

REFERENCE: U-4015A

PROJECT: 35013

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	PLAN
-L-	10+00 - 66+00	4-8
-Y1-	10+00 - 11+80	5
-Y2-	10+00 - 12+40	6

CROSS SECTIONS

LINE	STATION	SHEETS
-L-	11+50 - 65+50	9-37
-Y1-	11+00	38
-Y2-	10+50 - 12+00	39-40

APPENDICES

APPENDIX	TITLE	SHEETS
A	LAB RESULTS	41-42

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

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY GUILFORD
PROJECT DESCRIPTION SR 1556 (GALLIMORE DAIRY
RD.) FROM NC 68 (LYNWOD SMITH EXPY.) TO
AIRPARK RD. IN GREENSBORO

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4015A	1	44

CAUTION NOTICE

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

- 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.
- 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

B. GOODE

S. KABRA

F&ME PERSONNEL

INVESTIGATED BY RK&K, LLP

DRAWN BY B. GOODE

CHECKED BY S. KABRA

SUBMITTED BY RK&K, LLP

DATE APRIL 2022



P: (919) 878-9560
8601 Six Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. F-0112

Engineers | Construction Managers | Planners | Scientists
www.rkk.com

Responsive People | Creative Solutions



DocuSign by:
Atefeh Asoudeh
46293DE299B4C7

SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

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:				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 - GROUNDED 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. FLOTT - 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 CONSISTENCY OF THE INTRUDING 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 (SCREC) - 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.										MINERALOGICAL COMPOSITION				CRYSTALLINE ROCK (CR)				CRYSTALLINE ROCK (CR)	
GROUP CLASS.										COMPRESSIBILITY				NON-CRYSTALLINE ROCK (NCR)				NON-CRYSTALLINE ROCK (NCR)	
SYMBOL										PERCENTAGE OF MATERIAL				COASTAL PLAIN SEDIMENTARY ROCK (CP)				COASTAL PLAIN SEDIMENTARY ROCK (CP)	
% PASSING										GROUND WATER				WEATHERING				WEATHERING	
MATERIAL PASSING #10 #40 #200										ORGANIC MATERIAL				FRESH				FRESH	
GROUP INDEX										MISCELLANEOUS SYMBOLS				VERY SLIGHT (V SL)				VERY SLIGHT (V SL)	
USUAL TYPES OF MAJOR MATERIALS										RECOMMENDATION SYMBOLS				SLIGHT (SL)				SLIGHT (SL)	
GEN. RATING AS SUBGRADE										ABBREVIATIONS				MODERATE (MOD)				MODERATE (MOD)	
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30										EQUIPMENT USED ON SUBJECT PROJECT				SEVERE (SEV)				SEVERE (SEV)	
CONSISTENCY OR DENSENESS										SOIL MOISTURE - CORRELATION OF TERMS				COMPLETE				COMPLETE	
PRIMARY SOIL TYPE										PLASTICITY				ROCK HARDNESS				ROCK HARDNESS	
GENERALITY GRANULAR MATERIAL (NON-COHESIVE)										COLOR				VERY HARD				VERY HARD	
GENERALITY SILT-CLAY MATERIAL (COHESIVE)										TEXTURE OR GRAIN SIZE				HARD				HARD	
U.S. STD. SIEVE SIZE OPENING (MM)														MODERATELY HARD				MODERATELY HARD	
BOULDER (BLDR.)														MEDIUM HARD				MEDIUM HARD	
GRAIN SIZE														SOFT				SOFT	
														VERY SOFT				VERY SOFT	
														EXTREMELY HARD				EXTREMELY HARD	

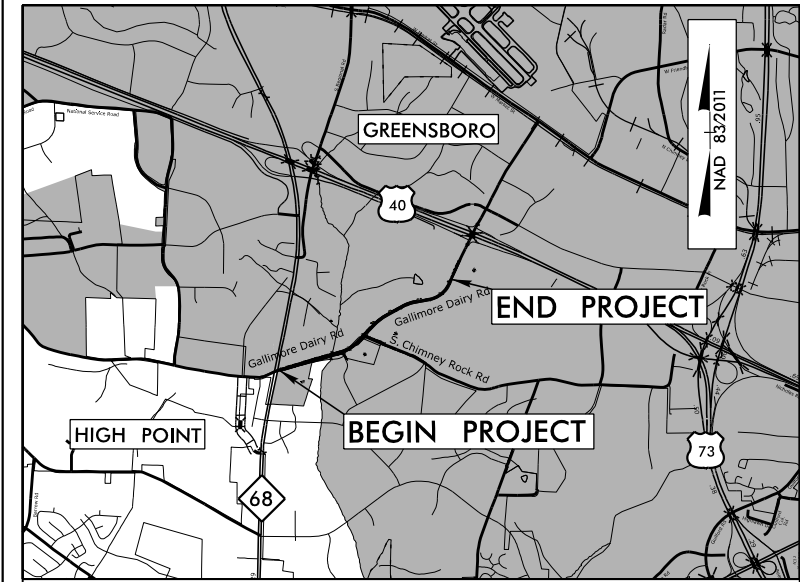
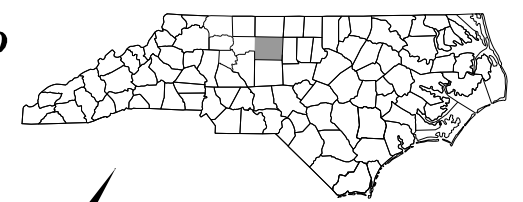
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4015A	3	44
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
35013.1.1	N/A	PE	
35013.2.4	N/A	ROW	
35013.2.5	N/A	UTL	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

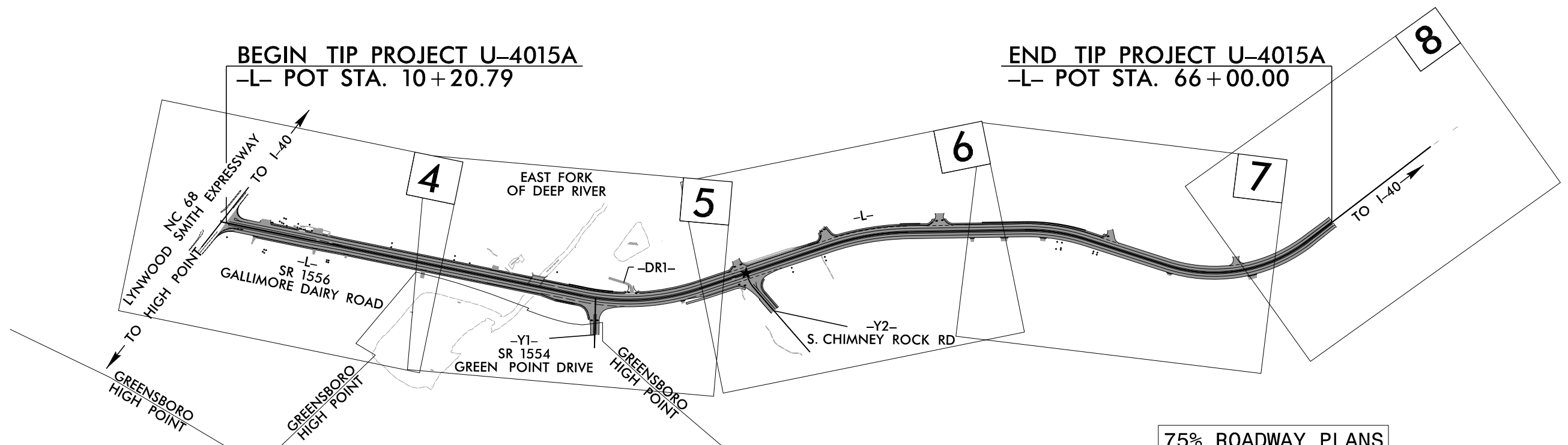
LOCATION: SR 1556 (GALLIMORE DAIRY RD.) FROM NC 68 (LYNWOOD SMITH EXPY.) TO AIRPARK RD. IN GREENSBORO

TYPE OF WORK: GRADING, PAVING, WIDENING, DRAINAGE, CULVERT, SIGNING, RETAINING WALLS, AND SIGNALS



VICINITY MAP (NTS)

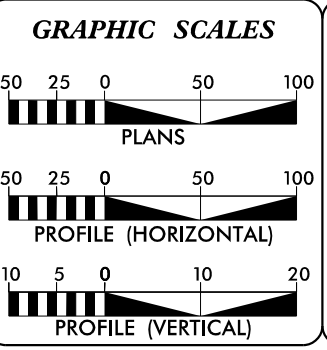
TIP PROJECT: U-4015A



- NOTES:
 1. A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF GREENSBORO & THE CITY OF HIGH POINT.
 2. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

75% ROADWAY PLANS
DATE: 05-28-2021

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2018 = 15,900
ADT 2040 = 18,800
V = 50 MPH
DHV = 10%
D = 65%
T = 6% *
* TTST = 2% DUAL = 4%
FUNC CLASS = URBAN MINOR ARTERIAL STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4015A.....	1.045 miles
LENGTH STRUCTURE TIP PROJECT U-4015A.....	0.011 miles
TOTAL LENGTH OF PROJECT U-4015A.....	1.056 miles

PLANS PREPARED BY:
RK&K
 8601 Six Forks Road, Forum 1 Suite 700
 RALEIGH, NORTH CAROLINA 27615-3960
 NC LICENSE NO. F-0112
 1-888-521-4455 OR 919-878-9560

FOR NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 2018 STANDARD SPECIFICATIONS

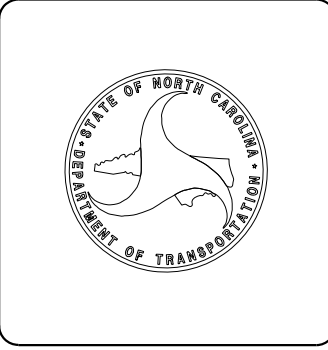
RIGHT OF WAY DATE: 05-21-2021	SCOTT D. BLEVINS, PE PROJECT ENGINEER
LETTING DATE: 05-16-2023	ZAC WILSON, EIT PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.





March 29, 2022

WBS Number: 35013.1.1

TIP Number: U-4015A

County: Guilford

Description: SR 1556 (Gallimore Dairy Rd.) from NC 68 (Lynwood Smith Expy.) To Airpark Rd. in Greensboro

Subject: Roadway Subsurface Inventory Report – Rev3

PROJECT DESCRIPTION

The proposed project consists of improvements to Gallimore Dairy Road, including widening, grading, drainage, paving, culvert, signing, retaining walls, and signals. The proposed project is approximately 1.06 miles in length. It begins at the intersection of NC68/Eastchester Dr. and Gallimore Dairy Rd., in Guilford County, NC, and it ends approximately 0.13 miles west of I-40/Fordham Blvd. bridge over Gallimore Dairy Rd.

The geotechnical investigation for -L- Sta. 10+00 to 66+00, including all -Y- lines, was performed during January 2021. During this time, a total of 38 Standard Penetration Test (SPT) borings and 6 hand auger borings with rod soundings and DCP were performed. The SPT borings were advanced with an ATV mounted CME 55 drill rig equipped with automatic hammers, while rod soundings and DCP were advanced using hand augers. Representative soil samples were collected from the split spoon and auger cuttings for field visual classification and laboratory testing.

The following alignments were investigated for this report. Selected cross sections of these alignments are included in this report.

<u>Line</u>	<u>Stations (±)</u>
-L-	10+00 – 66+00
-Y1-	10+00 – 11+80
-Y2-	10+00 – 12+40

PHYSIOGRAPHY AND GEOLOGY

The proposed project is located in the Piedmont Physiographic Province. The terrain within and around the project is flat to gently rolling hills, with a stretch of tall embankments along a commercialized area. The land surrounding the proposed roadway is forested, agricultural, and commercial. The Deep River cuts through a portion of the proposed alignment, where an existing bridge exists. Topographic relief along the length of the project alignment ranges in elevation from 794.1 feet to 895.8 feet.

The bedrock underlying the proposed project consists of Intrusive Rock members of the Carolina Slate Belt (Geologic Map of North Carolina, 1985). These rocks include metamorphosed granitic rocks (metagranite), which was encountered and identified during the investigation.

GROUNDWATER PROPERTIES

Groundwater was encountered during drilling operations (0-hr reading) within four borings at elevations ranging from 793.7’ to 849.3’. Some borings were backfilled immediately upon their completion because of safety concerns related to leaving the borings open overnight, but 24-hour stabilized groundwater measurements were taken at the majority of borings. Static (24-hr reading) measurements were recorded within seven borings at elevations ranging from 796.7’ to 876.0’. It should be noted that the groundwater levels fluctuate depending upon seasonal factors such as precipitation and temperature. As such, soil moisture and groundwater conditions at other times may vary from those described in this report.

SOIL PROPERTIES

Soils encountered during the subsurface investigation are separated into three categories based on origin. The origins consist of roadway embankment, alluvial soils, and residual soils.

Materials interpreted as roadway embankment were encountered within the limits of the existing Gallimore Dairy Rd. alignment and intersecting roads. The roadway embankment consists of medium dense to dense, silty SAND (A-2-4, A-2-5) and medium stiff to stiff, sandy to silty moderately to highly plastic CLAY (A-6, A-7-5, A-7-6). Encountered roadway embankment was up to 4.0 feet thick. Measured plasticity indices for selected samples ranged between 28 to 30.

Alluvial soils were encountered in low-lying wetland and drainage areas. They are composed of very loose, silty SAND (A-2-4). Encountered alluvial soils were up to 4.5 feet thick.

Soils classified as residual soils generally consisted of very loose to very dense, non-plastic silty to slightly plastic (PI = NP-11) clayey fine to coarse SAND (A-2-4, A-2-5, A-2-6, A-2-7); soft to hard, non-plastic sandy to highly plastic (PI = 3-39) clayey SILT (A-4, A-5); and soft to hard, sandy to silty slightly to highly plastic (PI = 14-39) CLAY (A-6, A-7-5, A-7-6). Varying amounts of mica and rock fragments were noted within soils interpreted as residual soils.

ROCK PROPERTIES

Weathered Rock: Weathered rock was encountered in two borings. Weathered rock encountered at the following location was above or within six feet of proposed grade at elevations ranging from 804.1’ to 815.3’:

<u>Line</u>	<u>Stations (±)</u>	<u>Offset</u>
-Y1-	10+50 – 11+50	LT & RT

Crystalline Rock: Crystalline rock is defined as auger refusal or SPT refusal with penetration by split spoon of less than or equal to 0.1 feet per 60 blows. Crystalline rock was encountered in three borings at elevations ranging from 791.7’ to 795.3’. Crystalline rock was not encountered at any of the locations above or within six feet of proposed grade.

AREAS OF SPECIAL GEOTECHNICAL INTEREST

Prepared by,

Soft, Loose and/or Wet Soils: Relatively soft or loose and/or wet soils were encountered along the proposed alignments at the following locations:

<u>Line</u>	<u>Stations (±)</u>	<u>Offset</u>
-L-	15+75 – 17+75	LT & RT
-L-	24+00 – 26+25	LT & RT
-L-	40+25 – 41+75	RT

Atefeh Asoudeh, P.E.
Project Manager, Geotechnical
Registered, North Carolina 043747

Maxime Metry, E.I.T
Geotechnical Professional

Highly Plastic Soils: Highly plastic soils with plasticity indices (PI) greater than 25 and within proposed cut sections or PI greater than 35 and/or high liquid limit within 3-ft of subgrade were encountered at the following locations:

<u>Line</u>	<u>Stations (±)</u>	<u>Offset</u>
-L-	35+75 – 37+25	LT & RT
-L-	41+75 – 52+75	LT & RT
-L-	53+75 – 65+75	LT & RT
-Y2-	10+25 – 12+25	LT & RT

Groundwater: Groundwater was encountered within **six (6) feet** of proposed grade at the following locations:

<u>Line</u>	<u>Stations (±)</u>	<u>Offset</u>
-L-	35+25 – 42+75	RT
-Y2-	10+25 – 11+75	LT & RT

Ponds: A pond is located near the proposed embankment at the following location:

<u>Line</u>	<u>Stations (±)</u>	<u>Offset</u>
-L-	24+18 – 24+87	LT

Water Wells: The following water well was found within the proposed slope stake limits on the project:

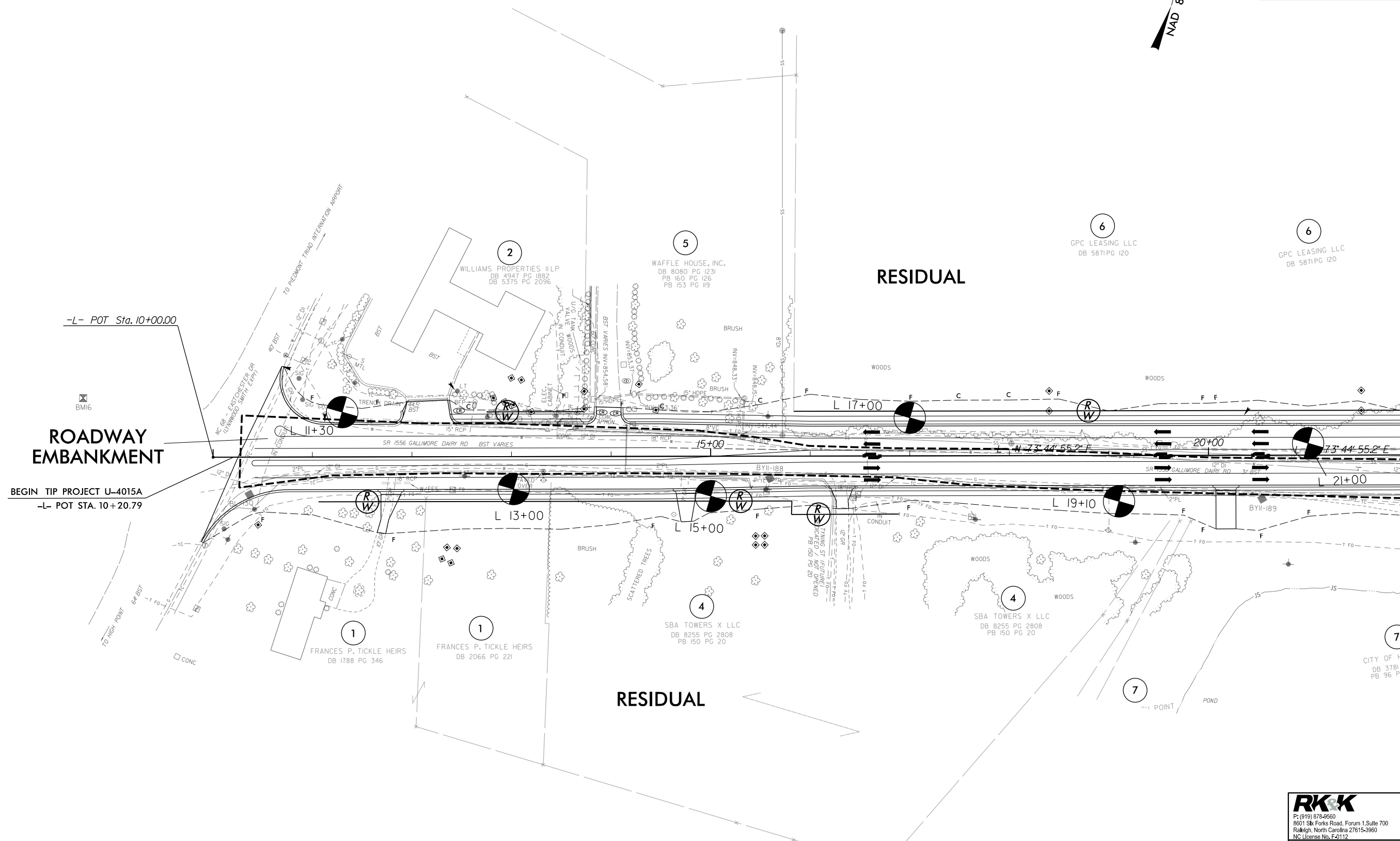
<u>Line</u>	<u>Stations (±)</u>	<u>Offset</u>
-L-	10+96	20' RT

Other water wells may be encountered during construction due to the presence of dwellings and businesses near the proposed right of way.

