

REFERENCE: R-2707E

PROJECT: 34497

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY CLEVELAND
 PROJECT DESCRIPTION US 74, SHELBY BYPASS FROM
EXISTING US 74 WEST OF SR 2238 (LONG BRANCH
ROAD) TO WEST OF SR 1001

SITE DESCRIPTION STRUCTURE #7 - BRIDGE NO. 494
OVER US 74 (DIXON BLVD.) ON -Y42- BETWEEN
SR 2041 (WILLIAMS RD.) AND US 74 BUSINESS
(E. MARION ST.)

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
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8-12	BORE LOGS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707E	1	12

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 T07-6850. 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

HPC

GOODNIGHT, D.J.

INVESTIGATED BY GOODNIGHT, D.J.

DRAWN BY CROCKETT, S.C.

CHECKED BY HAMM, J.R.

SUBMITTED BY FALCON ENG.

DATE MARCH 2019



DocuSigned by:
 Jeremy R Hamm

3/20/2019

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SIGNATURE

DATE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

SOIL LEGEND AND AASHTO CLASSIFICATION

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

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)
GENERALLY GRANULAR MATERIAL (NON-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 OPENING (MM)	4	10	40	60	200	270
	4.76	2.00	0.42	0.25	0.075	0.053
Boulder (BLDR.)						
Cobble (COB.)						
Gravel (GR.)						
Coarse Sand (CSE. SD.)						
Fine Sand (F SD.)						
Silt (SL.)						
Clay (CL.)						
GRAIN SIZE	305	75	2.0	0.25	0.05	0.005
MM						
IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

RECOMMENDATION SYMBOLS

- UNDERCUT EXCAVATION
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - 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
- W - UNIT WEIGHT
- W_d - DRY UNIT WEIGHT
- S - BULK
- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RS - ROCK
- RT - RECOMPACTED TRIAXIAL
- CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

- DRILL UNITS:
 - CME-45C
 - CME-55
 - CME-550X
 - 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 2 15/16" 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 IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

- WEATHERED ROCK (WR)
NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
- CRYSTALLINE ROCK (CR)
FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
- NON-CRYSTALLINE ROCK (NCR)
FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
- COASTAL PLAIN SEDIMENTARY ROCK (CP)
COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

- FRESH** - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
- VERY SLIGHT (IV SLI.)** - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
- SLIGHT (SLI.)** - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
- MODERATE (MOD.)** - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
- MODERATELY SEVERE (MOD. SEV.)** - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
- SEVERE (SEV.)** - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*
- VERY SEVERE (IV SEV.)** - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*
- COMPLETE** - ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

- VERY HARD** - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
- HARD** - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
- MODERATELY HARD** - CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
- MEDIUM HARD** - CAN BE GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
- SOFT** - CAN BE GROUDED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
- VERY SOFT** - CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

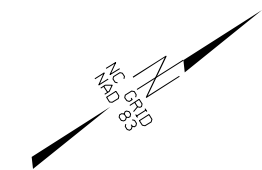
- FRIABLE** - RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
- MODERATELY INDURATED** - GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
- INDURATED** - GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
- EXTREMELY INDURATED** - SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

- ALLUVIUM (ALLUV.)** - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
- AQUIFER** - A WATER BEARING FORMATION OR STRATA.
- ARENACEOUS** - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
- ARGILLACEOUS** - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
- ARTESIAN** - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
- CALCAREOUS (CALC.)** - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
- COLLUVIUM** - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
- CORE RECOVERY (REC.)** - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
- DIKE** - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
- DIP** - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
- DIP DIRECTION (DIP AZIMUTH)** - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
- FAULT** - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
- FISSILE** - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
- FLOAT** - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED FROM PARENT MATERIAL.
- FLOOD PLAIN (FP)** - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
- FORMATION (FM)** - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
- JOINT** - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
- LEDGE** - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
- LENS** - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
- MOTTLED (MOT.)** - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
- PERCHED WATER** - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
- RESIDUAL (RES.) SOIL** - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
- ROCK QUALITY DESIGNATION (ROD)** - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
- SAPROLITE (SAP.)** - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
- SILL** - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
- SLICKENISE** - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
- STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)** - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
- STRATA CORE RECOVERY (SREC.)** - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- STRATA ROCK QUALITY DESIGNATION (SROD)** - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
- TOPSOIL (TS.)** - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

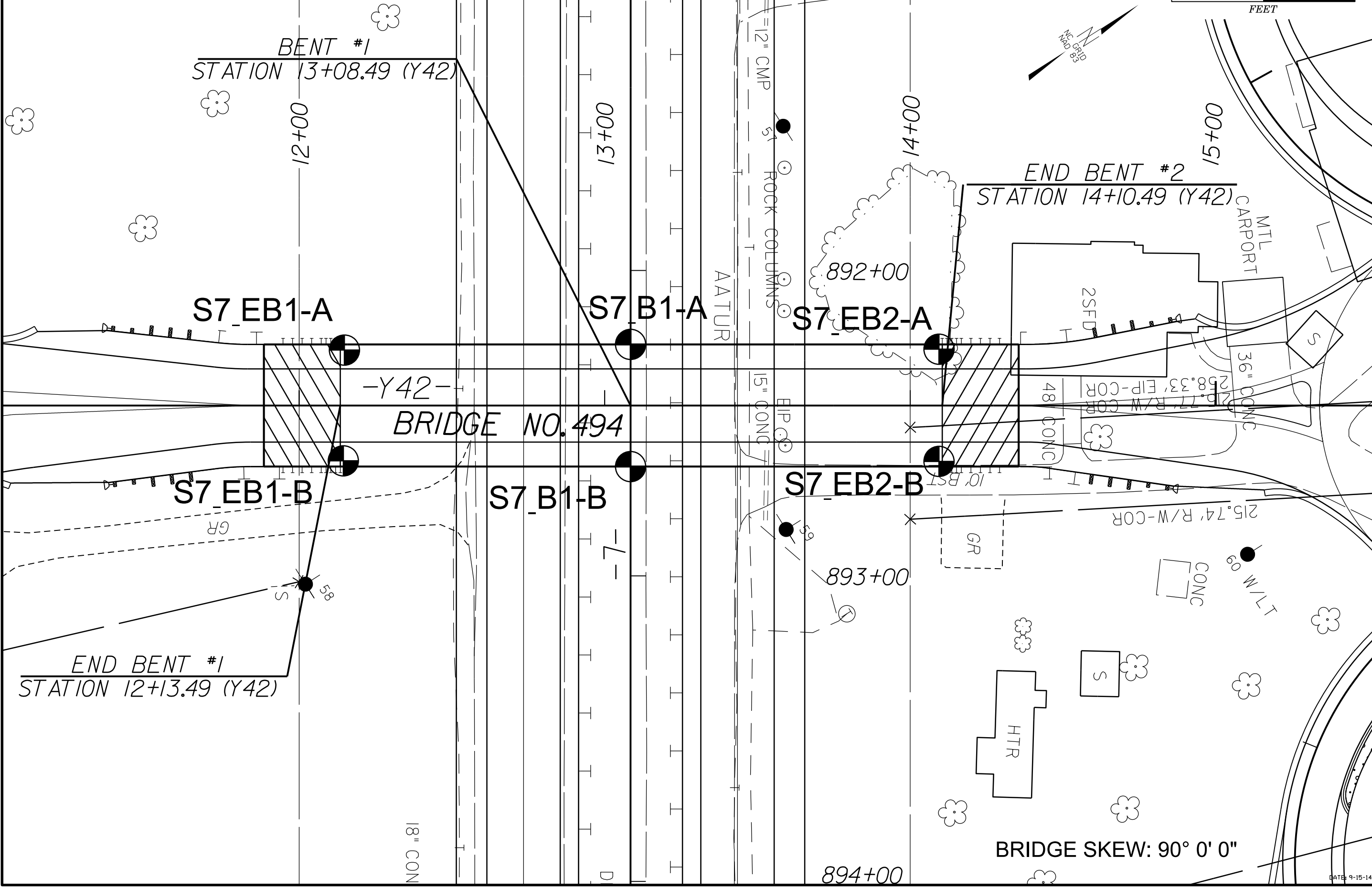
BENCH MARK: BY34-214
STATION -L- POT 889+00, I9.43' LT
N: 554966J, E: 1269217.6 ELEVATION: 770.37 FEET

