

REFERENCE: BR-0043

PROJECT: 67043

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0043	1	36

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 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

C. RANIERI, GIT

S. DAVIS

T. BEARD

INVESTIGATED BY F&R, Inc.

DRAWN BY T.T. WALKER

CHECKED BY P. ALTON, P.E.

SUBMITTED BY C. WANG, P.E.

DATE APRIL 2022

CONTENTS

LINE	STATION	PLAN	CROSS SECTION
-L-	20+00.00 to 24+50.00	4	8-12
-L-	27+00.00	4	13
-L-	28+00.00	4	14
-L-	29+00.00 to 39+06.56	4-5	15-23
-RPA-	17+50.00	4	24
-RPB-	21+00.00 to 22+50.00	4	25-26
-RPC-	17+50.00	4	27
-RPC-	19+50.00	4	28
-RPD-	20+00.00	4	29
-RPD-	21+50.00	4	30
-Y-	24+00.00	6	31
-Y-	26+00.00	4	32
-Y-	28+00.00	4	33
-Y-	32+00.00	4	34
-Y-	34+00.00	4	35
-Y-	36+00.00	7	36

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY ROCKINGHAM
PROJECT DESCRIPTION BRIDGE NO. 780151 ON US 158
OVER US 29

INVENTORY

SINCE **Prepared in the Office of:**
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Engineering Stability Since 1881
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DocuSigned by:
Cheng Wang 04/19/2022

1711224BF539492 SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
 SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)										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. FISSELE - 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 INTRODUCED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (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.									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										MINERALOGICAL COMPOSITION										WEATHERING										ROCK HARDNESS									
GROUP CLASS. A-1, A-1-b, A-3, 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										COMPRESSIBILITY										FRESH										VERY HARD									
SYMBOL										PERCENTAGE OF MATERIAL										VERY SLIGHT (V SLI.)										HARD									
% PASSING #10, #40, #200										GROUND WATER										SLIGHT (SLI.)										MODERATELY HARD (MOD. SEV.)									
MATERIAL PASSING #40, LL, PI										MISCELLANEOUS SYMBOLS										MODERATE (MOD.)										SEVERE (SEV.)									
GROUP INDEX										RECOMMENDATION SYMBOLS										SEVERE (SEV.)										VERY HARD									
USUAL TYPES OF MAJOR MATERIALS										ABBREVIATIONS										COMPLETE										HARD									
GEN. RATING AS SUBGRADE										EQUIPMENT USED ON SUBJECT PROJECT										COMPLETE										HARD									
PI OF A-7-5 SUBGROUP IS <= LL - 30, PI OF A-7-6 SUBGROUP IS > LL - 30										FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS										COMPLETE										HARD									
CONSISTENCY OR DENSENESS										INDURATION										COMPLETE										HARD									
PRIMARY SOIL TYPE										INDURATION										COMPLETE										HARD									
GENERALY GRANULAR MATERIAL (NON-COHESIVE)										INDURATION										COMPLETE										HARD									
GENERALY SILT-CLAY MATERIAL (COHESIVE)										INDURATION										COMPLETE										HARD									
TEXTURE OR GRAIN SIZE										INDURATION										COMPLETE										HARD									
U.S. STD. SIEVE SIZE OPENING (MM)										INDURATION										COMPLETE										HARD									
BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE. SD.), FINE SAND (F. SD.), SILT (SL.), CLAY (CL.)										INDURATION										COMPLETE										HARD									
GRAIN SIZE MM, IN.										INDURATION										COMPLETE										HARD									
SOIL MOISTURE - CORRELATION OF TERMS										INDURATION										COMPLETE										HARD									
SOIL MOISTURE SCALE (ATTERBERG LIMITS)										INDURATION										COMPLETE										HARD									
FIELD MOISTURE DESCRIPTION										INDURATION										COMPLETE										HARD									
GUIDE FOR FIELD MOISTURE DESCRIPTION										INDURATION										COMPLETE										HARD									
LL - LIQUID LIMIT										INDURATION										COMPLETE										HARD									
PL - PLASTIC LIMIT										INDURATION										COMPLETE										HARD									
OM - OPTIMUM MOISTURE										INDURATION										COMPLETE										HARD									
SL - SHRINKAGE LIMIT										INDURATION										COMPLETE										HARD									
PLASTICITY										INDURATION										COMPLETE										HARD									
NON PLASTIC, SLIGHTLY PLASTIC, MODERATELY PLASTIC, HIGHLY PLASTIC										INDURATION										COMPLETE										HARD									
PLASTICITY INDEX (PI)										INDURATION										COMPLETE										HARD									
DRY STRENGTH										INDURATION										COMPLETE										HARD									
COLOR										INDURATION										COMPLETE										HARD									
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										INDURATION										COMPLETE										HARD									

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

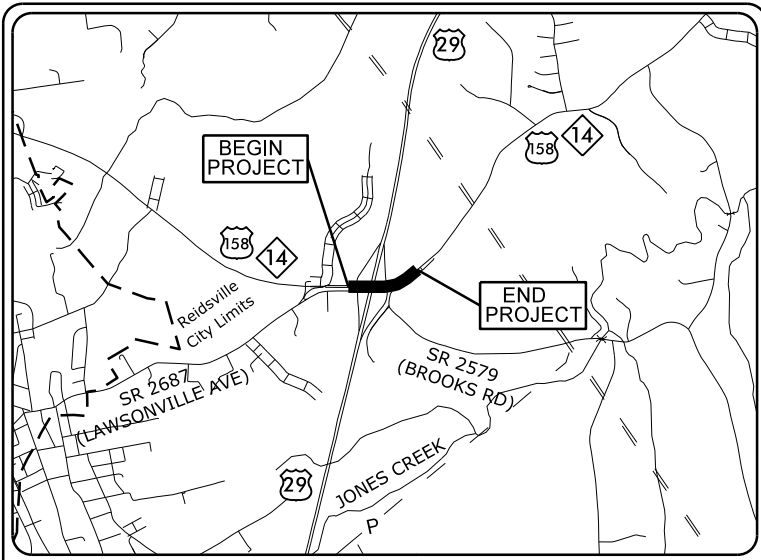
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROCKINGHAM COUNTY

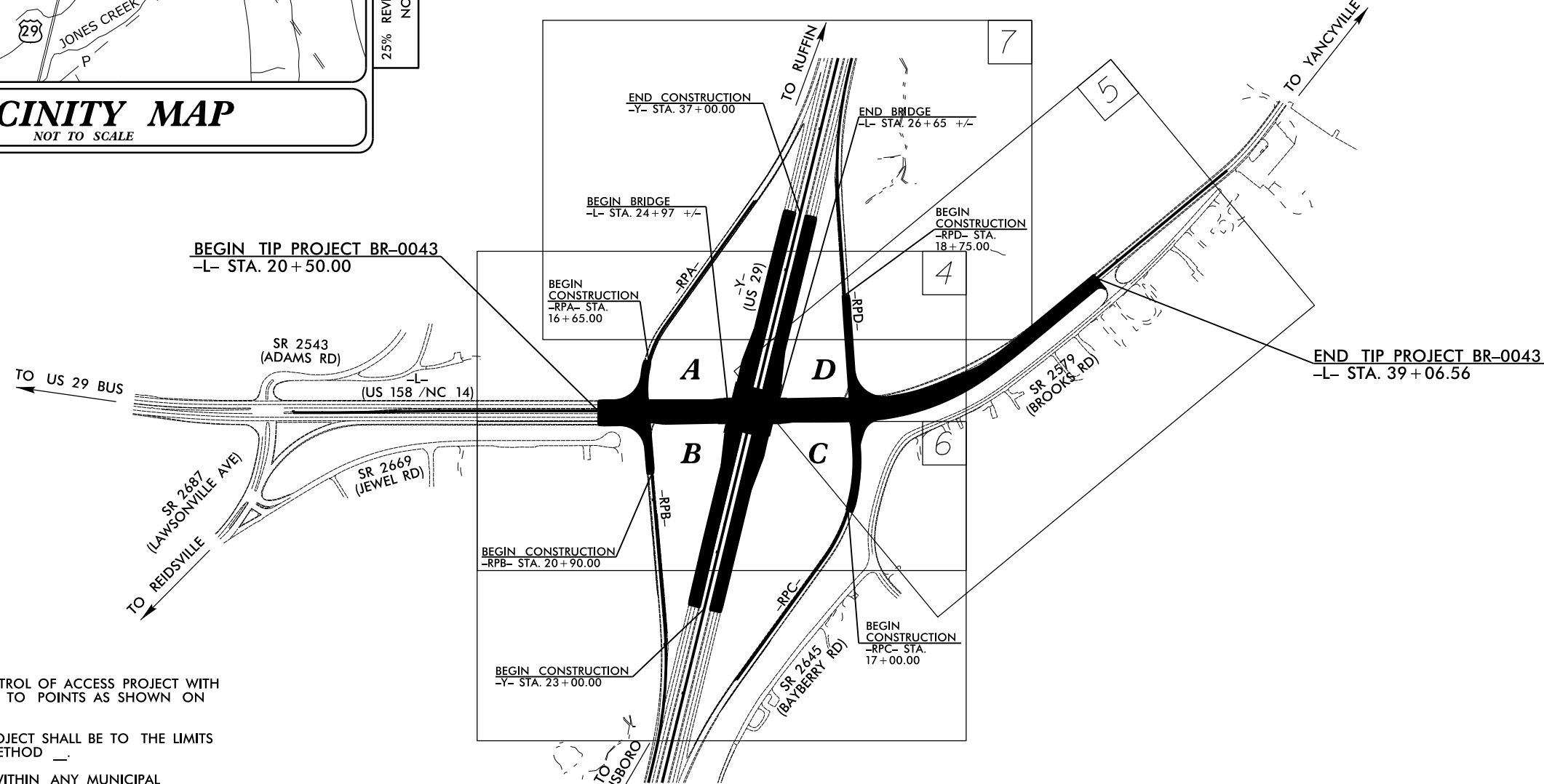
**LOCATION: REPLACE BRIDGE 780151 ON US 158 /NC 14
OVER US 29**

TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNAL, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0043	3	36
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
67043.1.1		PE	



25% REVISED ROADWAY PLANS
NOVEMBER 15, 2021



THIS IS A PARTIAL CONTROL OF ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

CLEARING ON THE PROJECT SHALL BE TO THE LIMITS ESTABLISHED USING METHOD ___

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

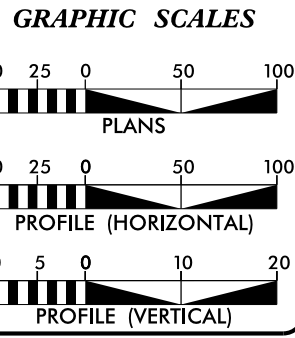
EXISTING SIGNAL

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TIP PROJECT: BR-0043

CONTRACT:



DESIGN DATA

ADT 2023 =	15,718
ADT 2043 =	17,109
K =	9 %
D =	55 %
T =	6 % *
V =	50 MPH
* TTST =	4% DUAL 2%
FUNC CLASS =	PRINCIPAL ARTERIAL REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT BR-0043 =	0.320 MI
LENGTH STRUCTURE TIP PROJECT BR-0043 =	0.032 MI
TOTAL LENGTH TIP PROJECT BR-0043 =	0.352 MI

Prepared in the Office of:

AECOM
2018 STANDARD SPECIFICATIONS

NC FIRM LICENSE No: F-0342
5438 Wade Park Blvd., Suite 200
Raleigh, NC 27607
(919) 461-1100

RIGHT OF WAY DATE:
AUGUST 15, 2022

LETTING DATE:
APRIL 18, 2023

JOHN C. MORRISON, P.E.
PROJECT ENGINEER

TIMOTHY A. KLOTZ, P.E.
PROJECT DESIGN ENGINEER

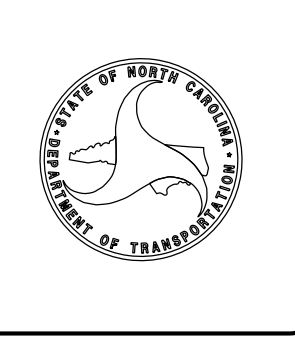
DAVID STUTTS, P.E.
NCDOT PROJECT MANAGER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



I:\2-APR-2022 11:02 AM\Projects\667-0235 (NCDOT-BR-0043 Rockingham Co)\BR-0043-RDW\CADD-GEOTECH\PlanProj\BR0043_geo.tsh.dgn
T:\walker AT 660861263



Engineering Stability Since 1881

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NC Engineering License # F-0266

April 13, 2022

State Project No.: 67043.1.1
TIP No.: BR-0043
Project ID: 38980
County: Rockingham
Description: Bridge No. 780151 on US 158 over US 29

SUBJECT: Geotechnical Report – Inventory

Project Description

The project primarily consists of the replacement of the existing Bridge 151 on US-158 (-L-) over US-29 (-Y-) in Reidsville, Rockingham County. The subject portion of US-158 begins approximately 500 feet west of its intersection with US-29 and continues for approximately 1,400 feet.

The existing four-lane bridge will be replaced with a slightly wider, longer, and higher, four-lane bridge. As a result of the bridge replacement, US-158 and US-29 will be widened as well as widening of the four ramps. The new alignments primarily extend along existing roadway shoulders and through some portions of wooded and undeveloped property.

The geotechnical field investigation was performed between January and February 2022. During this time period, a total of 27 Standard Penetration Test (SPT) borings were advanced with ATV-mounted CME-55 drill rig with an automatic hammer. In addition, one (1) hand auger boring was completed due to restrictive drill rig access. Representative soil samples were collected from the split spoon or hand auger cuttings for visual classification in the field and for analysis by F&R’s testing laboratory.

The following alignments were investigated:

<u>Alignment</u>	<u>Station (±)</u>
-L-	20+50 to 39+06.56
-Y-	23+00 to 37+00
-RPA-	16+65 to 18+37.73
-RPB-	20+90 to 23+06.87
-RPC-	17+00 to 20+49.45
-RPD-	18+75 to 22+72.56

Areas of Special Geotechnical Interest

1) Soft, Loose and/or Wet Soils: The following areas contain relatively soft, near-surface soils that have the potential to cause subgrade problems during construction:

<u>Alignment</u>	<u>Station (±)</u>
-L-	20+50 to 24+00, right
-L-	29+00 to 31+00, left
-L-	29+00 to 31+00, left
-L-	31+50 to 32+50, right
-Y-	35+00 to 37+00, right

2) Cohesive Soils: The following areas contain cohesive soils (AASHTO A-5, A-6 & A-7 soils) at existing subgrade in fill areas or at/near proposed subgrade in cut areas that have the potential to cause subgrade problems during construction:

<u>Alignment</u>	<u>Station (±)</u>
-L-	20+50 to 25+00
-L-	29+00 to 39+06.56
-RPA-	16+65 to 18+37.73
-RPB-	20+90 to 23+06.87
-RPD-	18+75 to 22+72.56, left
-Y-	35+00 to 37+00, right

3) Cohesive Soils: The following areas contain deeper deposits of relatively soft cohesive soils (AASHTO A-5, A-6 and A-7 soils) that have the potential to cause embankment instability or long-term settlement problems:

<u>Alignment</u>	<u>Station (±)</u>
-L-	24+00 to 30+50

Physiography and Geology

The existing road of US-158 generally runs in a west-to-east direction, and primarily through residential properties and undeveloped wooded areas. The existing ground surface along the centerline of -L- generally slopes gently downward from an elevation (EL) of ±766 feet at the beginning of the project to EL ±763 at the intersection with US-29. The ground surface slopes then downward to EL ±760 feet near station -L- 30+50 and upward to EL ±763 feet at the end of the project. And for -Y- (US-29), the ground surface gently slopes up from EL ±735 starting at approximate 700 ft south of the its intersection with US-158 to EL ±740 at the intersection, and then slopes down to EL ±732 at approximate 700 ft north of the intersection.

The project site is geologically located in the Piedmont Physiographic Province of North Carolina within the Charlotte and Milton Belts. More-specifically, it is located in an area mapped as biotite gneiss and schist

(CZbg). Typical weathered rock fragments recovered from our borings exhibit the characteristics of biotite gneiss and schist. Soils weathered from the parent rock generally consist of fine sandy silts and silty fine sands. The in-situ soils are the residual product of in-place chemical weathering of rock that was similar to the rock presently underlying the site.

Soils Properties

The subsurface conditions discussed below and those shown on the attached drawings, represent an estimate of the subsurface conditions based on interpretation of the boring data using normally-accepted geotechnical engineering judgments. The transitions between different soil strata are usually less distinct than those shown on the profile. Sometimes the relatively small sample obtained in the field is insufficient to definitively describe the origin of the subsurface material. Although individual soil test borings are representative of the subsurface conditions at the boring locations on the dates shown, they are not necessarily indicative of subsurface conditions at other locations or at other times.