Culverts: One quadruple 13'x11' reinforced concrete box culvert (RCBC) is located along the project corridor. The culvert is at the following location:

<u>Line</u>	<u>Station (±)</u>
-L-	25+58.6

PROJECT REFERENCE NO. U-4015A	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



ROADWAY EMBANKMENT

BEGIN TIP PROJECT U-4015A
-L- POT STA. 10+20.79

RESIDUAL

RESIDUAL

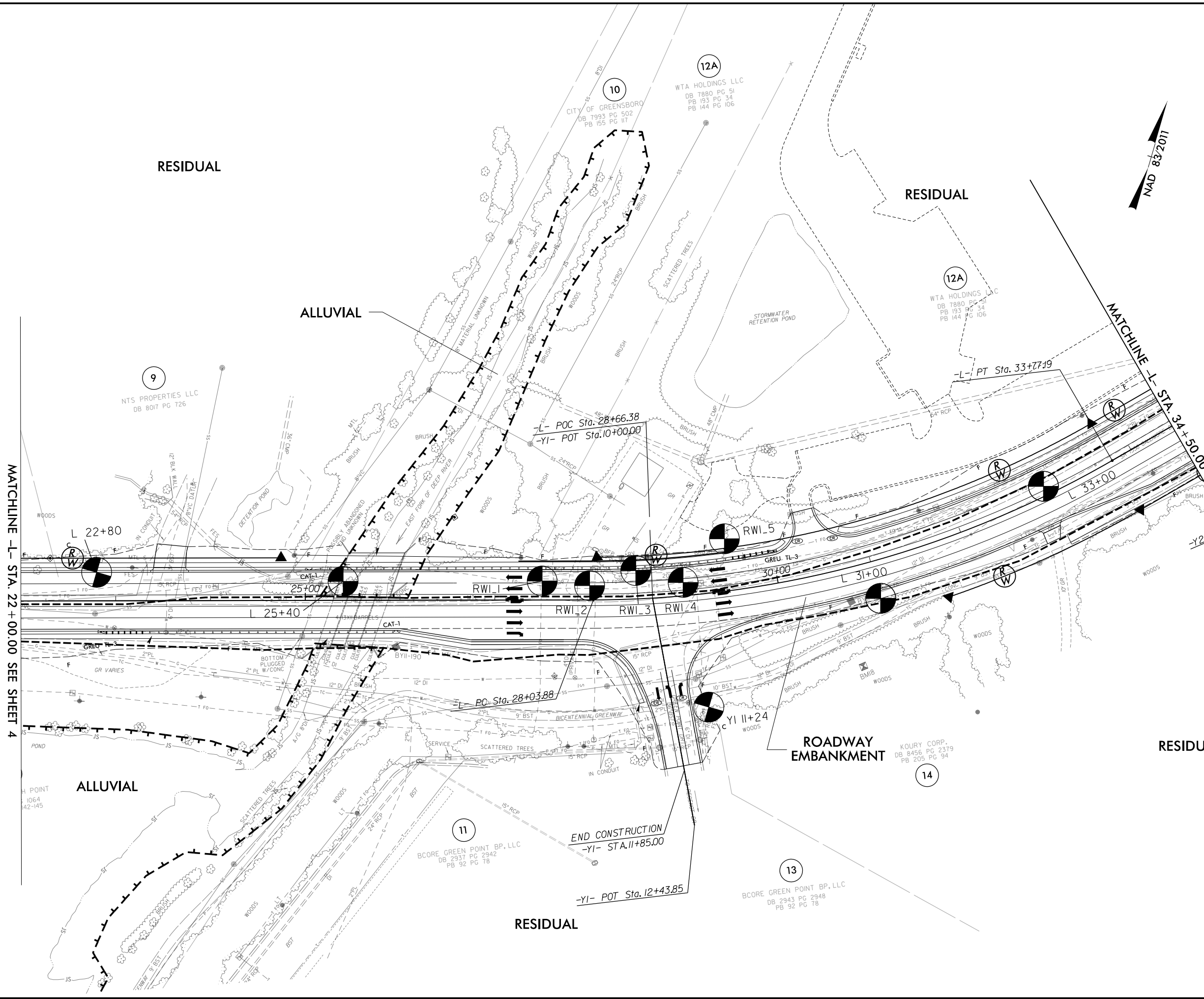
MATCHLINE -L- STA. 22 + 00.00 SEE SHEET 5

8/17/09

R:\CS\2022\Tech\InvestigationDesign\CADD_GEO\TECH\Plan\Prof\U4015A_GEO.rvt.004.dgn

RK&K
 P: (919) 873-6560
 8601 St. Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. FJ1172
 Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

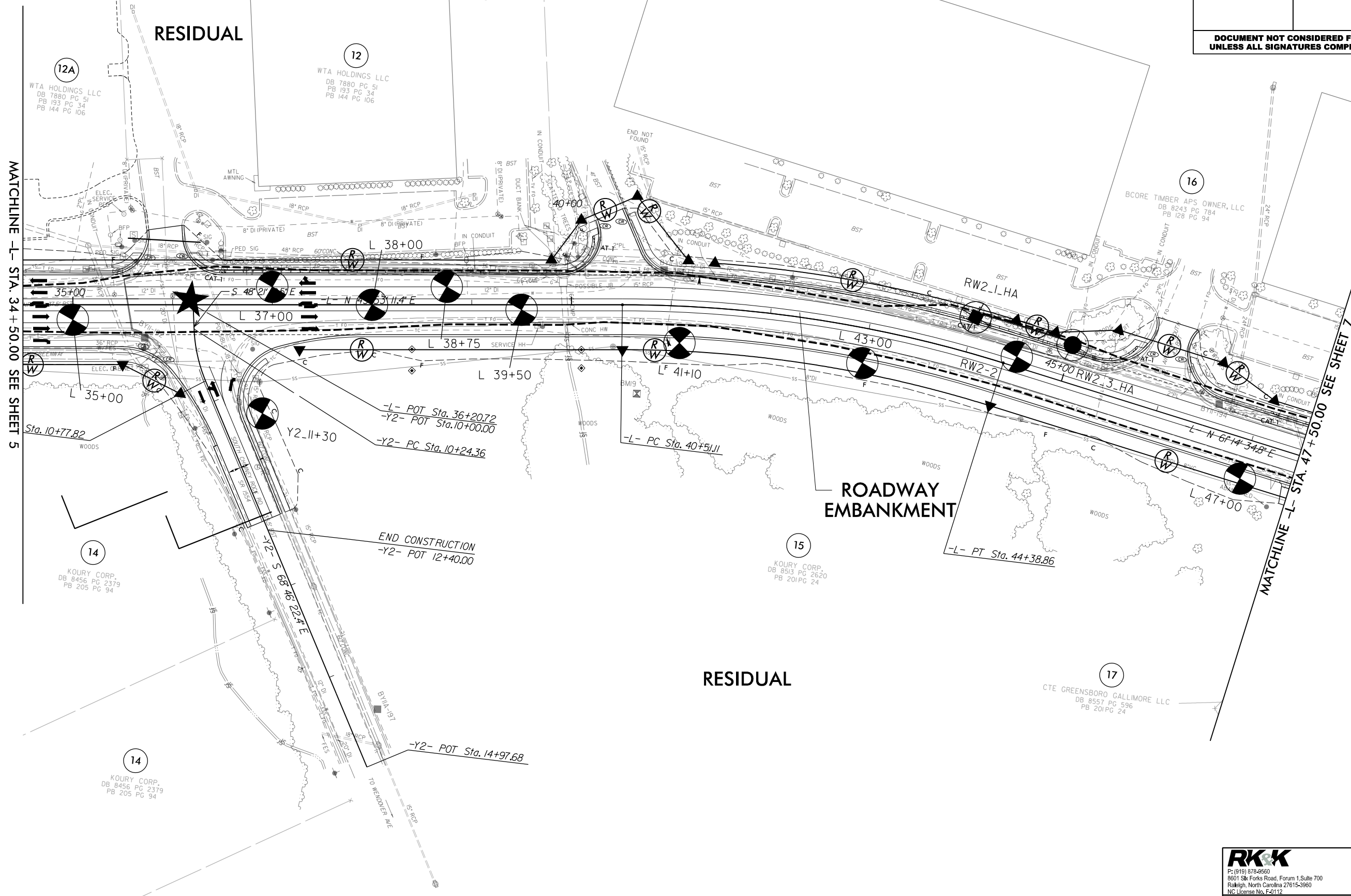
PROJECT REFERENCE NO. U-4015A	SHEET NO. 5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



8/17/09
R:\2022\Investigation\Design\CADD_GEO\TECH\Plan\Prof\U4015A_GEO.rvt.005.dgn
2/25/2022
R:\2022\Investigation\Design\CADD_GEO\TECH\Plan\Prof\U4015A_GEO.rvt.005.dgn

RK&K
 P: (919) 873-8560
 8601 St. Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. FJ1112
 Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

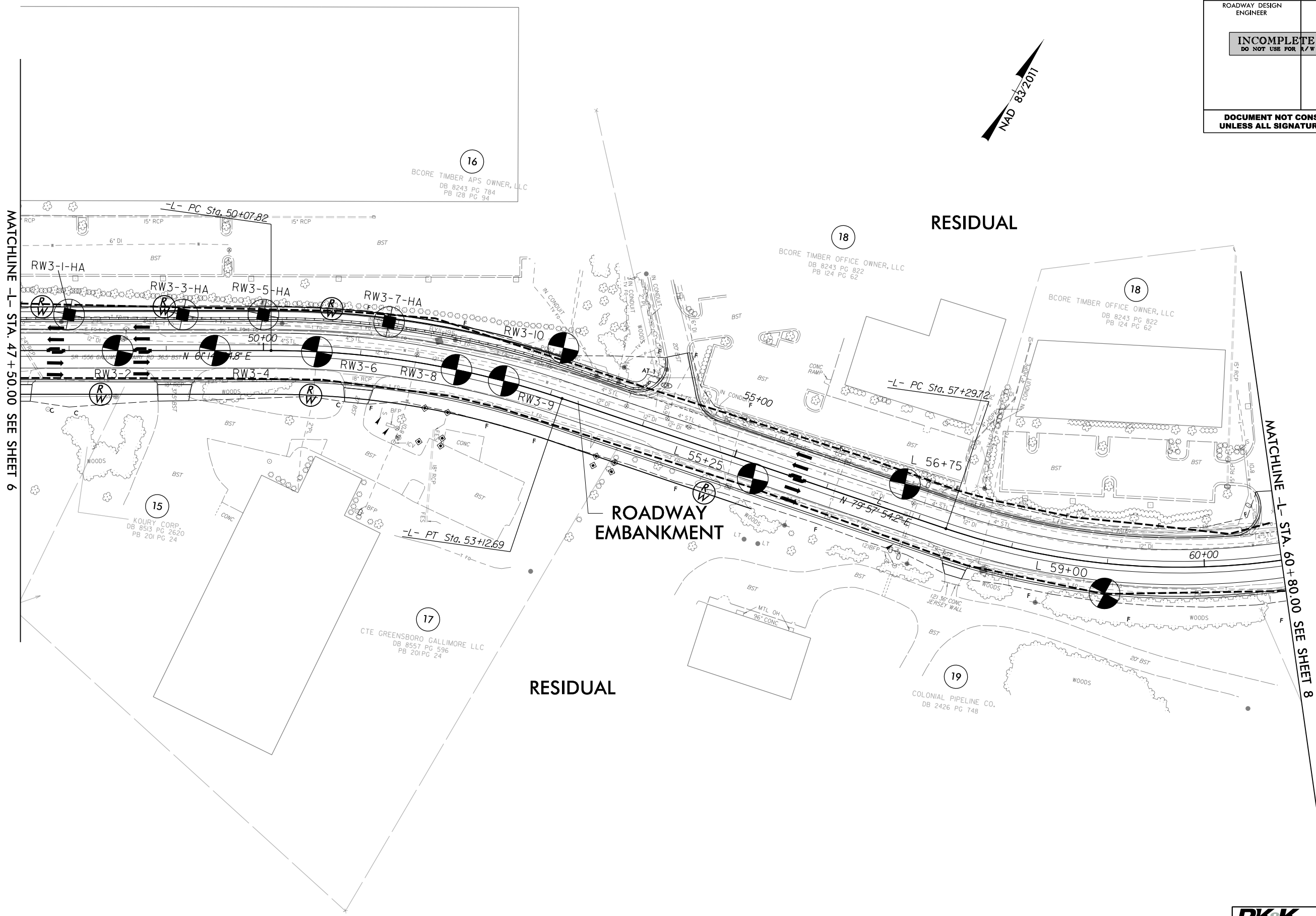
PROJECT REFERENCE NO. U-4015A	SHEET NO. 6
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



8/17/09
R:\2022\Tech\Investigation\Design\CADD_GEO\TECH\Plan\Prof\U4015A_GEO_mv_006.dgn

RK&K
 P: (919) 873-6560
 8601 St. Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. FJ1112
 Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

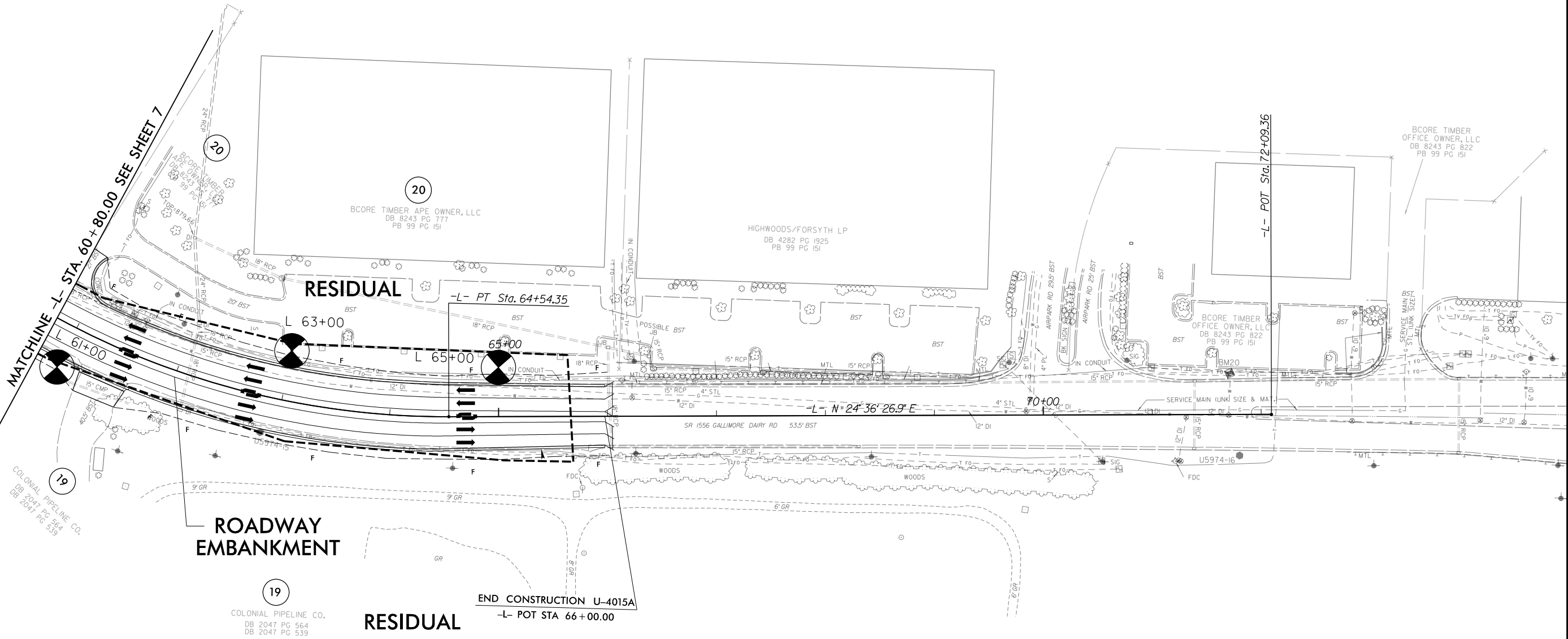
PROJECT REFERENCE NO. U-4015A	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



8/17/09
R:\CS\2022\Tech\Investigation\Design\CADD_GEO\TECH\Plan\Prof\U4015A_GEO_mv_007.dgn

RK&K
 P: (919) 873-6560
 8601 St. Forks Road, Forum 1, Suite 700
 Raleigh, North Carolina 27615-3960
 NC License No. FJ1112
 Engineers | Construction Managers | Planners | Scientists
 www.rkk.com
 Responsive People | Creative Solutions

PROJECT REFERENCE NO. <i>U-4015A</i>	SHEET NO. <i>8</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



