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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

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>
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

<u>LINE</u>	<u>STATION</u>	<u>SHEETS</u>
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

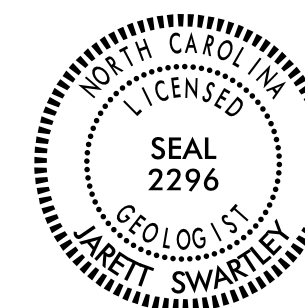
INVESTIGATED BY J.R. SWARTLEY

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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

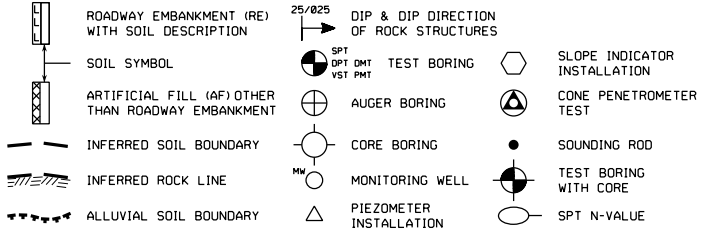
SIGNATURE

DATE

**DOCUMENT NOT CONSIDERED FINAL
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION

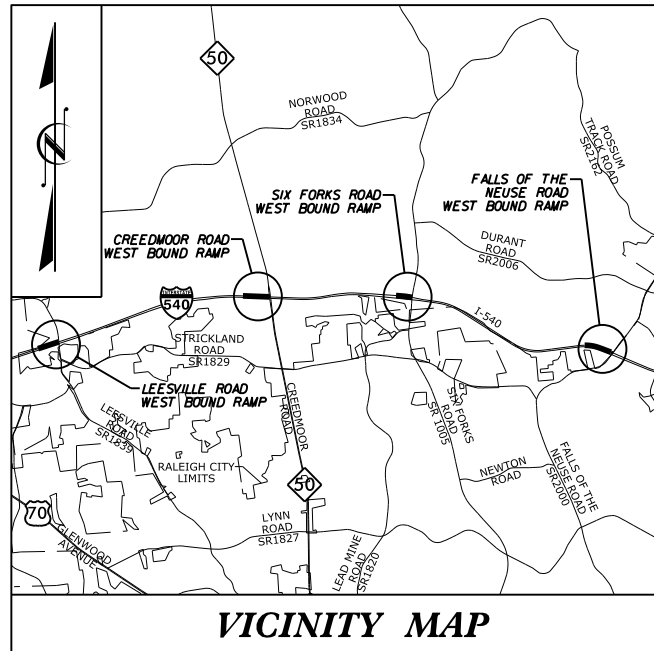
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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 209, 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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										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)  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. CRYSTALLINE ROCK (CR)  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE ROCK (NCR)  FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTARY ROCK (CP)  COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																																																																																																																													
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FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SL.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</i> VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</i> COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.																			
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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

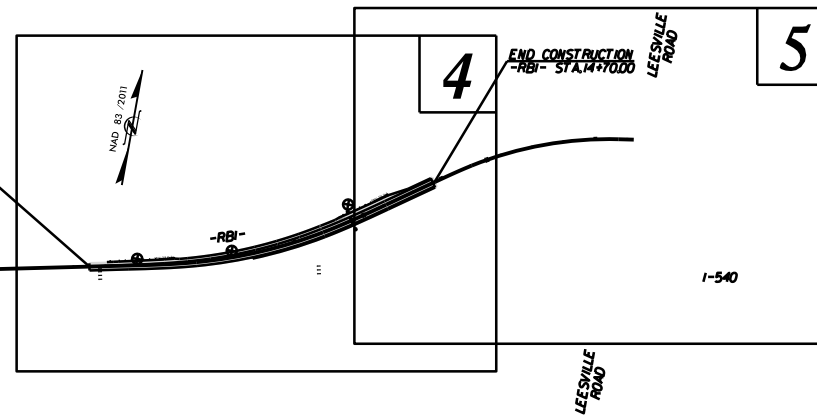
WAKE COUNTY

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).

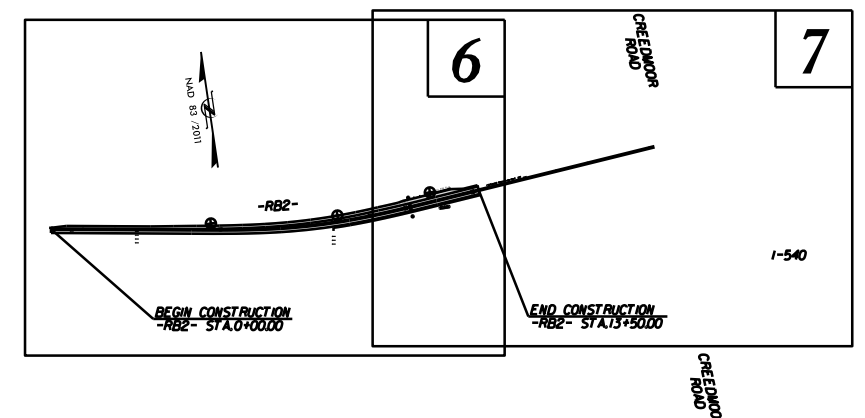
TYPE OF WORK: INSTALLING RAMP METERS - WIDENING, GRADING, PAVING, DRAINAGE, RETAINING WALL, ITS, AND SIGNALS

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.	

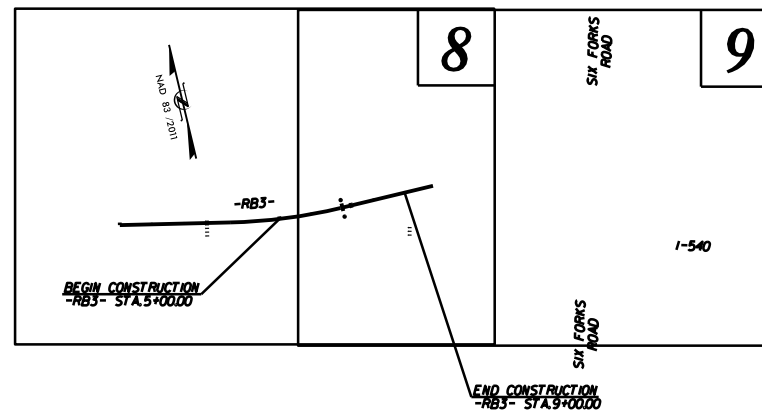
LEESVILLE ROAD



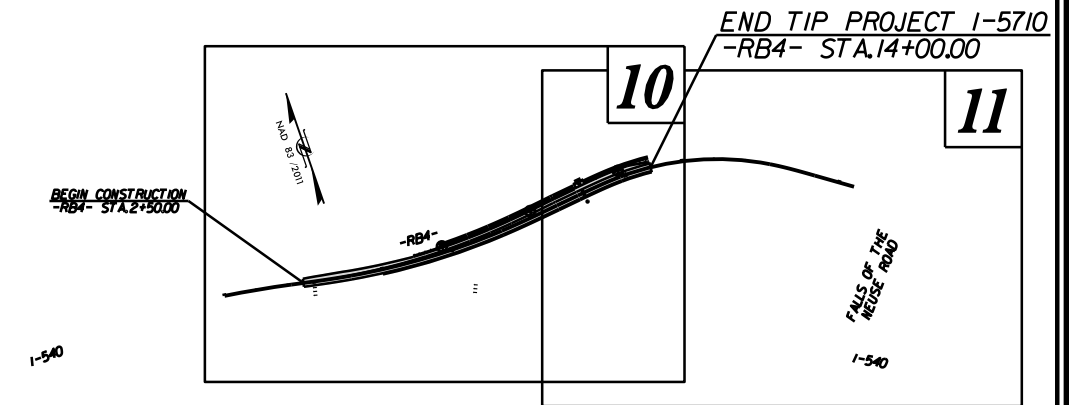
CREEDMOOR ROAD



SIX FORKS ROAD



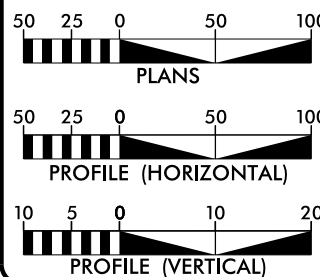
FALLS OF THE NEUSE ROAD



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

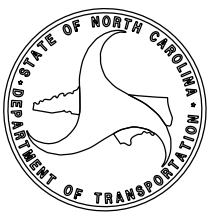
RIGHT OF WAY DATE:
N/A

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
7F355C29F75A413...