Soils within the area of this project have been divided into two categories: roadway embankment fill and residual soils:

Roadway Embankment: Roadway embankment (RE) soils were encountered at the surface of 19 borings. The RE was likely associated with previous construction of the roads and the bridge embankments. The RE extended to depths ranging from 2 to 22 feet, with the depth of RE generally increasing towards the bridge. The fill was generally described as dry to wet, soft to stiff, sandy silty CLAY (A-7 & A-7-5), sandy and clayey SILT (A-4 and A-5), and loose to medium dense, sandy GRAVEL (A-1-a) and silty SAND (A-2-4). A majority of the samples contained trace organic matter and/or gravel.

Residual Soils: A majority of the soils encountered on this project were residual soils. Residual soils were encountered below roadway embankment soils at 16 borings and at the surface of 12 borings. The residual soils were typically described as moist to wet, soft to very stiff sandy and silty CLAY (A-6 & A-7), medium stiff to hard, sandy and clayey SILT (A-4 & A-5), and loose to dense, silty SAND (A-2-4). A majority of the samples contained trace amounts of organics, gravel, and mica.

Rock Properties

Weathered Rock (WR) was encountered in 4 end bent borings. WR was encountered at initial depths ranging from 42.3 to 55.1 feet and elevations ranging from 708.2 to 719.0 feet.

Crystalline Rock (CR) was encountered in 4 end bent borings as indicated by auger and SPT refusal. All of the 4 end bent borings were terminated on Crystalline Rock (CR). The CR was encountered at depths ranging from 48.5 to 68.5 feet and elevations from 694.8 to 712.8 feet. The rock consisted of biotite gneiss and schist. Refusal is a designation applied to any material that cannot be penetrated by the soil auger, and is typically caused by encountering boulders, hard rock lenses/ledges or bedrock. The nature of the materials causing refusal was not explored in these borings, but is anticipated to represent the CR level.

Groundwater Properties

Groundwater measurements were attempted in all the borings except the 4 end bent borings which were backfilled immediately after drilling due to borings being located in the road. Immediately upon completion, groundwater was encountered in two end bent borings EB2-A and EB1-B at depths of 38.1 and 41 feet, and elevations of 722.5 and 723.2 feet, respectively. Groundwater was also observed in the augers right after drilling at depths 49.5 and 45.5 feet in borings EB1-A and EB2-B respectively. It should be noted that groundwater levels fluctuate depending upon seasonal factors such as precipitation and temperature.

We appreciate the opportunity to work with you on this project. Please contact us if you have any questions regarding this report or if we may be of further service.

Appendix A

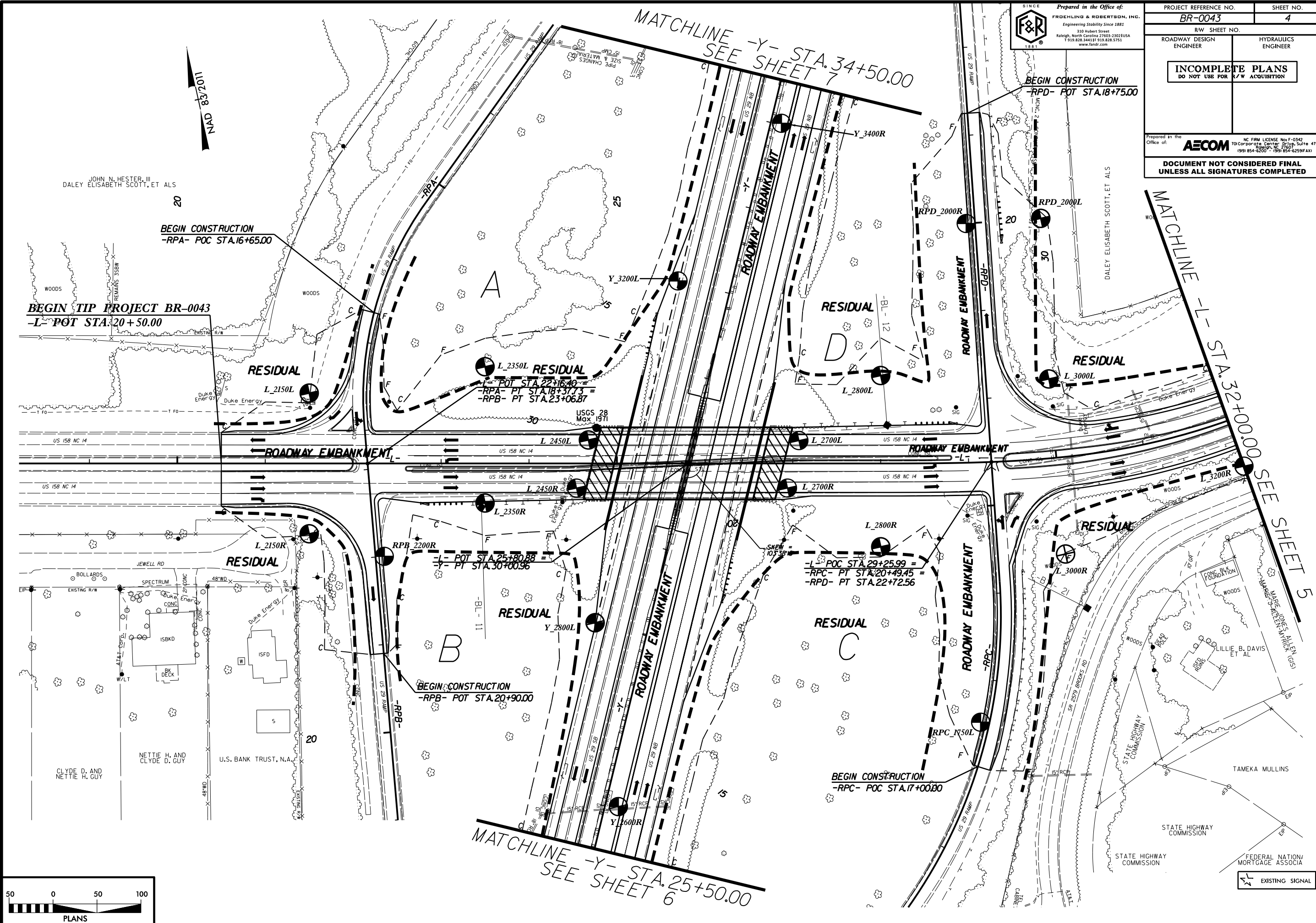
Shelby Tubes

The following Shelby tubes were obtained and transported to our laboratory for potential testing to determine the engineering properties of the soil. Two (2) Shelby tubes were attempted and able to be obtained.

Sample No.	Boring No.	Line	Station	Offset	Depth (ft)	Test(s) Performed
ST-1	L_2700L (EB2-A)	-L-	26+94	26' LT	13.0-15.0	Not tested
ST-2	L_2450R (EB1-B)	-L-	24+54	28' RT	8.0-10.0	Consolidation

5/14/2011

PROJECT REFERENCE NO. BR-0043		SHEET NO. 4	
RW SHEET NO. ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
Prepared in the Office of: FROELING & ROBERTSON, INC. Engineering Stability Since 1881 310 Hubert Street Raleigh, North Carolina 27603-2302 USA T 919 854-3443 F 919 854-3753 www.fandr.com		MC FIRM LICENSE No F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27601 (919) 854-6200 • (919) 854-6259 (Fax)	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



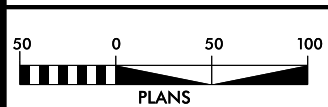
JOHN N. HESTER, III
DALEY ELISABETH SCOTT, ET ALS

BEGIN TIP PROJECT BR-0043
-L- POT STA. 20+50.00

BEGIN CONSTRUCTION
-RPA- POC STA. 16+65.00

MATCHLINE -Y- STA. 25+50.00
SEE SHEET 6

12-APR-2022 11:02
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EXISTING SIGNAL

5/14/20

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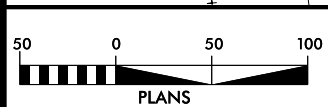
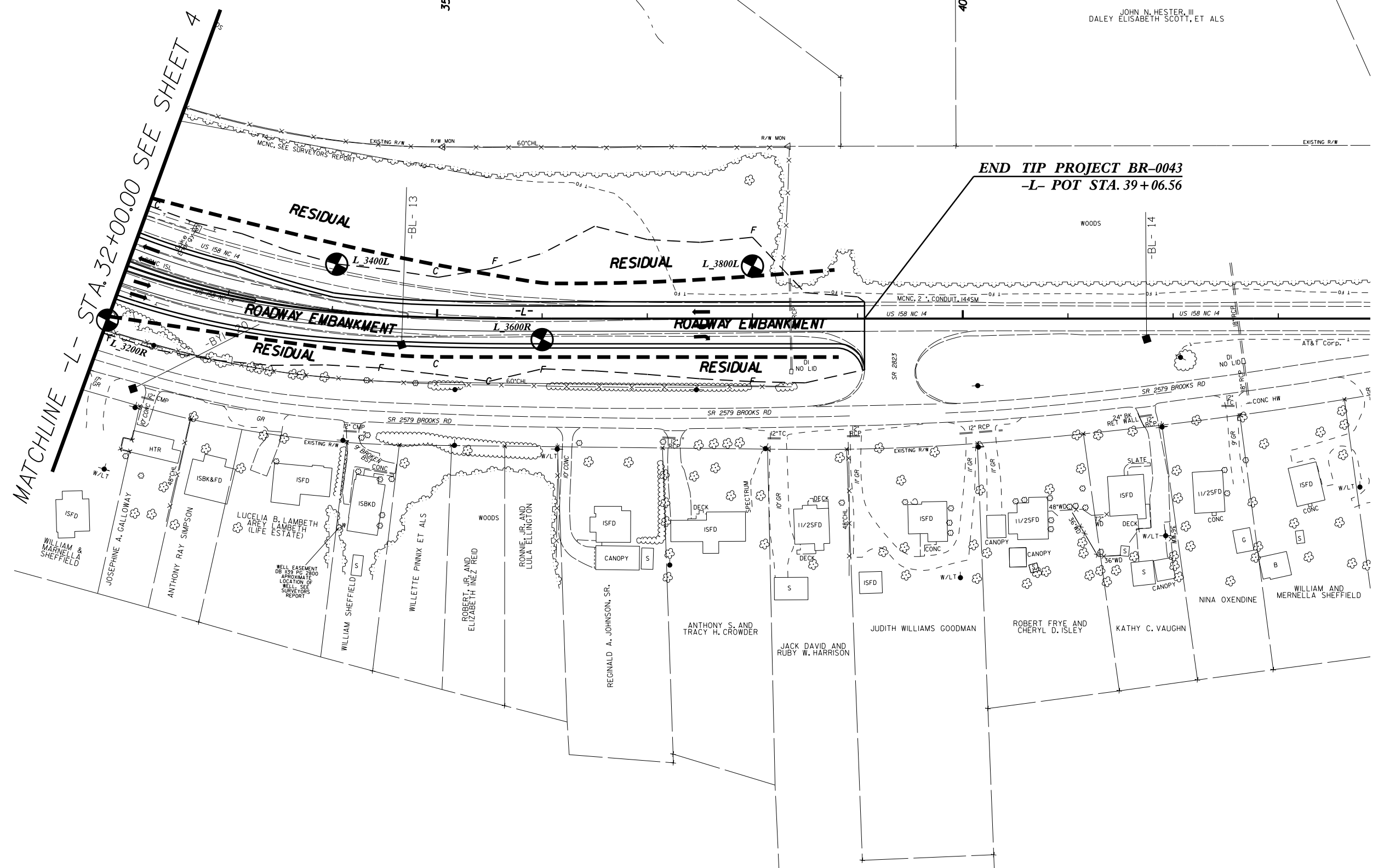
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RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
Prepared in the Office of:		NC FIRM LICENSE No F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27601 (919) 854-6200 • (919) 854-6259(FAX)	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



CLARK M. HOLT, TRUSTEE
JOHN N. HESTER, III
DALEY ELISABETH SCOTT, ET ALS

DALEY ELISABETH SCOTT, ET ALS

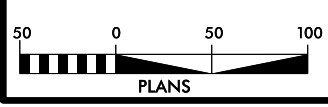
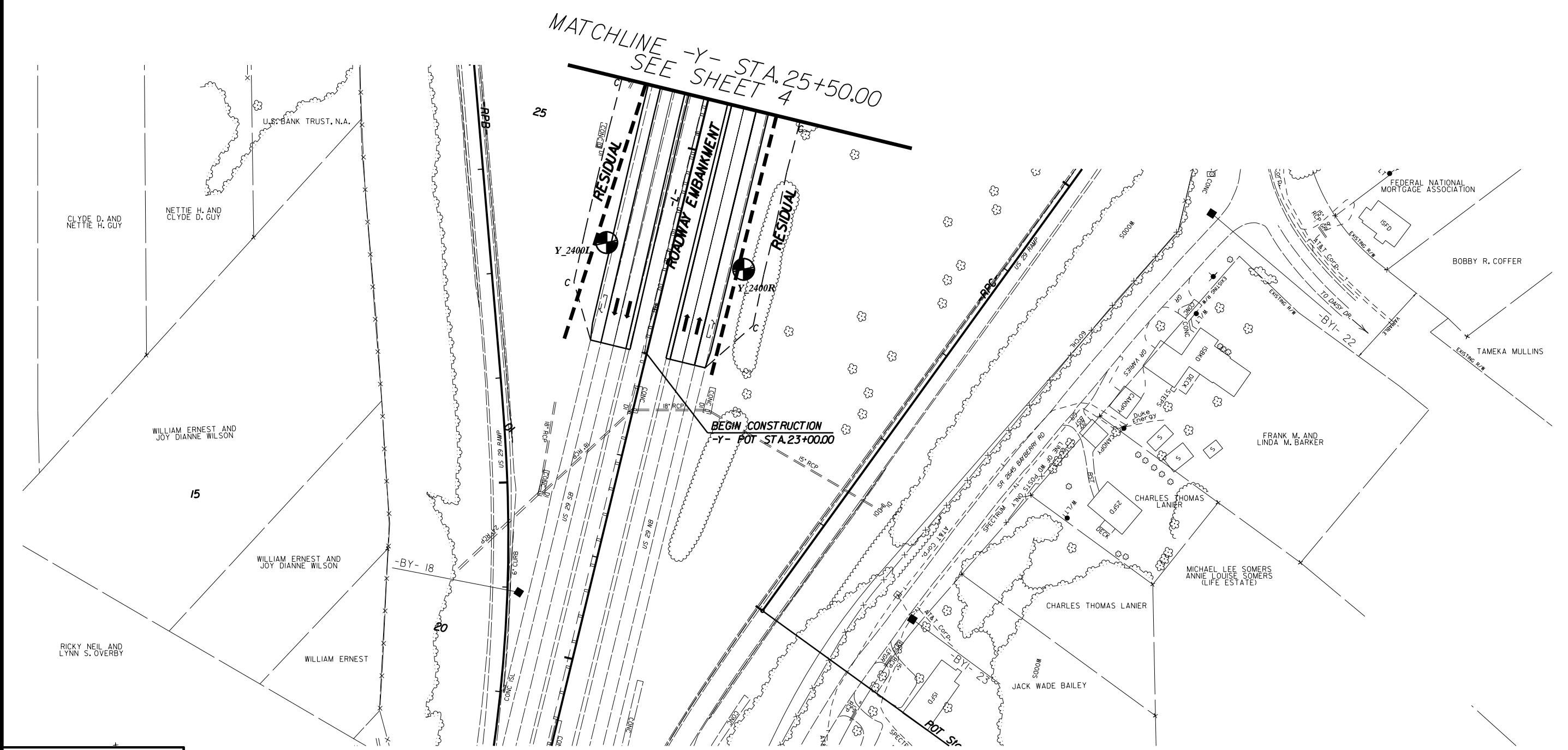
JOHN N. HESTER, III
DALEY ELISABETH SCOTT, ET ALS



NAD 83/2011



PROJECT REFERENCE NO. BR-0043	SHEET NO. 6
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
Prepared in the Office of: AECOM	NC FIRM LICENSE No F-0342 70 Corporate Center Drive, Suite 475 Raleigh, NC 27601 (919) 854-6200 • (919) 854-6259(FAX)
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