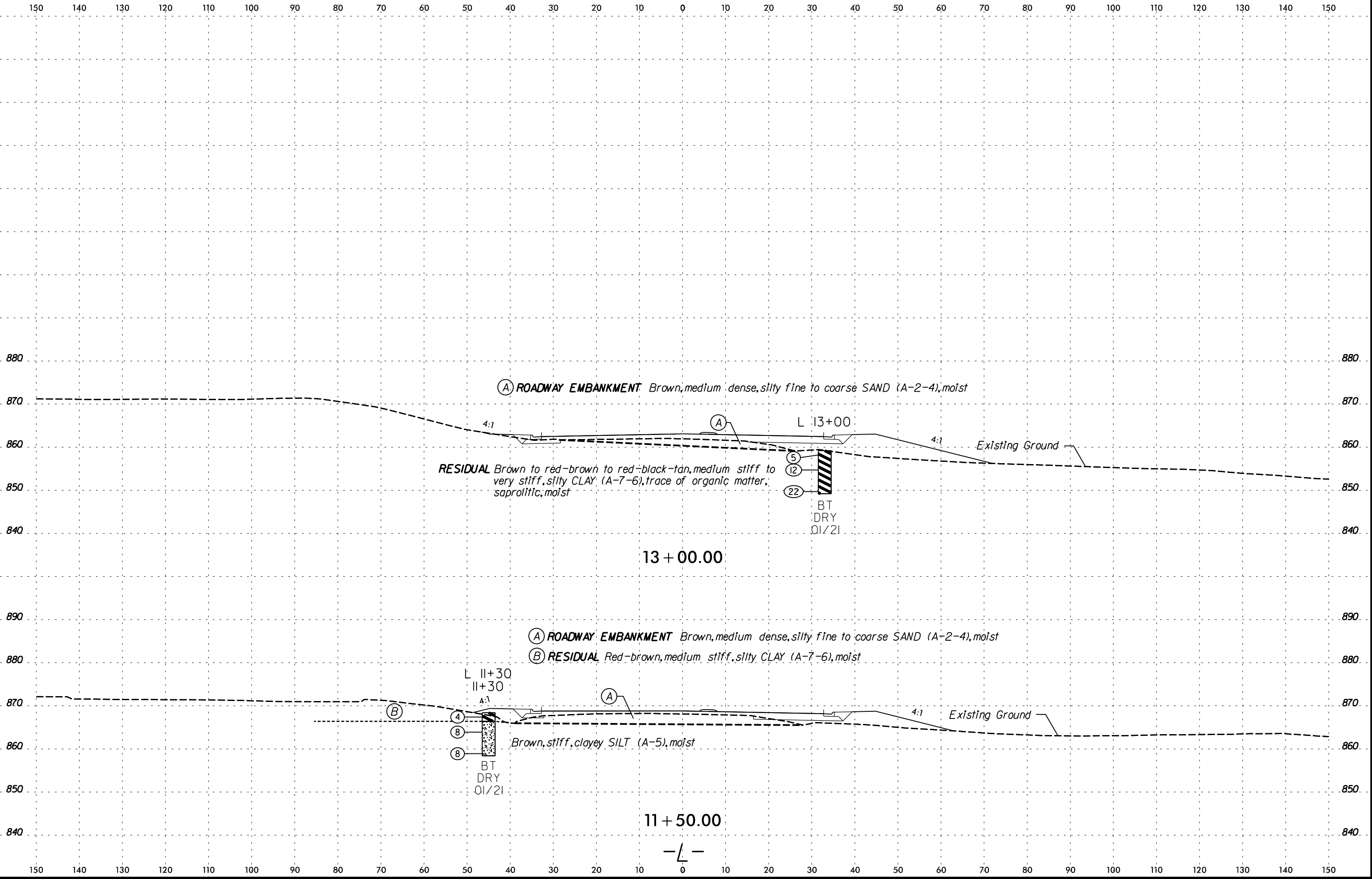
MATCHLINE -L- STA. 60+80.00 SEE SHEET 7

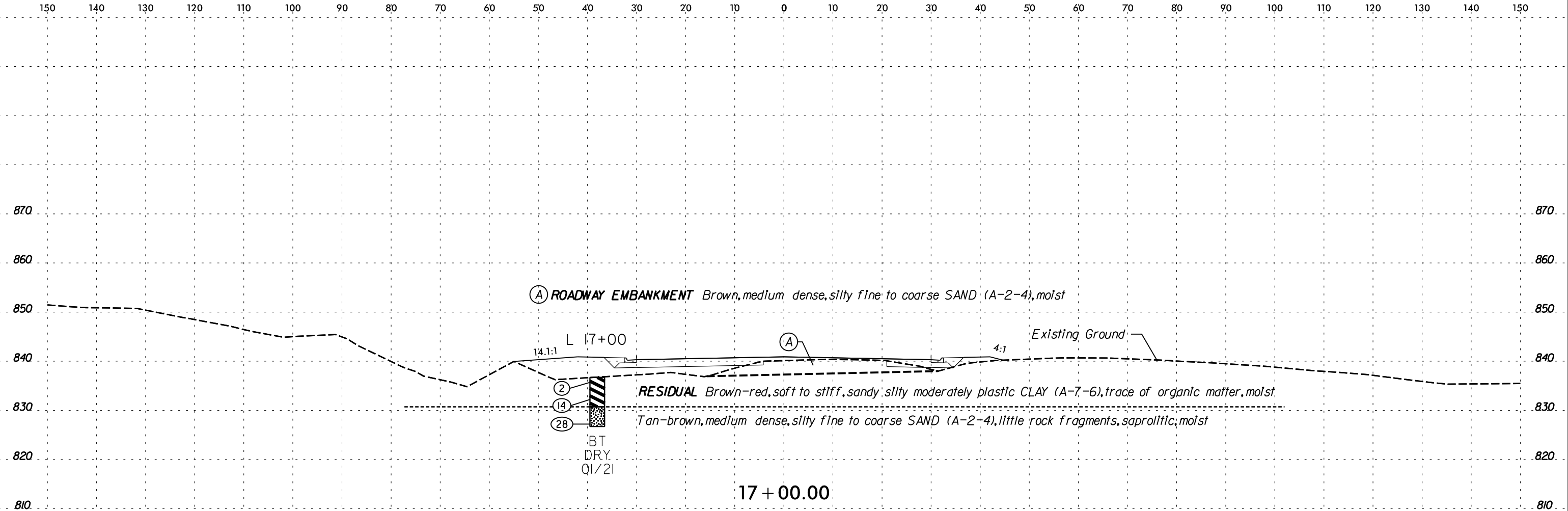
-L- POT Sta. 72+09.36

END CONSTRUCTION U-4015A
-L- POT STA 66+00.00

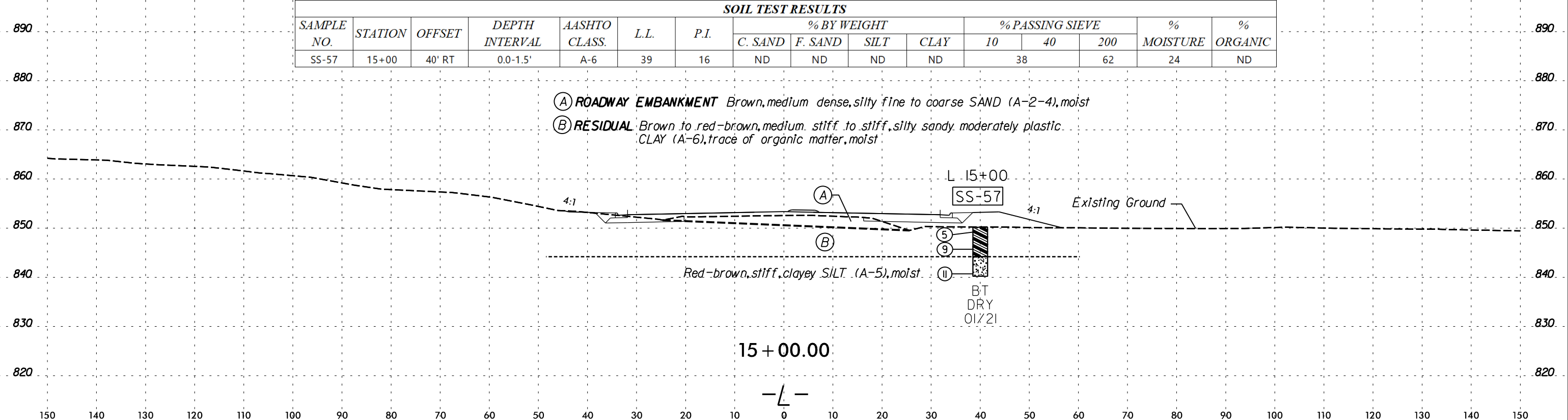
8/17/99
R:\GIS\2022\Tech\Investigation\Design\CADD_GEO\TECH\Plan\Prof\U4015A_GEO.rvt.008.dgn
8/17/2022

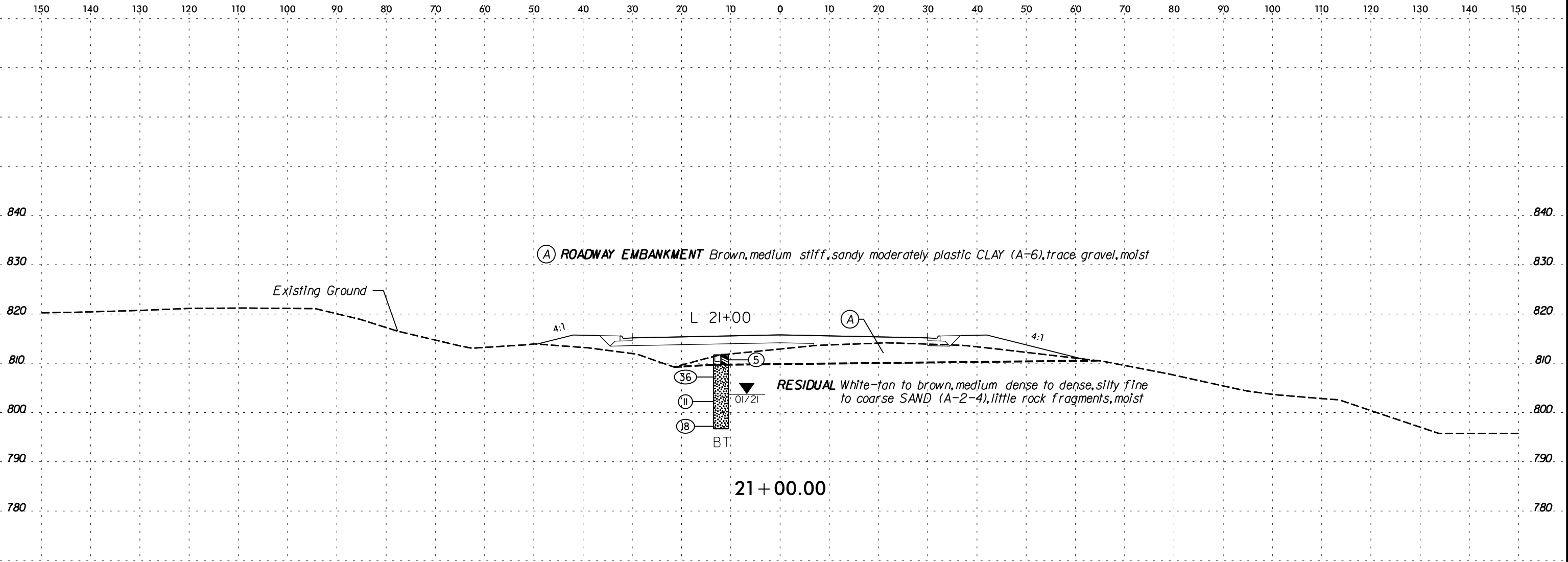
RK&K
P: (919) 873-6560
8601 St. Forks Road, Forum 1, Suite 700
Raleigh, North Carolina 27615-3960
NC License No. FJ1112
Engineers | Construction Managers | Planners | Scientists
www.rkk.com
Responsive People | Creative Solutions





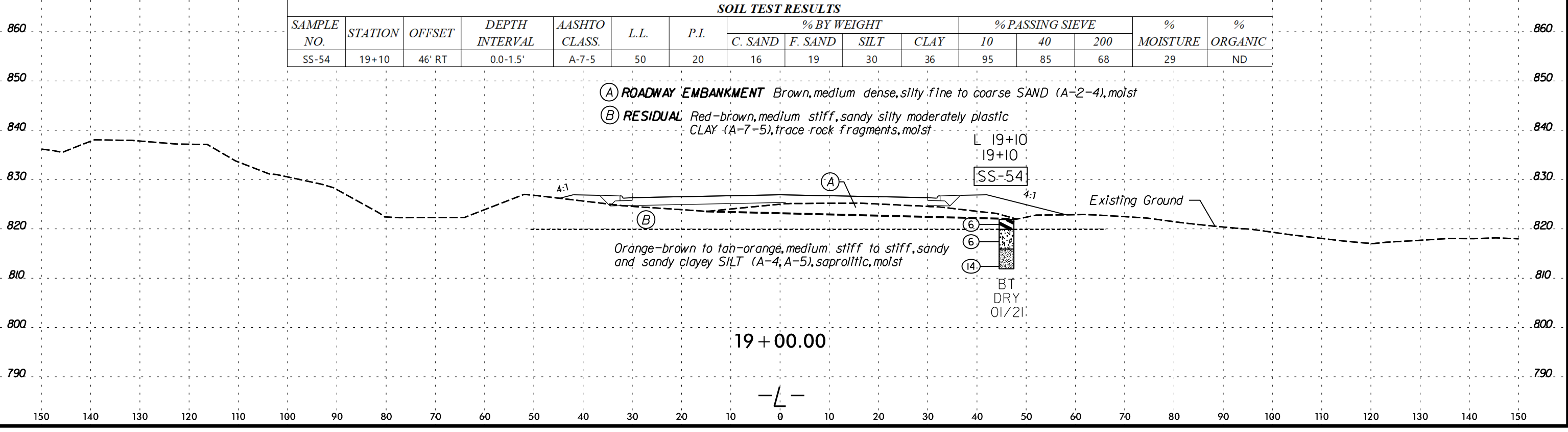
SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-57	15+00	40' RT	0.0-1.5'	A-6	39	16	ND	ND	ND	ND	38	62	24	ND	

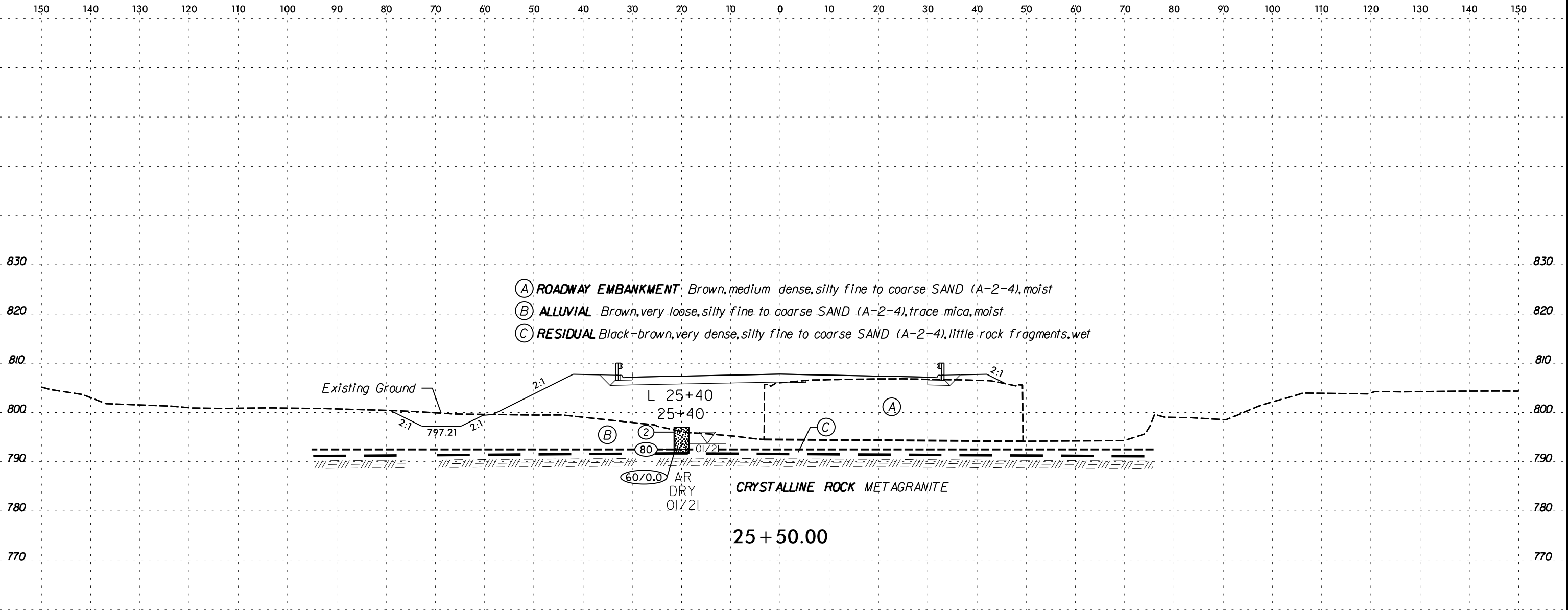




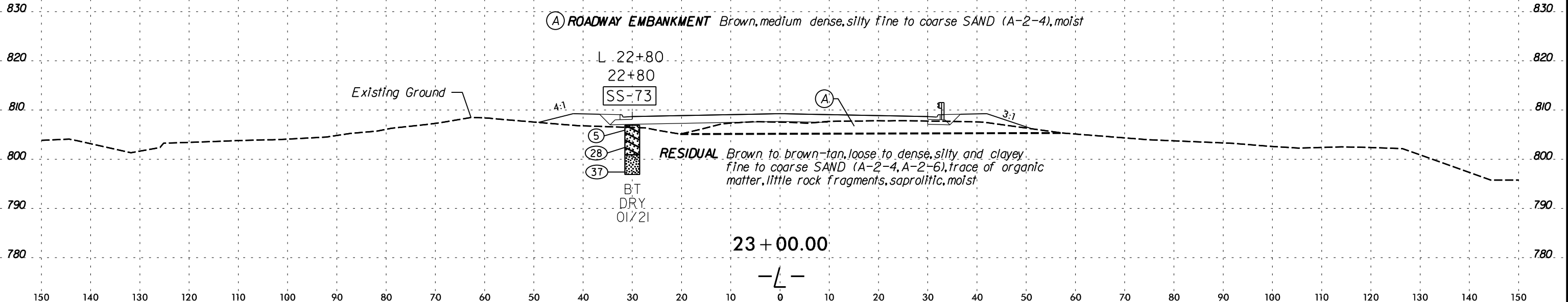
SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-54	19+10	46' RT	0.0-1.5'	A-7-5	50	20	16	19	30	36	95	85	68	29	ND





SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-73	22+80	30' LT	0.0-1.5'	A-2-6	33	11	ND	ND	ND	ND	66	34	19	ND	



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

860 860

850 850

SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-10	28+00	15' LT	0.0-1.5'	A-6	32	14	ND	ND	ND	ND	44	56	18	ND	

840 840

830 830

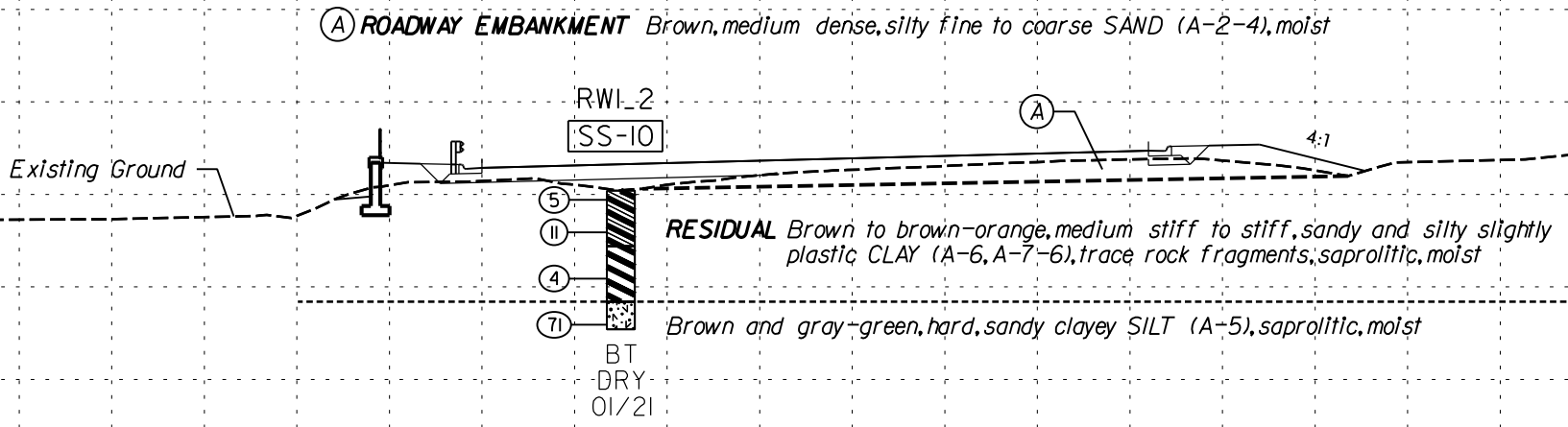
820 820

810 810

800 800

790 790

780 780



28 + 00.00

SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-8	27+50	20' LT	3.5-5.0'	A-6	37	17	23	23	17	38	99	84	59	23	ND

