

**SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION**

CONTENTS

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>	<u>X-SECT</u>
-L-	27+75 - 71+00	4 - 6, 8	9 - 11
-YI-	6+15 - 35+40	6 - 8	25 - 28
-Y2-	11+00 - 19+42.69	7	29 - 30
-RPA-	10+00 - 17+17.03	6	12 - 14
-RPB-	10+00 - 21+06.09	5 - 6	15 - 17
-RPC-	10+00 - 28+26.17	5 - 6	18 - 20
-RPD-	11+34.38 - 21+23.90	6, 8	21 - 24

LAB TESTS SHEET 31

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY **FORSYTH**
PROJECT DESCRIPTION **I-40/US 311 AT NC 109**
(THOMASVILLE RD.) / CLEMMONSVILLE RD. SPLIT
DIAMOND INTERCHANGE

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5880	1	31

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 OBTAINED FROM THE FIELD ARE OF DIFFERENT QUALITY. THE QUALITY OF THE DATA FROM THE FIELD, 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.

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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. STICKNEY

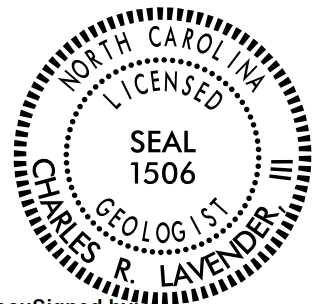
C.L. SMITH

B.E. FOSTER

INVESTIGATED BY C.R. LAVENDER, III

DRAWN BY J.E. BEVERLY

CHECKED BY J.E. BEVERLY

SUBMITTED BY K.B. MILLERDATE MARCH 2022

DocuSigned by:

[Signature] 03/10/2022

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DATE _____

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

REFERENCE: I-5880

PROJECT: 53080

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, *VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6*

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (< 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1	A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	
SYMBOL	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7				A-7-a, A-7-b	A-3	A-6, A-7	
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	
MATERIAL PASSING #40 LL PI	-		-		40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 11 MN	41 MN 11 MN		
GROUP INDEX	0		0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND		SILTY SOILS		CLAYEY SOILS		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD						FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270
	4.76	2.00	0.42	0.25	0.075	0.053
BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
LL LIQUID RANGE (PI) PL	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM SL	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	

GRADATION

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.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING

STATIC WATER LEVEL AFTER 24 HOURS

PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA

SPRING OR SEEP

MISCELLANEOUS SYMBOLS

ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION

SOIL SYMBOL

ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT

INFERRED SOIL BOUNDARY

INFERRED ROCK LINE

ALLUVIAL SOIL BOUNDARY

DIP & DIP DIRECTION OF ROCK STRUCTURES

TEST BORING

AUGER BORING

CORE BORING

MONITORING WELL

PIEZOMETER INSTALLATION

SLOPE INDICATOR INSTALLATION

CONE PENETROMETER TEST

SOUNDING ROD

TEST BORING WITH CORE

SPT N-VALUE

RECOMMENDATION SYMBOLS

UNDERCUT

SHALLOW UNDERCUT

UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE

UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK

UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
f - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HL. - HIGHLY

MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR. - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY

VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS
S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
☐ CME-45C
☐ CME-55
☒ CME-550

ADVANCING TOOLS:
☐ CLAY BITS
☐ 6" CONTINUOUS FLIGHT AUGER
☒ 8" HOLLOW AUGERS
☐ HARD FACED FINGER BITS
☐ TUNG.-CARBIDE INSERTS
☐ CASING ☐ W/ ADVANCER
☐ TRICONE _____ *STEEL TEETH
☐ TRICONE _____ *TUNG.-CARB.
☐ CORE BIT
☐ _____

HAMMER TYPE:
☒ AUTOMATIC ☐ MANUAL

CORE SIZE:
☐ -B _____ ☐ -H _____
☐ -N _____

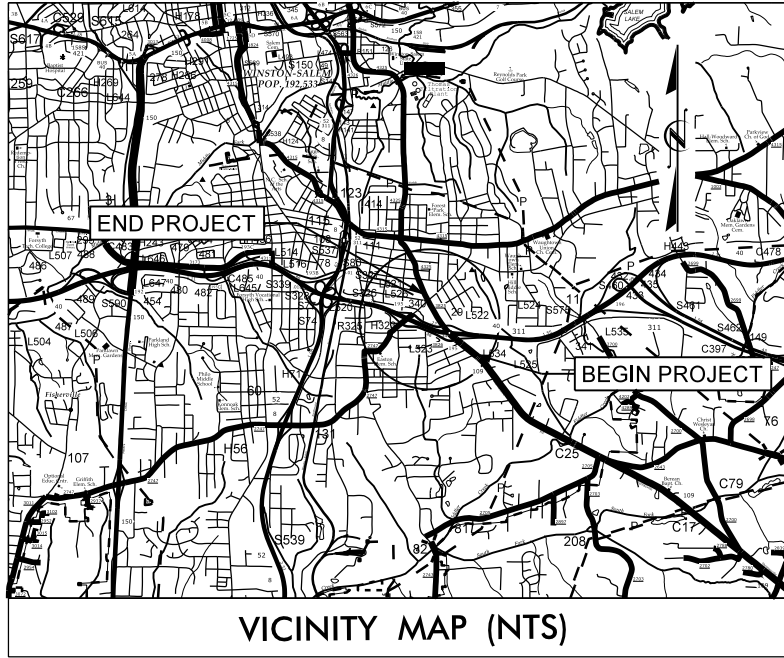
HAND TOOLS:

