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REFERENCE: U-3109B

PROJECT: 34900

SEE SHEET 3 FOR PLAN SHEET LAYOUT  
AT TIME OF INVESTIGATION

**CONTENTS**

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>	<u>PROFILE</u>
-L-	196+00 - 271+20	4 - 9	12 - 14
-LX-	10+00 - 18+90.85	4 - 5	16
-Y2I-	10+00 - 30+00	8, 10 - II	-
-Y22-	10+00 - 25+60.57	9-10	-
-Y2IREV-	10+45.02 - 21+75	8, 10 - II	15
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**CROSS SECTIONS**

<u>LINE</u>	<u>STATION</u>	<u>SHEETS</u>
-L-	195+50 - 271+50	17 - 55

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

**ROADWAY**  
**SUBSURFACE INVESTIGATION**

COUNTY ALAMANCE  
PROJECT DESCRIPTION NC 119 RELOCATION FROM  
NORTH OF SR 1921 (MEBANE ROGERS/STAGE  
COACH ROAD) TO SOUTH OF SR 1918 (MRS.  
WHITE LANE)

**INVENTORY - REVISED**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3109B	1	57

**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.

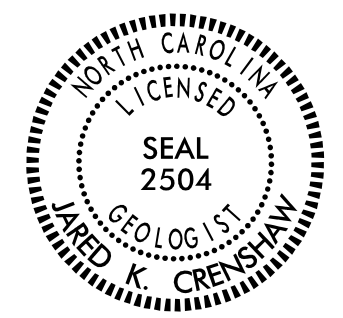
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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.K. CRENSHAW  
CATLIN INC.

INVESTIGATED BY J.K. CRENSHAW  
DRAWN BY J.K. CRENSHAW  
CHECKED BY E. HOWEY  
SUBMITTED BY B.D. KEANEY  
DATE MARCH 2018



DocuSigned by:  
Jared K. Crenshaw, 6/24/2018

3AB1C06A82EE4F1 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

Table with columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, ANGULARITY OF GRAINS, MINERALOGICAL COMPRESSION, COMPRESSIBILITY, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, EQUIPMENT USED ON SUBJECT PROJECT, ROCK HARDNESS, FRACTURE SPACING, BEDDING, INDURATION.

05/30/17

See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Symbols  
See 1C Sheet Series For Survey Control

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

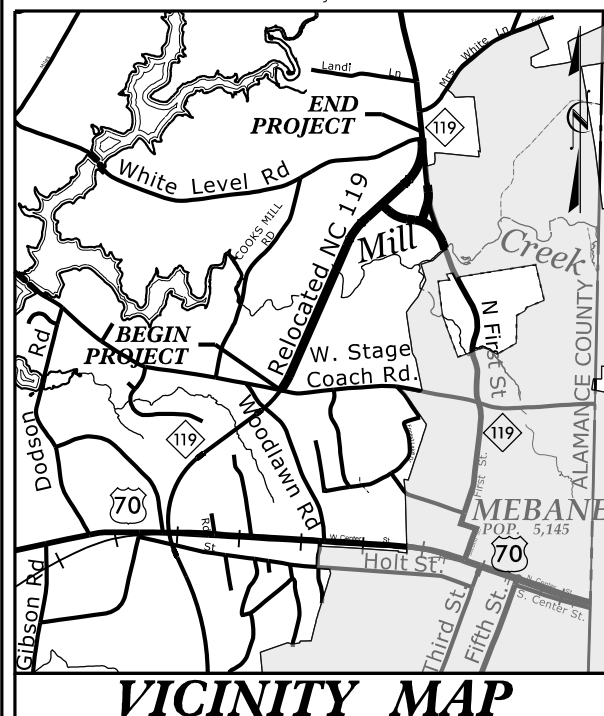
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3109B	3	57
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34900.1.FR3	STP-0119(11)	PE	
34900.2.3	STP-0119(8)	R/W	
34900.2.3	STP-0119(8)	UTILITIES	

## ALAMANCE COUNTY

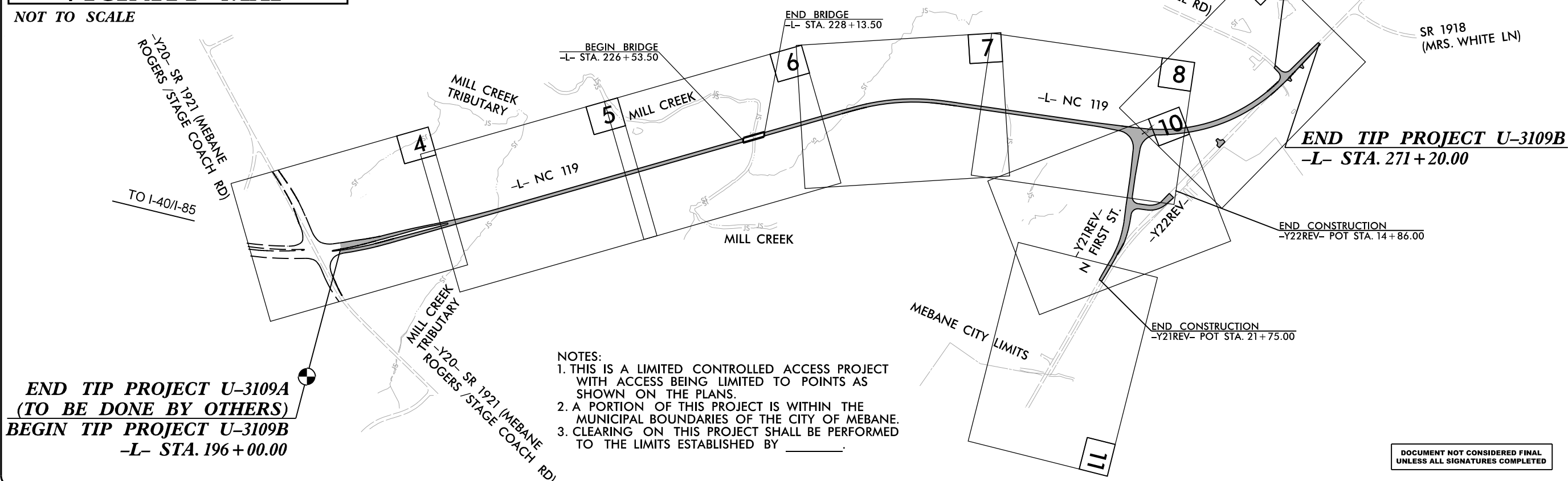
**LOCATION: NC 119 RELOCATION FROM NORTH OF  
SR 1921 (MEBANE ROGERS/STAGE COACH ROAD)  
TO SOUTH OF SR 1918 (MRS. WHITE LANE)**

**TYPE OF WORK: GRADING, PAVING, DRAINAGE, SIGNALS, AND STRUCTURE**

**TIP PROJECT: U-3109B**

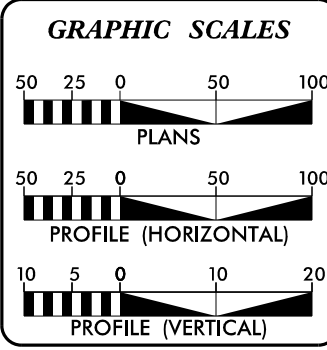


**ROW/CFI PLANS**



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**CONTRACT:**



**DESIGN DATA**

ADT 2018 =	8,809
ADT 2038 =	10,983
K =	9 %
D =	65 %
T =	5 % *
V =	50 MPH
(* TTST = 4% + DUAL 1%)	
FUNC CLASS =	MAJOR COLLECTOR REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT U-3109B	1.394 mi
LENGTH STRUCTURE TIP PROJECT U-3109B	0.030 mi
TOTAL LENGTH OF TIP PROJECT U-3109B	1.424 mi

**PLANS PREPARED BY:**

**DRMP**  
ENGINEERS PLANNERS SCIENTISTS

DRMP, INC.  
5950 FAIRVIEW ROAD, SUITE 320  
CHARLOTTE, NORTH CAROLINA 28210  
(704) 333-2289  
NC LICENSE NO. C-2213

**FOR DIVISION OF HIGHWAYS**

**2018 STANDARD SPECIFICATIONS**

**RIGHT OF WAY DATE:**  
AUGUST 30, 2017

**LETTING DATE:**  
JULY 17, 2018

**CHRISTOPHER K. HAIRE, PE**  
PROJECT ENGINEER

**MICHAEL D. HAGE, PE**  
PROJECT DESIGN ENGINEER

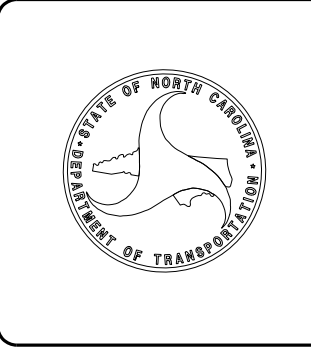
**NCDOT CONTACT:**  
**TATIA L. WHITE, PE, PLS**  
SENIOR PROJECT MANAGER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.



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November 3, 2017  
REVISED March 29, 2018

**STATE PROJECT: 34900.1.FR3**

**TIP NUMBER: U-3109B**

**COUNTY: ALAMANCE**

**DESCRIPTION: NC 119 Relocation from North of SR 1921 (Mebane Rogers/Stage Coach Road) to South of SR 1918 (Mrs. White Lane)**

**SUBJECT: Geotechnical Roadway Inventory Report - REVISED**

### PROJECT DESCRIPTION

The U-3109B project is designed to improve traffic flow and ease congestion in the City of Mebane, NC. The project consists of realigning a portion NC 119 around the City of Mebane, from south of US 70 to south of SR 1918. The proposed section of NC 119 within the area addressed in this report begins at Mebane Rogers/Stage Coach Road and extends to existing NC 119 south of Mrs. White Lane. This project adjoins currently ongoing roadway construction of NC 119, south of the corridor addressed in this report. Since the original investigation dated November 2017, -Y21- and -Y22- have been realigned. Hand auger borings were advanced on 3/22/18 along the realignments (-Y21REV- and -Y22REV-) to provide additional information; these borings are shown on the attached plan and profiles.

The field investigation was conducted in July and August of 2017 using an ATV mounted CME 550 and a track mounted CME 45B, both with automatic hammers. Standard Penetration Tests (SPT) were performed at selected locations. Borings were advanced with hollow stem augers and mud rotary equipment along the project corridor. Representative soil samples were collected and forwarded to an approved testing facility for soil quality analysis, moisture content, and AASHTO classification. Rock soundings were advanced with hollow stem augers in areas where crystalline rock was suspected to occur above the proposed grade.

#### The following alignments were investigated

Line	Station		Length (ft)	
-L-	196+00	to	271+20	7,520
-Y21REV-	10+00	to	21+75	1,175
-Y22REV-	10+00	to	13+40	340
			Total =	9,035 (~1.7 miles)

### PHYSIOGRAPHY AND GEOLOGY

#### Physiography and Geology

The project is located in the Piedmont Physiographic Province. Geologically, it is located in the Carolina Slate Belt. Soils in this area generally consist of residual sands, silts, and clays which can be saprolitic. Intermittently outcropping, but typically underlying the residual soils are metamorphosed felsic and mafic volcanic rock formations. These Cambrian rock formations consist of basaltic, and dacitic to rhyolitic flows and tuffs. Topography along the project corridor is gently rolling, traversing existing pastures and passing through a wooded area to the north of Mill Creek. Natural ground elevations range from 636± feet above sea level near the existing NC 119 roadway to 539± feet above sea level at the bottom of Mill Creek.

#### Soil and Rock Properties

Soil and rock encountered along the project corridor are divided into three categories based on origin: residual soils, weathered rock, and crystalline rock.

Residual soils consisting of medium dense to dense, coarse to fine sand and clayey to silty sand (A-1-b, A-2-4, A-2-6), soft to hard silt (A-4, A-5), and soft to hard, sandy and silty clay (A-6, A-7-5, A-7-6) were encountered throughout the area. These soils range in moisture from dry to moist, and vary in thickness from less than one foot to at least 42 feet. Within the cohesive residual soils, moisture contents ranged from 25.3% to 42.7%.

Weathered rock consisting of gray metavolcanic tuffs and flows was encountered at several locations along the corridor. Weathered rock layers vary in thickness from less than one foot to at least 13 feet, with the top of weathered rock ranging in elevation from ±539 feet to ±616 feet above sea level.

Crystalline rock was identified at some points along the corridor by split spoon refusal; however, no coring has been done at the time this report was written. The fragments that were recovered in the split-spoon were of gray, brown, and orange metavolcanic rocks. The top of crystalline rock encountered along the project corridor ranged in elevation from ±526 feet to ±613 feet above sea level.

**Ground Water**

All SPT borings were left open for at least 24 hours to allow ground water levels within the borehole to equilibrate with the surrounding conditions. Ground water data were collected in July and August of 2017, during a time of normal precipitation. Ground water elevations generally varied with topography, and ranged in elevation from 624± feet to 541± feet above sea level.

**Areas of Special Geotechnical Interest**

- 1) Crystalline rock was encountered above or within approximately 6 feet of the proposed grade within some of the cut sections along the project corridor. Rock soundings were advanced to the top of crystalline rock or deeper than the proposed grade to evaluate the presence of crystalline rock within the cut section.

**Rock was encountered above or within 6 feet of proposed grade in the following sections**

Alignment	Begin Station	End Station
-L-	201+25	204+75
-L-	231+75	232+75

- 2) The following sections contain cohesive soils which have the potential to cause embankment and or subgrade issues during construction.

**Soils with Plasticity Indices higher than 26 were encountered in the following sections**

Alignment	Begin Station	End Station
-L-	196+25	201+25
-L-	204+25	206+75
-L-	208+75	213+25

- 3) Ponds occur in the following areas within or near the proposed right of way.

Alignment	Station	Offset
-L-	219+20	±250' LT
-L-	253+00	±300' RT
-L-	268+00	±400' LT

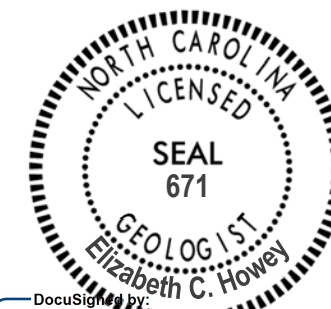
- 4) Ephemeral streams were encountered along the project corridor. During the time of the investigation there was little to no running water in the stream beds listed below.

Alignment	Station	Offset
-L-	234+46 & 235+00	CL
-L-	246+37	CL

Sincerely,  
HDR ENGINEERING, INC.



DocuSigned by:  
*Jared K. Crenshaw, L.G., P.E.* 2018  
Jared K. Crenshaw, L.G., P.E.  
Professional Geologist



DocuSigned by:  
*Elizabeth C. Howey, L.G., P.E.* 2018  
Elizabeth C. Howey, L.G., P.E.  
Senior Geotechnical Project Manager



PROJECT REFERENCE NO. <b>U-3109B</b>	SHEET NO. <b>4</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

PLANS PREPARED BY:  
 **DRMP**  
DRMP, INC. 5950 FAIRVIEW ROAD, SUITE 320 CHARLOTTE, NC 28215 NC LICENSE NO. C-2213 (704) 332-2209



**END TIP PROJECT U-3109A  
 (TO BE DONE BY OTHERS)  
 BEGIN TIP PROJECT U-3109B  
 -L- POT Sta. 196 + 00.00**

-LX- POC Sta. 10+00.00 =  
 -L- POS Sta. 199+09.62, 15' LT

-L- CS Sta. 198+48.15

-L- ST Sta. 200+39.64

-LX- PRC Sta. 13+91.04

RESIDUAL  
 BEGIN C/A  
 BEGIN FENCE

RESIDUAL

RESIDUAL

RESIDUAL

-L- +54.02  
 EXIST RW  
 BEGIN C/A  
 BEGIN FENCE

-L- +14.93  
 EXIST RW

8/17/99

REVISIONS

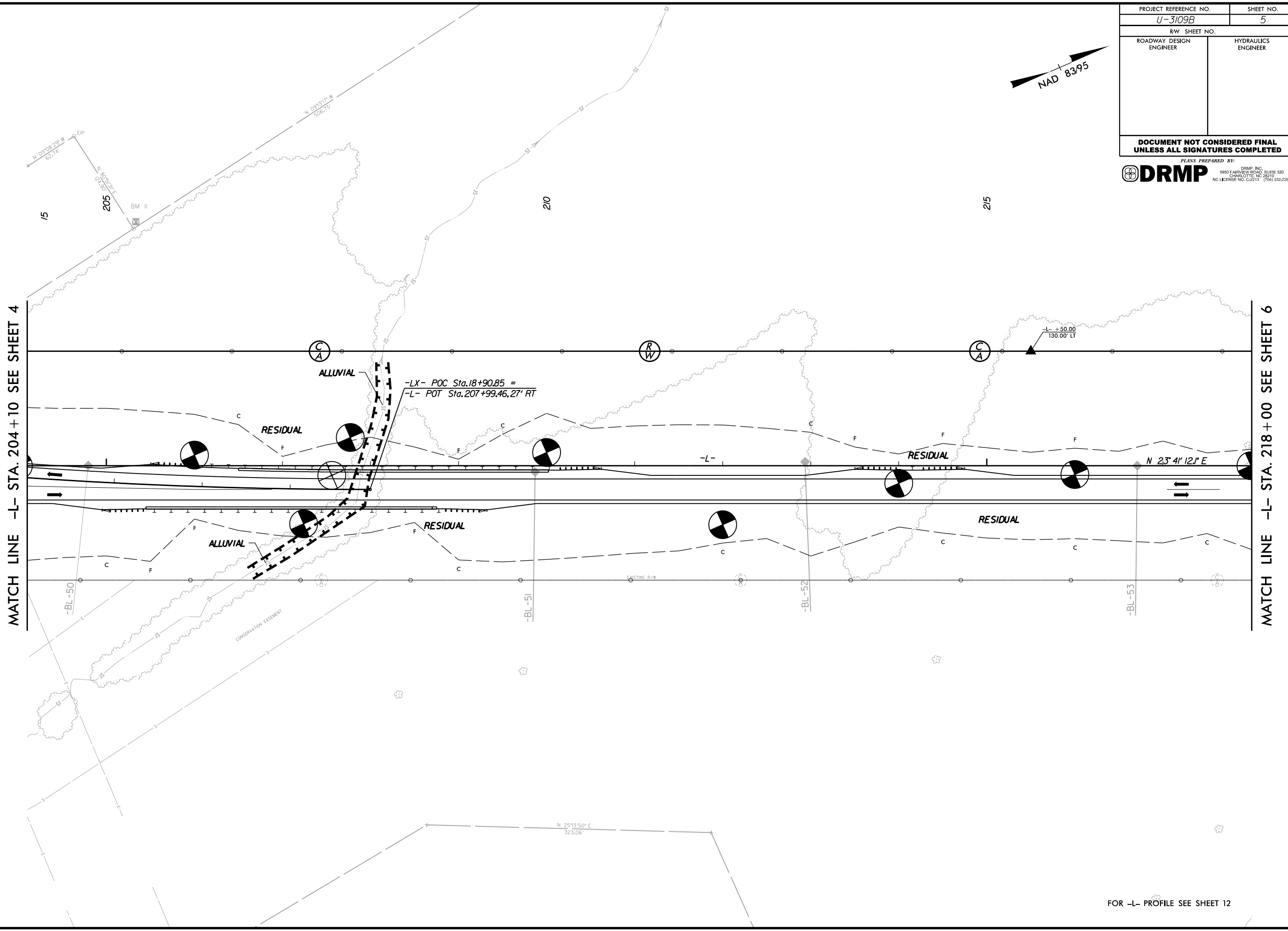
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MATCH LINE -L- STA. 204 + 10 SEE SHEET 5

FOR -L- PROFILE SEE SHEET 12

8/17/99

PROJECT REFERENCE NO. <i>U-3109B</i>	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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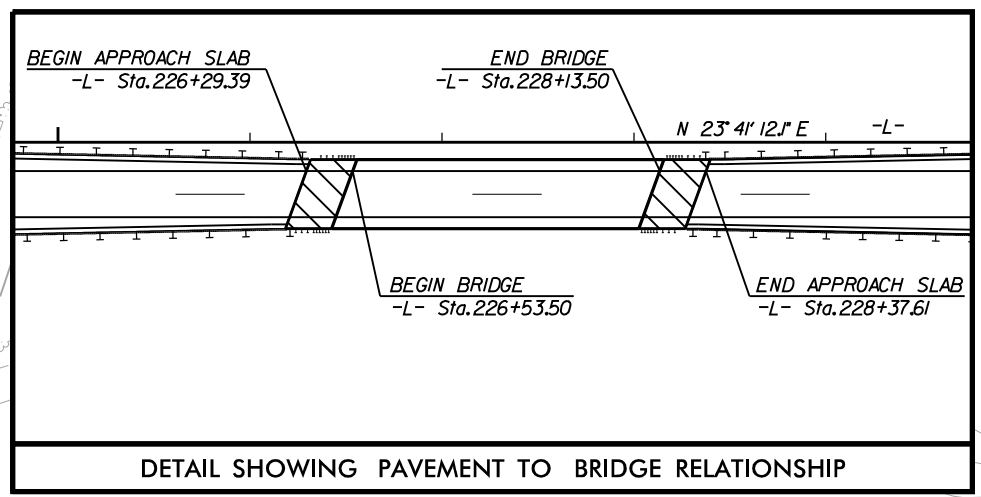
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FOR -L- PROFILE SEE SHEET 12



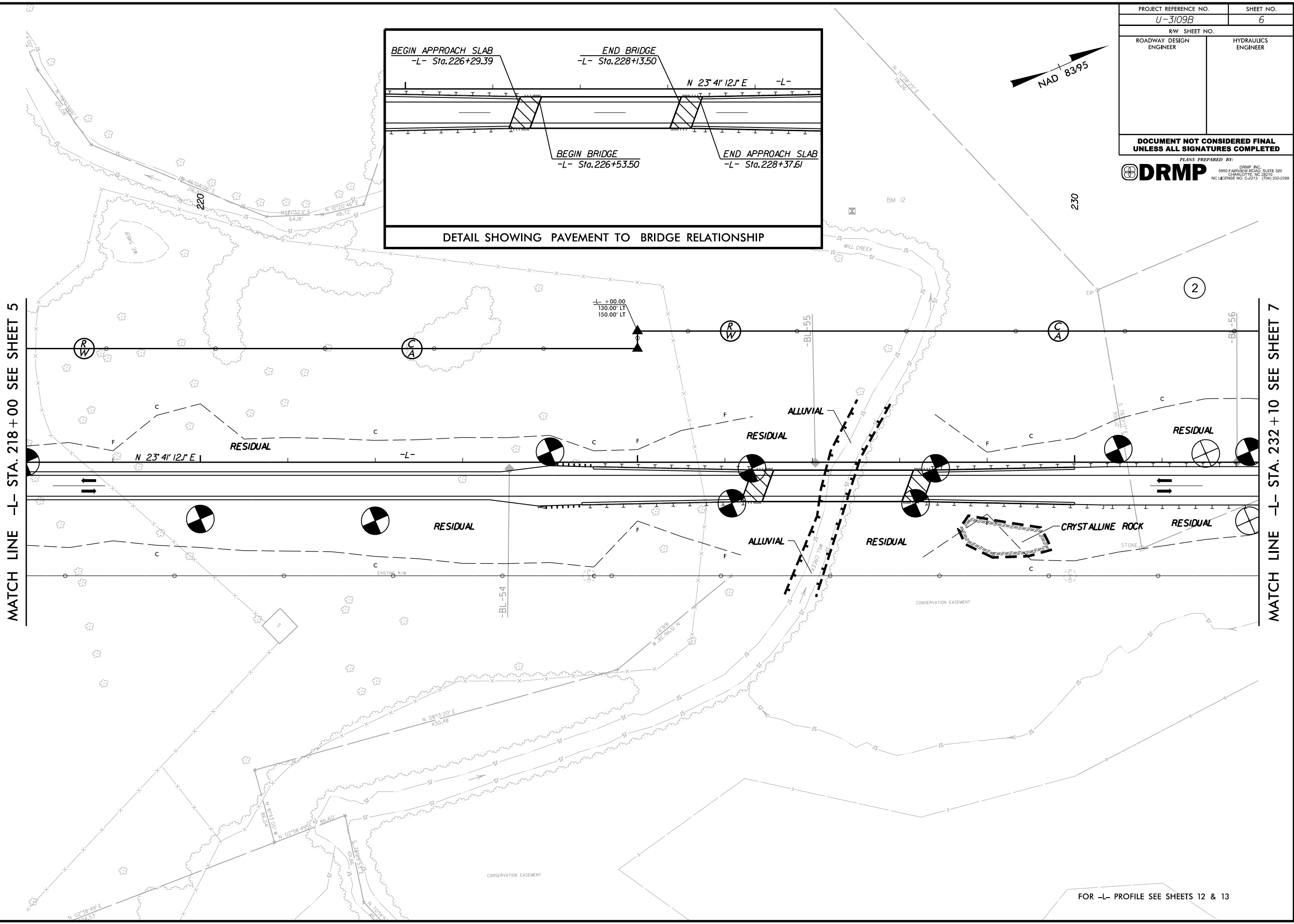
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PROJECT REFERENCE NO. <b>U-3109B</b>	SHEET NO. <b>6</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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<b>DRMP</b>	
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MATCH LINE -L- STA. 218+00 SEE SHEET 5

MATCH LINE -L- STA. 232+10 SEE SHEET 7



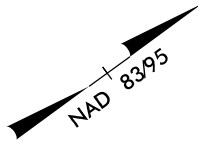
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FOR -L- PROFILE SEE SHEETS 12 & 13