NOTES:
FIAD - FILLED IMMEDIATELY AFTER DRILLING



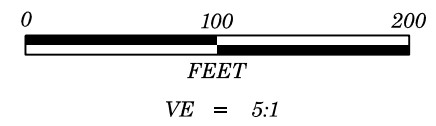
BENT #1
STATION 13+08.49 (Y42)

END BENT #2
STATION 14+10.49 (Y42)

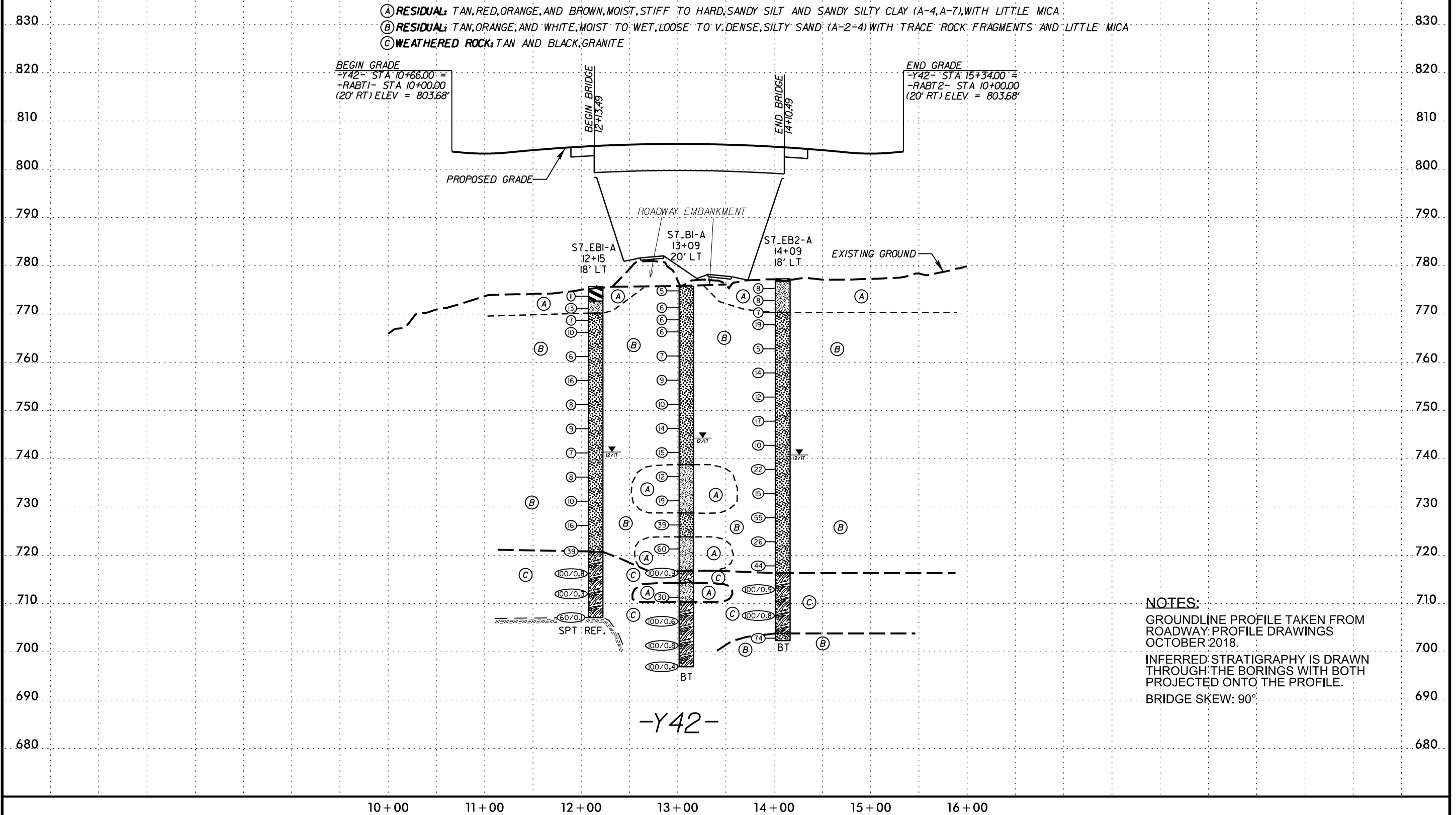


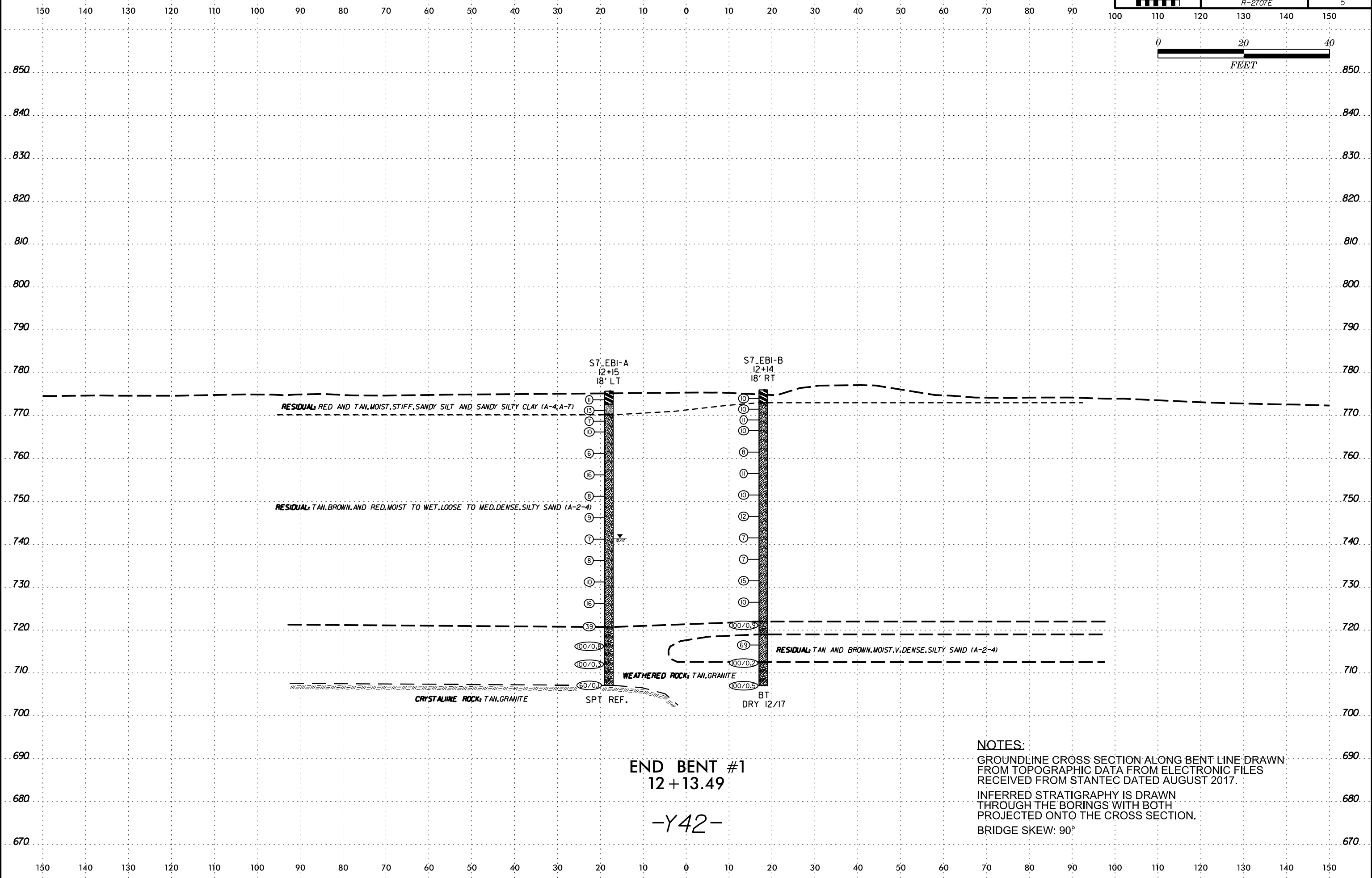
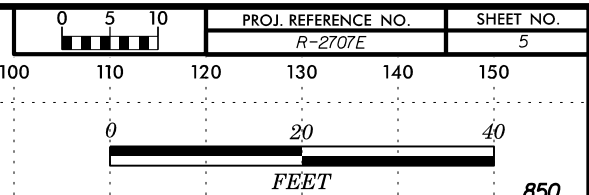
BRIDGE NO. 494

