

REFERENCE: I-5710

PROJECT: 50125

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.	I-5710	1	26

CONTENTS

LINE	STATION	PLAN
RB1	3+50-14+50	4
RB1	14+50-14+70	5
RB2	0+00-13+00	6
RB2	13+00-13+50	7
RB4	2+50-14+00	8

CROSS SECTIONS

LINE	STATION	SHEETS
RB1	3+00-5+00	9
RB1	5+50-8+00	10
RB1	8+50-10+00	11
RB1	10+50-13+00	12
RB1	13+50-14+75	13
RB2	0+00-1+50	14
RB2	2+00-3+50	15
RB2	4+00-6+00	16
RB2	6+50-9+00	17
RB2	9+50-11+50	18
RB2	12+00-13+50	19
RB4	2+00-4+00	20
RB4	4+50-6+50	21
RB4	7+00-8+00	22
RB4	8+50-9+50	23
RB4	10+00-11+00	24
RB4	11+50-12+50	25
RB4	13+00-14+50	26

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY WAKE
PROJECT DESCRIPTION WEST BOUND RAMPS ALONG
I-540 AT SR 1839 (LEESVILLE RD.), NC 50
(CREEDMOOR RD.), SR 1005 (SIX FORKS RD.) AND
SR 2000 (FALLS OF THE NEUSE RD.)

INVENTORY

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

J.R. SWARTLEY

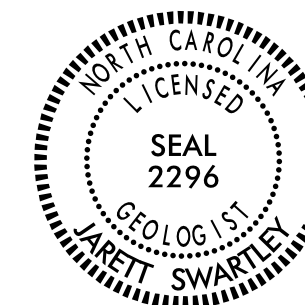
INVESTIGATED BY J.R. SWARTLEY

DRAWN BY J.R. SWARTLEY

CHECKED BY N.T. ROBERSON

SUBMITTED BY N.T. ROBERSON

DATE FEBRUARY 2016



DocuSigned by:
Jarett Swartley

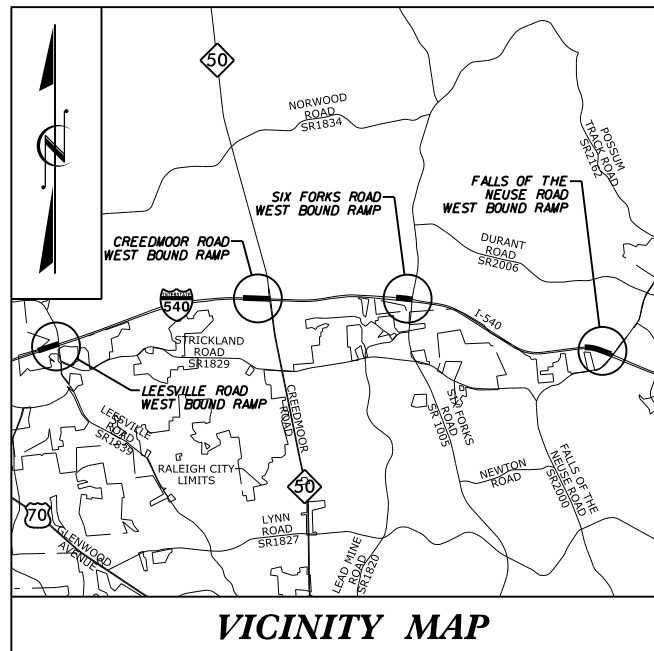
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**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

09/08/99

TIP PROJECT: I-5710

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



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

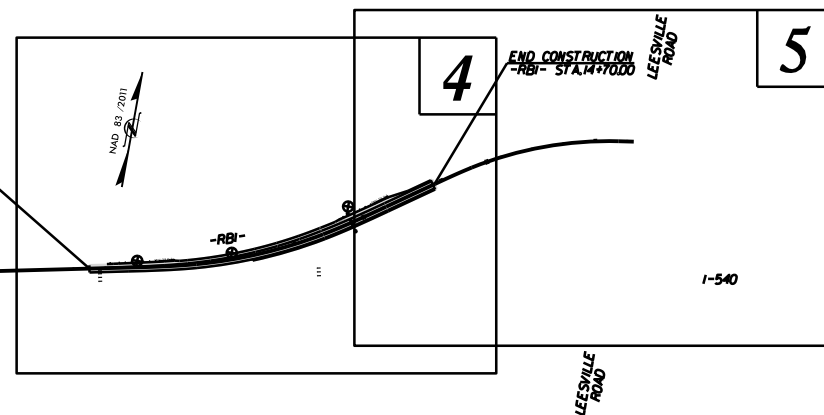
WAKE COUNTY

LOCATION: WEST BOUND RAMP ALONG I-540 AT SR 1839 (LEESVILLE ROAD), NC 50 (CREEDMOOR ROAD), SR 1005 (SIX FORKS ROAD), AND SR 2000 (FALLS OF THE NEUSE ROAD).

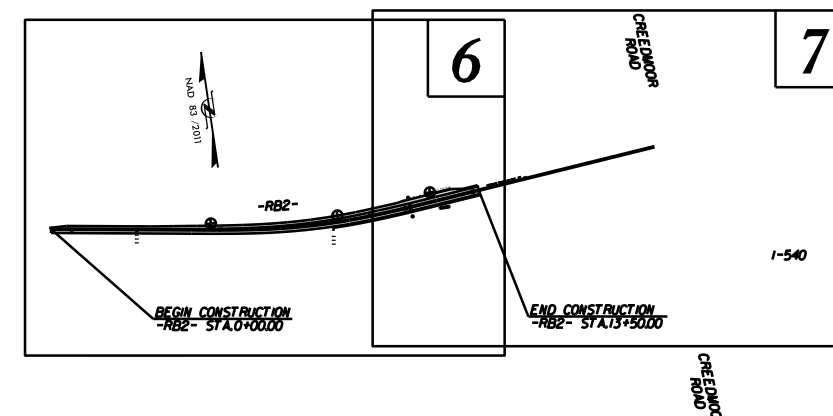
TYPE OF WORK: INSTALLING RAMP METERS - WIDENING, GRADING, PAVING, DRAINAGE, RETAINING WALL, ITS, AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5710	3	26
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50125.1.FS1	NHPP-0540(030)	P.E.	

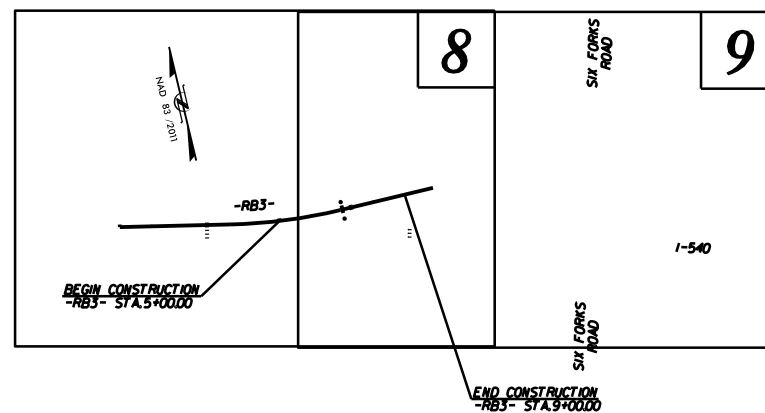
LEESVILLE ROAD



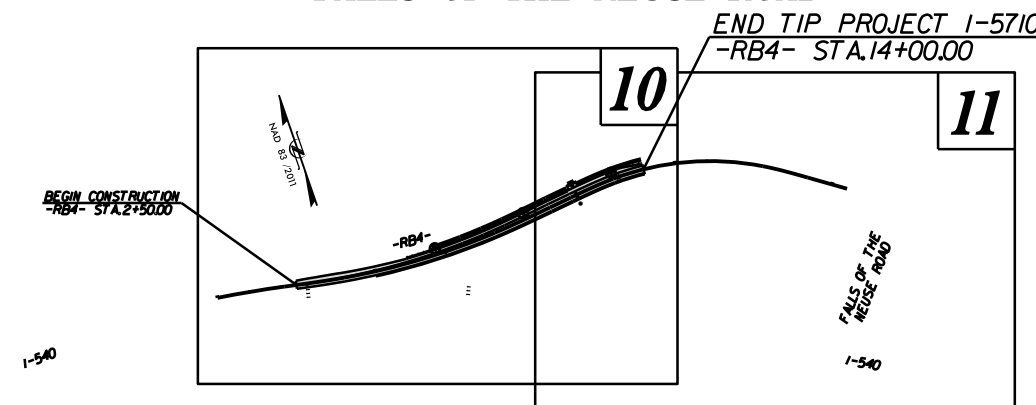
CREEDMOOR ROAD



SIX FORKS ROAD



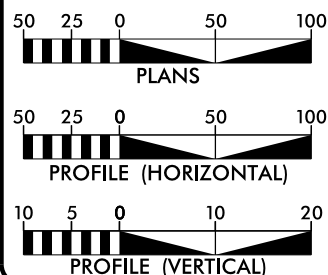
FALLS OF THE NEUSE ROAD



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

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

GRAPHIC SCALES



DESIGN DATA

ADT 2016 = 6,700-13,900
ADT 2036 = 7,300-15,200
DHV = 11-20 %
D = 100 %
* T = 3-7 %
V = 60 MPH
* (TTST 1% + DUAL 2-6%)
FUNC. CLASS. = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY T.I.P. PROJECT I-5710 = 0.762 MILE
TOTAL LENGTH T.I.P. PROJECT I-5710 = 0.762 MILE

Prepared In the Office of:
ATKINS 1616 E. MILLBROOK ROAD, SUITE #310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEEB #F-0326

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: N/A

LETTING DATE: SEPTEMBER 20, 2016

CLINTON MORGAN, P.E.
PROJECT ENGINEER

IAN BERDEAU, E.I.
PROJECT DESIGN ENGINEER

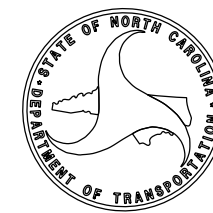
TONY HOUSER, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



03-MAR-2016 11:50 L:\Projects\Investigation\TIP\I5710_GEO_RDWY\CADD_ORIGINAL\I5710_Rdy_TSH.dgn

CONTRACT: C203791



PAT McCRORY
Governor
NICHOLAS J. TENNYSON
Secretary

Areas of Special Geotechnical Interest

1) Highly Plastic Clays: Highly plastic clays (PI>25) were encountered on the project at the following locations:

<u>Line</u>	<u>Station</u>	<u>Offset</u>
-RB1-	5+00	20 LT
-RB1-	8+00	20 LT

March 1, 2016

STATE PROJECT: 50125.1.FS1
 FEDERAL PROJECT: NHPP-0540 (030)
 COUNTY: Wake
 DESCRIPTION: West Bound Ramps Along I-540 at SR 1839 (Leesville Rd.), NC 50 (Creedmoor Rd.), SR 1005 (Six Forks Rd.) and SR 2000 (Falls Of The Neuse Rd.)

SUBJECT: Geotechnical Report – Inventory

The Geotechnical Engineering Unit has completed a reconnaissance and limited subsurface investigation for this project and presents the following inventory. Plans and cross sections will be submitted for this roadway project.

Project Description

This project lies within the city of Raleigh in Wake County. The project consists of widening and installing signals for four west bound on-ramps along I-540. The ramps include Leesville Rd. (SR 1839, -RB1-), Creedmoor Rd. (NC 50, -RB2-), Six Forks Rd. (SR 1005, -RB3-) and Falls of the Neuse Rd. (SR 2000, -RB4-). No grading will be performed along the Six Forks Rd. ramp (-RB3-) so no subsurface investigation was performed for this alignment. The total roadway project length is 0.762 miles.

Nine hand auger borings were performed at various offset locations along the -RB1-, -RB2-, and -RB4- alignments. Representative samples were collected for visual classification in the field and were submitted for laboratory analysis by the Materials and Tests Unit.

The following alignments, totaling 0.69 miles were investigated. Subsurface soil cross-sections of these alignments are included in this report.

<u>Line</u>	<u>Stations</u>
-RB1-	3+50 to 14+70
-RB2-	0+00 to 13+50
-RB4-	2+50 to 14+00

Physiography and Geology

The project is located in the Piedmont physiographic province of North Carolina. The project corridor is urban residential. A mixture of woods and grassy fields lie along the project corridor. The terrain is flat to gently sloping with some moderate existing cuts and fills. Geologically the soils in this region are derived from the underlying Mica Gneiss and Schists belonging to the Raleigh Belt. These rocks were formed by regional metamorphism in this area during the Permian Period.

Soil Properties

Soils encountered during this investigation are separated into 2 categories: Roadway Embankment and Residual soils.