Jarett Swartley, L.G.
Project Geological Engineer

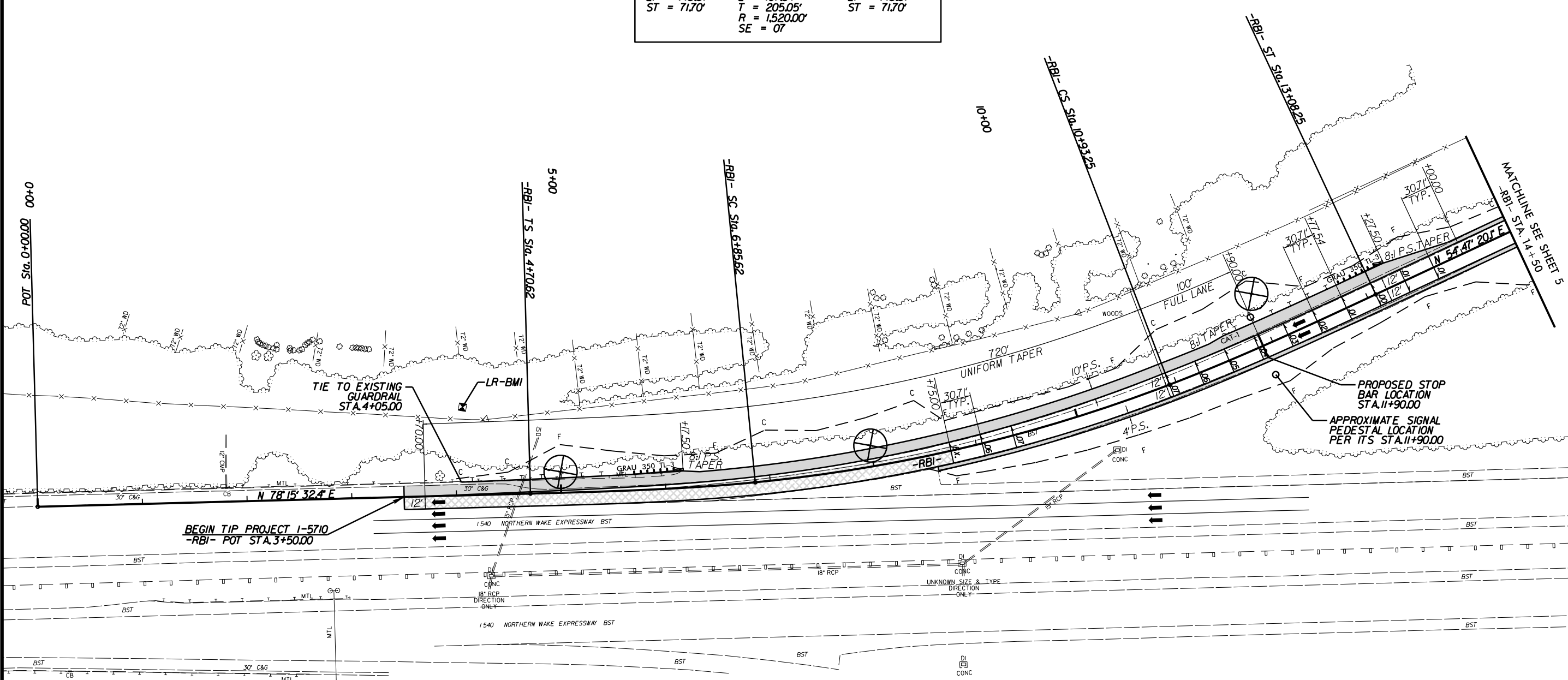
8/17/99

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)	$\theta_s = 4\ 03'\ 07.8''$
Ls = 215.00'	D = 3' 46" 10.1"	Ls = 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

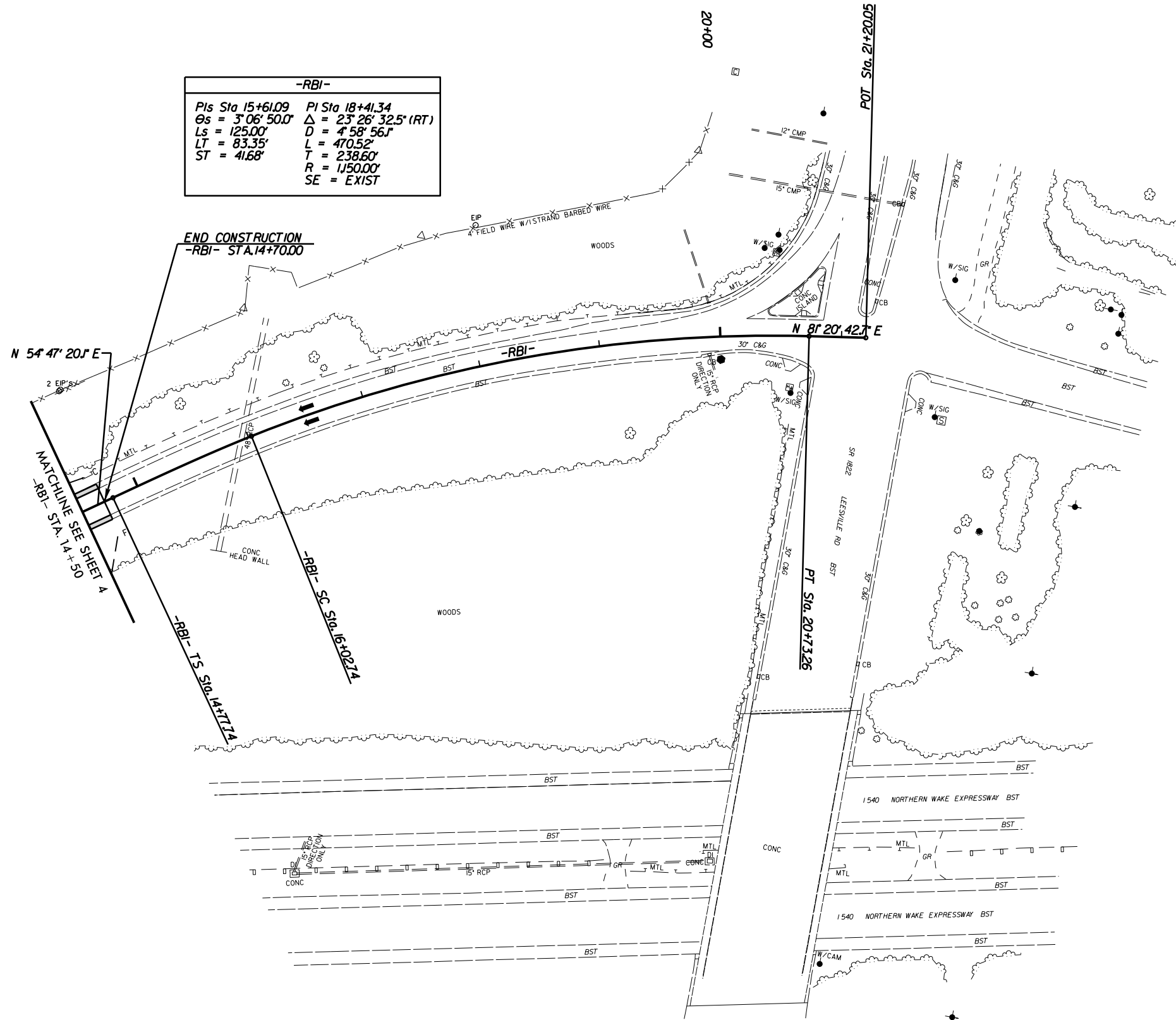
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 15710\15710_GEO_RDWY\CADD_GEO\TECH\Site&Sub\15710_GEO_Rdwy_PSH04.dgn



15+00

LEESVILLE ROAD

-RBI-	
PIs Sta 15+61.09	PI Sta 18+41.34
$\theta_s = 3^{\circ} 06' 50.0"$	$\Delta = 23^{\circ} 26' 32.5" (RT)$
$L_s = 125.00'$	$D = 4^{\circ} 58' 56.1"$
$LT = 83.35'$	$L = 470.52'$
$ST = 41.68'$	$T = 238.60'$
	$R = 1150.00'$
	$SE = EXIST$