BRIDGE SKEW: 90° 0' 0"



PROJECT REFERENCE NO.	SHEET NO.
R-2707E	4
STRUCTURE #7, BRIDGE OVER US 74 ON -Y42- BETWEEN 2041 AND US 74 BUS.	



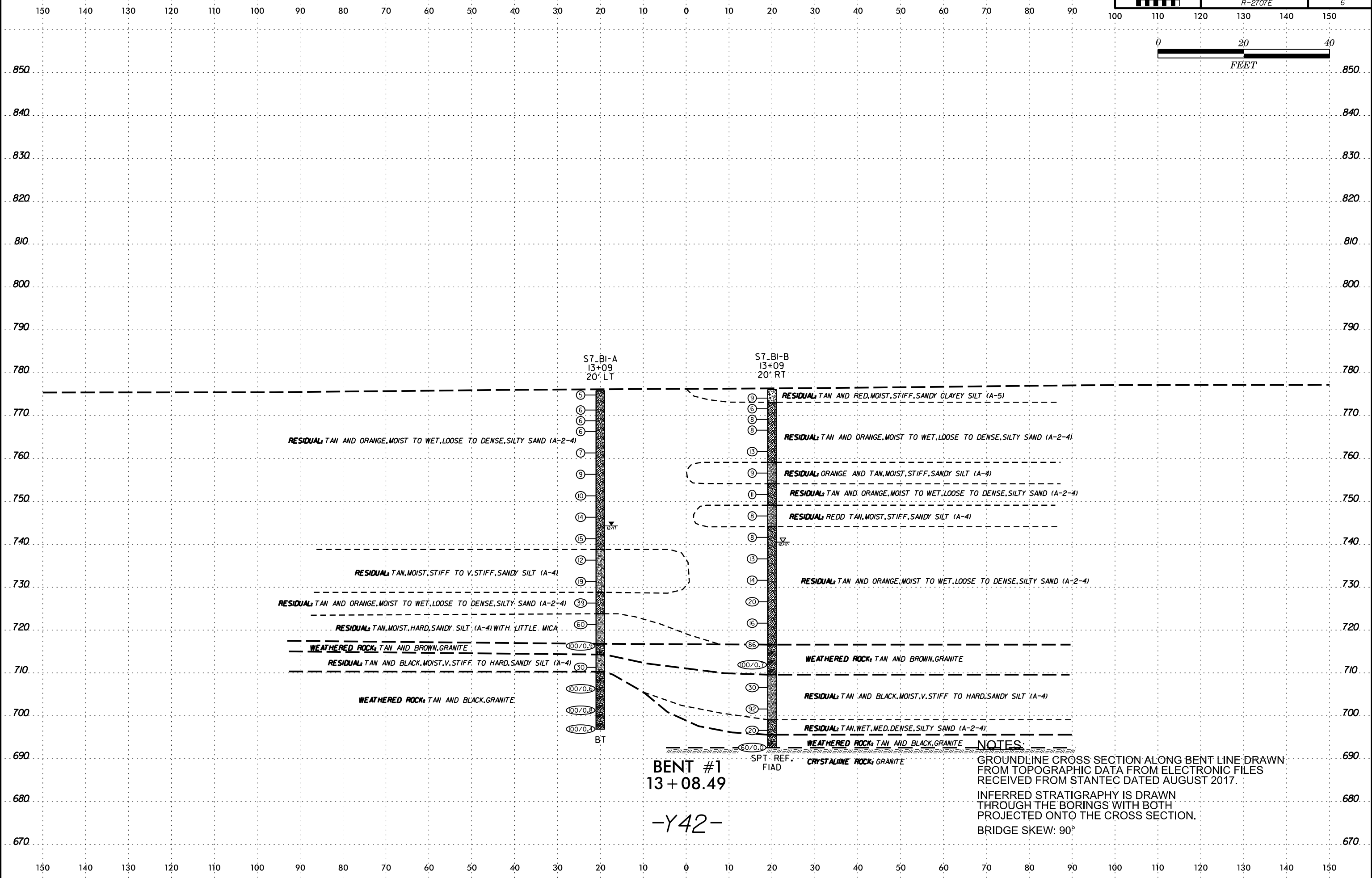
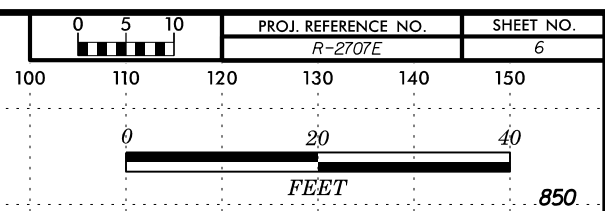


END BENT #1
12 + 13.49

-Y42-

NOTES:
GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM STANTEC DATED AUGUST 2017.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
BRIDGE SKEW: 90°

8/23/19



RESIDUAL TAN AND ORANGE, MOIST TO WET, LOOSE TO DENSE, SILTY SAND (A-2-4)

RESIDUAL TAN AND RED, MOIST, STIFF, SANDY CLAYEY SILT (A-5)

RESIDUAL TAN AND ORANGE, MOIST TO WET, LOOSE TO DENSE, SILTY SAND (A-2-4)

RESIDUAL ORANGE AND TAN, MOIST, STIFF, SANDY SILT (A-4)

RESIDUAL TAN AND ORANGE, MOIST TO WET, LOOSE TO DENSE, SILTY SAND (A-2-4)

RESIDUAL REDD TAN, MOIST, STIFF, SANDY SILT (A-4)

RESIDUAL TAN, MOIST, STIFF TO V. STIFF, SANDY SILT (A-4)