08-MAR-2022 09:55 S:\WFO\Harrispurq Investigation\TIP\I5880_CEO_RDWY_FORSYTH\CADD_GEO\TECH\PlanProf\I5880_rdy_tsh.dgn \$\$\$USERNAME\$\$\$

CONTRACT:

TIP PROJECT: I-5880

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



VICINITY MAP (NTS)

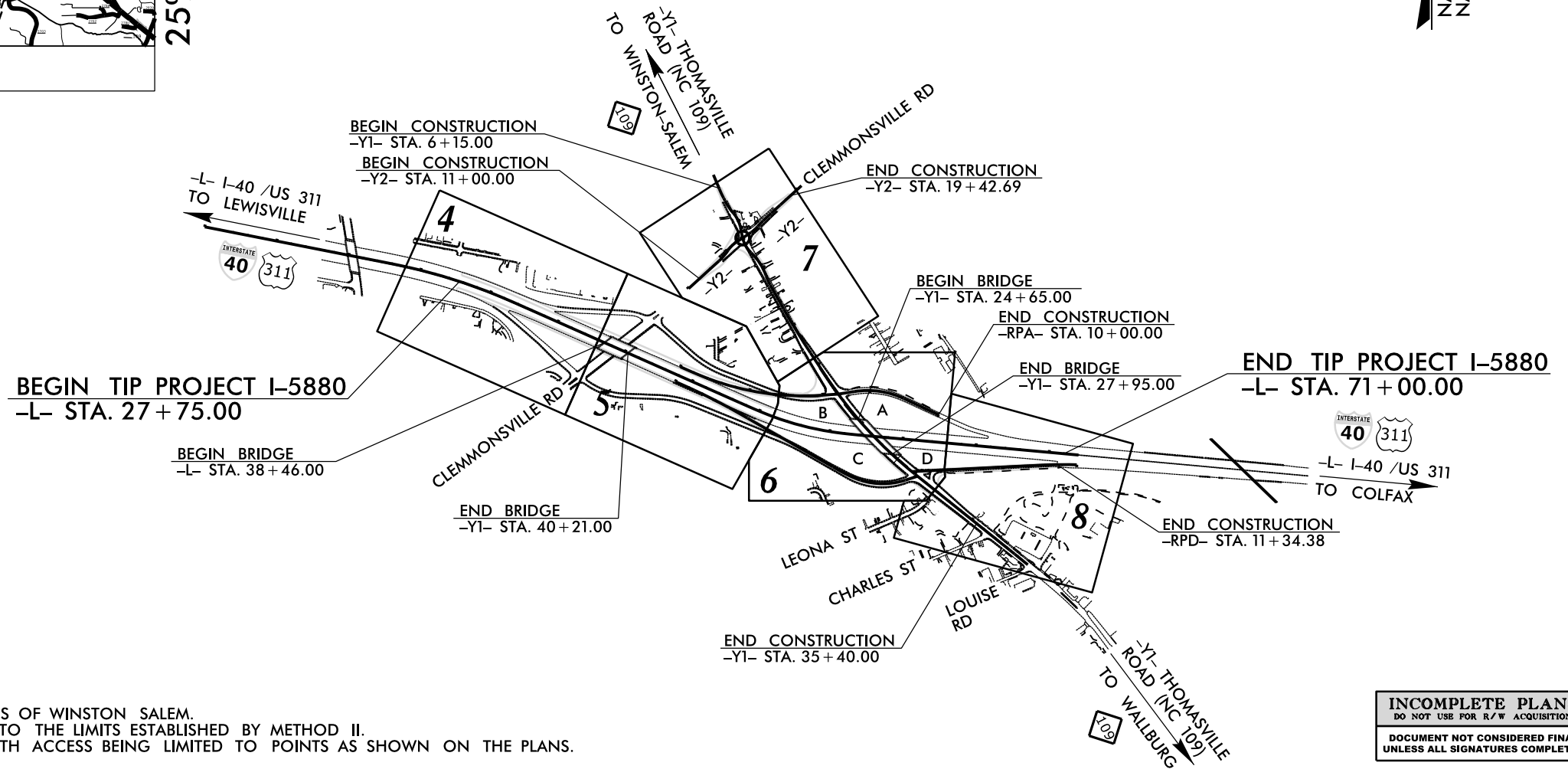
25% RE-SUBMITTAL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

FORSYTH COUNTY

LOCATION: I-40 /NC 109 INTERCHANGE PROJECT
IN WINSTON-SALEM, NC

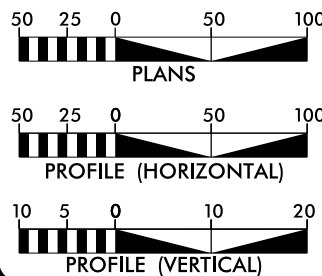
TYPE OF WORK: GRADING, DRAINAGE, PAVING,
STRUCTURES, SIGNALS AND SIGNING



- THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF WINSTON SALEM.
- CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
- THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

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

GRAPHIC SCALES



DESIGN DATA

ADT 2017 = 111,600
ADT 2040 = 139,800
K = 9 %
D = 60 %
T = 11 % *
V = 70 MPH
* TTST = 8% DUAL 3%
FUNC CLASS =
INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5880 = 0.786 MILES
LENGTH OF STRUCTURE I-5880 = 0.033 MILES
TOTAL LENGTH OF TIP PROJECT I-5880 = 0.819 MILES

NCDOT POINT OF CONTACT:

W. AL BLANTON, PE, PLS
PROJECT ENGINEER



Prepared In the Office of:
JOHNSON, MIRMIRAN, & THOMPSON, INC.
1130 Situs Court, Suite 200, Raleigh NC, 27606

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 2019

LETTING DATE:
NOVEMBER 2021

ENRICO A. ROQUE, PE
PROJECT ENGINEER

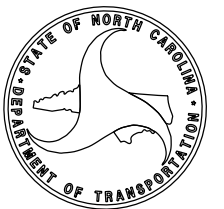
CHRISTOPHER J. DEWITT, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN
ENGINEER

SIGNATURE: P.E.





STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

March 8, 2022

TIP NO: I-5880
WBS NO: 53080.1.1
COUNTY: Forsyth
DESCRIPTION: I-40/US 311 at NC 109 (Thomasville Rd)/Clemmons Road Split, Diamond Interchange

SUBJECT: Geotechnical Report - Inventory

Project Description

The project consists of constructing a Diamond Interchange in a multilane, divided facility along new locations. The project begins just east of the bridge on Old Lexington Road (SR 2743) over I-40 and extends for approximately 0.82 miles, ending approximately 0.2 miles east of the bridge on Thomasville Road (NC 109) over I-40. The geotechnical investigation of subsurface conditions was confined to the corridor of proposed new construction.

The following alignments were investigated for this project:

<u>Alignment</u>	<u>Station (±)</u>
-L-	27+75 to 71+00
-Y1-	6+15 to 35+40
-Y2-	11+00 to 19+43
-RPA-	10+00 to 17+17
-RPB-	10+00 to 21+06
-RPC-	10+00 to 28+26
-RPD-	11+34 to 21+24

Physiography and Geography

The project corridor is located within the Charlotte/Milton Belt of the Piedmont Physiographic Province. Topography along -L- is relatively flat with elevations ranging from approximately 890 feet to 920 feet. The

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NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

Telephone: 919-707-6850
Fax: 919-250-4237
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

area is drained by tributaries of Fiddler’s Creek. The corridor extends eastward through predominately residential properties with commercial properties along Thomasville Road (109) to the south of I-40.

Geologically, the project corridor consists of Cambrian to Late Proterozoic age biotite gneiss and schist (Czbg) that locally contains potassic feldspar and garnet. Calc-sillimanite-mica schist, mica schist and amphibolite are also reported to occur.

Soil Properties

Roadway Embankment soils occur along existing roadways primarily at the beginning and end of the project. Typically, these soils consist of soft to stiff clayey silts and silty clays (A-5, A-7-5) with buried asphalt.

Residual soils are derived from the in-place weathering of parent materials. These soils are further subdivided into sands, silts, and clays. Residual soils encountered during this investigation contain varying concentrations of mica, ranging from a trace to being highly micaceous. Predominate residual soils encountered during this investigation were loose to medium dense, dry to wet, silty sand (A-2-4), moist to wet, medium stiff to very stiff sandy silt (A-4), moist to wet, soft to very stiff clayey silt (A-5), and moist, medium stiff to very stiff silty clay (A-7-5/A-7-6). The granular soils generally possess good to excellent engineering properties. The cohesive soils typically exhibit fair engineering properties with moisture content ranging from 21 to 32. Plasticity indices ranged from 5 (low plasticity) to 31 (high plasticity) with generally less than 50 percent of the material passing the No. 200 sieve. These cohesive soils may have the potential to cause problems with subgrade stability and/or embankment stability as well as settlement.

Weathered rock, classified as biotite gneiss and schist were encountered beneath the residual soils at an approximate depth of 60 feet below existing ground surface.

Rock Properties

Crystalline rock, classified as biotite gneiss and schist was encountered beneath the weathered rock, in one boring at an approximate depth of 61.1 feet below existing ground surface.

Ground Water Properties

Ground water was not encountered during the investigation at the depths investigated.

DocuSigned by:

85EA8D1BBA2E438...
Charles K. Lavender, III, P.E.
Geological Engineer

Areas of Special Geotechnical Interest

1. High Plasticity Soils

Cohesive soils containing clays are common along the project corridor. Cohesive soils with a high plasticity index (PI) were identified in localized, or limited areas. Soil quality results for high PI clay soils were identified as AASHTO classification A-7-5. The following sections contain cohesive soils with a $PI \geq 26$, which have the potential to cause embankment stability/long term settlement problems and/or subgrade stability issues:

<u>Alignment</u>	<u>Station ($\pm$)</u>
-RPB-	15+00 to 20+50

2. Crystalline Rock

Auger refusal was encountered within 10 feet of grade along -RPD-. Based upon data from other borings along -RPD-, it is believed that the auger refusal represents a cobble or boulder. The cobble/boulder occurred at:

<u>Alignment</u>	<u>Station ($\pm$)</u>
-RPD-	15+75 to 16+25

3. Water Wells

During the subsurface investigation, there were no water supply wells identified within the project construction limits. The possibility exists that there are water supply wells within the construction limits that were not observed during the performance of this investigation.