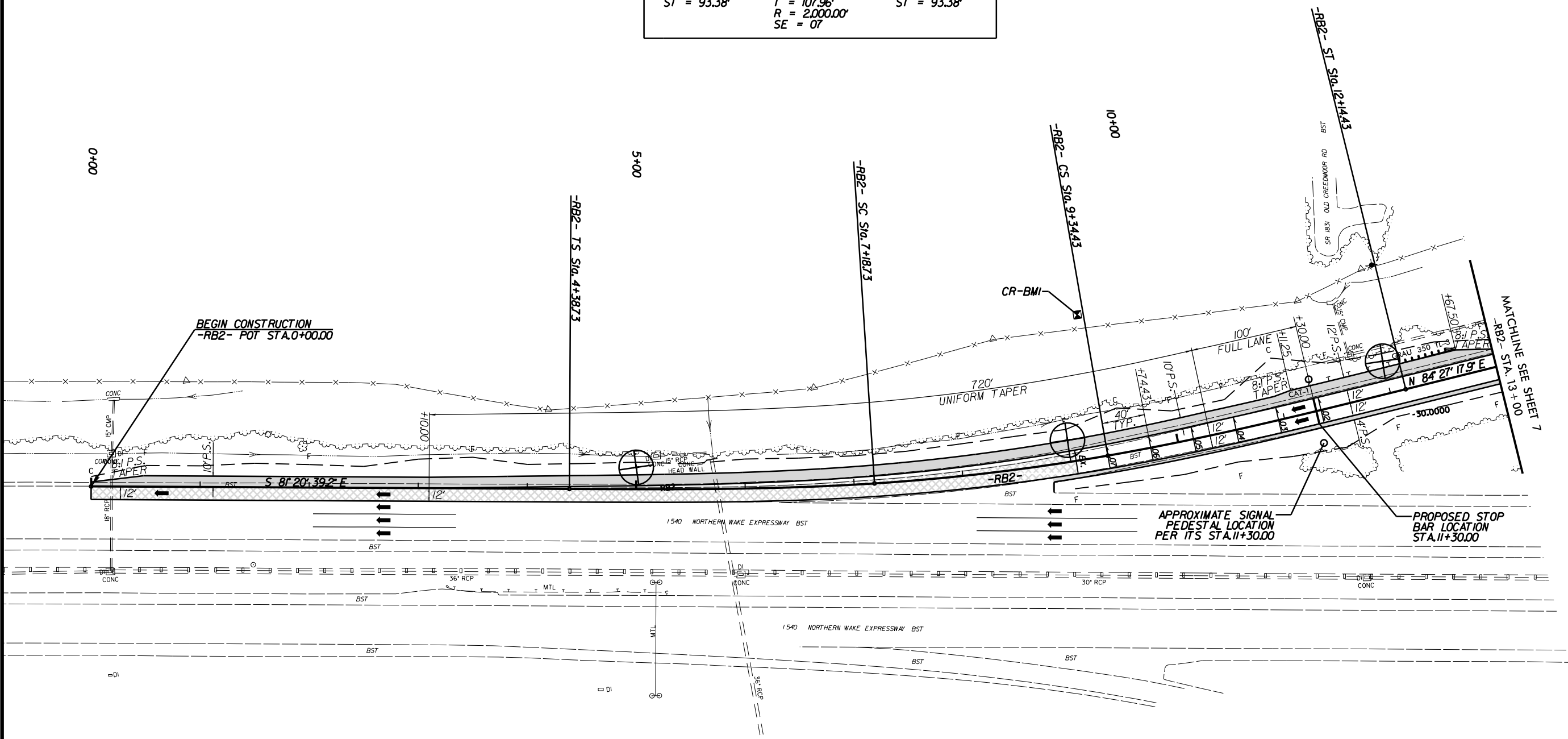
PROJECT REFERENCE NO.	SHEET NO.
1-5710	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
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PAVED SHOULDER

PROJECT REFERENCE NO.	SHEET NO.
1-5710	6
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	

CREEDMOOR ROAD

-RB2-		
PIs Sta 6+25.44	PI Sta 8+26.68	PIs Sta 10+27.81
$\Theta_s = 4^{\circ} 00' 38.5''$	$\Delta = 6^{\circ} 10' 45.9''$ (LT)	$\Theta_s = 4^{\circ} 00' 38.5''$
$L_s = 280.00'$	$D = 2^{\circ} 51' 53.2''$	$L_s = 280.00'$
$LT = 186.71'$	$L = 215.70'$	$LT = 186.71'$
$ST = 93.38'$	$T = 107.96'$	$ST = 93.38'$
	$R = 2,000.00'$	
	$SE = 07$	



- PAVED SHOULDER
- MILL AND RESURFACE

8/17/99
 03-MAR-2016 09:54
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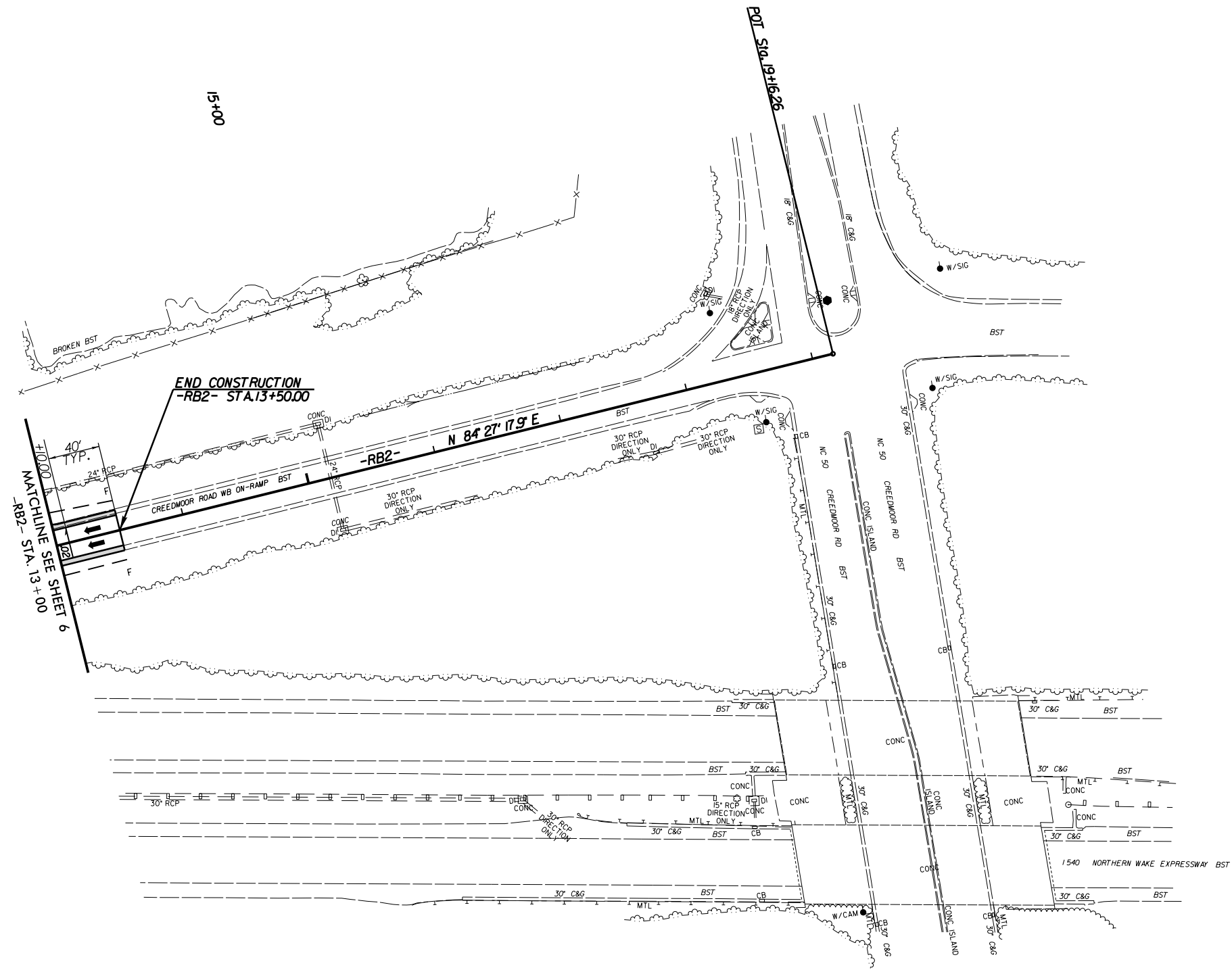
8/17/99

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CREEDMOOR ROAD

PROJECT REFERENCE NO. 1-5710	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	

