STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0095	1	22

REFERENCE: BR-0095

PROJECT: 67095

SEE SHEET 4 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	PLAN	XSC
-L-	12+25.00 to 21+50.00	4	5-11
-RPA-	11+30.00 to 14+09.39	4	12-14
-RPB-	10+00.00 to 11+30.00	4	15-16
-RPC-	10+00.00 to 11+00.00	4	17-18
-RPD-	12+20.00 to 13.24.94	4	19

APPENDICES

APPENDIX	TITLE	SHEETS
A	LABORATORY TESTS RESULTS SUMMARY	20-21

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *ROCKINGHAM*

PROJECT DESCRIPTION *REPLACE BRIDGE 780170 ON SR 1360 (SMITH RD) OVER US 220*

INVENTORY

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

P.M. WEAVER

C.R. PASTRANA

SUMMIT

INVESTIGATED BY *ESP Associates, INC.*

DRAWN BY *C.R. PASTRANA*

CHECKED BY *P.M. WEAVER*

SUBMITTED BY *ESP Associates, INC.*

DATE *September 2022*

ESP ASSOCIATES, INC.
7011 ALBERT PICK RD
SUITE E
GREENSBORO, NC 27409
WWW.ESPASSOCIATES.COM

NORTH CAROLINA LICENSED SEAL 1500 GEOLOGIST PAUL M. WEAVER

DocuSigned by:
Paul Weaver
01847D3739AD48C...
SIGNATURE

10/11/2022
DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
BR-0095	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
- [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: TIN FILE "br0095_ls_tin_20106.tin" WAS USED TO DETERMINE GROUND ELEVATION FOR ALL ROADWAY BORINGS
ELEVATION: FEET

NOTES:

F.I.A.D. FILLED IN AFTER DRILLING
REF ROADWAY EMBANKMENT FILL

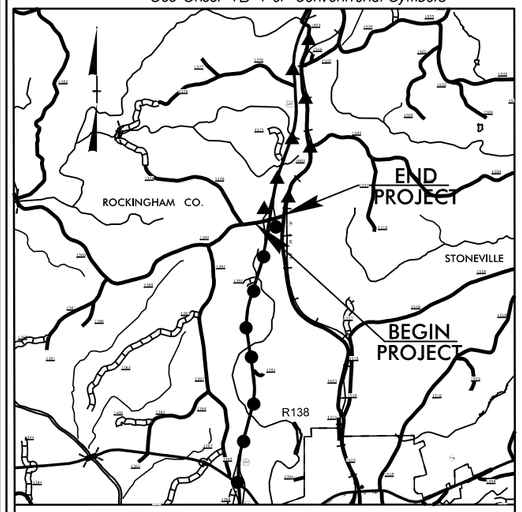
DATE: 8-15-14

09/08/99

CONTRACT:

TIP PROJECT: BR–0095

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP

EB DETOUR ROUTE

WB DETOUR ROUTE

FIELD INSPECTION PLAN SET

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

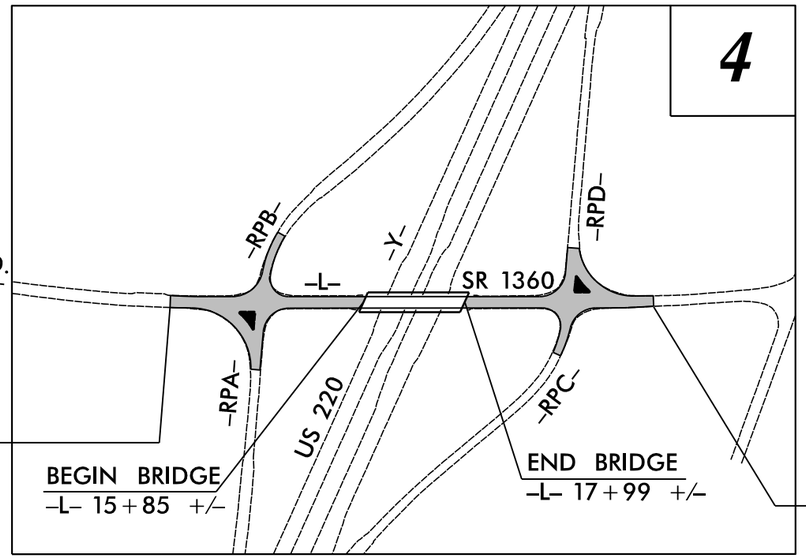
ROCKINGHAM COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR–0095	2A	22

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
67095.1.1		PE
67095.2.1		RW/UTIL
67095.3.1		CONST

LOCATION: BRIDGE #70 ON SR 1360 (SMITH RD) OVER US 220

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



BEGIN TIP PROJECT BR–0095
–L– STA. 12+25.00

BEGIN BRIDGE
–L– 15+85 +/–

END BRIDGE
–L– 17+99 +/–

END TIP PROJECT BR–0095
–L– STA. 21+50.00

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
THIS IS NOT A CONTROL OF ACCESS FACILITY.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD _____.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2023 = 862
ADT 2045 = 1200
K = 9 %
D = 60 %
T = 6 % *
V = 50 MPH
* TTST = 2% DUAL 4%
FUNC CLASS = LOCAL SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR–0095 = 0.134 MILES

LENGTH STRUCTURES TIP PROJECT BR–0095 = 0.041 MILES

TOTAL LENGTH TIP PROJECT BR–0095 = 0.175 MILES

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 3, 2022

LETTING DATE:
JUNE 20, 2023

KRISTY W. ALFORD, PE
PROJECT MANAGER

JORDAN A. WOODARD, PE
ROADWAY GROUP LEAD

SHERRI E. CALHOUN, PE
ROADWAY TEAM LEAD

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DEPARTMENT OF TRANSPORTATION • STATE OF NORTH CAROLINA •

September 21, 2022

STATE PROJECT NO.: 67095.1.1
TIP: BR-0095
COUNTY: Rockingham
DESCRIPTION: Replace Bridge 780170 on SR 1360 over US 220
SUBJECT: Geotechnical Report – Roadway Inventory

Project Description

This proposed project is located on the north side of Stoneville, North Carolina approximately 3 miles from the Virginia state line. The project begins at -L- (SR 1360/Smith Road) Station 12+25.00 and continues to -L-Station 21+50.00. The total length of the project is 0.175 miles. The existing -L- within the project corridor is a two-lane road. The project area is rural.

The proposed project construction consists of the following:

- The replacement of the existing bridge on the -L- alignment over US 220
- Widening of -L- and the US 220 ramps to accommodate paved shoulders

The proposed maximum new embankment fill heights are approximately 9 feet. The maximum cuts proposed for the project are approximately 2 feet.

The drainage along the project is generally handled by side ditches.

This geotechnical investigation was confined to the areas of proposed construction.

Initial site scoping was performed on June 10, 2022. The field investigation was performed from June 13 to June 14, 2022. Standard Penetration Test borings were advanced with a CME 550X drilling machine equipped with an automatic hammer. Representative soil samples were collected for visual classification in the field and for laboratory analyses.