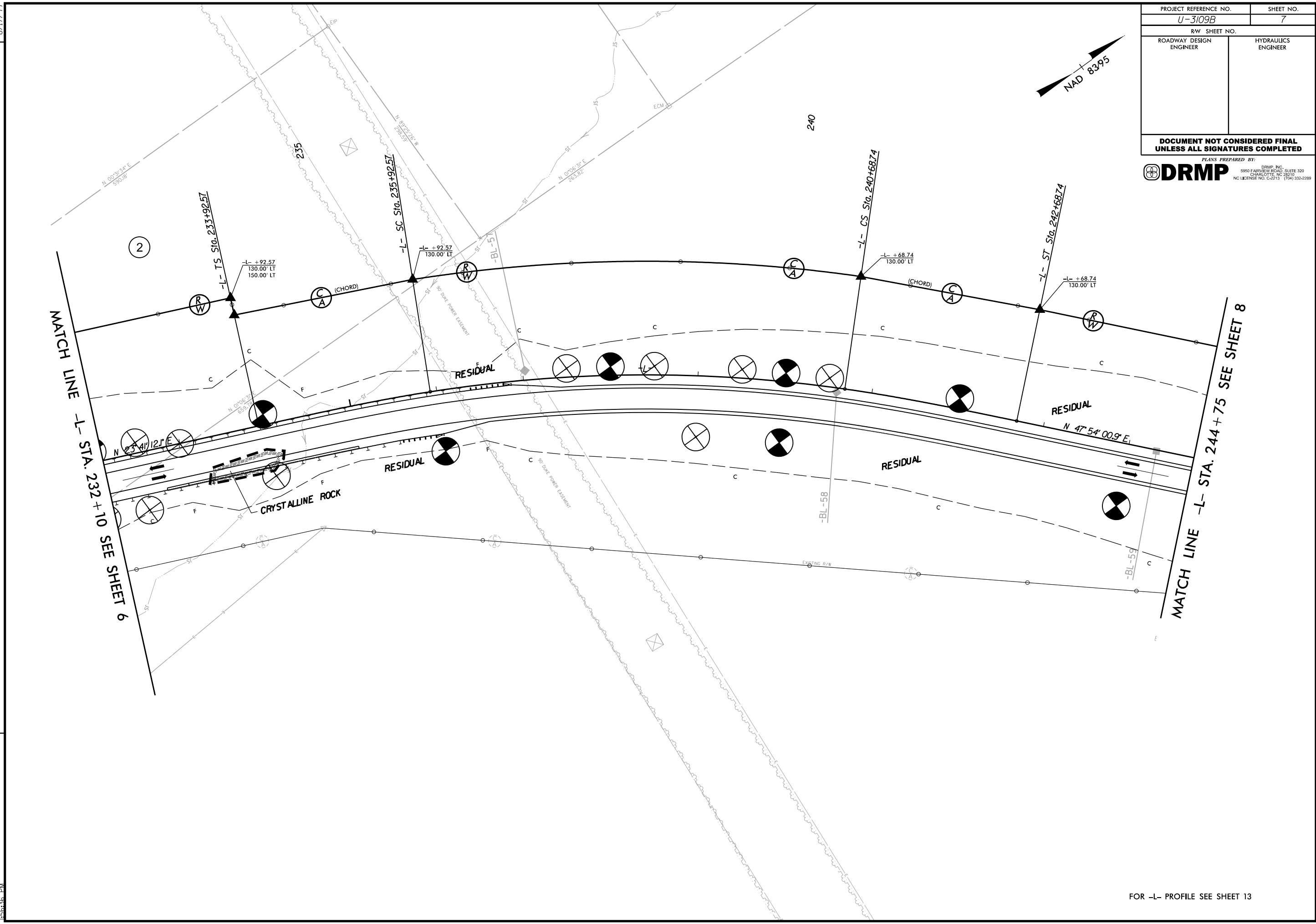
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RW SHEET NO.	
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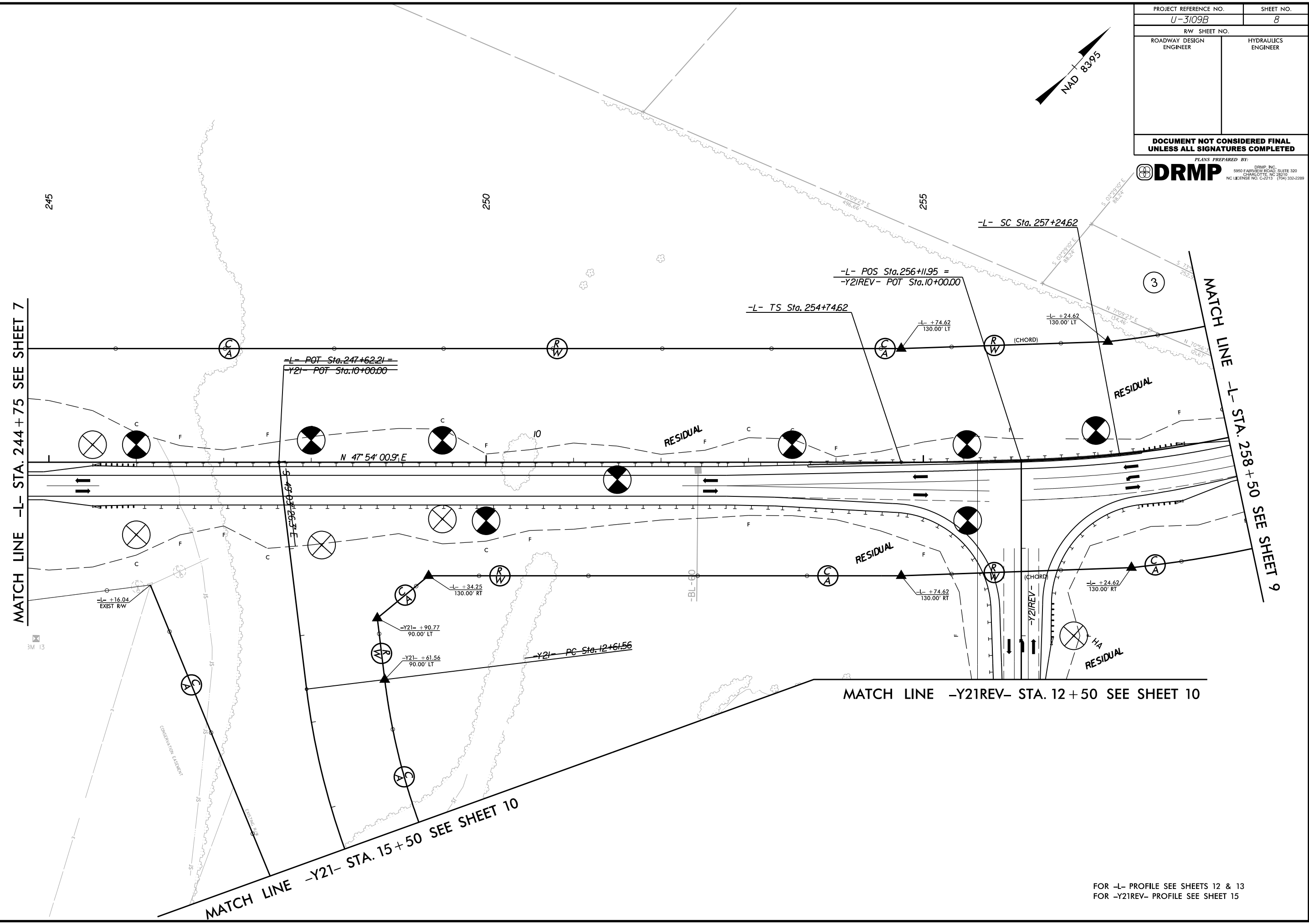
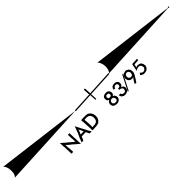
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FOR -L- PROFILE SEE SHEET 13

8/17/99

PROJECT REFERENCE NO. <b>U-3109B</b>		SHEET NO. <b>8</b>	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			
PLANS PREPARED BY: <b>DRMP</b>			
		<small>DRMP, INC. 9550 FAIRVIEW ROAD, SUITE 300 CHARLOTTE, NC 28215 NC LICENSE NO. C-2113 (704) 332-2209</small>	



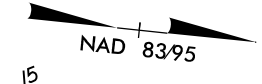
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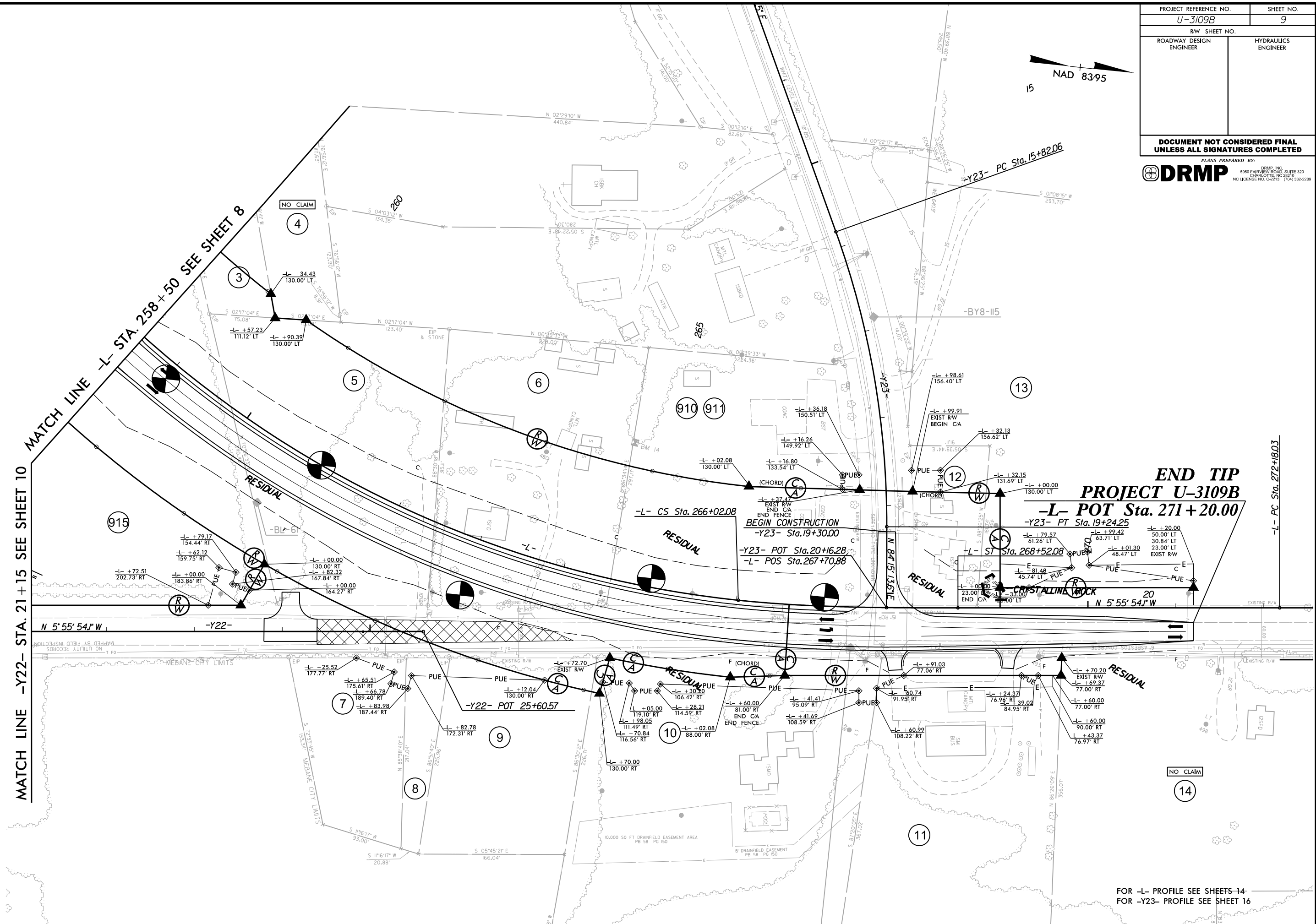
FOR -L- PROFILE SEE SHEETS 12 & 13  
 FOR -Y21REV- PROFILE SEE SHEET 15

PROJECT REFERENCE NO. <b>U-3109B</b>	SHEET NO. <b>9</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

PLANS PREPARED BY:  
 **DRMP**  
 DRMP, INC.  
 9550 FAIRVIEW ROAD, SUITE 300  
 CHARLOTTE, NC 28215  
 NC LICENSE NO. C-215 (T&E) 332-2209



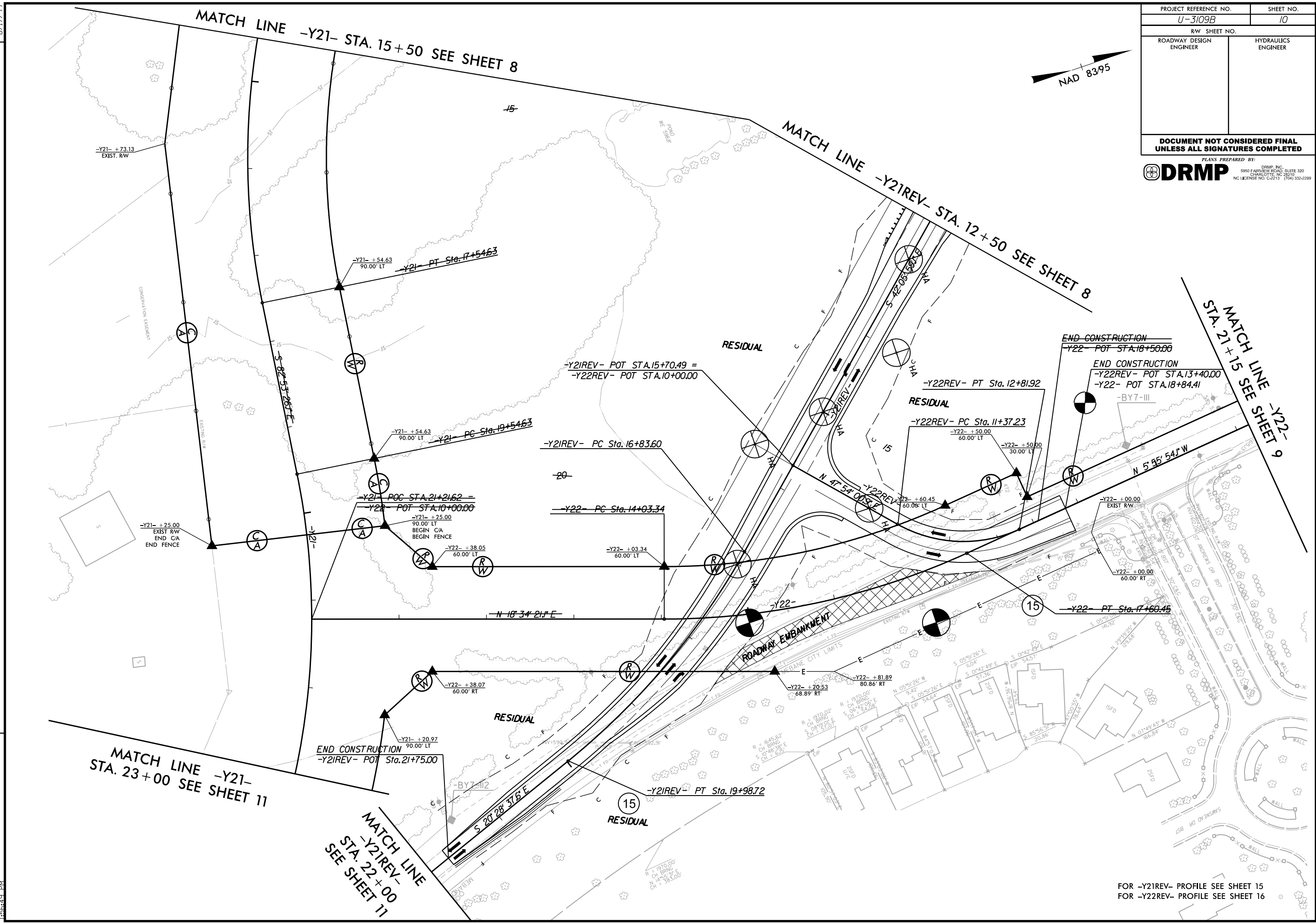
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 02/07/18 - R/W REVISION: REVISED PROPOSED R/W FROM -L- STA. 259+34.43 TO STA. 259+90.39 AND ELIMINATED A CLAIM ON PARCEL 4; REMOVED PROPOSED R/W AND ELIMINATED A CLAIM ON PARCEL 14. - NEW  
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FOR -L- PROFILE SEE SHEETS 14  
 FOR -Y23- PROFILE SEE SHEET 16

PROJECT REFERENCE NO. U-3109B	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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DRMP, INC. 9550 FAIRVIEW ROAD, SUITE 320 CHARLOTTE, NC 28215 NC LICENSE NO. C-2213 (704) 332-2209



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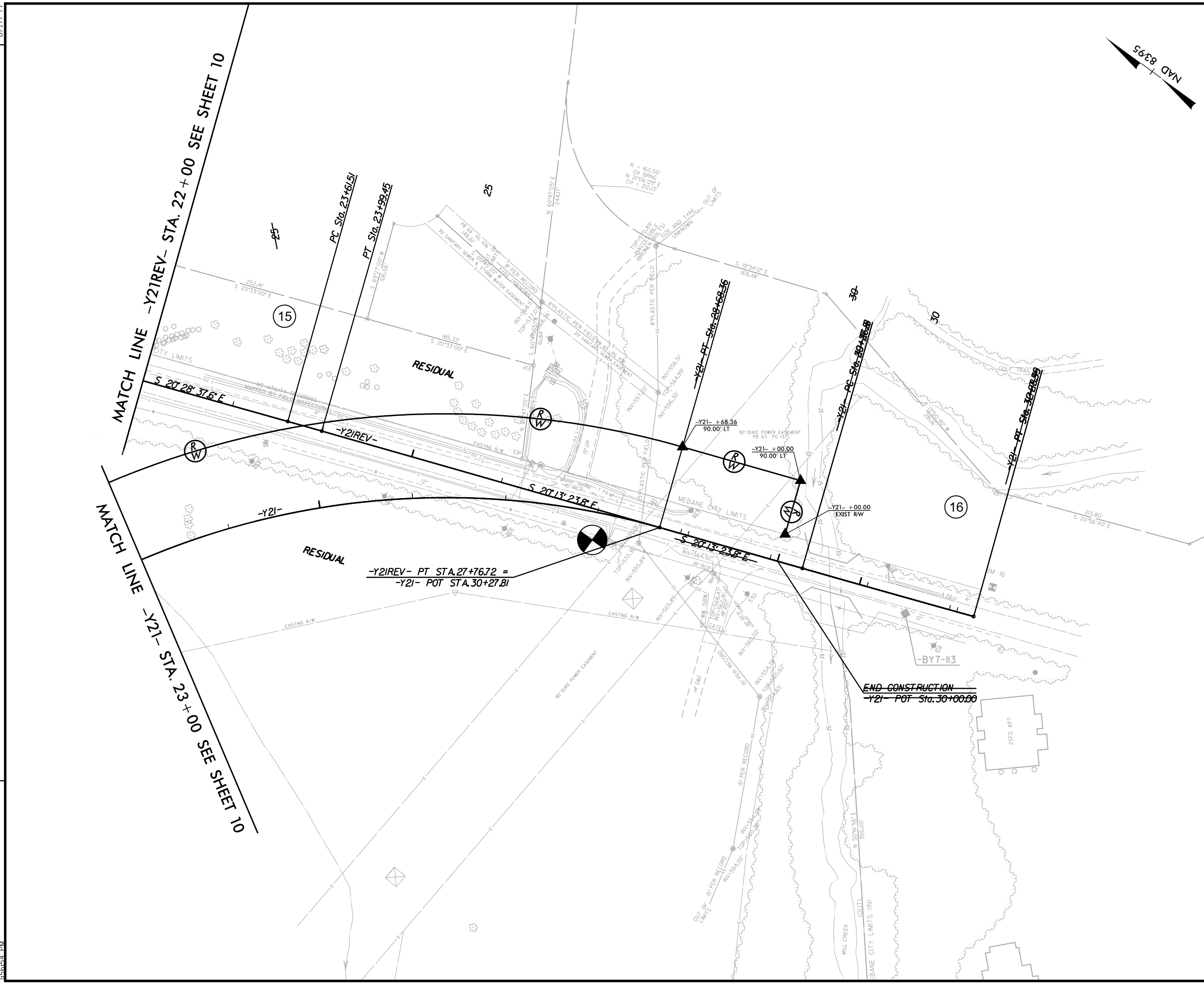
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FOR -Y21REV- PROFILE SEE SHEET 15  
 FOR -Y22REV- PROFILE SEE SHEET 16

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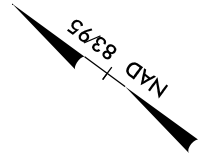
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PROJECT REFERENCE NO. <b>U-3109B</b>	SHEET NO. <b>11</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

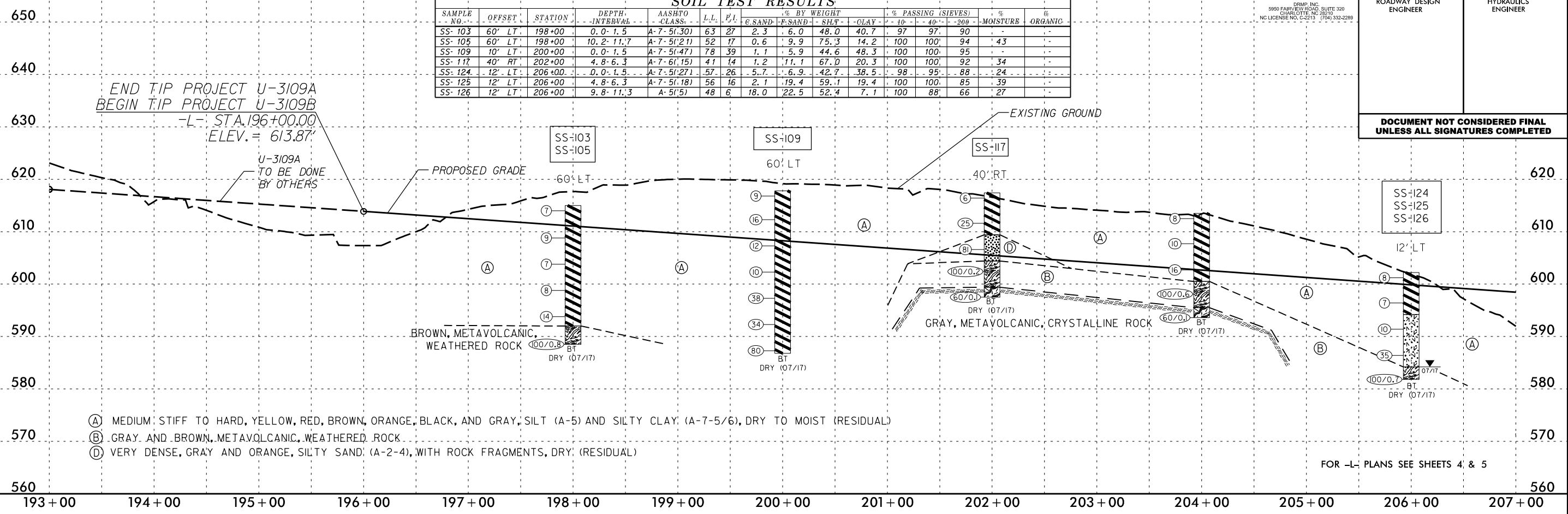
PLANS PREPARED BY:  
 **DRMP**  
 DRMP, INC.  
 5950 FAIRVIEW ROAD, SUITE 320  
 CHARLOTTE, NC 28215  
 NC LICENSE NO. C-2213 (704) 332-2209



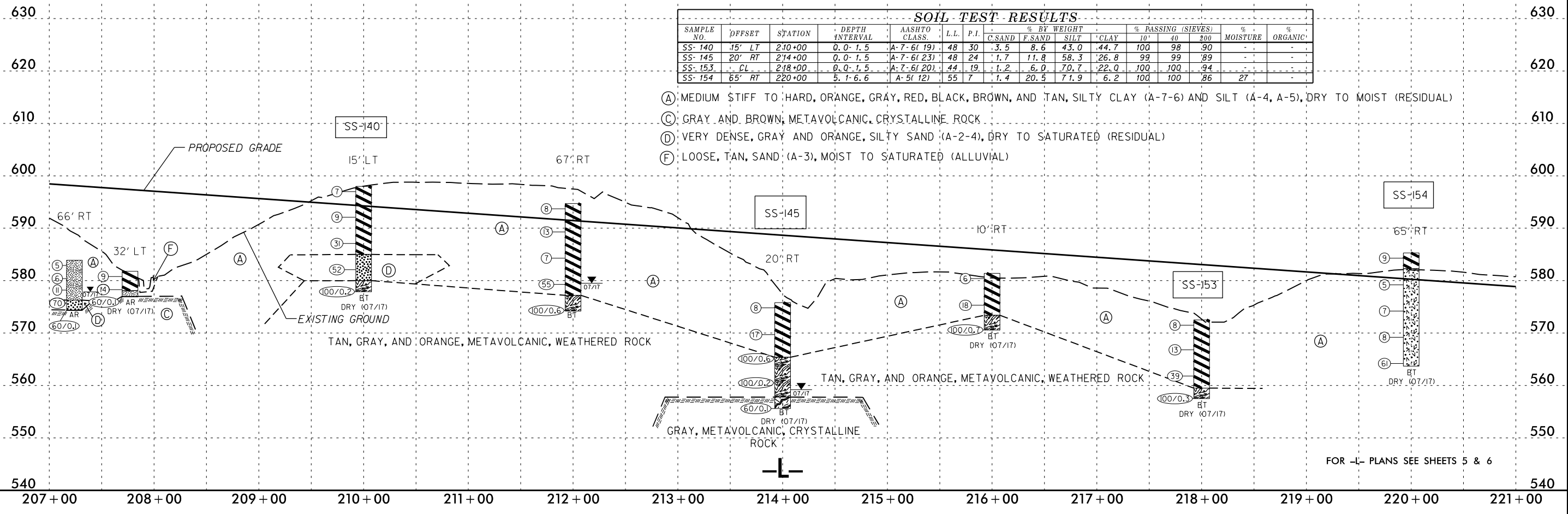


5/28/99

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'		
SS-103	60' LT	198+00	0.0-1.5	A-7-5(30)	63	27	2.3	6.0	48.0	40.7	97	97	90	-	-
SS-105	60' LT	198+00	10.2-11.7	A-7-5(21)	52	17	0.6	9.9	75.3	14.2	100	100	94	43	-
SS-109	10' LT	200+00	0.0-1.5	A-7-5(47)	78	39	1.1	5.9	44.6	48.3	100	100	95	-	-
SS-117	40' RT	202+00	4.8-6.3	A-7-6(15)	41	14	1.2	11.1	67.0	20.3	100	100	92	34	-
SS-124	12' LT	206+00	0.0-1.5	A-7-5(27)	57	26	5.7	6.9	42.7	38.5	98	95	88	24	-
SS-125	12' LT	206+00	4.8-6.3	A-7-5(18)	56	16	2.1	19.4	59.1	19.4	100	100	85	39	-
SS-126	12' LT	206+00	9.8-11.3	A-5(5)	48	6	18.0	22.5	52.4	7.1	100	88	66	27	-



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10'	40'	200'		
SS-140	15' LT	210+00	0.0-1.5	A-7-6(19)	48	30	3.5	8.6	43.0	44.7	100	98	90	-	-
SS-145	20' RT	214+00	0.0-1.5	A-7-6(23)	48	24	1.7	11.8	58.3	26.8	99	99	89	-	-
SS-153	CL	218+00	0.0-1.5	A-7-6(20)	44	19	1.2	6.0	70.7	22.0	100	100	94	-	-
SS-154	65' RT	220+00	5.1-6.6	A-5(12)	55	7	1.4	20.5	71.9	6.2	100	100	86	27	-



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5/28/99

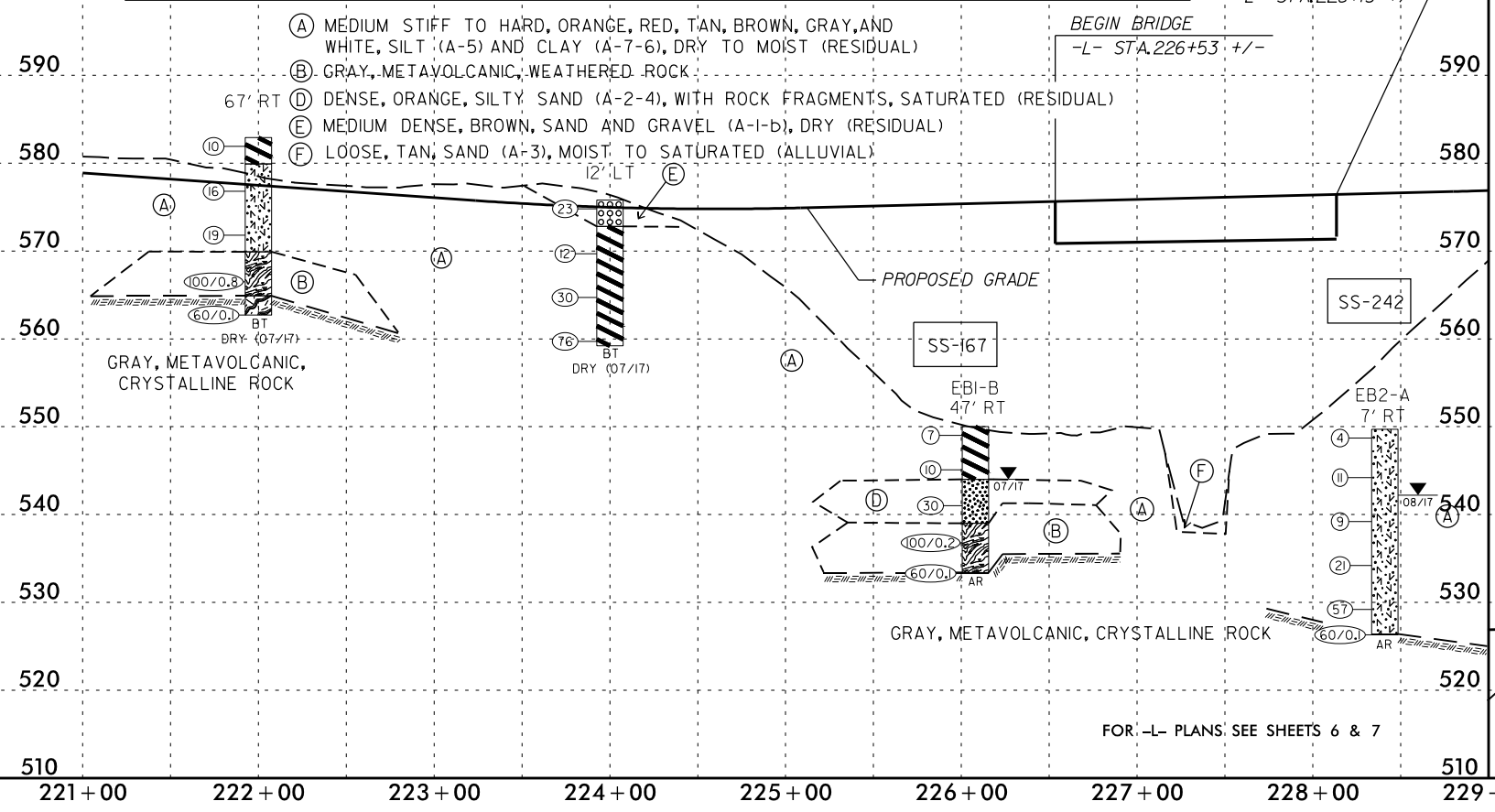
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-167	47' RT	226+08	3.9-5.4	A-7-6(24)	51	23	1.5	13.4	47.7	37.3	100	99	90	28	-
SS-242	7' RT	228+18	4.5-6.0	A-5(6)	48	19	4.6	7.3	43.5	43.8	99	96	90	30	-