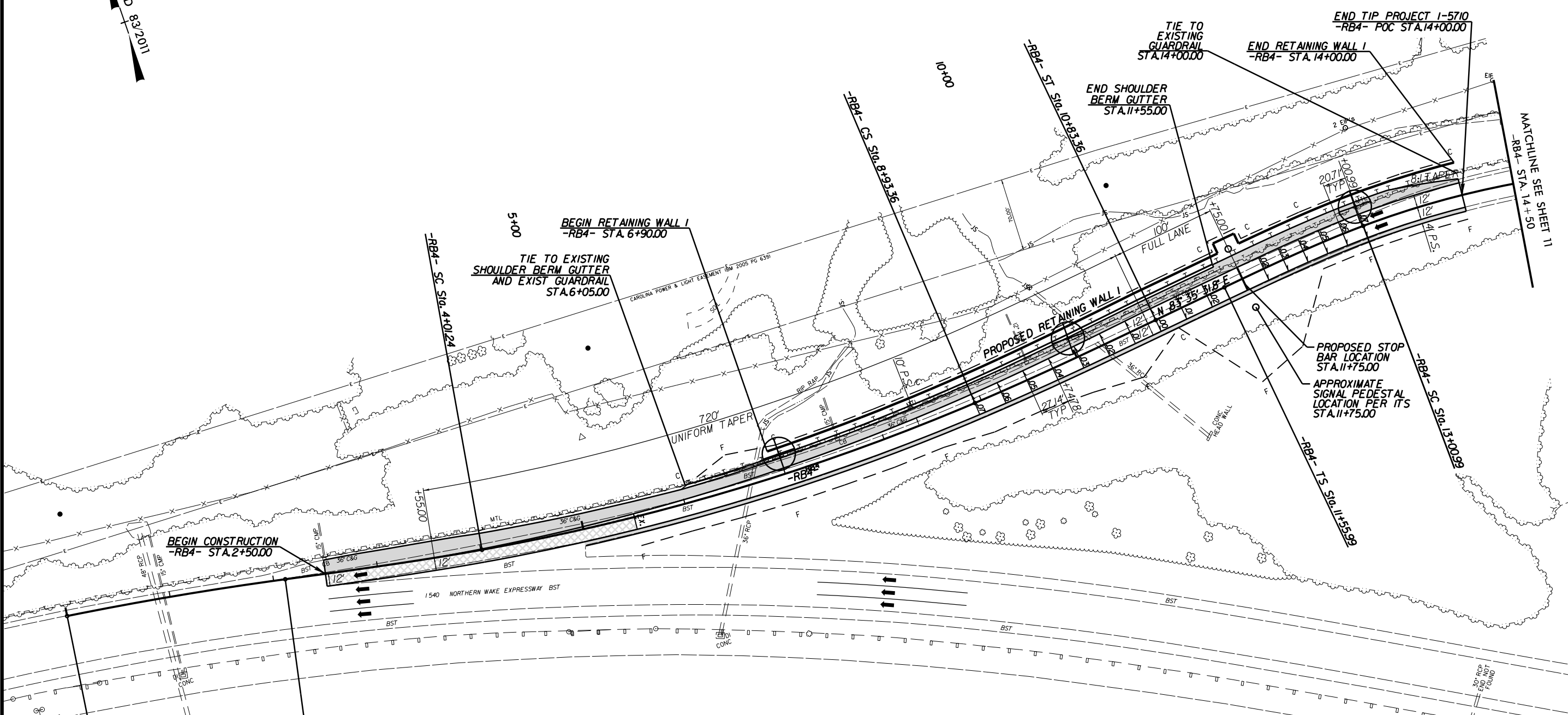


PAVED SHOULDER

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
$\Delta = 3^{\circ} 44' 08.0''$ (RT)	$\Theta_s = 2^{\circ} 28' 26.9''$	$\Delta = 12^{\circ} 48' 59.2''$ (LT)	$\Theta_s = 2^{\circ} 28' 26.9''$	$\Theta_s = 4^{\circ} 49' 48.6''$	$\Delta = 31^{\circ} 40' 25.6''$ (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