The following alignments were investigated. Subsurface cross sections of the alignments are included in this report:

Alignment	Station (±)
-L-	12+25.00 to 21+50.00
-RPA-	11+30.00 to 14+09.39
-RPB-	10+00.00 to 11+30.00
-RPC-	10+00.00 to 11+00.00
-RPD-	12+20.00 to 13+24.94

Physiography and Geography

The project corridor is located in the Sauratown Mountains Anticlinorium of the Piedmont physiographic province. “The Sauratown Mountains Anticlinorium lies at the juncture of the Blue Ridge, Inner Piedmont block, and the central Piedmont. The anticlinorium is a northeast-trending foliation arch characterized by a nearly symmetrical distribution of basement-cover rock sequences and an inverted sequence of metamorphic isograds” (*The Geology of the Carolinas*, Horton and Zullo, 1991). Parts of four stacked thrust sheets containing Middle Proterozoic basement and an overlying sequence of Late Proterozoic to early Cambrian metasedimentary and metaigneous rocks are exposed in the Sauratown Mountains window. According to the Geologic Map of North Carolina, 1985, the rock underlying the project corridor is “Mica Schist; garnet, staurolite, kyanite, or sillimanite locally; lenses and layers of quartz schist, micaceous quartzite, calc-silicate rock, biotite gneiss, amphibolite, and phyllite”. The relic rock structure evident in some of the soil samples obtained during our subsurface investigation, plus the high mica content in many of the soil samples, indicate that the underlying rock at the project site is most likely Mica Schist.

The topography along the project corridor generally consists of rolling hills. The roadway along Smith Road (-L-) generally slopes up from the beginning to the end of the project with elevations ranging from approximately 982 feet (MSL) to approximately 994 feet (MSL) except for under the bridge over US 220 where the elevation of the side ditches along both sides of US 220 along the -L- centerline is approximately 967 feet (MSL). The ramps roadways slope up towards -L- with elevations within the area of construction ranging from approximately 981 feet (MSL) to approximately 994 feet (MSL).

Soil Properties

Soils encountered within this project area have been divided into two categories: roadway embankment and residual soils.

Roadway embankment is present in the vicinity of the bridge over US 220 and in ramps A, B and C as they approach Smith Road. Roadway embankment was encountered in Borings L_1500 and L_1900 and ranged in thickness from approximately 2 feet to approximately 3 feet. The roadway embankment encountered consists of loose, silty sand (A-2-4) and very stiff, silty clay (A-7-5) with mica.

Residual soils were encountered in all the borings drilled for this project. The residual soils consist of very loose to dense silty sand (A-2-4) and of medium stiff to very stiff silty clay (A-7-5). Plasticities within the cohesive residual soils range from slightly to moderately plastic with laboratory plasticity index results ranging from 15 to 21. Mica was encountered in the majority of the soil samples collected with estimated mica contents ranging from trace mica to highly micaceous.

Rock Properties

Rock was not encountered within the depths explored and should not affect construction based on the 25 percent plans provided to ESP.

Groundwater Properties

Groundwater data was collected in June 2022. Groundwater was not encountered in any of the borings drilled and therefore, is not expected to be encountered during construction within 6 feet of the proposed grade.

Areas of Special Geotechnical Interest

The borings drilled for this project did not encounter loose sands or soft cohesive soils, wet to saturated soils, highly plastic soils, organic soils, or shallow groundwater or rock.

Water Wells

No water wells were identified within or adjacent to the proposed right-of-way on the plans provided to ESP or by ESP personnel in the field.

PROJECT REFERENCE NO.	SHEET NO.
BR-0095	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

NAD 83 / NA 2011

L

PI Sta 11+49.56	PI Sta 21+47.97
Δ = 7° 07' 53.6" (LT)	Δ = 4° 04' 57.5" (LT)
D = 2° 23' 14.4"	D = 1° 54' 35.5"
L = 298.73'	L = 213.77'
T = 149.56'	T = 106.93'
R = 2,400.00'	R = 3,000.00'
SE = EXIST.	SE = EXIST.

RPA

PI Sta 10+79.58	PI Sta 12+88.81
Δ = 1° 39' 28.4" (RT)	Δ = 44° 31' 04.7" (LT)
D = 1° 02' 30.3"	D = 25° 00' 01.2"
L = 159.15'	L = 178.07'
T = 79.58'	T = 93.80'
R = 5,500.00'	R = 229.18'
	① S 8° 24' 33.8" E

RPC

PI Sta 11+06.81	PI Sta 12+24.94
Δ = 39° 30' 07.8" (RT)	Δ = 5° 46' 40.5" (RT)
D = 24° 00' 36.3"	D = 1° 21' 30.7"
L = 164.52'	L = 78.52'
T = 85.68'	T = 39.29'
R = 238.63'	R = 778.63'
	② S 8° 58' 31.6" E

-L- PC Sta. 10+00.00

BEGIN TIP PROJECT BR-0095
-L- POC STA. 12+25.00

-RPA- PC Sta. 10+00.00

BEGIN CONSTRUCTION
-RPA- POC Sta. 11+30.00

-RPA- PT Sta. 11+59.15

-RPA- PC Sta. 11+95.01

-L- PT Sta. 12+98.73

-Y- POT Sta. 18+00.00

-RPD- POT Sta. 10+00.00

-L- PT Sta. 22+54.81

-L- PC Sta. 20+41.04

-RPD-POT Sta. 12+20.00
BEGIN CONSTRUCTION

-RPD- POT Sta. 13+24.94 =
-L- POT Sta. 19+80.94

ROADWAY EMBANKMENT

RESIDUAL

A

REMOVE EXIST. GUARDRAIL AND CONCRETE JERSEY WALL

RESIDUAL
-L- POT Sta. 16+91.66 =
-Y- POT Sta. 14+50.00

D

RESIDUAL

RESIDUAL

-RPA- PT Sta. 13+73.08

ROADWAY EMBANKMENT

-RPA- POT Sta. 14+09.39 =
-L- POT Sta. 14+07.32

RESIDUAL

B

RESIDUAL

C

ROADWAY EMBANKMENT

REMOVE EXIST. GUARDRAIL AND CONCRETE JERSEY WALL

END CONSTRUCTION
-RPC- POC Sta. 11+00.00

-RPB- POT Sta. 10+00.00 =
-L- POT Sta. 14+06.32

END CONSTRUCTION
-RPB-POT Sta. 11+30.00

-RPB- POT Sta. 13+82.98

-Y- POT Sta. 10+00.00

-RPC- POT Sta. 10+00.00 =
-L- POT Sta. 19+81.57

END TIP PROJECT BR-0095
-L- STA. 21+50.00

-RPC- PC Sta. 10+21.12

-RPC- PCC Sta. 11+85.65

-RPC- PT Sta. 12+64.17

-RPC- POT Sta. 14+00.61

RPA_1200

RPB_1100

L_1350

L_1500

L_1800

L_1900

L_2145

RPD_1250

S 36° 06' 30.9" W

N 76° 07' 13.0" E

S 8° 47' 18.8" E

N 10° 23' 47.0" E

S 9° 00' 48.9" E

S 36° 18' 16.7" W

skew=114° 16' 34"

