	**STATION** 18+25	**OFFSET** 5 ft LT	**ALIGNMENT** -Y5B-	**0 HR.** N/A
COLLAR ELEV. 846.4 ft	**TOTAL DEPTH** 26.9 ft	**NORTHING** 849,406	**EASTING** 1,666,237	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0070 CME-550X 79% 12/16/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Smith, C. L.	**START DATE** 01/22/21	**COMP. DATE** 01/22/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
850										
845										846.4 GROUND SURFACE 0.0 **ALLUVIAL** TAN, ORANGE, GRAY, WHITE, MOIST TO WET, VERY LOOSE TO LOOSE, CLAYEY SILTY SAND
	842.1	4.3	1	1	2	3		M		
840										
	837.1	9.3	1	2	3	5		W		
835										
	832.1	14.3	1	2	5	7		M		831.1 15.3 **RESIDUAL** TAN, GRAY, WHITE, BLACK, MOIST, MEDIUM DENSE TO VERY DENSE, CLAYEY SILTY SAND
830										
	827.1	19.3	11	31	23	54		M		
825										
	822.1	24.3	18	51	49/0.2	100/0.7				821.6 24.8 819.5 26.9 **WEATHERED ROCK** GRAY, WHITE, TAN, BROWN, WEATHERED ROCK Boring Terminated by Auger Refusal at Elevation 819.5 ft on Crystalline Rock
820										

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.	
SITE DESCRIPTION Culvert No. 0750 on Meredith Way over Fiddler's Creek				**GROUND WTR (ft)**
BORING NO. B-3	**STATION** 18+06	**OFFSET** 35 ft RT	**ALIGNMENT** -Y5B-	**0 HR.** N/A
COLLAR ELEV. 846.6 ft	**TOTAL DEPTH** 27.1 ft	**NORTHING** 849,370	**EASTING** 1,666,265	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0070 CME-550X 79% 12/16/2019		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Smith, C. L.	**START DATE** 01/22/21	**COMP. DATE** 01/22/21	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
850										
										846.6 GROUND SURFACE 0.0
845										**ALLUVIAL** TAN, ORANGE, GRAY, WHITE, MOIST TO WET, VERY LOOSE TO LOOSE, CLAYEY SILTY SAND
	842.4	4.2	1	1	1	2		M		
840										
	837.4	9.2	2	2	2	4		W		
835										
	832.4	14.2	4	10	16	26		M		833.0 13.6 **RESIDUAL** TAN, GRAY, WHITE, BLACK, MOIST, MEDIUM DENSE TO DENSE, CLAYEY SILTY SAND
830										
	827.4	19.2	5	10	21	31		M		
825										
	822.4	24.2	44	56/0.4		100/0.9				822.4 24.2 **WEATHERED ROCK** GRAY, WHITE, TAN, BROWN, WEATHERED ROCK
820										819.5 27.1 Boring Terminated by Auger Refusal at Elevation 819.5 ft on Crystalline Rock

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	5

REFERENCE: U-2579AB

PROJECT: 34839

CONTENTS

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 *CULVERT AT Sta. 19+75.11 -Y5B-*

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

INVESTIGATED BY *C.R. LAVENDER, III*

DRAWN BY *J.E. BEVERLY* DS JEB

CHECKED BY *K.B. MILLER*

SUBMITTED BY *C.R. LAVENDER, III*

DATE *SEPTEMBER 2020*

NORTH CAROLINA LICENSED SEAL 1506 GEOLOGIST CHARLES R. LAVENDER III

DocuSigned by:
8EEA8D1BBA2E438...
9/23/2020
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	6 MX		—	—	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	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	UNSUITABLE

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 RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	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 (COHESIVE)	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	4	10	40	60	200	270
OPENING (MM)	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	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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-GRAY), MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC 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
- PW — 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
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW 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
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
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-55
- [X] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] 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 YEILD 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 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 GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN 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.