850 850

840 840

830 830

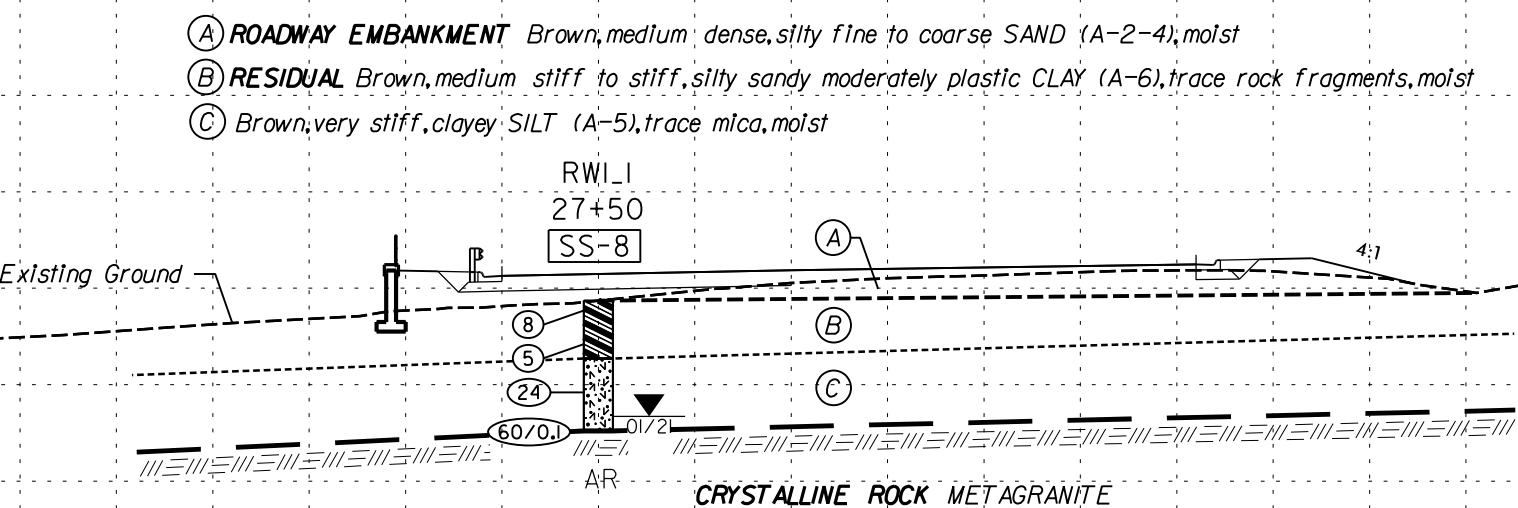
820 820

810 810

800 800

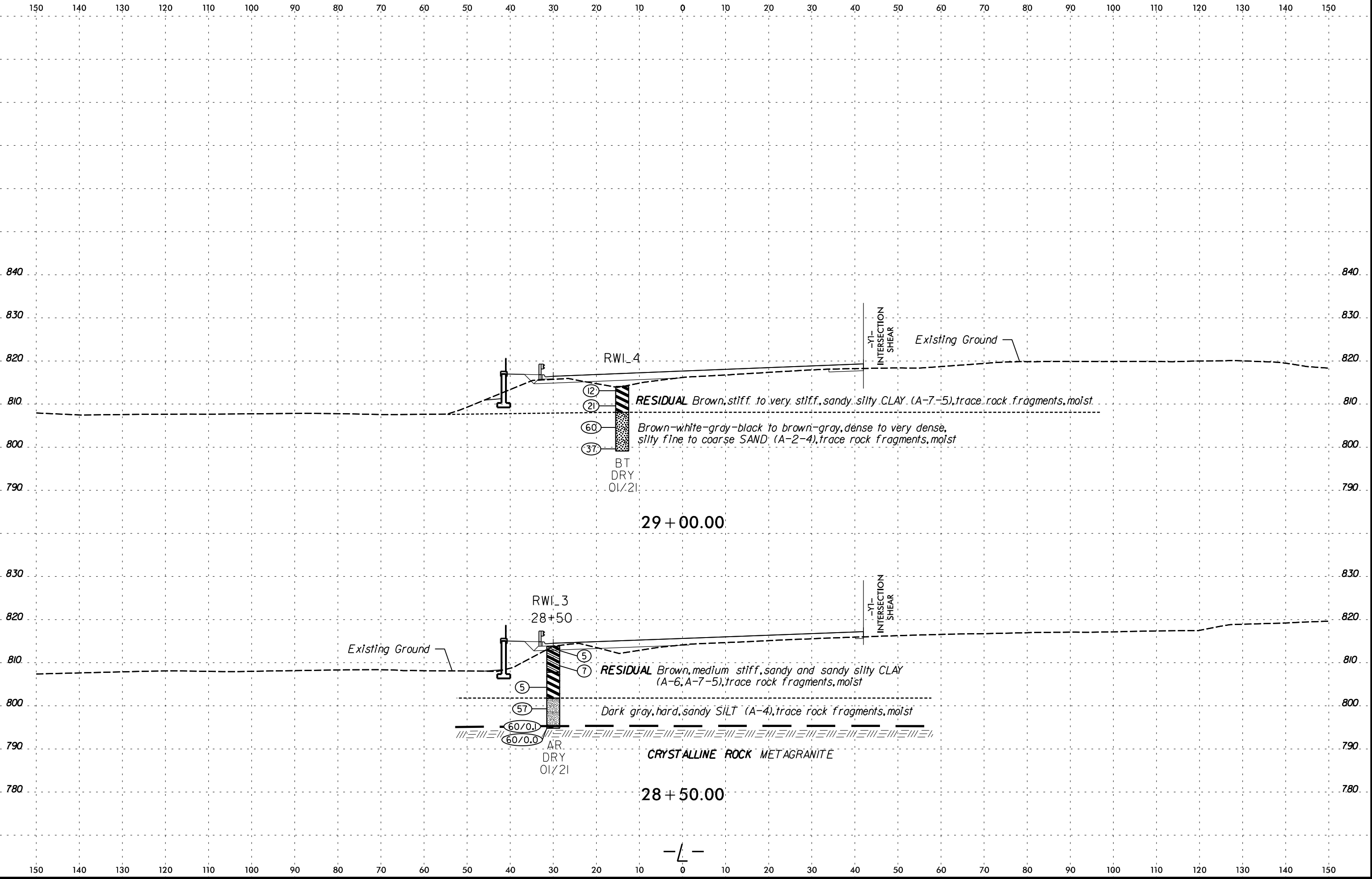
790 790

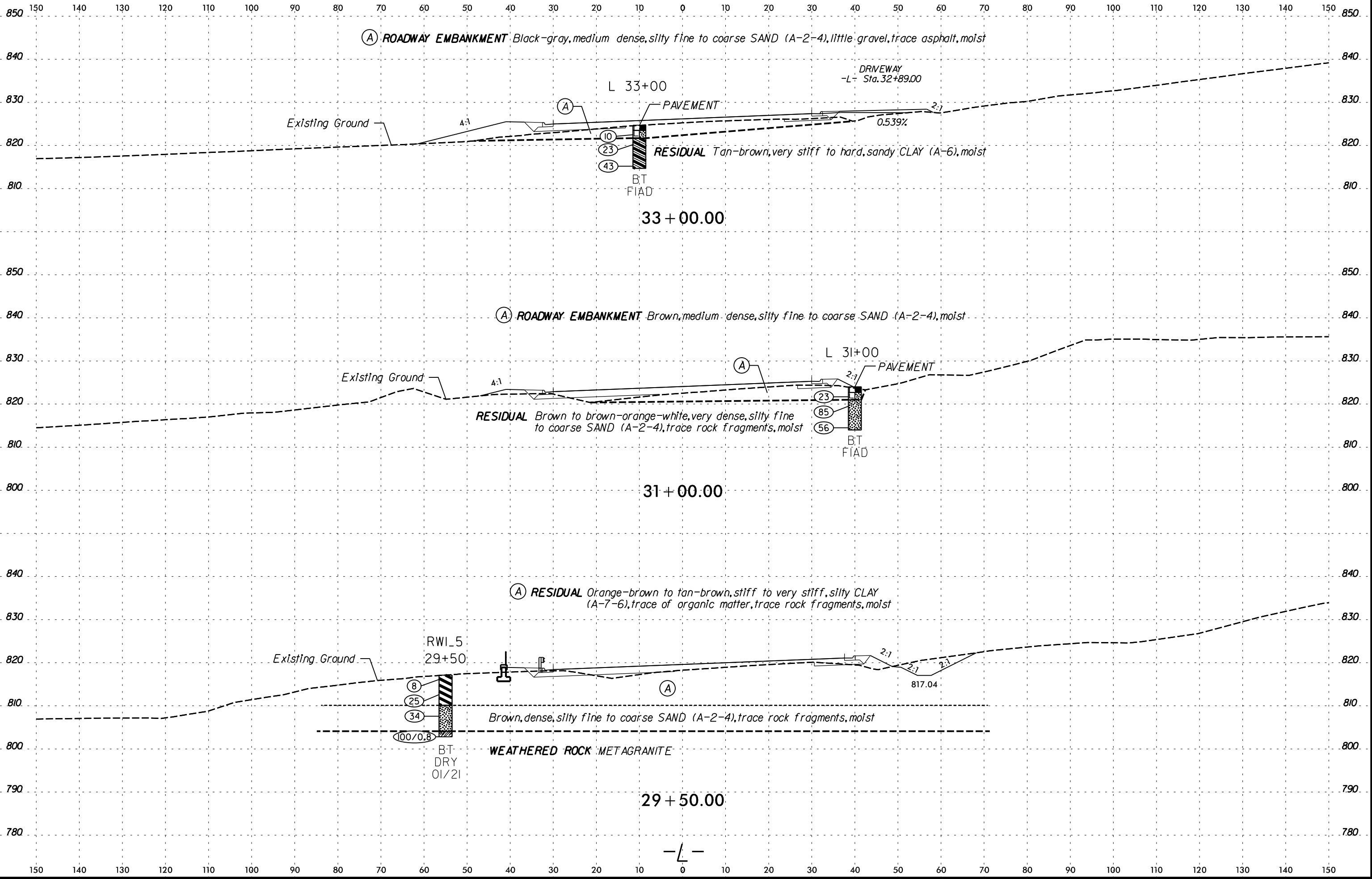
780 780

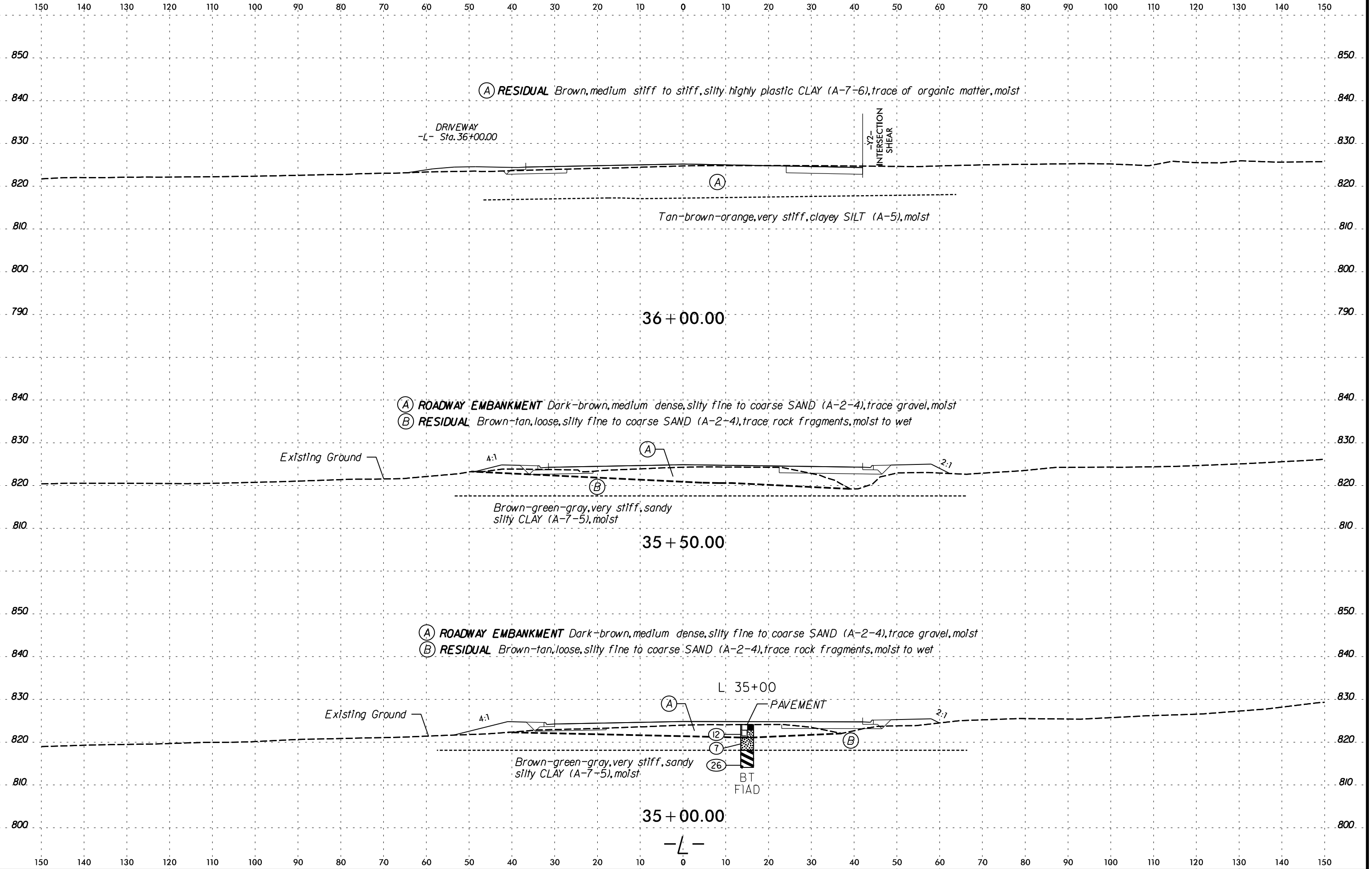


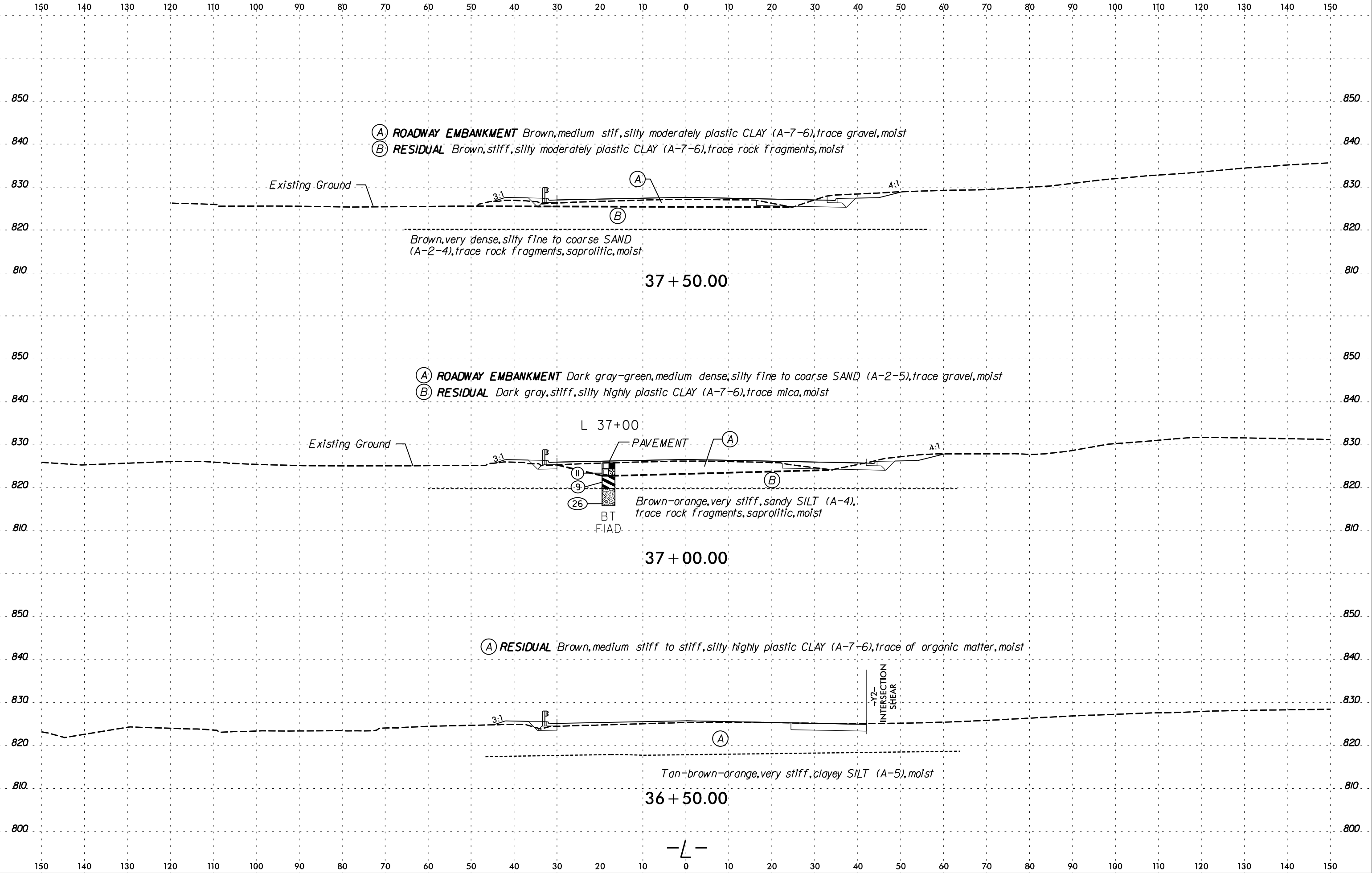
27 + 50.00

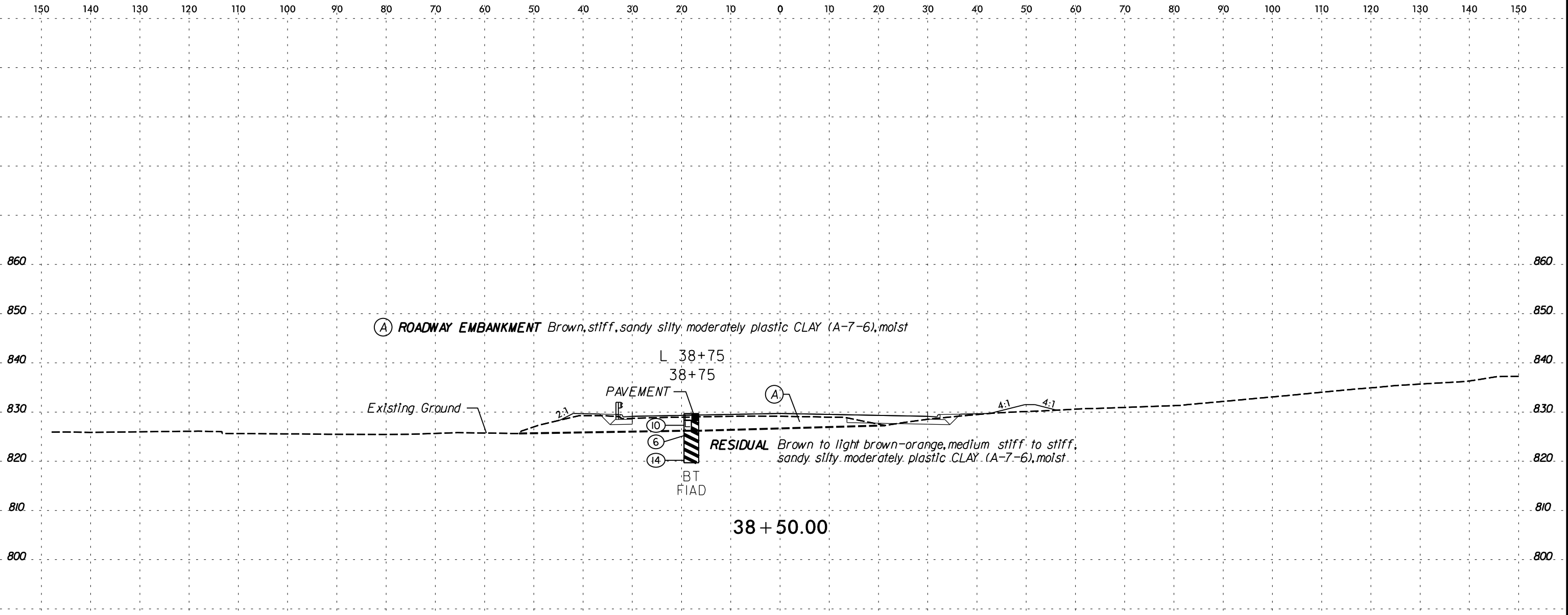
-L-





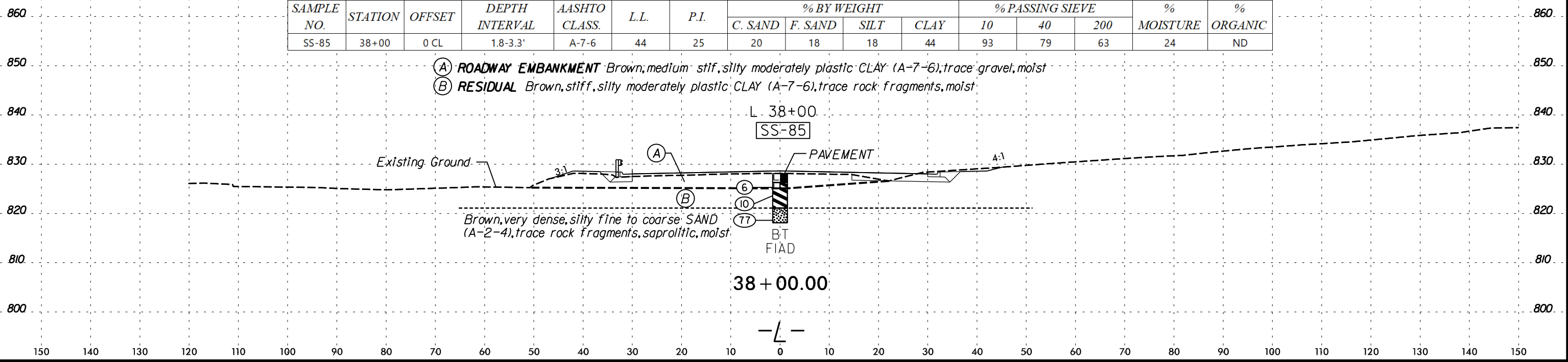


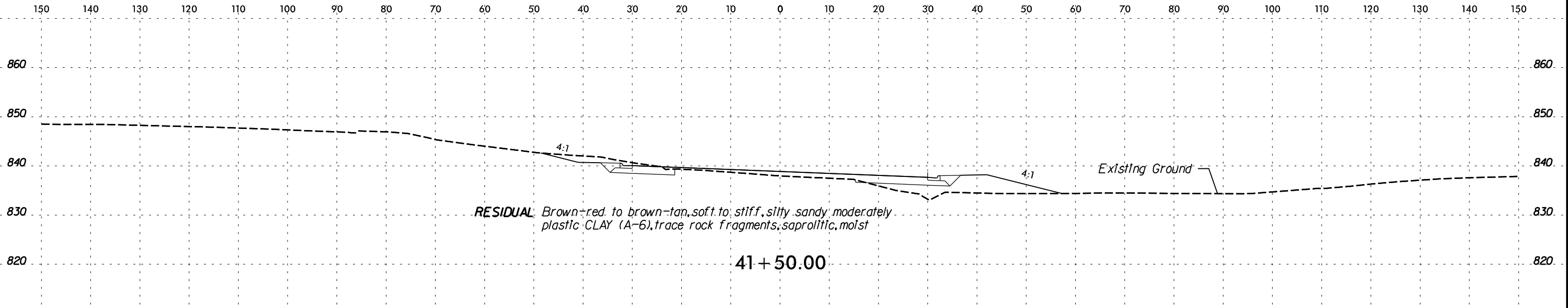




SOIL TEST RESULTS

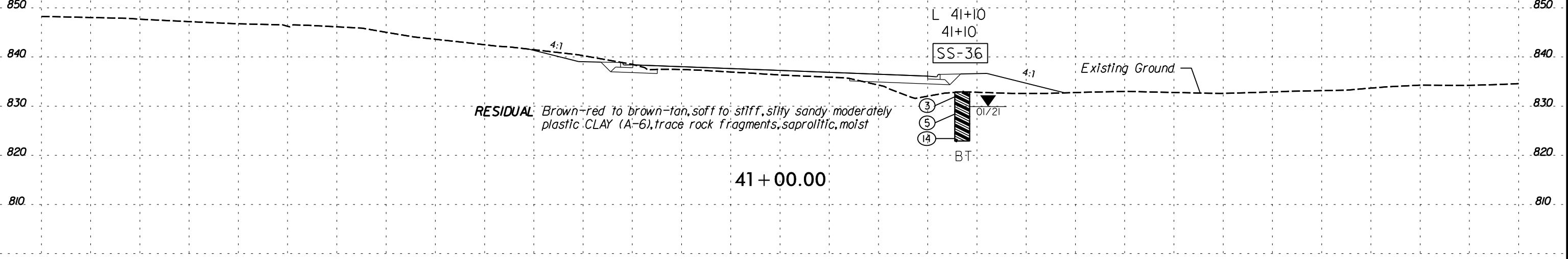
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-85	38+00	0 CL	1.8-3.3'	A-7-6	44	25	20	18	18	44	93	79	63	24	ND