Bridges and Culverts

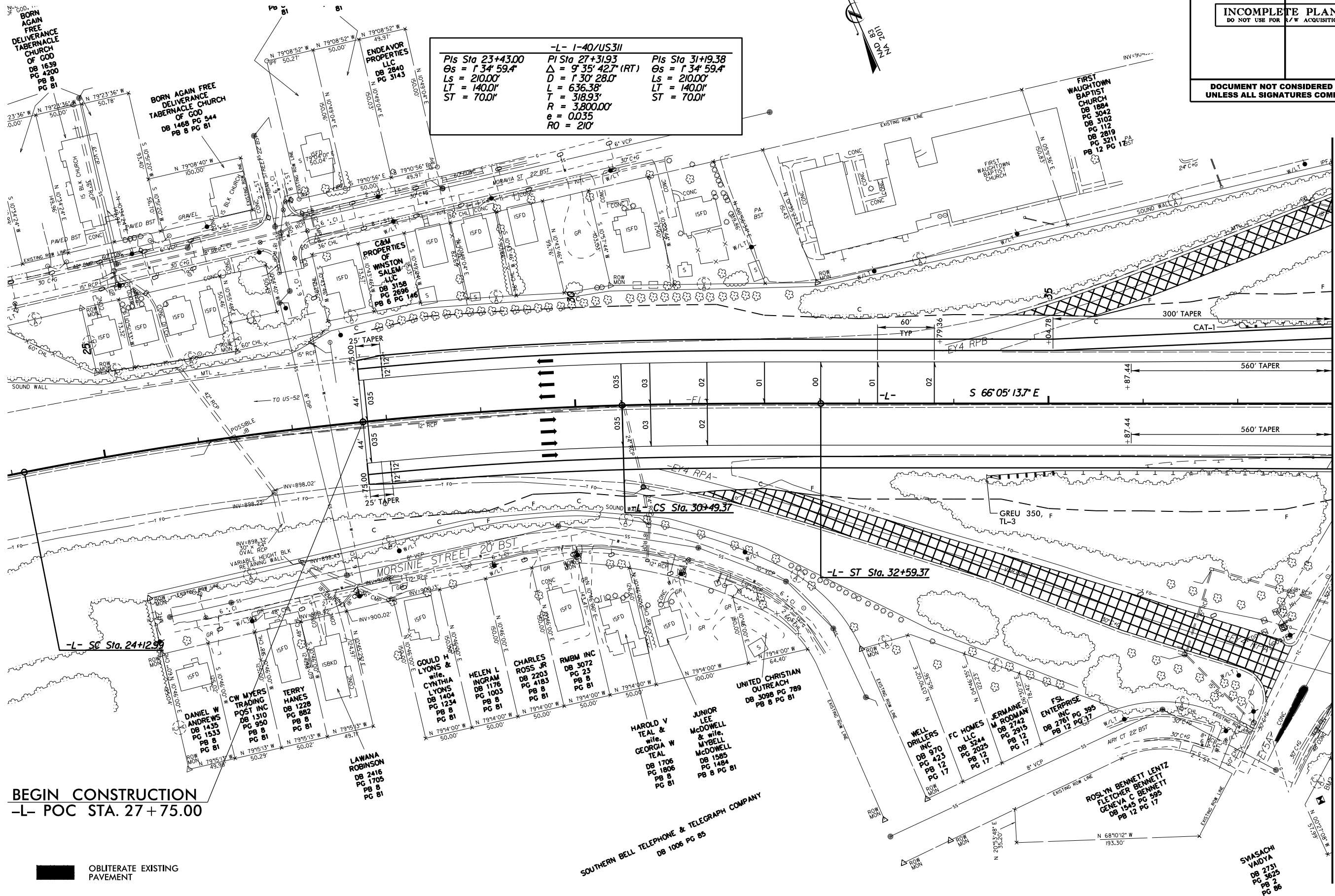
There is one proposed bridge along the corridor. The bridge is located on NC 109 (-Y1-, from station 24+65 to 27+95). One soil boring was advanced on opposing corners at each end bend. The boings identified residual soils comprised of moist, medium dense, silty sand (A-2-4) that is highly micaceous, and moist, medium stiff to very stiff clayey silt (A-5). The bridge will be addressed in a separate report.

Prepared by:

8/17/99
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ST:\VRO\Cherryburg
Investigation\TIP\15880_GEO\RDWY_FORSYTH\CADD_GEO\TECH\Plan\Pro\15880_rdy_psh_04.dgn
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PROJECT REFERENCE NO.	SHEET NO.
1-5880	04
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCH LINE STA. 38+00.00 SEE SHEET 05