Roadway Embankment soils are likely derived from nearby sources and are similar to Residual soils in composition. These soils generally consist of stiff, orange and tan, silty clay (A-7-6) and sandy clay (A-6).

Residual soils are derived from the weathering of underlying rock in the area. These soils consist of orange, tan, and brown, stiff, silty clay (A-7-6), sandy silt (A-4) and dense, saprolitic, silty sand (A-2-4).

Groundwater

Groundwater was not encountered in any borings.

Respectfully submitted,



DocuSigned by:
Jarett Swartley
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Jarett Swartley, L.G.
Project Geological Engineer

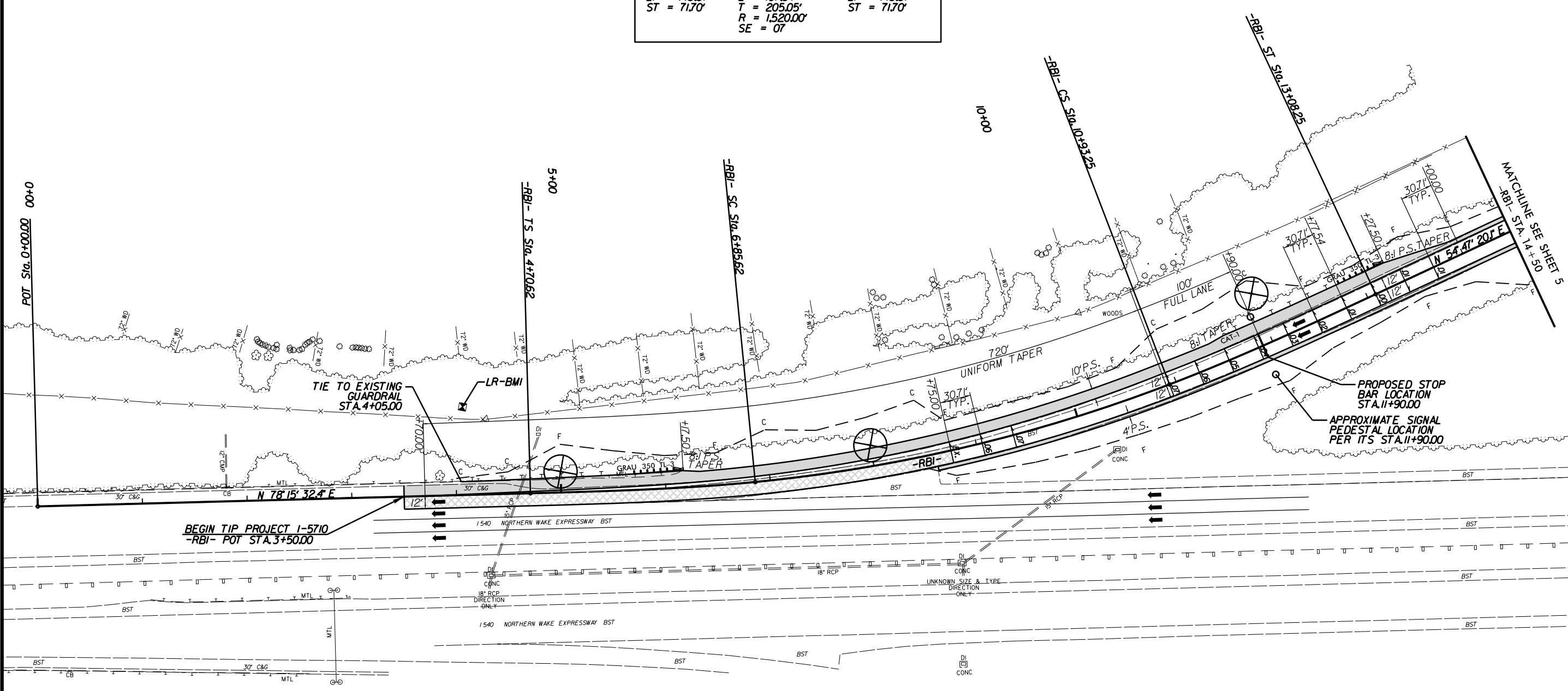
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PROJECT REFERENCE NO. 1-5710	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

LEESVILLE ROAD



-RBI-		
Pls Sta 6+13.99	PI Sta 8+90.67	Pls Sta 11+64.96
$\theta_s = 4.03' 07.8''$	$\Delta = 15' 21' 56.7''$ (LT)	$\theta_s = 4.03' 07.8''$
$L_s = 215.00'$	$D = 3' 46' 10.1''$	$L_s = 215.00'$
$LT = 143.37'$	$L = 407.64'$	$LT = 143.37'$
$ST = 71.70'$	$T = 205.05'$	$ST = 71.70'$
	$R = 1520.00'$	
	$SE = 07'$	



- PAVED SHOULDER
- MILL AND RESURFACE

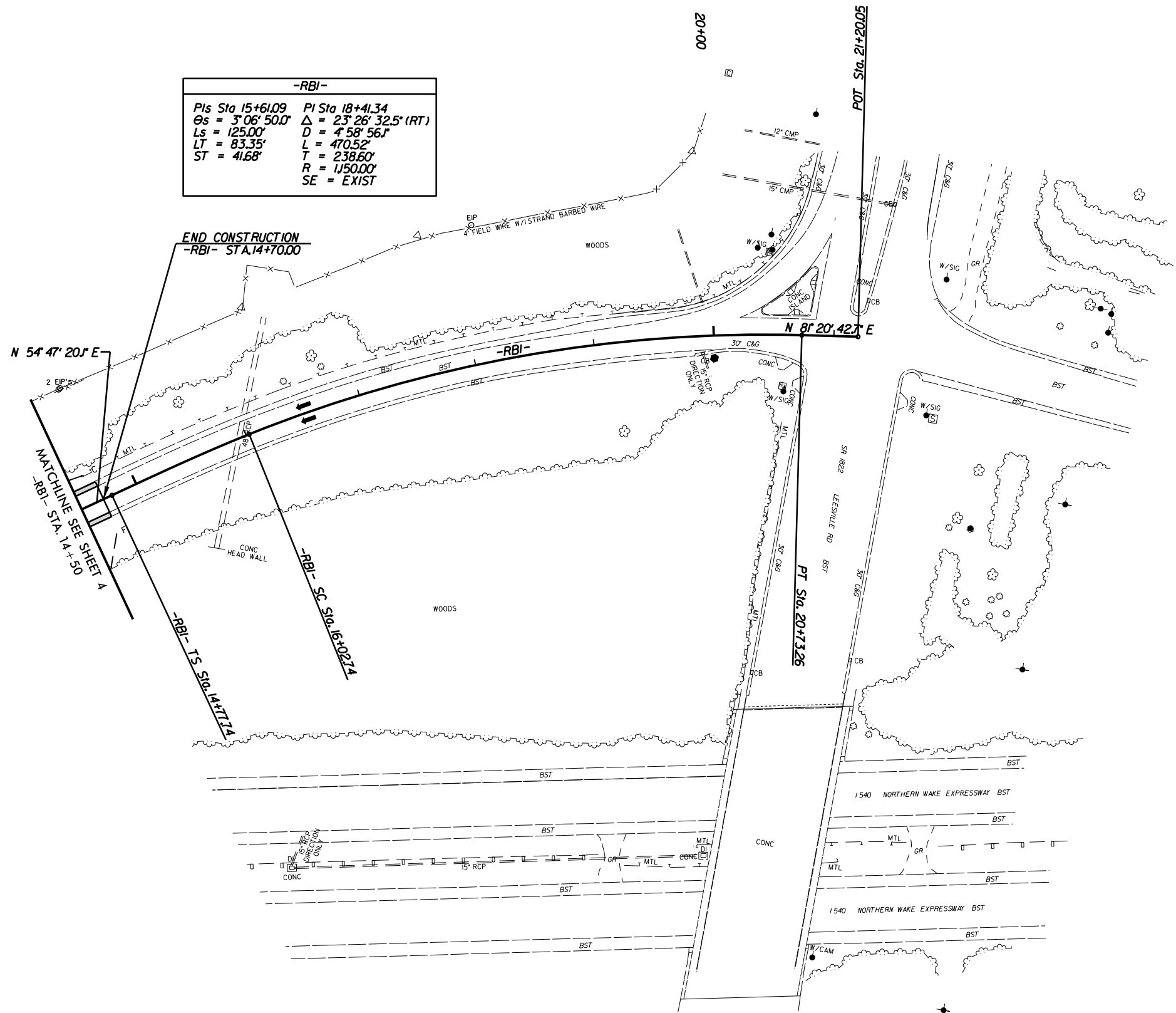
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PROJECT REFERENCE NO. 1-5710	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

LEESVILLE ROAD



-RBI-	
<i>PIs Sta 15+61.09</i>	<i>PI Sta 18+41.34</i>
$\theta_s = 3^\circ 06' 50.0''$	$\Delta = 23^\circ 26' 32.5''$ (RT)
$L_s = 125.00'$	$D = 4^\circ 58' 56.7''$
$LT = 83.35'$	$L = 470.52'$
$ST = 41.68'$	$T = 238.60'$
	$R = 1150.00'$
	$SE = EXIST$



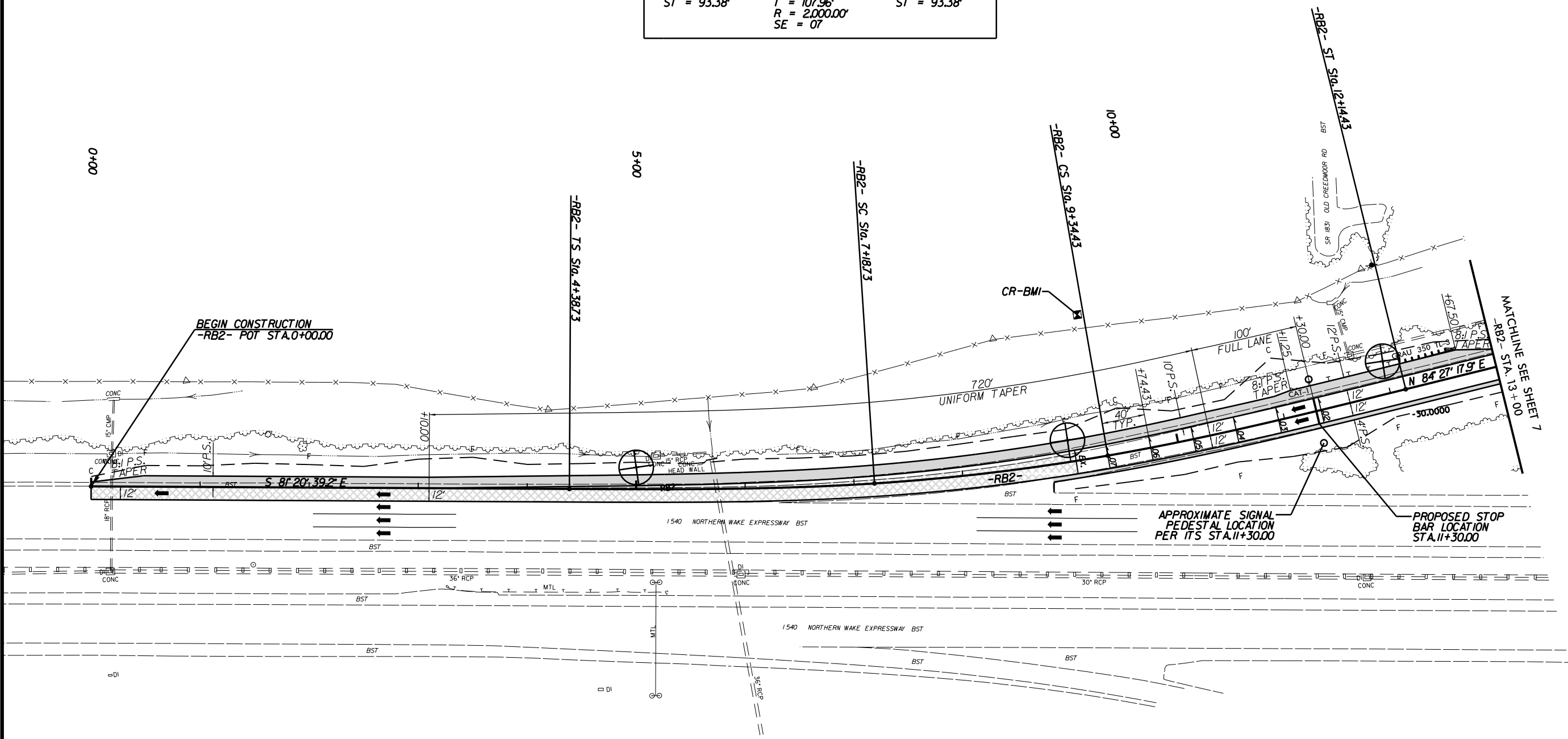
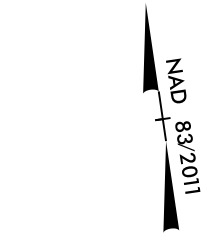
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 \$\$\$\$LEESVILLE\$\$\$\$