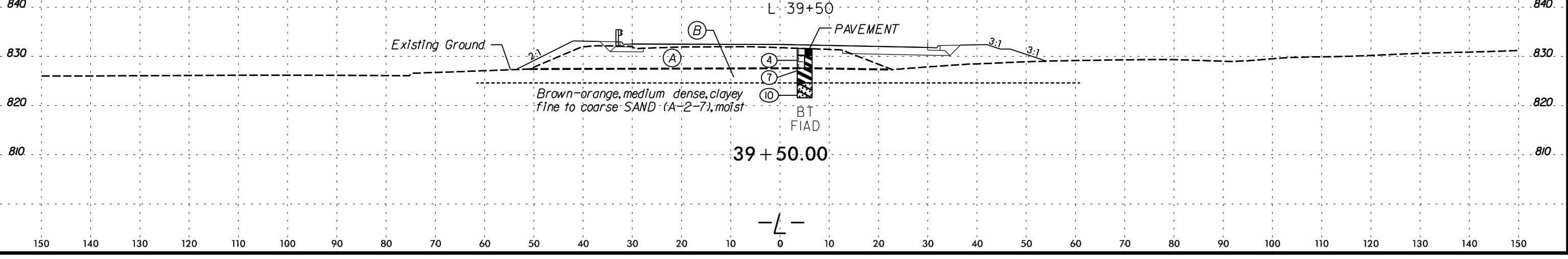


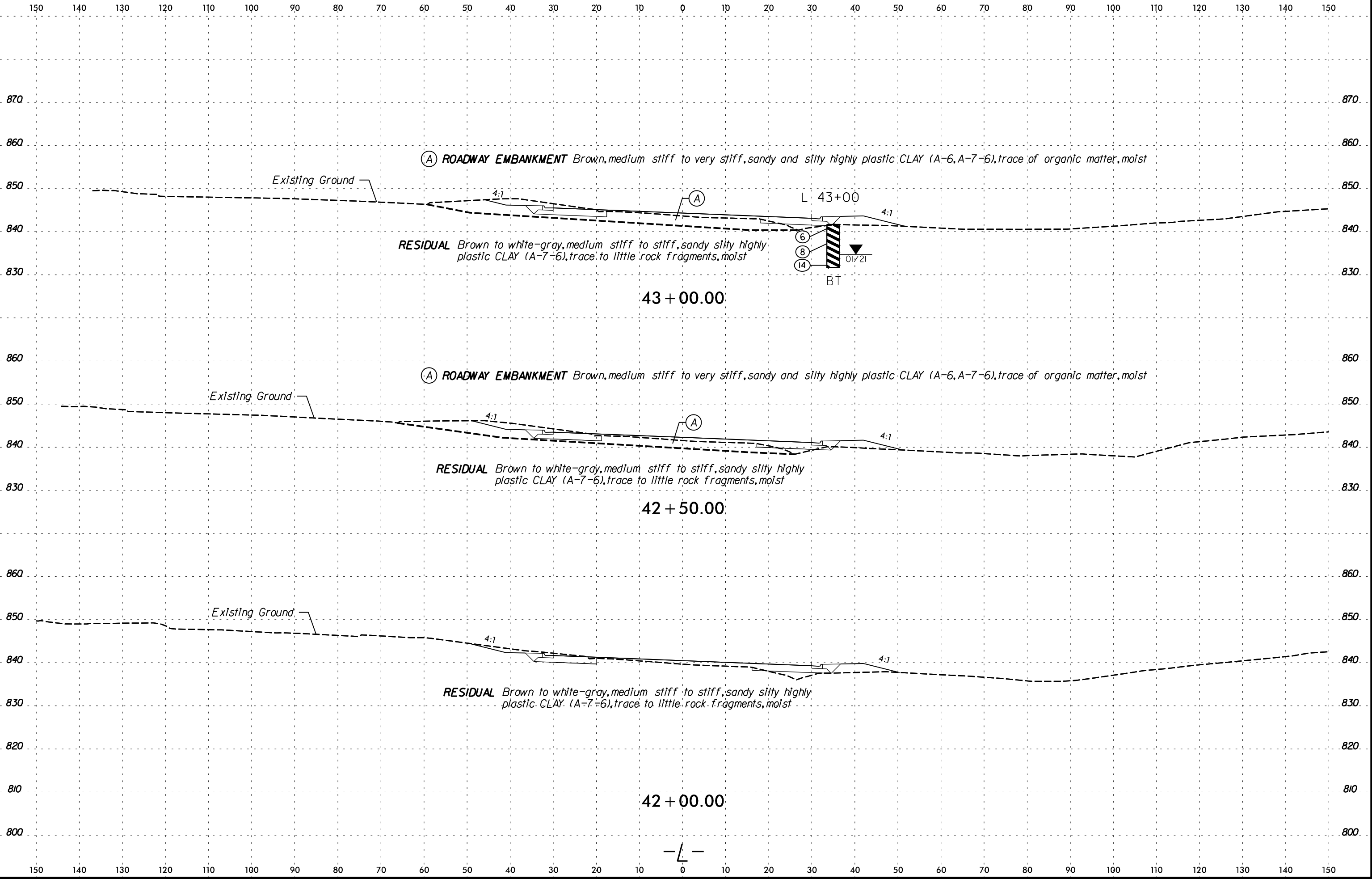
SOIL TEST RESULTS

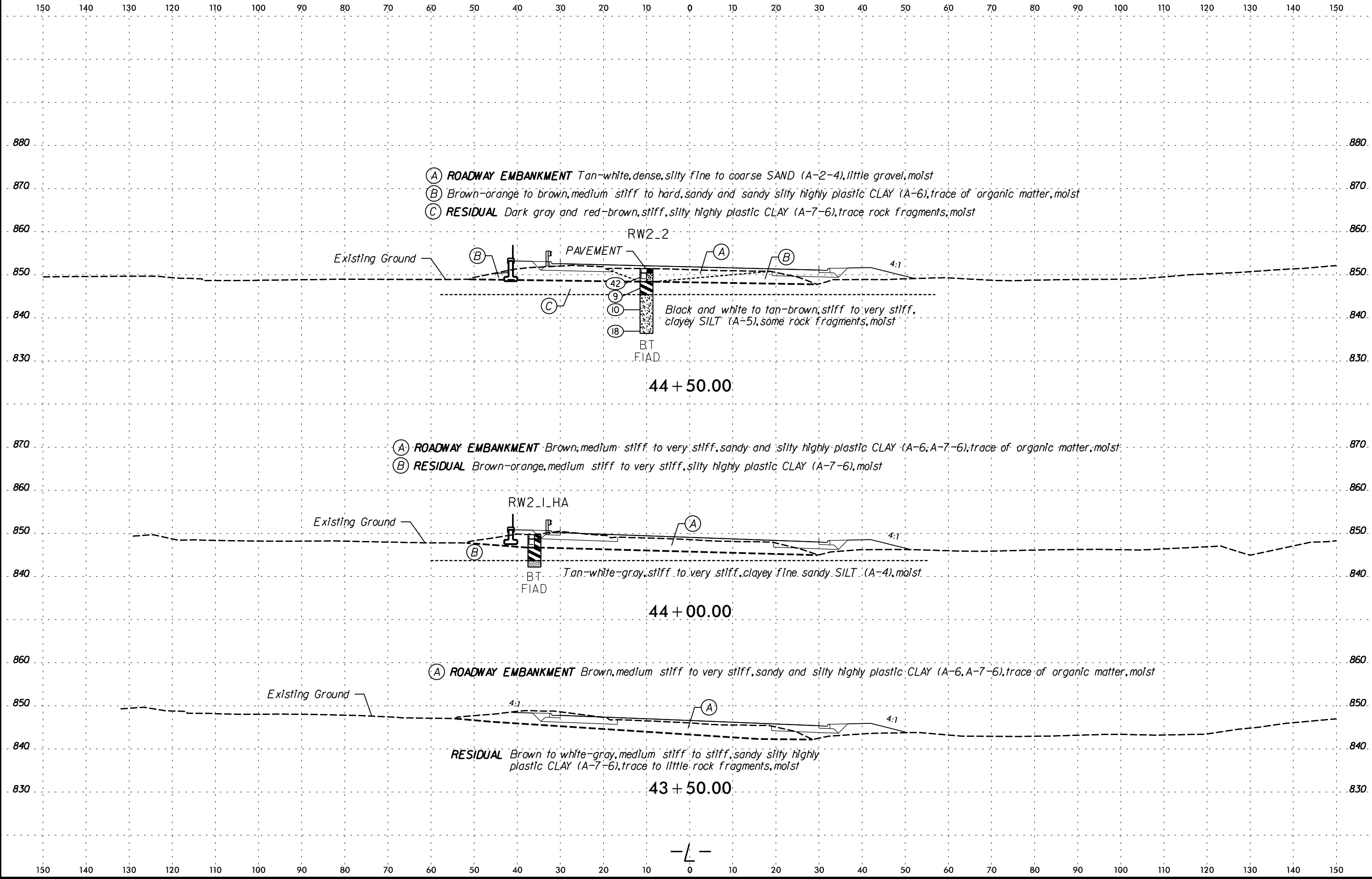
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-36	41+10	37' RT	0.0-1.5'	A-6	38	16	18	24	28	30	97	85	64	27	ND

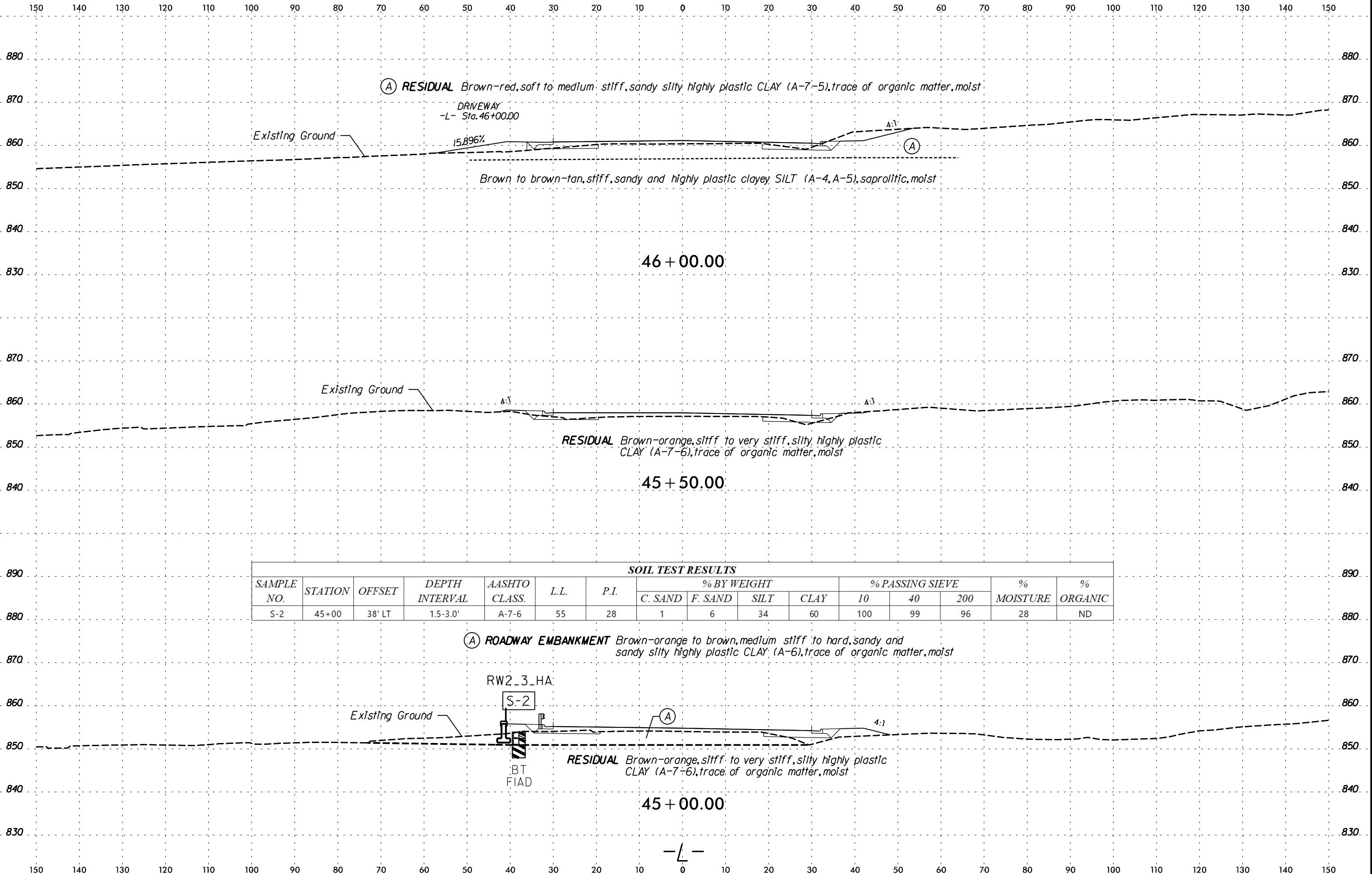


- (A) ROADWAY EMBANKMENT Red-brown, medium stiff, sandy silty moderately plastic CLAY (A-7-6), trace gravel, moist
- (B) RESIDUAL Red-brown to dark brown, medium stiff, sandy silty moderately plastic CLAY (A-7-6), trace rock fragments, moist

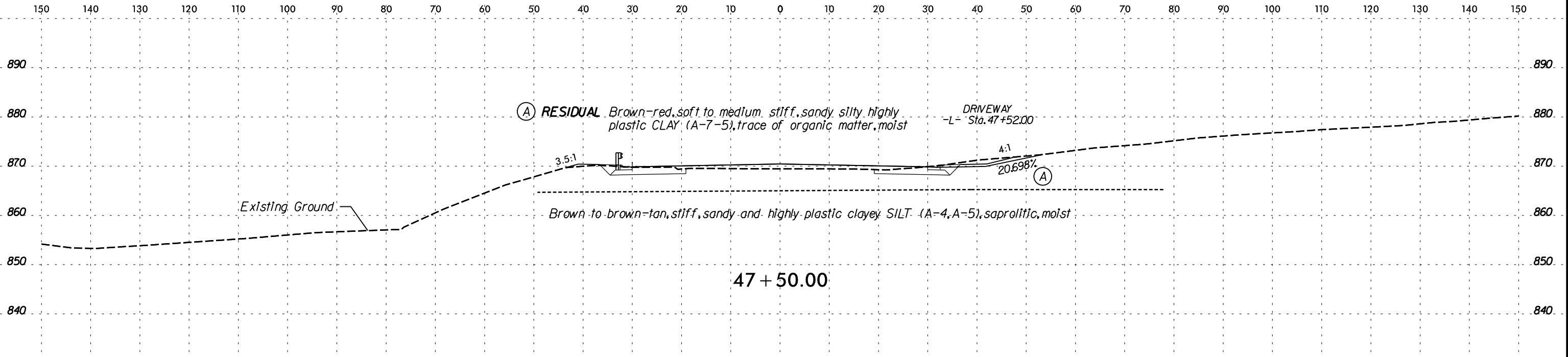






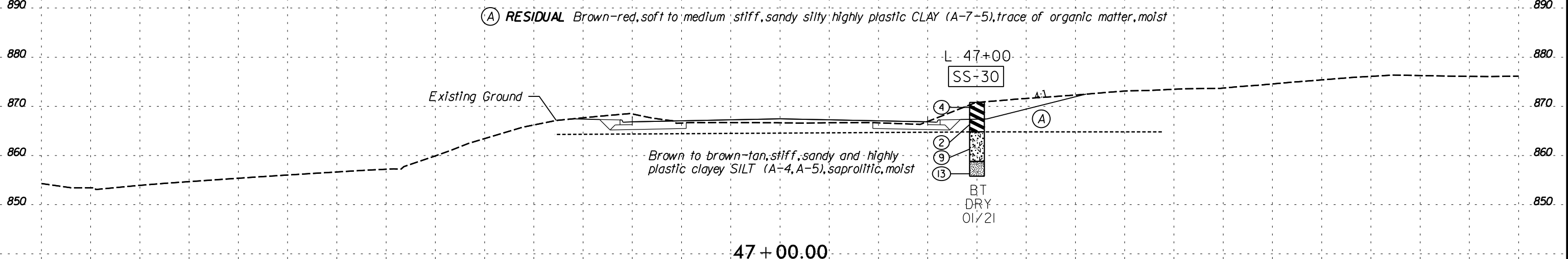


SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-2	45+00	38' LT	1.5-3.0'	A-7-6	55	28	1	6	34	60	100	99	96	28	ND

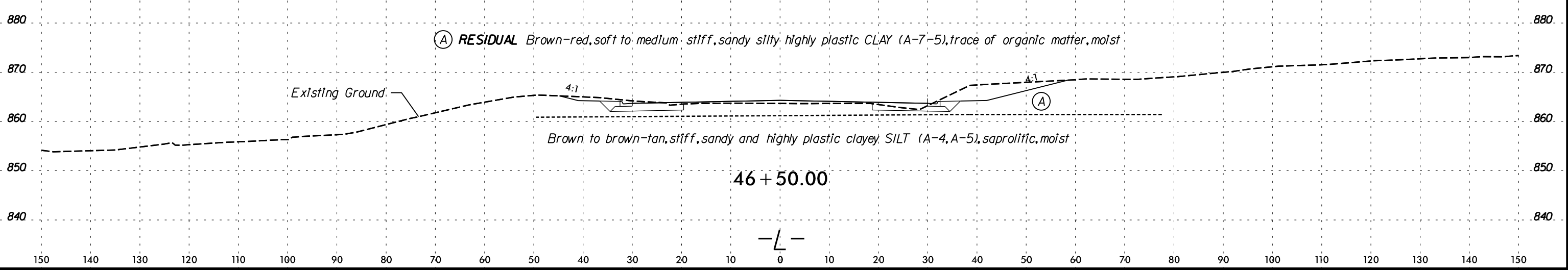


47 + 50.00

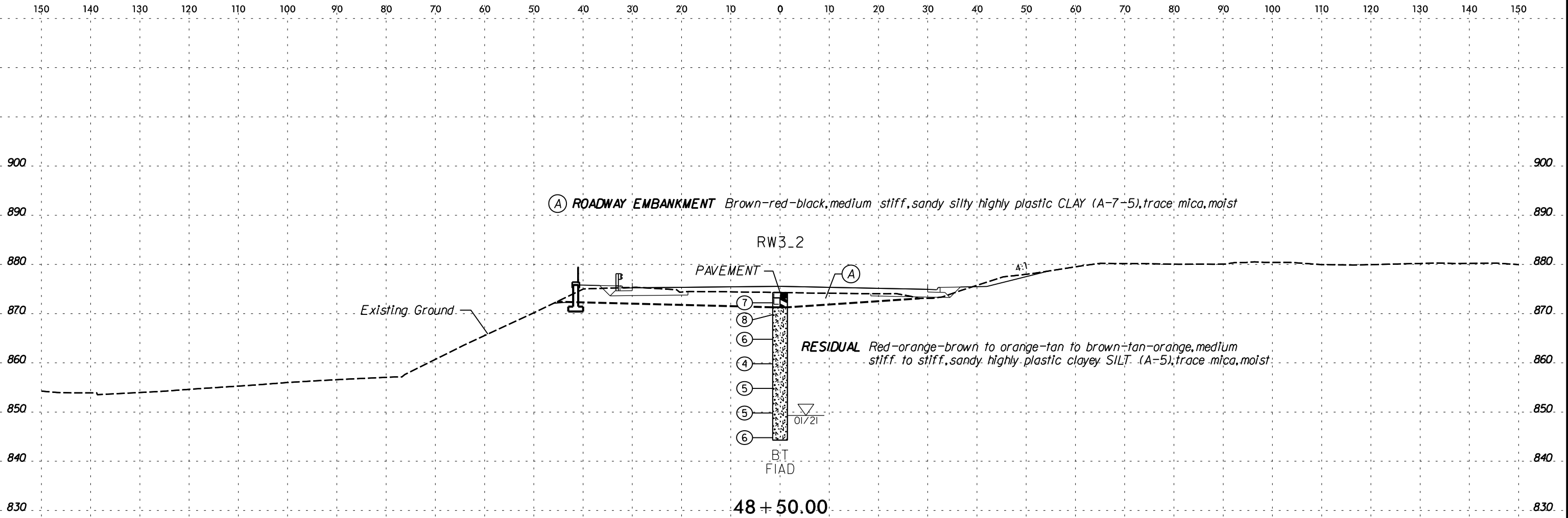
SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-30	47+00	40' RT	3.5-5.0'	A-7-5	71	39	ND	ND	ND	ND	21	79	43	ND	