SEE SHEET 9 FOR -L- PROFILES

8/17/99



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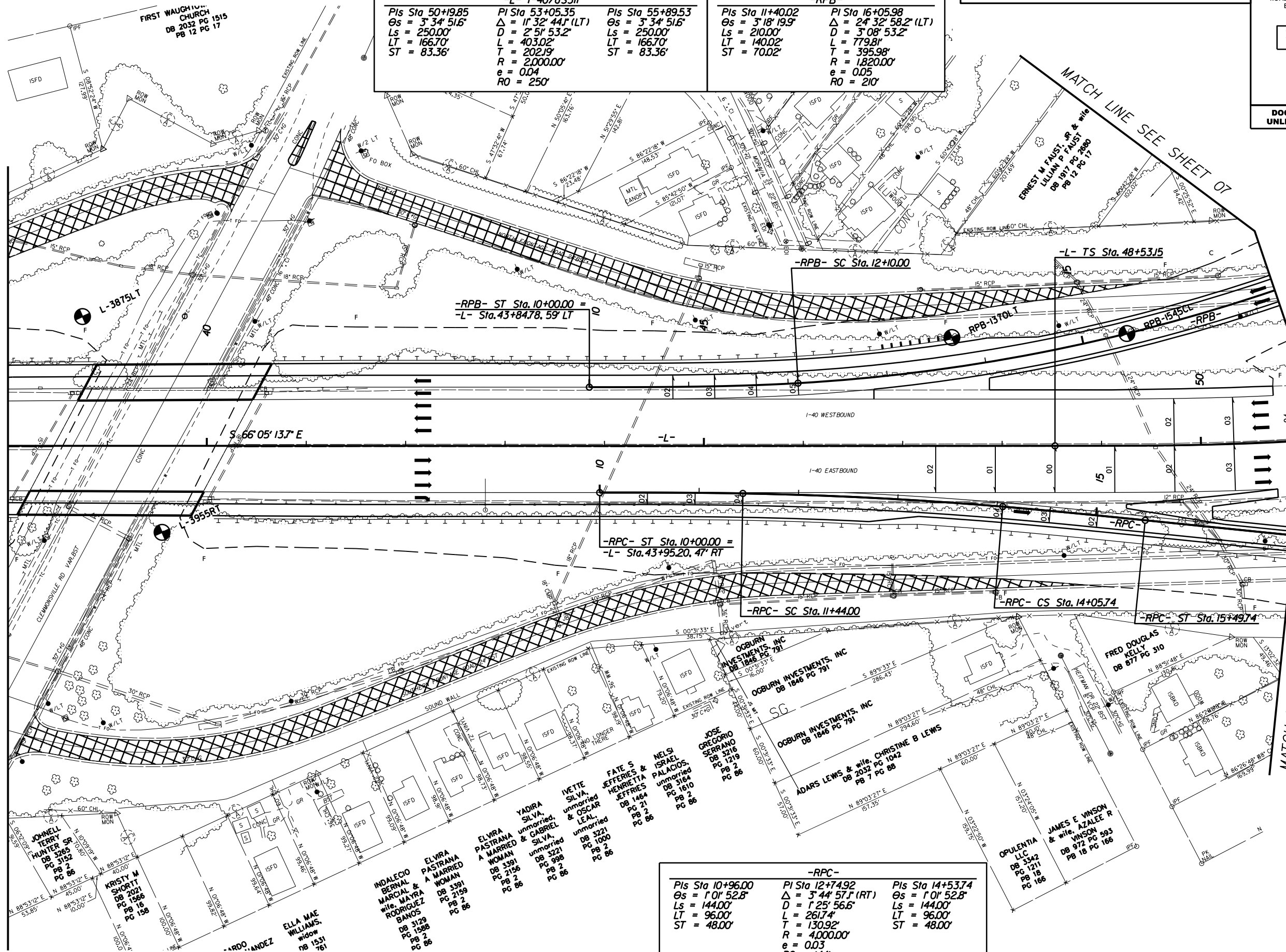
PROJECT REFERENCE NO.	SHEET NO.
1-5880	05
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

REVISIONS

MATCH LINE STA. 38+00.00 SEE SHEET 04

MATCH LINE STA. 17+00.00 SEE SHEET 06

-L- I-40/US311			-RPB-		
Pls Sta 50+19.85	PI Sta 53+05.35	Pls Sta 55+89.53	Pls Sta 11+40.02	PI Sta 16+05.98	
Os = 3' 34' 51.6"	Δ = 1' 32' 44.1" (LT)	Os = 3' 34' 51.6"	Os = 3' 18' 19.9"	Δ = 2' 32' 58.2" (LT)	
Ls = 250.00'	D = 2' 51' 53.2"	Ls = 250.00'	Ls = 210.00'	D = 3' 08' 53.2"	
LT = 166.70'	L = 403.02'	LT = 166.70'	LT = 140.02'	L = 779.81'	
ST = 83.36'	T = 202.19'	ST = 83.36'	ST = 70.02'	T = 395.98'	
	R = 2,000.00'			R = 1,820.00'	
	e = 0.04			e = 0.05	
	RO = 250'			RO = 210'	



-RPC-		
Pls Sta 10+96.00	PI Sta 12+74.92	Pls Sta 14+53.74
Os = 1' 01' 52.8"	Δ = 3' 44' 57.1" (RT)	Os = 1' 01' 52.8"
Ls = 144.00'	D = 1' 25' 56.6"	Ls = 144.00'
LT = 96.00'	L = 261.74'	LT = 96.00'
ST = 48.00'	T = 130.92'	ST = 48.00'
	R = 4,000.00'	
	e = 0.03	
	RO = 144'	