FOR -L- PLANS SEE SHEETS 6 & 7

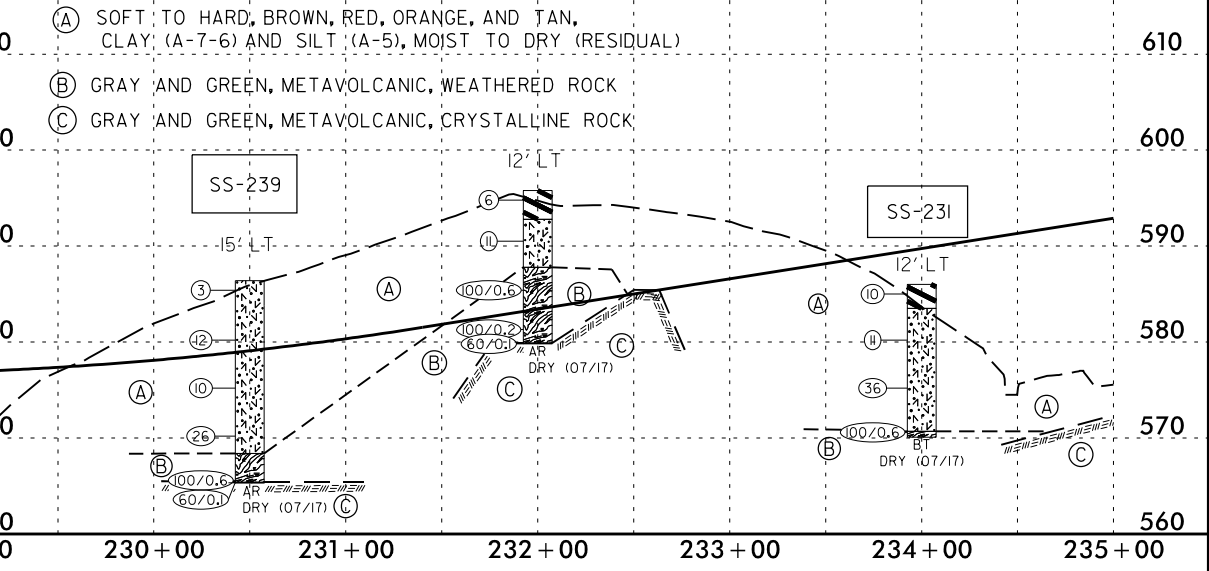
PLANS PREPARED BY:  
**DRMP**  
 5950 FAIRVIEW ROAD, SUITE 200  
 CHARLOTTE, NC 28215 (704) 332-2289

PROJECT REFERENCE NO. U-3109B	SHEET NO. 13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

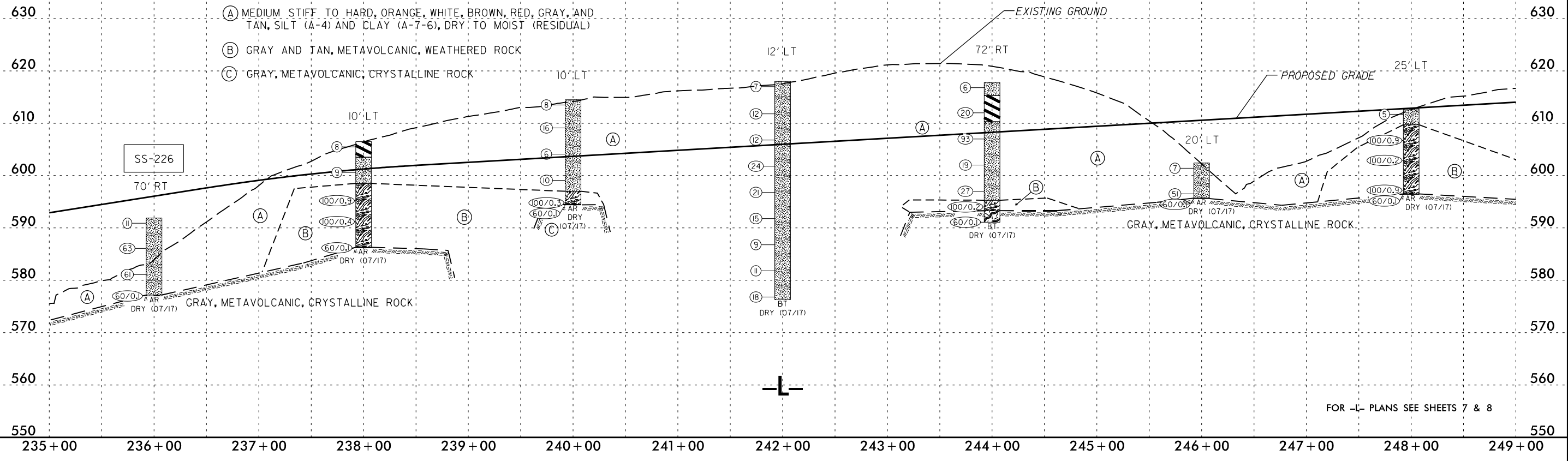
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-239	15' LT	230+50	10.2-11.7	A-5(13)	44	10	1.7	6.9	69.5	21.7	100	99	94	26	-
SS-231	12' LT	234+00	4.8-6.3	A-5(5)	44	2	7.9	12.2	66.4	13.5	100	95	84	29	-



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-226	70' RT	236+00	0.0-1.5	A-4(8)	36	10	10.1	8.3	54.5	22.4	95	89	79	16	-



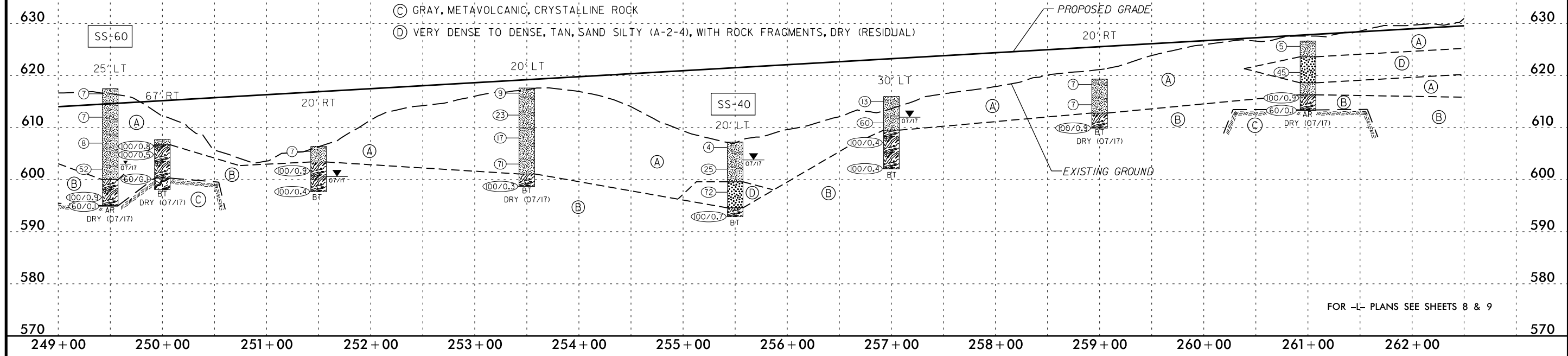
FOR -L- PLANS SEE SHEETS 7 & 8

4/16/2018 11:33:55 PM \\s10109B\_GEO\_pfl13.dgn

5/28/99

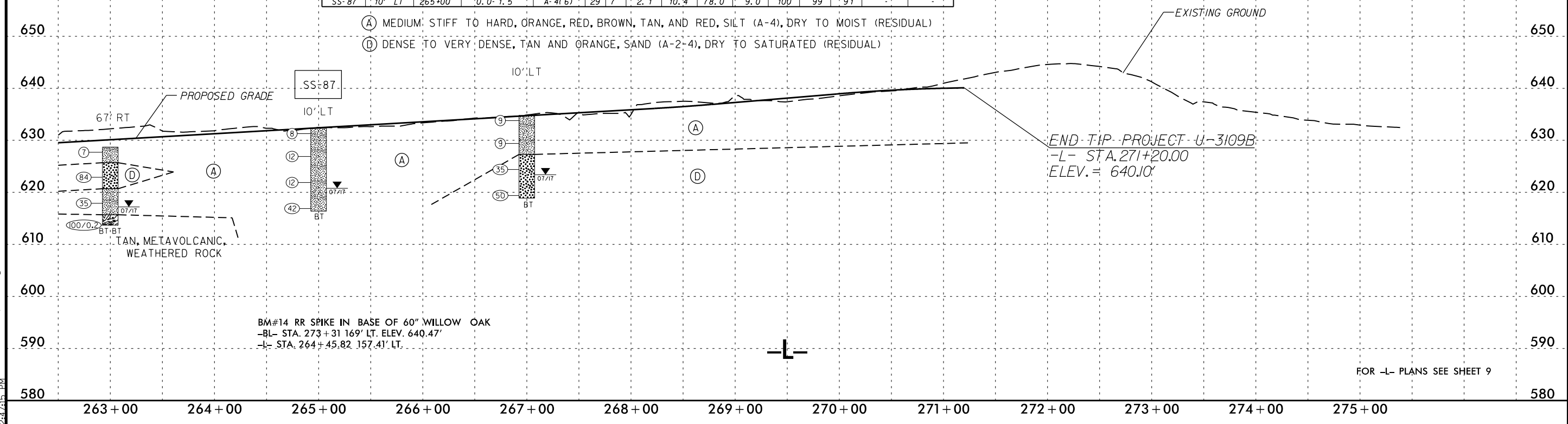
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	ORGANIC
							C SAND	F SAND	SILT	CLAY	10	40	200		
SS-60	25' LT	249+50	4.5-6.0	A-4(1)	33	NP	1.9	17.5	71.2	9.3	100	100	87	29	-
SS-40	20' LT	255+50	0.0-1.5	A-4(7)	31	9	4.3	14.6	51.8	27.0	98	97	84	-	-

- (A) MEDIUM STIFF TO HARD, ORANGE, GRAY, BLACK, TAN, RED, AND BROWN, SILT (A-4), DRY TO MOIST (RESIDUAL)
- (B) BROWN, RED, GRAY, ORANGE, GREEN, AND TAN, METAVOLCANIC, WEATHERED ROCK
- (C) GRAY, METAVOLCANIC, CRYSTALLINE ROCK
- (D) VERY DENSE TO DENSE, TAN, SAND SILTY (A-2-4), WITH ROCK FRAGMENTS, DRY (RESIDUAL)



SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	ORGANIC
							C SAND	F SAND	SILT	CLAY	10	40	200		
SS-87	10' LT	265+00	0.0-1.5	A-4(6)	29	7	2.1	10.4	78.0	9.0	100	99	91	-	-

- (A) MEDIUM STIFF TO HARD, ORANGE, RED, BROWN, TAN, AND RED, SILT (A-4), DRY TO MOIST (RESIDUAL)
- (B) DENSE TO VERY DENSE, TAN AND ORANGE, SAND (A-2-4), DRY TO SATURATED (RESIDUAL)



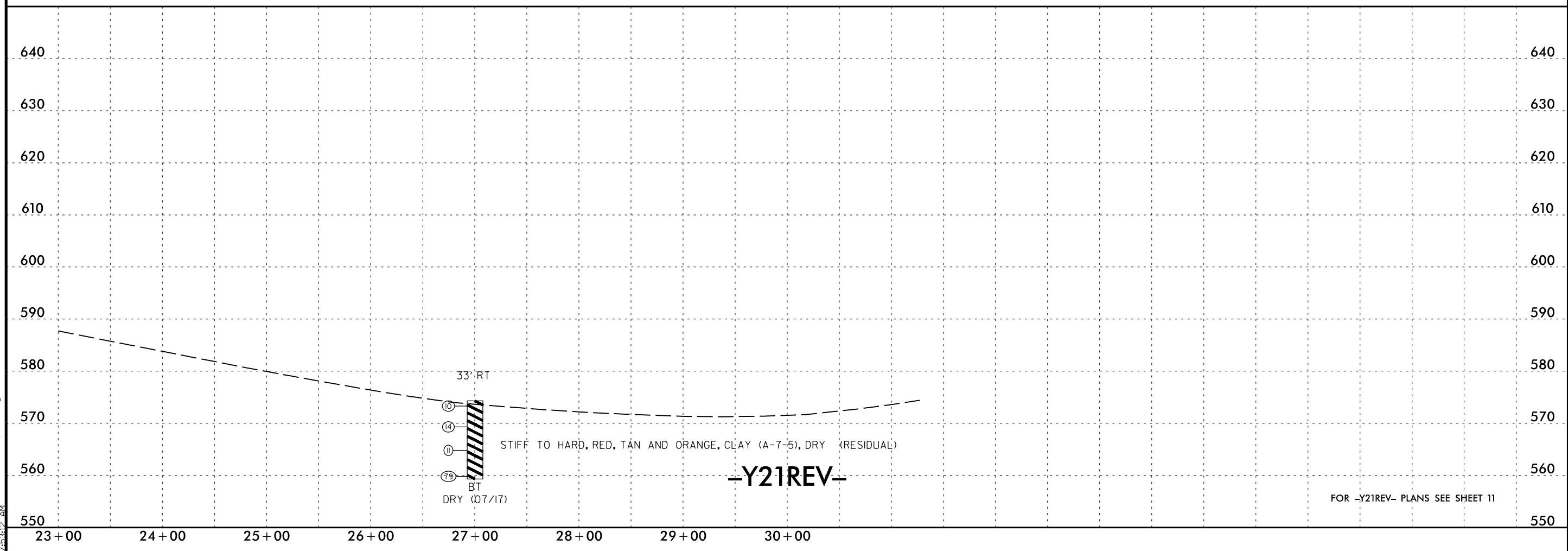
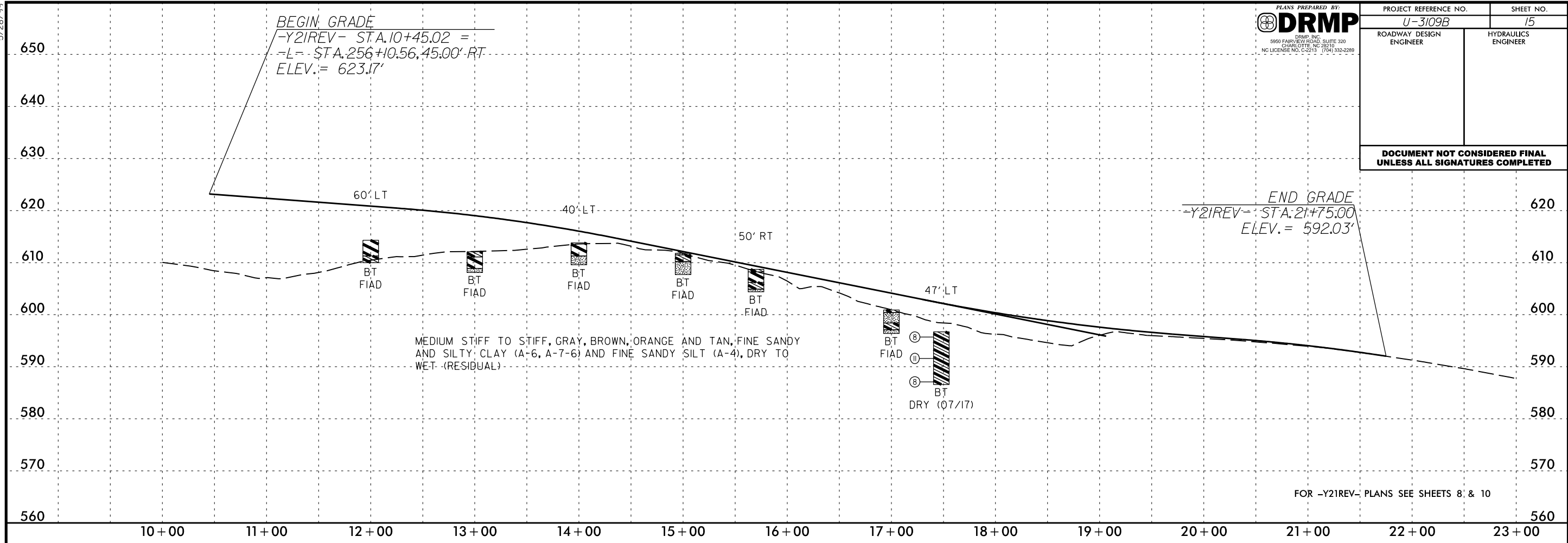
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5/28/99



PROJECT REFERENCE NO. U-3109B	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

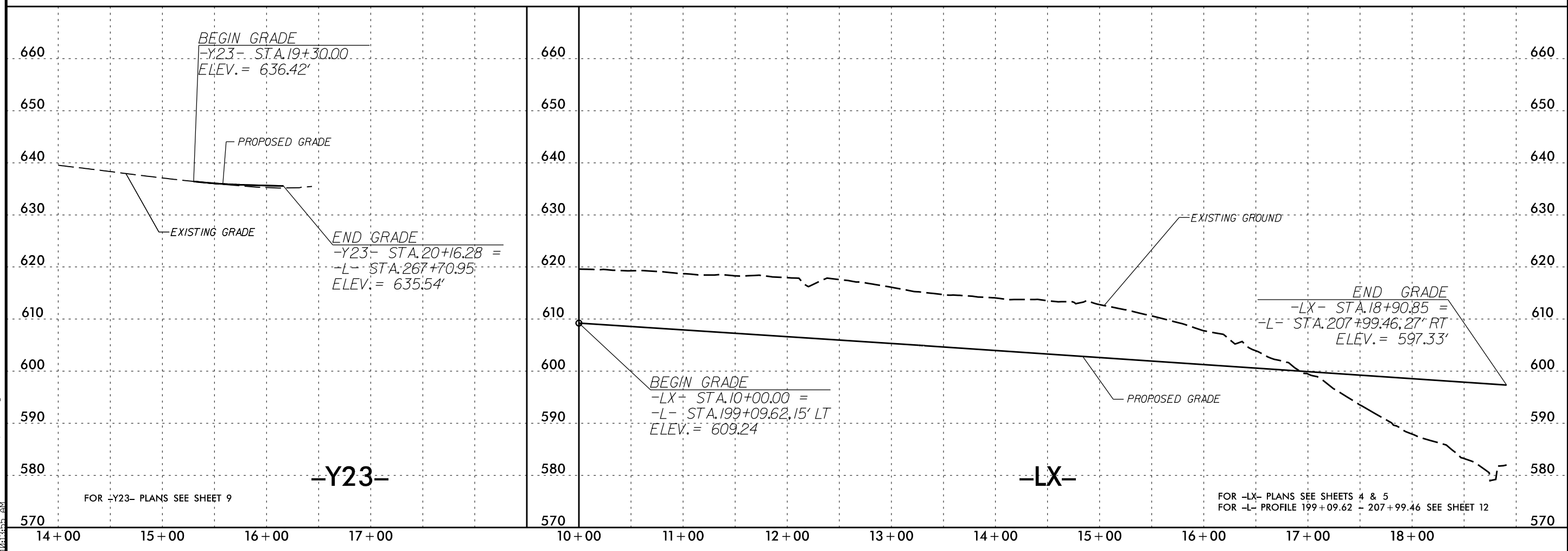
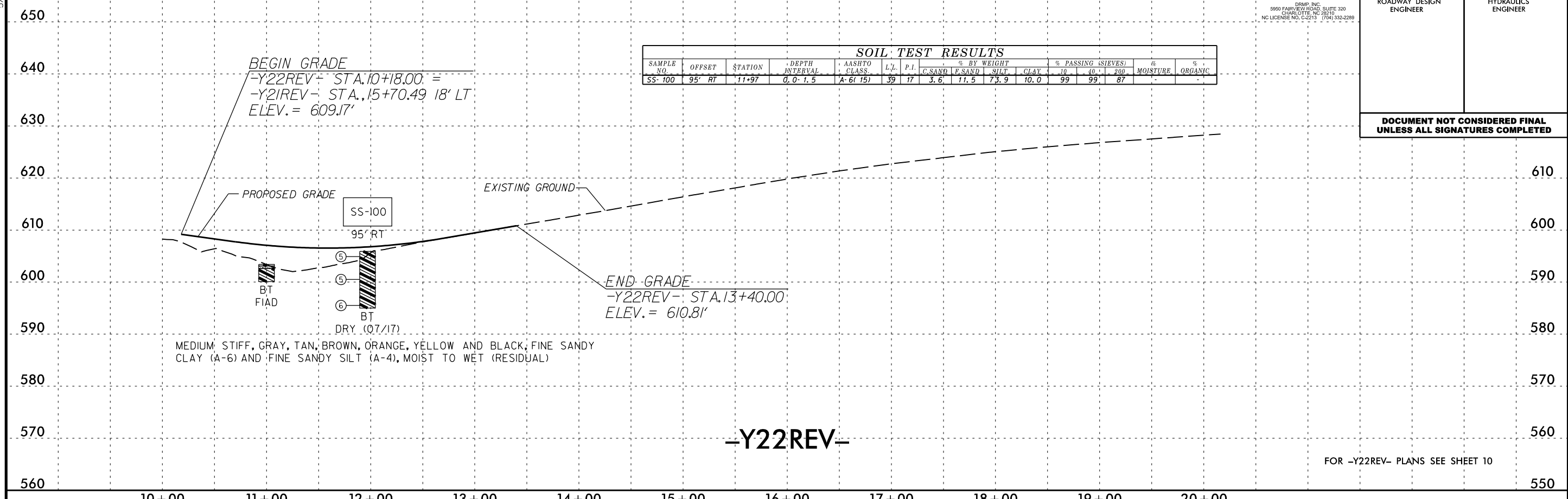
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5/28/99

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		
SS-100	95' RT	11+97	0.0-1.5	A-6(15)	39	17	3.6	11.5	73.9	10.0	99	99	87		



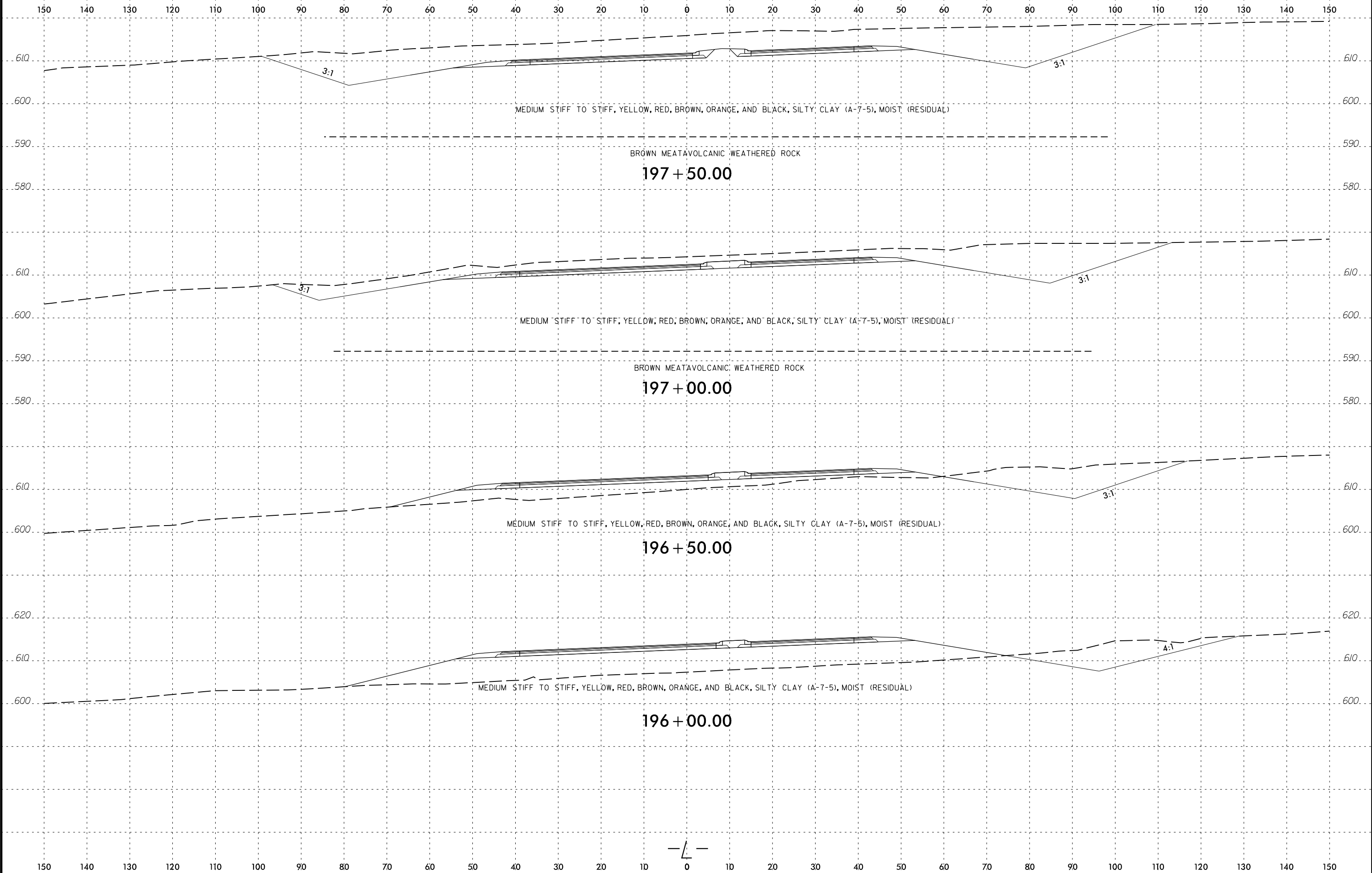
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6/23/16