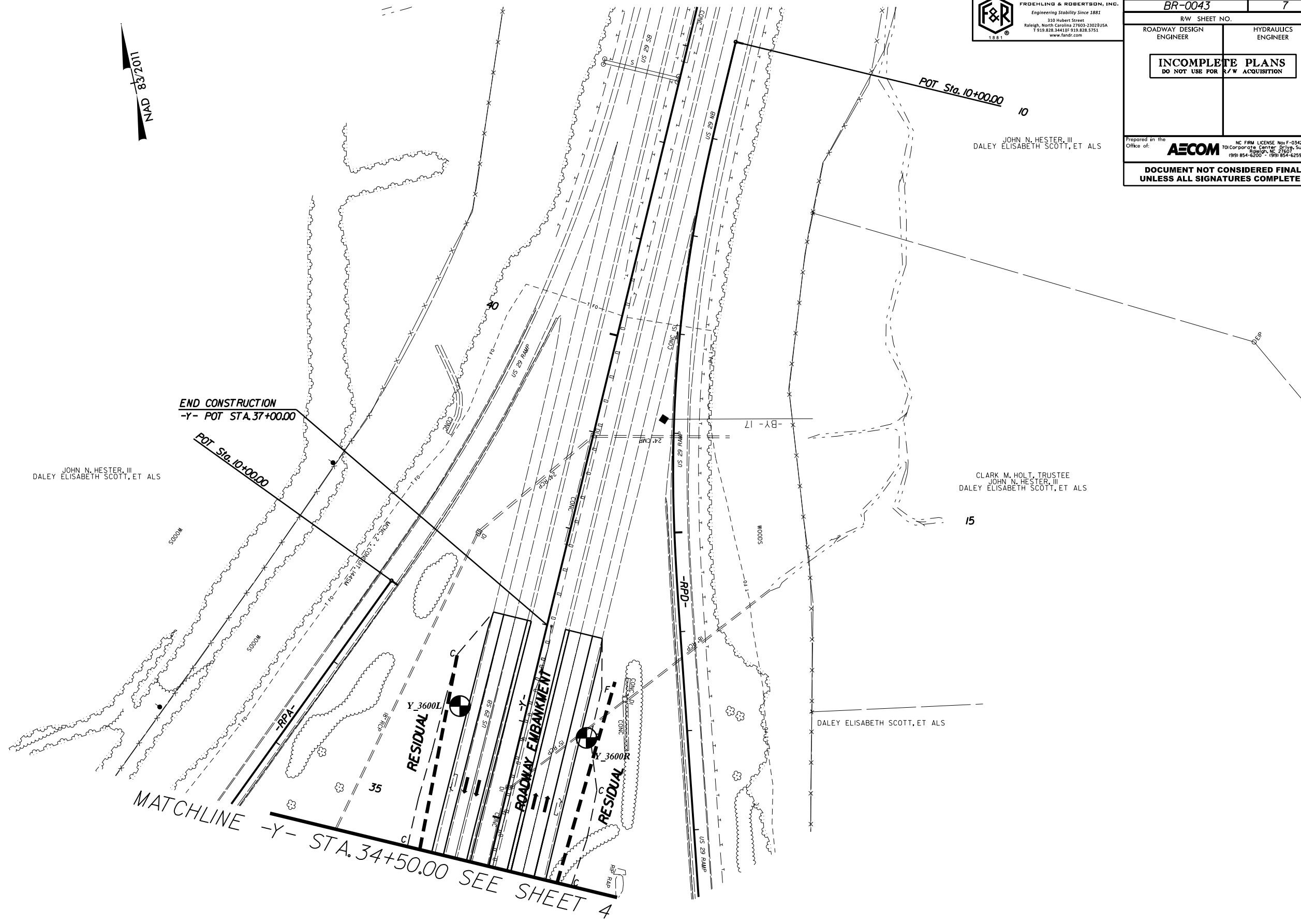
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5/14/20

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 FROEHLING & ROBERTSON, INC.
 Engineering Stability Since 1881
 310 Hubert Street
 Raleigh, North Carolina 27603-2302 USA
 T 919 854-6200 F 919 854-6253
 www.fandr.com

PROJECT REFERENCE NO. BR-0043	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
Prepared in the Office of: AECOM	MC FIRM LICENSE No F-0342 701 Corporate Center Drive, Suite 475 Raleigh, NC 27601 (919) 854-6200 • (919) 854-6259(FAX)
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

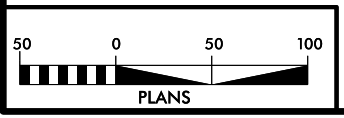


JOHN N. HESTER, III
DALEY ELISABETH SCOTT, ET ALS

CLARK M. HOLT, TRUSTEE
JOHN N. HESTER, III
DALEY ELISABETH SCOTT, ET ALS

DALEY ELISABETH SCOTT, ET ALS

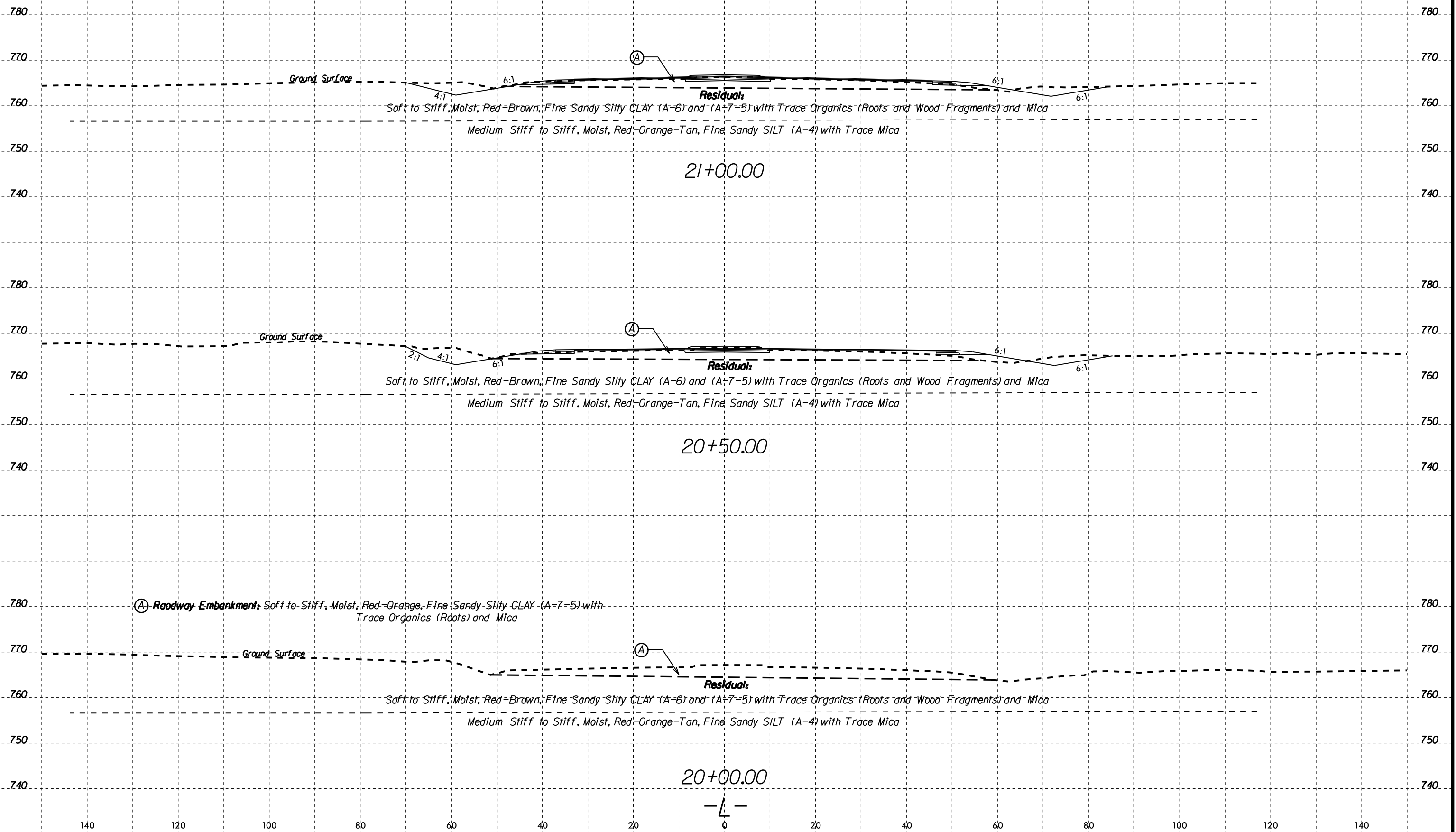
MATCHLINE -Y- STA. 34+50.00 SEE SHEET 4



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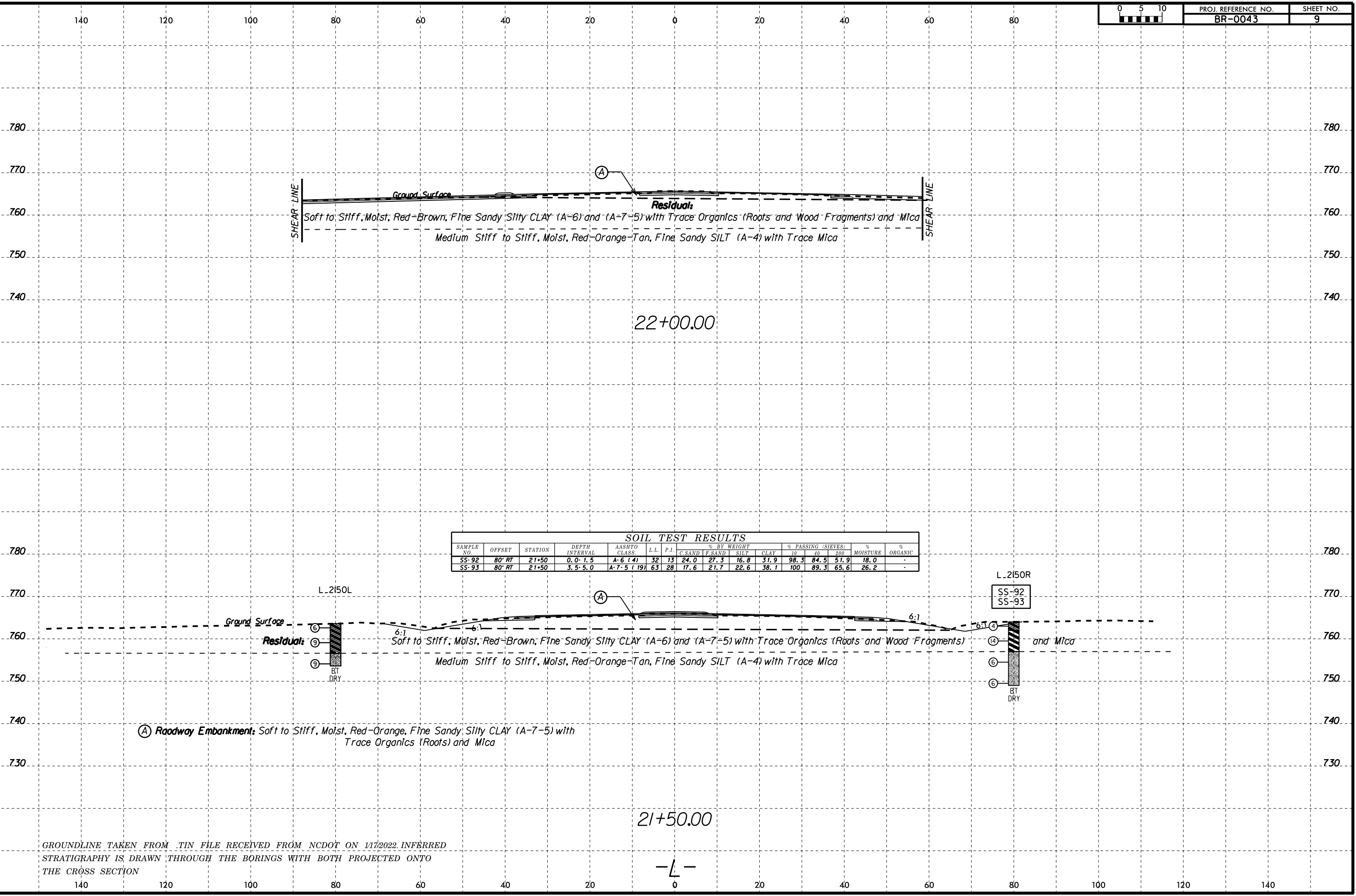
6/23/16

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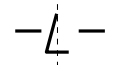
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)			MOISTURE	% ORGANIC	
							C.SAND	F.SAND	SILT CLAY	10	40	200			
SS-92	80' RT	21+50	0.0-1.5	A-6 (A)	32	13	24.0	27.3	16.8	31.9	98.3	84.5	51.9	18.0	-
SS-93	80' RT	21+50	3.5-5.0	A-7-5 (19)	63	28	17.6	21.7	22.6	38.1	100	89.3	65.6	26.2	-

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 11/7/2022. INFERRED
 STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO
 THE CROSS SECTION

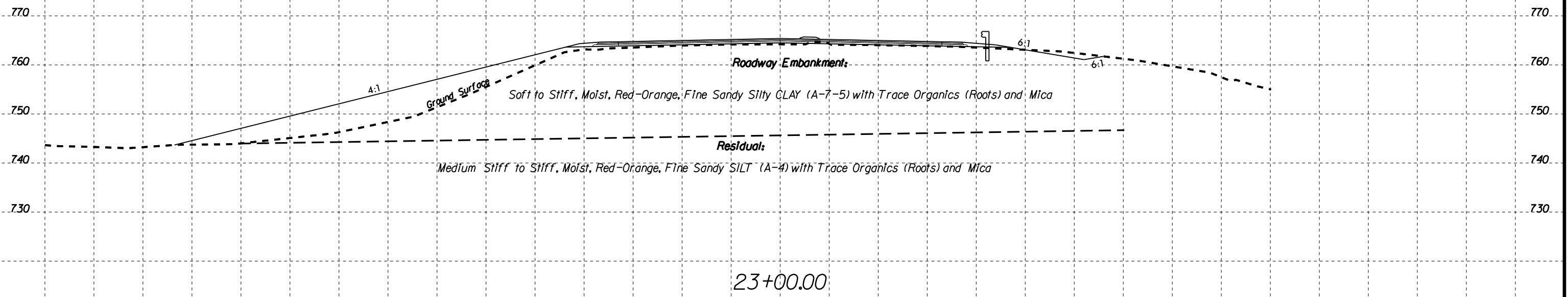


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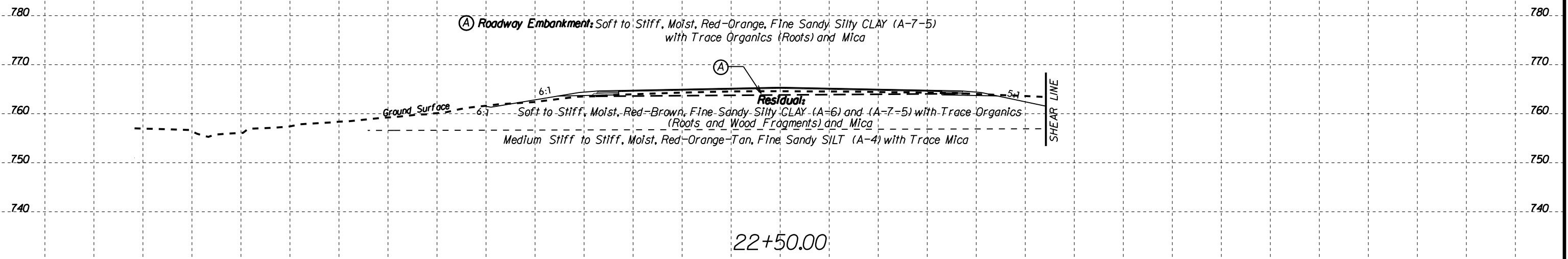