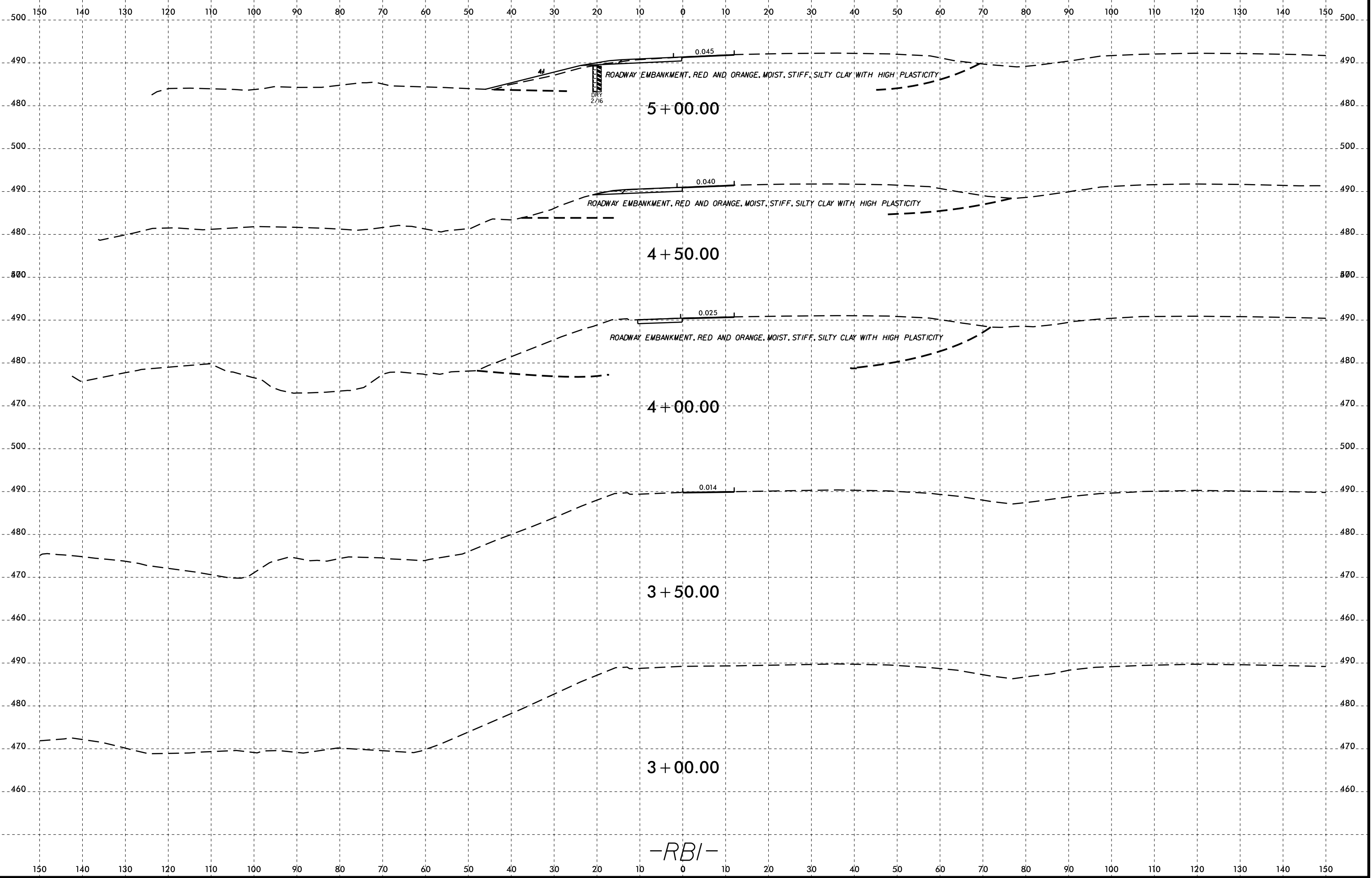
PAVED SHOULDER
 MILL AND RESURFACE

-RB4- PC Sta. 0+00.00
FN-BMI

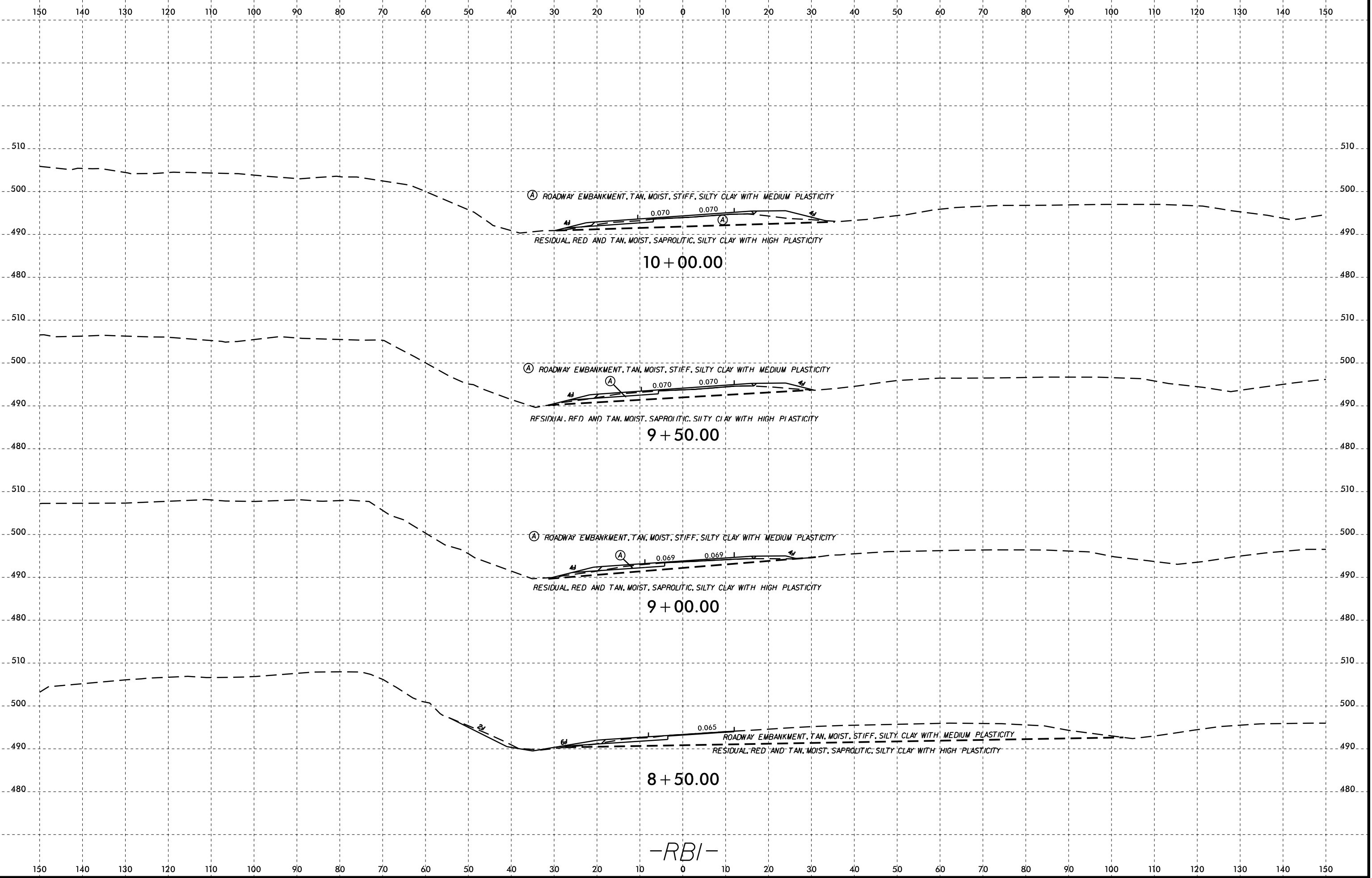
-RB4- CS Sta. 2+11.24

30' RCP
END POINT
FOUND

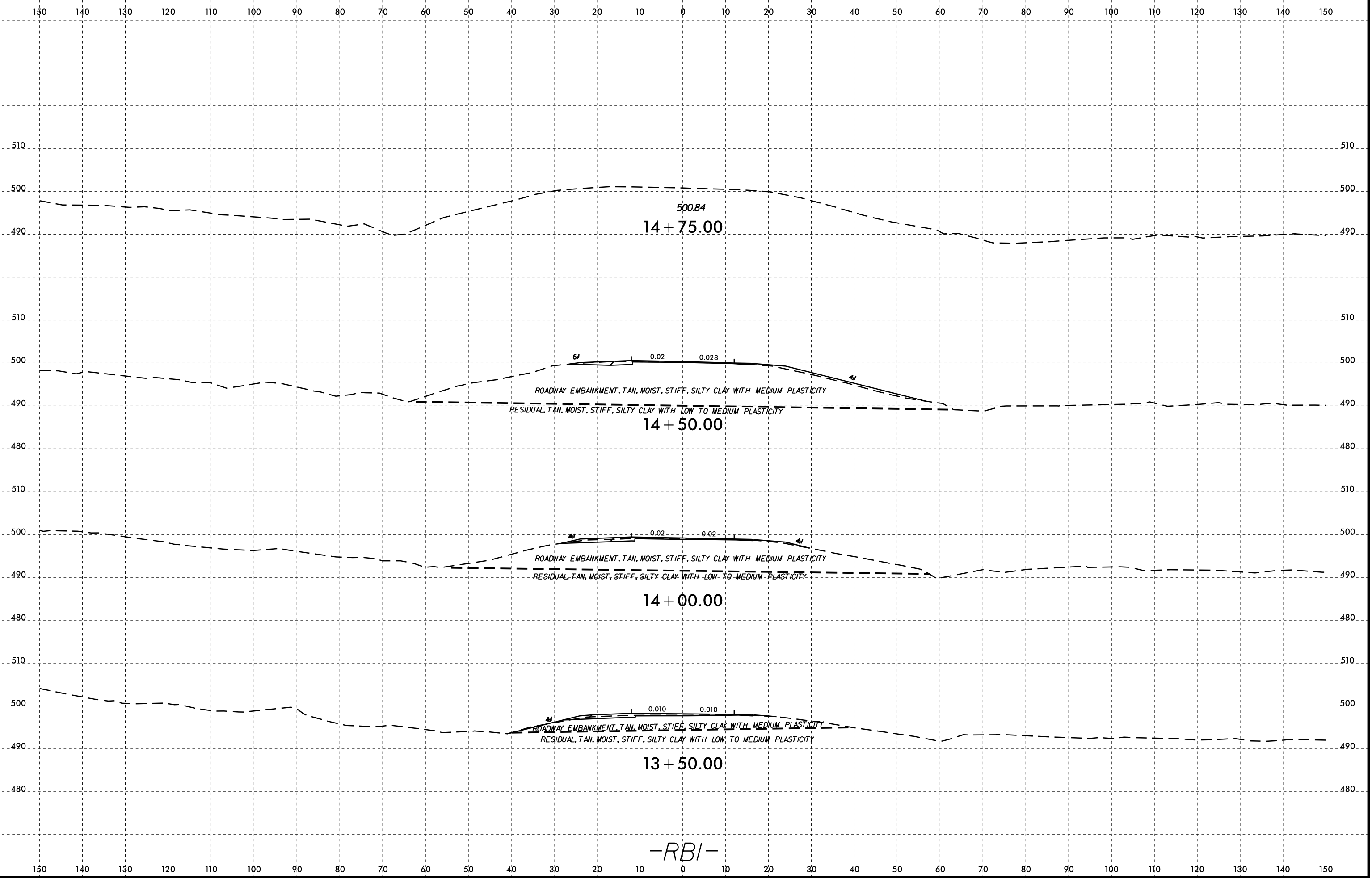
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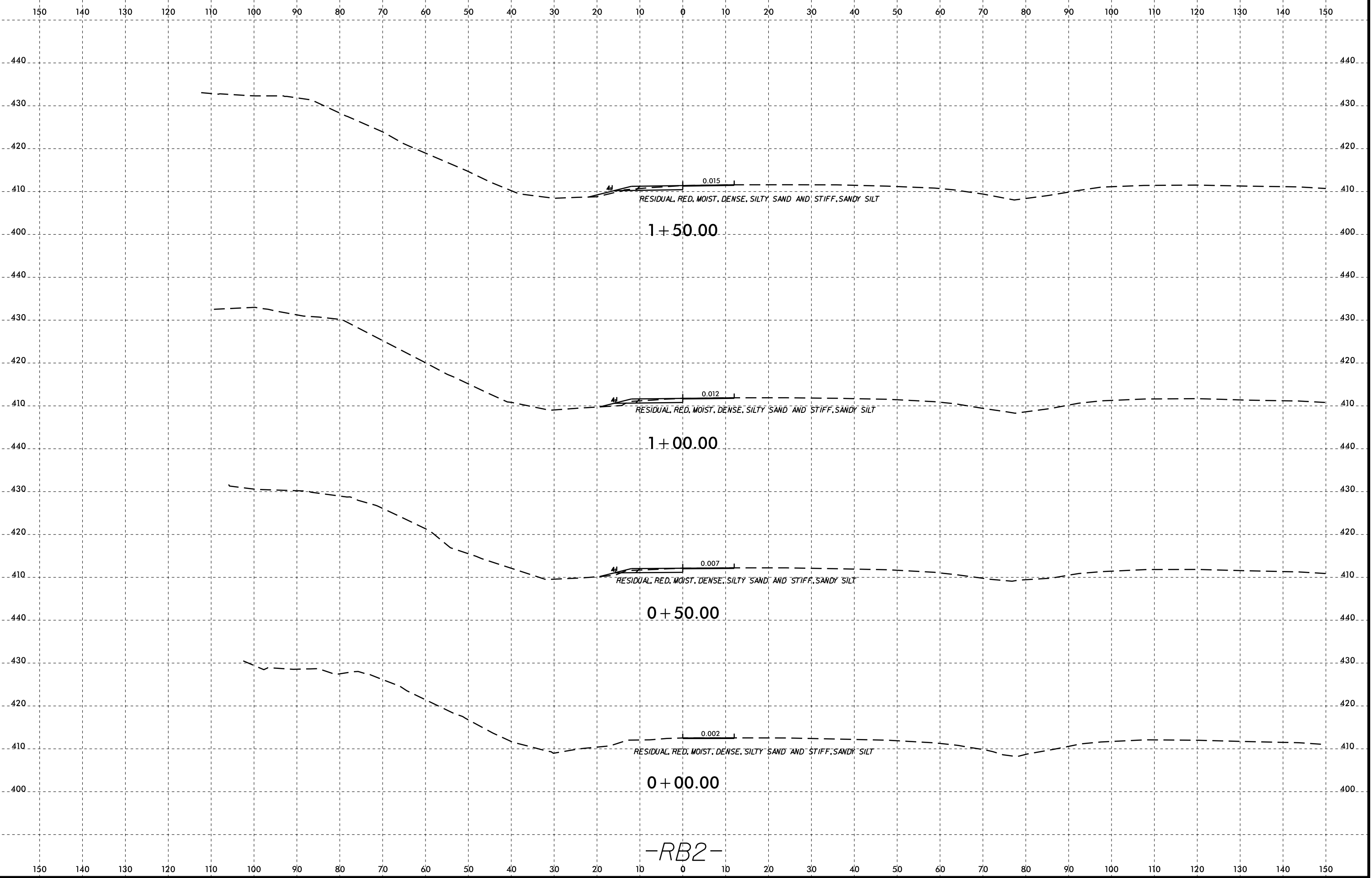
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-RBI-