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U-3109B

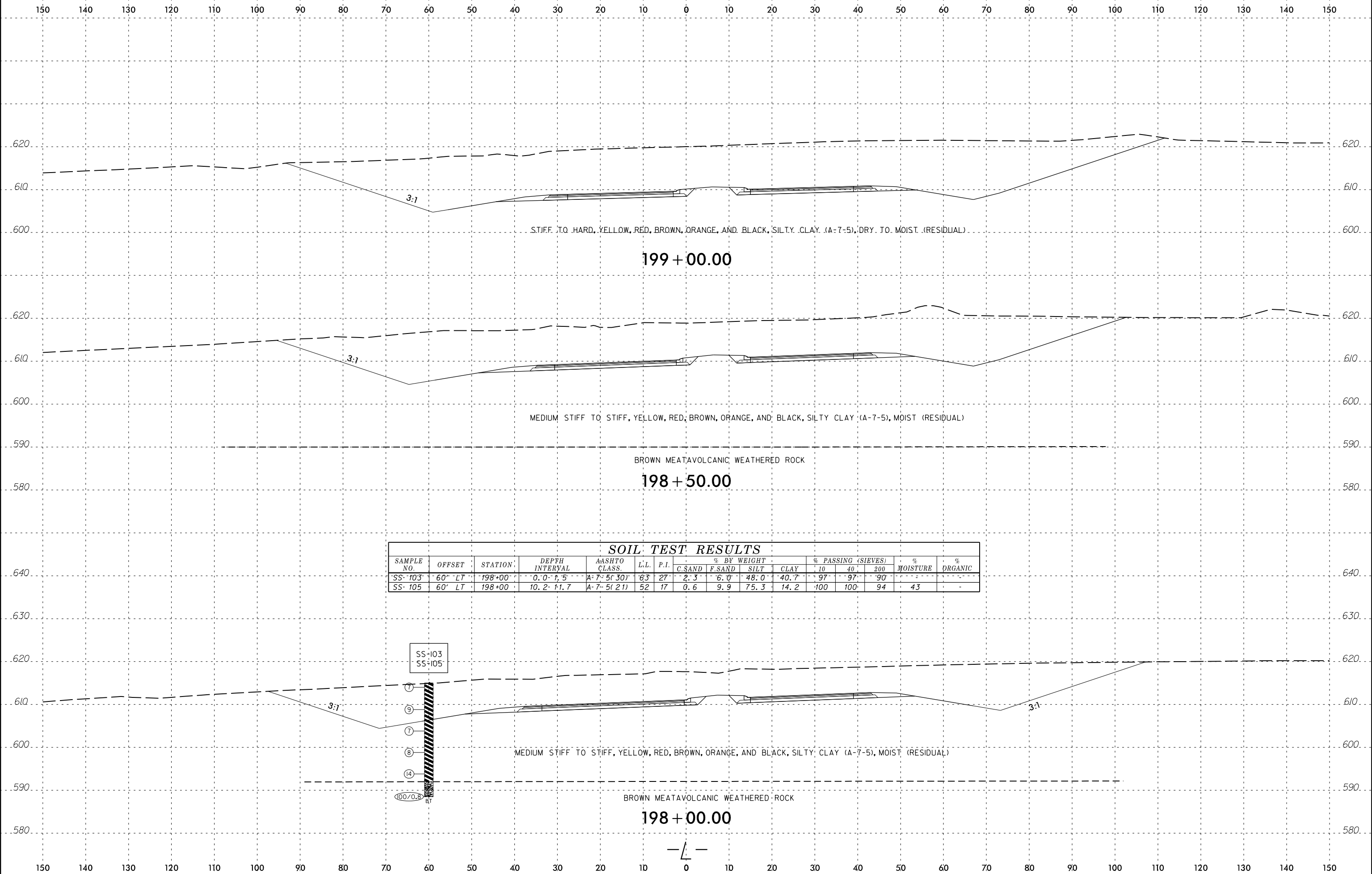
SHEET NO.  
17



9:20:41 AM  
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199 + 00.00

STIFF TO HARD, YELLOW, RED, BROWN, ORANGE, AND BLACK, SILTY CLAY (A-7-5), DRY TO MOIST (RESIDUAL)

198 + 50.00

MEDIUM STIFF TO STIFF, YELLOW, RED, BROWN, ORANGE, AND BLACK, SILTY CLAY (A-7-5), MOIST (RESIDUAL)

BROWN METAVOLCANIC WEATHERED ROCK

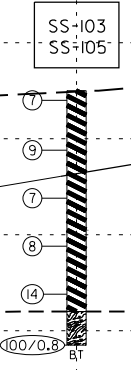
SOIL TEST RESULTS

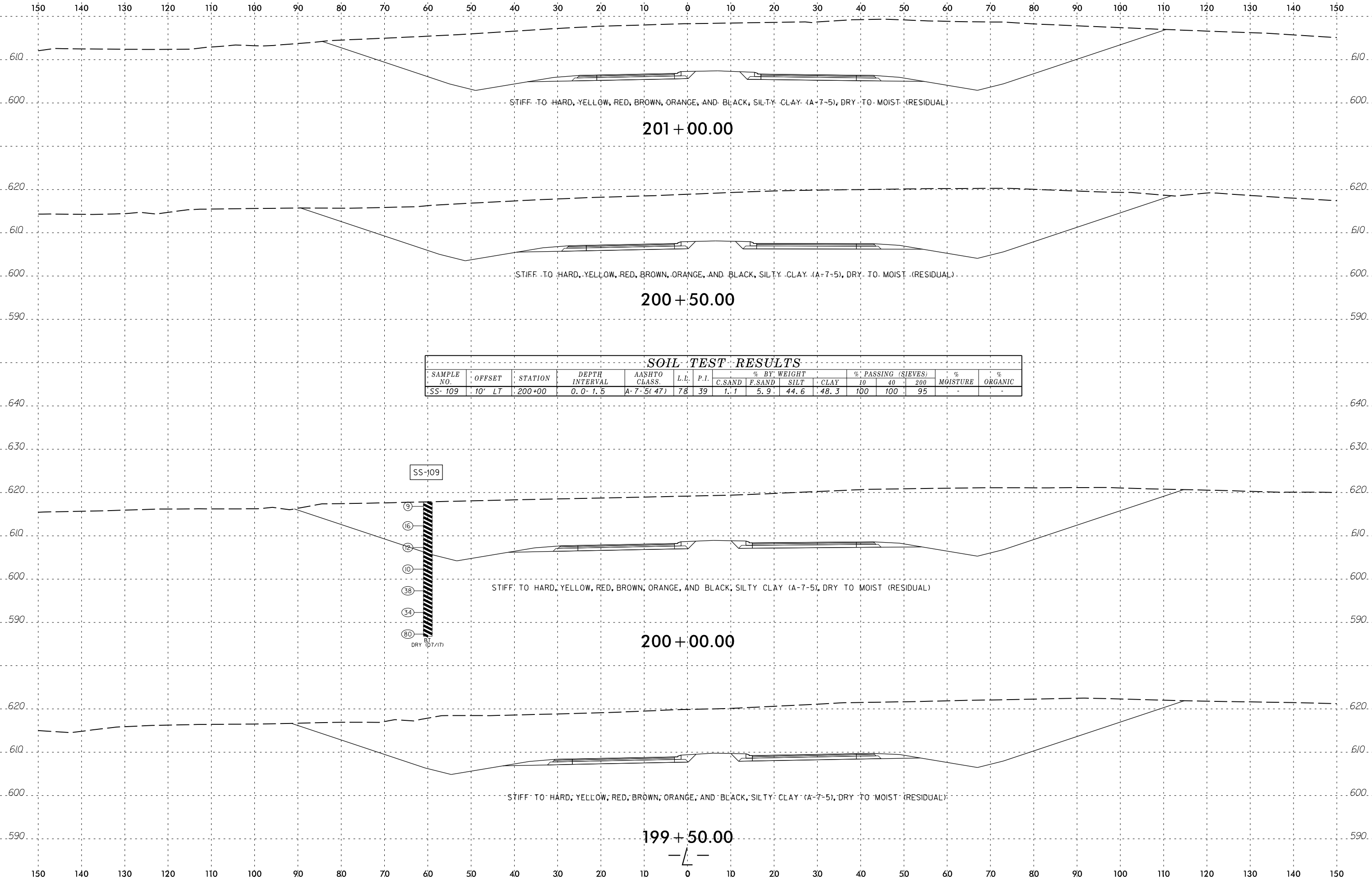
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-103	60' LT	198+00	0.0 - 1.5	A-7-5(30)	63	27	2.3	6.0	48.0	40.7	97	97	90	-	-
SS-105	60' LT	198+00	10.2 - 11.7	A-7-5(21)	52	17	0.6	9.9	75.3	14.2	100	100	94	43	-

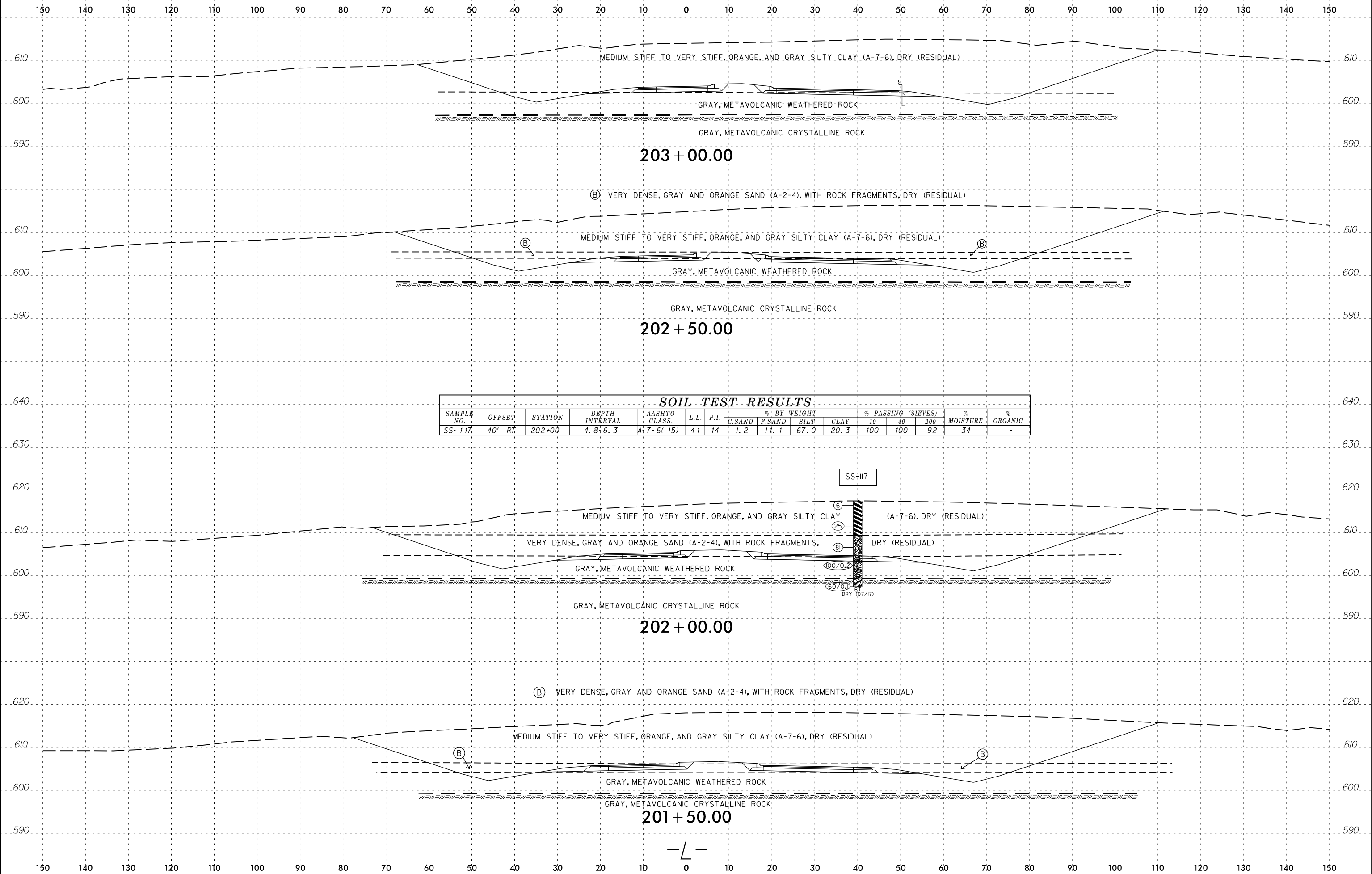
198 + 00.00

MEDIUM STIFF TO STIFF, YELLOW, RED, BROWN, ORANGE, AND BLACK, SILTY CLAY (A-7-5), MOIST (RESIDUAL)

BROWN METAVOLCANIC WEATHERED ROCK





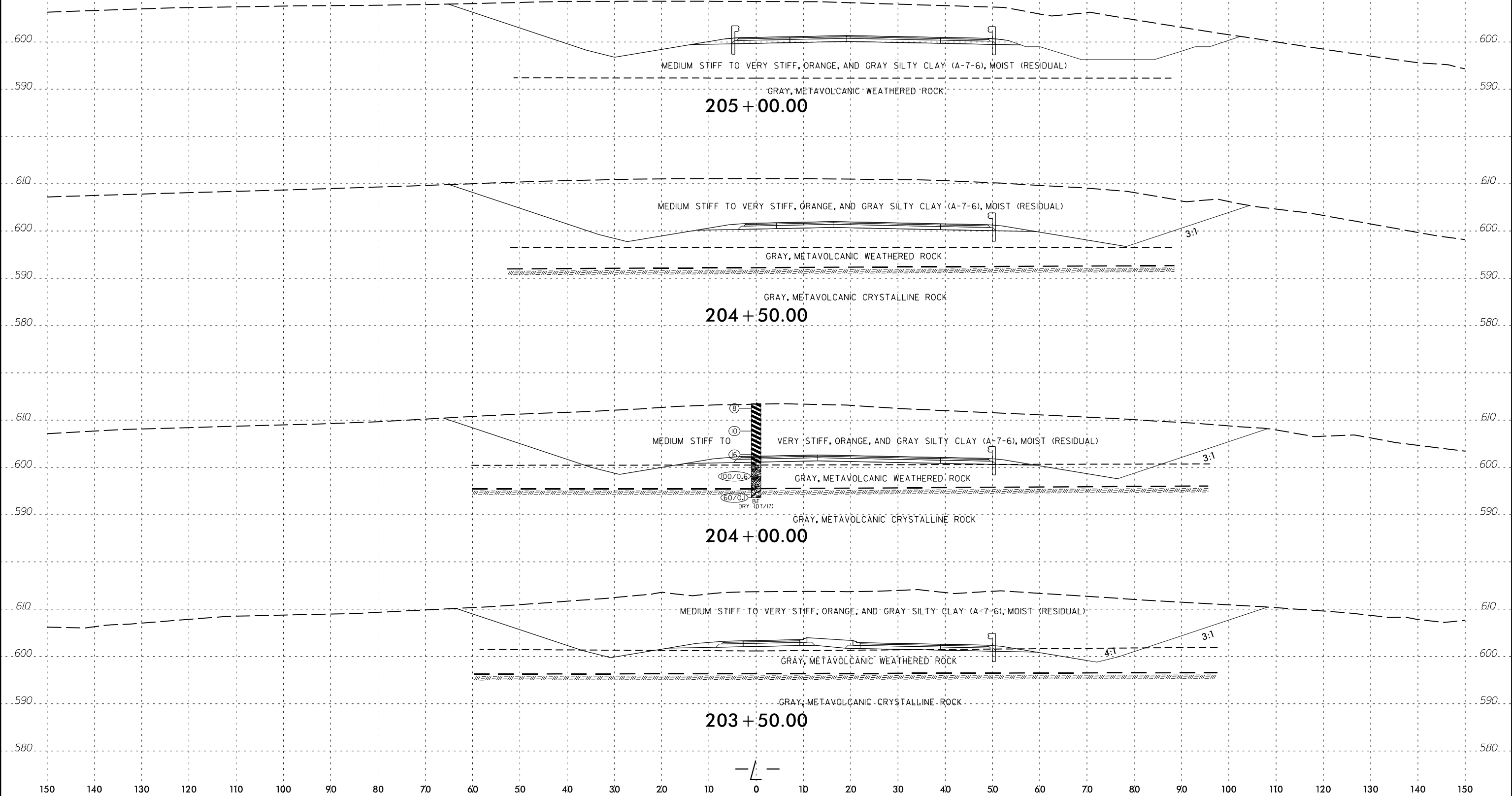


6/23/16



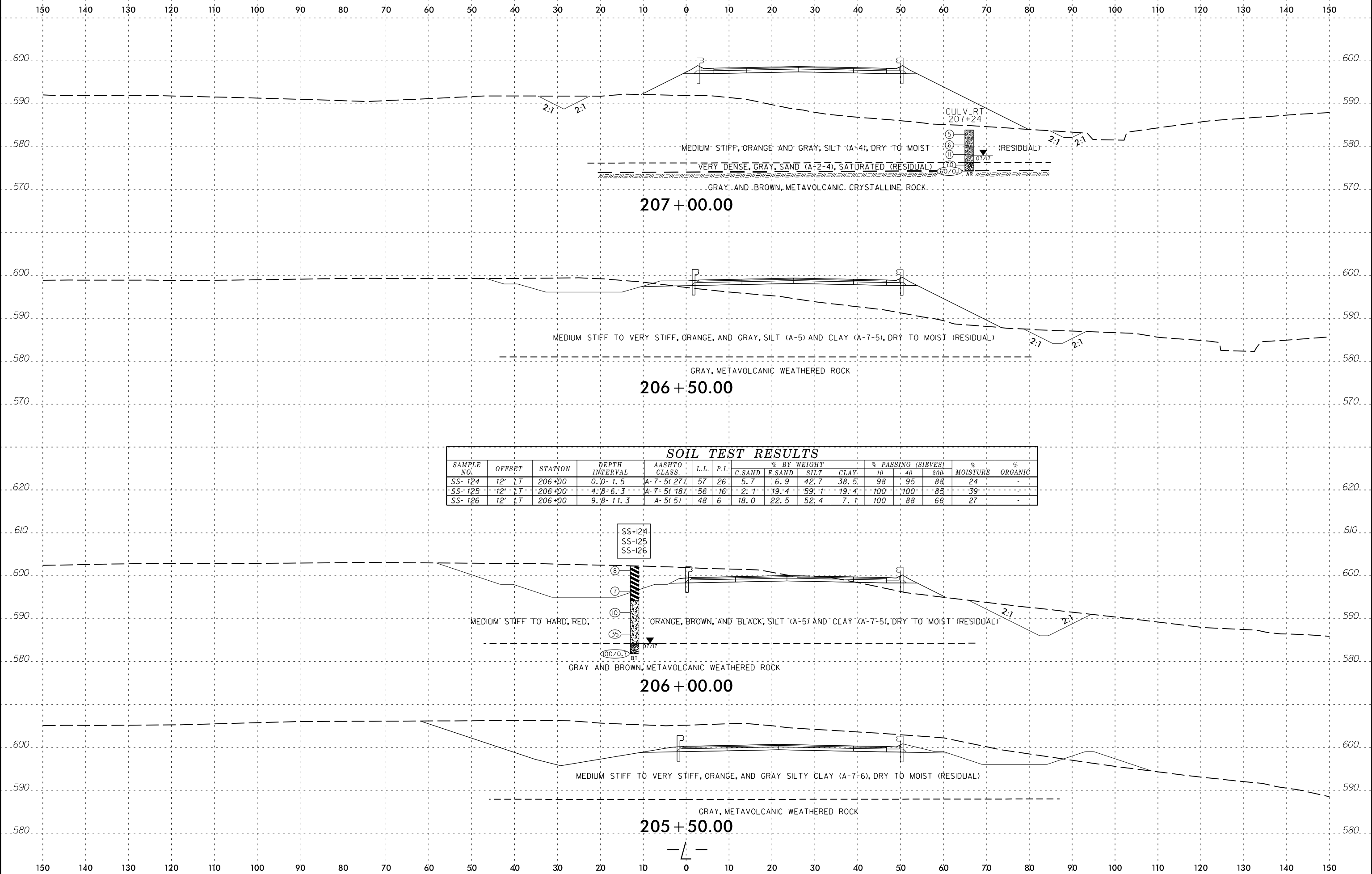
PROJ. REFERENCE NO.	SHEET NO.
U-3109B	21

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6/23/16



**SOIL TEST RESULTS**

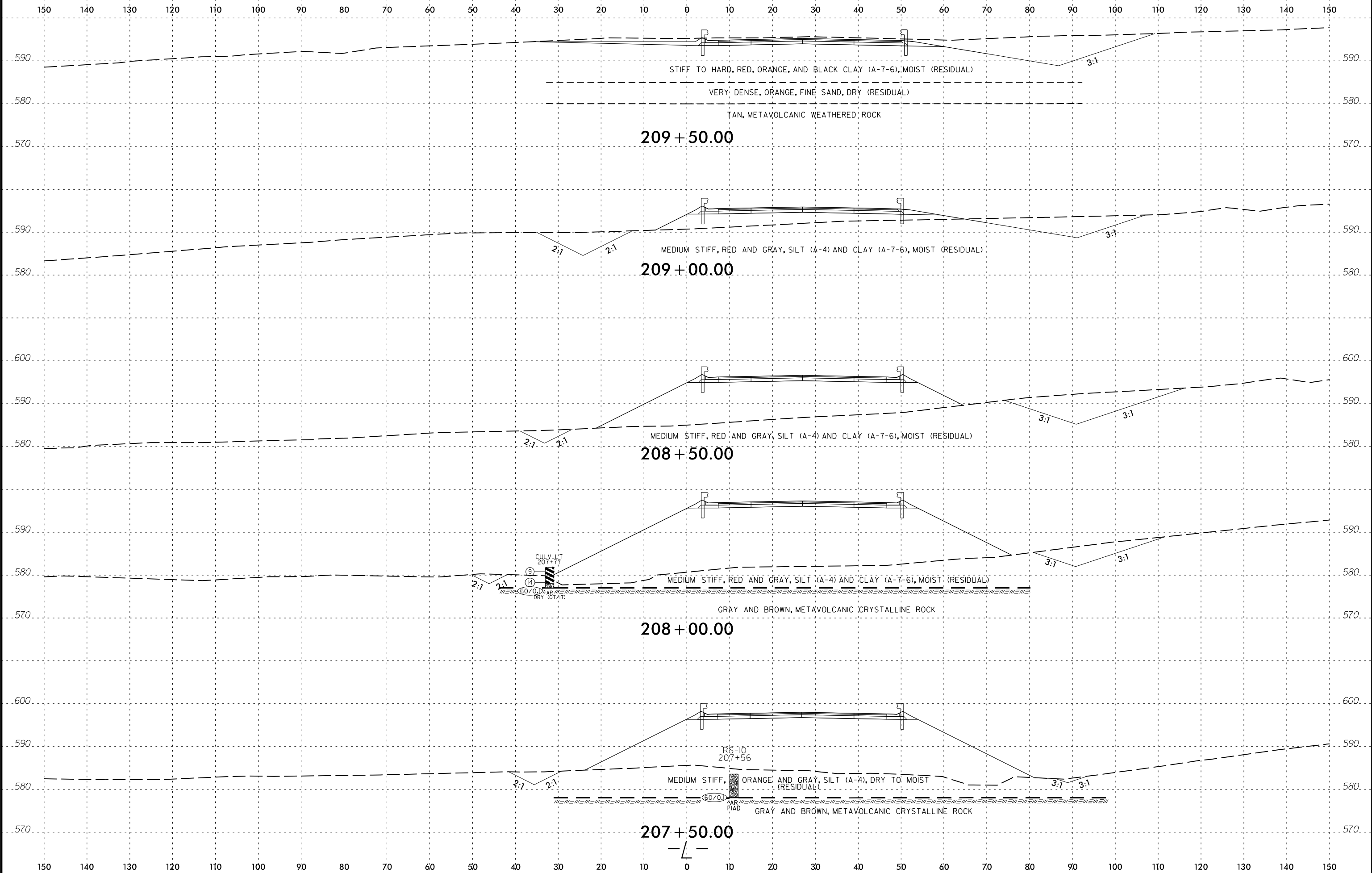
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-124	12' LT	206+00	0.0 - 1.5	A-7-5(27)	57	26	5.7	6.9	42.7	38.5	98	95	88	24	-
SS-125	12' LT	206+00	4.8 - 6.3	A-7-5(18)	56	16	2.1	19.4	59.1	19.4	100	100	88	39	-
SS-126	12' LT	206+00	9.8 - 11.3	A-5(5)	48	6	18.0	22.5	52.4	7.1	100	88	66	27	-

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SUBSTRATE

6/23/16



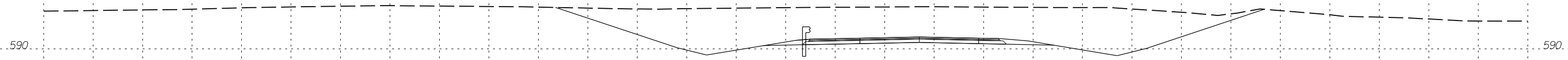
PROJ. REFERENCE NO.	SHEET NO.
U-3109B	23



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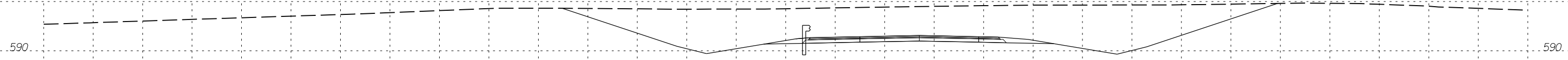
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STIFF TO HARD, RED, ORANGE, AND BLACK CLAY (A-7-6), MOIST (RESIDUAL)

TAN, METAVOLCANIC WEATHERED ROCK

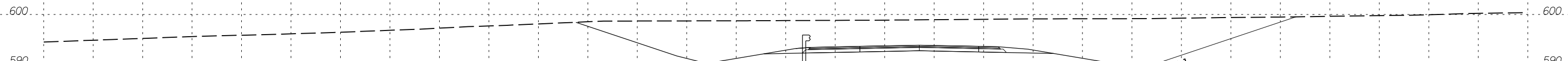
211 + 50.00



STIFF TO HARD, RED, ORANGE, AND BLACK CLAY (A-7-6), MOIST (RESIDUAL)

TAN, METAVOLCANIC WEATHERED ROCK

211 + 00.00



STIFF TO HARD, RED, ORANGE, AND BLACK CLAY (A-7-6), MOIST (RESIDUAL)

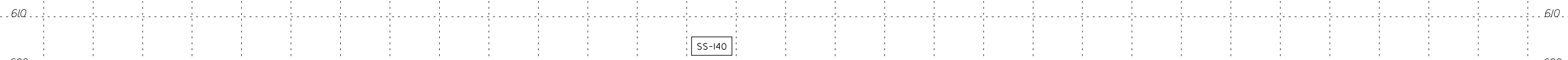
VERY DENSE, ORANGE, FINE SAND, DRY (RESIDUAL)

TAN, METAVOLCANIC WEATHERED ROCK

210 + 50.00

**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-140	15' LT	210+00	0.0 - 1.5	A-7-6(19)	48	30	3.5	8.6	43.0	44.7	100	98	90	-	-

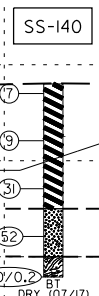


STIFF TO HARD, RED, ORANGE, AND BLACK SILTY CLAY (A-7-6), MOIST (RESIDUAL)

VERY DENSE, ORANGE, FINE SAND, DRY (RESIDUAL)