PROJECT REFERENCE NO. 1-5710	SHEET NO. 6
RW SHEET NO.	
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

CREEDMOOR ROAD

-RB2-		
<i>PIs Sta 6+25.44</i>	<i>PI Sta 8+26.68</i>	<i>PIs Sta 10+27.81</i>
<i>θs = 4°00'38.5"</i>	<i>Δ = 6°10'45.9" (LT)</i>	<i>θs = 4°00'38.5"</i>
<i>Ls = 280.00'</i>	<i>D = 2°51'53.2"</i>	<i>Ls = 280.00'</i>
<i>LT = 186.71'</i>	<i>L = 215.70'</i>	<i>LT = 186.71'</i>
<i>ST = 93.38'</i>	<i>T = 107.96'</i>	<i>ST = 93.38'</i>
	<i>R = 2,000.00'</i>	
	<i>SE = 07</i>	



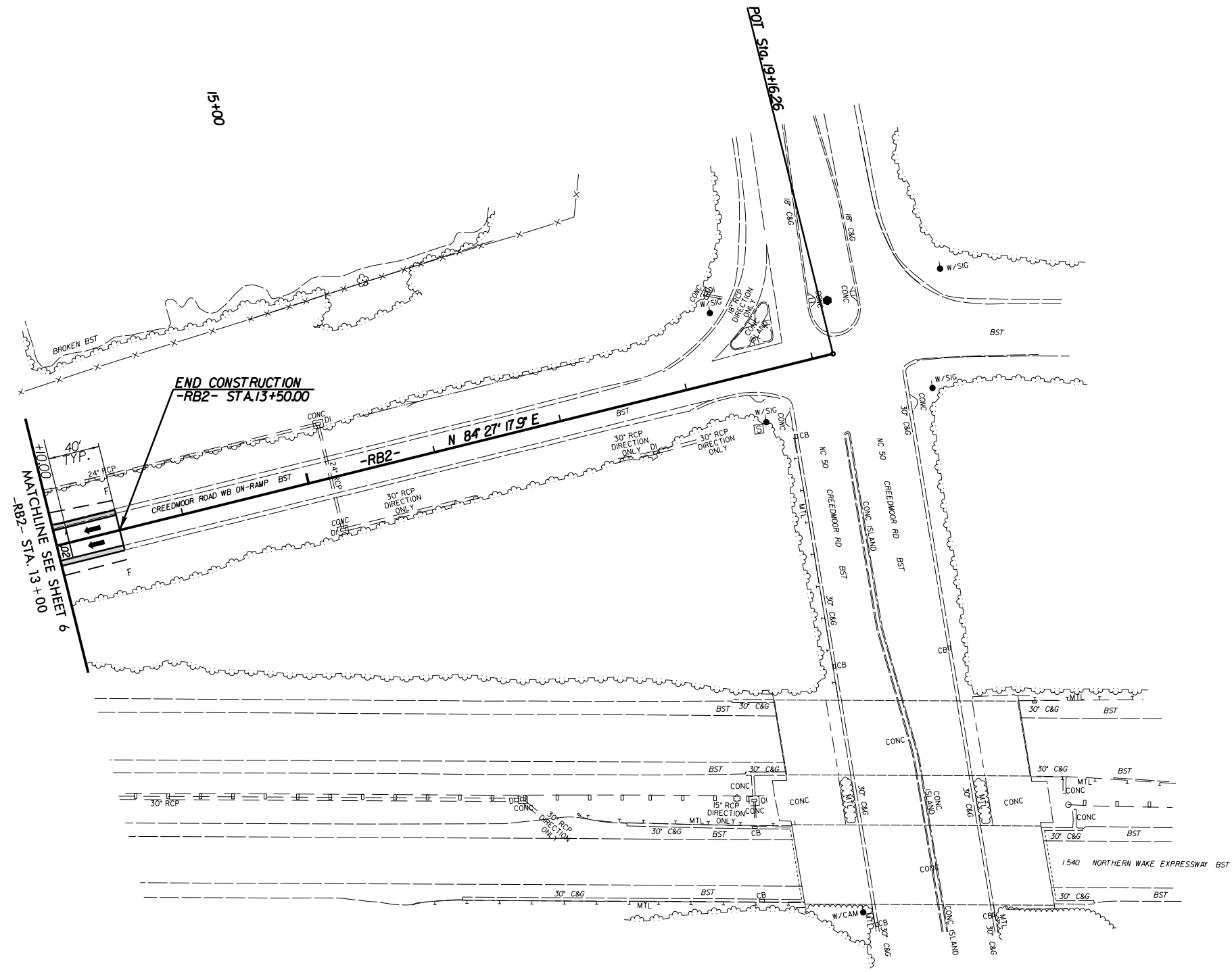
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- MILL AND RESURFACE

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CREEDMOOR ROAD

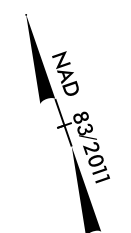
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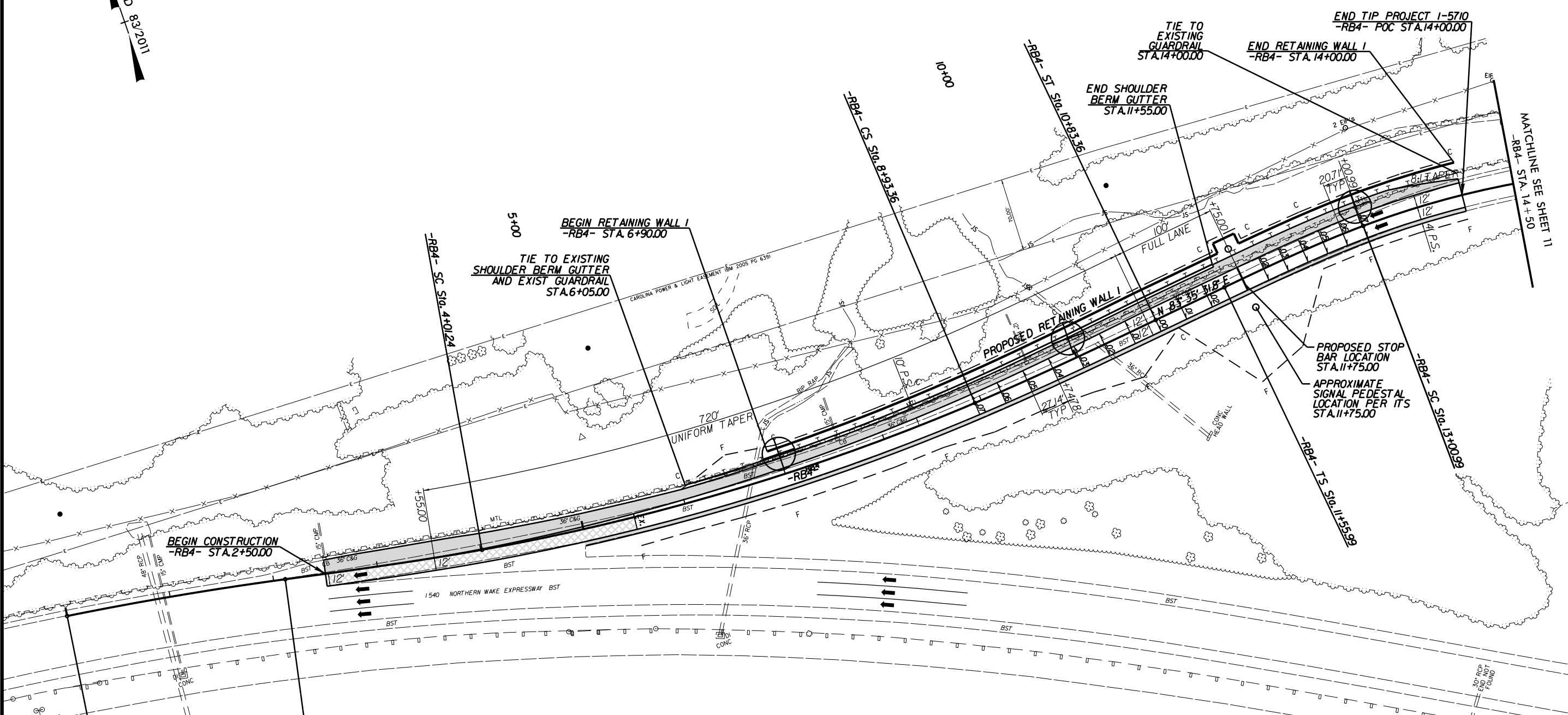
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PROJECT REFERENCE NO.	SHEET NO.
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FALLS OF THE NEUSE ROAD

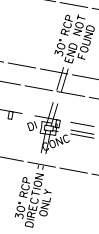
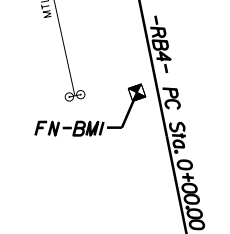


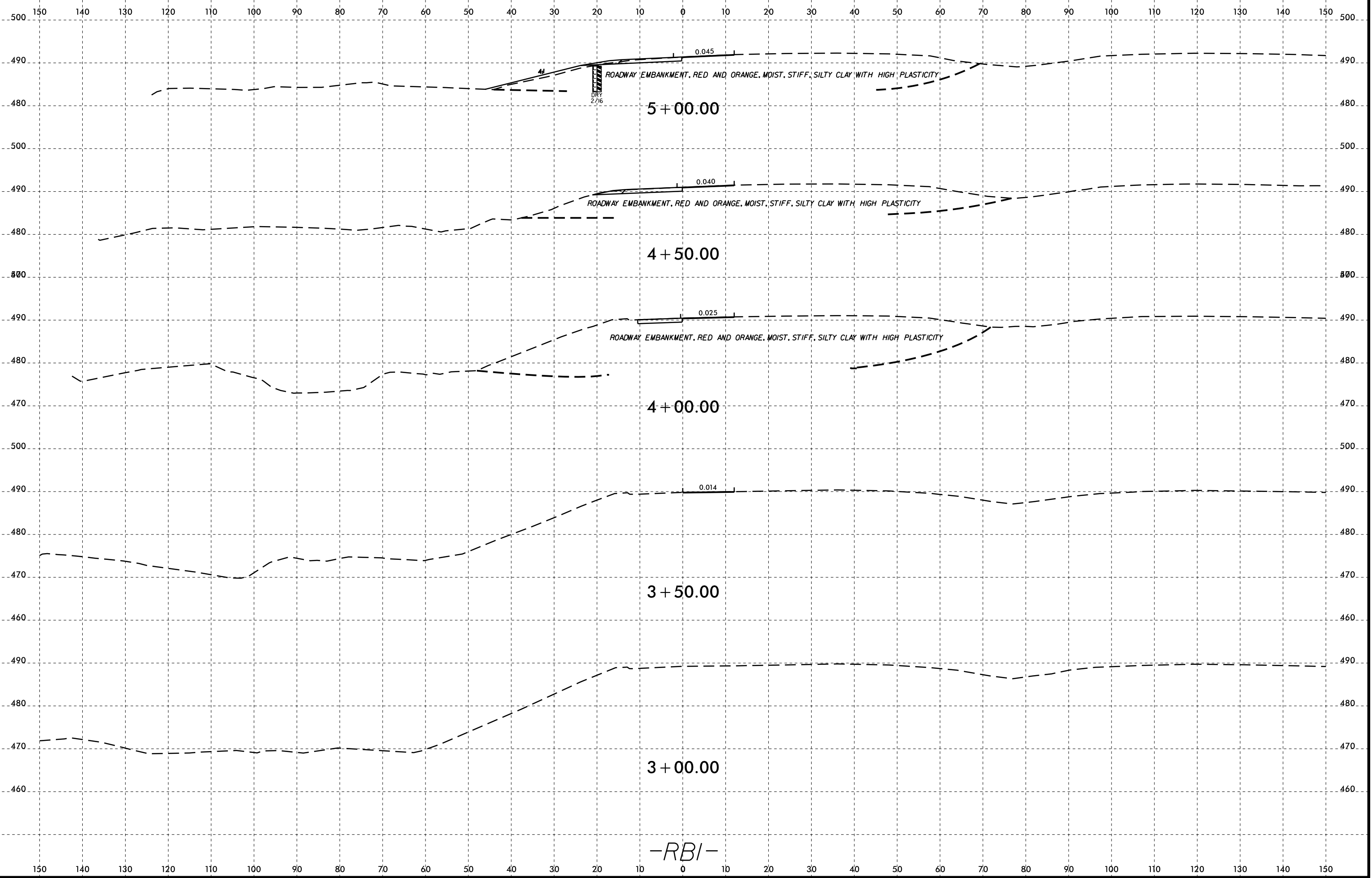
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-RB4-					
PI Sta 1+05.66	PIs Sta 3+37.92	PI Sta 6+48.33	PIs Sta 9+56.70	PIs Sta 12+52.69	PI Sta 15+44.95
$\Delta = 3' 44' 08.0''$ (RT)	$\Delta = 2' 28' 26.9''$	$\Delta = 12' 48' 59.2''$ (LT)	$\Delta = 2' 28' 26.9''$	$\Delta = 4' 49' 48.6''$	$\Delta = 31' 40' 25.6''$ (RT)
D = 1' 46' 06.2"	Ls = 190.00'	D = 2' 36' 15.7"	Ls = 190.00'	Ls = 145.00'	D = 6' 39' 44.3"
L = 211.24'	LT = 126.68'	L = 492.12'	LT = 126.68'	LT = 96.70'	L = 475.42'
T = 105.66'	ST = 63.34'	T = 247.09'	ST = 63.34'	ST = 48.37'	T = 243.95'
R = 3,240.00'		R = 2,200.00'			R = 860.00'
SE = EXIST		SE = 07			SE = 07