PROJ. REFERENCE NO.	SHEET NO.
BR-0043	10

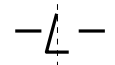
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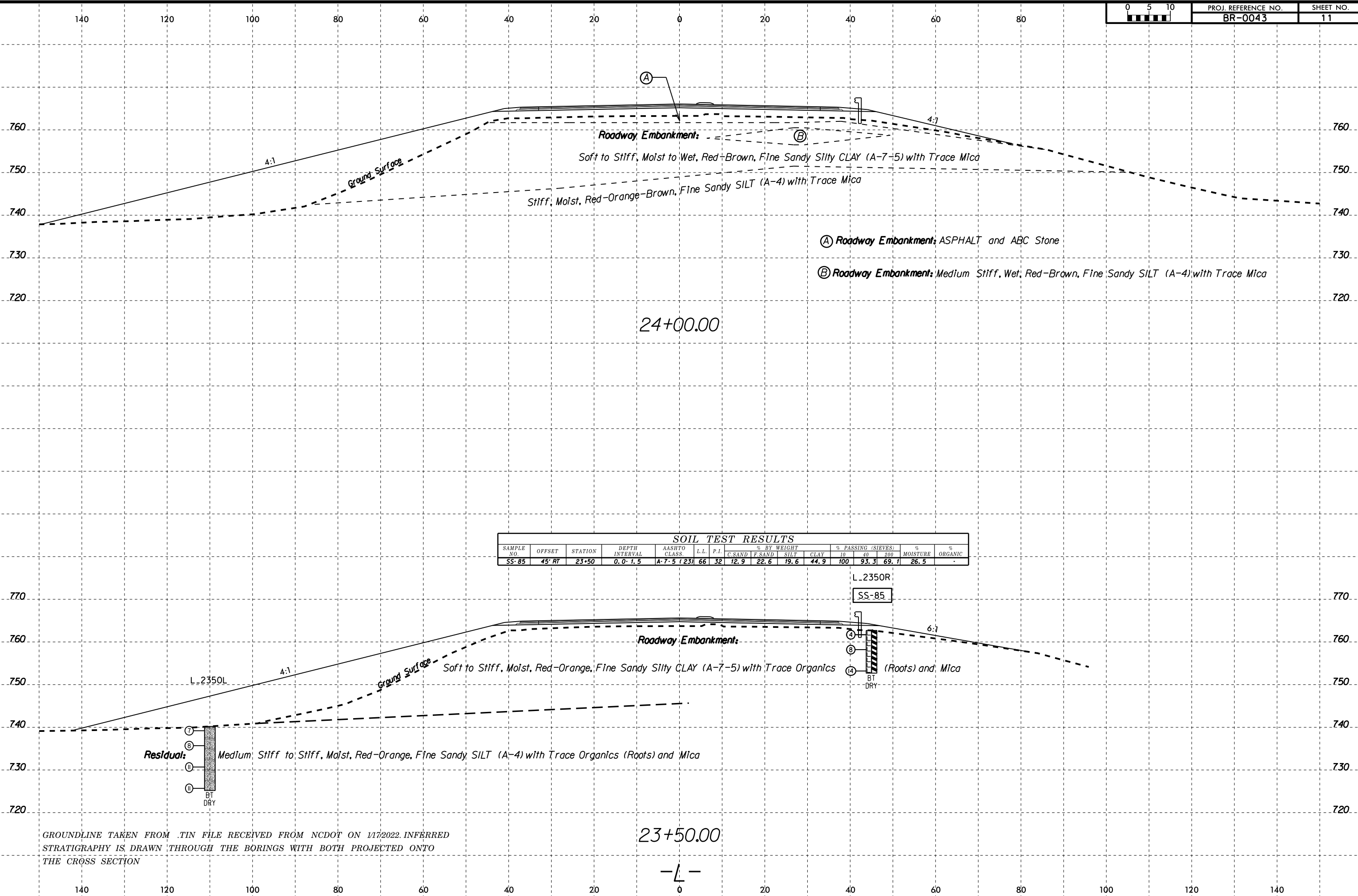
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22+50.00



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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							F. SAND	F. SAND	SILT	CLAY	19	40	200		
SS-85	45' RT	23+50	0.0-1.5	A-7-5 (23)	66	32	12.9	22.6	19.6	44.9	100	93.3	69.1	26.5	-

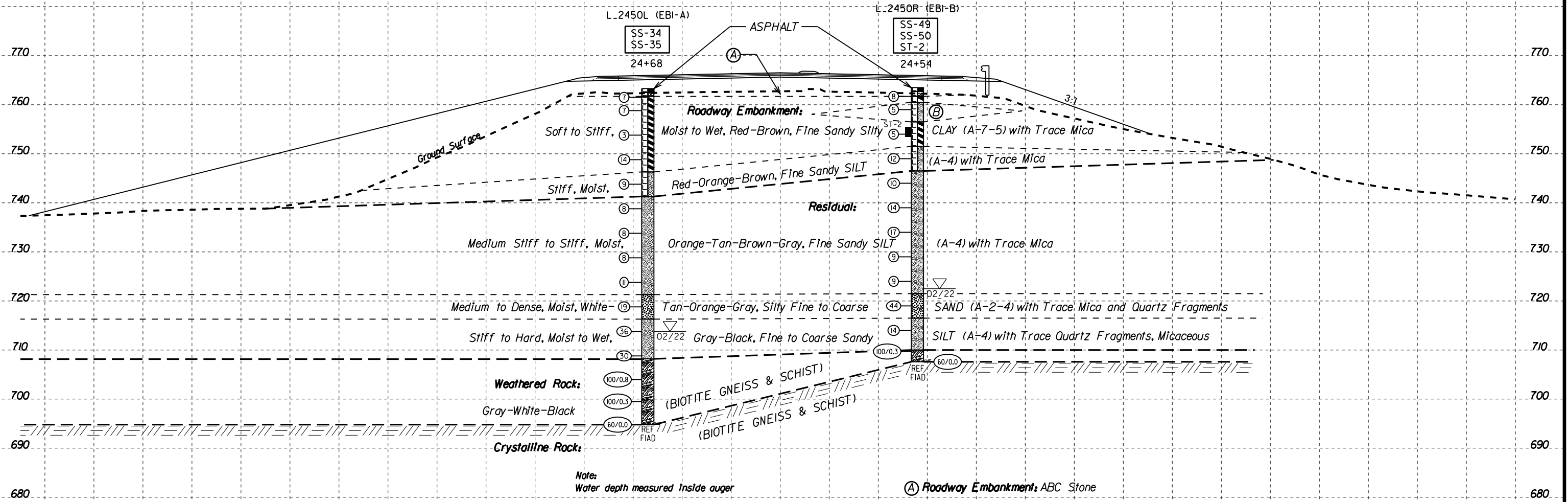
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GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

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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-34	27' LT	24+68	3.5-5.0	-	-	-	-	-	-	-	-	-	-	24.7	-
SS-35	27' LT	24+68	8.5-10.0	A-7-5 (13)	61	20	17.7	26.0	18.5	37.8	99.9	95.5	61.6	-	-
SS-49	28' RT	24+54	3.5-5.0	-	-	-	-	-	-	-	-	-	-	28.6	-
SS-50	28' RT	24+54	8.5-10.0	A-7-5 (16)	60	25	16.5	25.1	14.7	43.7	99.7	91.0	62.7	-	-
ST-2	28' RT	24+54	8.0-10.0	A-7-5 (13)	61	17	9.9	32.8	20.8	36.5	100.0	95.5	64.0	31.6	-



Note:
Water depth measured inside auger

- Ⓐ Roadway Embankment: ABC Stone
- Ⓑ Roadway Embankment: Medium Stiff, Wet, Red-Brown, Fine Sandy SILT (A-4) with Trace Mica

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 11/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

24+50.00

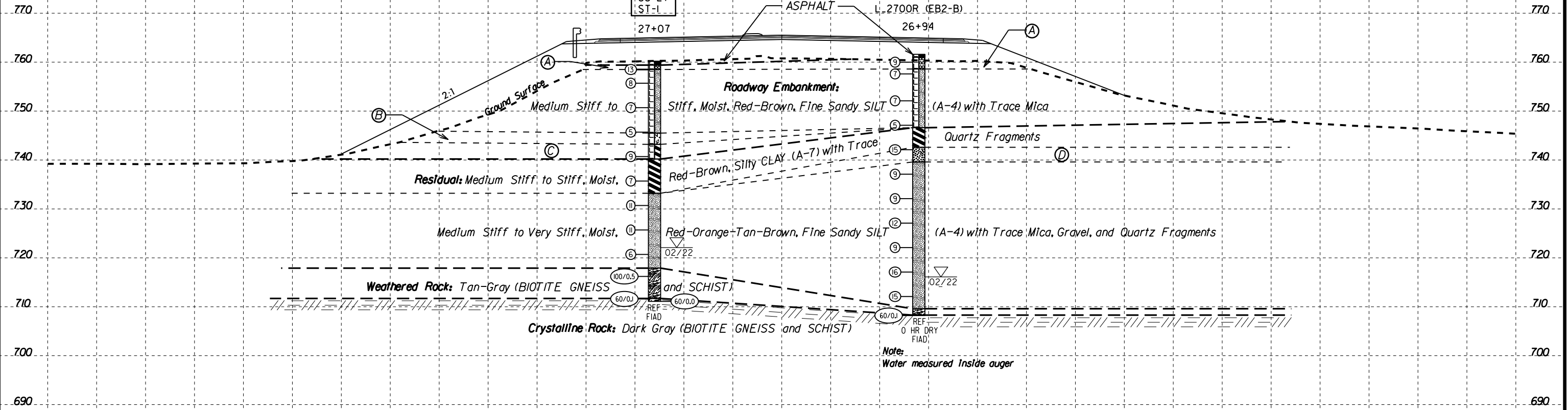
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SOIL TEST RESULTS														
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)		% MOISTURE	% ORGANIC
							C SAND	F SAND	SILT	CLAY	10	200		
SS-25	26' LT	27+07	3.5-5.0	A-4 (0)	NP	NP	15.5	40.9	21.9	21.7	99.2	91.6	51.5	24.9
SS-26	26' LT	27+07	14.7-15.0	-	55	9	-	-	-	-	-	-	-	32.9
SS-27	26' LT	27+07	18.5-20.0	A-7-6 (8)	44	21	19.8	30.9	13.0	36.3	96.6	86.3	51.9	26.4
ST-1	26' LT	27+07	13.0-15.0	-	-	-	-	-	-	-	-	-	-	-

L-2700L (EB2-A)

SS-25
 SS-26
 SS-27
 ST-1

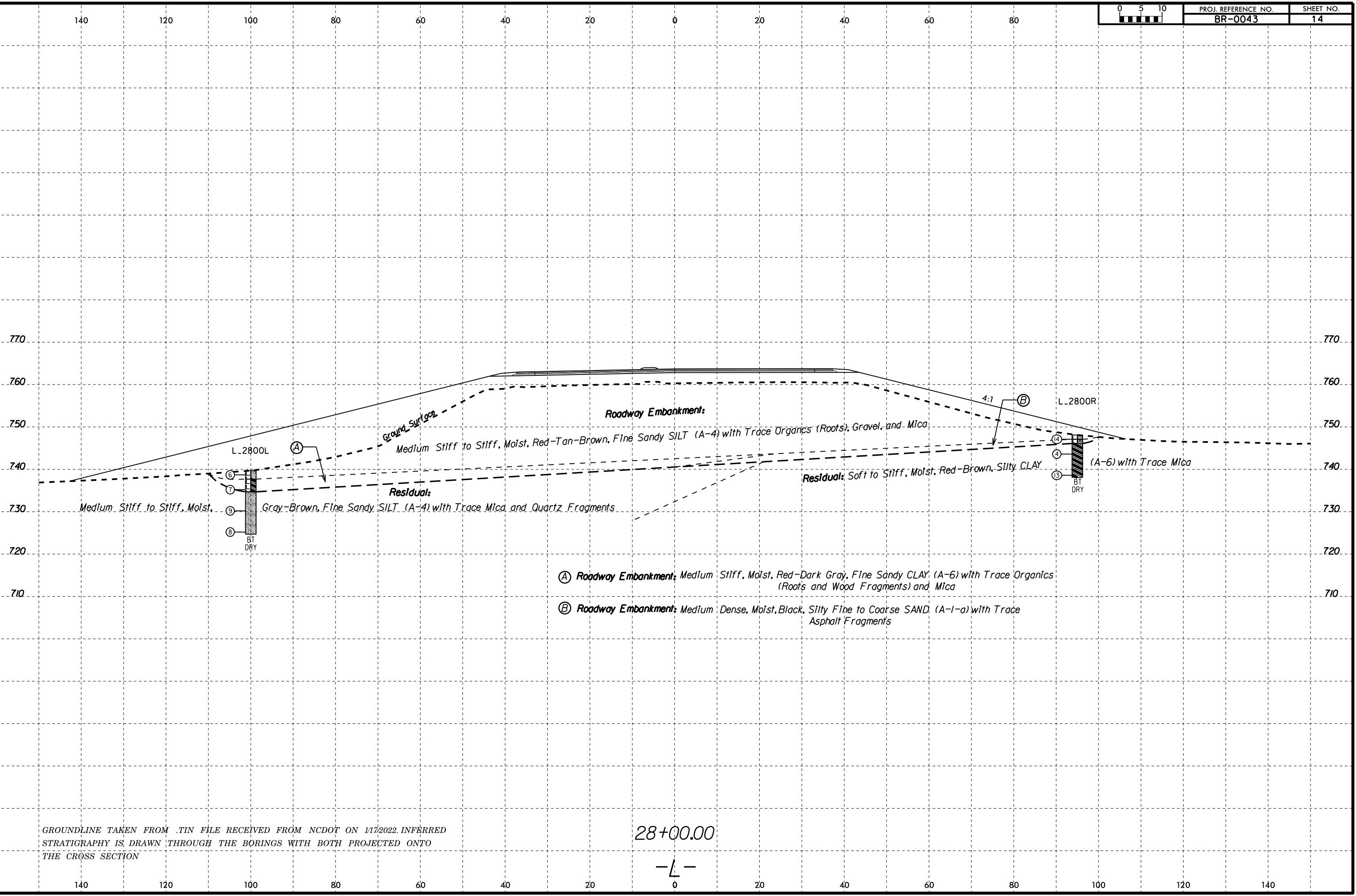


- Ⓐ Roadway Embankment: ABC Stone
- Ⓑ Roadway Embankment: Medium Stiff, Wet, Red-Brown, Fine Sandy Clayey SILT (A-5) with Trace Mica
- Ⓒ Roadway Embankment: Stiff, Moist, Gray, Fine Sandy Silty CLAY (A-7-6) with Trace Organics (Roots), Mica, and Quartz Fragments
- Ⓓ Residual: Medium Dense, Moist, Red-Orange, Silty Fine to Coarse SAND (A-2-4) with Trace Mica and Quartz Fragments

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/17/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

27+00.00

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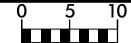
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GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

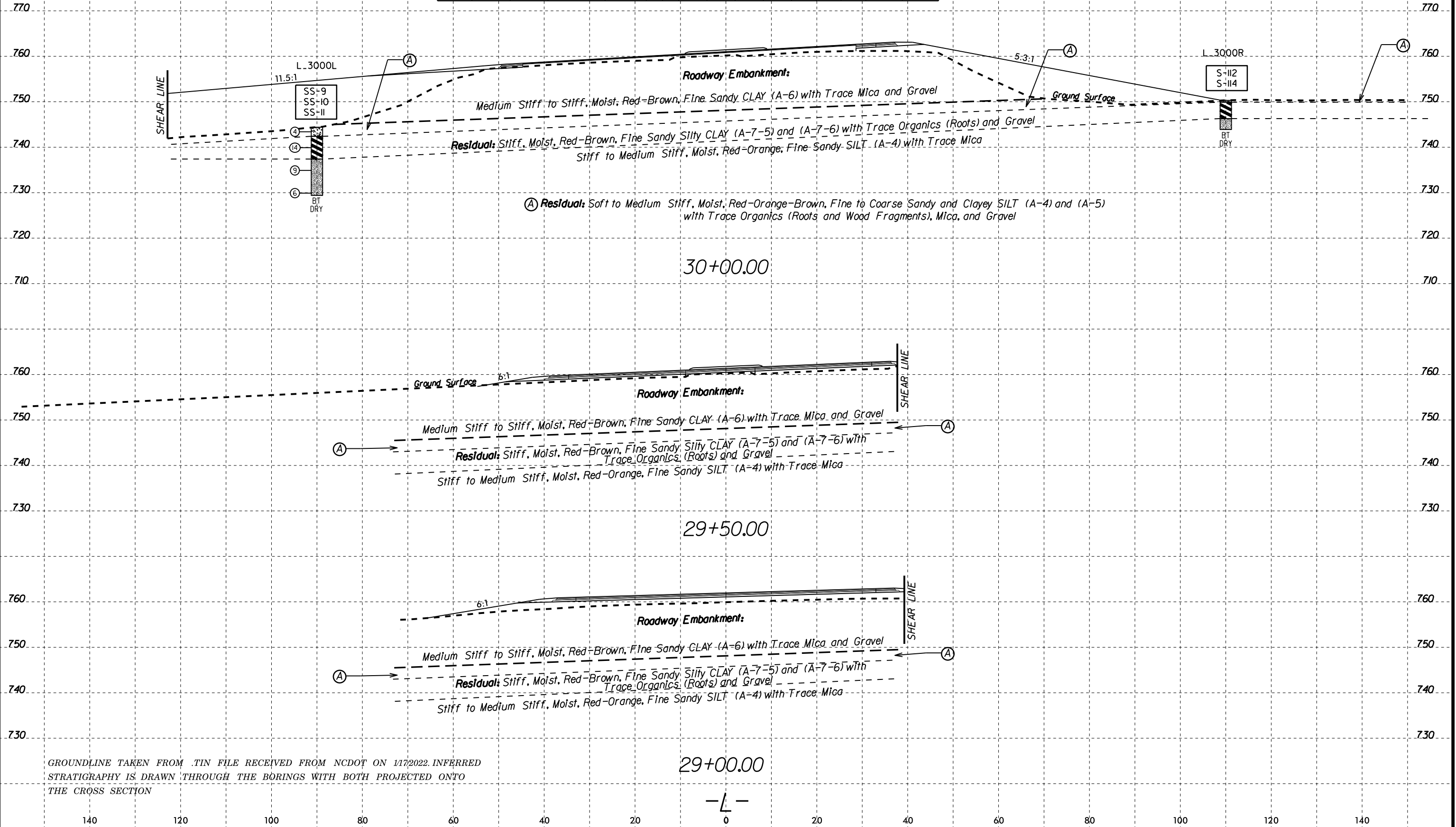
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6/23/16