TAN, METAVOLCANIC WEATHERED ROCK

210 + 00.00



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

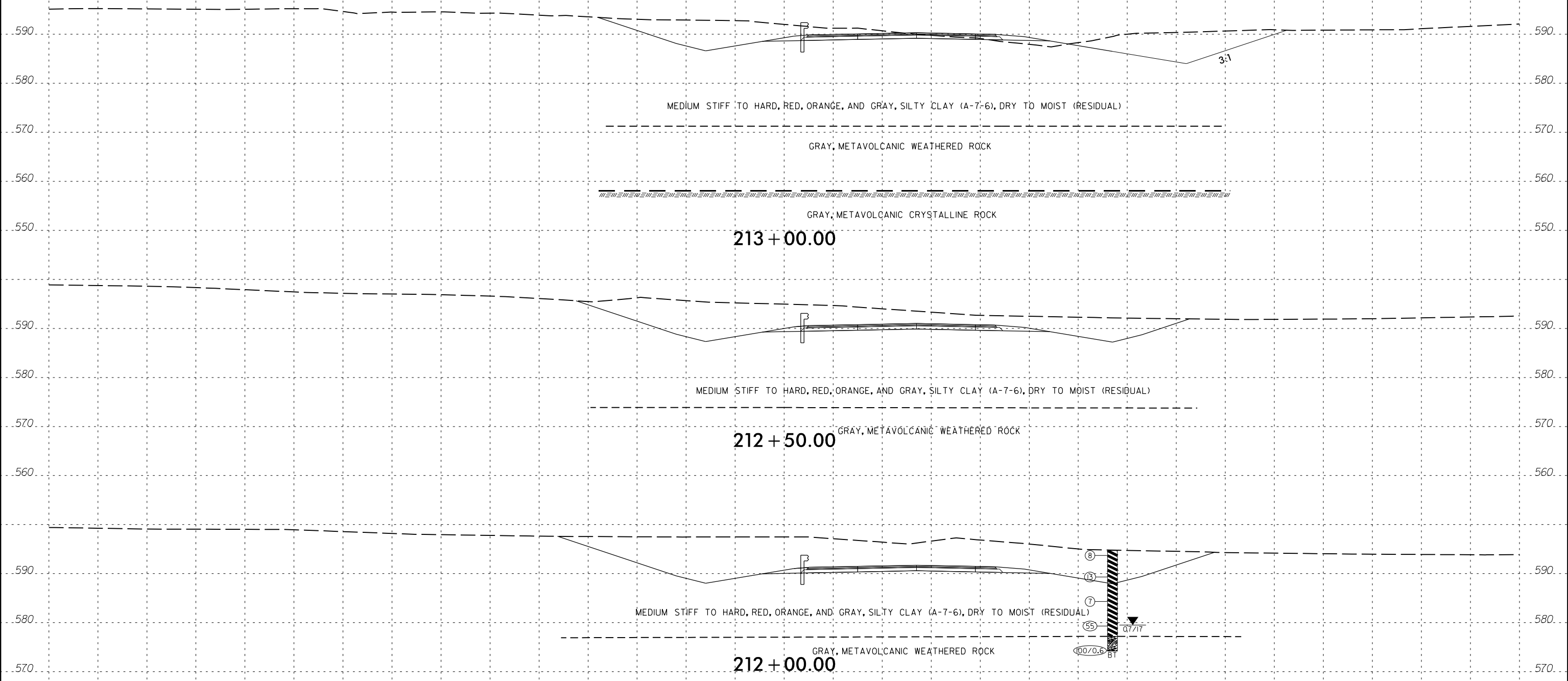
6/23/16



PROJ. REFERENCE NO.  
U-3109B

SHEET NO.  
25

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



213 + 00.00

212 + 50.00

212 + 00.00

MEDIUM STIFF TO HARD, RED, ORANGE, AND GRAY, SILTY CLAY (A-7-6), DRY TO MOIST (RESIDUAL)

GRAY, METAVOLCANIC WEATHERED ROCK

GRAY, METAVOLCANIC CRYSTALLINE ROCK

8  
13  
7  
55  
00/0.6  
BT

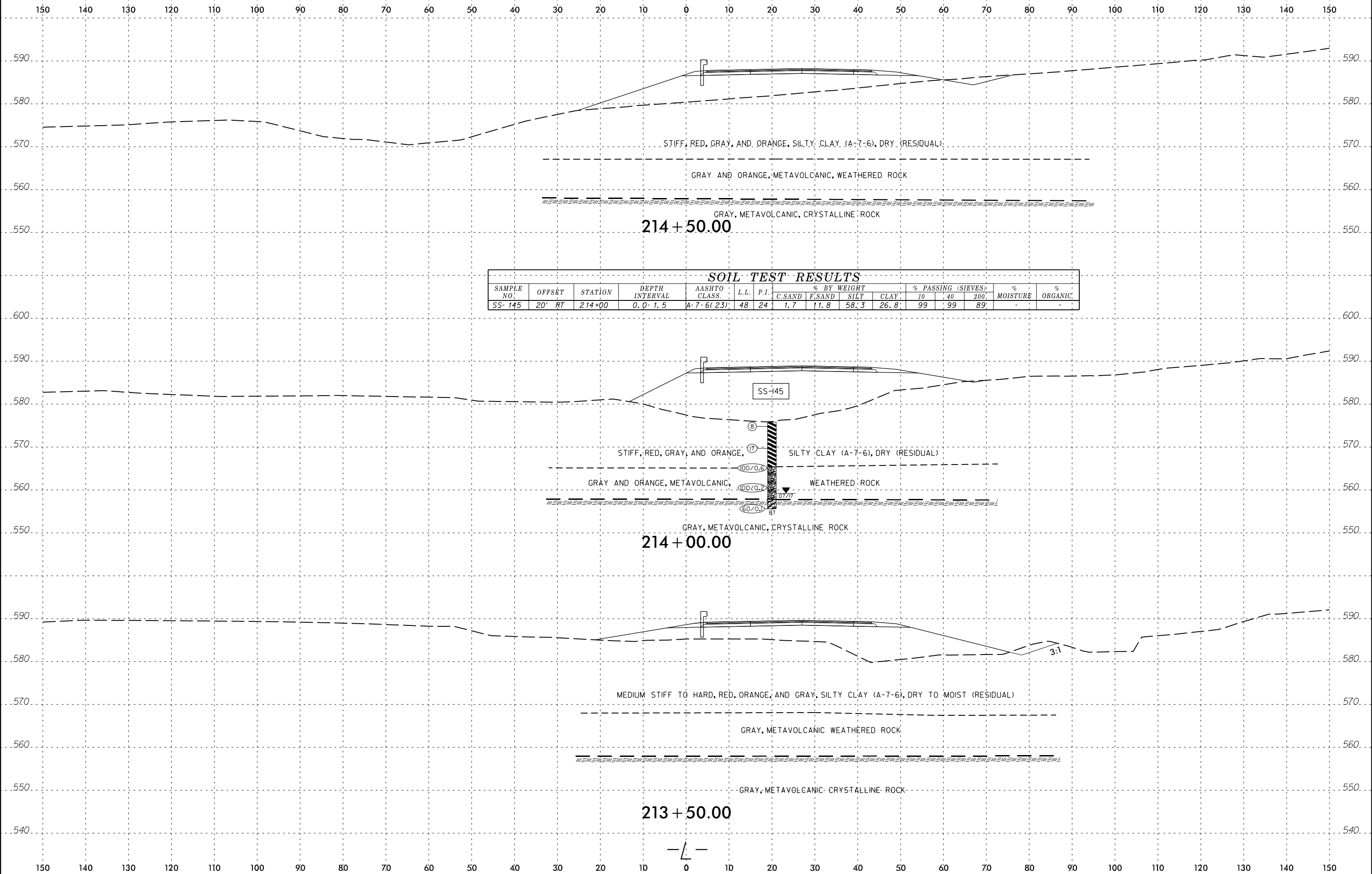
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9:20:48 AM  
U3109B  
SUBSURFACE

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6/23/16



**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-145	20' RT	214+00	0.0-1.5	A-7-6(23)	48	24	1.7	11.8	58.3	26.8	99	99	89	-	-

214 + 50.00

214 + 00.00

213 + 50.00

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SSUBSTRATE

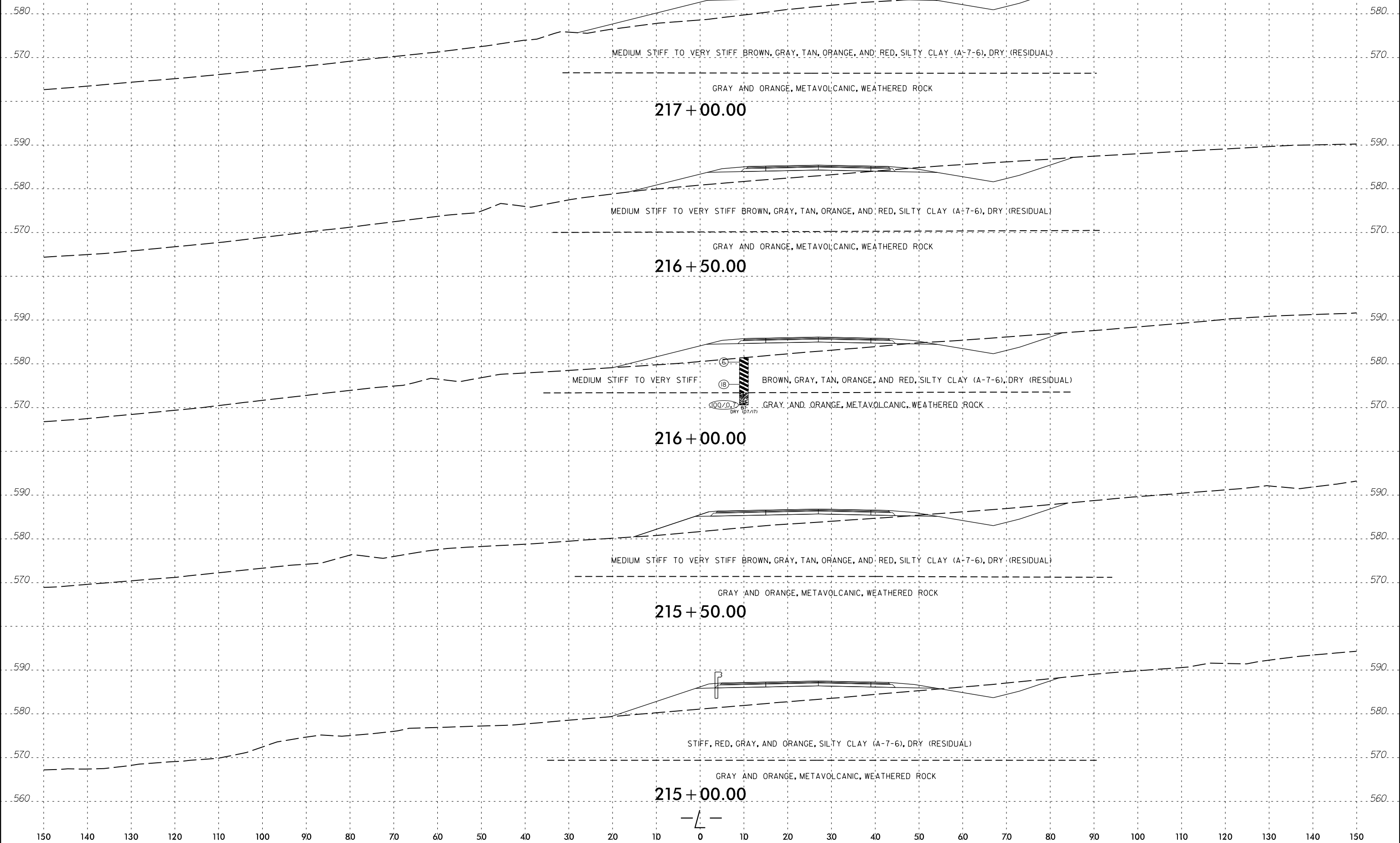
6/23/16



PROJ. REFERENCE NO.  
U-3109B

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217 + 00.00

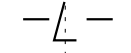
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216 + 00.00

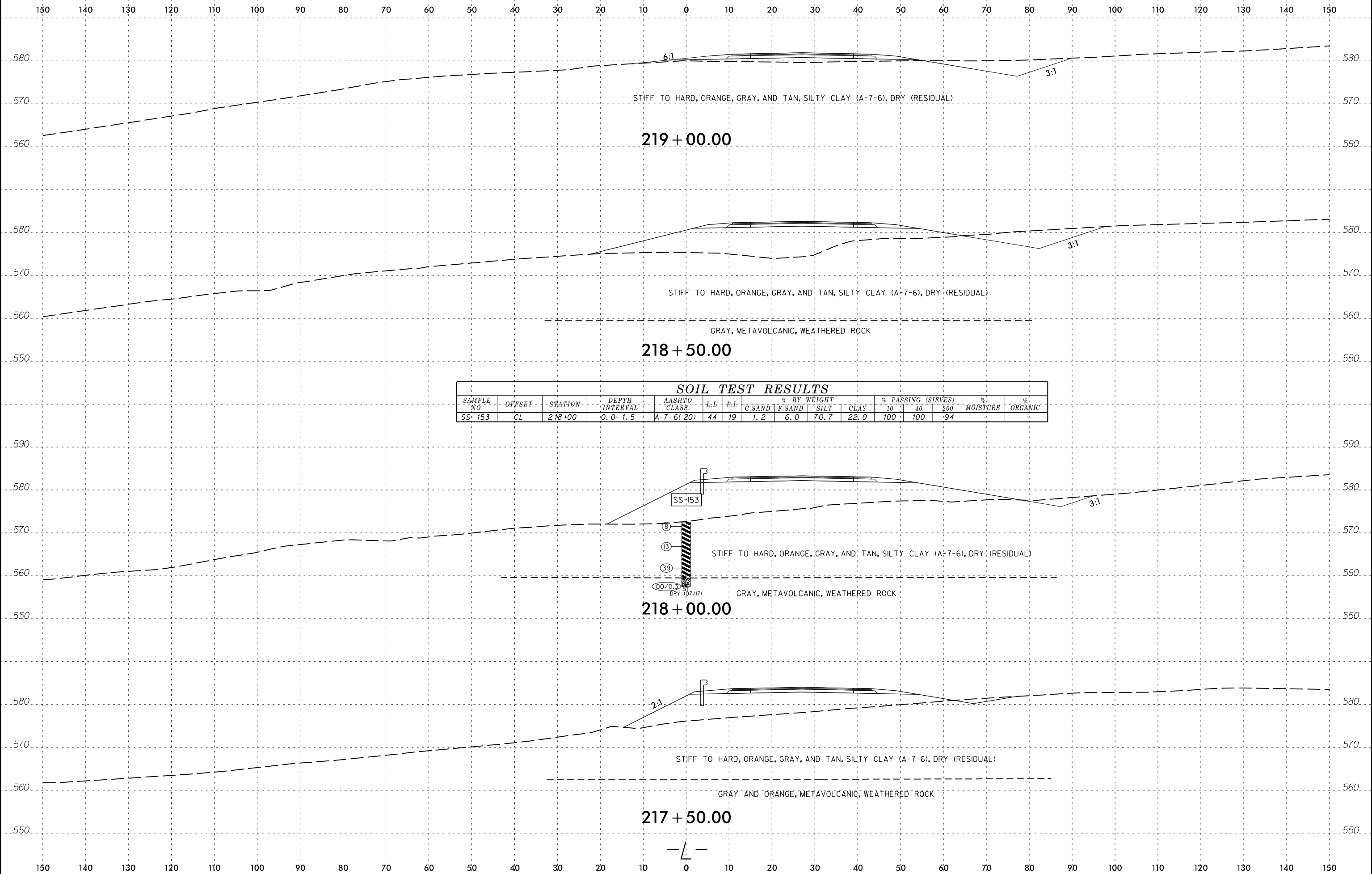
215 + 50.00

215 + 00.00

9:20:50 AM  
U3109B  
SUBSTRATE



6/23/16



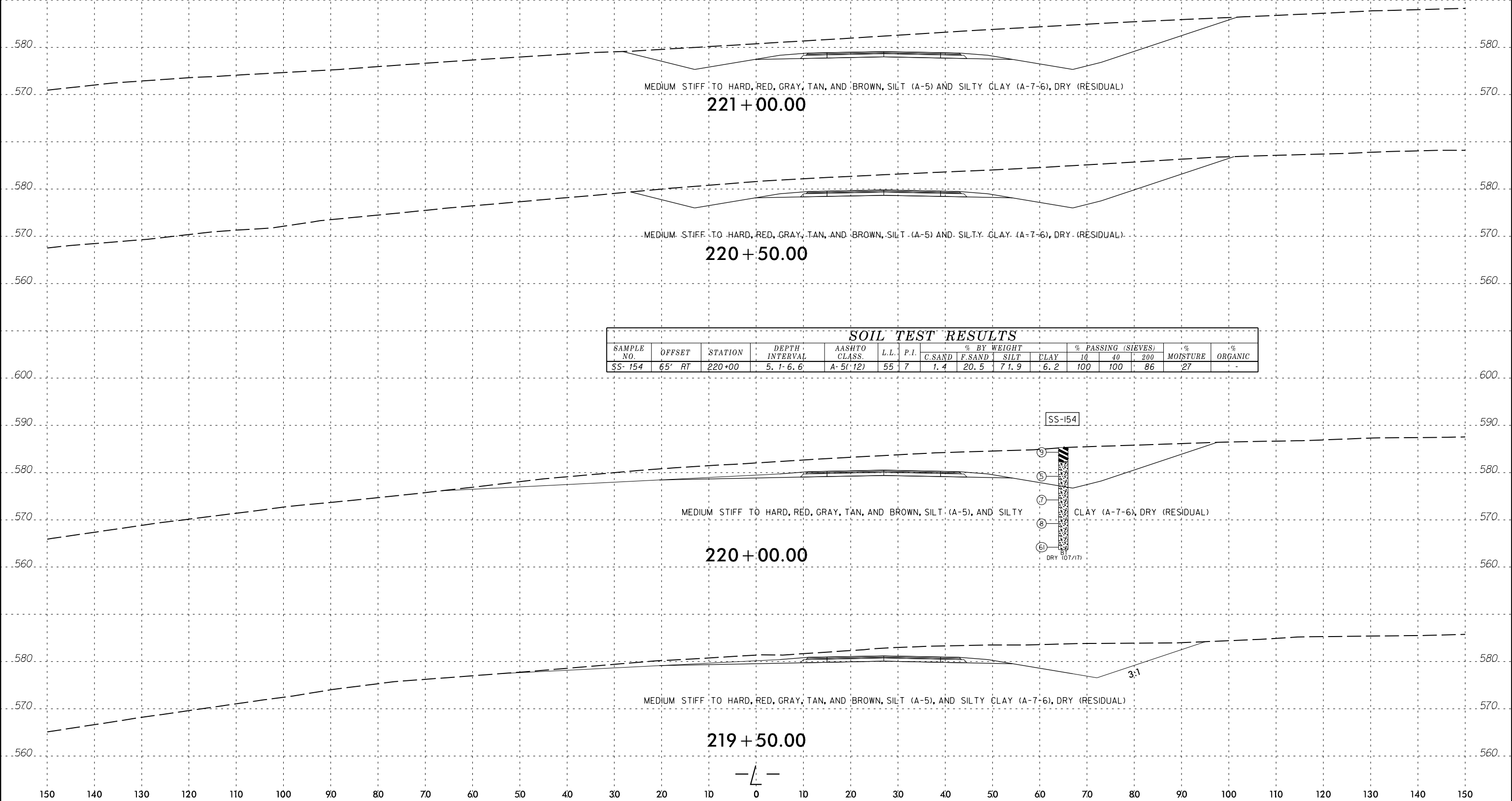
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-153	CL	218+00	0.0-1.5	A-7-6(20)	44	19	1.2	6.0	70.7	22.0	100	100	94	-	-

9:20:51AM  
U3109B  
SUBSTRATE

6/23/16



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



MEDIUM STIFF TO HARD, RED, GRAY, TAN, AND BROWN, SILT (A-5) AND SILTY CLAY (A-7-6), DRY (RESIDUAL)

221 + 00.00

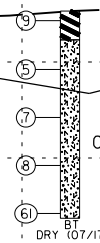
MEDIUM STIFF TO HARD, RED, GRAY, TAN, AND BROWN, SILT (A-5) AND SILTY CLAY (A-7-6), DRY (RESIDUAL)

220 + 50.00

**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-154	65' RT	220+00	5.1-6.6'	A-5(12)	55	7	1.4	20.5	71.9	6.2	100	100	86	27	-

SS-154



MEDIUM STIFF TO HARD, RED, GRAY, TAN, AND BROWN, SILT (A-5), AND SILTY CLAY (A-7-6), DRY (RESIDUAL)

220 + 00.00

3:1

MEDIUM STIFF TO HARD, RED, GRAY, TAN, AND BROWN, SILT (A-5), AND SILTY CLAY (A-7-6), DRY (RESIDUAL)

219 + 50.00

9:20:52 AM  
U3109B  
SUBSTRATE

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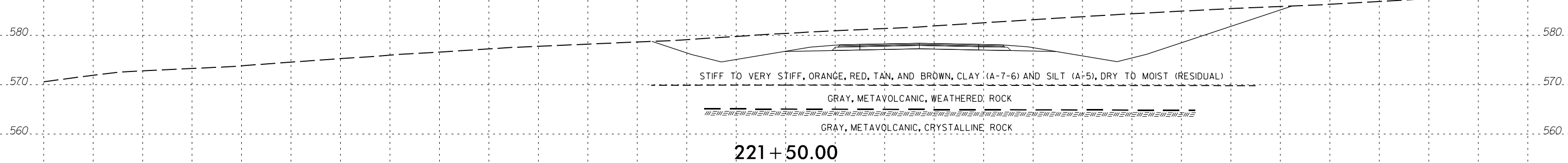
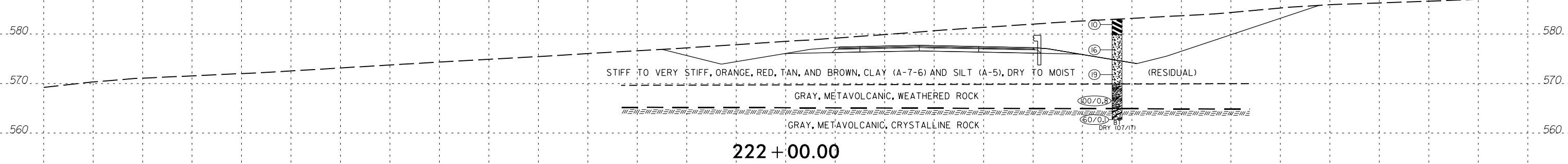
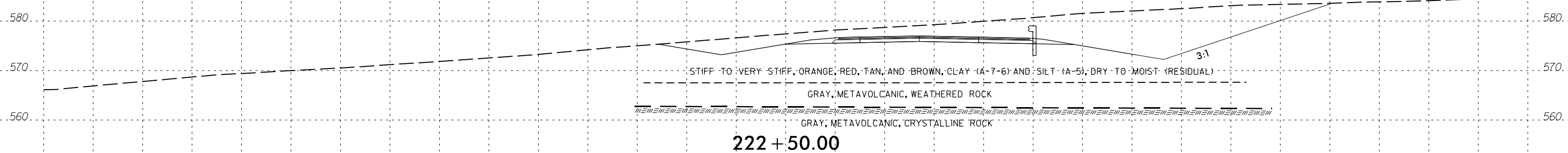
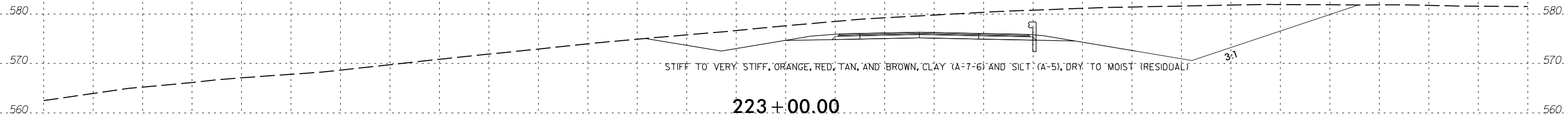
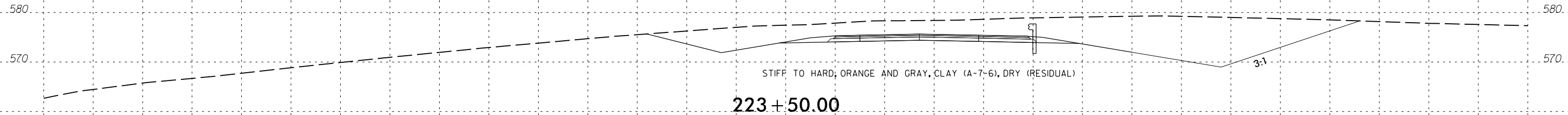
6/23/16



PROJ. REFERENCE NO.  
U-3109B

SHEET NO.  
30

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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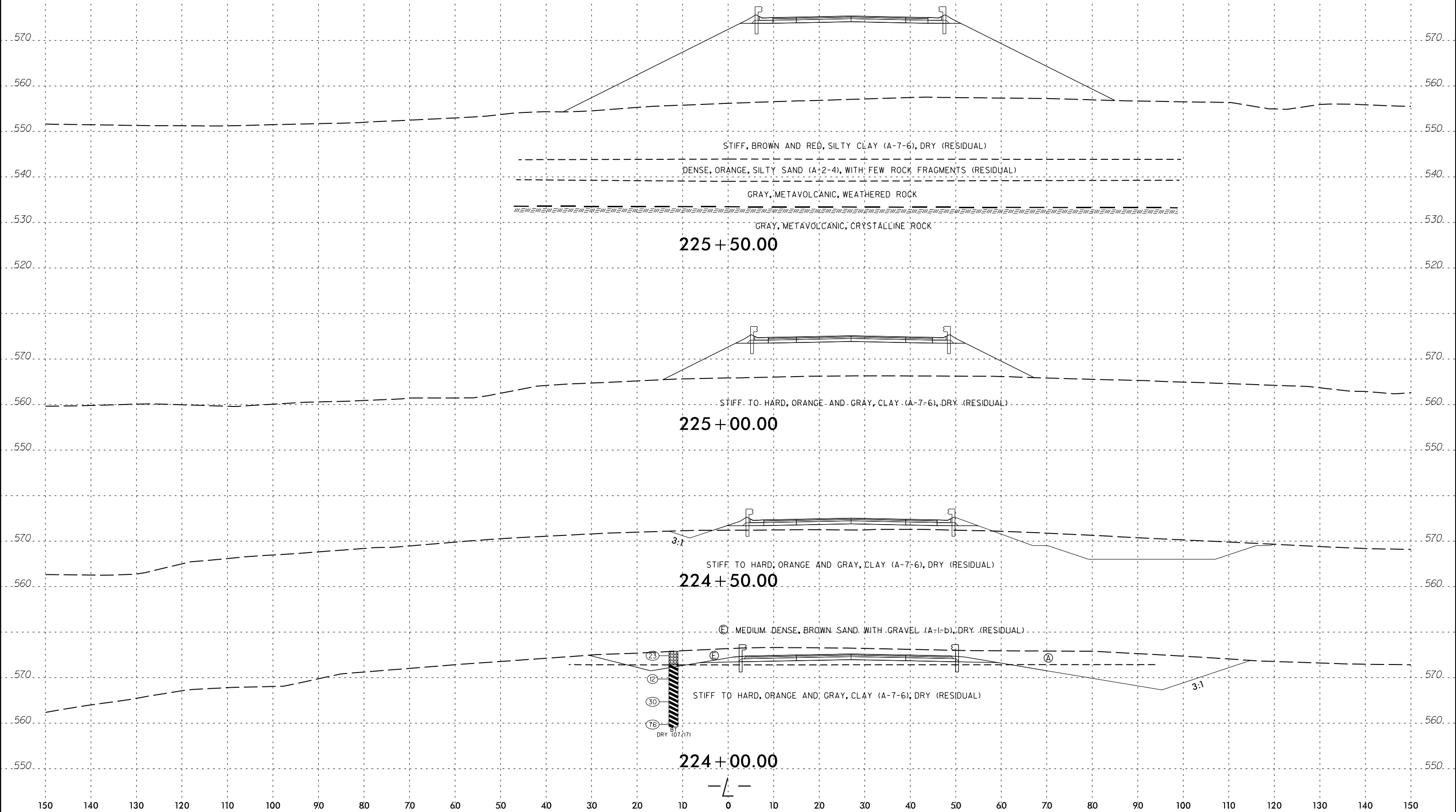
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U3109B  
SUBSTRATE