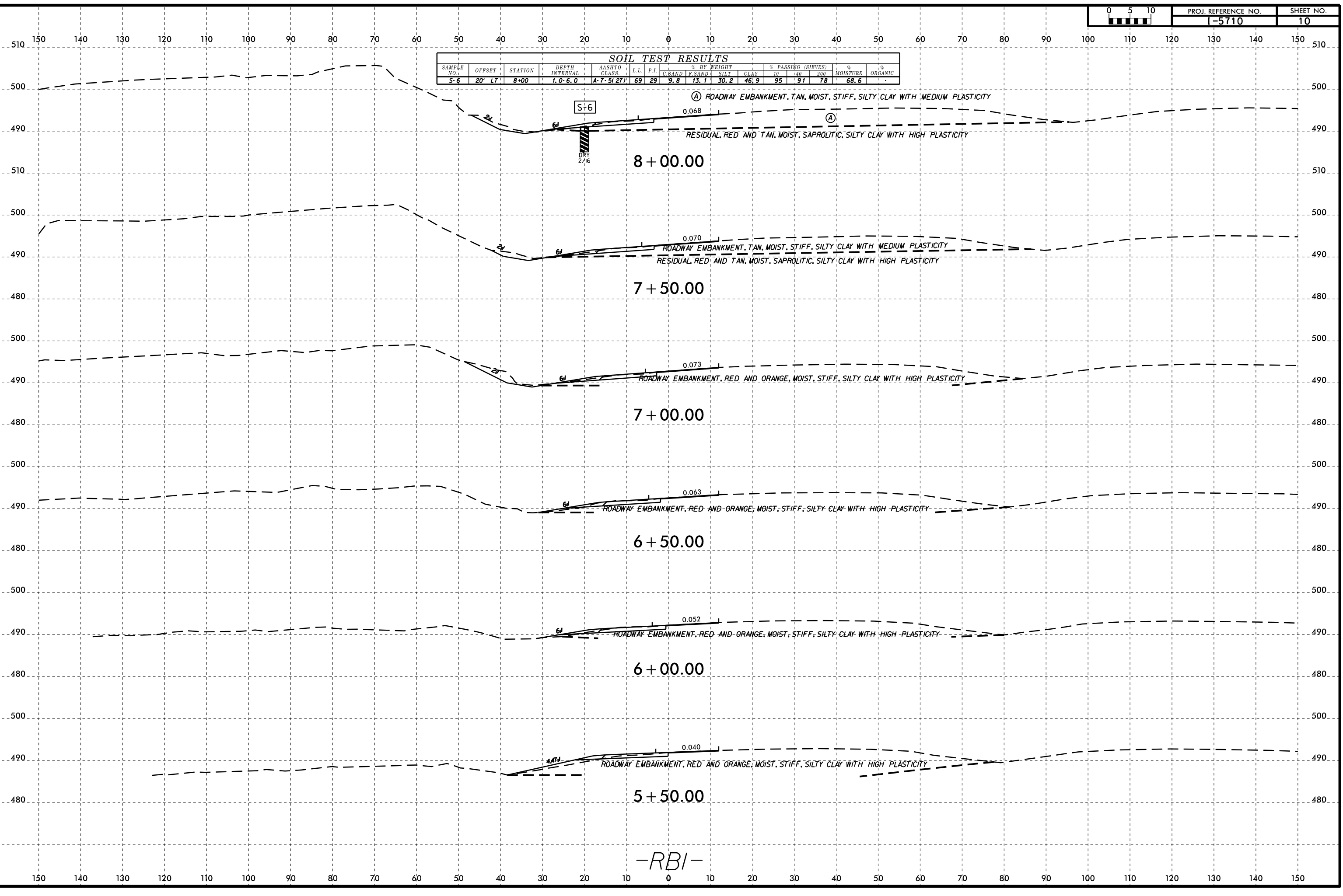
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- MILL AND RESURFACE





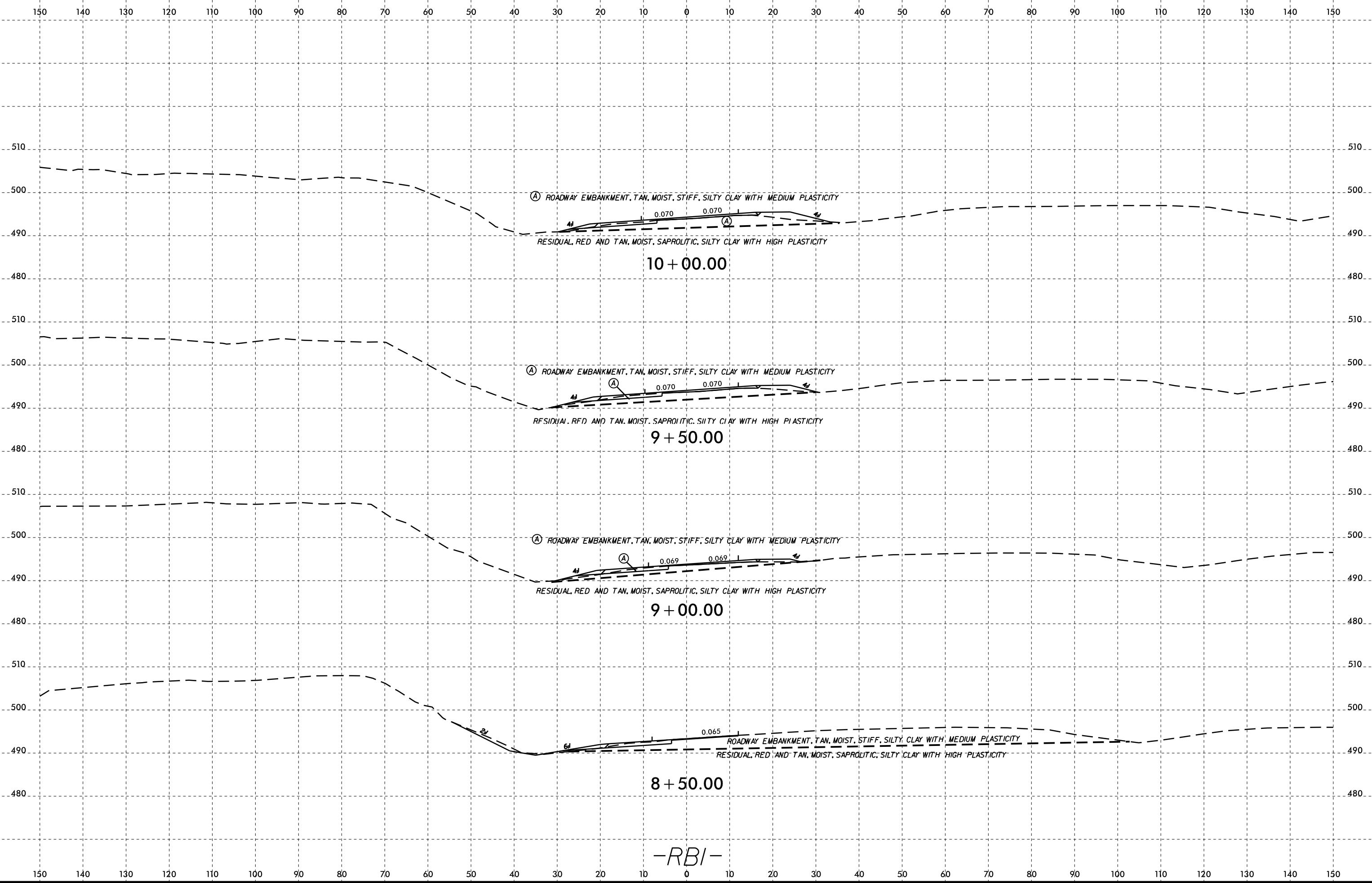
8/23/99

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		
S-6	20' LT	8+00	1.0'-6.0'	A-7-5(27)	69	29	9.8	13.1	30.2	46.9	95	91	78	68.6	-



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-RBI-



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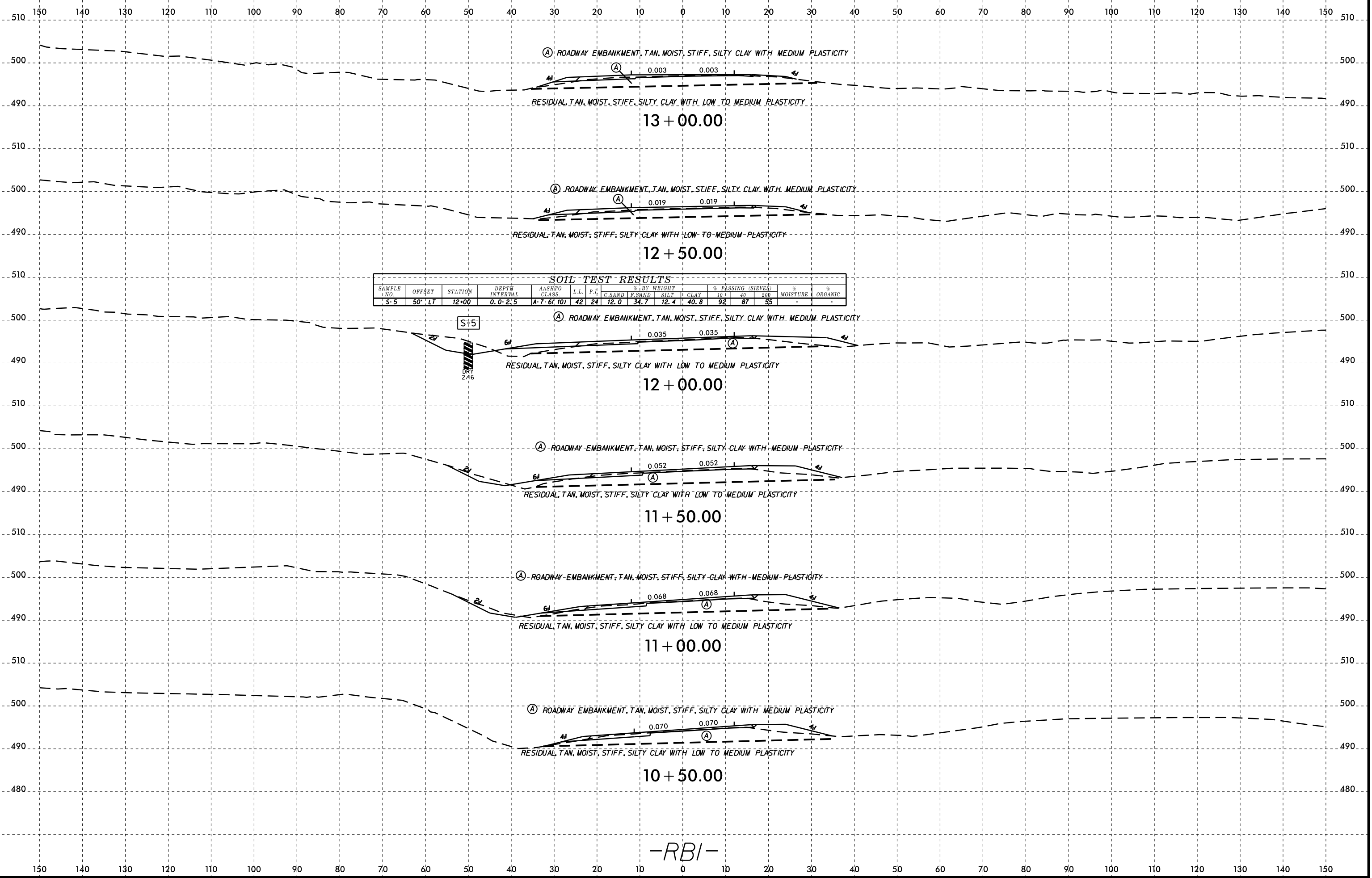
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9 + 00.00