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-9	90' LT	30+00	0.0-1.5	A-5 (3)	41	10	19.8	31.1	20.9	28.2	86.8	77.3	47.6	-	-
SS-10	90' LT	30+00	3.5-5.0	A-7-5 (22)	64	32	13.9	22.8	15.9	47.4	100	91.9	67.9	-	-
SS-11	90' LT	30+00	8.5-10.0	-	-	-	-	-	-	-	-	-	38.4	-	-
S-112	110' RT	30+00	0.4-0.7	A-7-6 (19)	56	34	15.5	26.5	9.6	48.4	99.8	91.8	62.1	22.5	-
S-114	110' RT	30+00	1.0-4.0	A-7-5 (21)	65	34	17.2	21.5	10.8	50.5	98.3	89.0	63.7	23.7	-

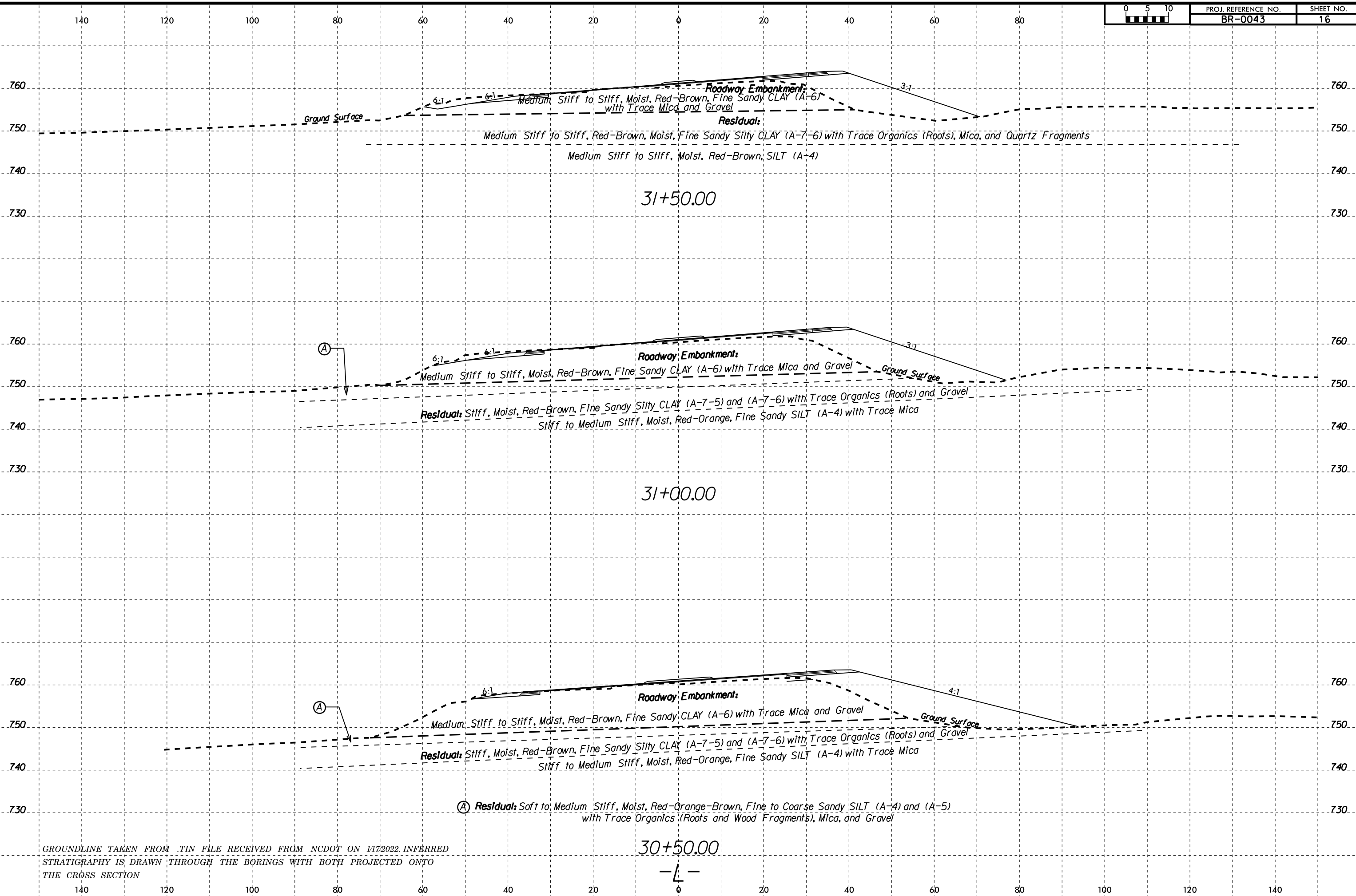
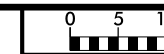


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29+00.00
-L-

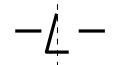
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6/23/16



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GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION



140

120

100

80

60

40

20

0

20

40

60

80

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-107	55' RT	32+00	0.0 - 1.5	A-7-6	131	50	24	16.2	25.0	15.5	43.3	97.1	89.1	61.4	31.6	-

770

770

760

760

750

750

740

740

730

730

720

720

710

710

Roadway Embankment:
Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy CLAY (A-6)
with Trace Mica and Gravel

Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy Silty CLAY (A-7-6)

Medium Stiff to Stiff, Moist, Red-Brown,

Ground Surface Residual:
with Trace Organics (Roots), Mica, and Quartz Fragments

SILT (A-4)

L. 3200R

SS-107



3:1

6:1

6:1

32+00.00

-L-

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

140

120

100

80

60

40

20

0

20

40

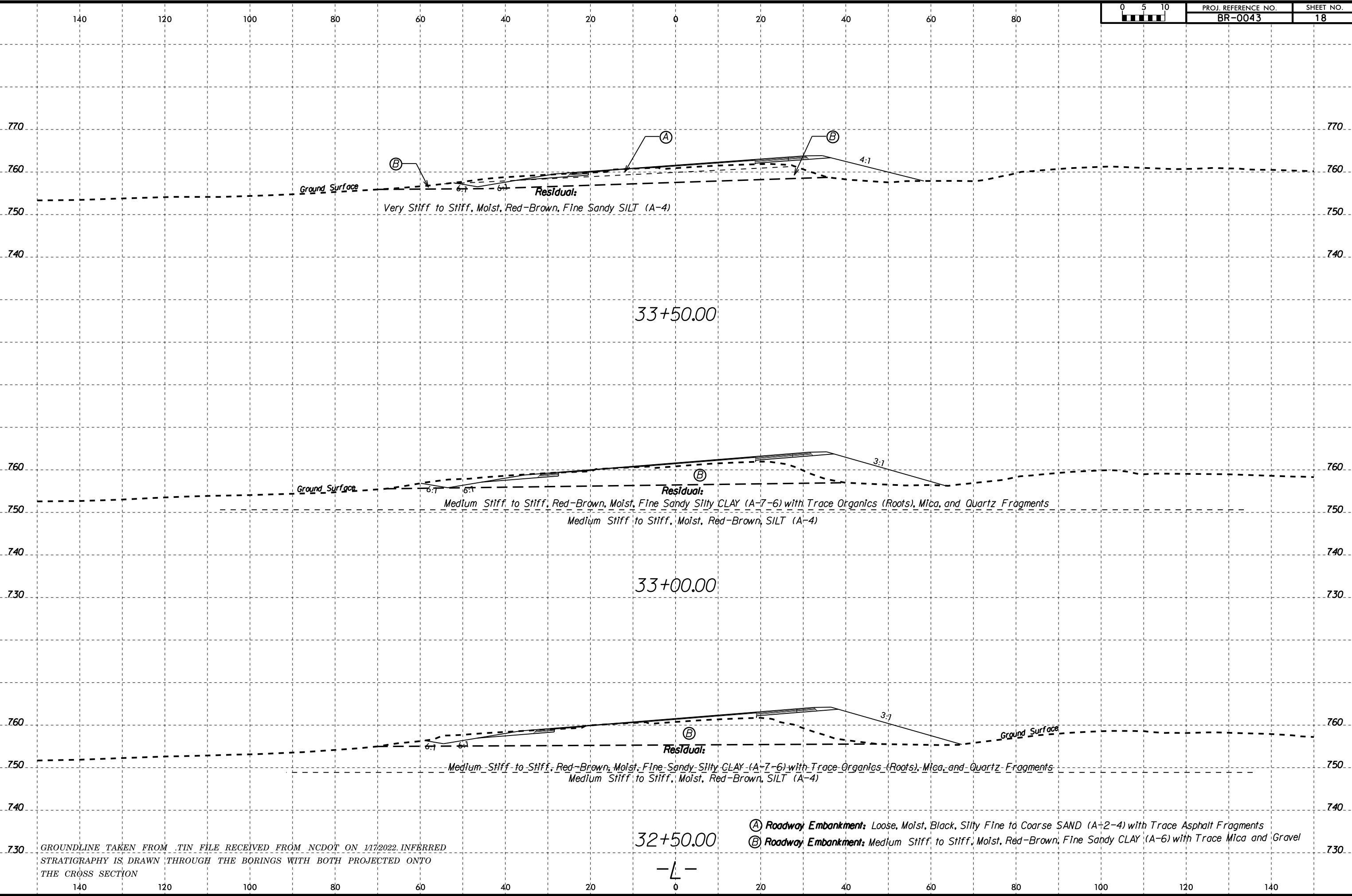
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80

100

120

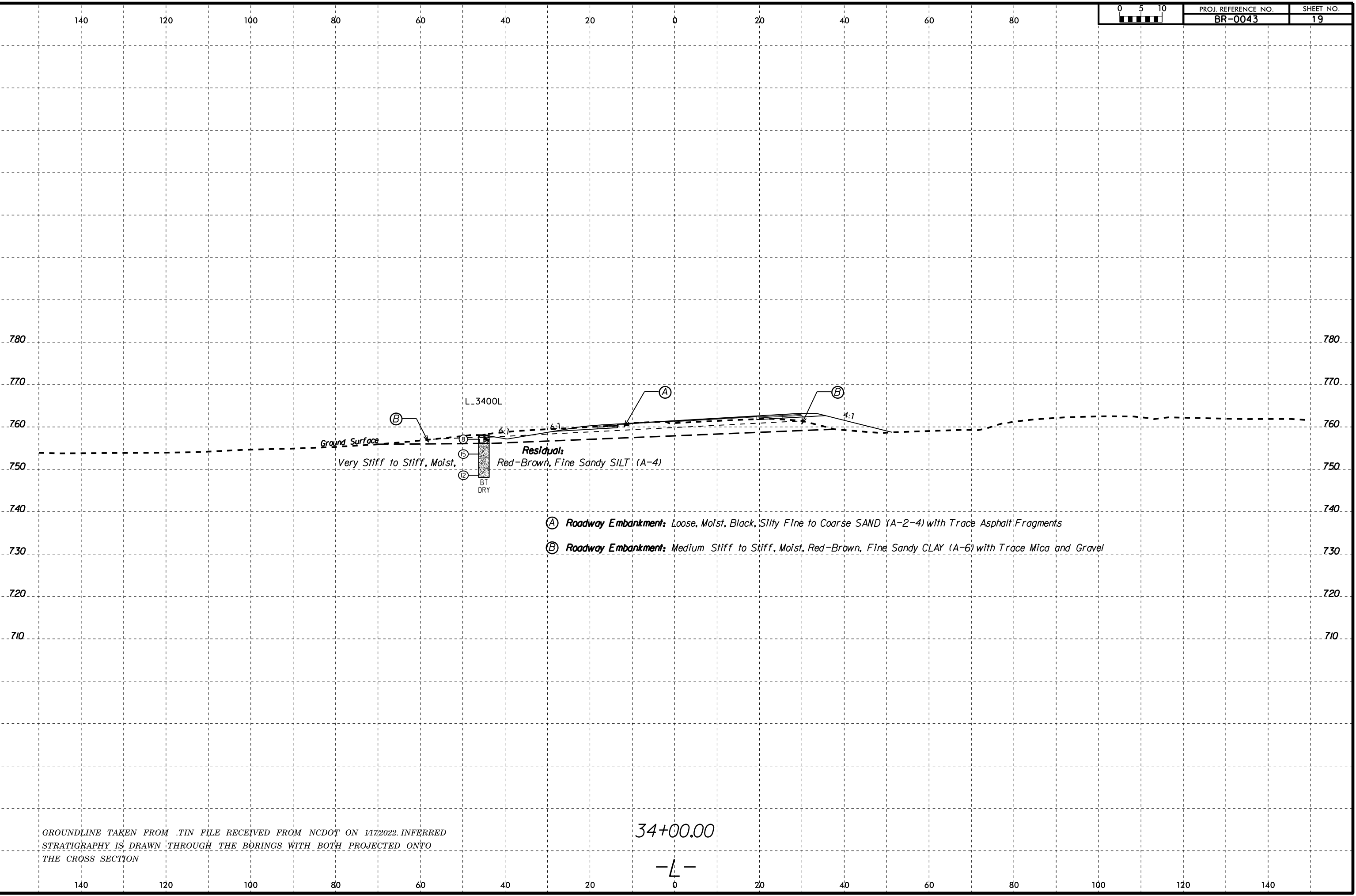
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T Walker

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

- (A) Roadway Embankment: Loose, Moist, Black, Silty Fine to Coarse SAND (A-2-4) with Trace Asphalt Fragments
- (B) Roadway Embankment: Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy CLAY (A-6) with Trace Mica and Gravel