BY-6

BY-8

BY-9

BYI-1

BL-1

BL-5

SEE SHEET 5 FOR PROFILE OF -L-
SEE SHEET 6 FOR PROFILE OF -RPA-, -RPB-, -RPC-, AND -RPD-

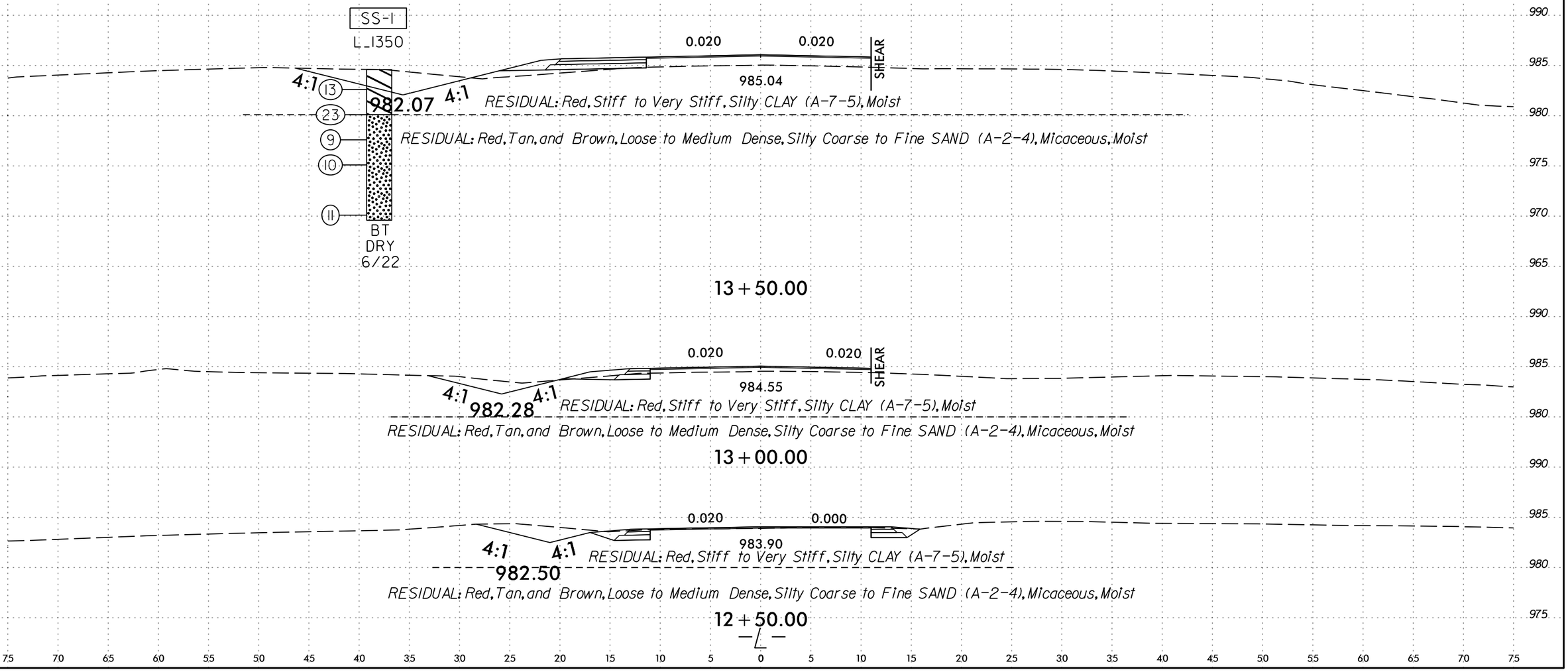
REVISIONS

8/17/99

9/22/2022 6:23:38 AM
W:\Projects\2020 (N)\S14.300 (NCDOT 2020-2022 On-Call Contract)\S14.320 (BR-0095 Roadway)\BR0095_GEO_RDWY\CADD_GEOTECH\PlanProf\BR0095_Geo_psh04.dgn

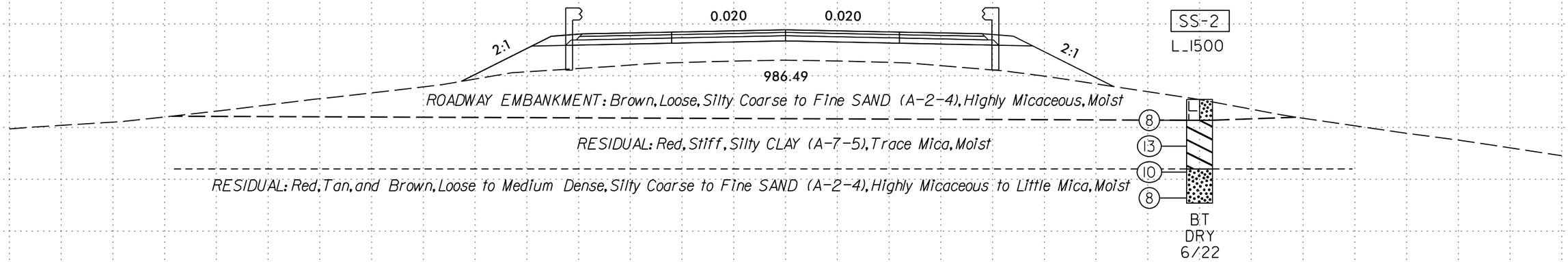
SOIL TEST RESULTS

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- 1	38' LT	13+50	1. 0- 2. 5	A-7-5(16)	63	21	12	25	7	56	99	93	67	25. 0	-

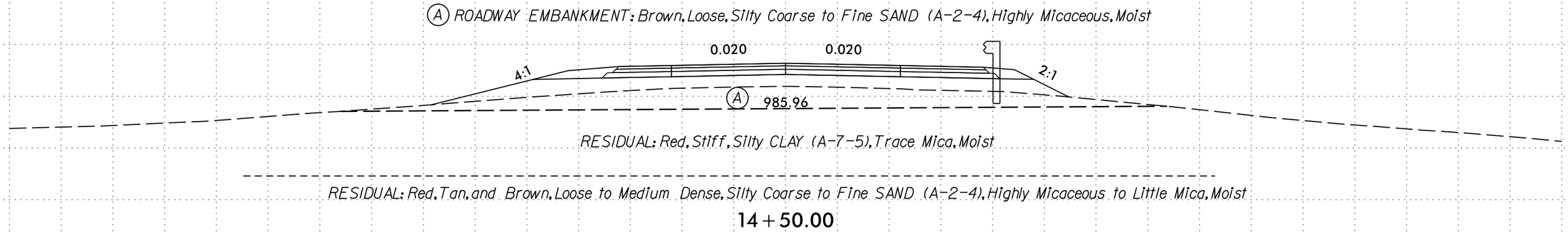


SOIL TEST RESULTS

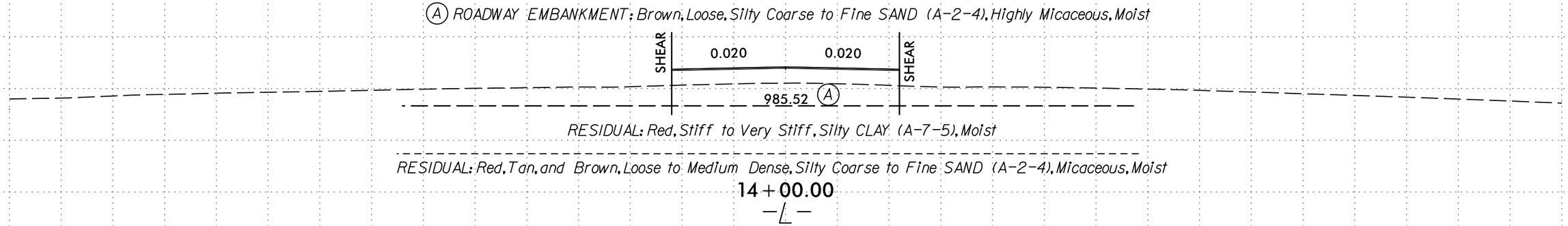
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2	40' RT	15+00	1.0-2.5	A-2-4(0)	NP	NP	26	52	11	11	99	90	33	26.0	-



15+00.00



14+50.00



14+00.00

PROJ. REFERENCE NO.	SHEET NO.
BR-0095	7

0 2.5 5

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

1000
995
990
985
980
975
970

0.020 0.020

990.42

2:1 2:1

987.00

ROADWAY EMBANKMENT: Brown, Loose, Silty Coarse to Fine SAND (A-2-4), Highly Micaceous, Moist

RESIDUAL: Red, Stiff, Silty CLAY (A-7-5), Trace Mica, Moist

RESIDUAL: Red, Tan, and Brown, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Highly Micaceous to Little Mica, Moist