RESIDUAL TAN AND ORANGE, MOIST TO WET, LOOSE TO DENSE, SILTY SAND (A-2-4)

RESIDUAL TAN AND ORANGE, MOIST TO WET, LOOSE TO DENSE, SILTY SAND (A-2-4)

RESIDUAL TAN, MOIST, HARD, SANDY SILT (A-4) WITH LITTLE MICA

WEATHERED ROCK TAN AND BROWN, GRANITE

WEATHERED ROCK TAN AND BROWN, GRANITE

RESIDUAL TAN AND BLACK, MOIST, V. STIFF TO HARD, SANDY SILT (A-4)

WEATHERED ROCK TAN AND BROWN, GRANITE

WEATHERED ROCK TAN AND BLACK, GRANITE

RESIDUAL TAN AND BLACK, MOIST, V. STIFF TO HARD, SANDY SILT (A-4)

RESIDUAL TAN, WET, MED. DENSE, SILTY SAND (A-2-4)

WEATHERED ROCK TAN AND BLACK, GRANITE

CRYSTALLINE ROCK GRANITE

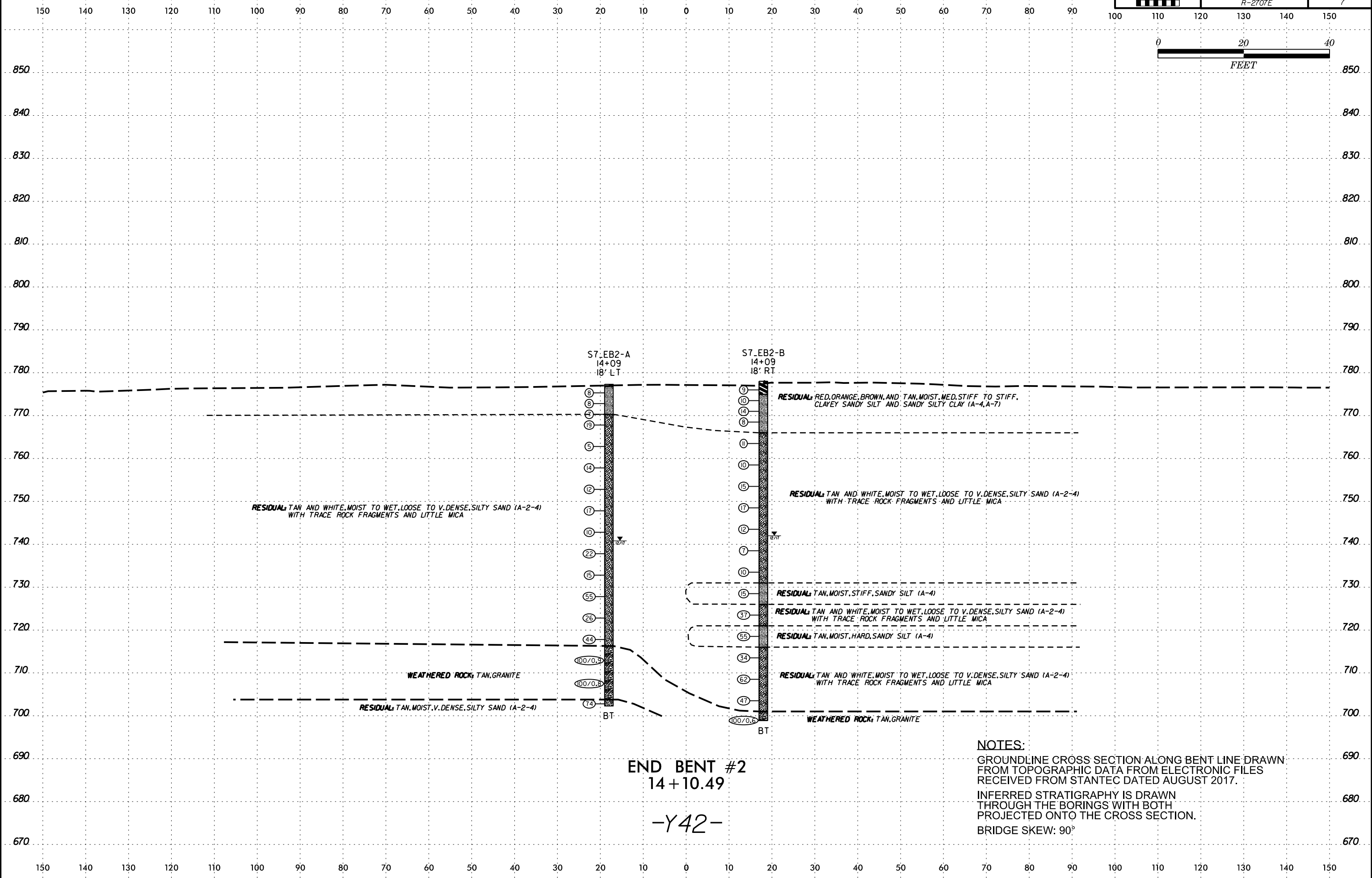
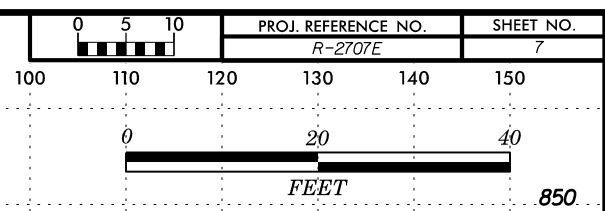
BENT #1
13 + 08.49

-Y42-

NOTES:
 GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM STANTEC DATED AUGUST 2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
 BRIDGE SKEW: 90°

8/23/19

SDATES



END BENT #2
14 + 10.49

-Y42-

NOTES:
 GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM STANTEC DATED AUGUST 2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
 BRIDGE SKEW: 90°

8/23/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.	
SITE DESCRIPTION Bridge No. 494 over US 74 (Dixon Blvd.) on -Y42- Between SR 2041 and US 74 Bus. (E. Marion St.)							GROUND WTR (ft)
BORING NO. S7_EB1-A		STATION 12+15		OFFSET 18 ft LT		ALIGNMENT -Y42-	
COLLAR ELEV. 775.7 ft		TOTAL DEPTH 68.6 ft		NORTHING 554,619		EASTING 1,269,385	
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 92% 12/09/2015		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic			
DRILLER Cain, J.		START DATE 12/05/17		COMP. DATE 12/05/17		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
780															
775	774.7	1.0	4	4	7									0.4' TOPSOIL	0.0
	772.2	3.5	4	6	7									RESIDUAL RED, SANDY SILTY CLAY (A-7)	3.0
770	769.7	6.0	3	4	3									RED AND TAN, FINE SANDY SILT (A-4)	5.5
	767.2	8.5	3	4	6									TAN, SILTY SAND (A-2-4)	
765															
	762.2	13.5	3	2	4										
760															
	757.2	18.5	4	8	8										
755															
	752.2	23.5	3	4	4										
750															
	747.2	28.5	4	4	5										
745															
	742.2	33.5	3	3	4										
740															
	737.2	38.5	2	4	4										
735															
	732.2	43.5	3	4	6										
730															
	727.2	48.5	4	6	10										
725															
	722.2	53.5	13	15	24										
720															
	717.2	58.5	32	57	43/0.3										
715															
	712.2	63.5	100/0.3												
710															
	707.2	68.5	60/0.1												

NCDOT BORE SINGLE R2707_GEO_BORINGS COPY.GPJ NC_DOT.GDT 3/18/19

Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 707.1 ft IN CRYSTALLINE ROCK: GRANITE