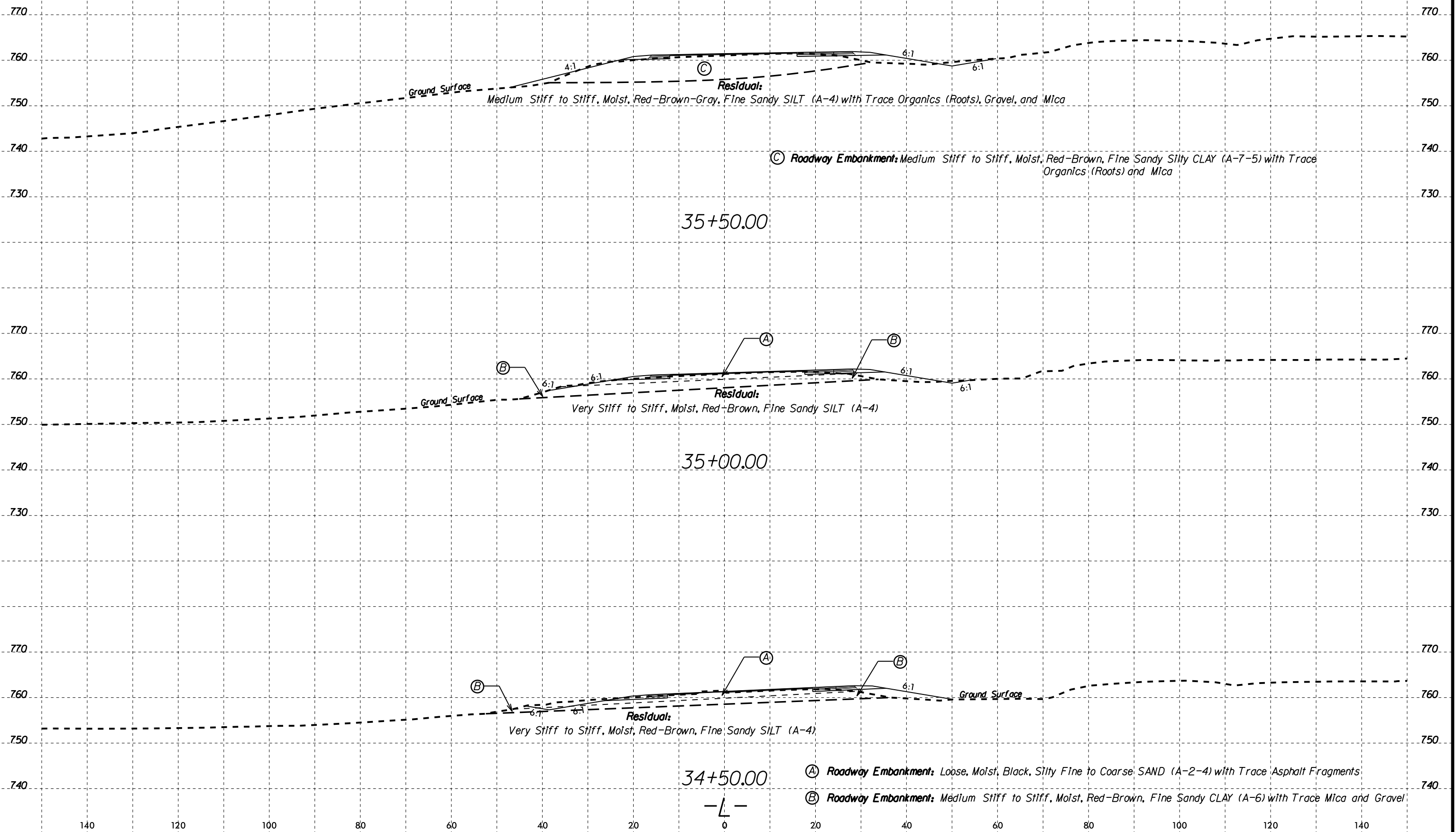


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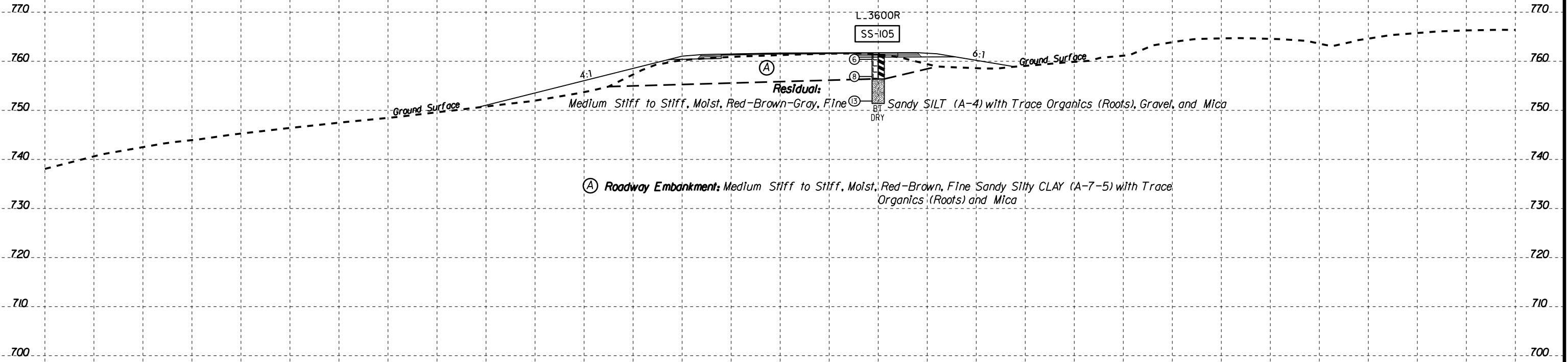
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Walker_A_660861263

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION



—L—

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		
SS-105	20' RT	36+00	0.0-1.5	A-7-5 (B)	48	16	17.3	30.5	18.5	33.7	99.6	89.8	58.2	24.4



Ⓐ **Roadway Embankment: Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy Silty CLAY (A-7-5) with Trace Organics (Roots) and Mica**

Ⓑ **Sandy SILT (A-4) with Trace Organics (Roots), Gravel, and Mica**

Ⓐ **Residual:**

Ⓐ **Medium Stiff to Stiff, Moist, Red-Brown-Gray, Fine**

Ⓒ **DRY**

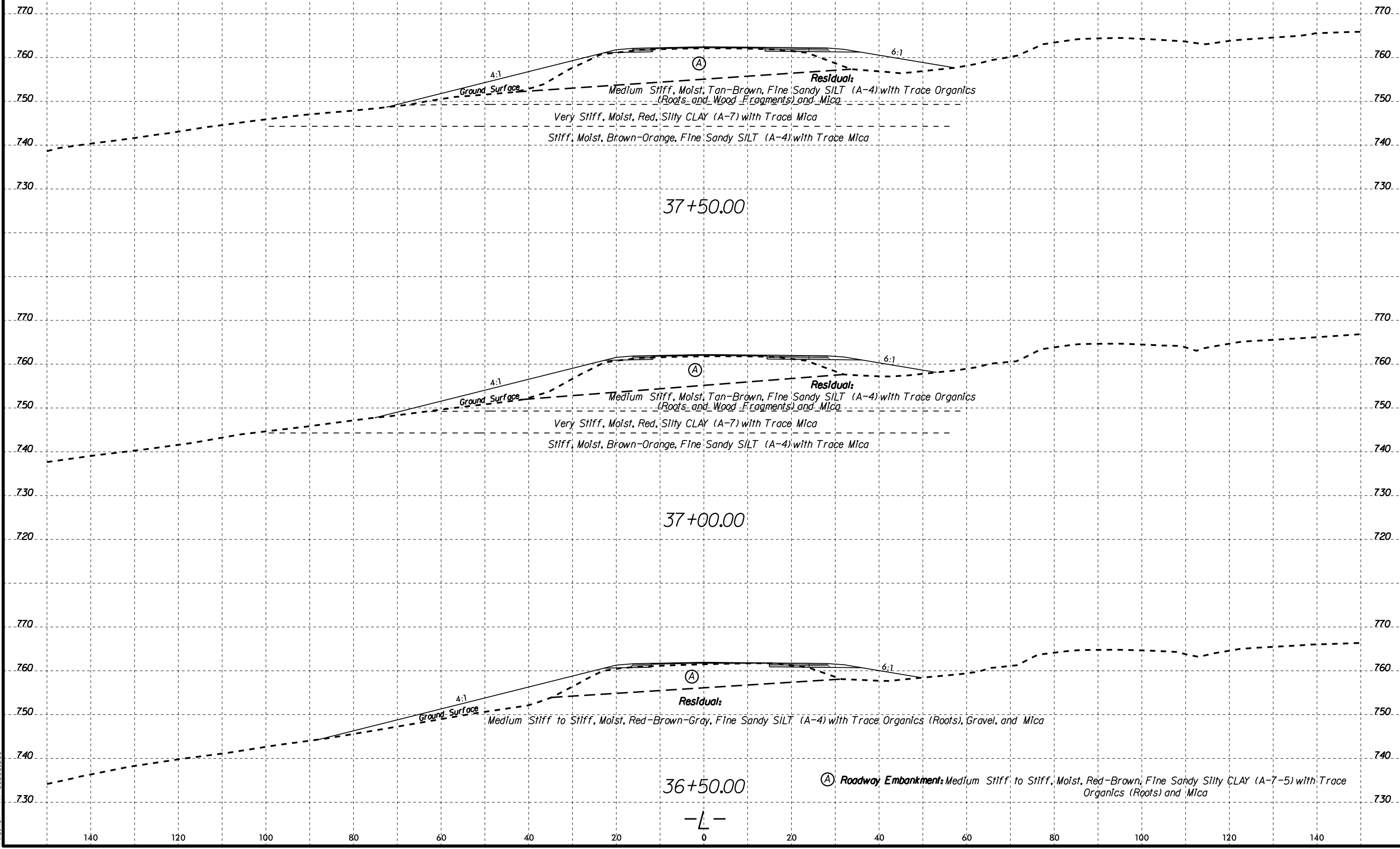
GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/17/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

36+00.00

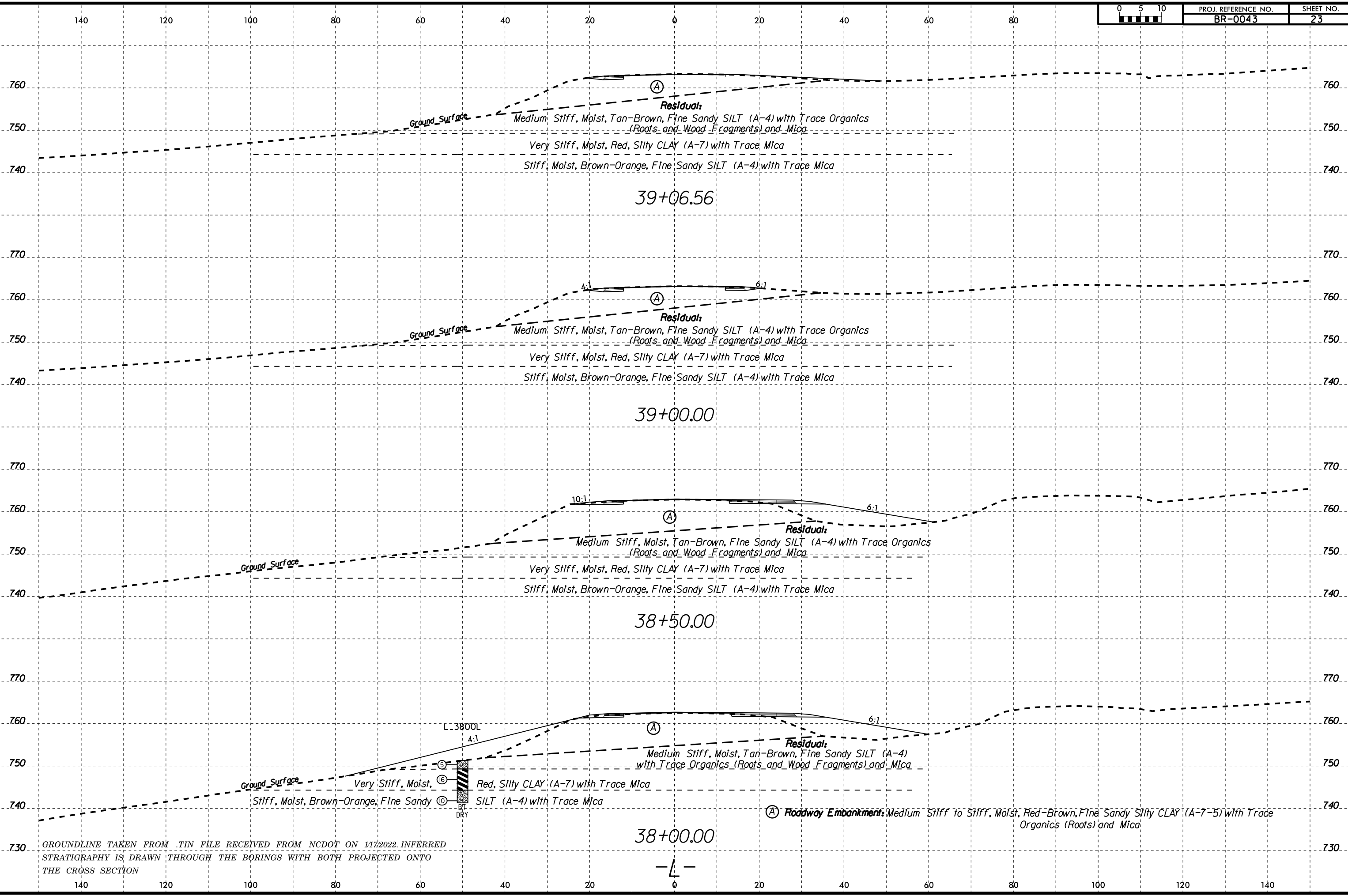
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Walker_A_660861263

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION



6/23/16



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GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/17/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

38+00.00

38+50.00

39+00.00

39+06.56

(A) Roadway Embankment: Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy Silty CLAY (A-7-5) with Trace Organics (Roots) and Mica

Residual: Medium Stiff, Moist, Tan-Brown, Fine Sandy SILT (A-4) with Trace Organics (Roots and Wood Fragments) and Mica

Very Stiff, Moist, Red, Silty CLAY (A-7) with Trace Mica

Stiff, Moist, Brown-Orange, Fine Sandy SILT (A-4) with Trace Mica

Very Stiff, Moist, Red, Silty CLAY (A-7) with Trace Mica

Stiff, Moist, Brown-Orange, Fine Sandy SILT (A-4) with Trace Mica

Residual: Medium Stiff, Moist, Tan-Brown, Fine Sandy SILT (A-4) with Trace Organics (Roots and Wood Fragments) and Mica

Residual: Medium Stiff, Moist, Tan-Brown, Fine Sandy SILT (A-4) with Trace Organics (Roots and Wood Fragments) and Mica

Very Stiff, Moist, Red, Silty CLAY (A-7) with Trace Mica

Stiff, Moist, Brown-Orange, Fine Sandy SILT (A-4) with Trace Mica

Residual: Medium Stiff, Moist, Tan-Brown, Fine Sandy SILT (A-4) with Trace Organics (Roots and Wood Fragments) and Mica

Very Stiff, Moist, Red, Silty CLAY (A-7) with Trace Mica

Stiff, Moist, Brown-Orange, Fine Sandy SILT (A-4) with Trace Mica

L 3800L

4:1

(5)

(6)

(7)

BT DRY

—L—

6/23/16

140

120

100

80

60

40

20

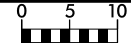
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20

40

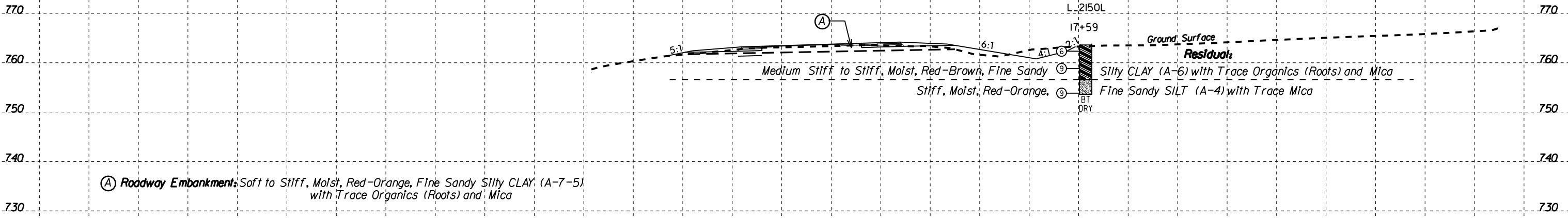
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80



PROJ. REFERENCE NO.
BR-0043

SHEET NO.
24



(A) Roadway Embankment: *Soft to Stiff, Moist, Red-Orange, Fine Sandy Silty CLAY (A-7-5) with Trace Organics (Roots) and Mica*

17+50.00

-RPA-

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/17/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

140

120

100

80

60

40

20

0

20

40

60

80

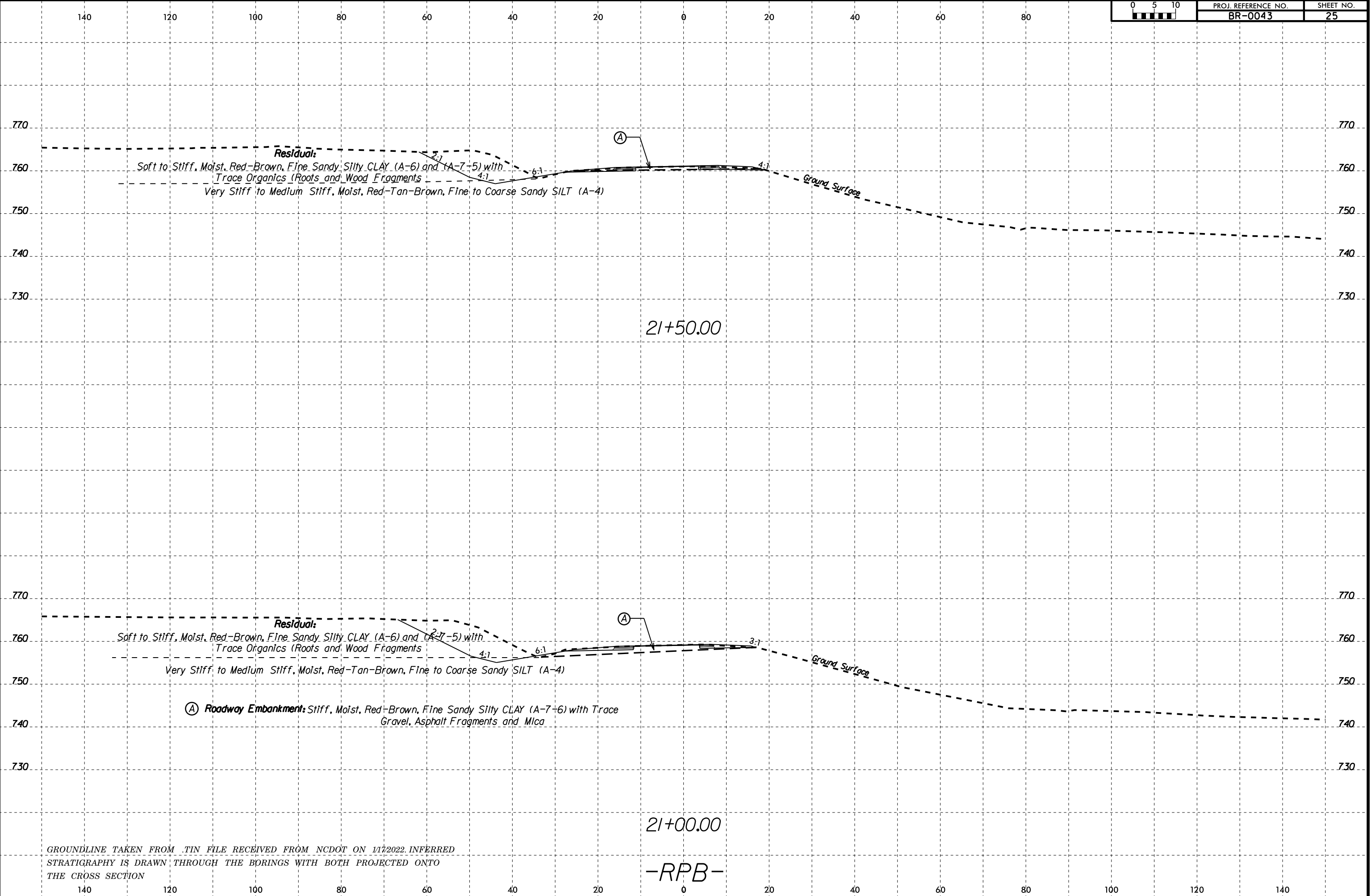
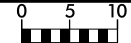
100