15+50.00

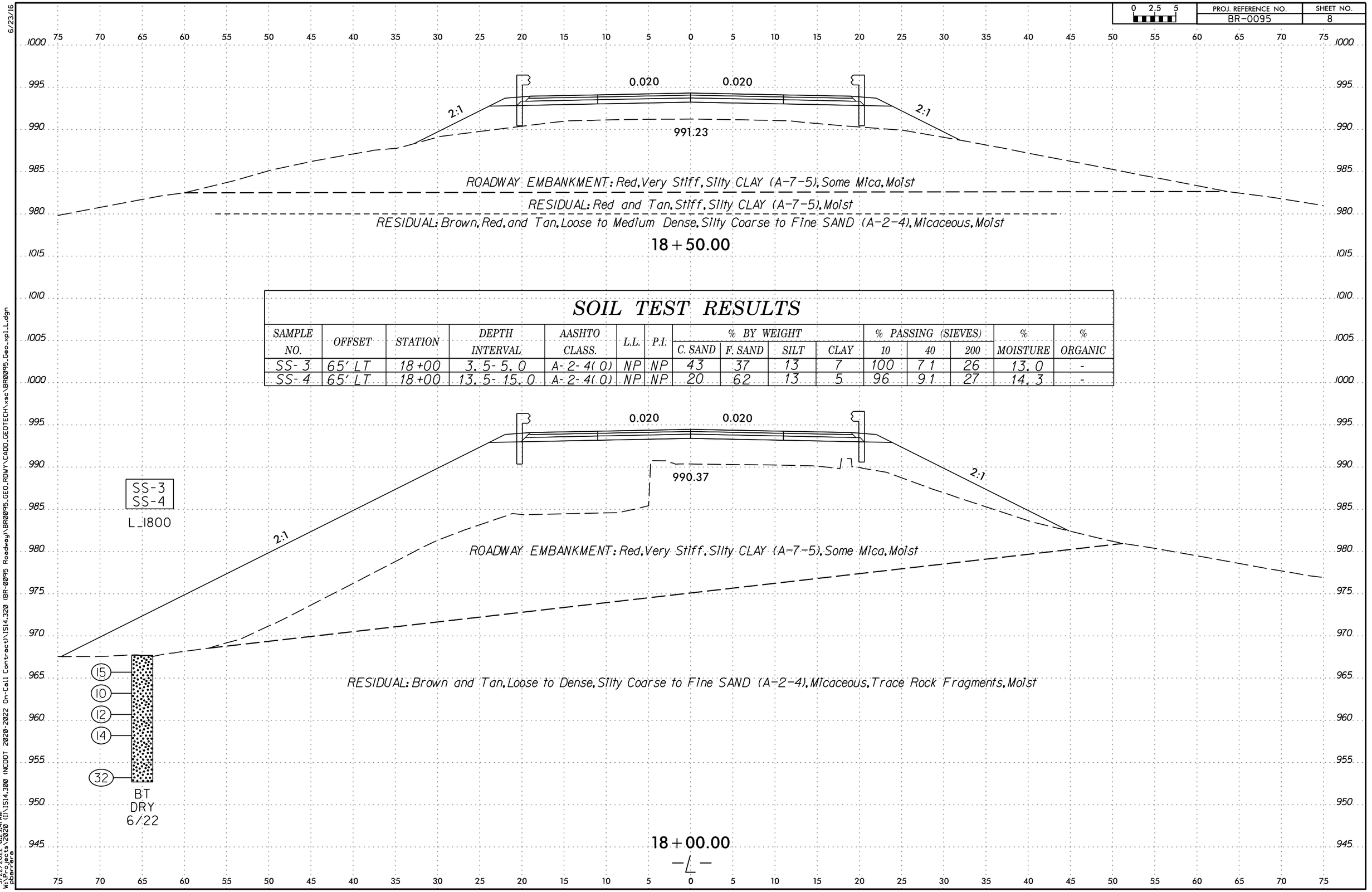
—L—

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

1000 995 990 985 980 975 970

6/23/16

9/22/2022 6:29:41 AM
W:\Projects\2020 (I)\IS14.300 INCDOT 2020-2022 On-Call Contract\IS14.320 (BR-0095 Roadway\BR0095_GEO_RDWY\CADD_GEOTECH\xsc\BR0095_Geo_xpLL.dgn
pbarrero



SOIL TEST RESULTS

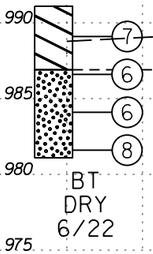
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-3	65' LT	18+00	3.5-5.0	A-2-4(0)	NP	NP	43	37	13	7	100	71	26	13.0	-
SS-4	65' LT	18+00	13.5-15.0	A-2-4(0)	NP	NP	20	62	13	5	96	91	27	14.3	-

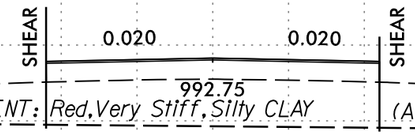
SOIL TEST RESULTS

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-6	14' RT	12+50	6.0-7.5	A-2-4(0)	NP	NP	34	45	13	8	99	79	28	15.5	-

NOTE: STATION AND OFFSET REFER TO -RPD- ALIGNMENT

SS-6
RPD_1250
-L- Station 19+73



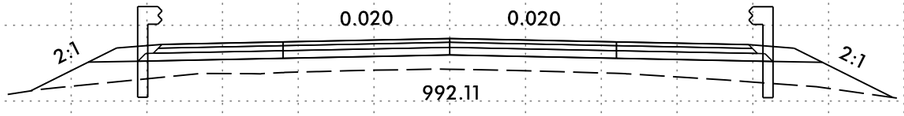


ROADWAY EMBANKMENT: Red, Very Stiff, Silty CLAY (A-7-5), Some Mica, Moist

RESIDUAL: Red, Medium Stiff to Stiff, Silty CLAY (A-7-5), Some Mica, Moist

RESIDUAL: Brown, Red, Tan, and Yellow, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Trace Mica to Micaceous, Moist

19+50.00

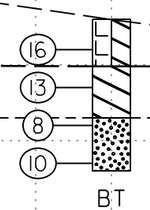


ROADWAY EMBANKMENT: Red, Very Stiff, Silty CLAY (A-7-5), Some Mica, Moist

RESIDUAL: Red and Tan, Stiff, Silty CLAY (A-7-5), Moist

RESIDUAL: Brown, Red, and Tan, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Micaceous, Moist

L_1900



19+00.00
-L-

9/22/2022 6:29:42 AM
W:\Projects\2020 (1)\SI14.300 (NCDOT 2020-2022 On-Call Contract)\SI14.320 (BR-0095 Roadway)\BR0095_GEO_RDWY\CADD_GEOTECH\xsc\BR0095_Geo_xpLL.dgn
pbarrera
6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BR-0095	10

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

1000
995
990
985

0.020 0.020
994.95
4:1
4:1
4:1
993.80
RESIDUAL: Red with Tan, Stiff to Very Stiff, Silty CLAY (A-7-5), Some Mica, Moist
RESIDUAL: Tan, Brown, and Yellow, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Micaceous, Moist

21+00.00

SHEAR
0.020 0.020
994.31
4:1
RESIDUAL: Red with Tan, Stiff to Very Stiff, Silty CLAY (A-7-5), Some Mica, Moist
RESIDUAL: Tan, Brown, and Yellow, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Micaceous, Moist

20+50.00

(B) ROADWAY EMBANKMENT: Red, Very Stiff, Silty CLAY (A-7-5), Some Mica, Moist

SHEAR SHEAR
0.020 0.020
993.51
(B)
RESIDUAL: Red, Medium Stiff to Stiff, Silty CLAY (A-7-5), Some Mica, Moist
RESIDUAL: Brown, Red, Tan, and Yellow, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Trace Mica to Micaceous, Moist