GEOTECHNICAL BORING REPORT BORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.	
SITE DESCRIPTION Bridge No. 494 over US 74 (Dixon Blvd.) on -Y42- Between SR 2041 and US 74 Bus. (E. Marion St.)							GROUND WTR (ft)
BORING NO. S7_EB1-B		STATION 12+14		OFFSET 18 ft RT		ALIGNMENT -Y42-	
COLLAR ELEV. 776.0 ft		TOTAL DEPTH 69.0 ft		NORTHING 554,599		EASTING 1,269,410	
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 92% 12/09/2015		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic			
DRILLER Cain, J.		START DATE 12/05/17		COMP. DATE 12/05/17		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
780															
775	775.0	1.0	3	5	5									0.4' TOPSOIL	0.0
	772.5	3.5	3	4	6									RESIDUAL RED AND TAN, SANDY SILTY CLAY (A-7)	3.0
770	770.0	6.0	3	5	6									TAN, BROWN, AND RED, SILTY SAND (A-2-4)	
	767.5	8.5	3	5	5										
765															
	762.5	13.5	3	4	4										
760															
	757.5	18.5	4	6	5										
755															
	752.5	23.5	4	5	5										
750															
	747.5	28.5	5	6	6										
745															
	742.5	33.5	3	3	4										
740															
	737.5	38.5	3	3	4										
735															
	732.5	43.5	3	6	9										
730															
	727.5	48.5	3	4	6										
725															
	722.5	53.5	21	45	55/0.4										
720															
	717.5	58.5	8	14	55										
715															
	712.5	63.5	100/0.2												
710															
	707.5	68.5	100/0.5												

NCDOT BORE SINGLE R2707_GEO_BORINGS COPY.GPJ NC_DOT.GDT 3/18/19

Boring Terminated at Elevation 707.0 ft IN WEATHERED ROCK: GRANITE

GEOTECHNICAL BORING REPORT BORE LOG

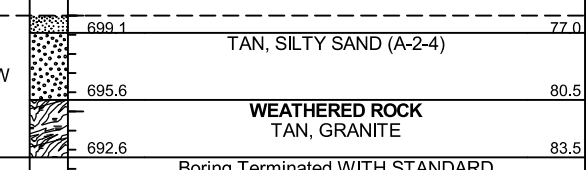
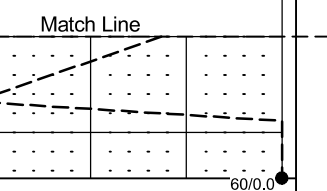
WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Bridge No. 494 over US 74 (Dixon Blvd.) on -Y42- Between SR 2041 and US 74 Bus. (E. Marion St.)							GROUND WTR (ft)									
BORING NO. S7_B1-B		STATION 13+09		OFFSET 20 ft RT		ALIGNMENT -Y42-										
COLLAR ELEV. 776.1 ft		TOTAL DEPTH 83.5 ft		NORTHING 554,669		EASTING 1,269,461										
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 92% 12/09/2015				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Cain, J.		START DATE 12/07/17		COMP. DATE 12/07/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
780																
775	775.1	1.0	2	4	5											
	772.6	3.5	2	3	3											
770	770.1	6.0	2	4	4											
	767.6	8.5	2	4	4											
765																
	762.6	13.5	7	8	5											
760																
	757.6	18.5	4	4	5											
755																
	752.6	23.5	3	5	6											
750																
	747.6	28.5	3	4	4											
745																
	742.6	33.5	4	4	4											
740																
	737.6	38.5	5	5	8											
735																
	732.6	43.5	5	7	7											
730																
	727.6	48.5	7	10	10											
725																
	722.6	53.5	6	6	10											
720																
	717.6	58.5	20	38	48											
715																
	712.6	63.5	70	30/0.2												
710																
	707.6	68.5	8	13	17											
705																
	702.6	73.5	30	37	55											
700																

NCDOT BORE SINGLE R2707_GEO_BORINGS COPY.GPJ NC_DOT.GDT 3/18/19

GEOTECHNICAL BORING REPORT BORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Bridge No. 494 over US 74 (Dixon Blvd.) on -Y42- Between SR 2041 and US 74 Bus. (E. Marion St.)							GROUND WTR (ft)									
BORING NO. S7_B1-B		STATION 13+09		OFFSET 20 ft RT		ALIGNMENT -Y42-										
COLLAR ELEV. 776.1 ft		TOTAL DEPTH 83.5 ft		NORTHING 554,669		EASTING 1,269,461										
DRILL RIG/HAMMER EFF./DATE HPC2473 CME-550 92% 12/09/2015				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Cain, J.		START DATE 12/07/17		COMP. DATE 12/07/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
700																
	697.6	78.5	5	7	13											
695																
	692.6	83.5	60/0.0													

NCDOT BORE SINGLE R2707_GEO_BORINGS COPY.GPJ NC_DOT.GDT 3/18/19



Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 692.6 ft ON CRYSTALLINE ROCK: GRANITE

REFERENCE: R-2707E

PROJECT: 34497

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY CLEVELAND
 PROJECT DESCRIPTION US 74, SHELBY BYPASS FROM
EXISTING US 74 WEST OF SR 2238 (LONG
BRANCH RD.) TO WEST OF SR 1001

SITE DESCRIPTION NOISE WALL 10a FROM -NW10a-
STA. 10 + 00.00 (-L- STA. 935 + 69.92, 61.76' LT) TO
-NW10a- STA. 23 + 95.00 (-L- STA. 949 + 50.07, 72.5' LT)

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN AND PROFILE
4 - 10	BORE LOGS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707E	1	10

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

TRIGON

GOODNIGHT, D.J.

INVESTIGATED BY GOODNIGHT, D.J.

DRAWN BY CROCKETT, S.C.

CHECKED BY HUNSBERGER, W.S.

SUBMITTED BY FALCON ENG.

DATE JANUARY 2023



DocuSigned by:
Stephen Crockett 1/6/2023
 C5CA5FED48E0435...
 SIGNATURE DATE

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

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (<= 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)							ORGANIC MATERIALS			
	A-1	A-3	A-2	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7			
GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7					A-7-5	A-7-6						
SYMBOL																		
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	36 MN	36 MN	36 MN					
MATERIAL PASSING #40 LL PI	-	-	40 MX 10 MN	41 MN 10 MN	40 MX 11 MN	41 MN 11 MN	40 MX 11 MN	41 MN 11 MN	40 MX 11 MN	41 MN 11 MN								
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	UNSATURABLE									

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)
GENERALLY GRANULAR MATERIAL (NON-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 OPENING (MM)	4	10	40	60	200	270
	4.75	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.)						