6/23/16



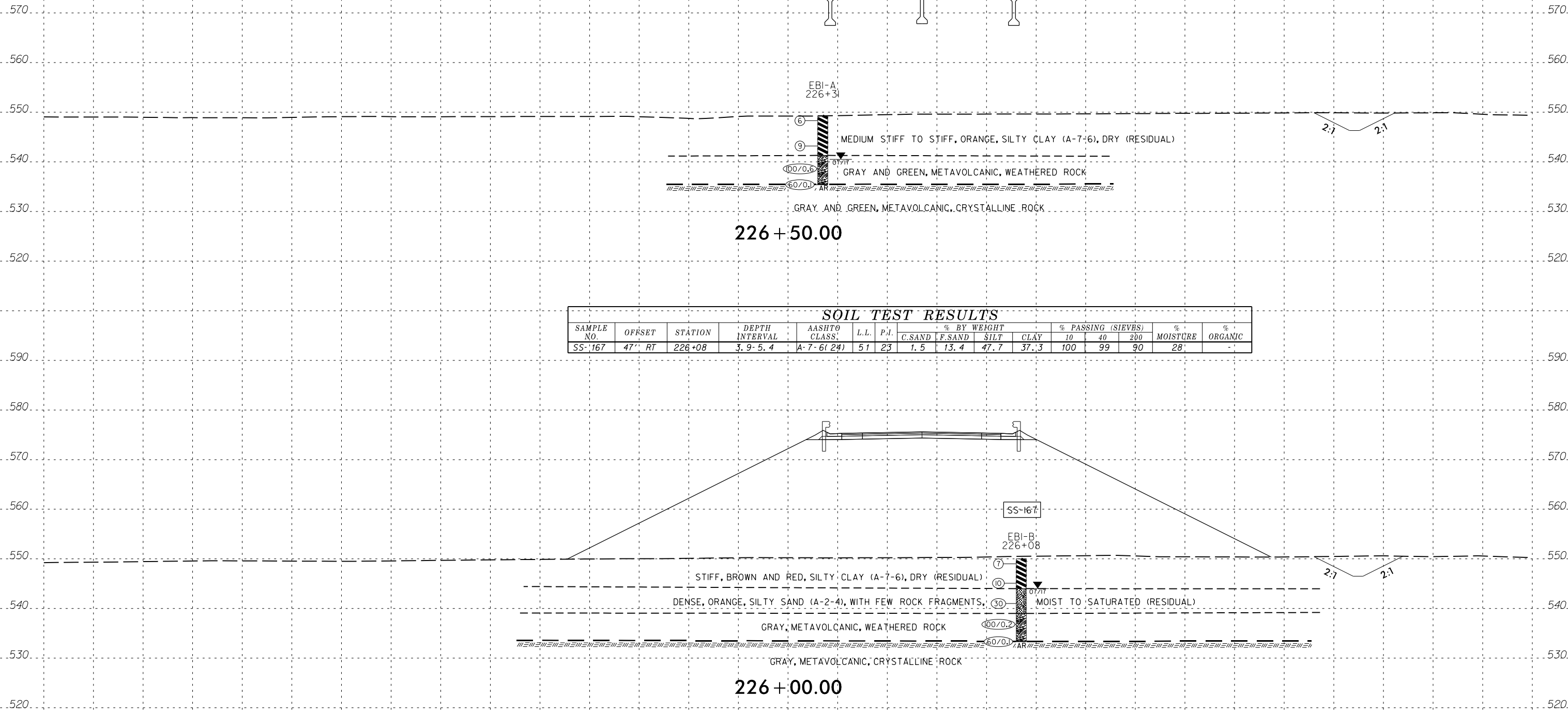
PROJ. REFERENCE NO.	SHEET NO.
U-3109B	31

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SUBSTRATE

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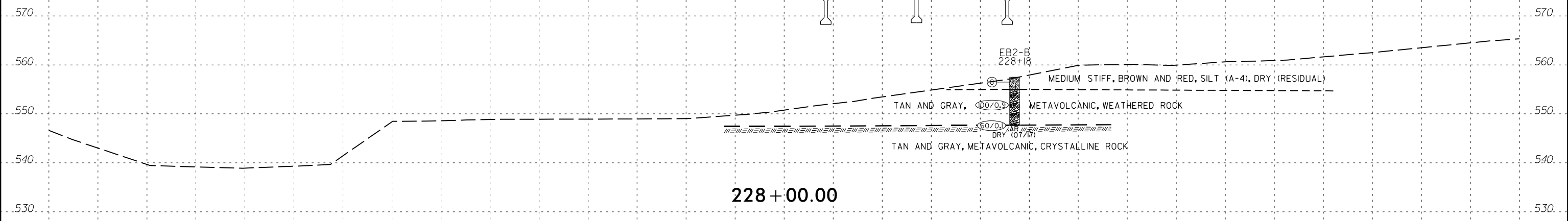
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6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-3109B	33

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



228+00.00

EB2-B  
228+08

MEDIUM STIFF, BROWN AND RED, SILT (A-4), DRY (RESIDUAL)

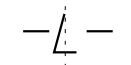
TAN AND GRAY, (00/0.9) METAVOLCANIC, WEATHERED ROCK

TAN AND GRAY, METAVOLCANIC, CRYSTALLINE ROCK

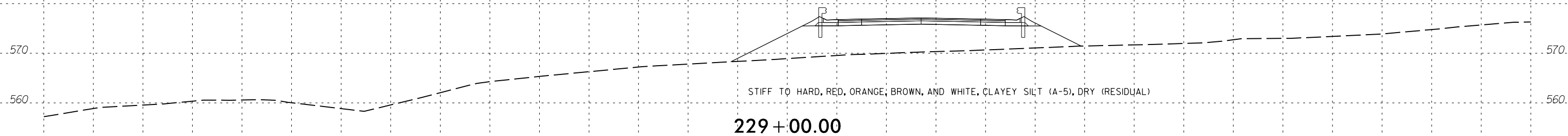
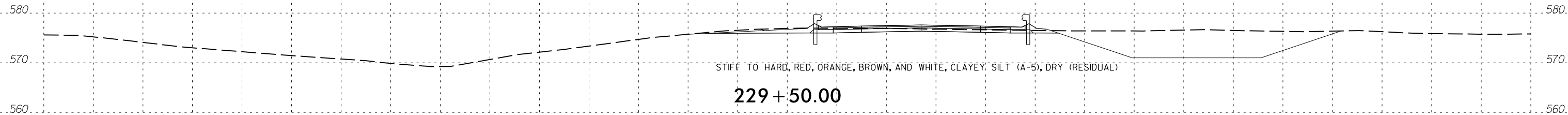
(60/0.0) TAN AND GRAY, DRY (01/11)

9:20:56 AM  
U3109B  
SUBSTRATE

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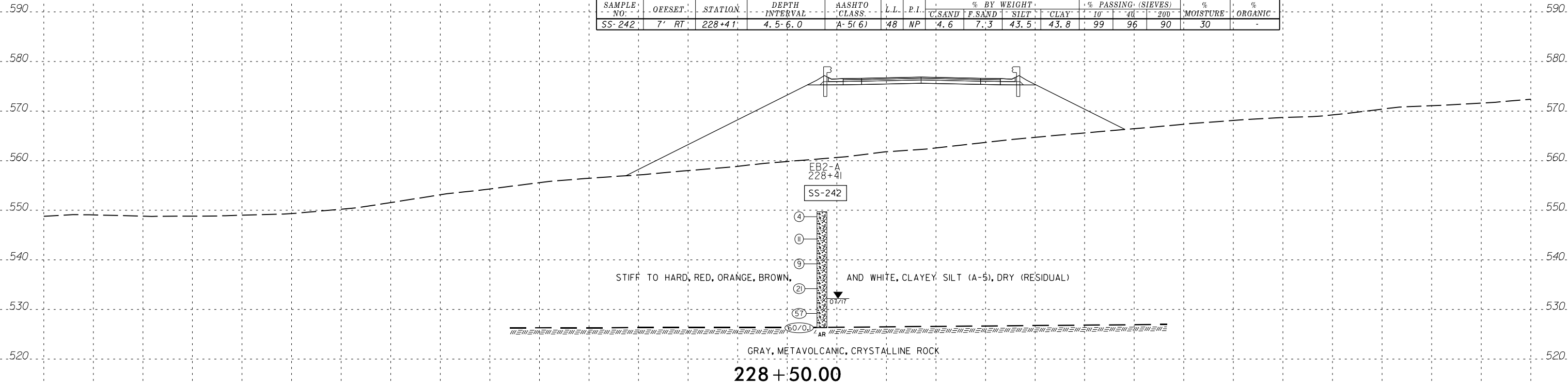


150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

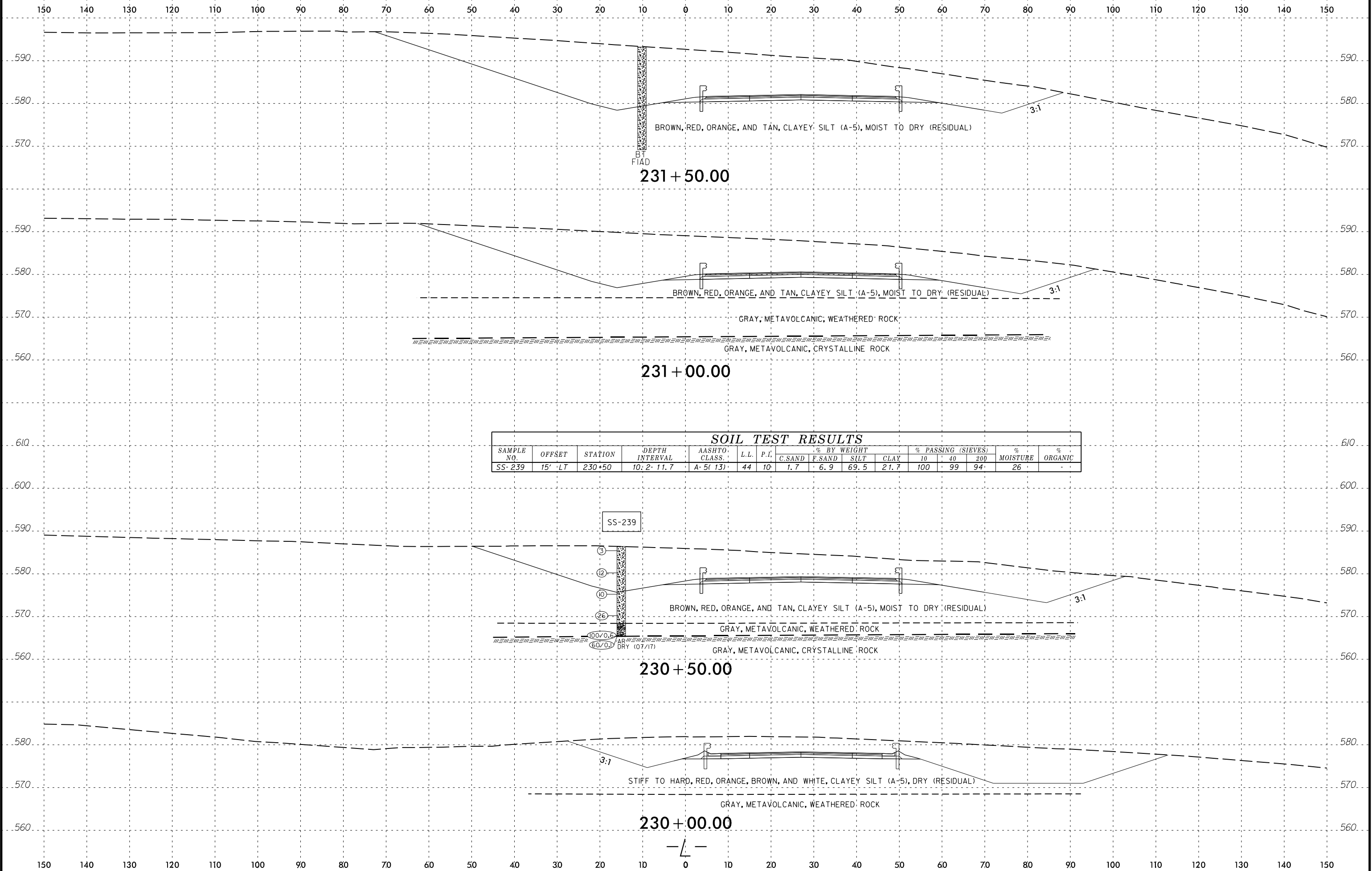


**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE %	ORGANIC %
							C SAND	F SAND	SILT	CLAY	10	40	200		
SS-242	7' RT	228+41	4.5-6.0	A-5(6)	48	NP	4.6	7.3	43.5	43.8	99	96	90	30	-



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

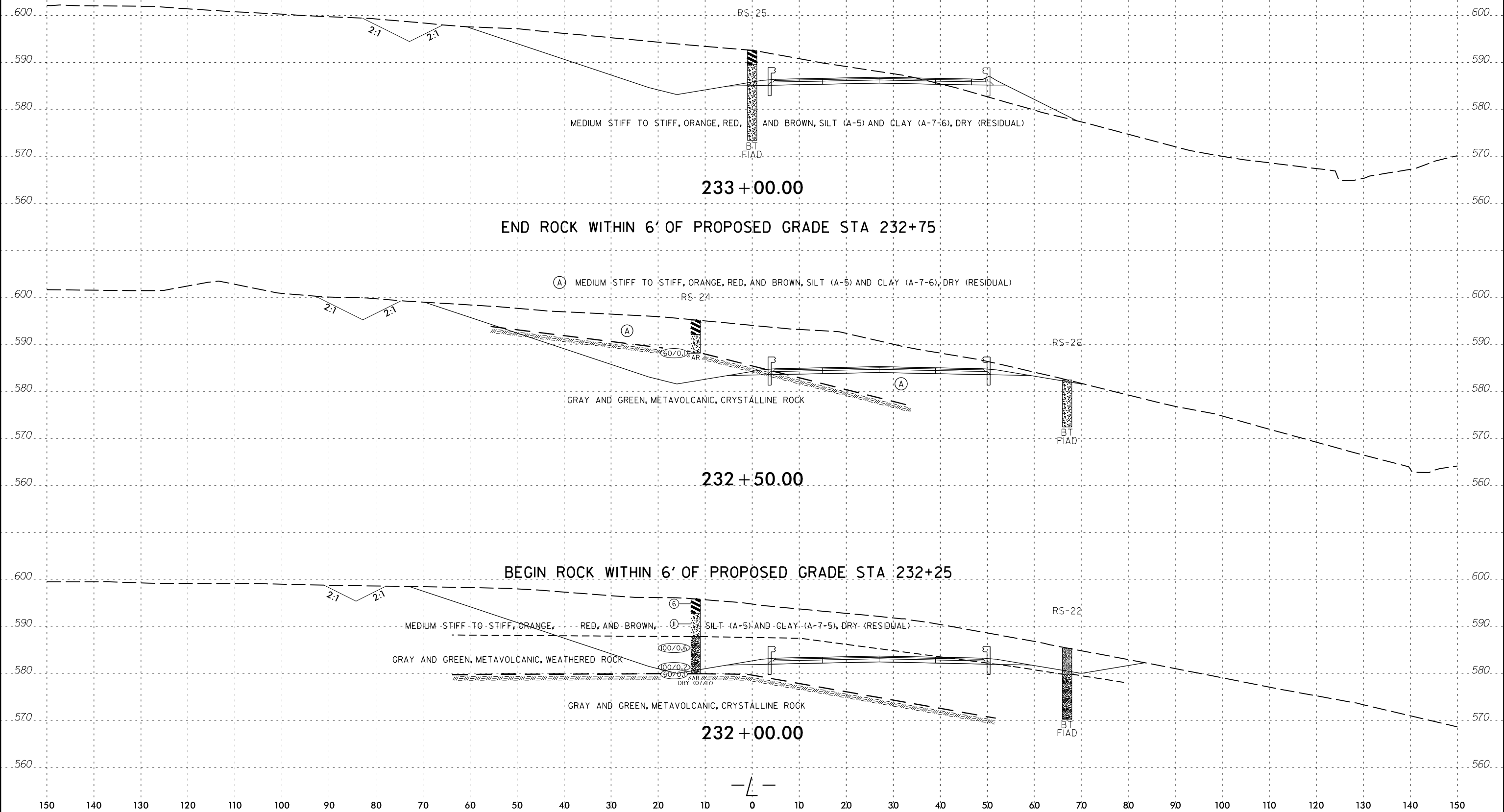


6/23/16

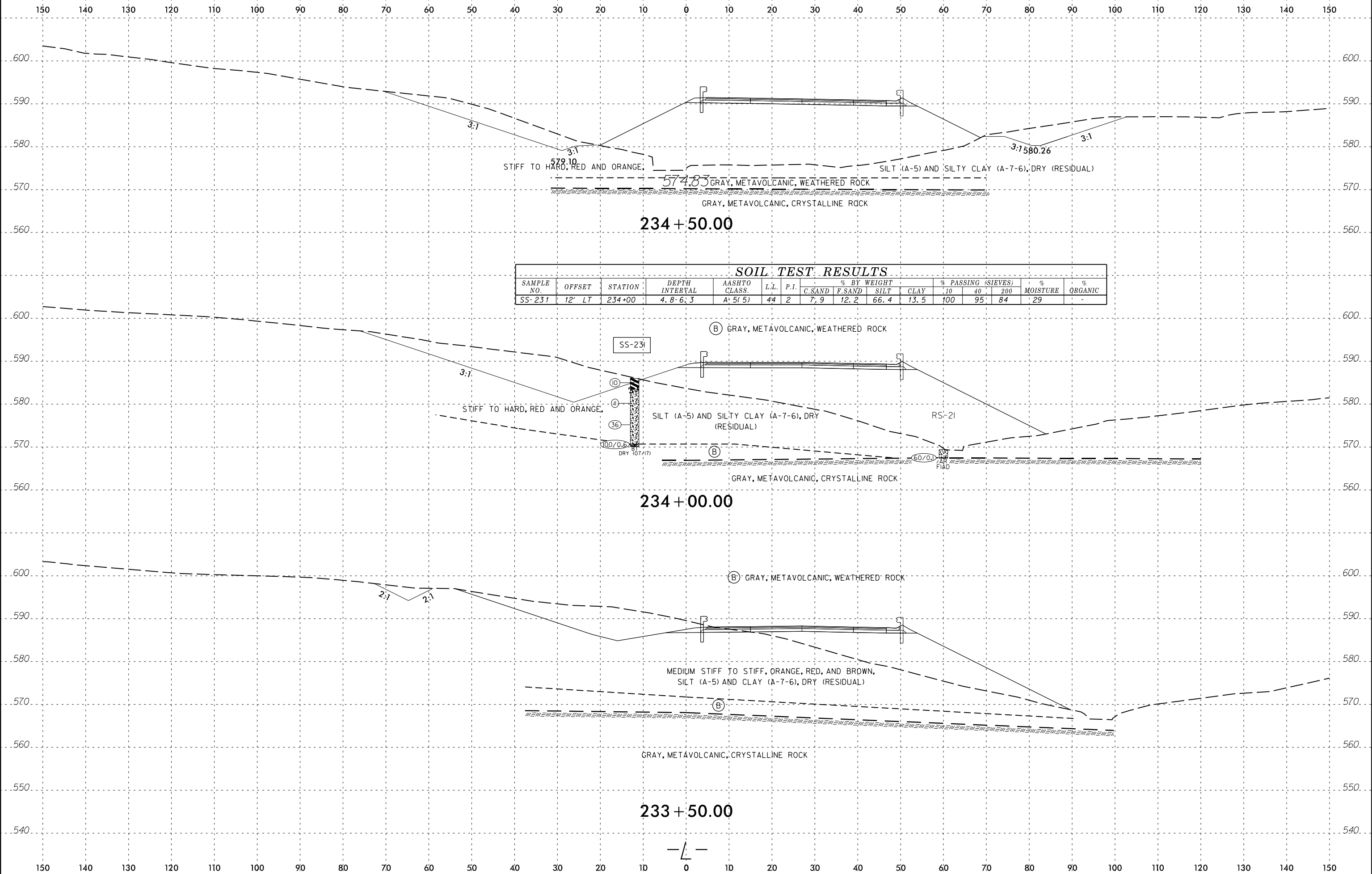


PROJ. REFERENCE NO.	SHEET NO.
U-3109B	36

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9:20:59 AM  
U3109B  
SUBSTRATE



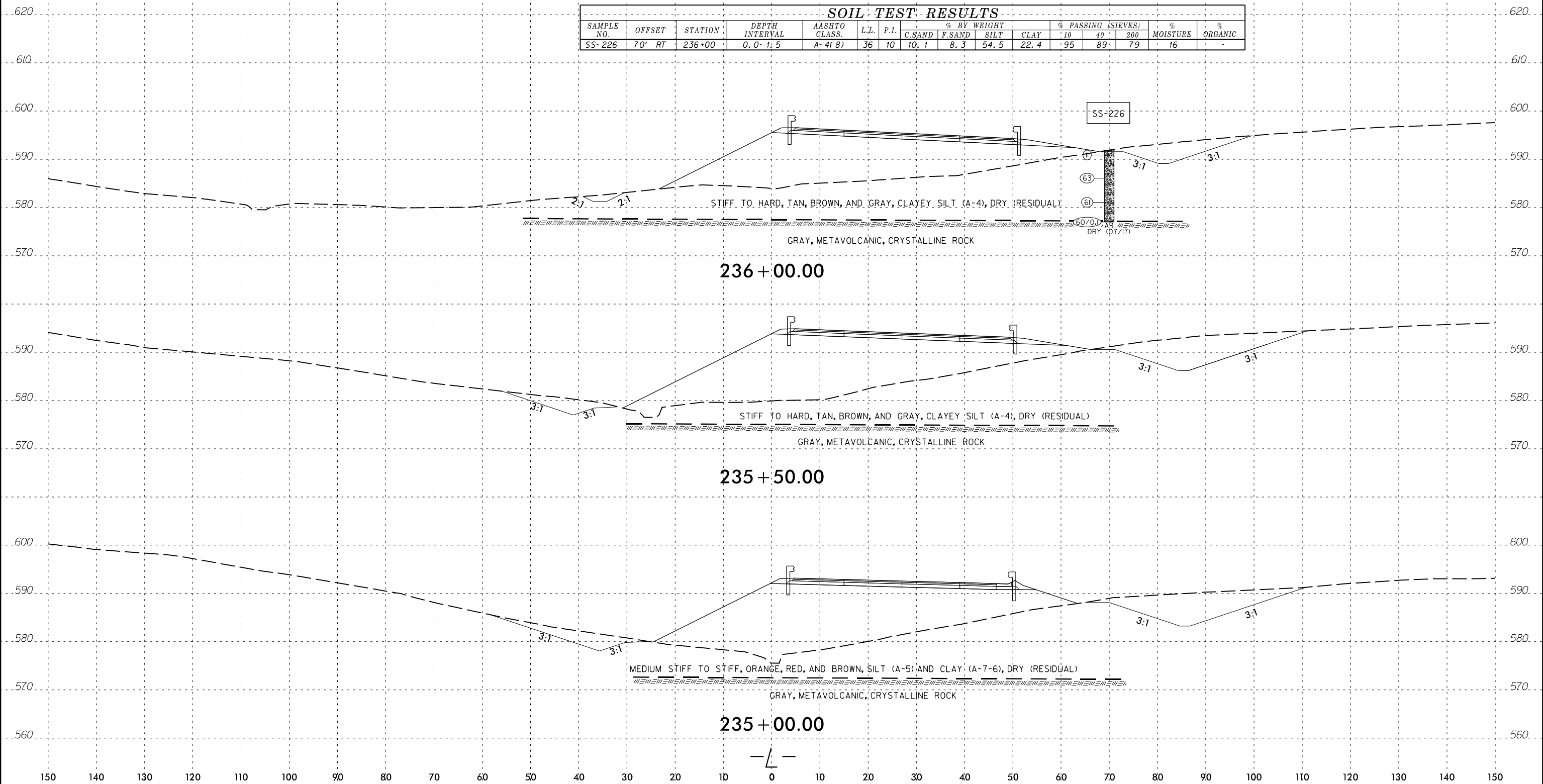
**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-231	12' LT	234+00	4.8-6.3	A-5(5)	44	2	7.9	12.2	66.4	13.5	100	95	84	29	-



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

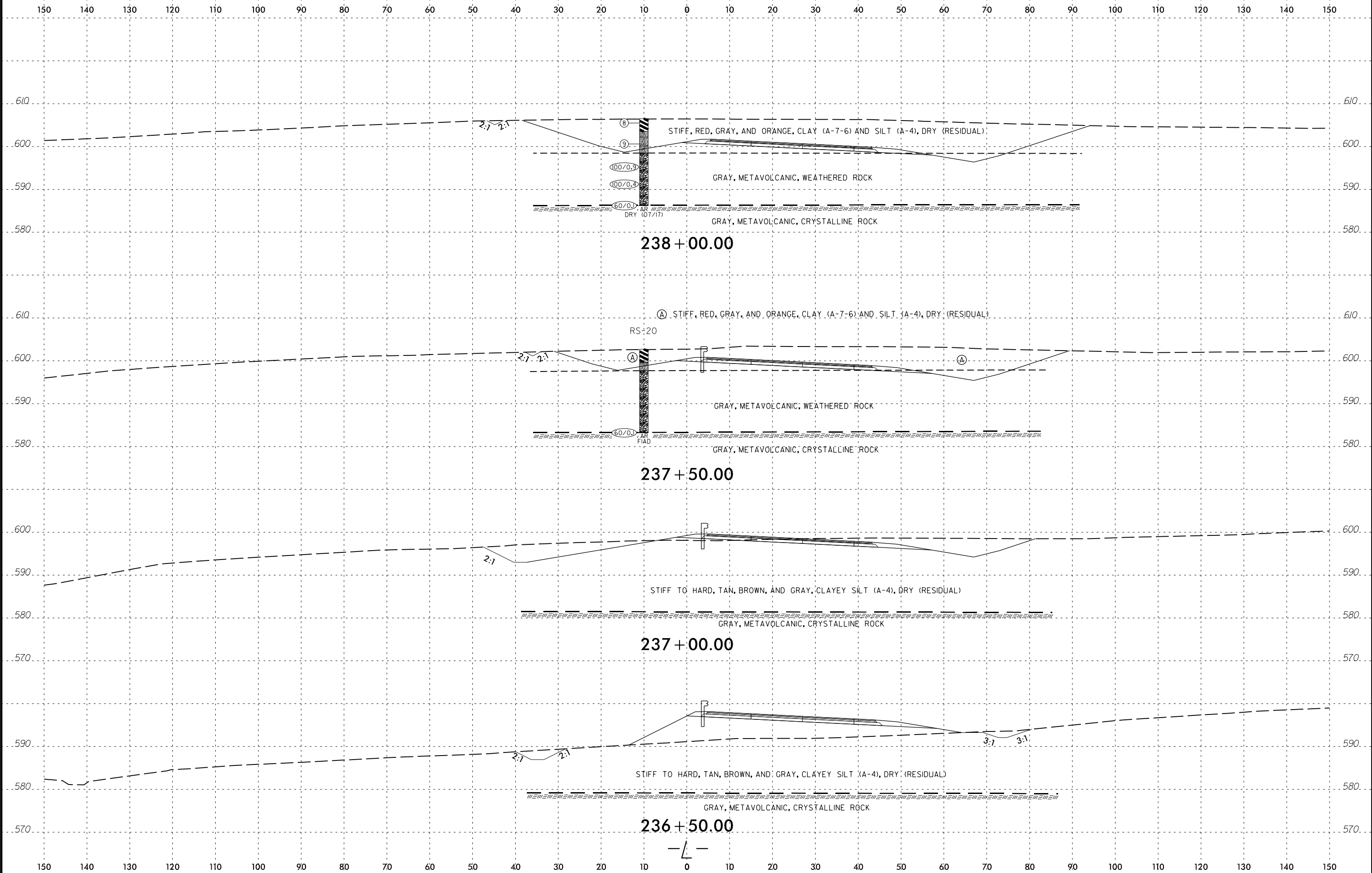
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	#10	#40	#200		
SS-226	70' RT	236+00	0.0-1.5	A-4(8)	36	10	10.1	8.3	54.5	22.4	95	89	79	16	-