20+00.00

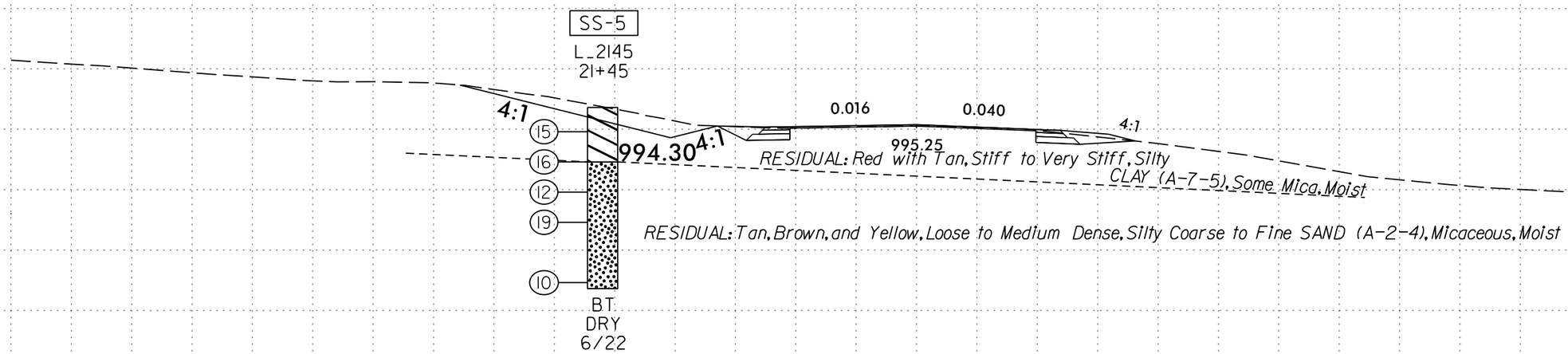
—L—

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

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BR-0095	11

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-5	26' LT	21+45	1.0-2.5	A-7-5(10)	61	15	20	24	10	46	98	86	59	28.1	-



0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BR-0095	12

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

990 985 980 975 970 965

(A) ROADWAY EMBANKMENT: Brown, Loose, Silty Coarse to Fine SAND (A-2-4), Highly Micaceous, Moist

981.50

4:1 978.94 4:1

RESIDUAL: Tan, Red, and Brown, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Micaceous, Moist

12 + 25.00

(A) ROADWAY EMBANKMENT: Brown, Loose, Silty Coarse to Fine SAND (A-2-4), Highly Micaceous, Moist

RPA_1200

980.69

4:1 978.30 4:1

8 9 11 14

BT
DRY
6/22

RESIDUAL: Tan, Red, and Brown, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Micaceous, Moist

12 + 00.00

(A) ROADWAY EMBANKMENT: Brown, Loose, Silty Coarse to Fine SAND (A-2-4), Highly Micaceous, Moist

979.93

RESIDUAL: Tan, Red, and Brown, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Micaceous, Moist

11 + 75.00

(A) ROADWAY EMBANKMENT: Brown, Loose, Silty Coarse to Fine SAND (A-2-4), Highly Micaceous, Moist

979.24

RESIDUAL: Tan, Red, and Brown, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Micaceous, Moist

11 + 50.00

-RPA-

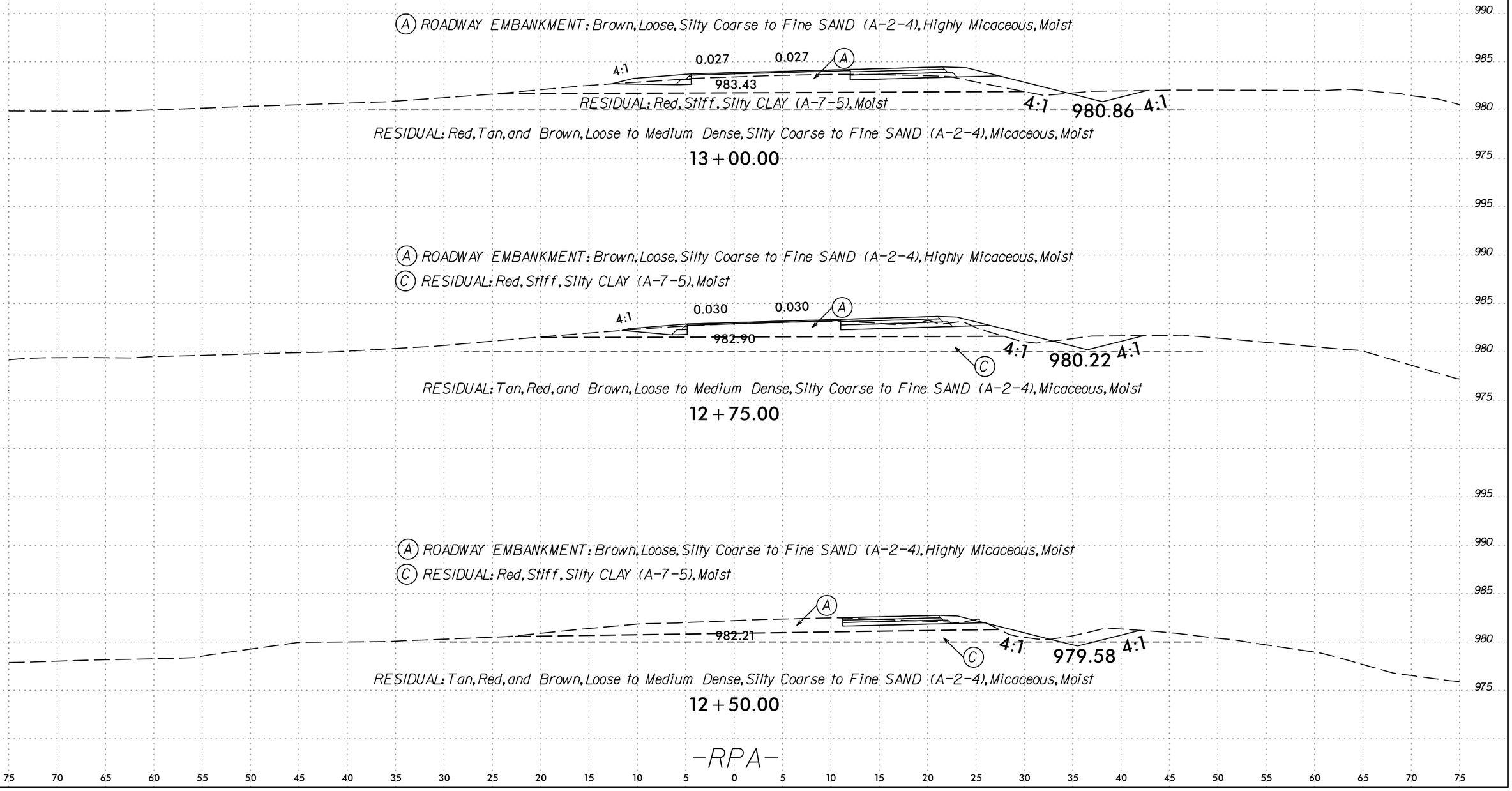
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

990 985 980 975 970 965

6/23/16

9/22/2022 6:29:44 AM
W:\Projects\2020 (I)\S14.300 (NCDOT 2020-2022 On-Call Contract)\S14.320 (BR-0095 Roadway)\BR0095_GEO_RDWY\CADD_GEOTECH\xsc\BR0095_Geo_xpl_RPA.dgn
pbarrera