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

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.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BORING LOCATIONS AND ELEVATIONS SURVEYED BY NCDOT LOCATION AND SURVEYS UNIT

ELEVATION: FEET

NOTES:

FIAD - FILLED IMMEDIATELY AFTER DRILLING

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	3

SITE PLAN

0 50 100
FEET

NAD 83/95

-Y5B- PC Sta. 20+00.34

-Y5B- PT Sta. 17+77.81

1 @ 7'X8' RCBC, BURIED 1', BACKFILLED WITH MIXTURE OF CLASS B RIP RAP AND NATIVE MATERIAL

3 @ 12'X7' RCBC, BURIED 1' WITH 2' SILLS IN BARRELS 2 & 3, BACKFILLED WITH MIXTURE OF CLASS B RIP RAP AND NATIVE MATERIAL

SPECIAL CUT DITCH SEE SHEET '2D-1' DETAIL 'B'

STANDARD 'V' DITCH SEE SHEET '2D-1' DETAIL 'Y' SLOPE = 0.97%

CULVERT AT -Y5B- 19+75.11

Y5B1978

Y5B1998

MEREDITH WAY

BACK DR

EMBARK DR

REMOVE CB

REMOVE 61' OF PIPE

REPAIR LAST JOINT

RETAIN

REMOVE

GREU TL-2

2GI

15" RCP-III

15" RCP

15" HDPE

48" WD

72" WD

48" WD RAIL

48" CONC

72" CONC

BST

JS

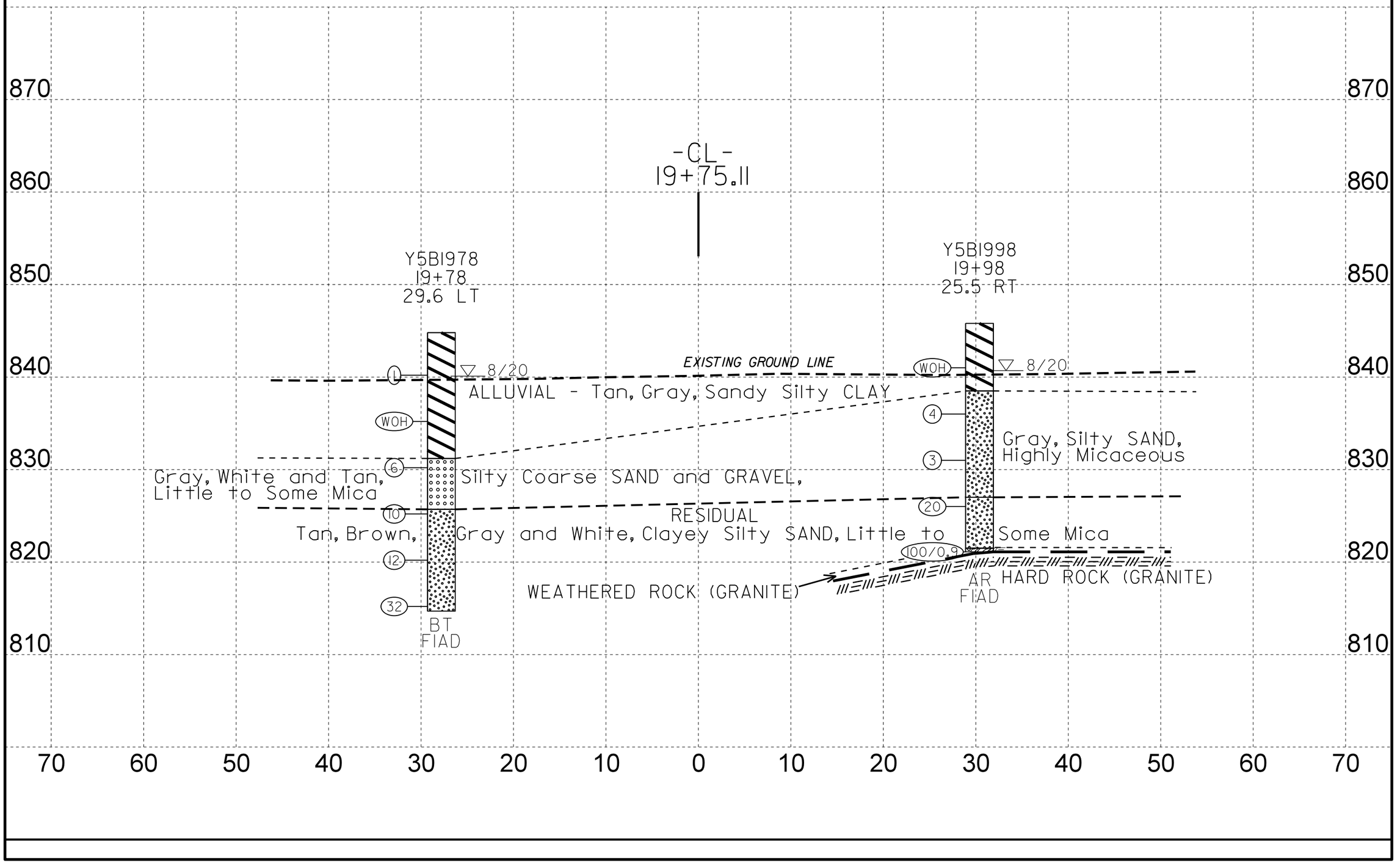
ST

2601 2602 2603 2604 2605 2606 2607 2608 2609 2611 2612 2613 2614 2615

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	4

SECTION ALONG CULVERT –CL– AT STA. 19+75.11 –Y5B–, SKEW: 76 DEGREES

0 10 20
FEET
VE = 1:1



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.	
SITE DESCRIPTION CULVERT ON MEREDITH WAY OVER TRIBUTARY TO FIDDLER'S CREEK				**GROUND WTR (ft)**
BORING NO. Y5B1978	**STATION** 19+78	**OFFSET** 30 ft LT	**ALIGNMENT** -Y5B-	**0 HR.** 4.7
COLLAR ELEV. 844.8 ft	**TOTAL DEPTH** 30.1 ft	**NORTHING** 849,553	**EASTING** 1,666,283	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550X 89% 12/16/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Smith, C. L.	**START DATE** 07/08/20	**COMP. DATE** 07/08/20	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