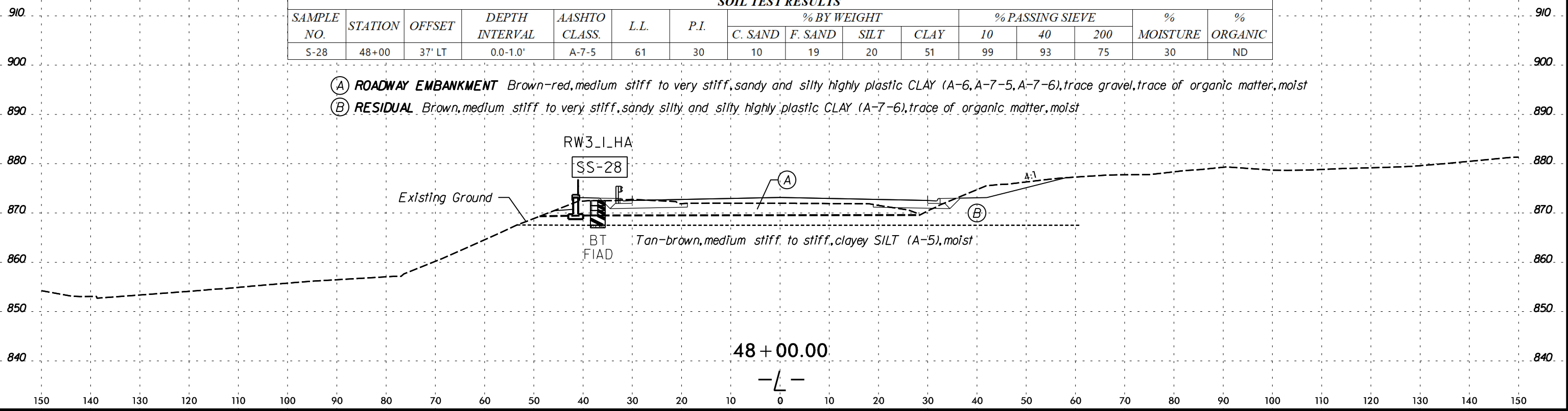
47 + 00.00

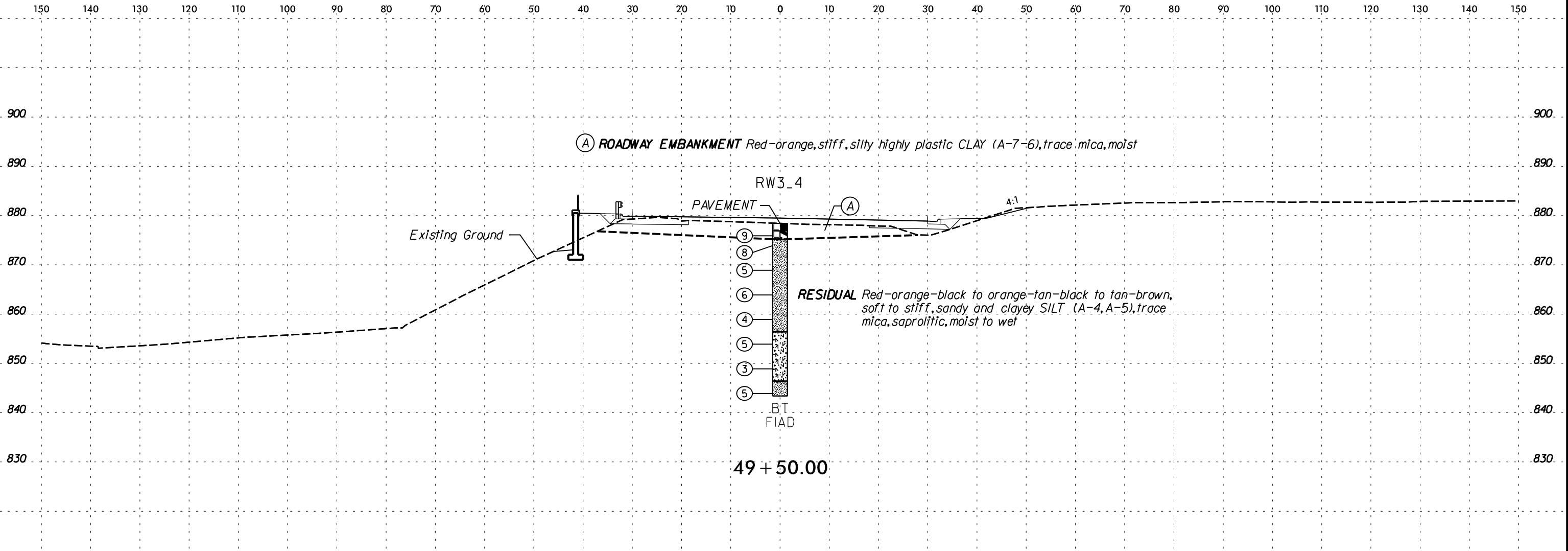


46 + 50.00



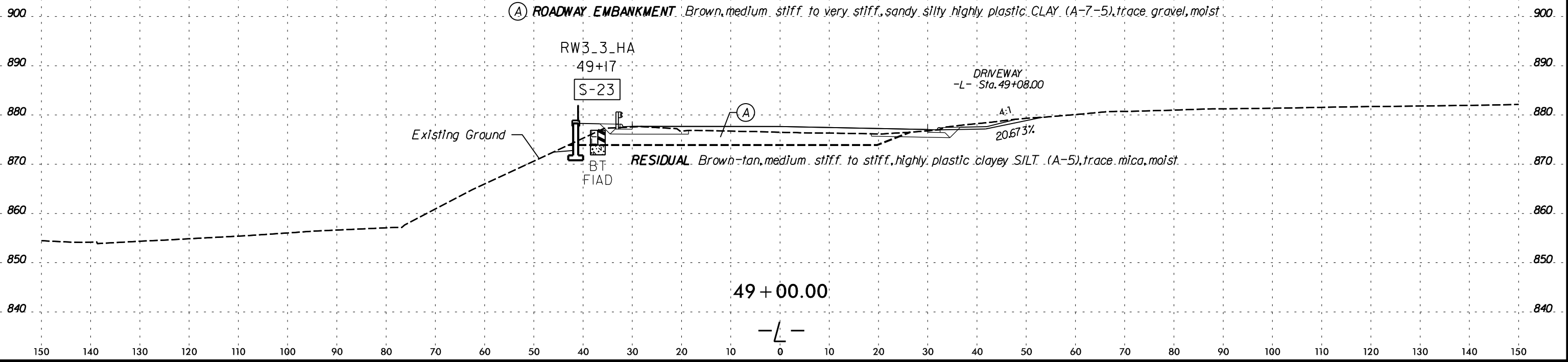
SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-28	48+00	37' LT	0.0-1.0'	A-7-5	61	30	10	19	20	51	99	93	75	30	ND





49 + 50.00

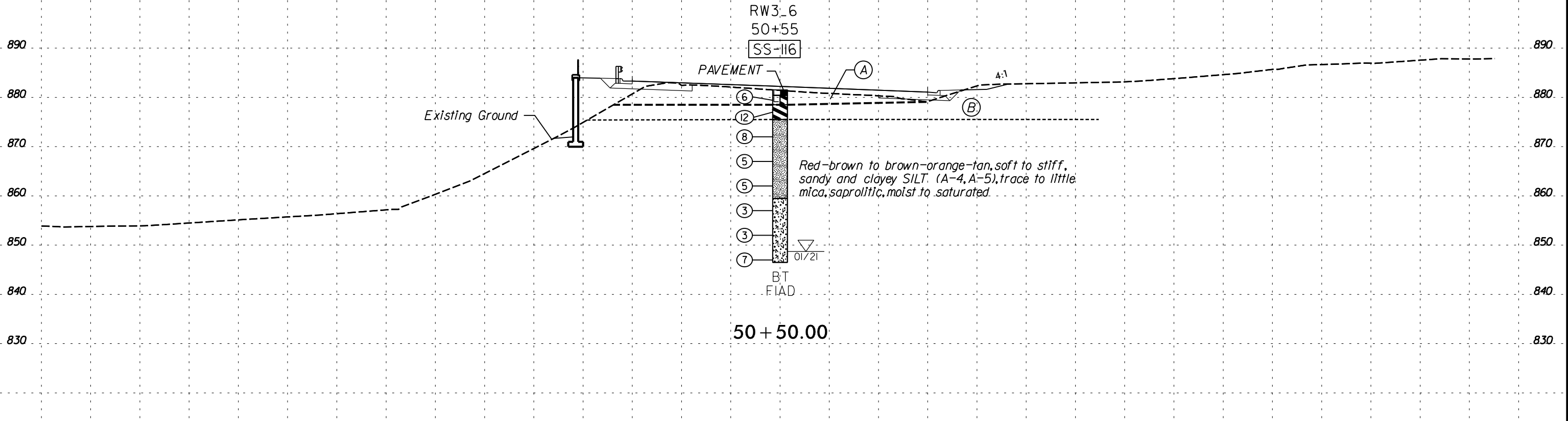
SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-23	49+17	37' LT	0.0-1.0'	A-7-5	58	28	ND	ND	ND	ND	36	64	25	ND	



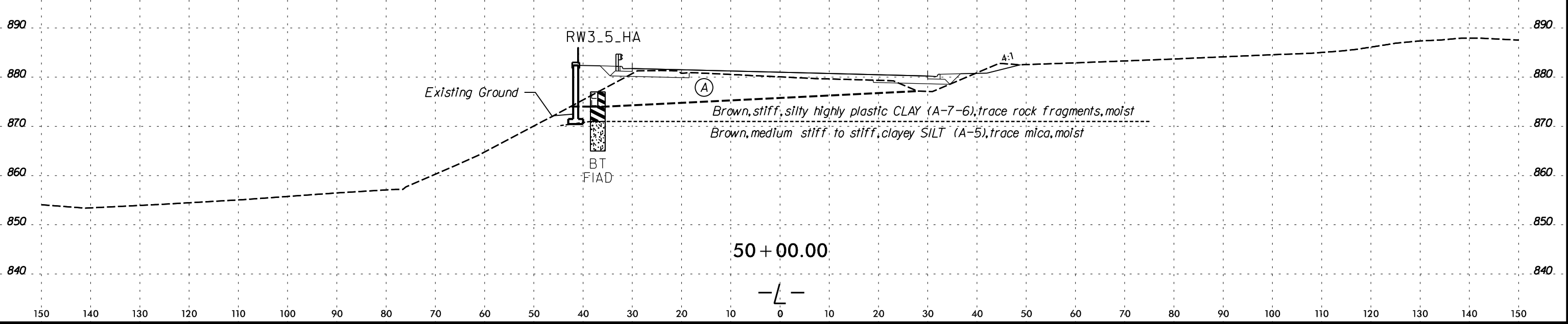
49 + 00.00

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
							SS-116	50+55	0 CL	1.1-2.6'	A-7-6	58	31		

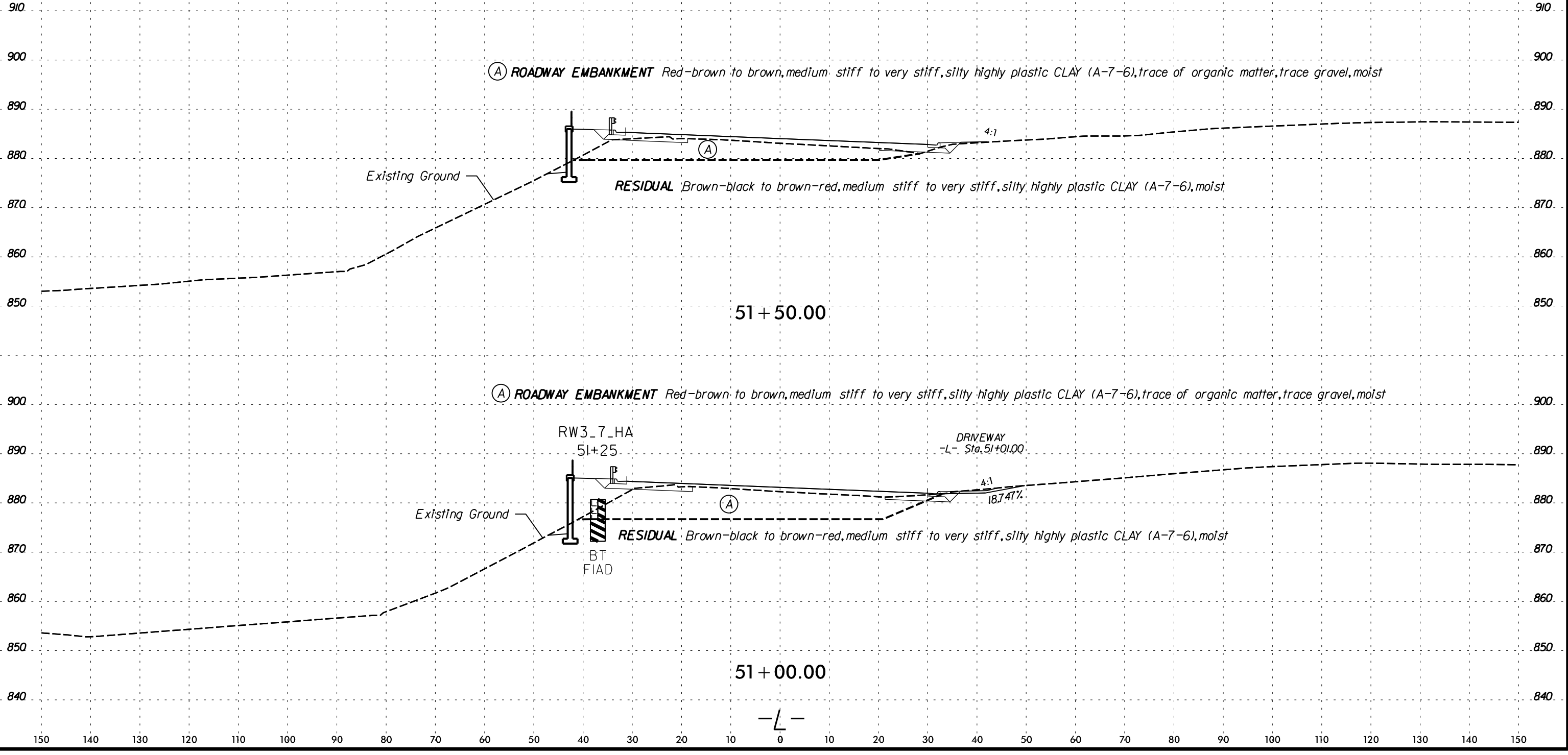
- (A) ROADWAY EMBANKMENT Red-brown, medium stiff, silty highly plastic CLAY (A-7-6), moist
- (B) RESIDUAL Red-brown, stiff, silty highly plastic CLAY (A-7-6), moist



- (A) ROADWAY EMBANKMENT Red-brown, medium stiff to very stiff, sandy silty highly plastic CLAY (A-7-6), trace gravel, moist

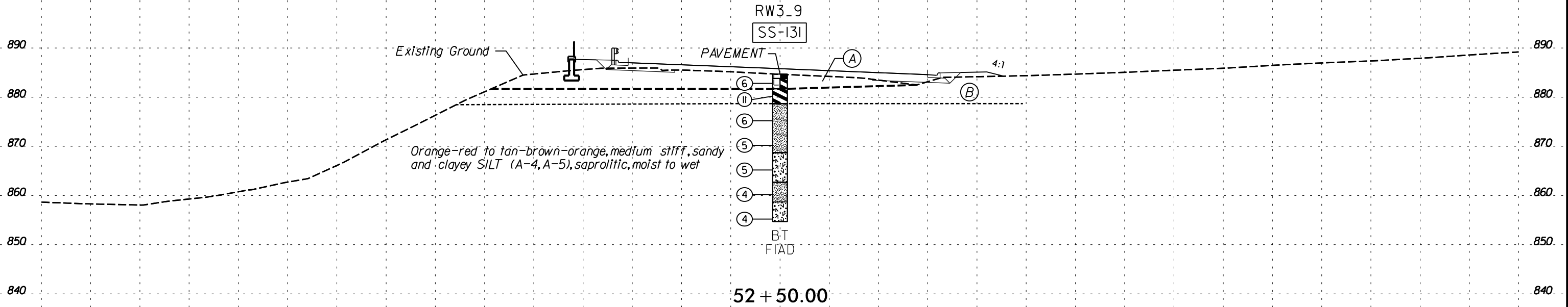


150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

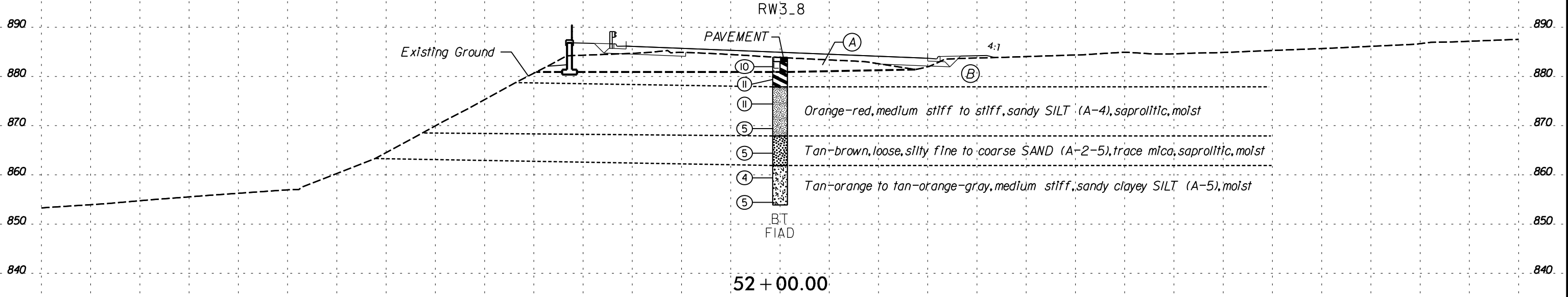


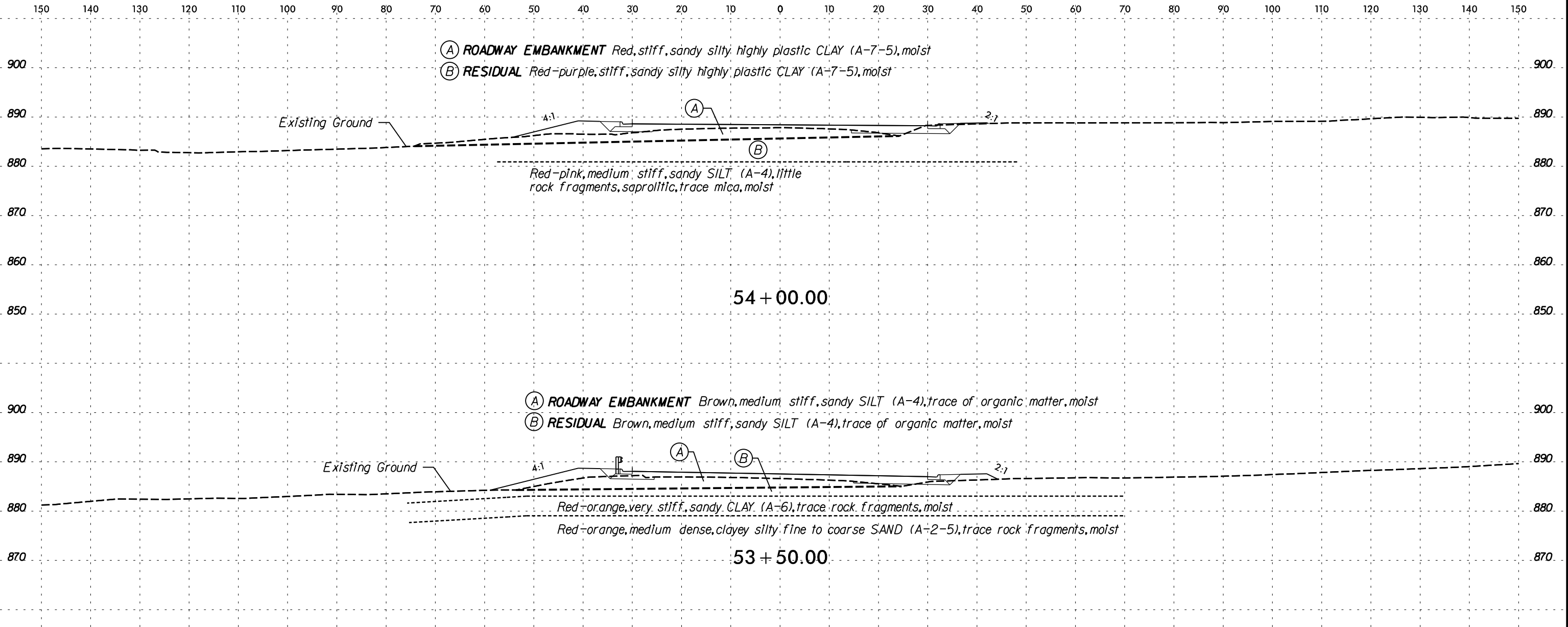
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
							SS-131	52+50	0 CL	0.9-2.4'	A-7-6	56	28		