SEE SHEET 10 FOR -L- PROFILES
SEE SHEET 13 FOR -RPB- PROFILE
SEE SHEET 14 FOR -RPC- PROFILE

8/17/99



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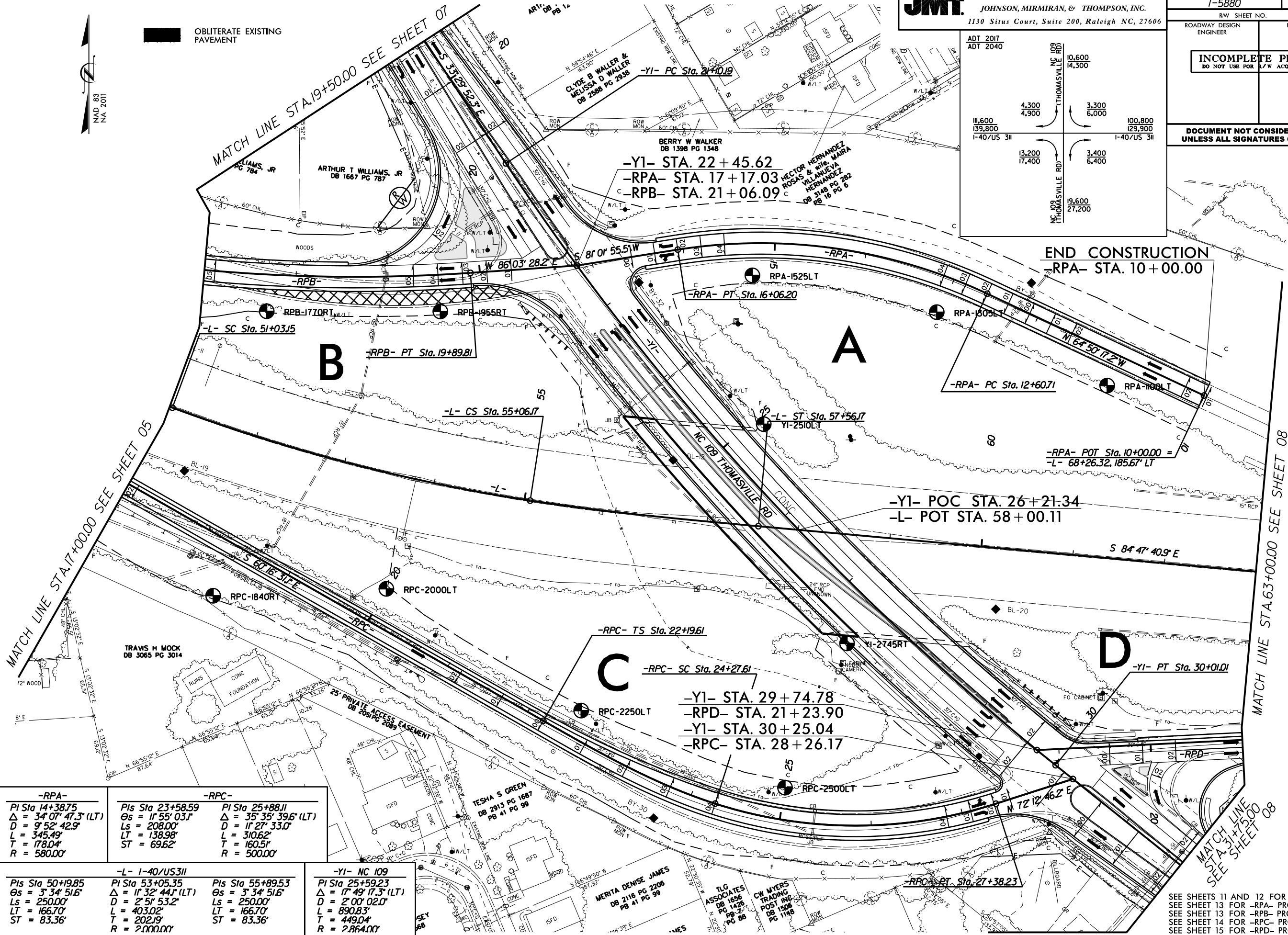
PROJECT REFERENCE NO.	SHEET NO.
1-5880	06
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



OBLITERATE EXISTING PAVEMENT



-RPA-	-RPC-	-YI- NC 109
PI Sta 14+38.75 Δ = 34° 07' 47.3" (LT) D = 9° 52' 42.9" L = 345.49' T = 178.04' R = 580.00'	PI Sta 23+58.59 Δ = 11° 55' 03.1" Ls = 208.00' LT = 138.98' ST = 69.62' R = 500.00'	PI Sta 25+88.11 Δ = 35° 35' 39.6" (LT) D = 17° 27' 33.0" L = 310.62' T = 160.51' R = 500.00'
PI Sta 50+19.85 Δ = 3° 34' 51.6" Ls = 250.00' LT = 166.70' ST = 83.36'	PI Sta 53+05.35 Δ = 11° 32' 44.1" (LT) Ls = 250.00' LT = 166.70' ST = 83.36'	PI Sta 55+89.53 Δ = 3° 34' 51.6" Ls = 250.00' LT = 166.70' ST = 83.36'
PI Sta 51+03.15 Δ = 11° 32' 44.1" (LT) Ls = 250.00' LT = 166.70' ST = 83.36'	PI Sta 53+05.35 Δ = 11° 32' 44.1" (LT) Ls = 250.00' LT = 166.70' ST = 83.36'	PI Sta 55+89.53 Δ = 3° 34' 51.6" Ls = 250.00' LT = 166.70' ST = 83.36'

SEE SHEETS 11 AND 12 FOR -YI- PROFILE
SEE SHEET 13 FOR -RPA- PROFILE
SEE SHEET 13 FOR -RPB- PROFILE
SEE SHEET 14 FOR -RPC- PROFILE
SEE SHEET 15 FOR -RPD- PROFILE

8/17/99

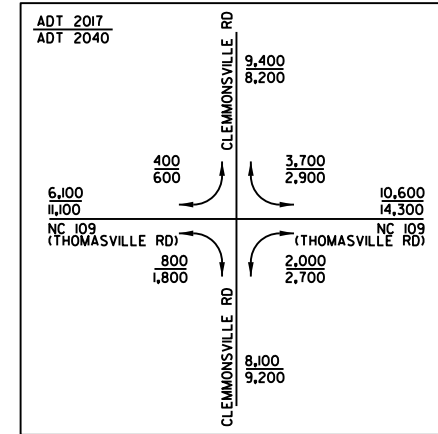
REVISIONS

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END CONSTRUCTION
-Y2- STA. 19+42.69