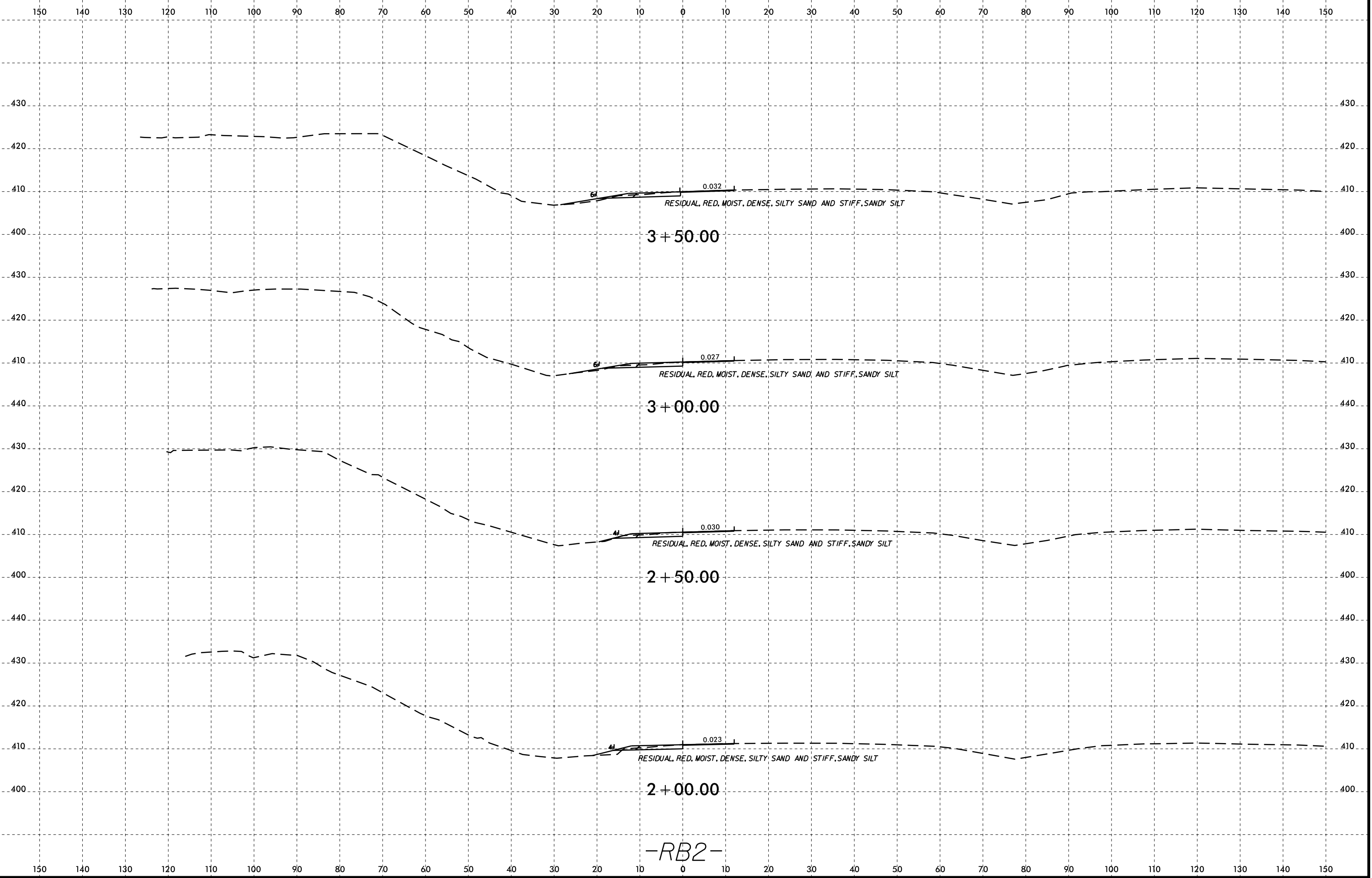


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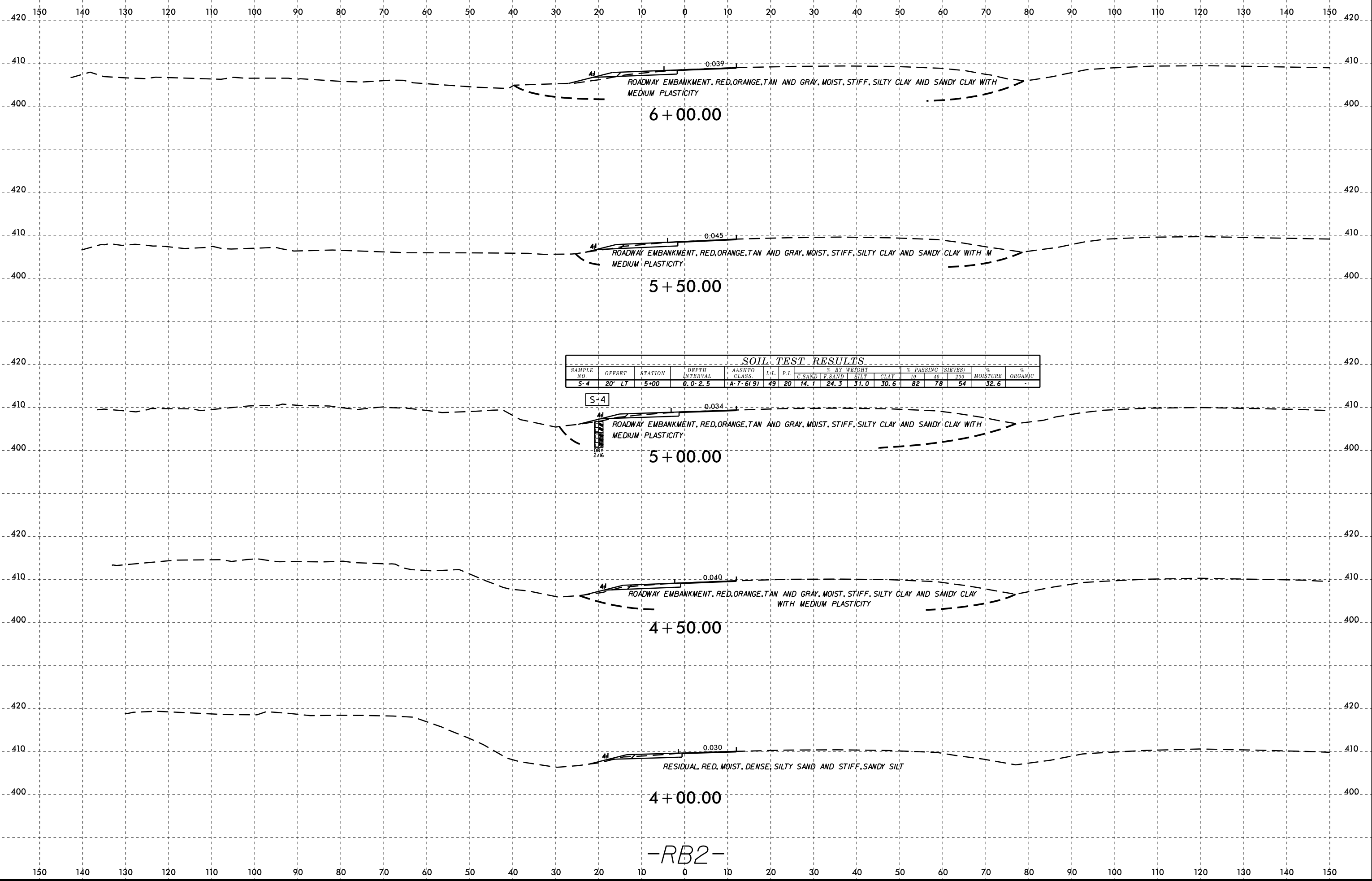
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-RB2-