8 + 50.00

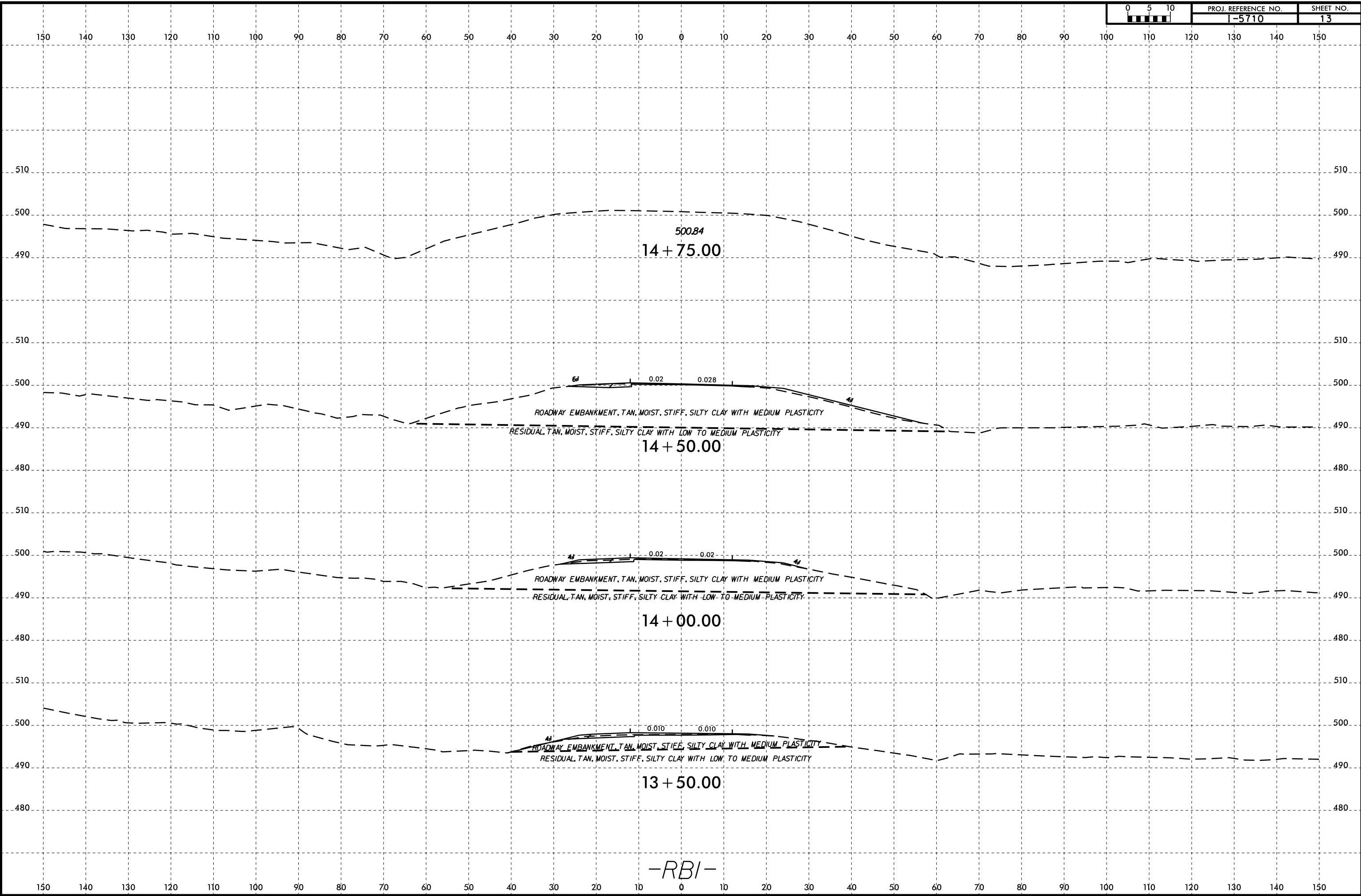
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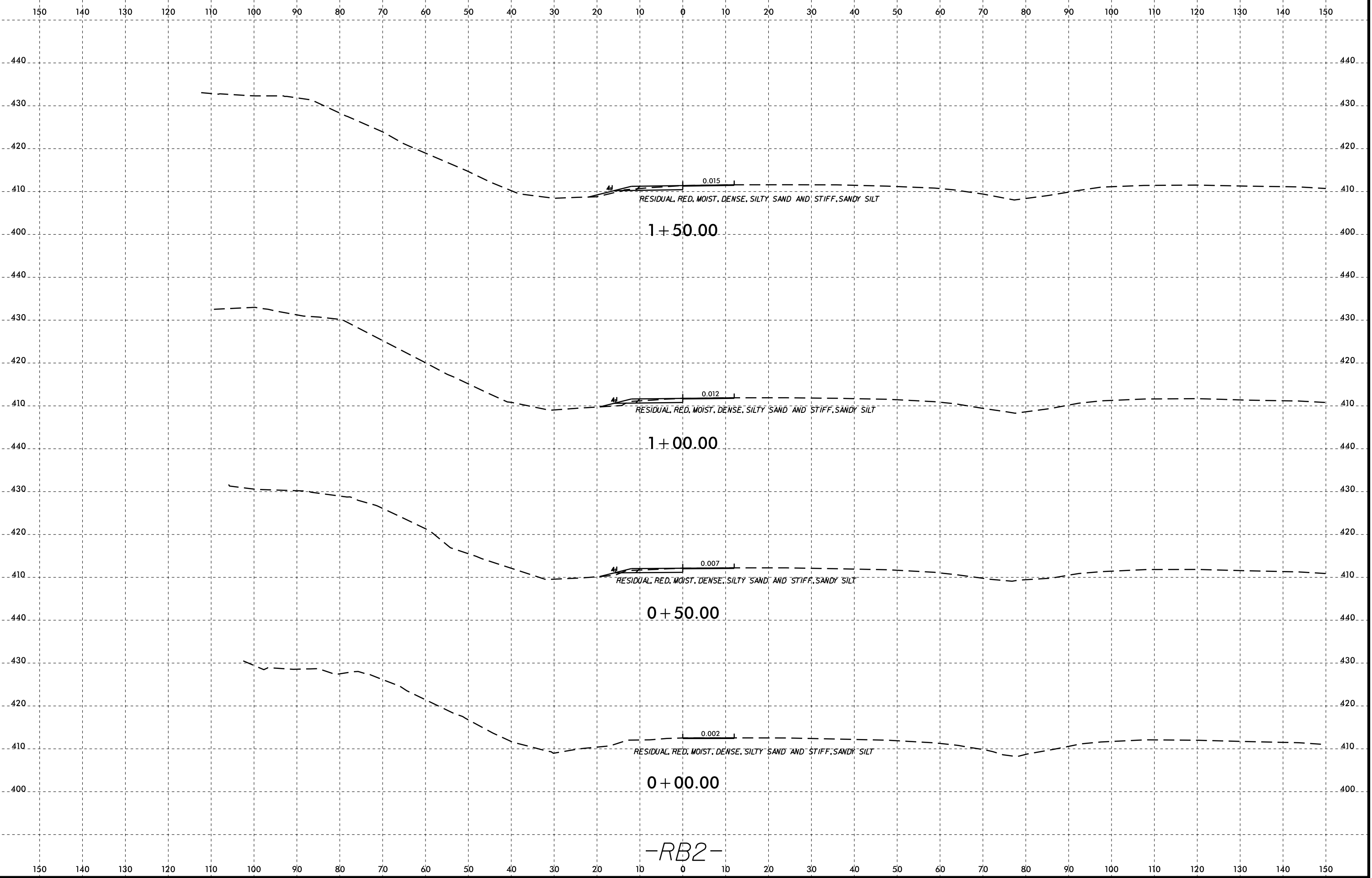


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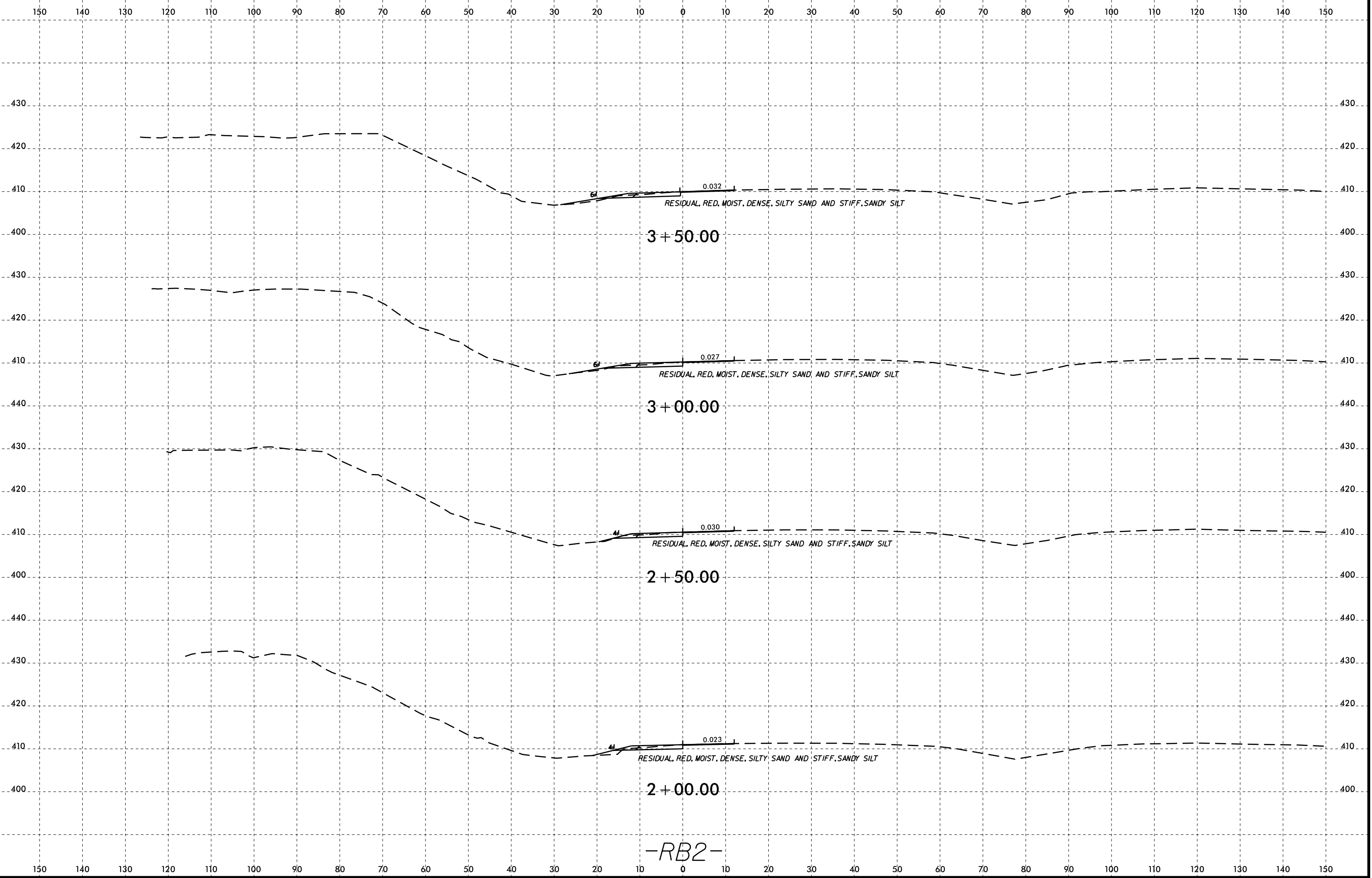
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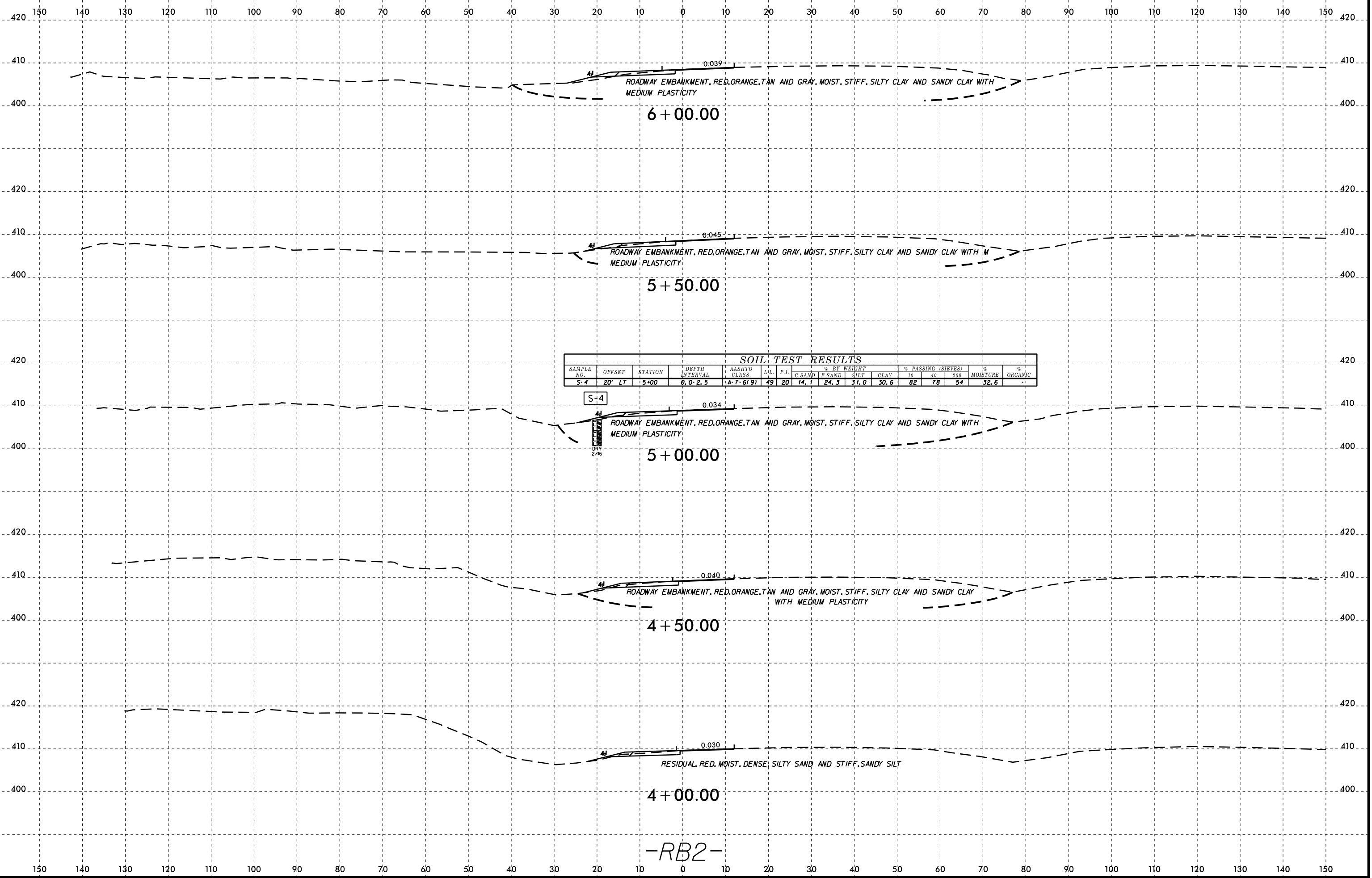
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SOIL TEST RESULTS