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING

STATIC WATER LEVEL AFTER 24 HOURS

PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA

SPRING OR SEEP

MISCELLANEOUS SYMBOLS

RECOMMENDATION SYMBOLS

ABBREVIATIONS

AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST
BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED
CL. - CLAY	MOD. - MODERATELY	U - UNIT WEIGHT
CPT - CONE PENETRATION TEST	NP - NON PLASTIC	U _G - DRY UNIT WEIGHT
CSE. - COARSE	ORG. - ORGANIC	
DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	SAMPLE ABBREVIATIONS
DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	S - BULK
e - VOID RATIO	SD. - SAND, SANDY	SS - SPLIT SPOON
F - FINE	SL. - SILT, SILTY	ST - SHELBY TUBE
FOSS. - FOSSILIFEROUS	SLI. - SLIGHTLY	RS - ROCK
FRAC. - FRACTURED, FRACTURES	TCR - TRICONE REFUSAL	RT - RECOMPACTED TRIAXIAL
FRAGS. - FRAGMENTS	w - MOISTURE CONTENT	CBR - CALIFORNIA BEARING RATIO
HI. - HIGHLY	V - VERY	

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:
<input type="checkbox"/> CME-45C	<input type="checkbox"/> CLAY BITS	<input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL
<input type="checkbox"/> CME-55	<input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER	
<input type="checkbox"/> CME-550X	<input checked="" type="checkbox"/> 8" HOLLOW AUGERS	CORE SIZE:
<input type="checkbox"/> VANE SHEAR TEST	<input type="checkbox"/> HARD FACED FINGER BITS	<input type="checkbox"/> -B <input type="checkbox"/> -H
<input type="checkbox"/> PORTABLE HOIST	<input type="checkbox"/> TUNG-CARBIDE INSERTS	<input type="checkbox"/> -N
<input checked="" type="checkbox"/> MOBILE B-57	<input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER	HAND TOOLS:
	<input type="checkbox"/> TRICONE _____ *STEEL TEETH	<input type="checkbox"/> POST HOLE DIGGER
	<input type="checkbox"/> TRICONE _____ *TUNG-CARB.	<input type="checkbox"/> HAND AUGER
	<input type="checkbox"/> CORE BIT	<input type="checkbox"/> SOUNDING ROD
		<input type="checkbox"/> 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 IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)		FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)		FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)		COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.

VERY SLIGHT (V SL.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.

SLIGHT (SL.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.

MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.

MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*

SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*

VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*

COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.

HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.

MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.

MEDIUM HARD CAN BE GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.

SOFT CAN BE GROUDED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.

VERY SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.

FRACTURE SPACING		BEDDING	
TERM	SPACING	TERM	THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 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 DISLOADED FROM PARENT MATERIAL.

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

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

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

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

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

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

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

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

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

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENISE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

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

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

BENCH MARK: ELEVATIONS OBTAINED FROM TIN FILE R2707_LS_TNL_180309 DATED MARCH, 2018

ELEVATION: _____ FEET

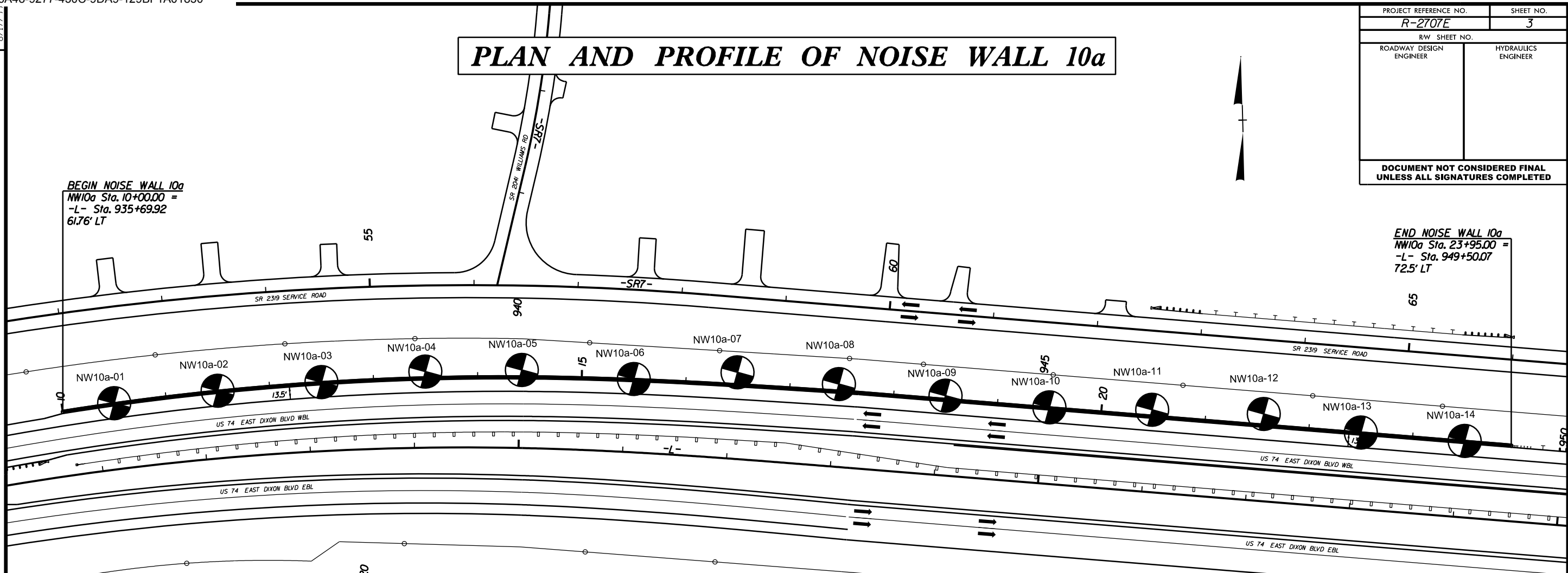
NOTES:
 FIAD - FILLED IMMEDIATELY AFTER DRILLING

PROJECT REFERENCE NO.	SHEET NO.
R-2707E	3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PLAN AND PROFILE OF NOISE WALL 10a

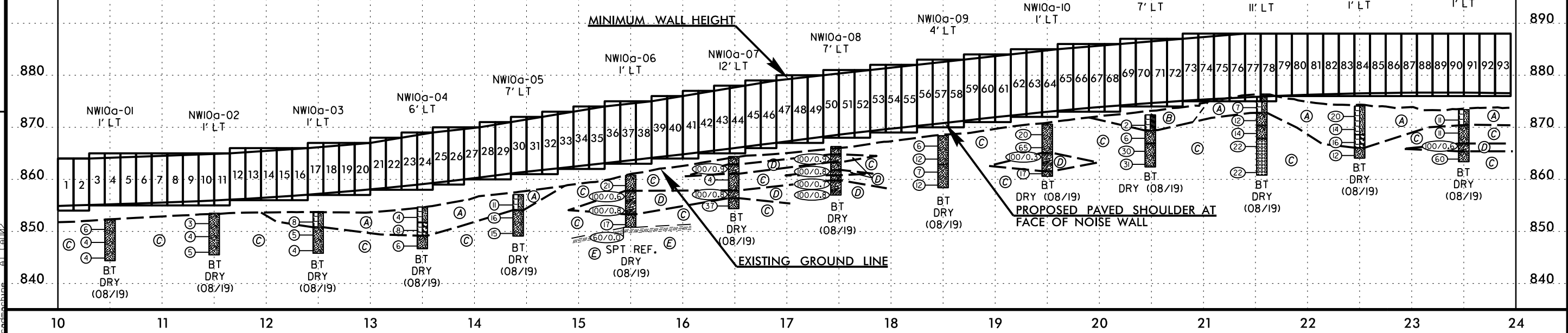
BEGIN NOISE WALL 10a
 NW10a Sta. 10+00.00 =
 -L- Sta. 935+69.92
 61.76' LT