- (A) ROADWAY EMBANKMENT Red-orange, medium stiff, silty highly plastic CLAY (A-7-6), moist
- (B) RESIDUAL Red-orange, stiff, silty highly plastic CLAY (A-7-6), moist



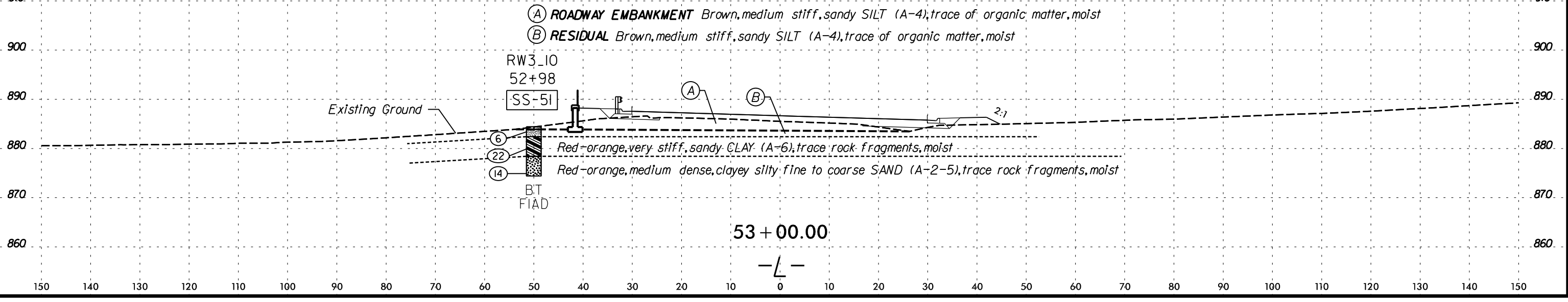
- (A) ROADWAY EMBANKMENT Red-orange, stiff, silty highly plastic CLAY (A-7-6), trace gravel, moist
- (B) RESIDUAL Red-orange, stiff, sandy silty highly plastic CLAY (A-7-6), trace rock fragments, moist

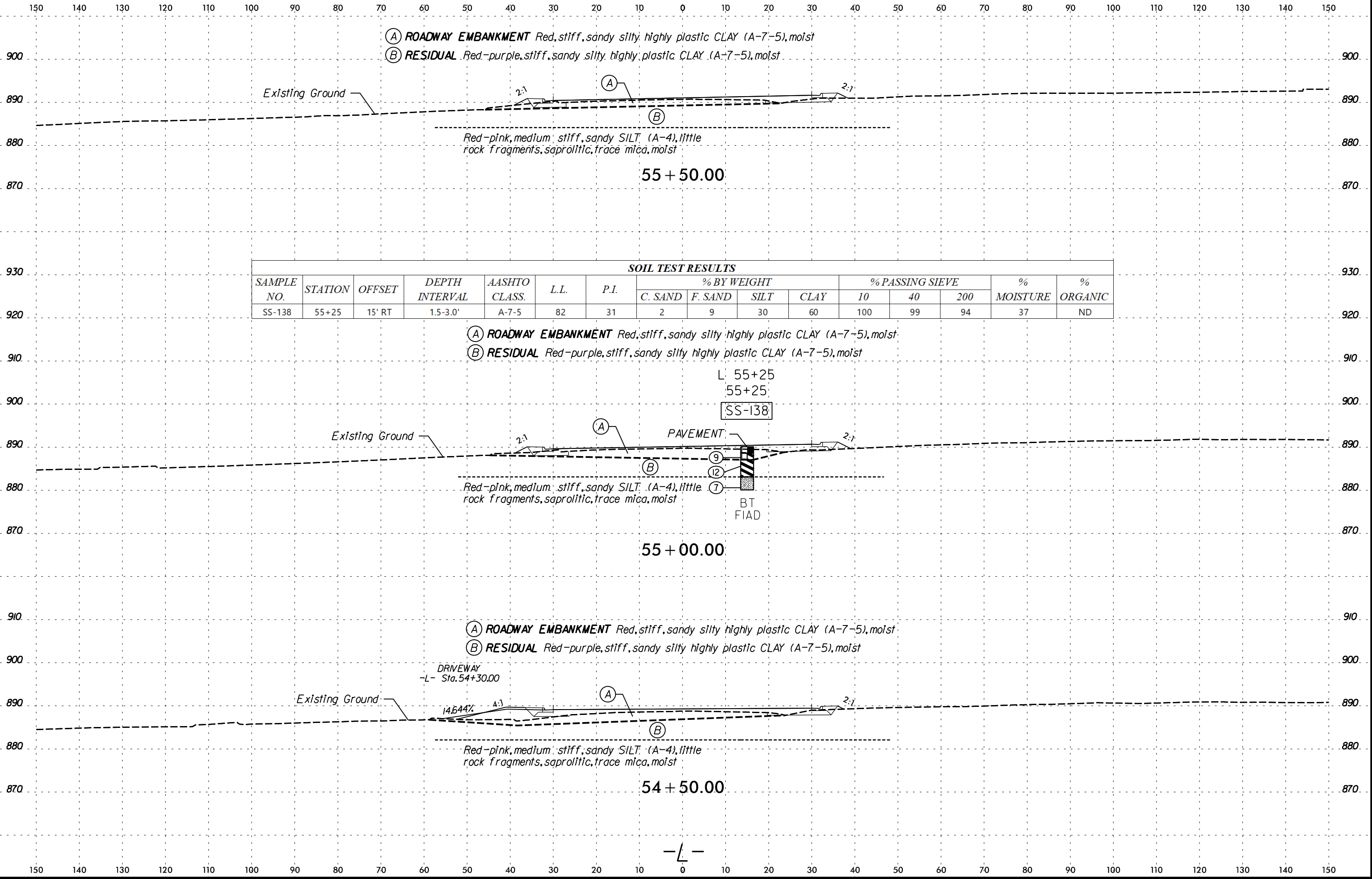




SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-51	52+98	50' LT	0.0-1.5'	A-4	18	3	ND	ND	ND	ND	ND	43	12	ND	





(A) ROADWAY EMBANKMENT Red, stiff, sandy silty, highly plastic CLAY (A-7-5), moist
 (B) RESIDUAL Red-purple, stiff, sandy silty, highly plastic CLAY (A-7-5), moist

Red-pink, medium stiff, sandy SILT (A-4), little rock fragments, saprolitic, trace mica, moist

55 + 50.00

SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-138	55+25	15' RT	1.5-3.0'	A-7-5	82	31	2	9	30	60	100	99	94	37	ND

(A) ROADWAY EMBANKMENT Red, stiff, sandy silty, highly plastic CLAY (A-7-5), moist
 (B) RESIDUAL Red-purple, stiff, sandy silty, highly plastic CLAY (A-7-5), moist

L 55+25

55+25

SS-138

PAVEMENT

9

12

T

BT FIAD

Red-pink, medium stiff, sandy SILT (A-4), little rock fragments, saprolitic, trace mica, moist

55 + 00.00

(A) ROADWAY EMBANKMENT Red, stiff, sandy silty, highly plastic CLAY (A-7-5), moist
 (B) RESIDUAL Red-purple, stiff, sandy silty, highly plastic CLAY (A-7-5), moist

DRIVEWAY
 -L- Sta. 54+30.00

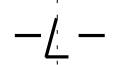
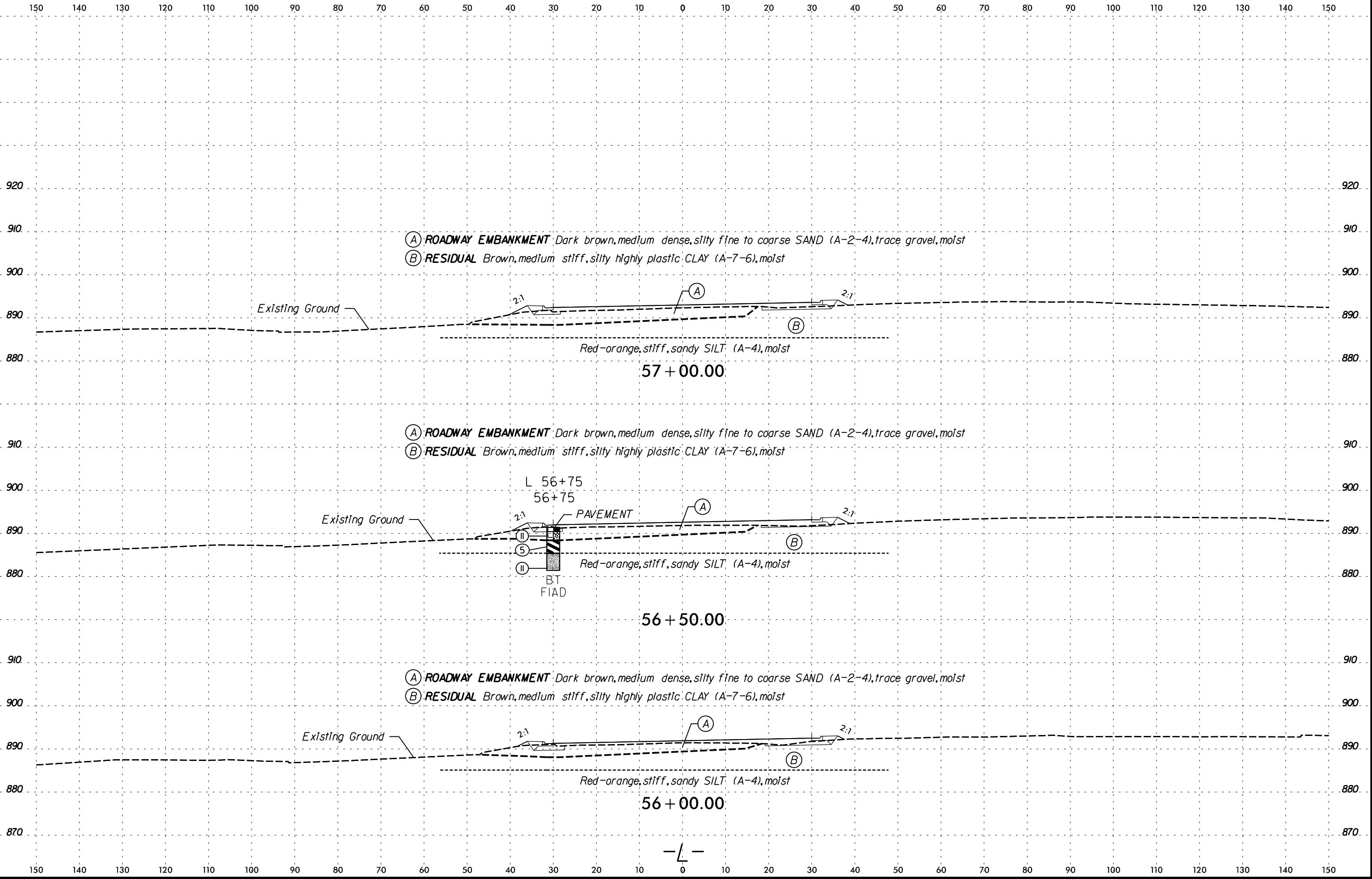
14.64%

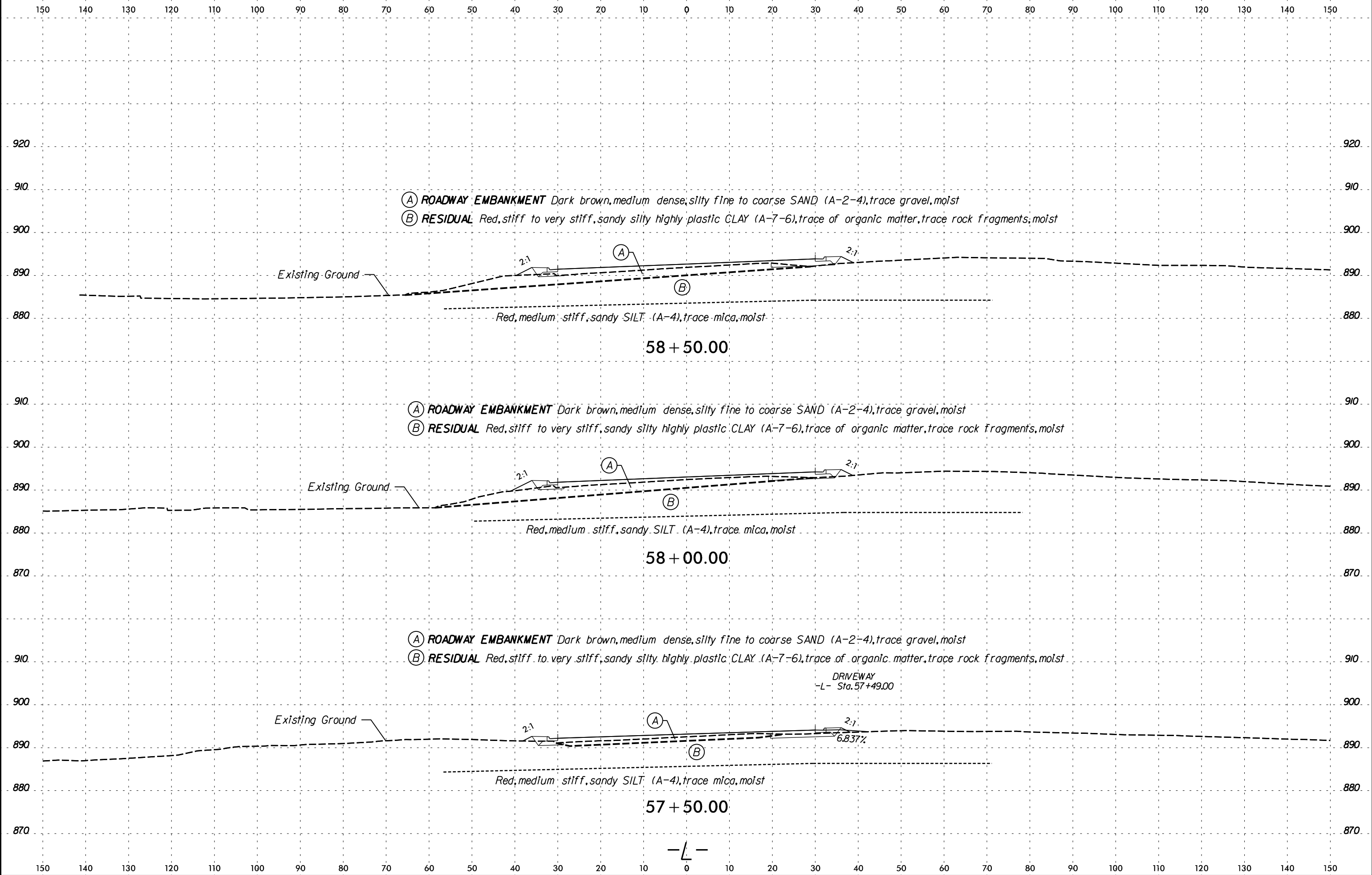
4:1

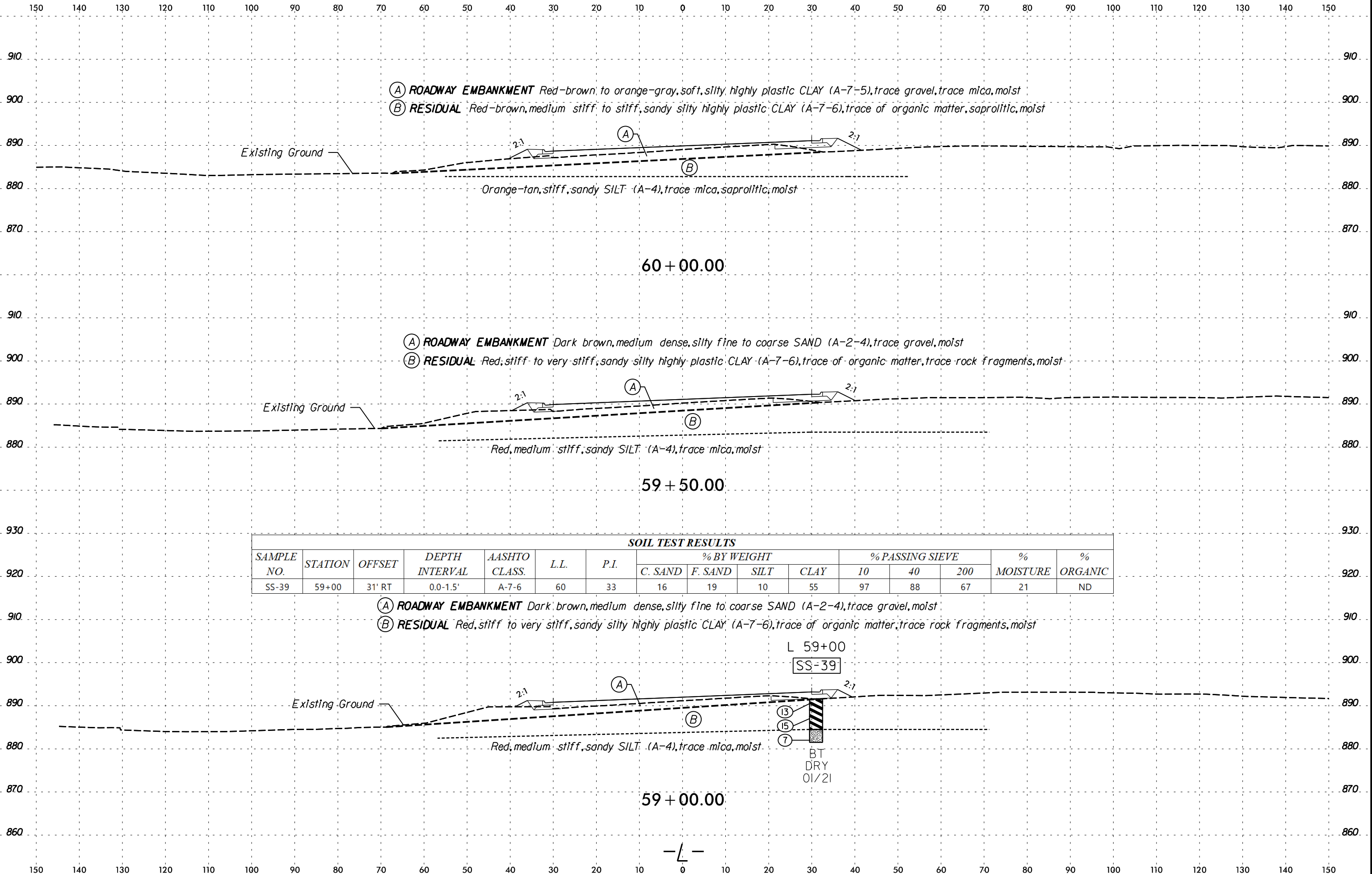
Red-pink, medium stiff, sandy SILT (A-4), little rock fragments, saprolitic, trace mica, moist