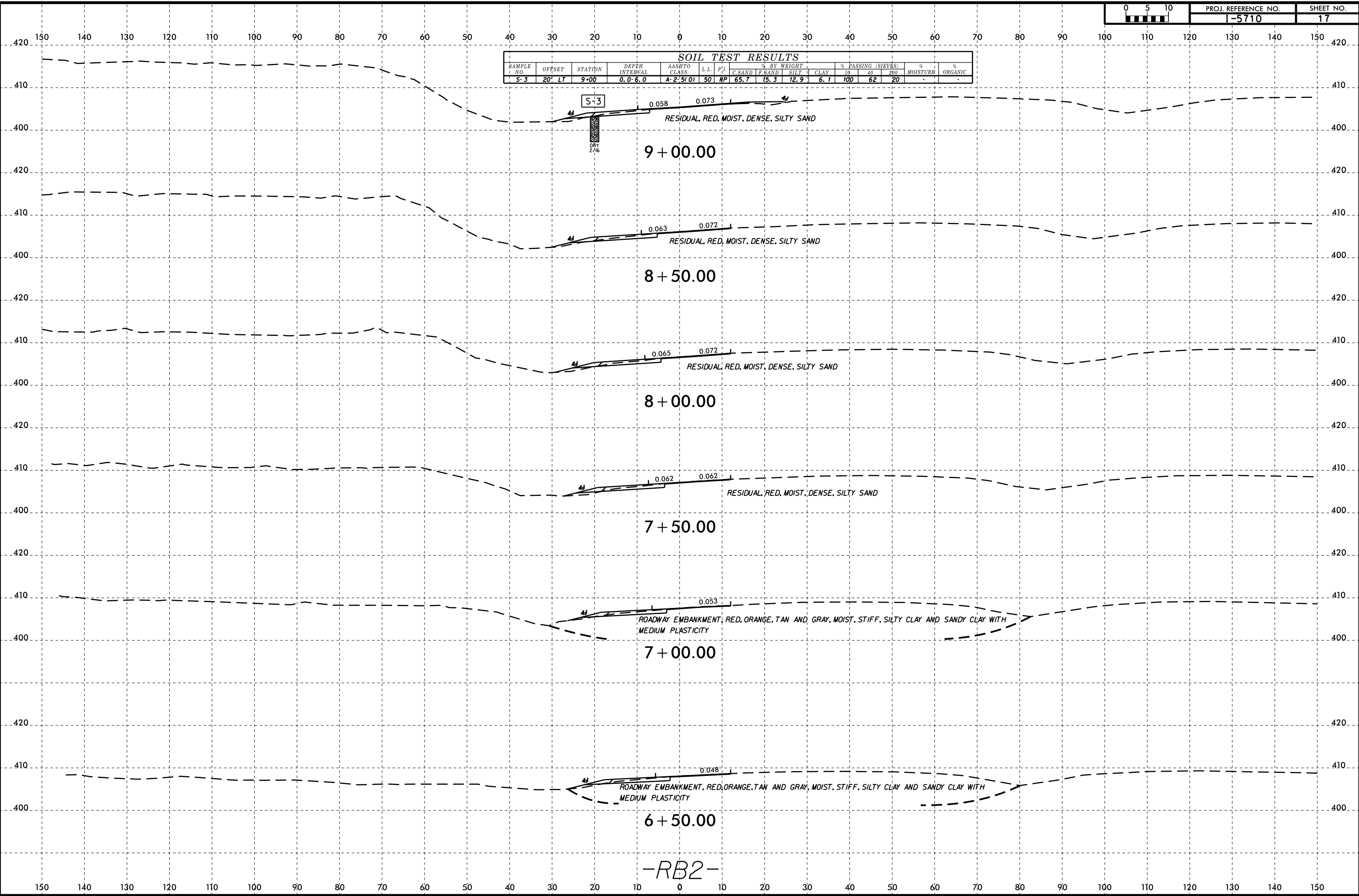
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C. SAND	F. SAND	SILT CLAY	10	40	200			
S-4	20' LT	5+00	0.0-2.5	A-7-6(9)	49	20	14.1	24.3	31.0	30.6	82	78	54	52.6	-

S-4

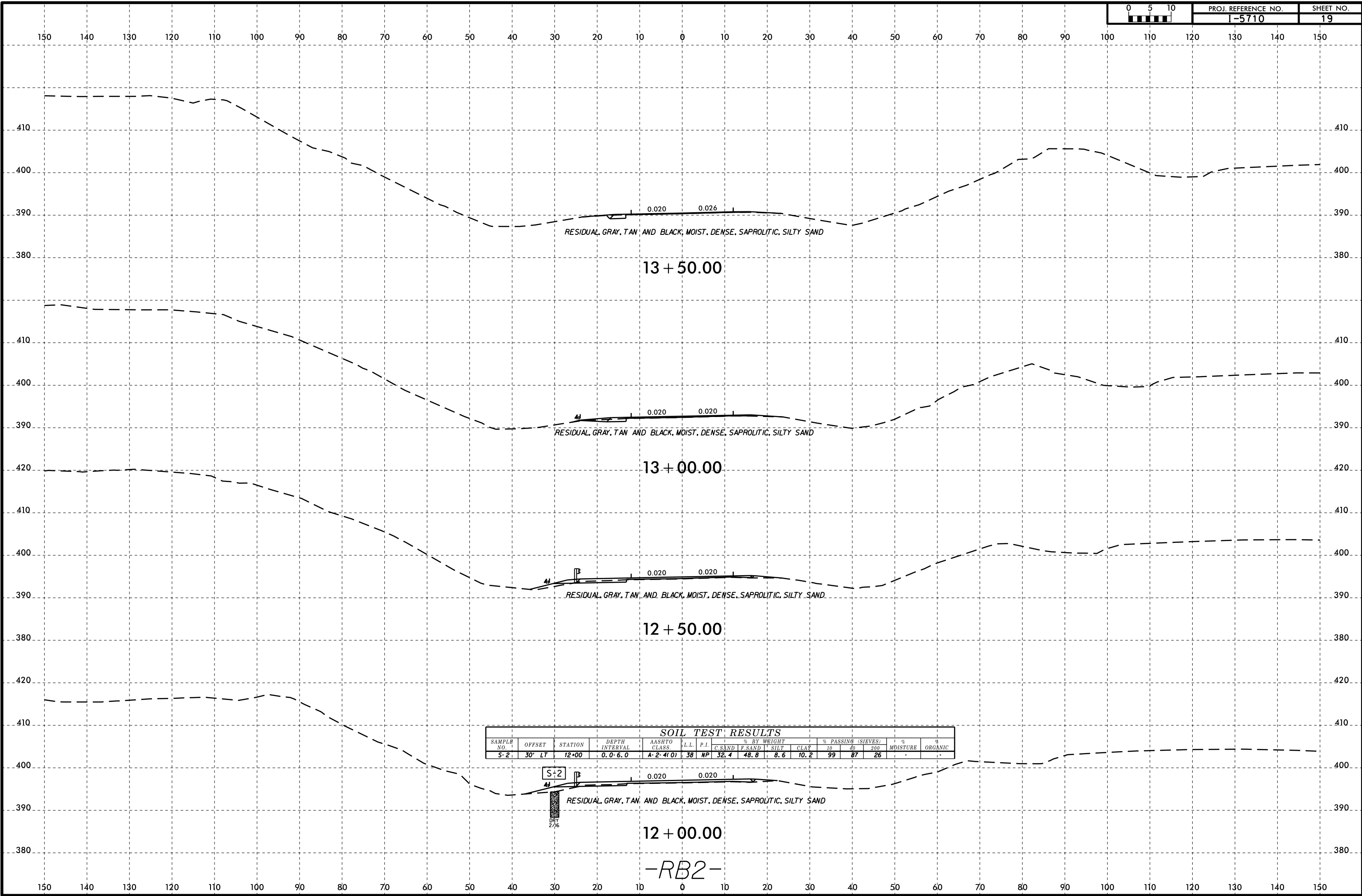


SOIL TEST RESULTS

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
S-3	20' LT	9+00	0.0-6.0	A-2.5(0)	50	NP	65.7	15.3	12.9	6.1	100	62	20	-	-