END NOISE WALL 10a
 NW10a Sta. 23+95.00 =
 -L- Sta. 949+50.07
 72.5' LT



PANEL NUMBER	1-2	3-11	12-16	17-20	21-22	23-24	25-26	27	28-29	30-31	32	33	34-35	36-38	39-40	41	42	43-44	45-46	47-49	50-52	53-55	56-58	59-61	62-64	65-68	69-72	73-78	79-93
TOP ELEVATION	864'	865'	866'	867'	868'	869'	870'	870'	871'	872'	873'	873'	874'	875'	876'	877'	877'	878'	879'	880'	881'	882'	883'	884'	885'	886'	887'	888'	888'
PANEL LENGTH	30'	135'	75'	60'	30'	30'	30'	15'	30'	30'	15'	15'	30'	45'	30'	15'	15'	30'	30'	45'	45'	45'	45'	45'	60'	60'	90'	225'	
PANEL HEIGHT	10'	10'	10'	10'	10'	11'	11'	10'	11'	11'	12'	11'	12'	12'	12'	13'	12'	13'	13'	13'	13'	13'	13'	13'	13'	13'	13'	13'	12'

- Ⓐ ROADWAY EMBANKMENT: TAN AND RED, MOIST, LOOSE TO MED. DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6) WITH TRACE GRAVEL AND LITTLE MICA
- Ⓑ ROADWAY EMBANKMENT: TAN-BROWN, MOIST, SOFT, SANDY CLAY (A-6)
- Ⓒ RESIDUAL: TAN AND RED, MOIST, LOOSE TO V. DENSE, SILTY AND CLAYEY SILTY SAND (A-1-b, A-2-4, A-2-5) WITH TRACE TO LITTLE MICA AND LITTLE ROCK FRAGMENTS
- Ⓓ WEATHERED ROCK: TAN AND WHITE, GRANITE
- Ⓔ CRYSTALLINE ROCK: GRANITE



REVISIONS

DC: JAN-2023 17:05
 P: Projects\2023\617053.00 DELAYED Startec R2707D&E Shelby Bypass\Bypass\R2707_NCDDT_Electronic_File_Tree\Geotech\InvestigationDesign\R2707_GEO_RDWY\CA0D_GEO\TECH\Site&Sub\NOISE_WALL\R2707E_GEO_NW10a_03.dgn
 8/17/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)									
BORING NO. NW10a-01		STATION 10+50		OFFSET 1 ft LT		ALIGNMENT -NW10a-										
COLLAR ELEV. 852.4 ft		TOTAL DEPTH 8.0 ft		NORTHING 553,887		EASTING 1,273,481										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Estep, J. E.		START DATE 08/07/19		COMP. DATE 08/07/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
855																
	851.4	1.0	2	3	3										852.4	0.0
850	848.9	3.5	1	2	2								M			
	845.9	6.5	2	2	2								M			
845													M		844.4	8.0
Boring Terminated at Elevation 844.4 ft IN RESIDUAL: SILTY SAND																

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)									
BORING NO. NW10a-02		STATION 11+50		OFFSET 1 ft LT		ALIGNMENT -NW10a-										
COLLAR ELEV. 853.5 ft		TOTAL DEPTH 8.0 ft		NORTHING 553,896		EASTING 1,273,580										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Estep, J. E.		START DATE 08/07/19		COMP. DATE 08/07/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
855																
	852.5	1.0	1	2	1										853.5	0.0
850	850.0	3.5	2	2	2								M			
	847.0	6.5	2	2	3								M			
													M		845.5	8.0
Boring Terminated at Elevation 845.5 ft IN RESIDUAL: SILTY SAND																

NCDOT BORE DOUBLE R2707_GEO_BORINGS CURRENT.GPJ NC_DOT.GDT 1/6/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)									
BORING NO. NW10a-03		STATION 12+50		OFFSET 1 ft LT		ALIGNMENT -NW10a-										
COLLAR ELEV. 853.8 ft		TOTAL DEPTH 8.0 ft		NORTHING 553,902		EASTING 1,273,680										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Estep, J. E.		START DATE 08/07/19		COMP. DATE 08/07/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
855																
	852.8	1.0	3	3	5								M		853.8	0.0
	850.3	3.5	2	2	3								M		850.8	3.0
	847.3	6.5	1	2	2								M		845.8	8.0
Boring Terminated at Elevation 845.8 ft IN RESIDUAL: SILTY SAND																

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)									
BORING NO. NW10a-04		STATION 13+50		OFFSET 6 ft LT		ALIGNMENT -NW10a-										
COLLAR ELEV. 854.7 ft		TOTAL DEPTH 8.0 ft		NORTHING 553,909		EASTING 1,273,780										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Estep, J. E.		START DATE 08/07/19		COMP. DATE 08/07/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
855																
	853.7	1.0	3	2	2								M		854.7	0.0
	851.2	3.5	3	4	4								M		851.7	3.0
	848.2	6.5	2	3	3								M		849.2	5.5
													M		846.7	8.0
Boring Terminated at Elevation 846.7 ft IN RESIDUAL: SILTY SAND																

NCDOT BORE DOUBLE R2707_GEO_BORINGS CURRENT.GPJ NC_DOT.GDT 1/6/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.									
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)								
BORING NO. NW10a-05		STATION 14+42		OFFSET 7 ft LT		ALIGNMENT -NW10a-									
COLLAR ELEV. 857.1 ft		TOTAL DEPTH 8.0 ft		NORTHING 553,908		EASTING 1,273,873									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Estep, J. E.		START DATE 08/07/19		COMP. DATE 08/07/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
860															
855	856.1	1.0	2	3	8								M	0.3' TOPSOIL	0.0
	853.6	3.5	4	8	8								M	ROADWAY EMBANKMENT RED-TAN, SILTY SAND (A-2-4) WITH LITTLE MICA	3.0
850	850.6	6.5	5	9	6								M	RESIDUAL TAN, SILTY SAND (A-2-4) WITH CLAYEY ZONES	8.0
Boring Terminated at Elevation 849.1 ft IN RESIDUAL: SILTY SAND															

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.									
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)								
BORING NO. NW10a-06		STATION 15+50		OFFSET 1 ft LT		ALIGNMENT -NW10a-									
COLLAR ELEV. 860.8 ft		TOTAL DEPTH 10.0 ft		NORTHING 553,896		EASTING 1,273,980									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Estep, J. E.		START DATE 08/07/19		COMP. DATE 08/07/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
865															
860	859.8	1.0	2	13	8								M	0.3' TOPSOIL	0.0
	857.3	3.5	50	50/0.1									M	RESIDUAL TAN AND WHITE, SILTY F. TO CSE. SAND (A-2-4) WITH LITTLE ROCK FRAGMENTS	3.0
855	854.8	6.0	82	18/0.3									M	WEATHERED ROCK WHITE-TAN, GRANITE	7.5
	852.3	8.5	8	4	13								M	RESIDUAL TAN, SILTY SAND (A-2-4) WITH LITTLE ROCK FRAGMENTS	10.0
	850.8	10.0	60/0.0											Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 850.8 ft ON CRYSTALLINE ROCK: GRANITE	

NCDOT BORE DOUBLE R2707_GEO_BORINGS CURRENT.GPJ NC_DOT.GDT 1/6/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)									
BORING NO. NW10a-07		STATION 16+49		OFFSET 12 ft LT		ALIGNMENT -NW10a-										
COLLAR ELEV. 864.4 ft		TOTAL DEPTH 10.0 ft		NORTHING 553,900		EASTING 1,274,080										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Estep, J. E.		START DATE 08/07/19		COMP. DATE 08/07/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
865														864.4	0.4' TOPSOIL	0.0
	863.4	1.0	5	15	85/0.4								M	862.9	RESIDUAL TAN, SILTY SAND (A-2-4)	1.5
860	860.9	3.5	5	2	2								M	861.1	WEATHERED ROCK TAN, GRANITE	3.3
	858.4	6.0	3	6	94/0.3									857.9	RESIDUAL TAN, SILTY SAND (A-2-4)	6.5
	855.9	8.5	50	27	10								M	856.4	WEATHERED ROCK TAN, GRANITE	8.0
													M	854.4	RESIDUAL TAN, SILTY SAND (A-2-4) WITH TRACE MICA	10.0
Boring Terminated at Elevation 854.4 ft IN RESIDUAL: SILTY SAND																