120

140

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6/23/16



Residual:
Soft to Stiff, Moist, Red-Brown, Fine Sandy Silty CLAY (A-6) and (A-7-5) with Trace Organics (Roots and Wood Fragments)
Very Stiff to Medium Stiff, Moist, Red-Tan-Brown, Fine to Coarse Sandy SILT (A-4)

21+50.00

Residual:
Soft to Stiff, Moist, Red-Brown, Fine Sandy Silty CLAY (A-6) and (A-7-5) with Trace Organics (Roots and Wood Fragments)
Very Stiff to Medium Stiff, Moist, Red-Tan-Brown, Fine to Coarse Sandy SILT (A-4)

21+00.00

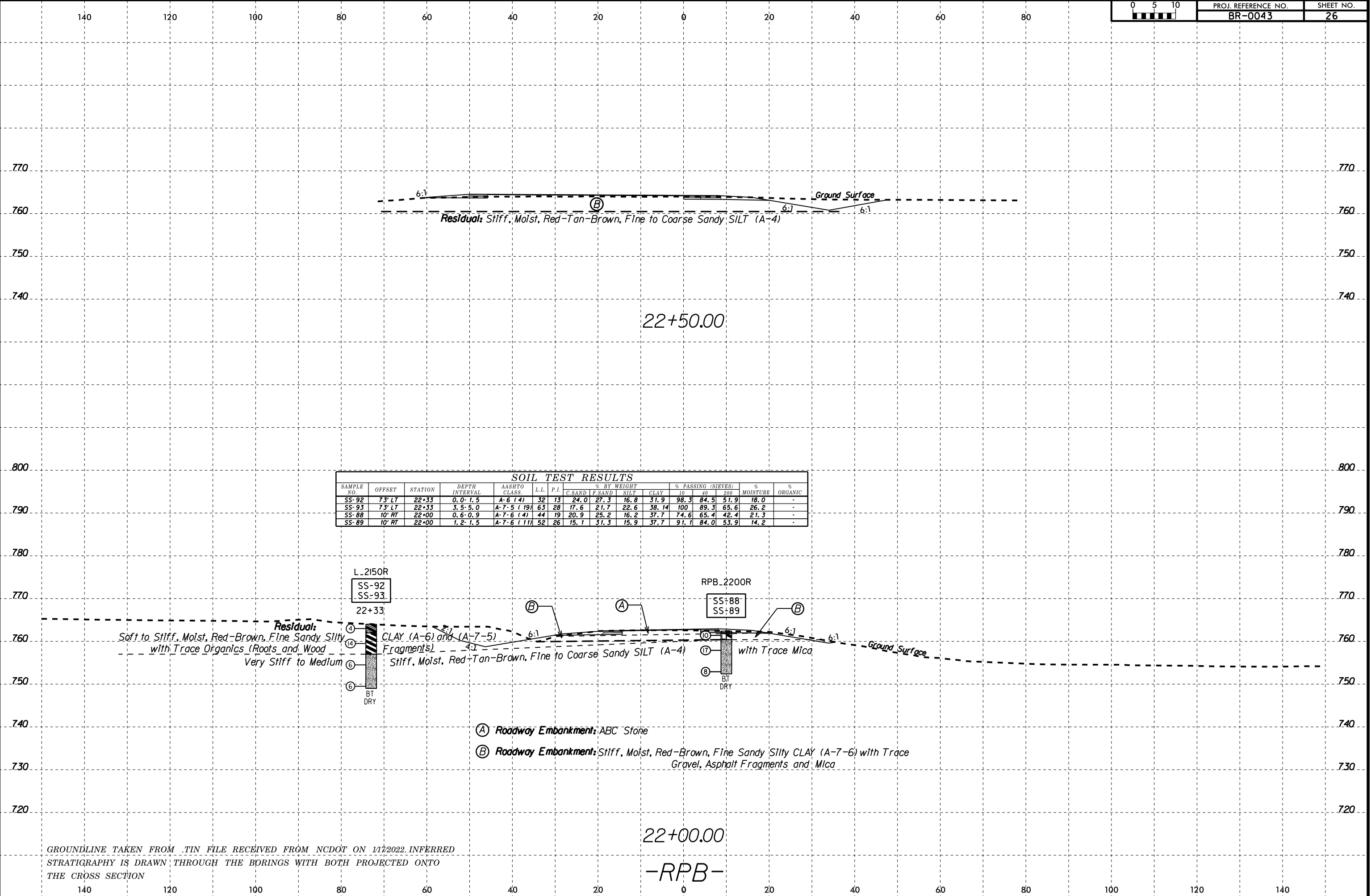
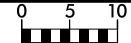
(A) Roadway Embankment: Stiff, Moist, Red-Brown, Fine Sandy Silty CLAY (A-7-6) with Trace Gravel, Asphalt Fragments and Mica

GROUNDLINE TAKEN FROM TIN FILE RECEIVED FROM NCDOT ON 11/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

-RPB-

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6/23/16
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 NCDOT-BR-0043 Rockingham Co.\BR-0043-ROW\CADD-GEOTECH\SSC\BR0043-geo-ssi-RPB.dgn



Residual: Stiff, Moist, Red-Tan-Brown, Fine to Coarse Sandy SILT (A-4)

22+50.00

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT			% PASSING (SIEVES)		% MOISTURE	% ORGANIC	
							C SAND	F SAND	SILT	#10	#40			
SS-92	73' LT	22+33	0.0-1.5	A-6 (14)	32	13	24.0	27.3	16.8	31.9	98.3	84.5	51.9	18.0
SS-93	73' LT	22+33	3.5-5.0	A-7-5 (19)	63	28	17.6	21.7	22.6	38.14	100	89.3	65.6	26.2
SS-88	10' RT	22+00	0.6-0.9	A-7-6 (4)	44	19	20.9	25.2	16.2	37.7	74.6	65.4	42.4	21.3
SS-89	10' RT	22+00	1.2-1.5	A-7-6 (11)	52	26	15.1	31.3	15.9	37.7	91.1	84.0	53.9	14.2

L-2150R
SS-92
SS-93
22+33

RPB-2200R
SS-88
SS-89

Residual:
Soft to Stiff, Moist, Red-Brown, Fine Sandy Silty
with Trace Organics (Roots and Wood
Fragments)
Very Stiff to Medium

CLAY (A-6) and
Fragments)
Stiff, Moist, Red-Tan-Brown, Fine to Coarse Sandy SILT (A-4)

with Trace Mica

- (A) Roadway Embankment: ABC Stone
- (B) Roadway Embankment: Stiff, Moist, Red-Brown, Fine Sandy Silty CLAY (A-7-6) with Trace Gravel, Asphalt Fragments and Mica

22+00.00

-RPB-

GROUNDLINE TAKEN FROM TIN FILE RECEIVED FROM NCDOT ON 11/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

140

120

100

80

60

40

20

0

20

40

60

80

770

760

750

740

730

720

710

770

760

750

740

730

720

710

Ground Surface

RPC_1750L

(B)

(A)

(C)

(D)

(E)

(F)

(G)

(H)

(I)

(J)

(K)

(L)

(M)

(N)

(O)

(P)

(Q)

(R)

(S)

(T)

Roadway
Stiff to Medium Stiff
Trace Gravel and Mica

Embankment:
Moist, Red-Brown, Fine Sandy CLAY (A-6) with

- (A) Roadway Embankment: Loose, Moist, Black-Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Organics (Roots) and Little Gravel
- (B) Roadway Embankment: Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy SILT (A-4) with Trace Mica and Gravel

17+50.00

-RPC-

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

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Walker_A\660861263

140

120

100

80

60

40

20

0

20

40

60

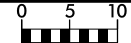
80

100

120

140

6/23/16

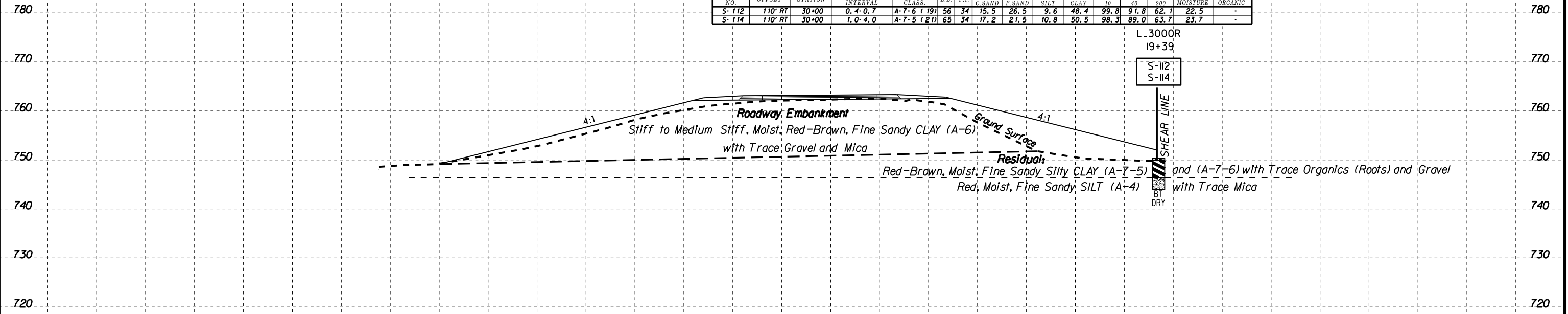


PROJ. REFERENCE NO. BR-0043

SHEET NO. 28

140 120 100 80 60 40 20 0 20 40 60 80

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-112	110' RT	30+00	0.4-0.7	A-7-6 (19)	56	34	15.5	26.5	9.6	48.4	99.8	91.8	62.1	22.5	-
S-114	110' RT	30+00	1.0-4.0	A-7-5 (21)	65	34	17.2	21.5	10.8	50.5	98.3	89.0	63.7	23.7	-



L_3000R
19+39
S-112
S-114
SHEAR LINE
BT
DRY

19+50.00

-RPC-

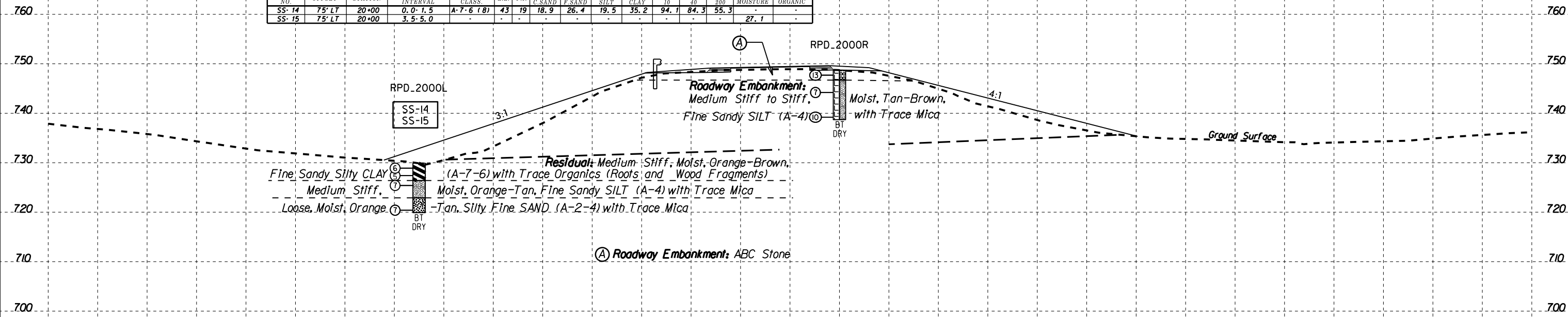
GROUNDLINE TAKEN FROM TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED
STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO
THE CROSS SECTION

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6/23/16

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-14	75' LT	20+00	0.0-1.5	A-7-6 (8)	43	19	18.9	26.4	19.5	35.2	94.1	84.3	55.3	-	-
SS-15	75' LT	20+00	3.5-5.0	-	-	-	-	-	-	-	-	-	27.1	-	



GROUNDLINE TAKEN FROM TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

20+00.00
-RPD-

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6/23/16

140

120

100

80

60

40

20

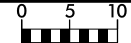
0

20

40

60

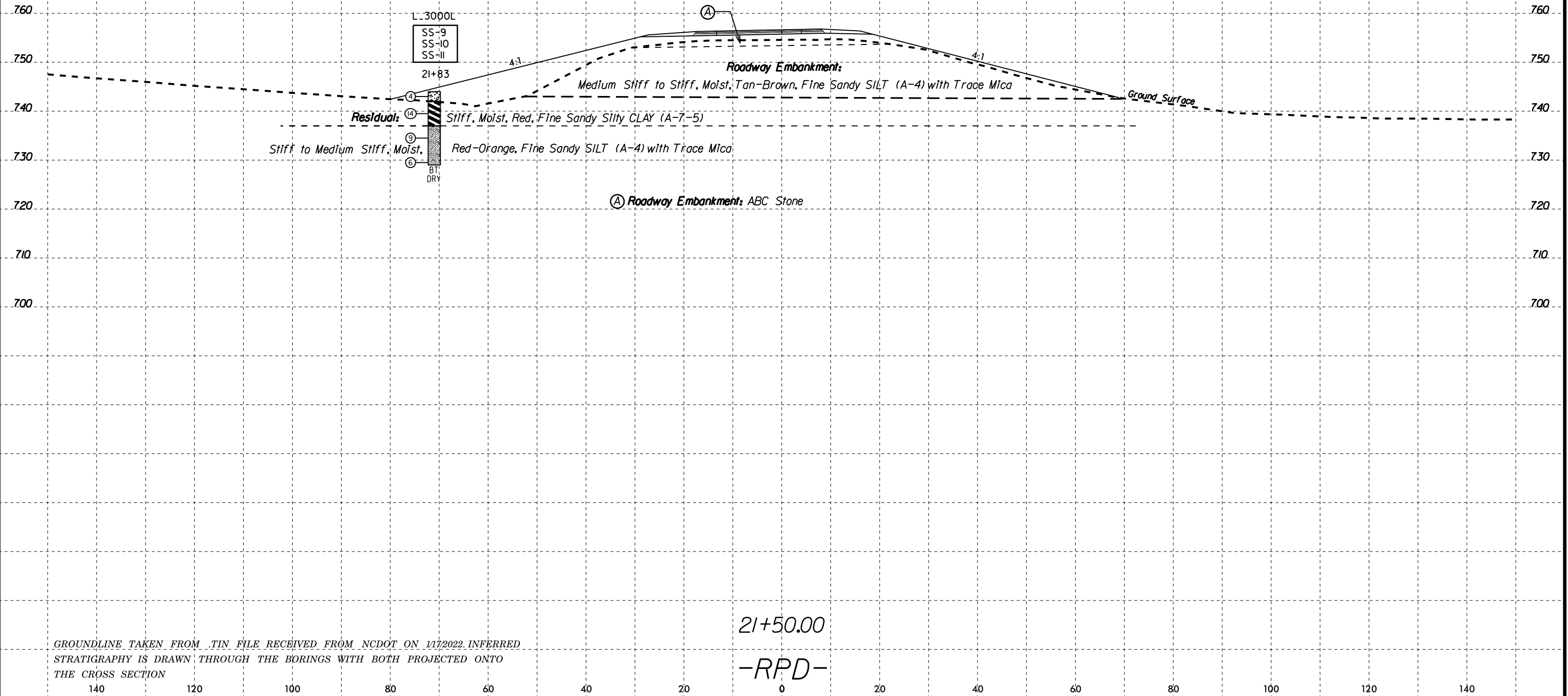
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PROJ. REFERENCE NO. BR-0043