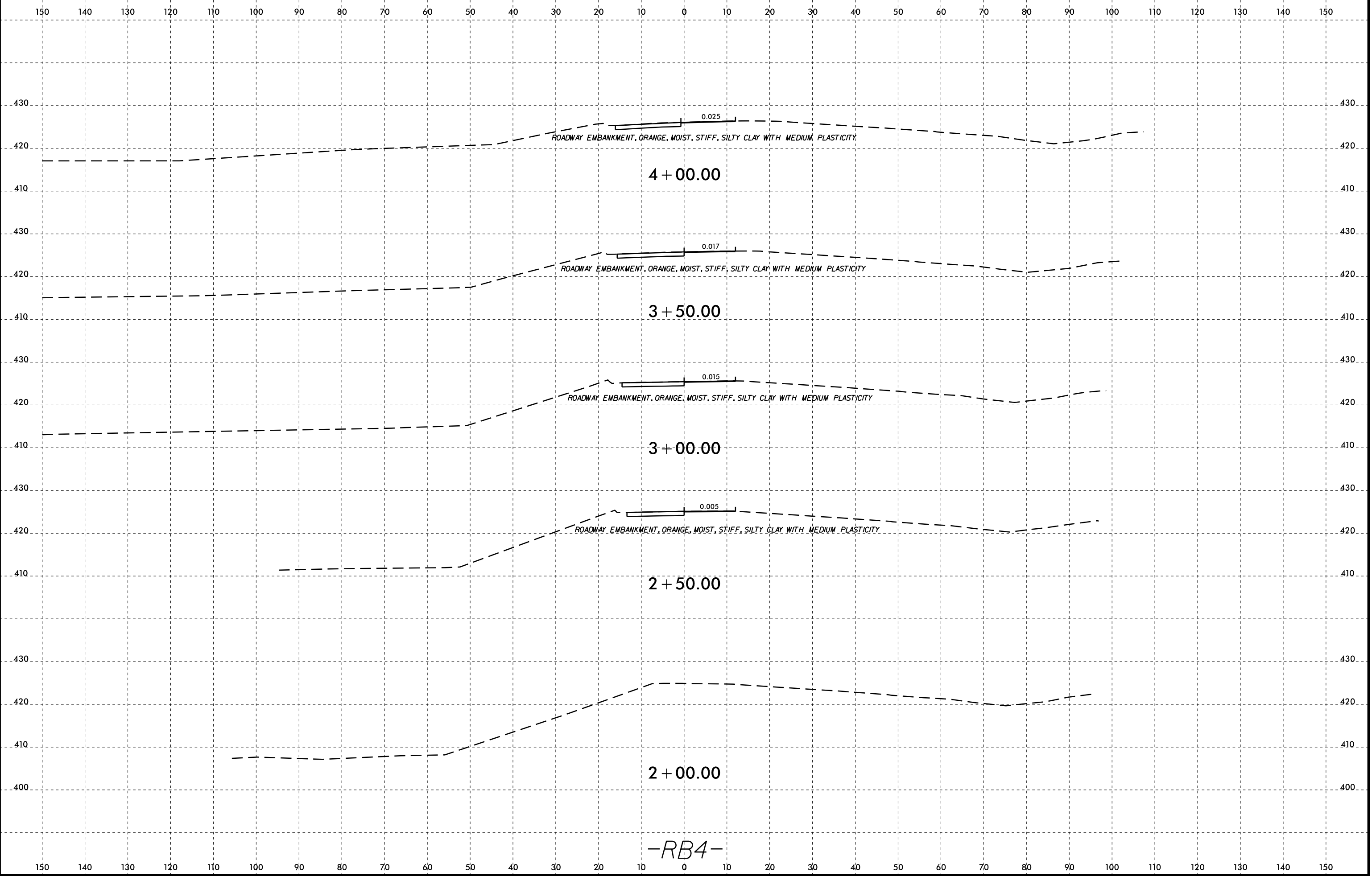


-RB2-



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	20	200		
S-2	30' LT	12+00	0.0-6.0	A-2-4(0)	38	NP	32.4	48.8	8.6	10.2	99	87	26	-	-

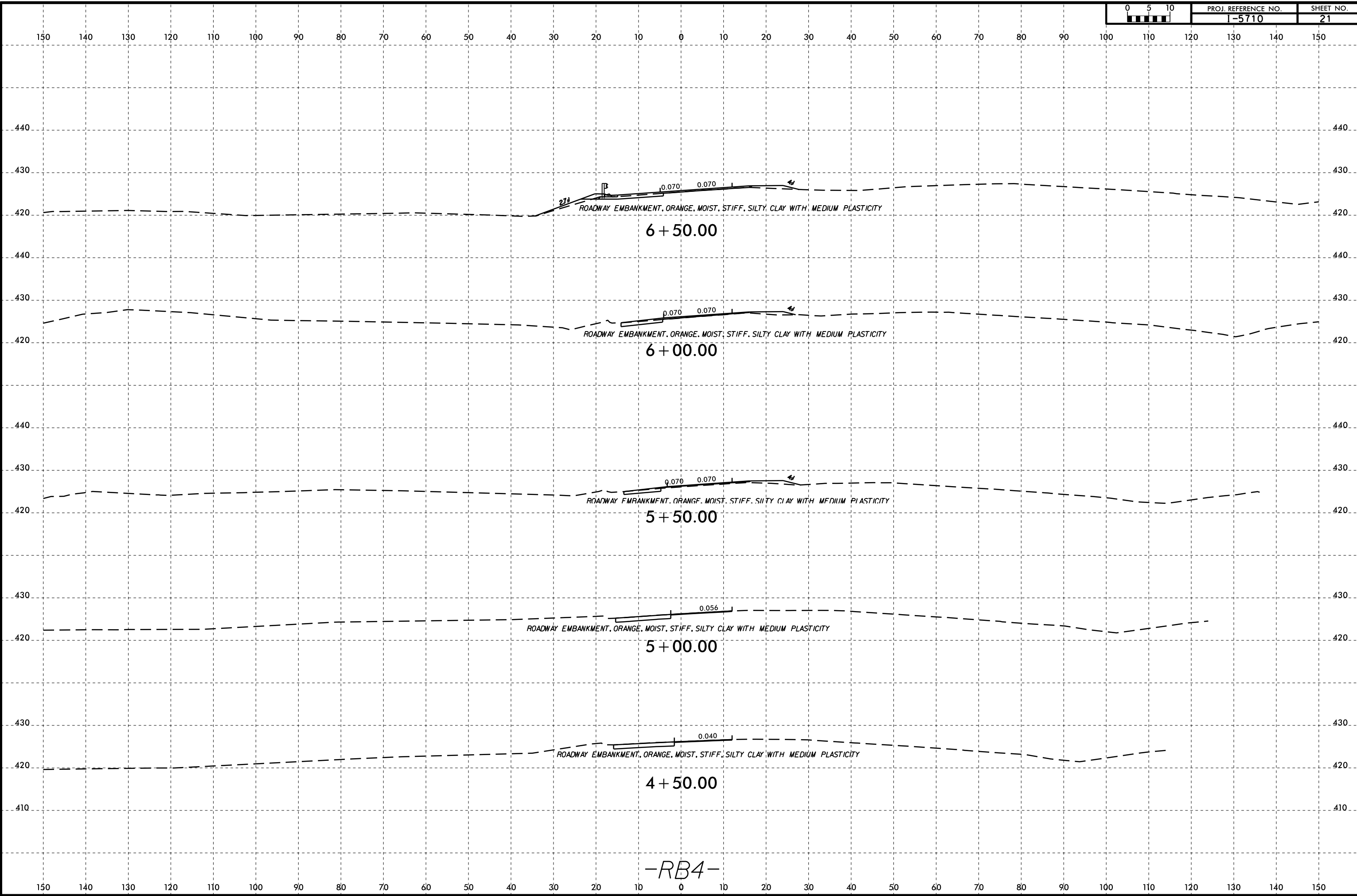




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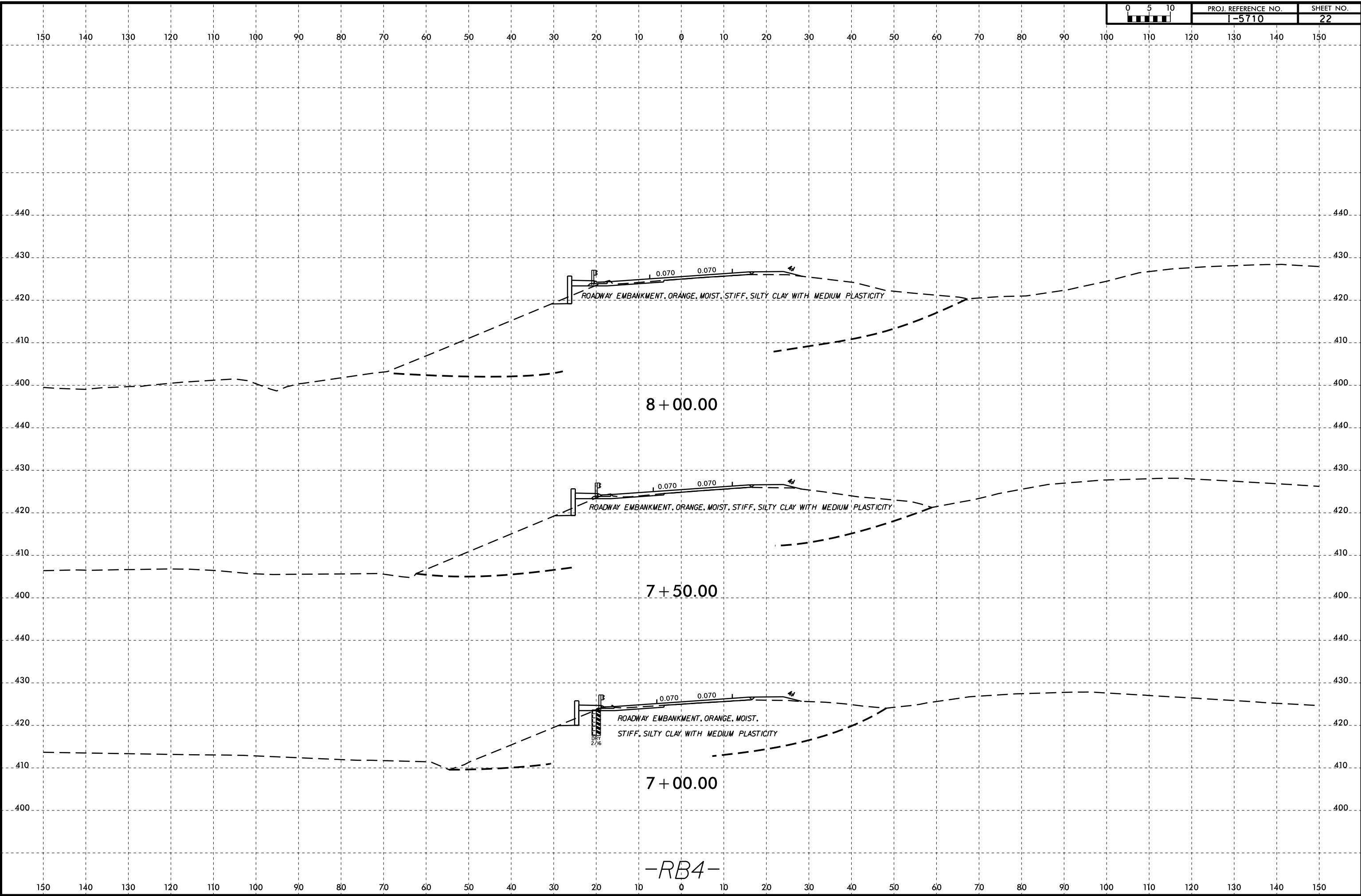
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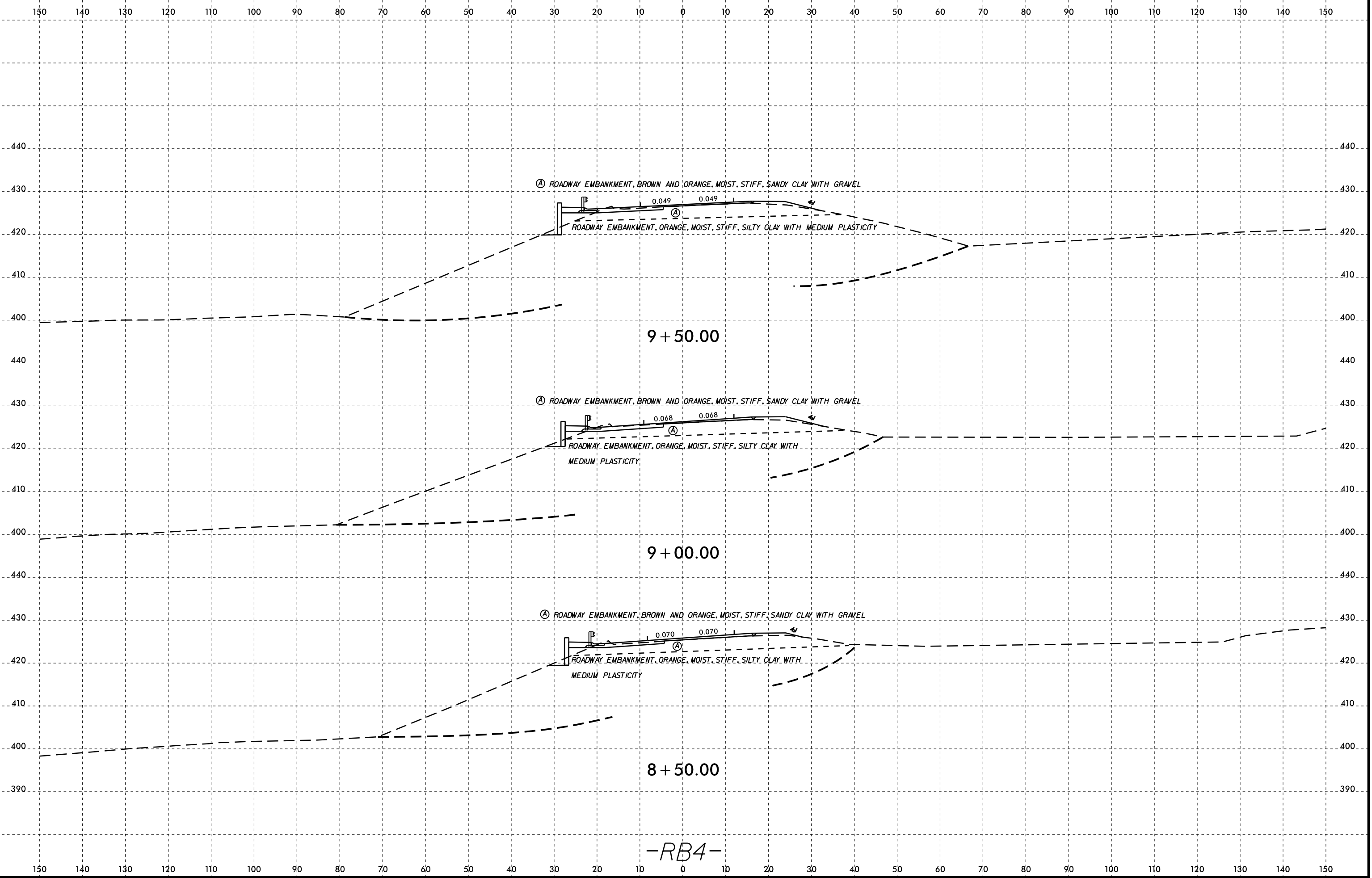
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-RB4-