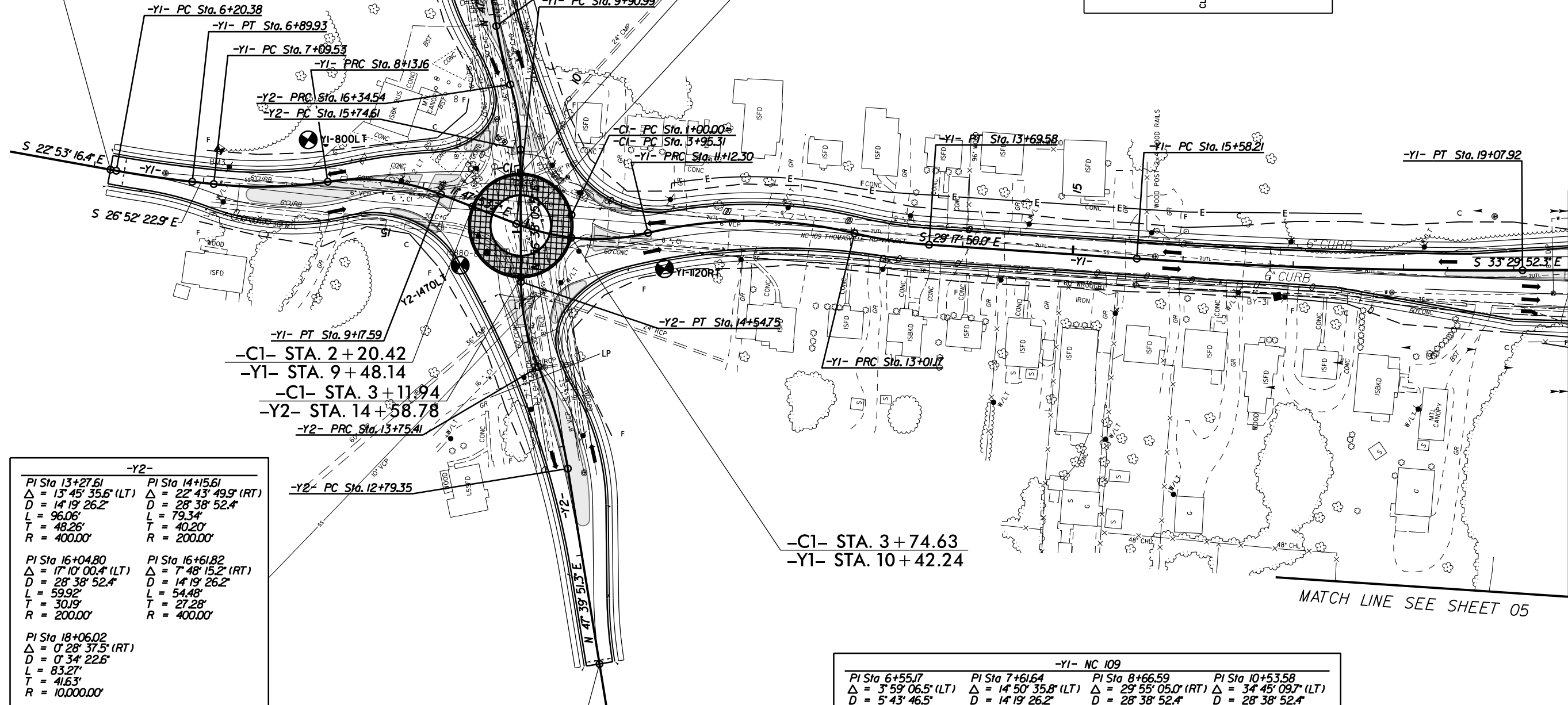
JMT. Prepared In the Office of:
JOHNSON, MIRMIRAN, & THOMPSON, INC.
1130 Situs Court, Suite 200, Raleigh NC, 27606

PROJECT REFERENCE NO.	SHEET NO.
1-5880	07
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-C1-	
PI Sta 1+47.00 Δ = 90° 00' 00.0" (LT) D = 12° 54' 21.3" L = 73.83' T = 47.00' R = 47.00'	PI Sta 2+20.83 Δ = 90° 00' 00.0" (LT) D = 12° 54' 21.3" L = 73.83' T = 47.00' R = 47.00'
PI Sta 2+94.65 Δ = 90° 00' 00.0" (LT) D = 12° 54' 21.3" L = 73.83' T = 47.00' R = 47.00'	PI Sta 3+68.48 Δ = 90° 00' 00.0" (LT) D = 12° 54' 21.3" L = 73.83' T = 47.00' R = 47.00'

BEGIN CONSTRUCTION
-Y1- STA. 6+15.00



-Y2-	
PI Sta 13+27.61 Δ = 13° 45' 35.6" (LT) D = 14° 19' 26.2" L = 96.06' T = 48.26' R = 400.00'	PI Sta 14+15.61 Δ = 22° 43' 49.9" (RT) D = 28° 38' 52.4" L = 79.34' T = 40.20' R = 200.00'
PI Sta 16+04.80 Δ = 17° 10' 00.4" (LT) D = 28° 38' 52.4" L = 59.92' T = 30.19' R = 200.00'	PI Sta 16+61.82 Δ = 7° 48' 15.2" (RT) D = 14° 19' 26.2" L = 54.48' T = 27.28' R = 400.00'
PI Sta 18+06.02 Δ = 0° 28' 37.5" (RT) D = 0° 34' 22.6" L = 83.27' T = 41.63' R = 10,000.00'	