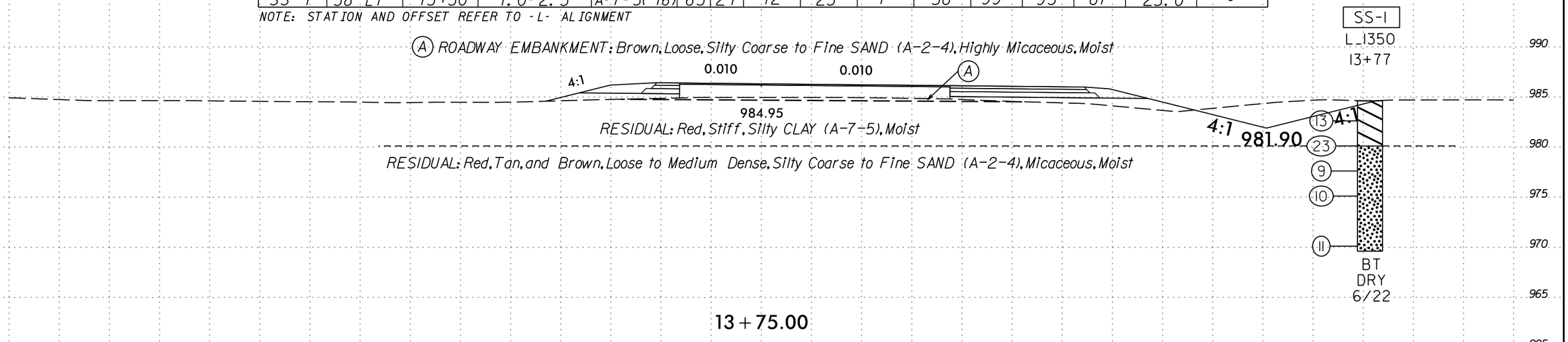
0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BR-0095	13



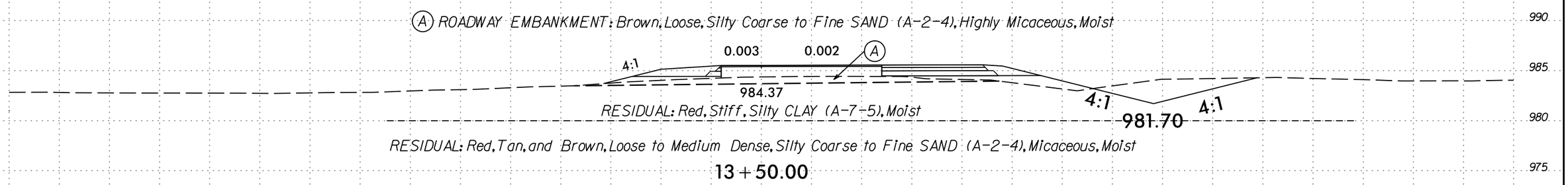
SOIL TEST RESULTS

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-1	38' LT	13+50	1.0-2.5	A-7-5(16)	63	21	12	25	7	56	99	93	67	25.0	-

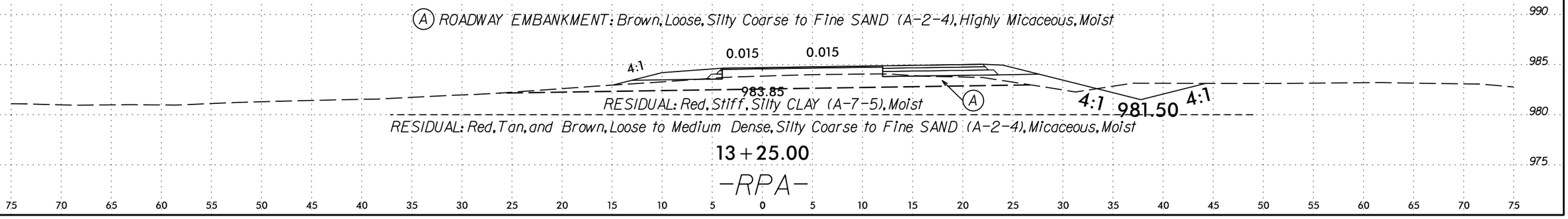
NOTE: STATION AND OFFSET REFER TO -L- ALIGNMENT