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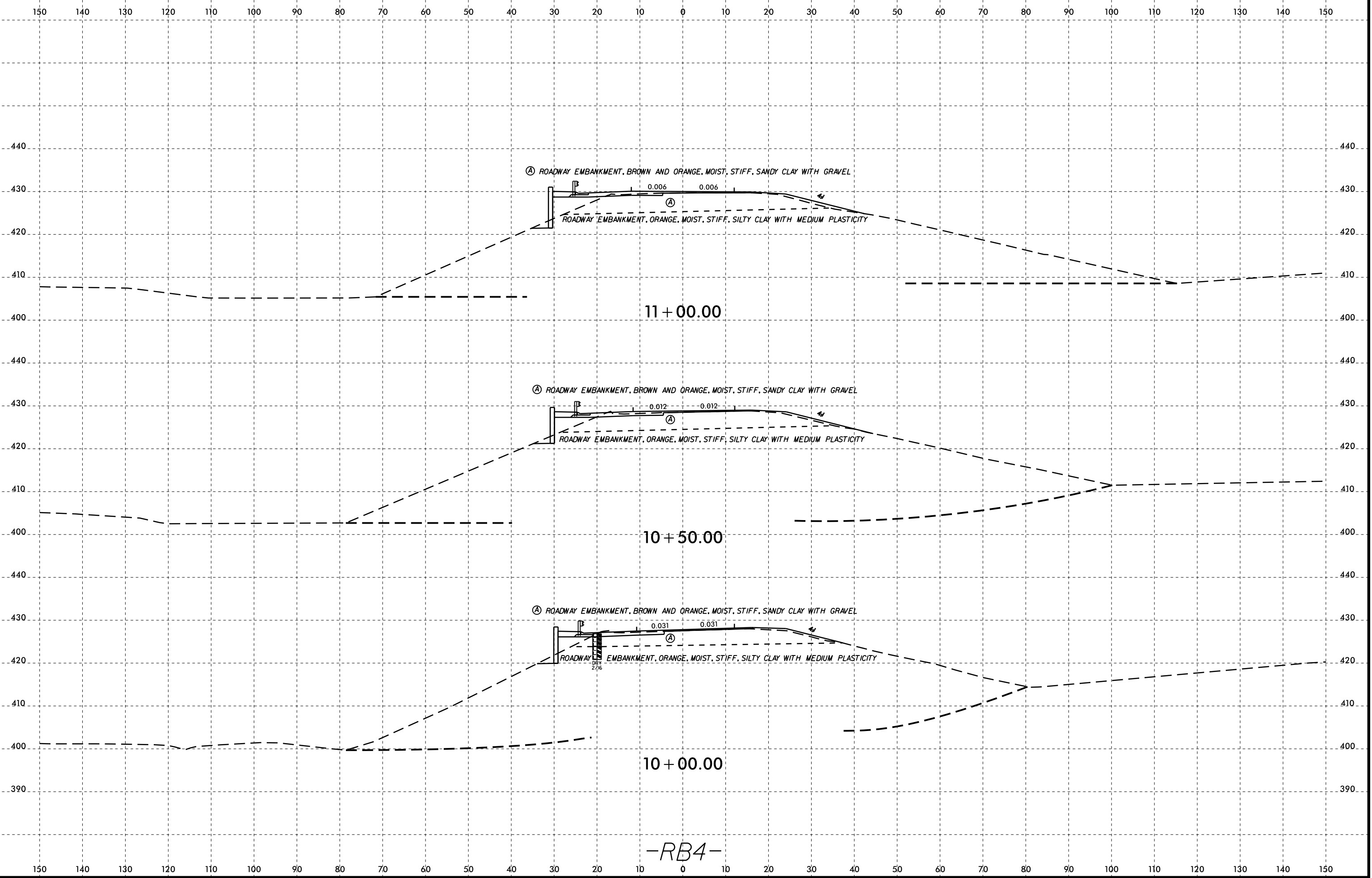


9 + 50.00

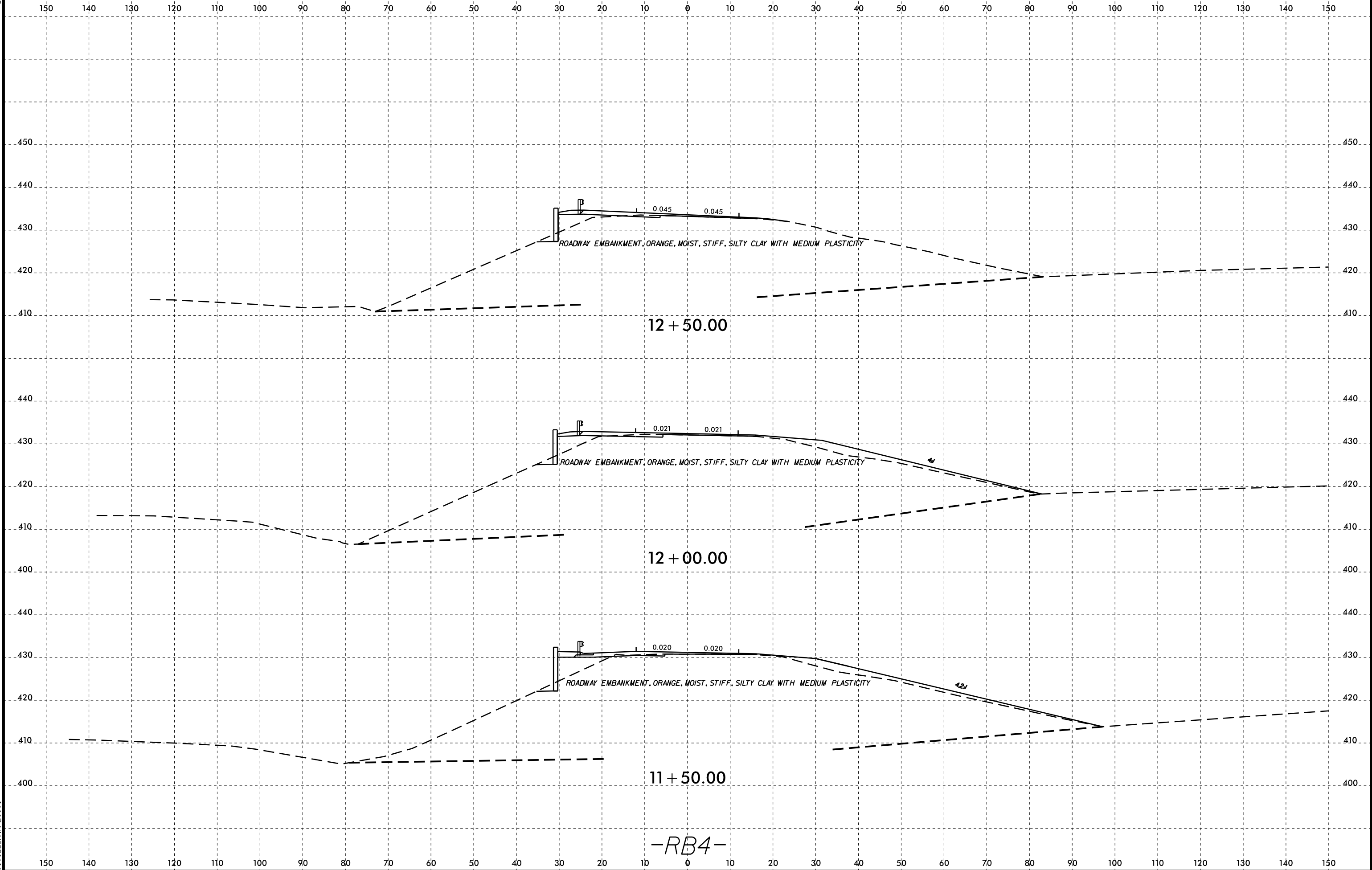
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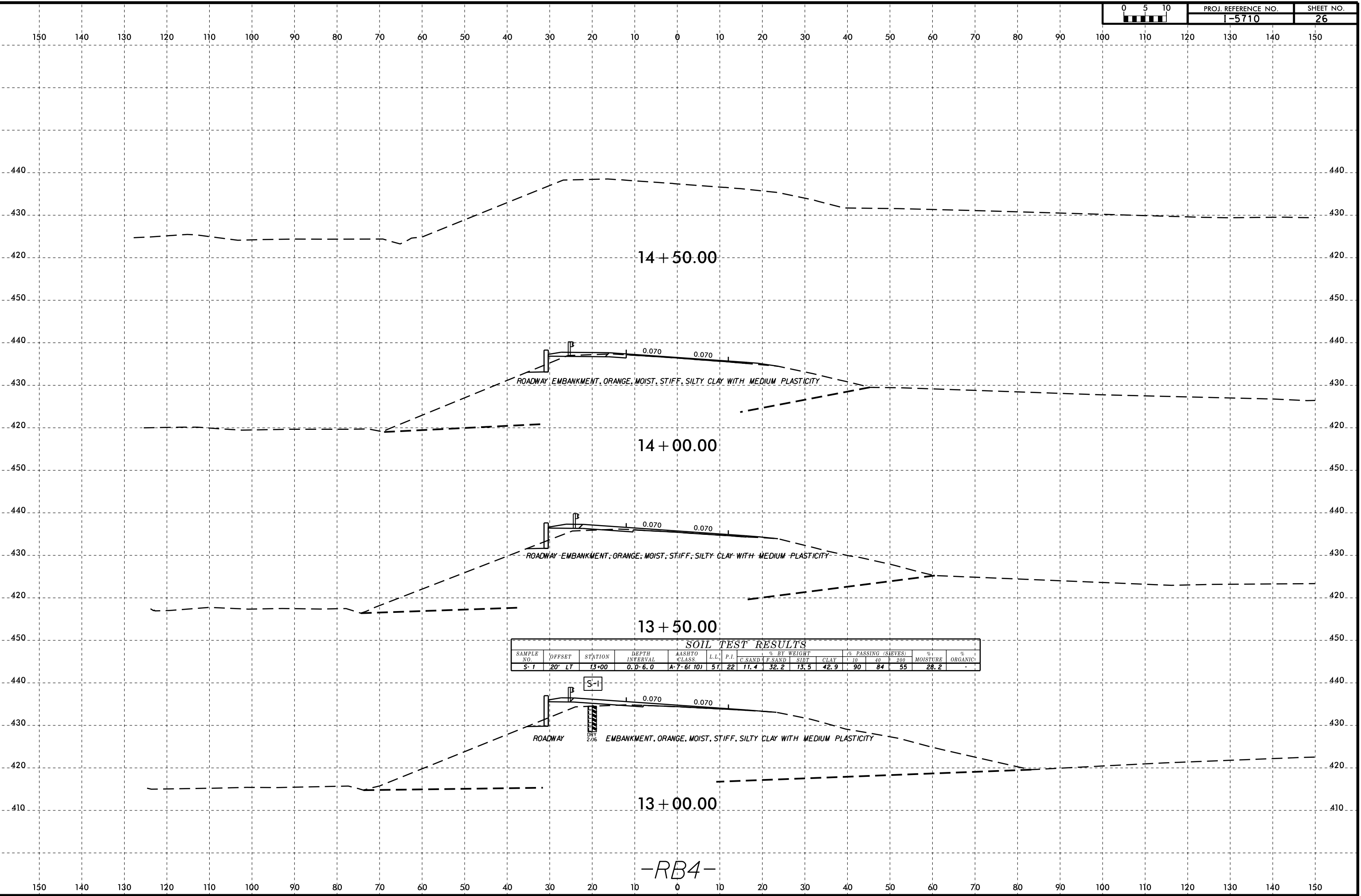
8 + 50.00

-RB4-



-RB4-





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		
S-1	20' LT	13+00	0.0-6.0	A-7-6(10)	5.1	22	11.4	32.2	13.5	42.9	90	84	55	28.2	-