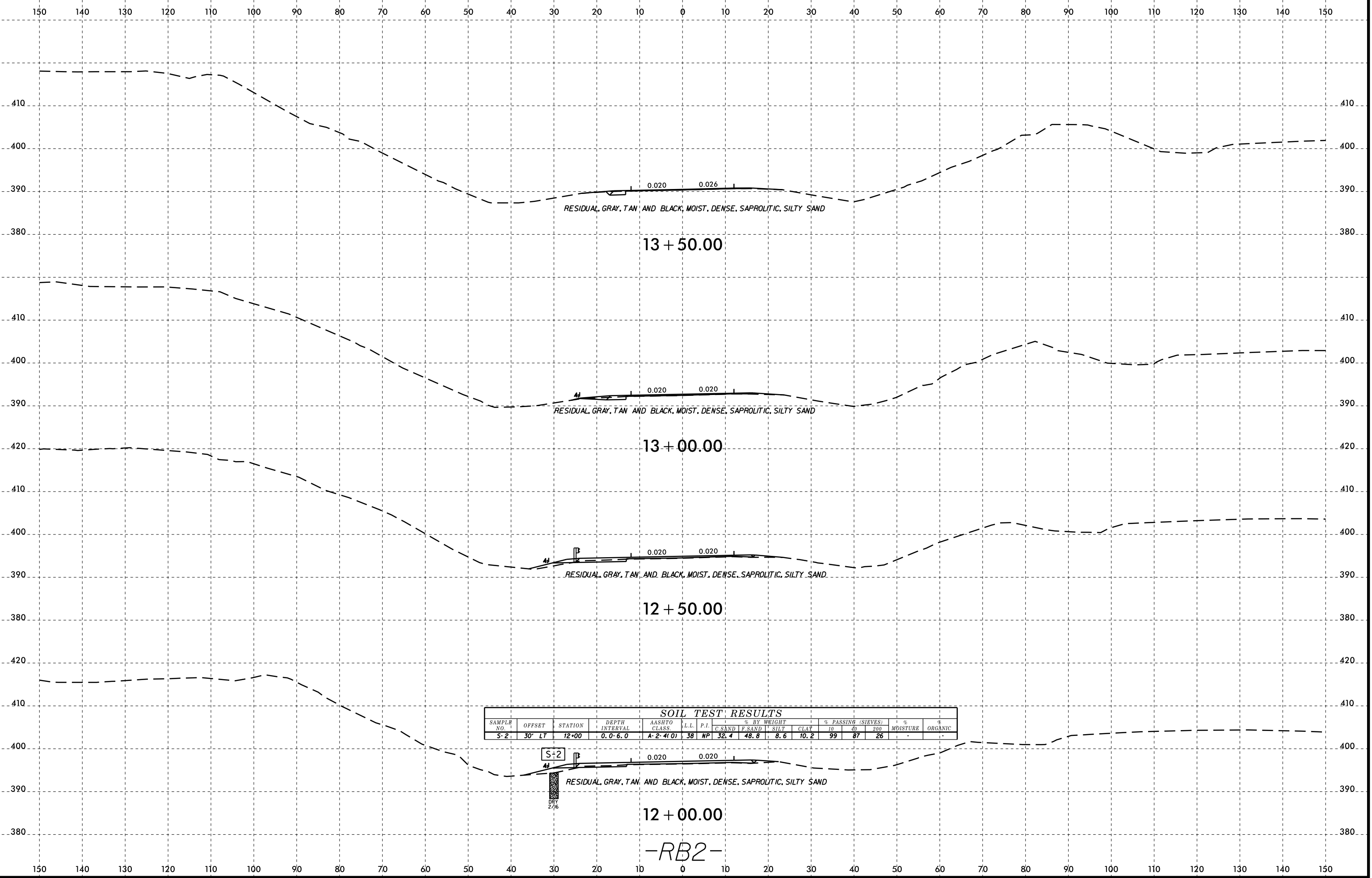


SOIL TEST RESULTS

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





RESIDUAL, GRAY, TAN AND BLACK, MOIST, DENSE, SAPROLITIC, SILTY SAND

13 + 50.00

RESIDUAL, GRAY, TAN AND BLACK, MOIST, DENSE, SAPROLITIC, SILTY SAND

13 + 00.00

RESIDUAL, GRAY, TAN AND BLACK, MOIST, DENSE, SAPROLITIC, SILTY SAND

12 + 50.00

RESIDUAL, GRAY, TAN AND BLACK, MOIST, DENSE, SAPROLITIC, SILTY SAND

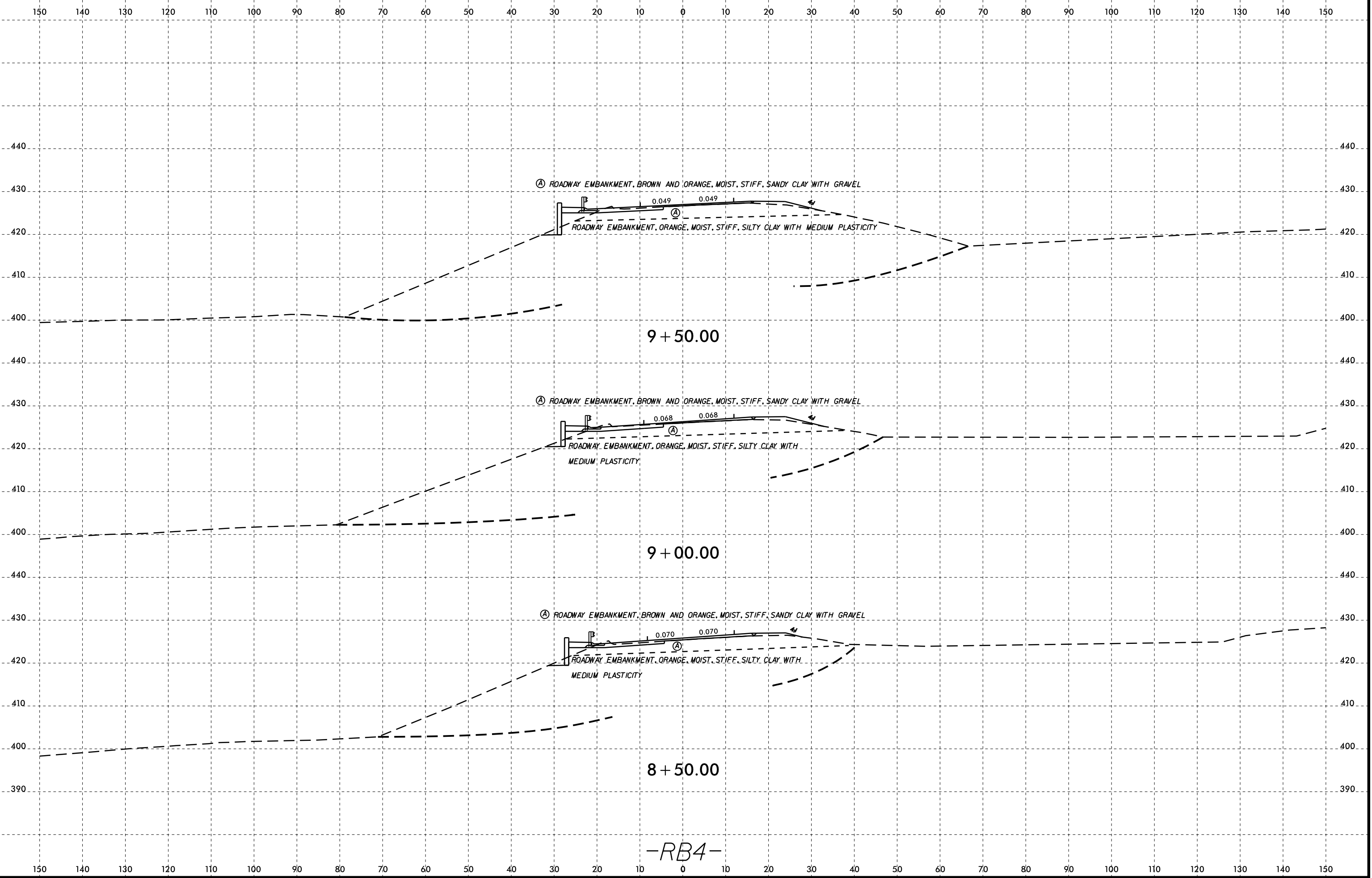
12 + 00.00

-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	-	-

S-2