6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-3109B	39



238 + 00.00

237 + 50.00

237 + 00.00

236 + 50.00

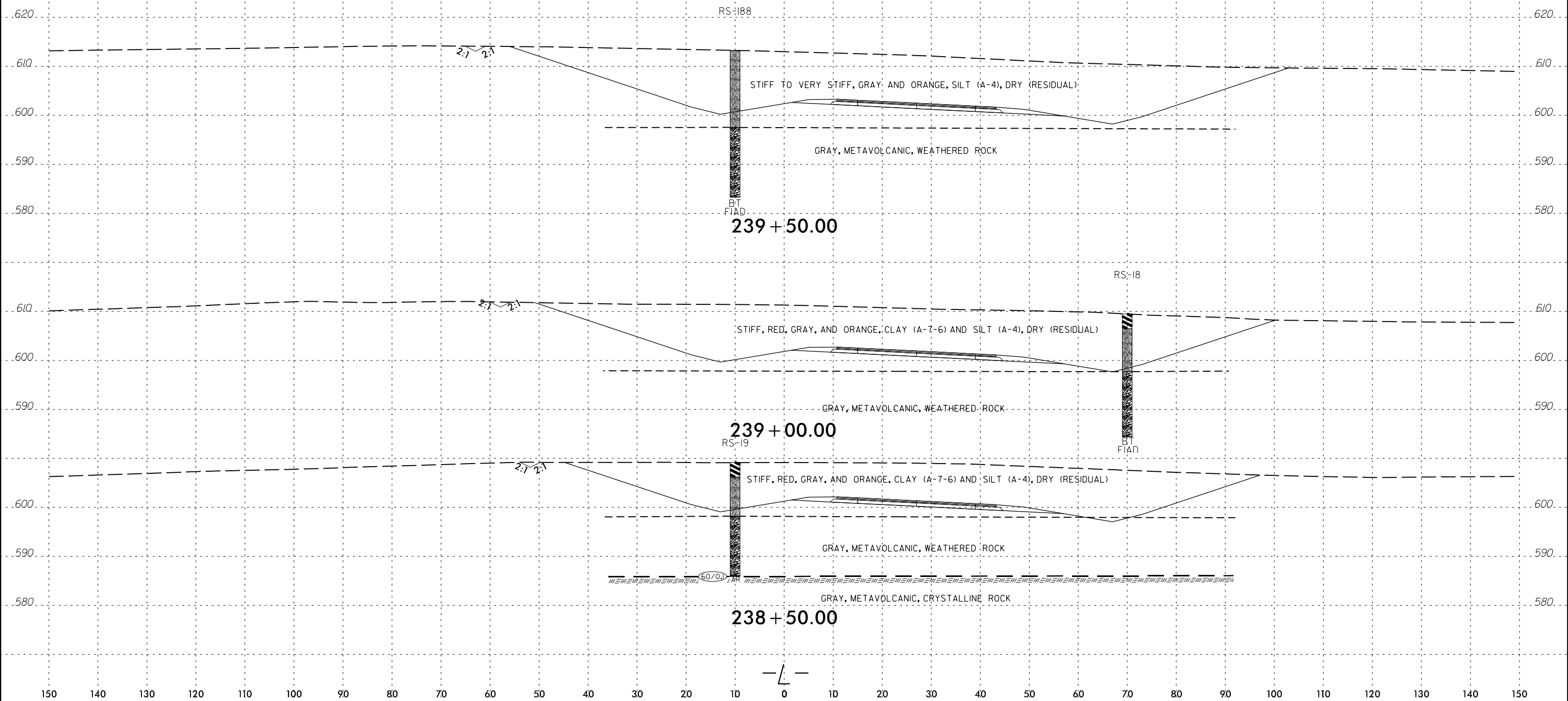
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3/23/16 11:53:53

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-3109B	40

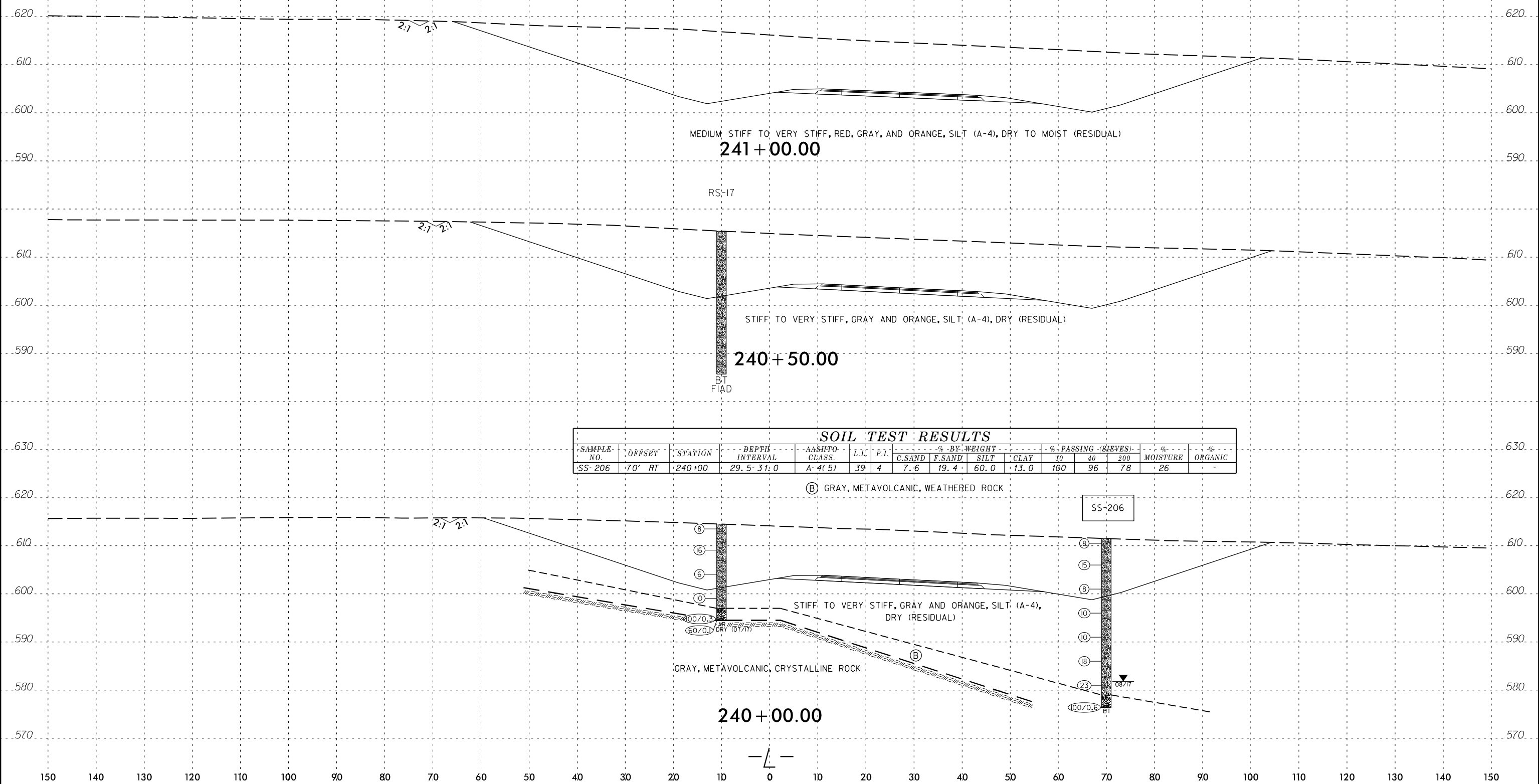
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9:21:03 AM  
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SUBSTRATE

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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



MEDIUM STIFF TO VERY STIFF, RED, GRAY, AND ORANGE, SILT (A-4), DRY TO MOIST (RESIDUAL)  
**241 + 00.00**

RS-17

**240 + 50.00**

BT  
FIAD

**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-206	70' RT	240+00	29.5-31.0	A-4(5)	39	4	7.6	19.4	60.0	13.0	100	96	78	26	-

(B) GRAY, METAVOLCANIC, WEATHERED ROCK

SS-206

STIFF TO VERY STIFF, GRAY AND ORANGE, SILT (A-4), DRY (RESIDUAL)

GRAY, METAVOLCANIC, CRYSTALLINE ROCK

**240 + 00.00**

BT

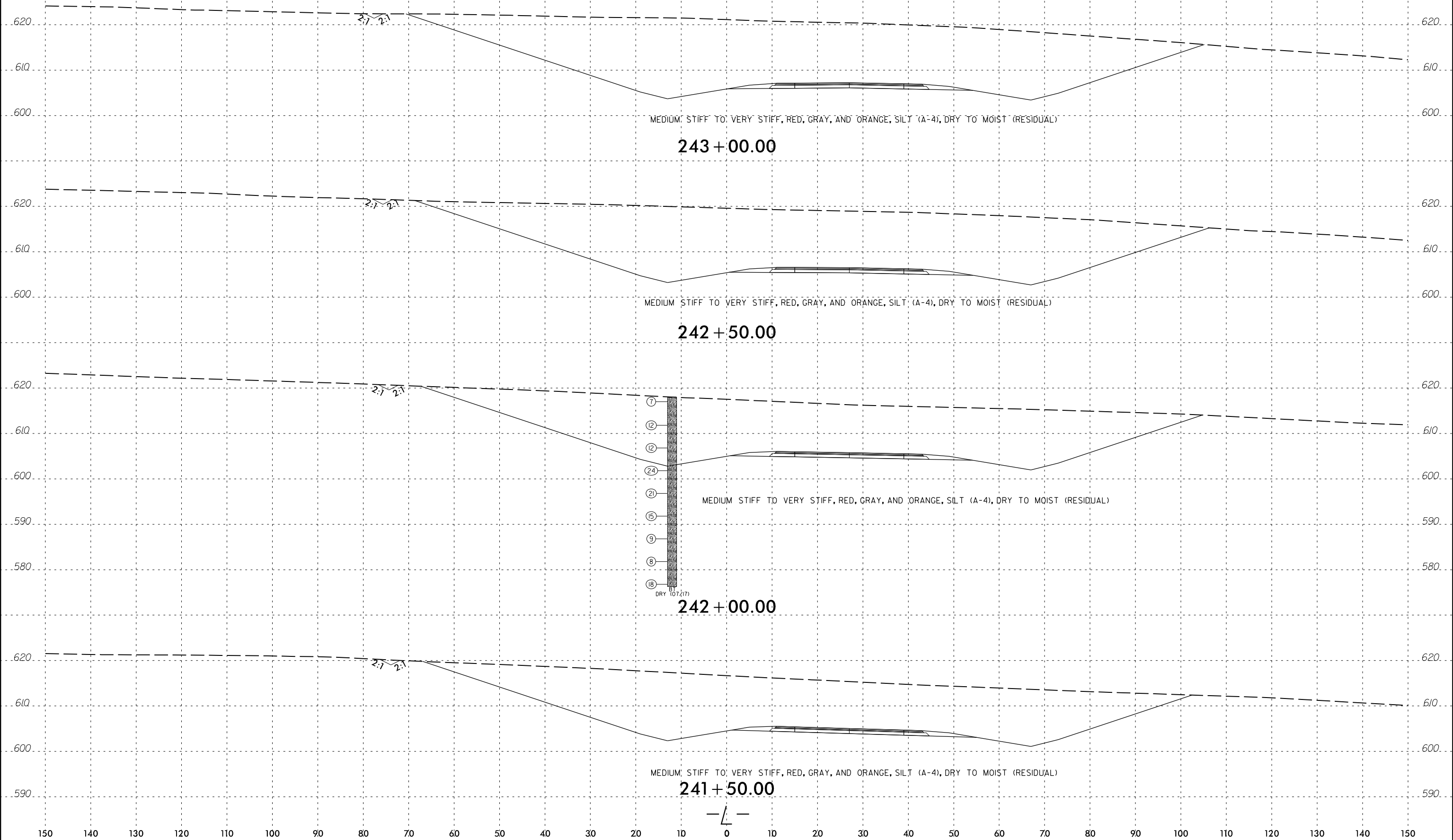
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6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-3109B	42

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



MEDIUM STIFF TO VERY STIFF, RED, GRAY, AND ORANGE, SILT (A-4), DRY TO MOIST (RESIDUAL)

243+00.00

MEDIUM STIFF TO VERY STIFF, RED, GRAY, AND ORANGE, SILT (A-4), DRY TO MOIST (RESIDUAL)

242+50.00

MEDIUM STIFF TO VERY STIFF, RED, GRAY, AND ORANGE, SILT (A-4), DRY TO MOIST (RESIDUAL)

242+00.00

MEDIUM STIFF TO VERY STIFF, RED, GRAY, AND ORANGE, SILT (A-4), DRY TO MOIST (RESIDUAL)

241+50.00

- 7
- 12
- 12
- 24
- 21
- 15
- 9
- 8
- 18

DRY (07/17)

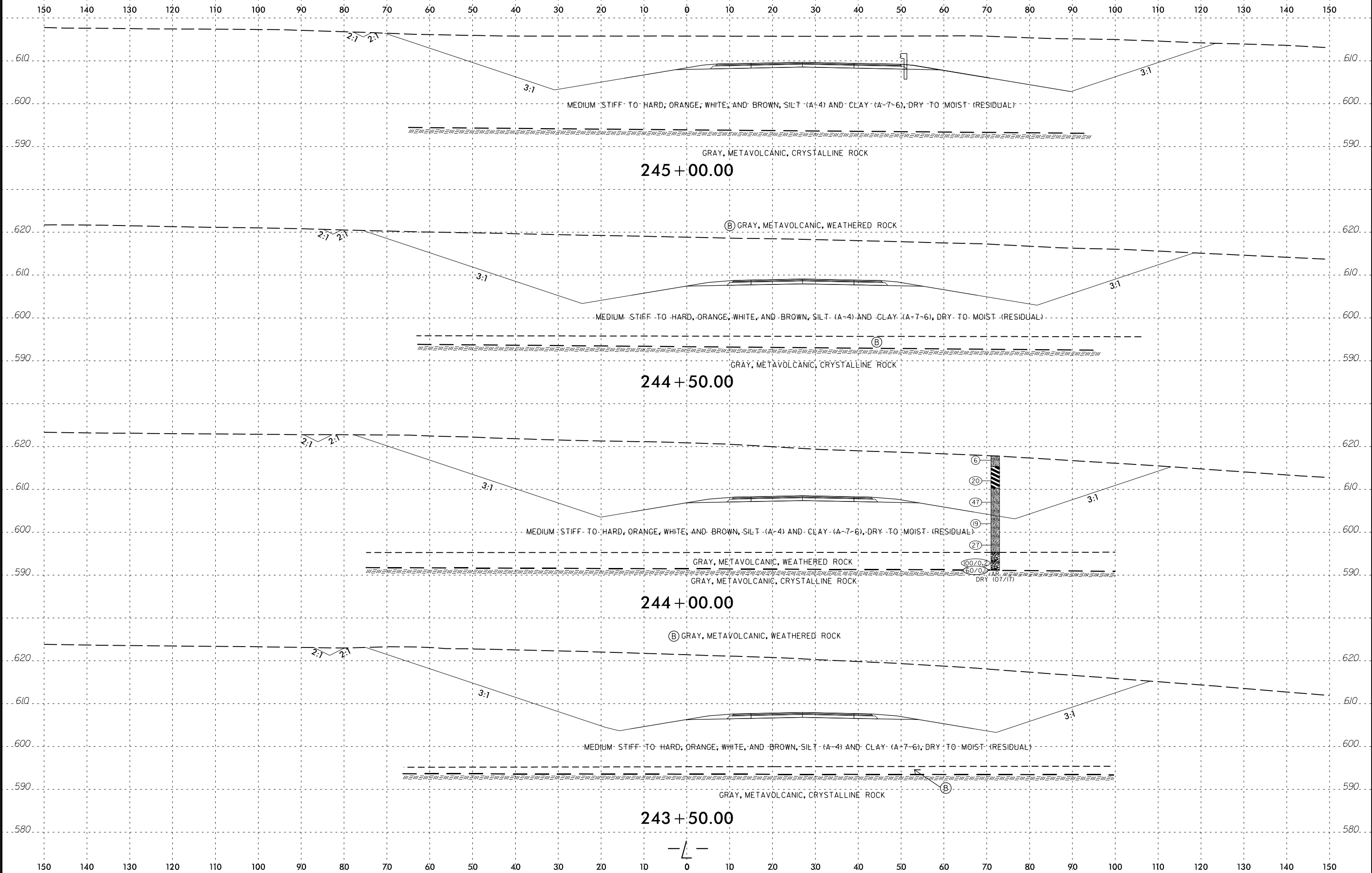
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3/23/16 11:53:53

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6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-3109B	43



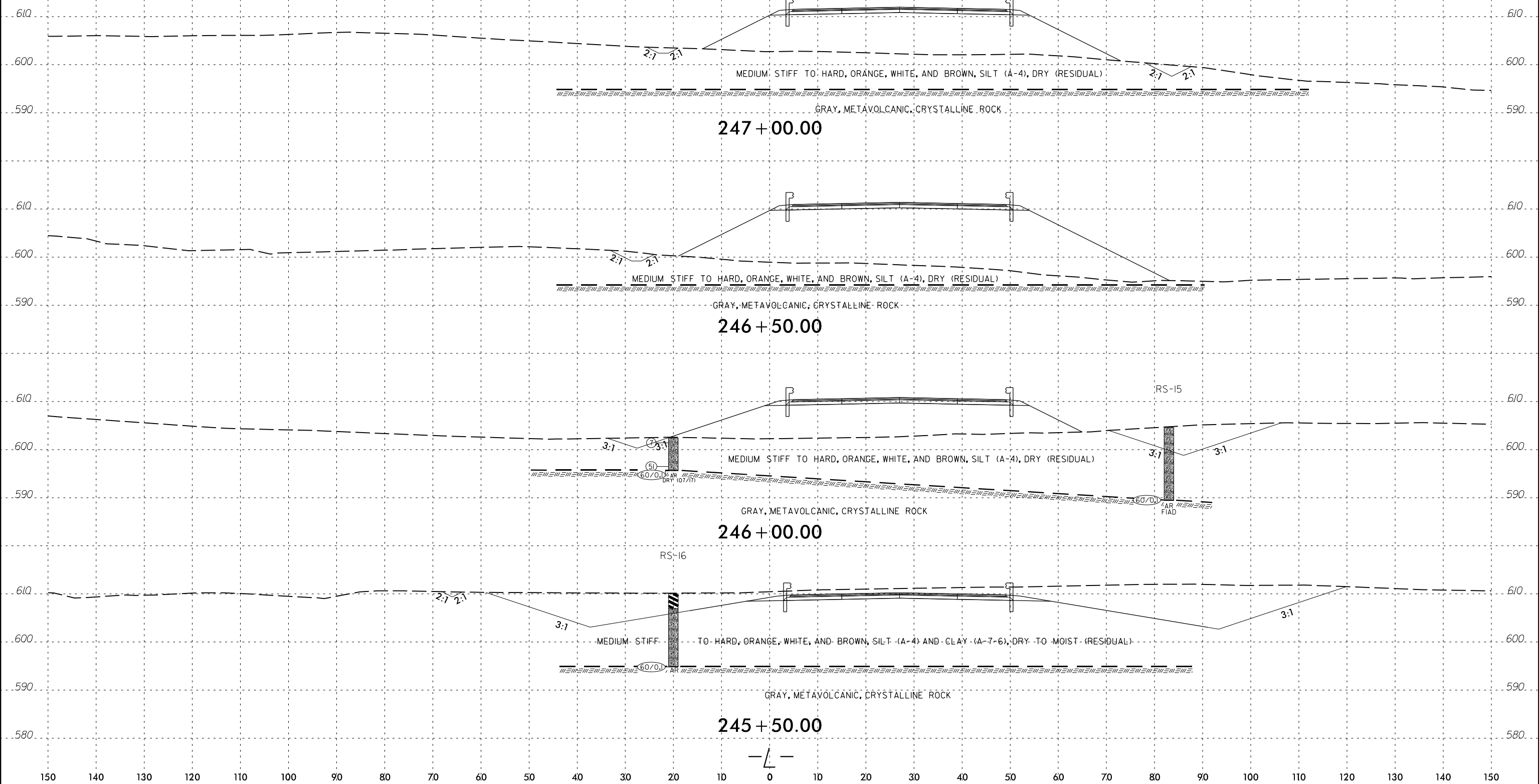
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3/23/16 11:53:59

6/23/16



PROJ. REFERENCE NO.	SHEET NO.
U-3109B	44

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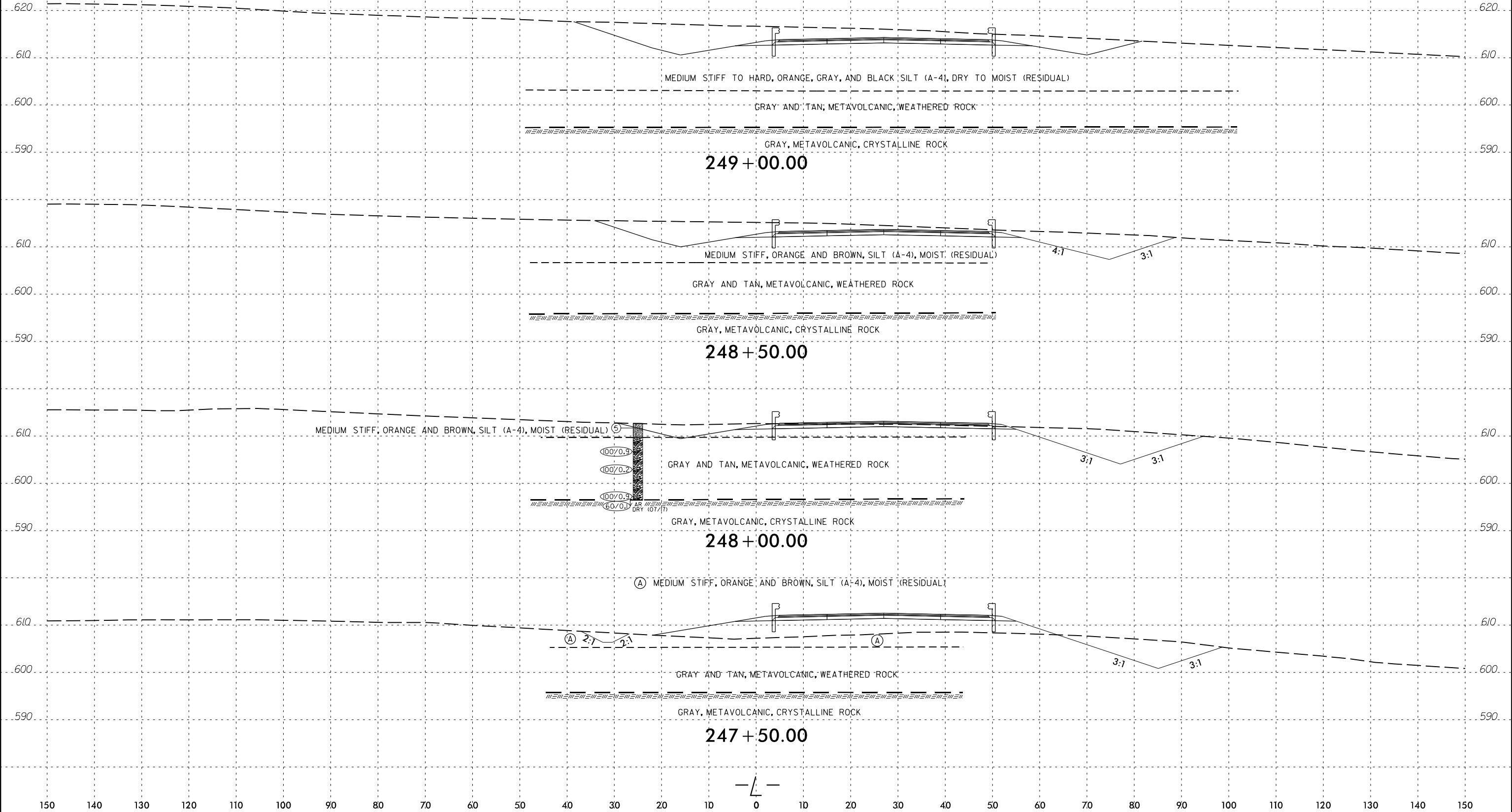
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6/23/16

6/23/16



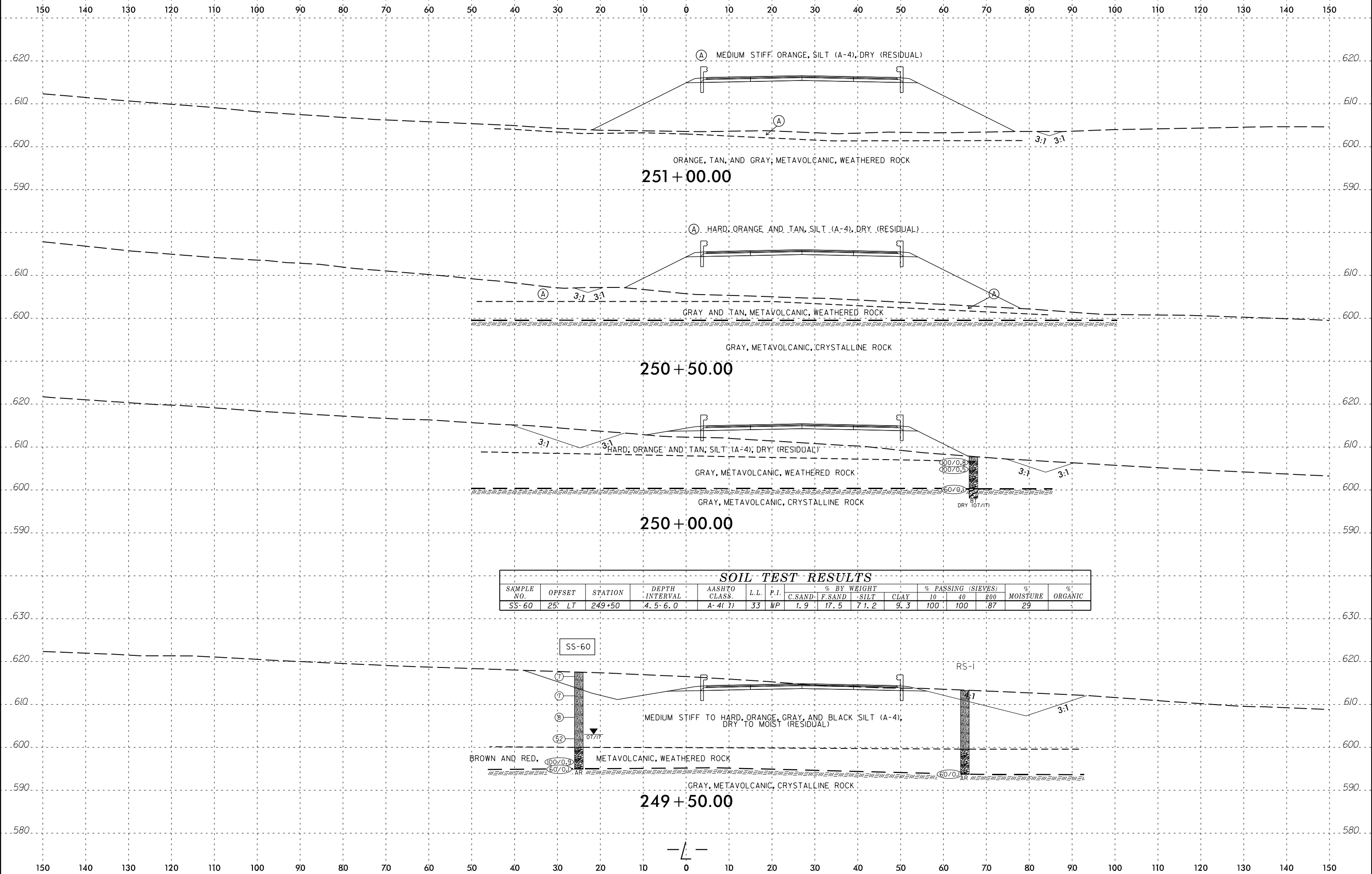
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U-3109B	45

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



9:21:08 AM  
U3109B  
SUBSTRUCTURE





**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-60	25' LT	249+50	4.5-6.0	A-4(1)	33	NP	1.9	17.5	71.2	9.3	100	100	87	29	