SHEET NO. 30

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-9	7'2" LT	21+83	0.0- 1.5	A-5 (3)	41	10	19.8	31.1	20.9	28.2	86.8	77.3	47.6	-	-
SS-10	7'2" LT	21+83	3.5- 5.0	A-7-5 (22)	64	32	13.9	22.8	15.9	47.4	100	91.9	67.9	-	-
SS-11	7'2" LT	21+83	8.5- 10.0	-	-	-	-	-	-	-	-	-	38.4	-	-



GROUNDLINE TAKEN FROM TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED
 STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO
 THE CROSS SECTION

21+50.00

-RPD-

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 16/06/2022

6/23/16



140

120

100

80

60

40

20

0

20

40

60

80

750

740

730

720

710

700

690

750

740

730

720

710

700

690

Y_2400L

23+94

7

22

32

BT

DRY

(A)

6:1

Residual:

Medium Stiff to Hard, Moist, Gray-Tan-Brown, Fine Sandy SILT (A-4) with Trace Organics (Roots) and Mica

(A)

Y_2400R

5

8

14

BT

DRY

6:1

A-T

Ground Surface

(A) Roadway Embankment: Medium Stiff, Wet, Brown, Fine Sandy SILT (A-4) with Trace Organics (Roots) and Mica

24+00.00

-Y-

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

140

120

100

80

60

40

20

0

20

40

60

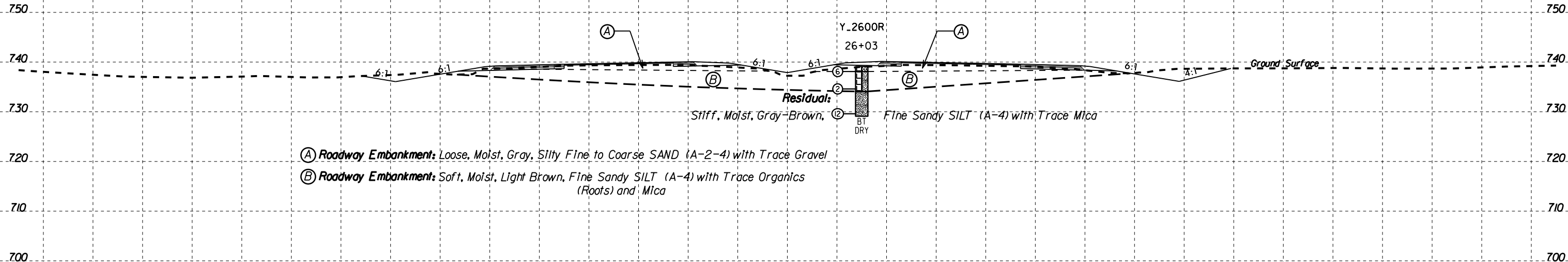
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100

120

140

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Walker-A\660861263



- Ⓐ **Roadway Embankment:** Loose, Moist, Gray, Silty Fine to Coarse SAND (A-2-4) with Trace Gravel
- Ⓑ **Roadway Embankment:** Soft, Moist, Light Brown, Fine Sandy SILT (A-4) with Trace Organics (Roots) and Mica

26+00.00

-Y-

GROUNDLINE TAKEN FROM TIN FILE RECEIVED FROM NCDOT ON 11/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16



PROJ. REFERENCE NO.
BR-0043

SHEET NO.
33

140

120

100

80

60

40

20

0

20

40

60

80

760

750

740

730

720

710

760

750

740

730

720

710

Ground Surface

4:1

6:1

Y_2800L

ⓐ

ⓑ

ⓒ

BT

DRY

Residual:

Medium Stiff to Stiff, Moist, Light Brown, Fine to Coarse Sandy SILT (A-4) with Trace Mica

6:1, 6:1

ⓐ

6:1

4:1 - 2:1

ⓐ

Roadway Embankment: Loose, Moist, Tan, Silty Fine SAND (A-2-4) with Trace Mica

28+00.00

-Y-

GROUNDLINE TAKEN FROM .TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

140

120

100

80

60

40

20

0

20

40

60

80

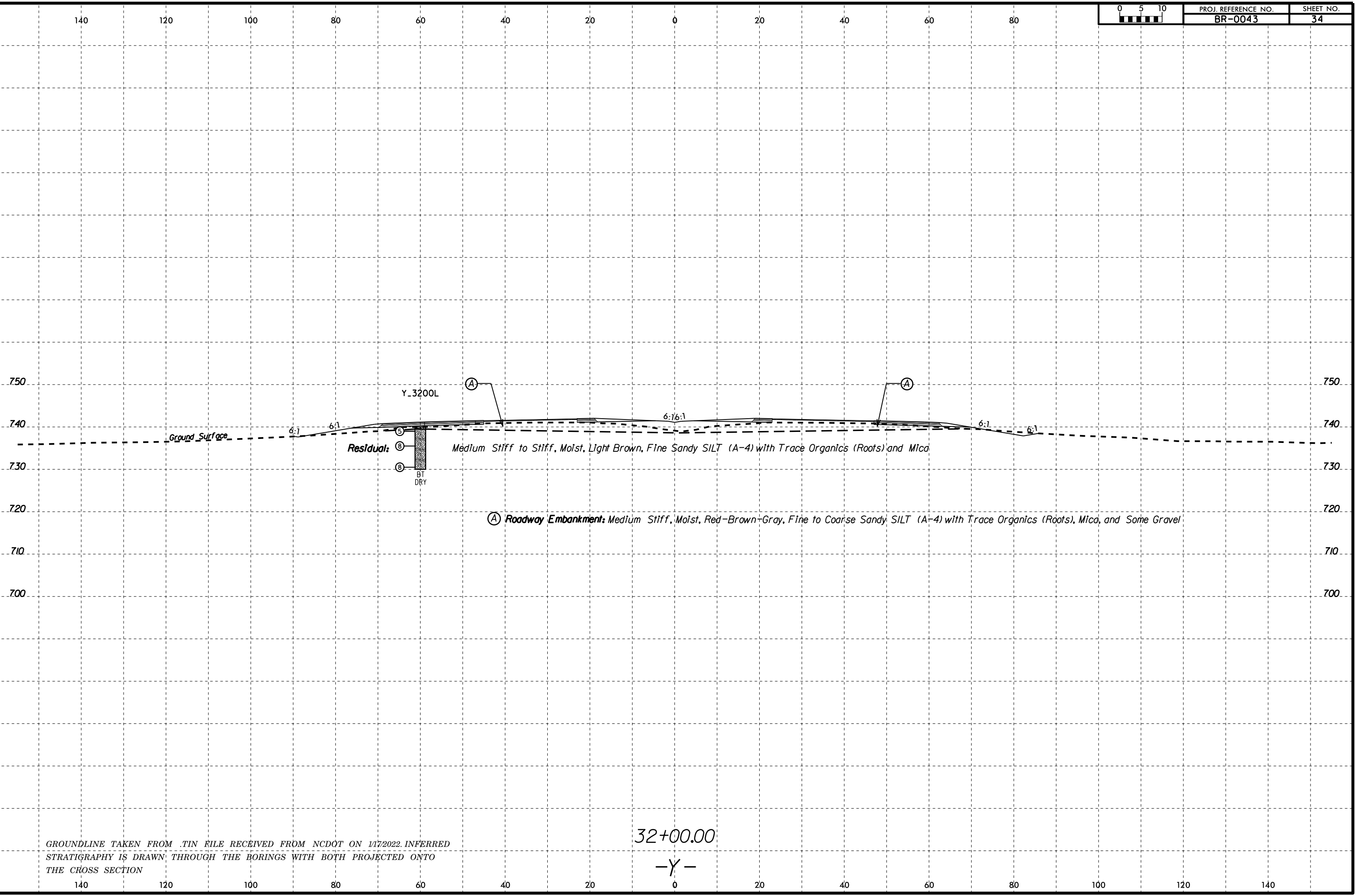
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120

140

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6/23/16

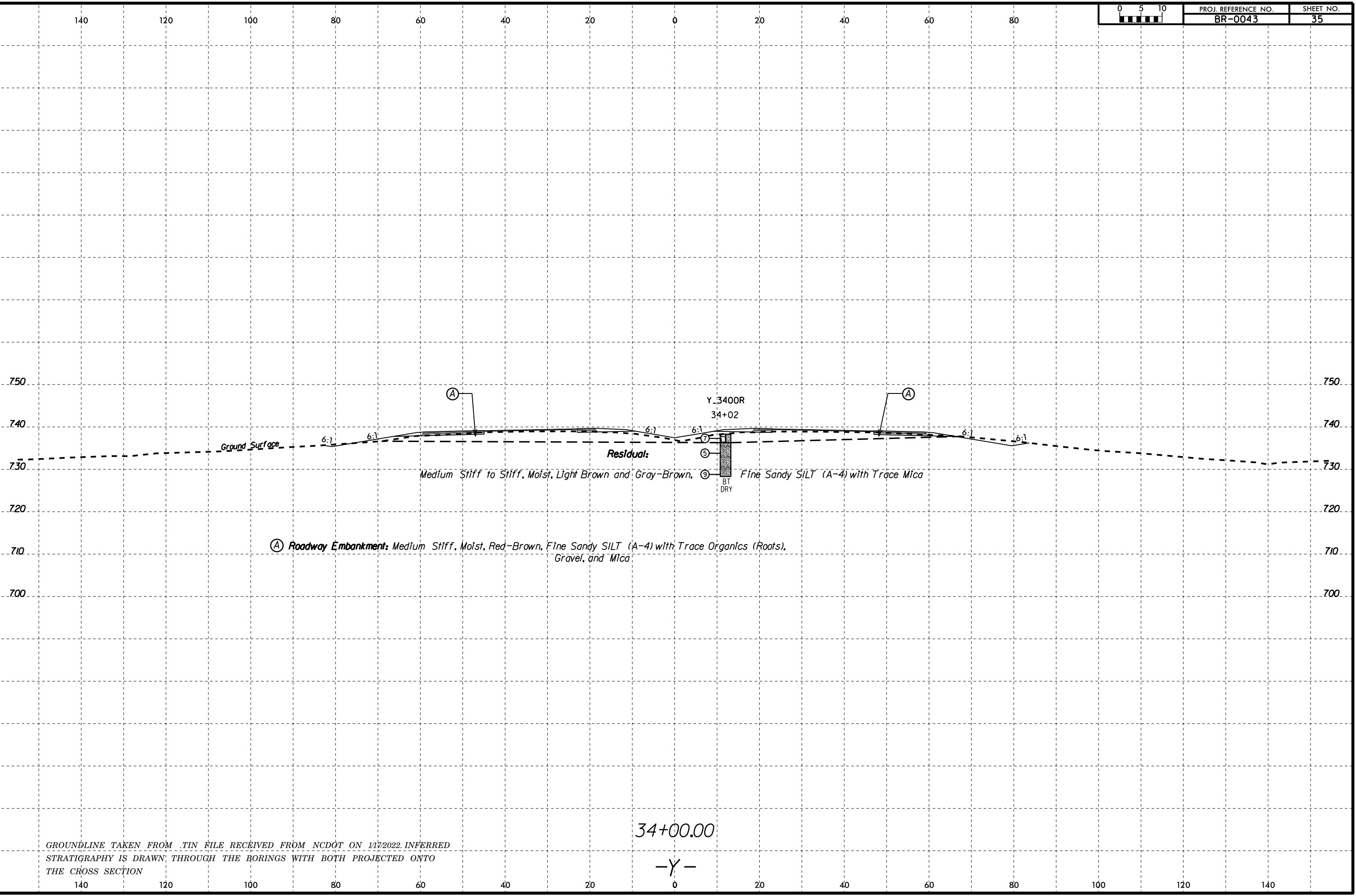


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32+00.00

-Y-



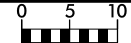
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GROUNDLINE TAKEN FROM TIN FILE RECEIVED FROM NCDOT ON 1/7/2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION

34+00.00

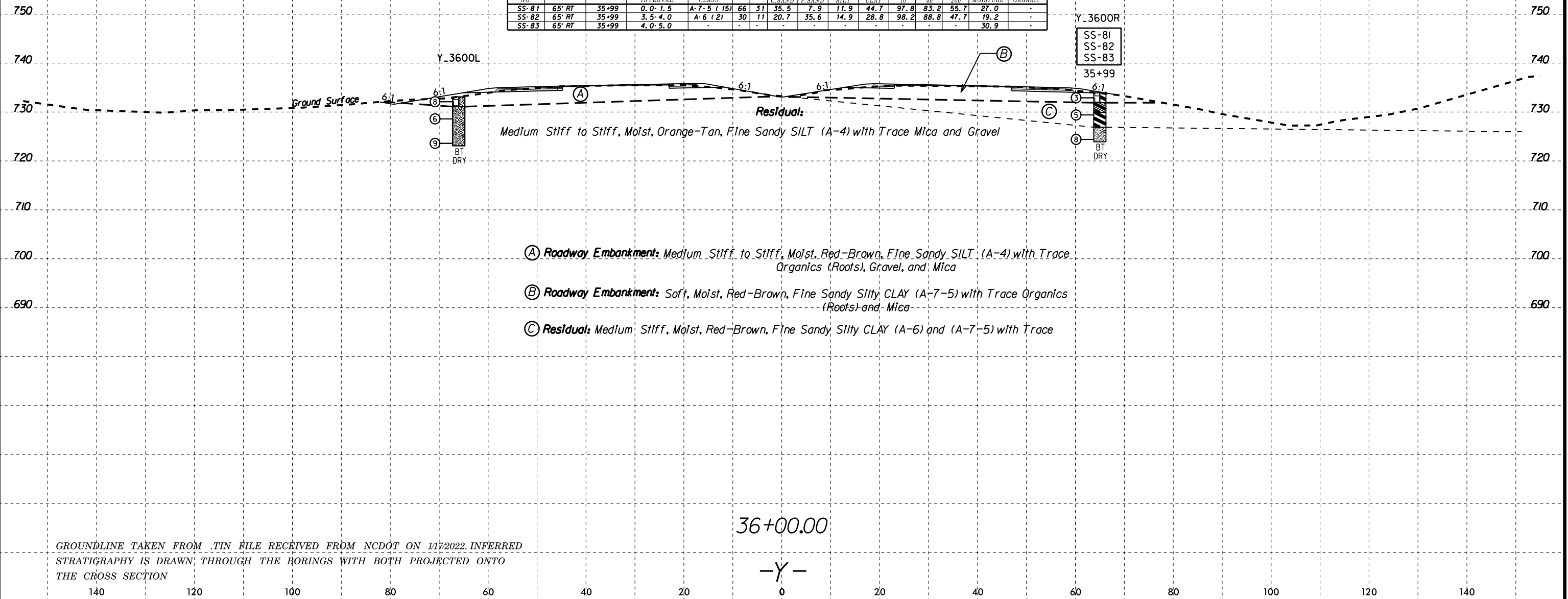
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-81	65' RT	35+99	0.0-1.5	A-7-5 (15)	66	31	35.5	7.9	11.9	44.7	97.8	83.2	55.7	27.0	-
SS-82	65' RT	35+99	3.5-4.0	A-6 (2)	30	11	20.7	35.6	14.9	28.8	98.2	88.8	47.7	19.2	-
SS-83	65' RT	35+99	4.0-5.0	-	-	-	-	-	-	-	-	-	-	30.9	-



Residual: Medium Stiff to Stiff, Moist, Orange-Tan, Fine Sandy SILT (A-4) with Trace Mica and Gravel

- (A) *Roadway Embankment: Medium Stiff to Stiff, Moist, Red-Brown, Fine Sandy SILT (A-4) with Trace Organics (Roots), Gravel, and Mica*
- (B) *Roadway Embankment: Soft, Moist, Red-Brown, Fine Sandy Silty, CLAY (A-7-5) with Trace Organics (Roots) and Mica*
- (C) *Residual: Medium Stiff, Moist, Red-Brown, Fine Sandy Silty CLAY (A-6) and (A-7-5) with Trace*

GROUNDLINE TAKEN FROM TIN FILE RECEIVED FROM NCDOT ON 1/17/2022. INFERRED
 STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO
 THE CROSS SECTION

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140