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)									
BORING NO. NW10a-08		STATION 17+47		OFFSET 7 ft LT		ALIGNMENT -NW10a-										
COLLAR ELEV. 866.3 ft		TOTAL DEPTH 9.3 ft		NORTHING 553,886		EASTING 1,274,177										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Estep, J. E.		START DATE 08/09/19		COMP. DATE 08/09/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
870														866.3	0.3' TOPSOIL	0.0
	865.3	1.0	9	12	88/0.4								M	864.8	RESIDUAL TAN, SILTY SAND (A-2-4)	1.5
865	862.8	3.5	5	8	92/0.3								M	863.3	WEATHERED ROCK TAN, GRANITE	3.0
	860.3	6.0	8	19	82/0.2								M	861.8	RESIDUAL TAN, GRANITE	4.5
	857.8	8.5	10	90/0.3									M	860.8	RESIDUAL TAN, SILTY SAND (A-2-4)	5.5
													M	859.8	WEATHERED ROCK TAN, GRANITE	6.5
														857.0	RESIDUAL TAN, SILTY SAND (A-2-4)	9.3
Boring Terminated at Elevation 857.0 ft IN WEATHERED ROCK: GRANITE																

NCDOT BORE DOUBLE R2707_GEO_BORINGS CURRENT.GPJ NC_DOT.GDT 1/6/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)									
BORING NO. NW10a-09		STATION 18+50		OFFSET 4 ft LT		ALIGNMENT -NW10a-										
COLLAR ELEV. 868.4 ft		TOTAL DEPTH 10.0 ft		NORTHING 553,872		EASTING 1,274,279										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Estep, J. E.		START DATE 08/09/19		COMP. DATE 08/09/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
870																
	867.4	1.0	2	2	4										868.4	0.0
	864.9	3.5	1	5	7											
	862.4	6.0	5	3	4										862.9	5.5
	859.9	8.5	5	5	7										858.4	10.0
Boring Terminated at Elevation 858.4 ft IN RESIDUAL: SILTY SAND																

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)									
BORING NO. NW10a-10		STATION 19+50		OFFSET 1 ft LT		ALIGNMENT -NW10a-										
COLLAR ELEV. 870.6 ft		TOTAL DEPTH 10.0 ft		NORTHING 553,858		EASTING 1,274,378										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Estep, J. E.		START DATE 08/09/19		COMP. DATE 08/09/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
875																
															870.6	0.0
	869.6	1.0	10	11	9											
	867.1	3.5	3	23	42											
	864.6	6.0	100/0.3												865.1	5.5
	862.1	8.5	58	12	5										861.6	9.0
															860.6	10.0
Boring Terminated at Elevation 860.6 ft IN RESIDUAL: SILTY SAND																

NCDOT BORE DOUBLE R2707_GEO_BORINGS CURRENT.GPJ NC_DOT.GDT 1/6/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.									
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)								
BORING NO. NW10a-11		STATION 20+49		OFFSET 7 ft LT		ALIGNMENT -NW10a-									
COLLAR ELEV. 872.4 ft		TOTAL DEPTH 10.0 ft		NORTHING 553,853		EASTING 1,274,477									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Estep, J. E.		START DATE 08/09/19		COMP. DATE 08/09/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
875															
870	871.4	1.0	2	1	1								M	872.4 0.4' TOPSOIL	0.0
	868.9	3.5	2	2	4								M	ROADWAY EMBANKMENT TAN-BROWN, SANDY CLAY (A-6)	3.0
	866.4	6.0	36	20	10								M	RESIDUAL TAN, CLAYEY SILTY SAND (A-2-5)	5.5
	863.9	8.5	15	19	12								M	TAN, SILTY SAND (A-2-4)	
													M	Boring Terminated at Elevation 862.4 ft IN RESIDUAL: SILTY SAND	10.0

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.									
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)								
BORING NO. NW10a-12		STATION 21+56		OFFSET 11 ft LT		ALIGNMENT -NW10a-									
COLLAR ELEV. 875.8 ft		TOTAL DEPTH 15.0 ft		NORTHING 553,846		EASTING 1,274,584									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Estep, J. E.		START DATE 08/09/19		COMP. DATE 08/09/19		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
880															
875	874.8	1.0	4	4	3								M	875.8 0.3' TOPSOIL	0.0
	872.3	3.5	2	6	6								M	ROADWAY EMBANKMENT TAN, CLAYEY SILTY SAND (A-2-5) WITH TRACE GRAVEL	3.0
	869.8	6.0	5	6	8								M	RESIDUAL TAN, SILTY SAND (A-2-4)	5.5
	867.3	8.5	5	9	13								M	TAN AND BROWN, CLAYEY SILTY SAND (A-2-5) WITH LITTLE MICA	8.0
	862.3	13.5	5	8	14								M	TAN, SLI. SILTY F. TO CSE. SAND (A-1-b) WITH LITTLE QUARTZ FRAGMENTS AND MICA	15.0
														Boring Terminated at Elevation 860.8 ft IN RESIDUAL: SAND	

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GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)									
BORING NO. NW10a-13		STATION 22+50		OFFSET 1 ft LT		ALIGNMENT -NW10a-										
COLLAR ELEV. 874.1 ft		TOTAL DEPTH 10.0 ft		NORTHING 553,826		EASTING 1,274,677										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Estep, J. E.		START DATE 08/09/19		COMP. DATE 08/09/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
875														874.1	0.3' TOPSOIL	0.0
	873.1	1.0	6	11	9										ROADWAY EMBANKMENT	
	870.6	3.5	8	7	7										TAN, CLAYEY SILTY SAND (A-2-5) WITH TRACE GRAVEL	
	868.1	6.0	4	7	9										RESIDUAL	
	865.6	8.5	4	4	8										RED-TAN, CLAYEY SILTY SAND (A-2-5)	10.0
Boring Terminated at Elevation 864.1 ft IN RESIDUAL: CLAYEY SILTY SAND																

WBS 34497.1.1		TIP R-2707E		COUNTY CLEVELAND		GEOLOGIST Goodnight, D. J.										
SITE DESCRIPTION Noise Wall 10a from -L- Sta. 935+69.92, 61.76' LT to --L- Sta. 949+50.07, 72.5' LT							GROUND WTR (ft)									
BORING NO. NW10a-14		STATION 23+50		OFFSET 1 ft LT		ALIGNMENT -NW10a-										
COLLAR ELEV. 873.4 ft		TOTAL DEPTH 10.0 ft		NORTHING 553,815		EASTING 1,274,776										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Estep, J. E.		START DATE 08/09/19		COMP. DATE 08/09/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
875														873.4	0.3' TOPSOIL	0.0
	872.4	1.0	6	5	6										ROADWAY EMBANKMENT	
	869.9	3.5	3	3	8										TAN, SILTY SAND (A-2-4) WITH TRACE GRAVEL	3.0
	867.4	6.0	6	41	59/0.1										RESIDUAL	
	864.9	8.5	38	35	25										TAN, SILTY F. TO CSE. SAND (A-2-4)	6.5
															WEATHERED ROCK	8.0
															TAN, GRANITE	8.0
															RESIDUAL	10.0
Boring Terminated at Elevation 863.4 ft IN RESIDUAL: SILTY SAND																

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