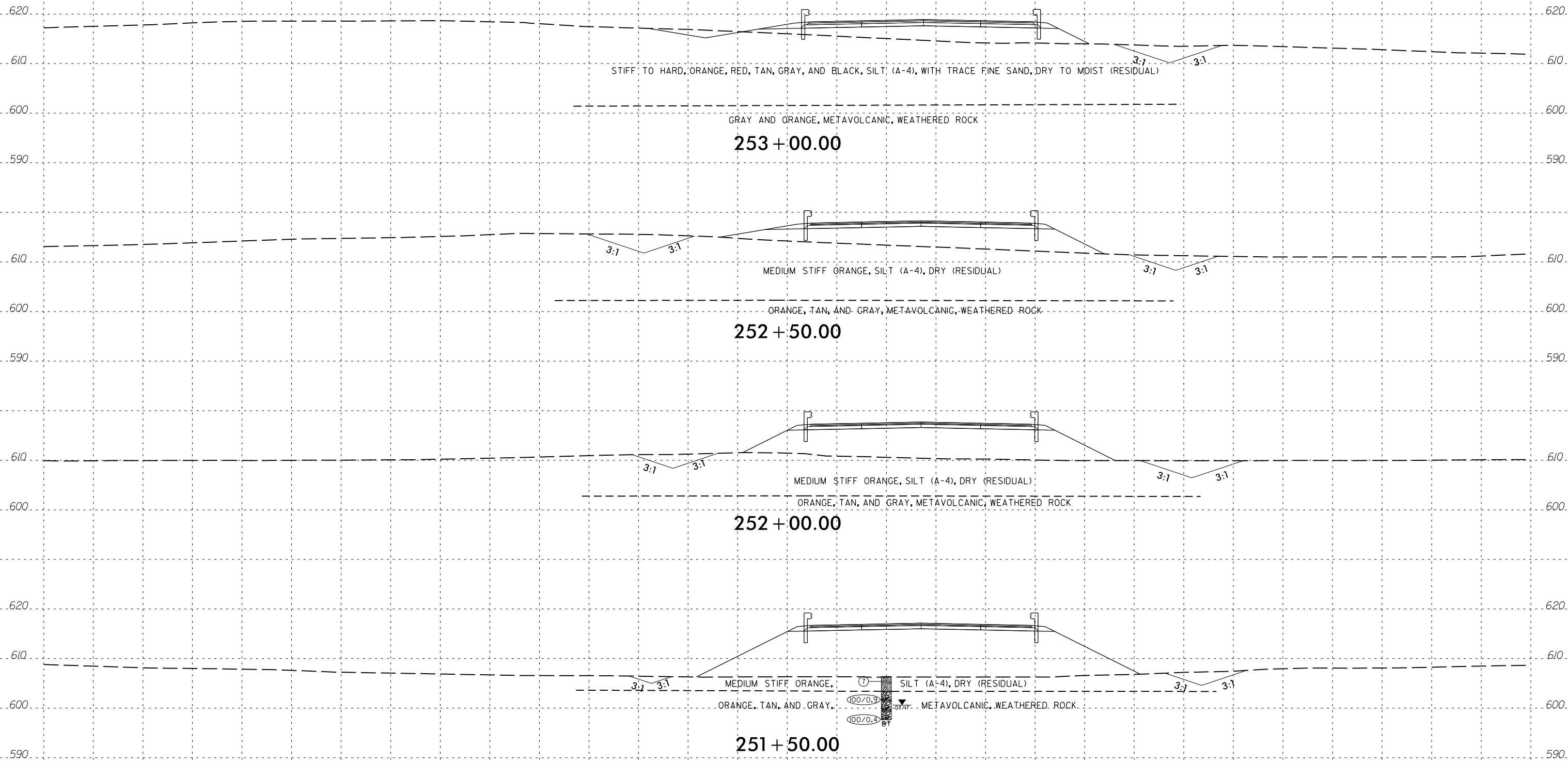
6/23/16



PROJ. REFERENCE NO.  
U-3109B

SHEET NO.  
47

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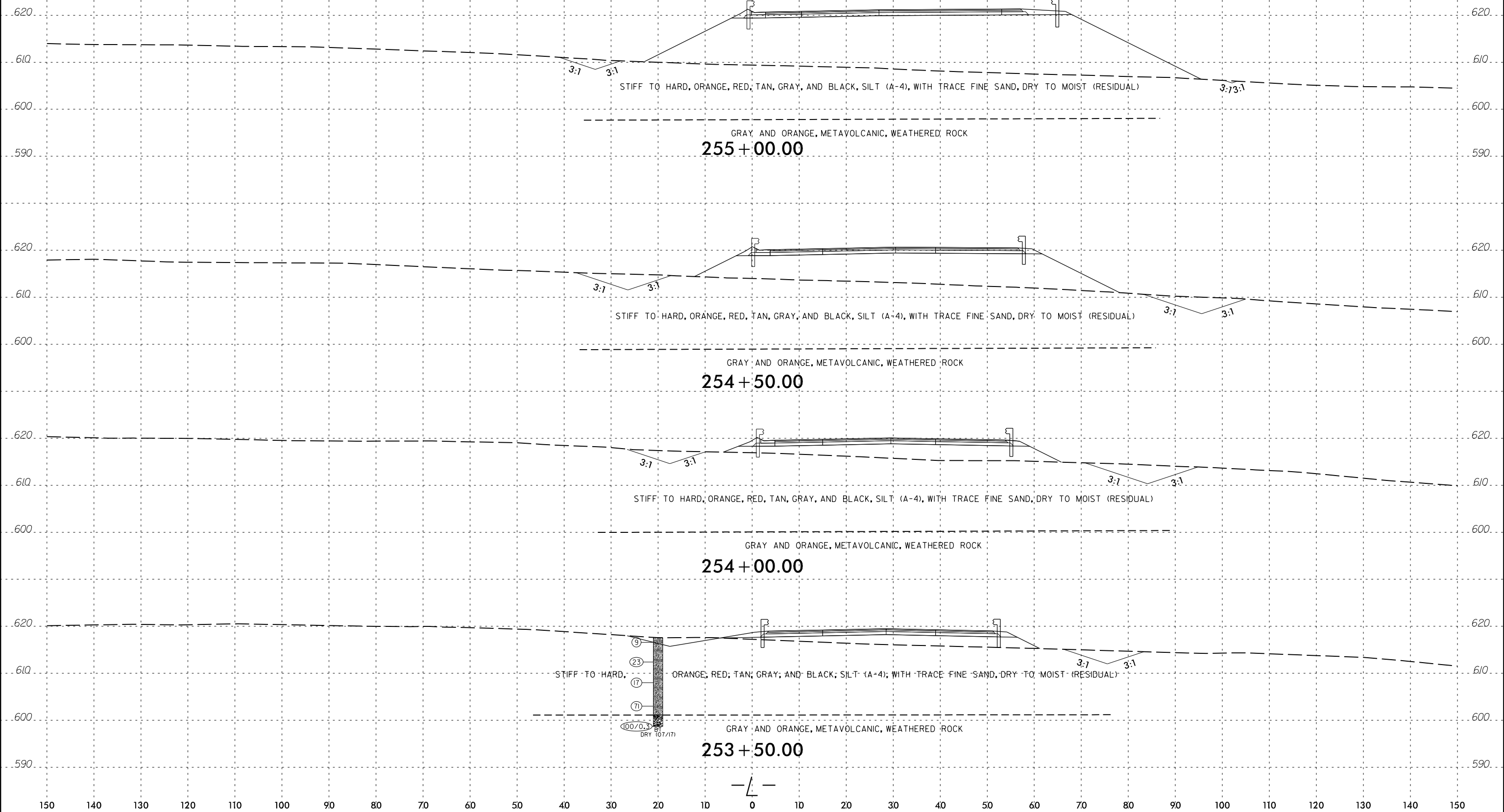


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150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

620. 620.

610. 610.

600. 600.

STIFF TO HARD, BROWN, GRAY, AND ORANGE, SILT (A-4), DRY TO MOIST (RESIDUAL)

GRAY, GREEN, AND BROWN, METAVOLCANIC, WEATHERED ROCK

256+50.00

620. 620.

610. 610.

600. 600.

590. 590.

MEDIUM STIFF TO VERY STIFF, ORANGE, TAN, BROWN, AND BLACK, SANDY SILT (A-4), DRY TO MOIST (RESIDUAL)

GRAY AND WHITE, METAVOLCANIC, WEATHERED ROCK

256+00.00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-40	20' LT	255+50	0.0-1.5	A-4(7)	31	9	4.3	14.6	51.8	27.0	98	97	84	-	-

630. 630.

(A) VERY DENSE, WHITE SAND TAN SILTY SAND (A-2-4), DRY, (RESIDUAL)

620. 620.

SS-40

610. 610.

MEDIUM STIFF TO VERY STIFF, ORANGE, TAN, BROWN, AND BLACK, SANDY SILT (A-4), DRY TO MOIST (RESIDUAL)

(4)

(25)

(A)

(100/0.07)

ORANGE, GRAY, AND WHITE, METAVOLCANIC, WEATHERED ROCK

ORANGE, GRAY AND WHITE, METAVOLCANIC, CRYSTALLINE ROCK

255+50.00

590. 590.

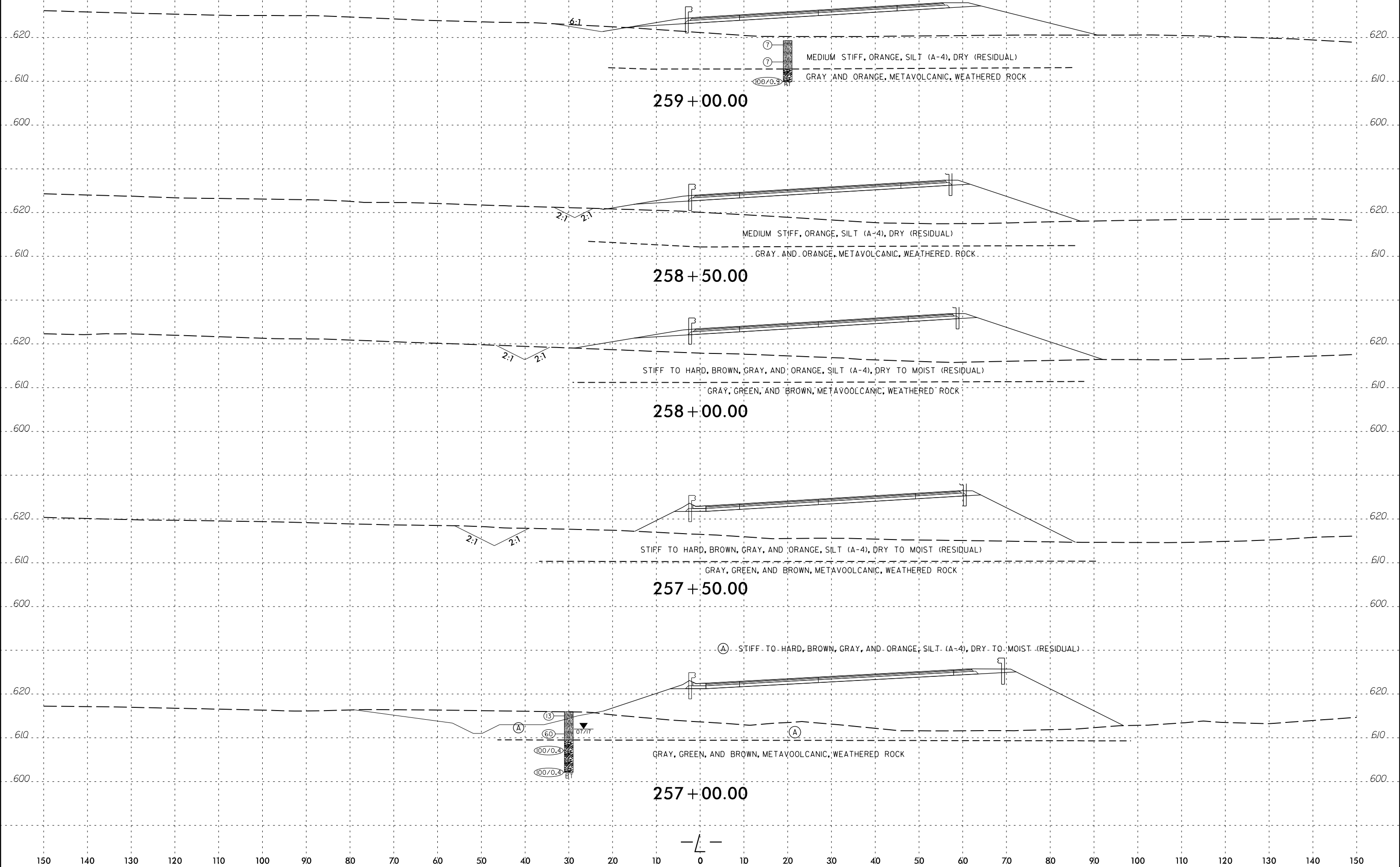
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6/23/16



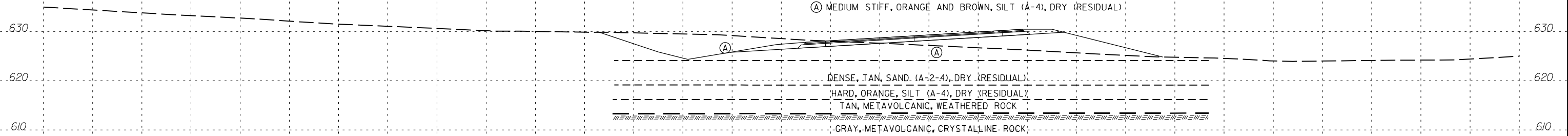
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U-3109B	50

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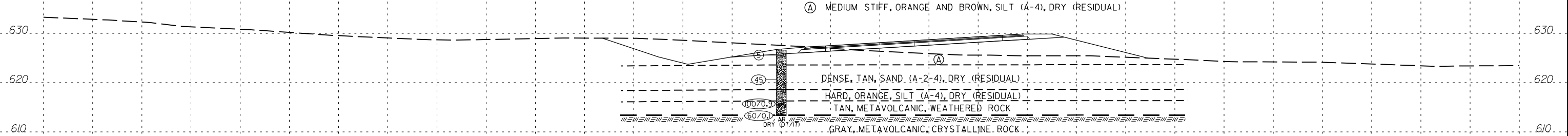


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SUBSTRATE

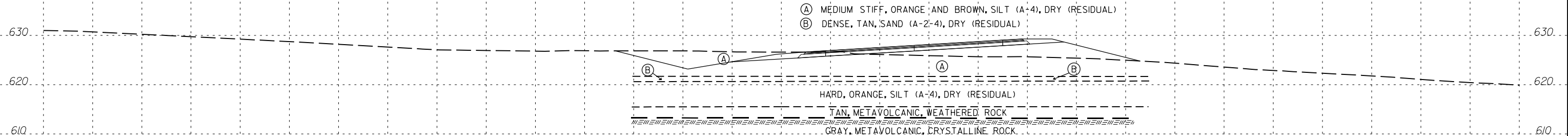
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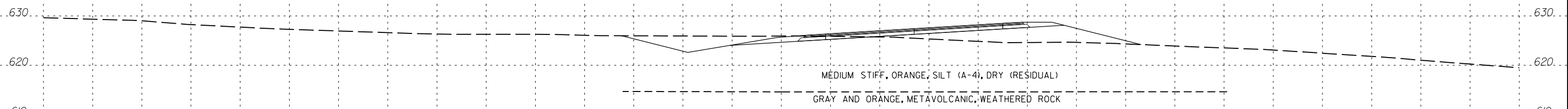
261 + 50.00



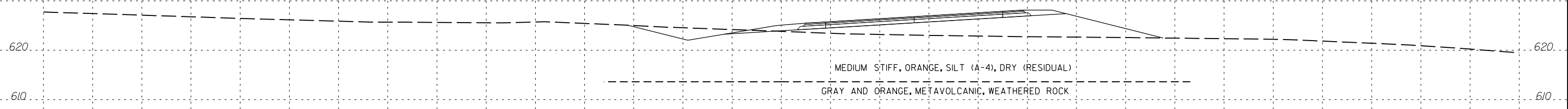
261 + 00.00



260 + 50.00

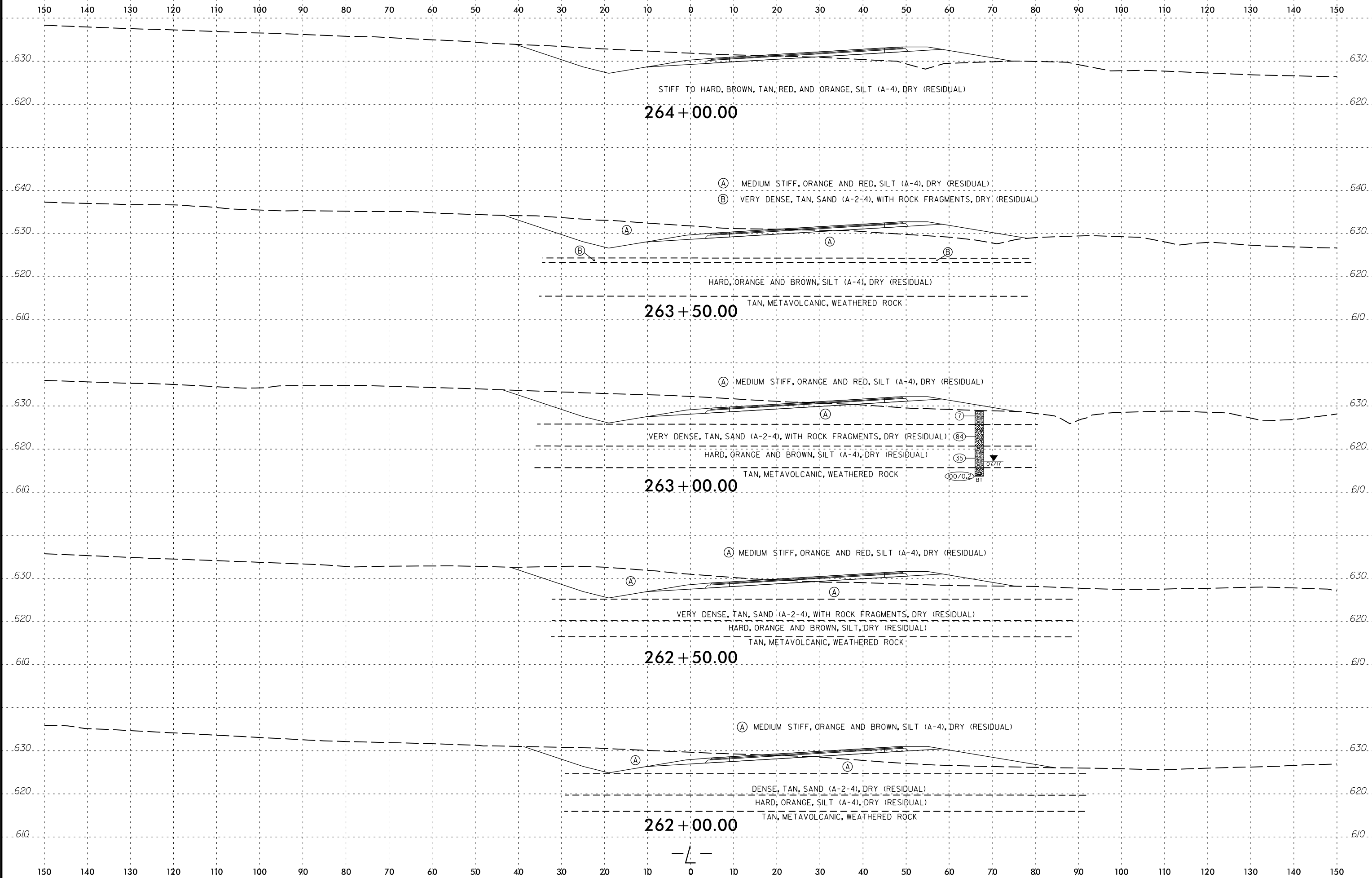


260 + 00.00

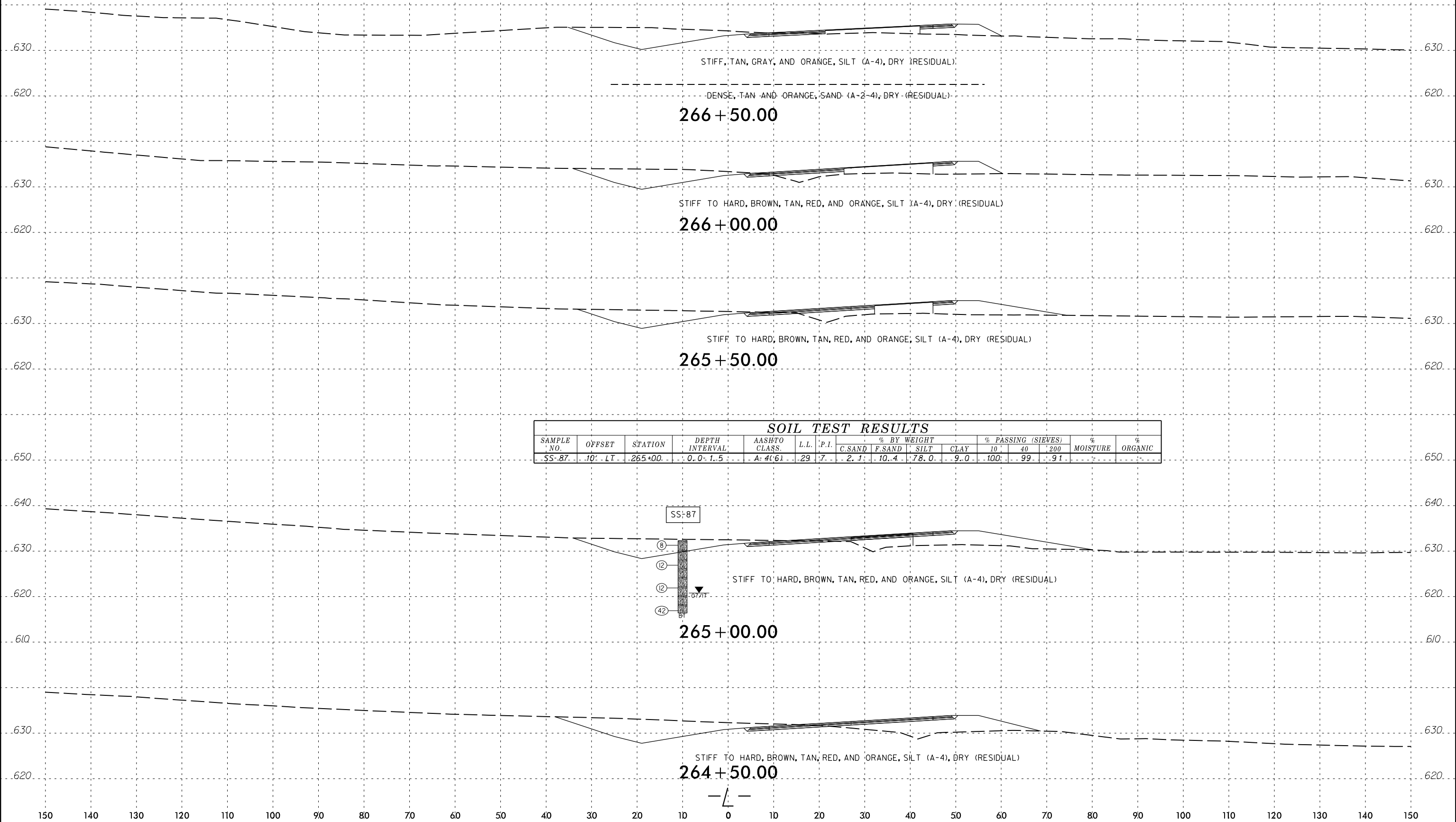


259 + 50.00

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



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





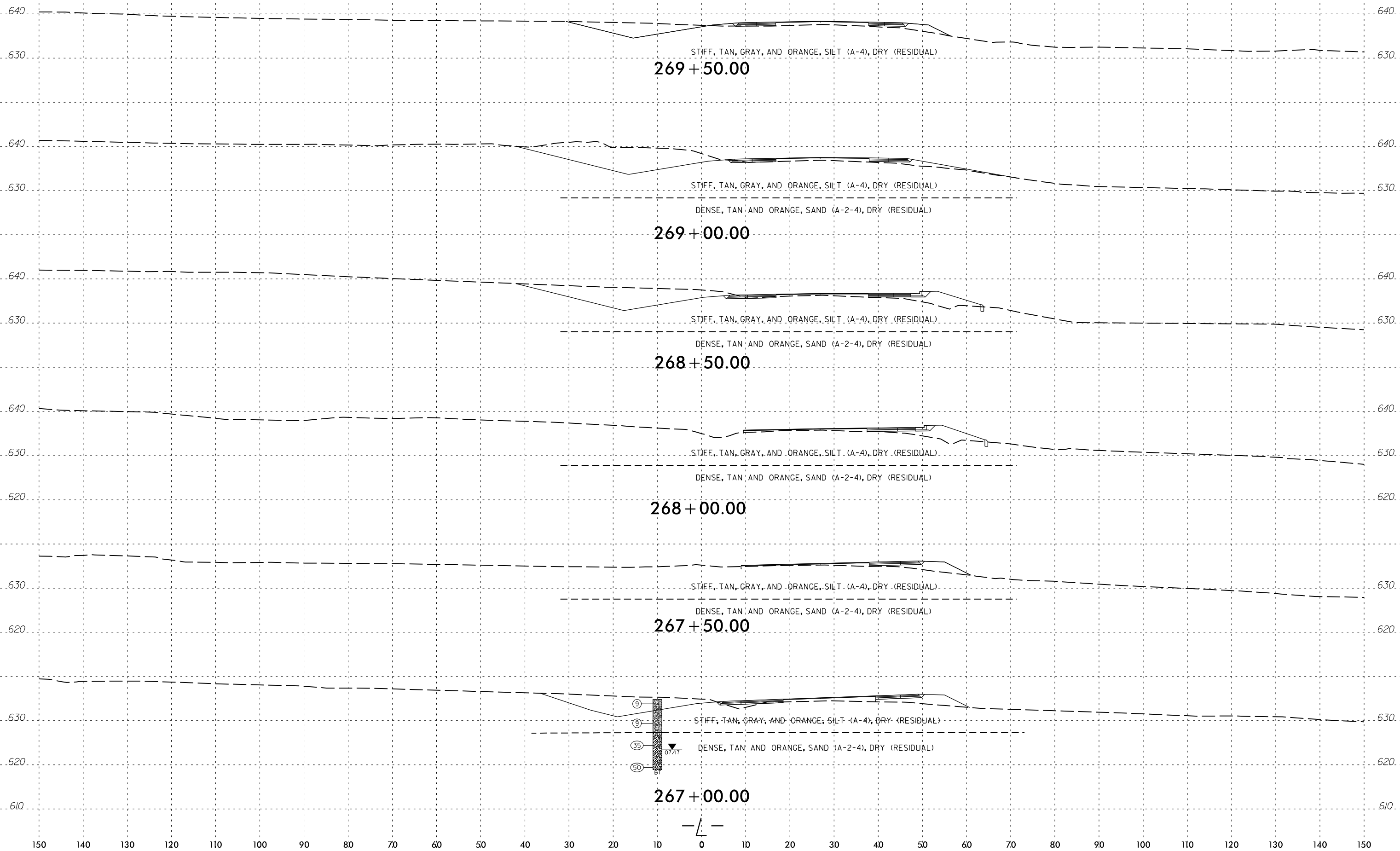
6/23/16



PROJ. REFERENCE NO.  
U-3109B

SHEET NO.  
54

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



269+50.00

269+00.00

268+50.00

268+00.00

267+50.00

267+00.00

9  
9  
35  
50

0.77

6/23/16 AM  
U-3109B  
SUBSECTION 15553

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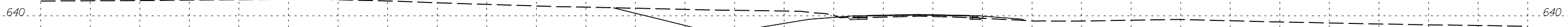
6/23/16



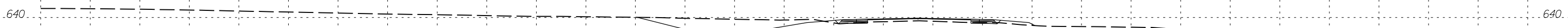
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U-3109B

SHEET NO.  
55

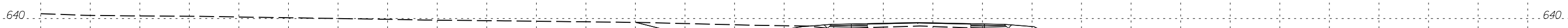
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STIFF, TAN, GRAY, AND ORANGE, SILT (A-4), DRY (RESIDUAL)  
**271+00.00**



STIFF, TAN, GRAY, AND ORANGE, SILT (A-4), DRY (RESIDUAL)  
**270+50.00**



STIFF, TAN, GRAY, AND ORANGE, SILT (A-4), DRY (RESIDUAL)  
**270+00.00**



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

6/23/16 AM  
U-3109B  
SUBSTRATE