13+75.00

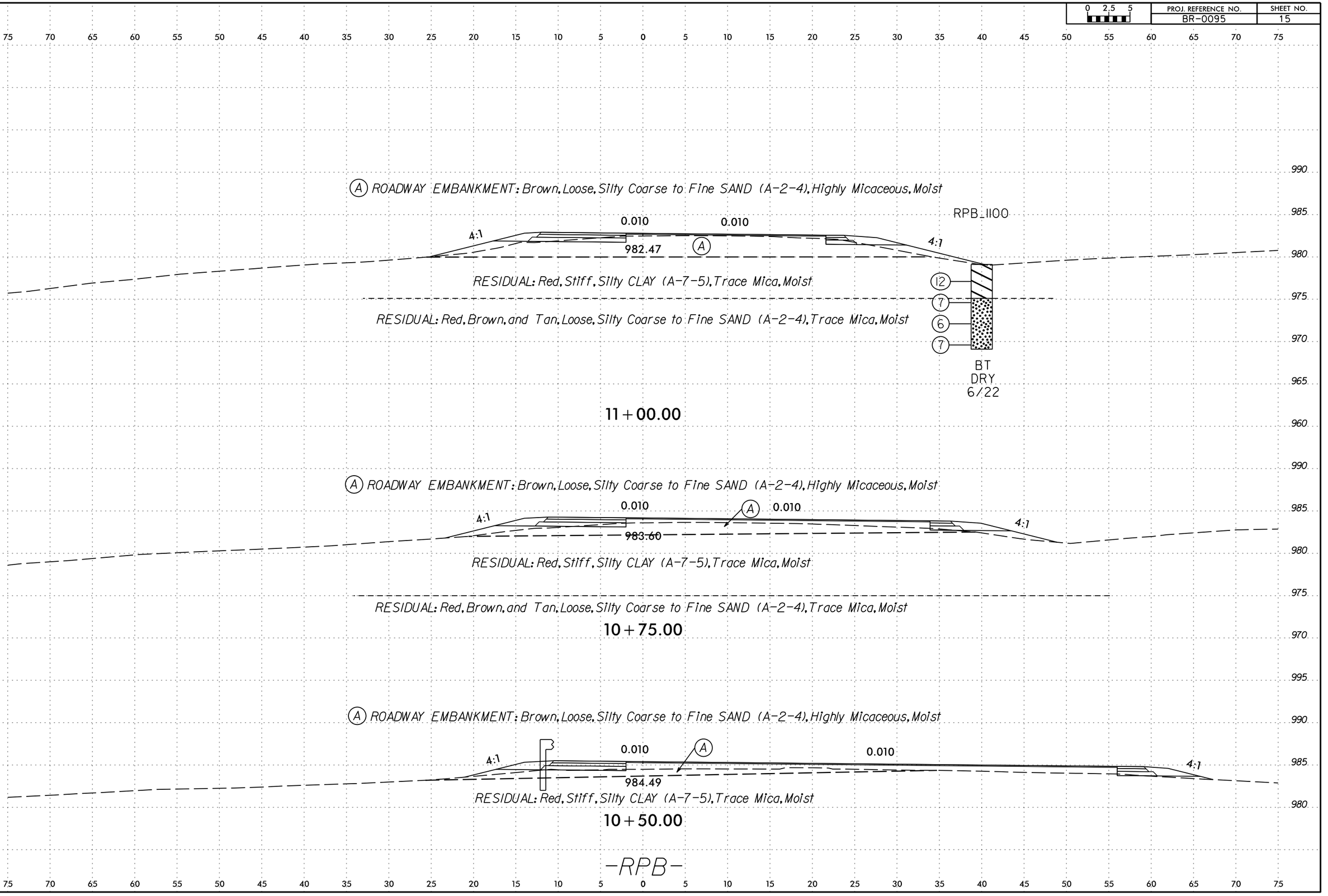


13+50.00



13+25.00

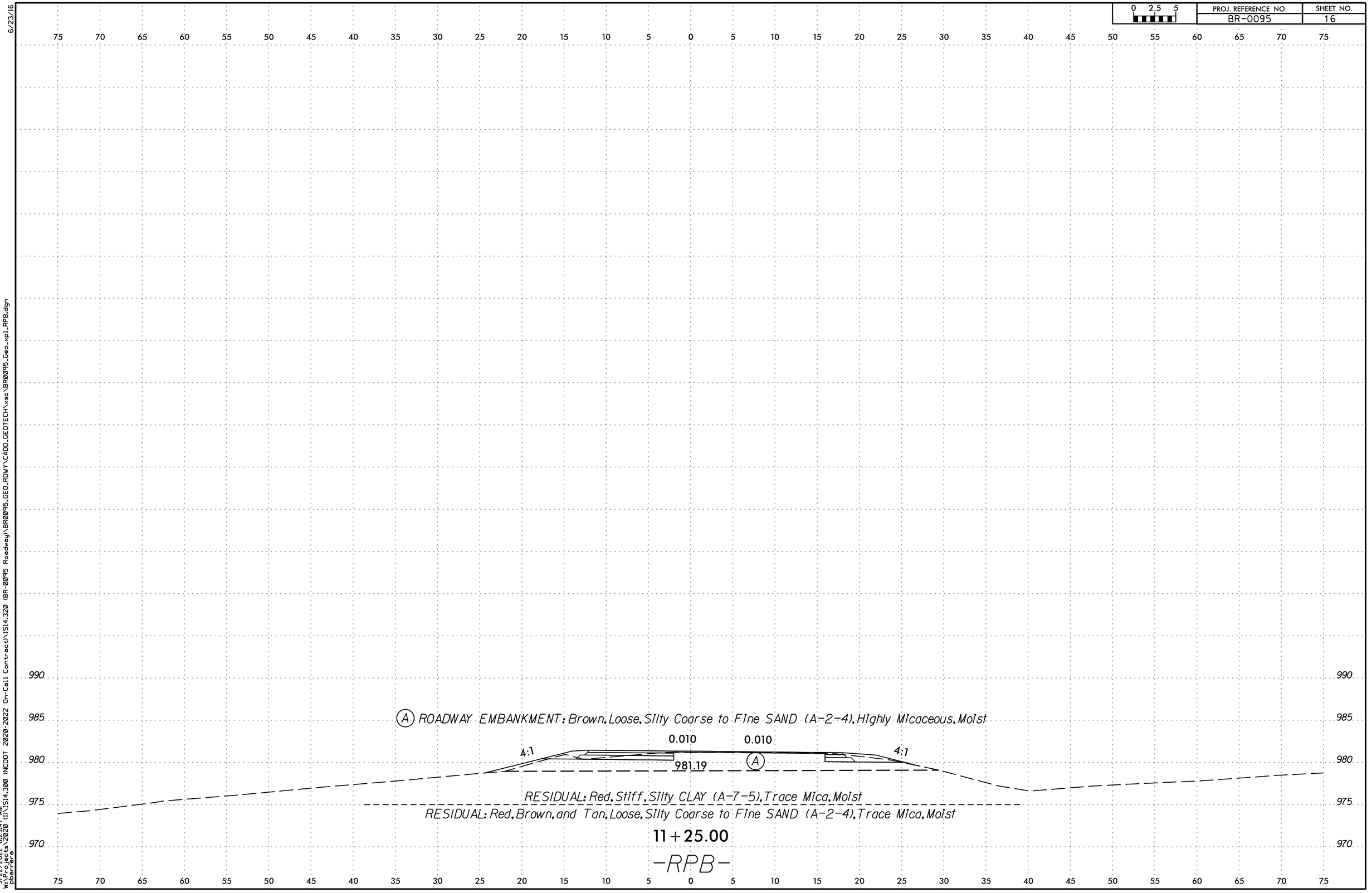
-RPA-



6/23/16

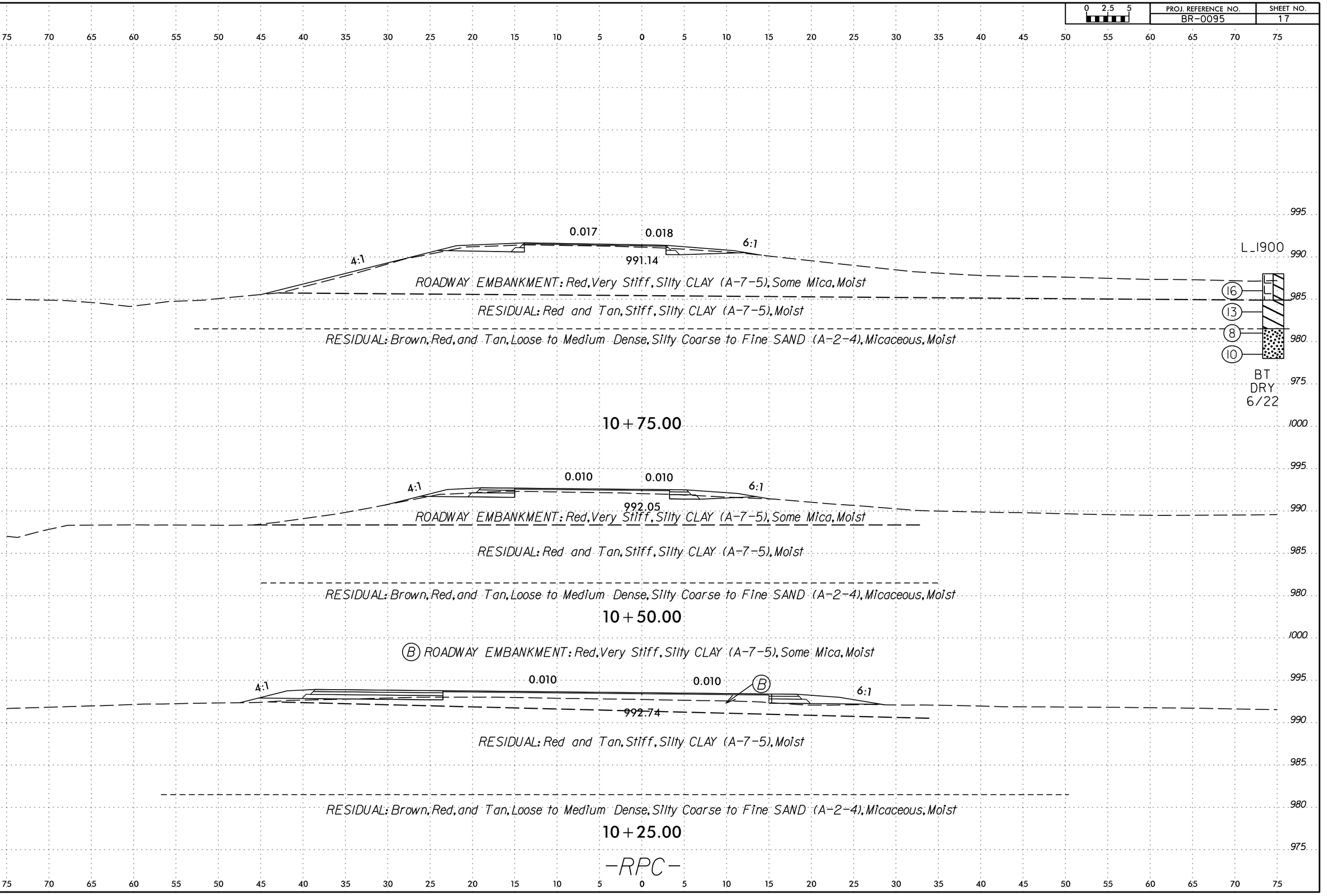
9/22/2022 6:29:47 AM
W:\Projects\2020 (I\SI4.300 INCDOT 2020-2022 On-Call Contracts\SI4.320 (BR-0095 Roadway\BR0095_GEO_RDWY\CADD_GEOTECH\xsc\BR0095_Geo_xpl_RPB.dgn
pbarrero