DRY 2/16



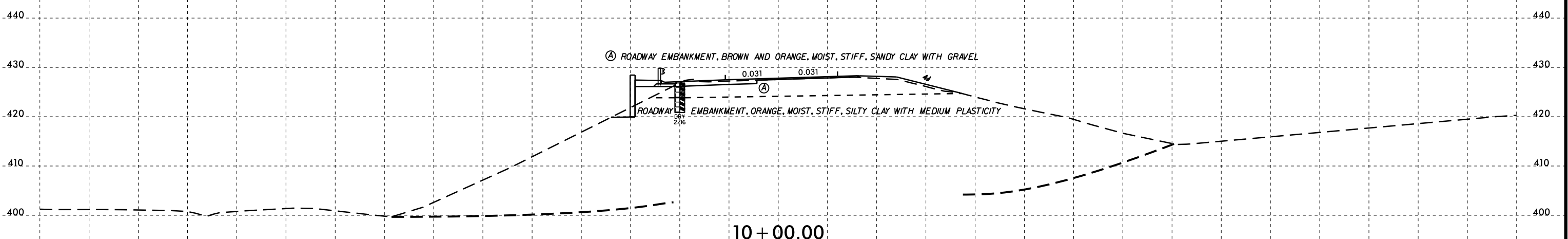
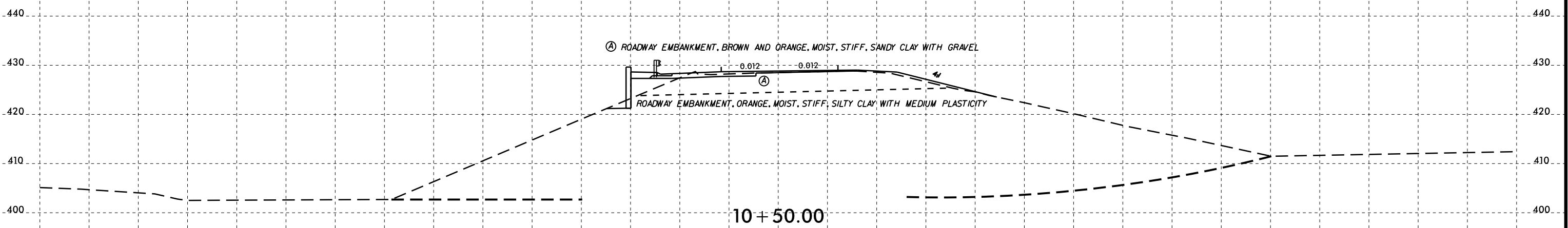
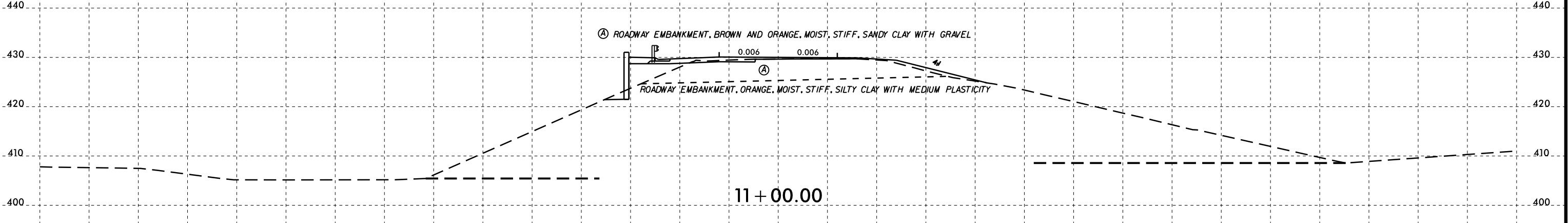
9 + 50.00

9 + 00.00

8 + 50.00

-RB4-

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

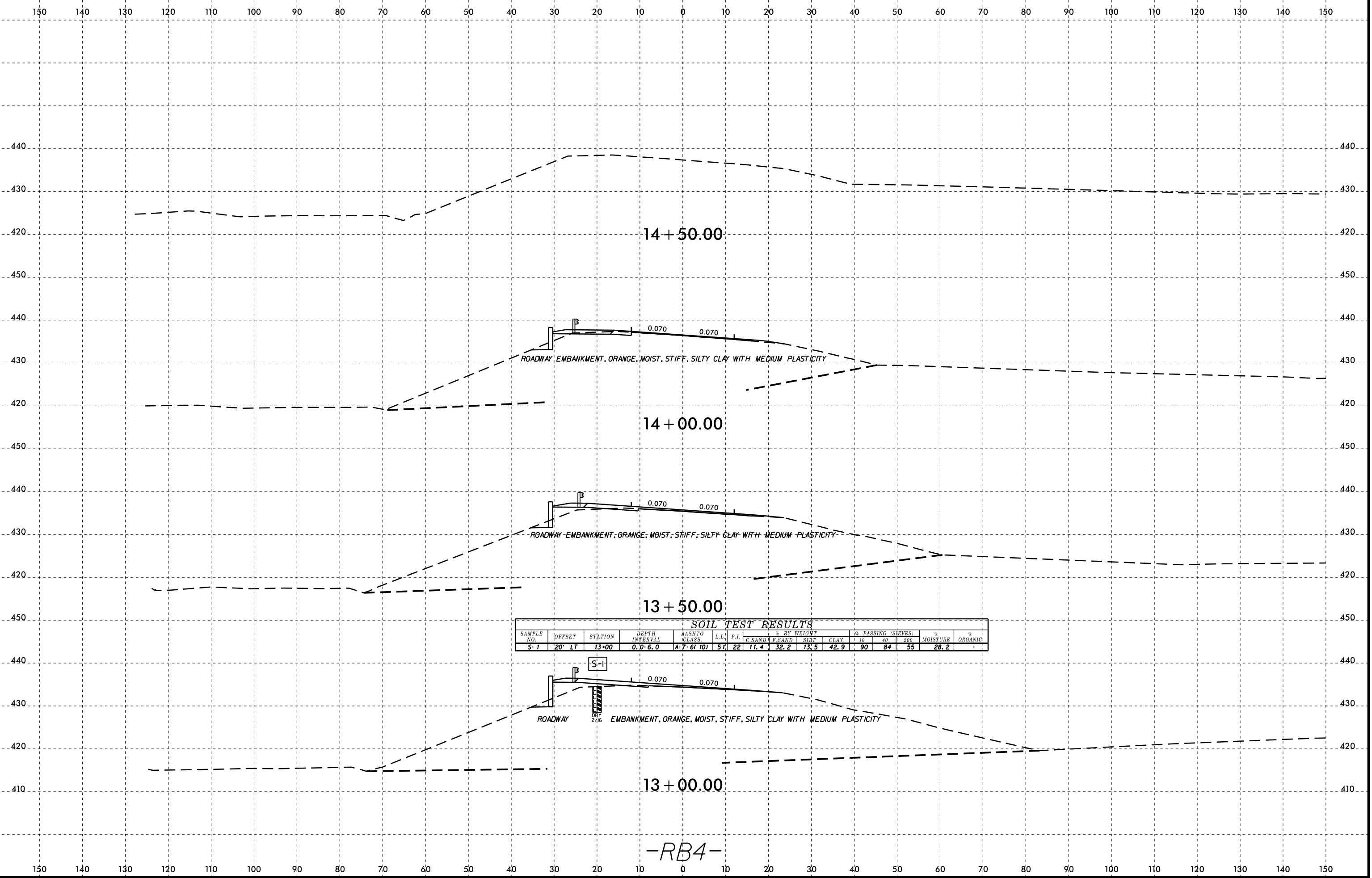


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-RB4-

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8/23/99



14 + 50.00

14 + 00.00

13 + 50.00

13 + 00.00

-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	-

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