54 + 50.00

-L-

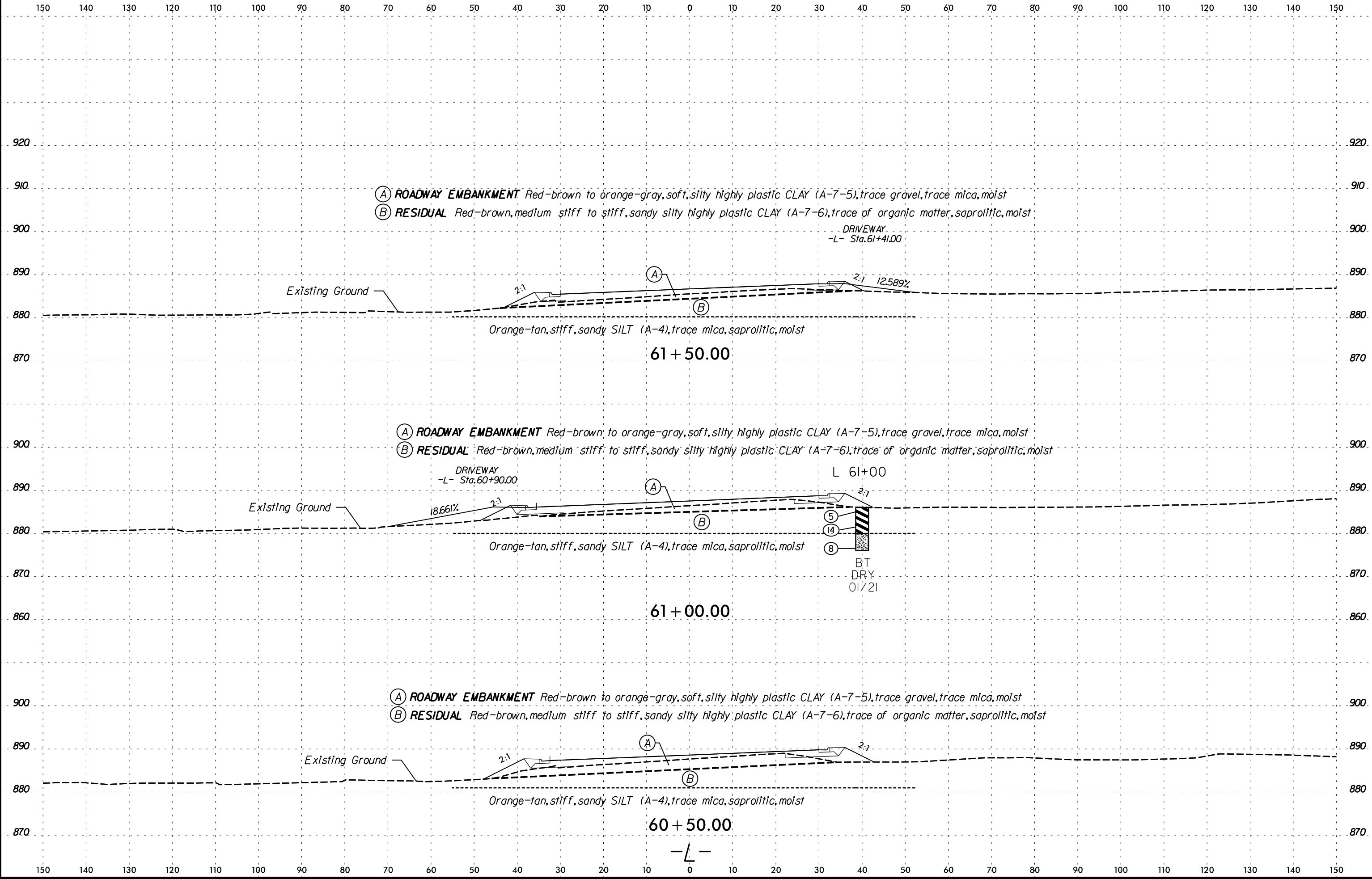


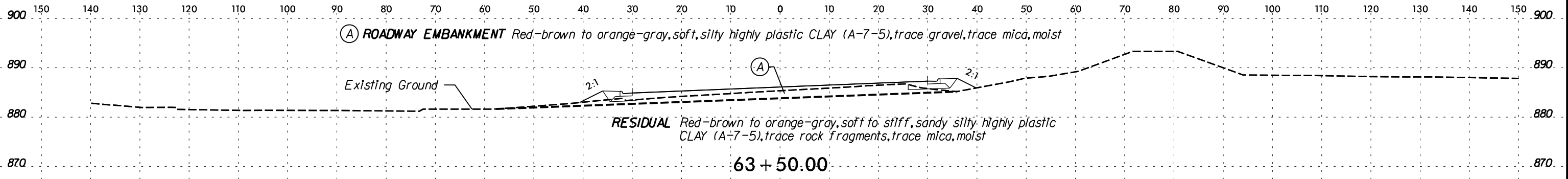




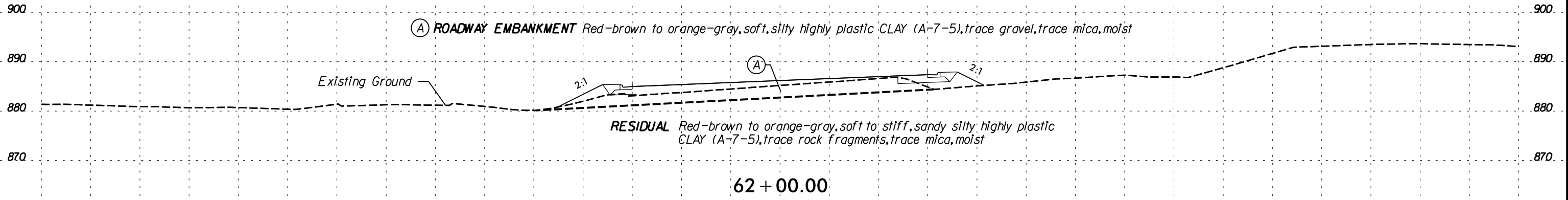
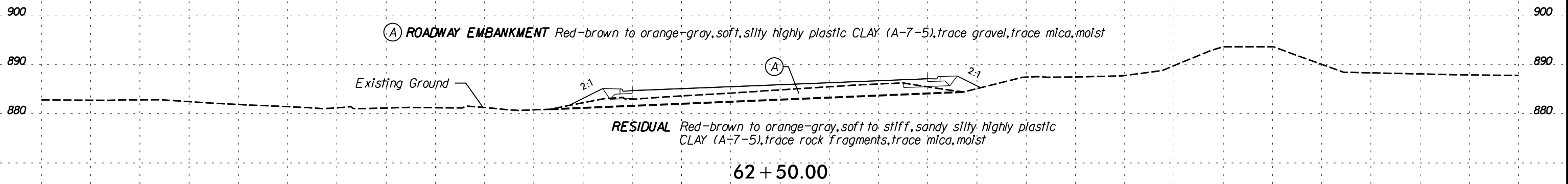
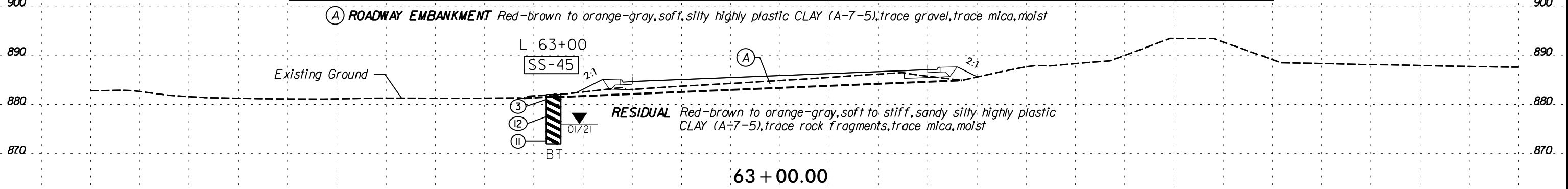
SOIL TEST RESULTS

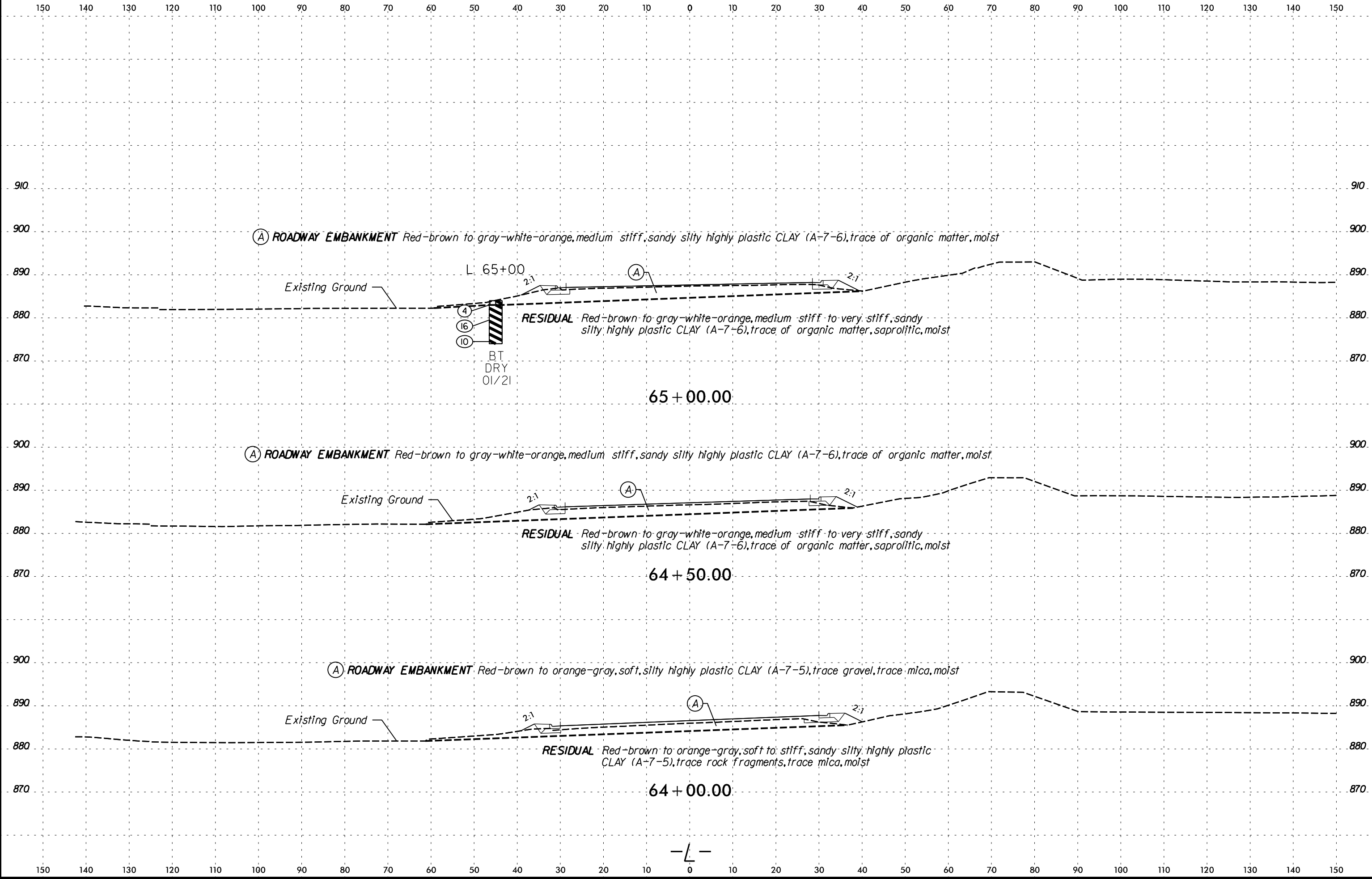
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-39	59+00	31' RT	0.0-1.5'	A-7-6	60	33	16	19	10	55	97	88	67	21	ND





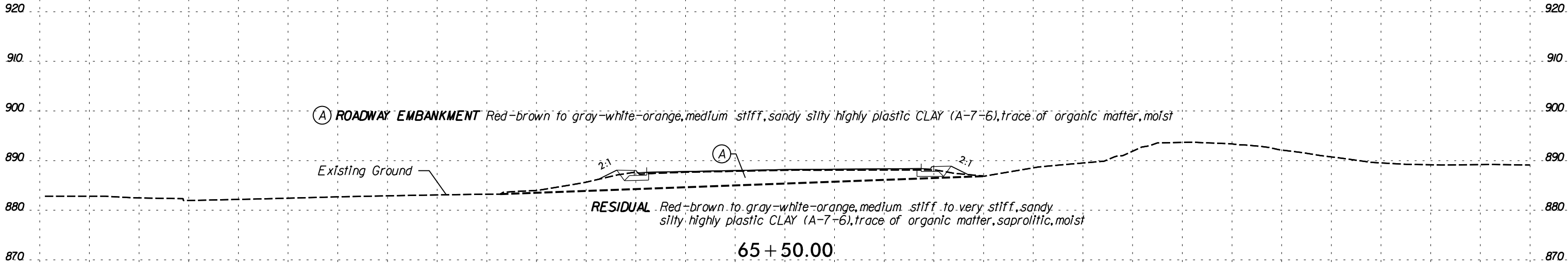
SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-45	63+00	46' LT	0.0-1.5'	A-7-5	74	39	9	13	22	56	99	93	82	31	ND



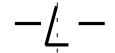




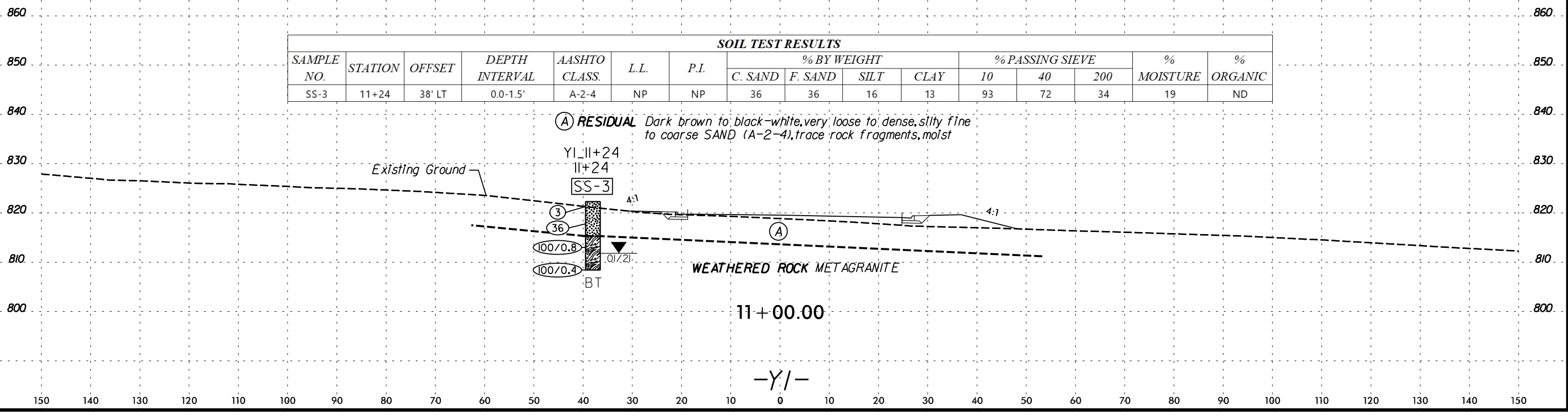
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



65 + 50.00

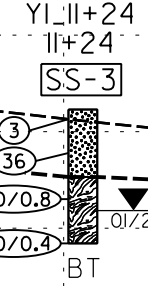


150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



SOIL TEST RESULTS															
SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-3	11+24	38' LT	0.0-1.5'	A-2-4	NP	NP	36	36	16	13	93	72	34	19	ND

Ⓐ **RESIDUAL** Dark brown to black-white, very loose to dense, silty fine to coarse SAND (A-2-4), trace rock fragments, moist

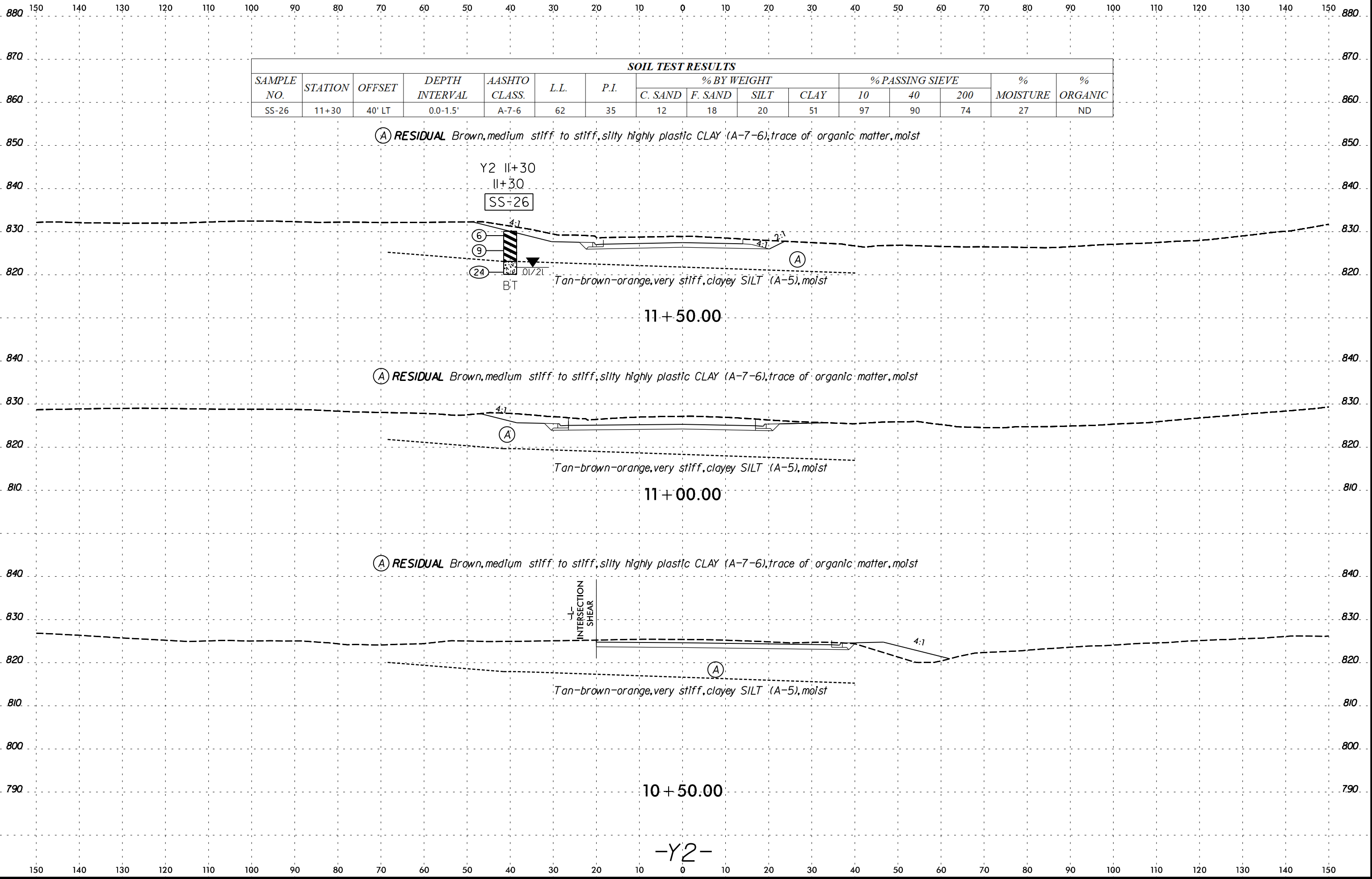


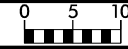
WEATHERED ROCK METAGRANITE

11+00.00

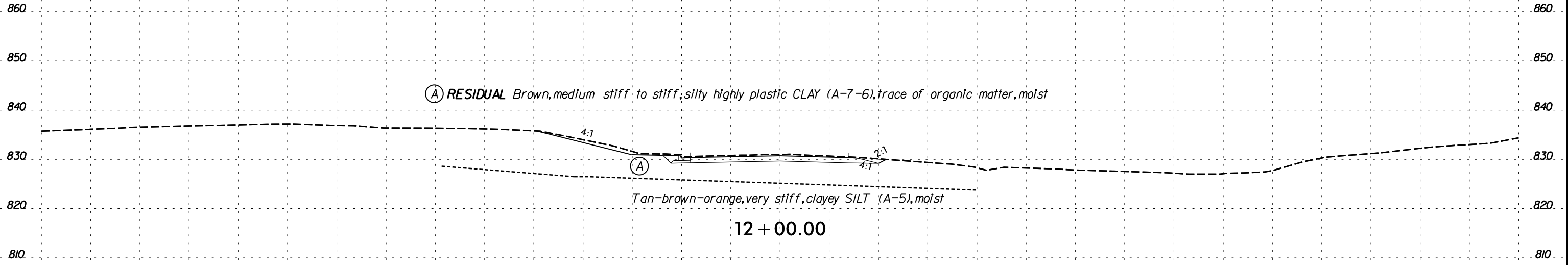
-Y/-

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVE			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
							SS-26	11+30	40' LT	0.0-1.5'	A-7-6	62	35		





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



12 + 00.00

-Y2-

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4015A	41	44

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

ROADWAY
SUBSURFACE INVESTIGATION

APPENDIX A
LABORATORY TEST RESULTS

REFERENCE: U-4015A

PROJECT: 35013