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BR-0095	16



6/23/16

9/22/2022 6:29:47 AM
W:\Projects\2020 (I)\SI4.300 INCDOT 2020-2022 On-Call Contracts\SI4.320 (BR-0095 Roadway\BR0095_GEO_RDWY\CADD_GEOTECH\xsc\BR0095_Geo_xpl_RPB.dgn
pbarrero



PROJ. REFERENCE NO.	SHEET NO.
BR-0095	18

0 2.5 5

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

995
990
985
980
975

0.020
0.020
6:1
990.04

ROADWAY EMBANKMENT: Red, Very Stiff, Silty CLAY (A-7-5), Some Mica, Moist

RESIDUAL: Red and Tan, Stiff, Silty CLAY (A-7-5), Moist

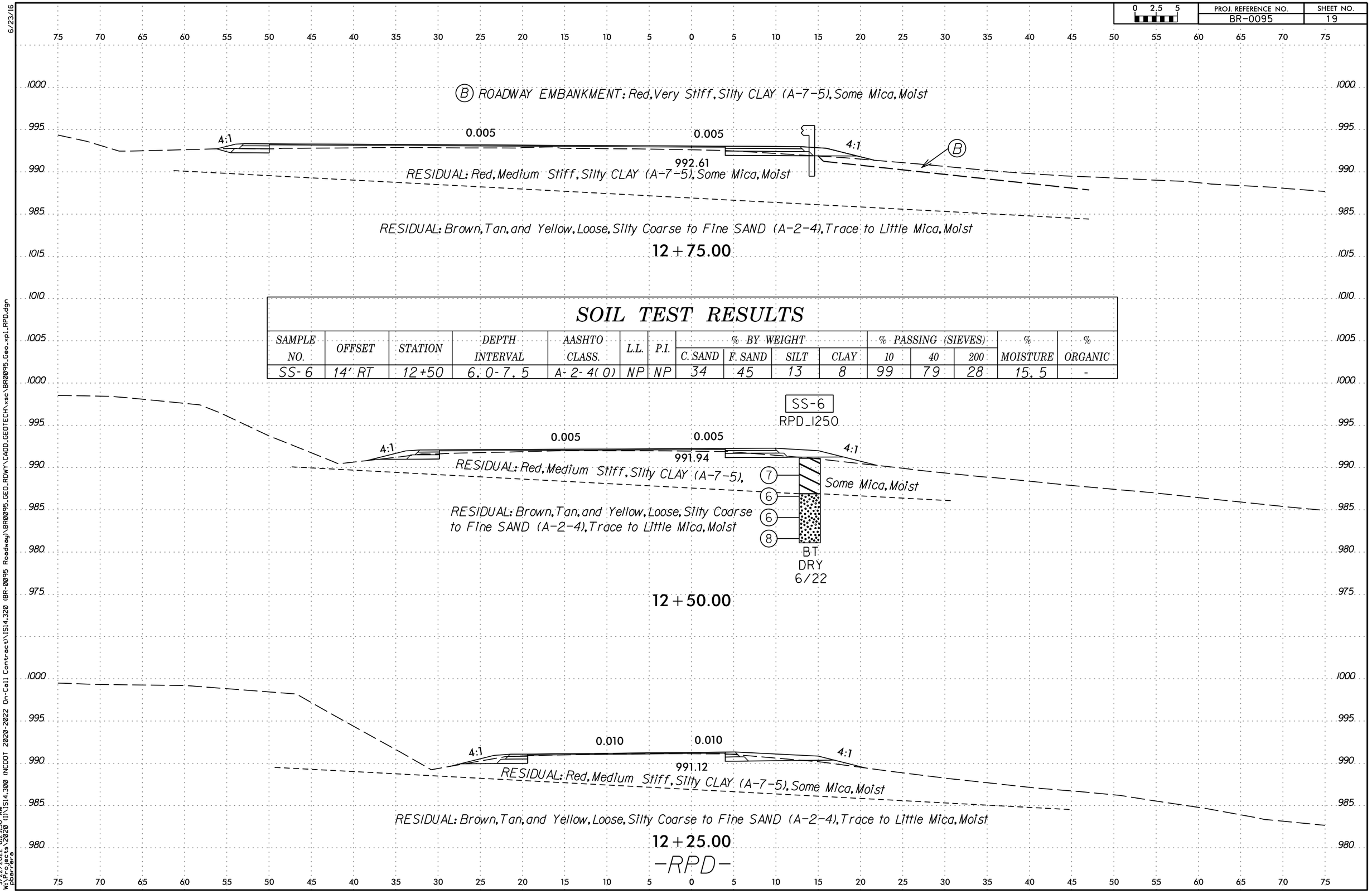
RESIDUAL: Brown, Red, and Tan, Loose to Medium Dense, Silty Coarse to Fine SAND (A-2-4), Micaceous, Moist

11+00.00

-RPC-

6/23/16

9/22/2022 6:29:49 AM
W:\Projects\2020 (IN\SI4.300 INCDOT 2020-2022 On-Call Contract\SI4.320 (BR-0095 Roadway\BR0095_GEO_RDWY\CADD_GEOTECH\xsc\BR0095_Geo_xpl_RPC.dgn
pbarrero



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-6	14' RT	12+50	6.0-7.5	A-2-4(0)	NP	NP	34	45	13	8	99	79	28	15.5	-

PROJECT REFERENCE NO.	SHEET NO.
BR–0095	20

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX A
LABORATORY TESTS RESULTS SUMMARY

REFERENCE: BR–0095

PROJECT: 67095

ESP
ESP ASSOCIATES, INC.
7011 ALBERT PICK RD
SUITE E
GREENSBORO, NC 27409
WWW.ESPASSOCIATES.COM

SOILS LABORATORY TESTS RESULTS

WBS NO.: 67095.1.1

TIP NO.: BR-0095

COUNTY: Rockingham

SITE DESCRIPTION: Replace Bridge No. 780170 on SR 1360 Over US 220

BORING NO.	SAMPLE NO.	BORING LOCATION	DEPTH INTERVAL (FT)	AASHTO CLASS	N	L.L	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
								CSE. SAND	F. SAND	SILT	CLAY	10	40	200		
L_1350	SS-1	-L- STA. 13+50, 38' LT	1.0-2.5	A-7-5 (16)	13	63	21	12	25	7	56	99	93	67	25.0	-
L_1500	SS-2	-L- STA. 15+00, 40' RT	1.0-2.5	A-2-4 (0)	8	NP	NP	26	52	11	11	99	90	33	26.0	-
L_1800	SS-3	-L- STA. 18+00, 65' LT	3.5-5.0	A-2-4 (0)	10	NP	NP	43	37	13	7	100	71	26	13.0	-
L_1800	SS-4	-L- STA. 18+00, 65' LT	13.5-15.0	A-2-4 (0)	32	NP	NP	20	62	13	5	96	91	27	14.3	-
L_2145	SS-5	-L- STA. 21+45, 26' LT	1.0-2.5	A-7-5 (10)	15	61	15	20	24	10	46	98	86	59	28.1	-
RPD-1250	SS-6	-RPD- STA. 12+50, 14' RT	6.0-7.5	A-2-4 (0)	6	NP	NP	34	45	13	8	99	79	28	15.5	-

Certification No. 144-02-0718