845										844.8 GROUND SURFACE	0.0
	841.2	3.6	WOH	WOH	1	1		M		**ALLUVIAL** Tan, Gray, Sandy Silty CLAY	
840											
	836.2	8.6	WOH	WOH	WOH	0		W			
835											
	831.2	13.6	1	2	4	6		Sat.		831.2 Gray, White and Tan, Silty Coarse SAND and GRAVEL, Little to Some Mica	13.6
830											
	826.2	18.6	6	5	5	10		M		825.7 **RESIDUAL** Tan, Brown, Gray and White, Clayey Silty SAND, Little to Some Mica	19.1
825											
	821.2	23.6	2	5	7	12		M			
820											
	816.2	28.6	20	20	12	32				814.7 Boring Terminated at Elevation 814.7 ft in Residual, Silty SAND	30.1
815											

WBS 34839.1.8	**TIP** U-2579AB	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.	
SITE DESCRIPTION CULVERT ON MEREDITH WAY OVER TRIBUTARY TO FIDDLER'S CREEK				**GROUND WTR (ft)**
BORING NO. Y5B1998	**STATION** 19+98	**OFFSET** 26 ft RT	**ALIGNMENT** -Y5B-	**0 HR.** 5.1
COLLAR ELEV. 845.8 ft	**TOTAL DEPTH** 24.7 ft	**NORTHING** 849,546	**EASTING** 1,666,342	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550X 89% 12/16/2019		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Smith, C. L.	**START DATE** 07/07/20	**COMP. DATE** 07/07/20	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
850												
	842.0	3.8	WOH	WOH	WOH	0					845.8	GROUND SURFACE 0.0
845												
	837.0	8.8	1	2	2	4		M				
840												
	832.0	13.8	1	2	1	3					838.5	Gray, Silty SAND, Highly Micaceous 7.3
835								M				
	827.0	18.8	4	6	14	20		Sat.				
830												
	822.0	23.8	7	93/0.4		100/0.9		Sat.			827.0	**RESIDUAL** Tan, Brown, Gray and White, Clayey Silty SAND, Little to Some Mica 18.8
825												
											821.5	24.3
											821.1	**WEATHERED ROCK** Tan, Brown, Gray and White (GRANITE) 24.7
												Boring Terminated by Auger Refusal at Elevation 821.1 ft on CRYSTALLINE ROCK (GRANITE)