BEGIN CONSTRUCTION
-Y2- STA. 11+00.00

-Y1- NC 109			
PI Sta 6+55.17 Δ = 3° 59' 06.5" (LT) D = 5° 43' 46.5" L = 69.55' T = 34.79' R = 1,000.00'	PI Sta 7+61.64 Δ = 14° 50' 35.8" (LT) D = 14° 19' 26.2" L = 103.63' T = 52.10' R = 400.00'	PI Sta 8+66.59 Δ = 29° 55' 05.0" (RT) D = 28° 38' 52.4" L = 104.43' T = 53.44' R = 200.00'	PI Sta 10+53.58 Δ = 34° 45' 09.7" (LT) D = 28° 38' 52.4" L = 121.31' T = 53.44' R = 200.00'
PI Sta 12+08.53 Δ = 27° 03' 10.5" (RT) D = 14° 19' 26.2" L = 188.87' T = 96.23' R = 400.00'	PI Sta 13+35.46 Δ = 9° 47' 57.2" (LT) D = 14° 19' 26.2" L = 68.41' T = 34.29' R = 400.00'	PI Sta 17+33.15 Δ = 4° 12' 02.2" (LT) D = 1° 12' 04.2" L = 349.71' T = 174.93' R = 4,770.00'	

SEE SHEET 11 FOR -Y1- PROFILE
SEE SHEET 12 FOR -Y2- PROFILE
SEE SHEET 15 FOR -C1- PROFILE

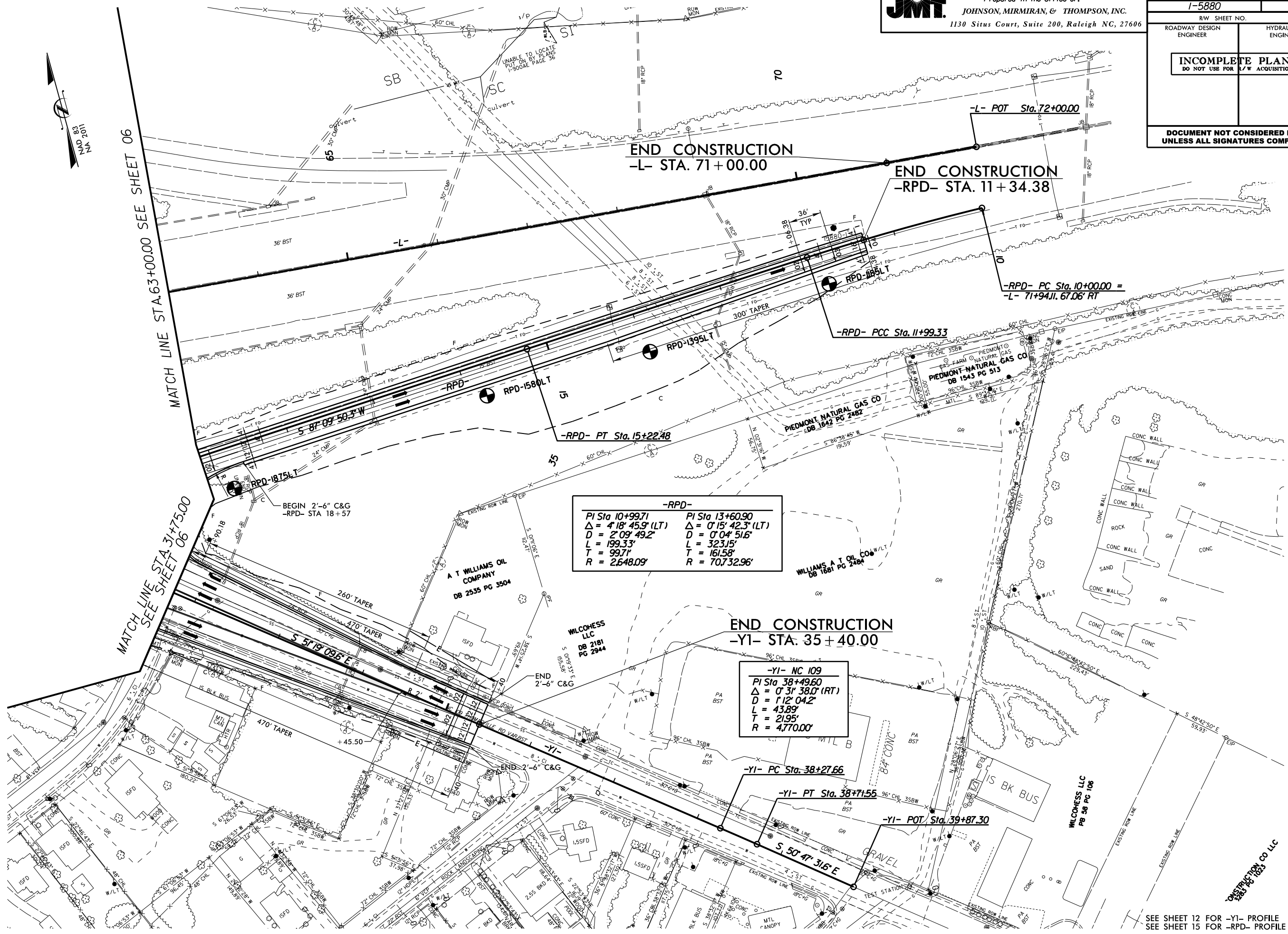
MATCH LINE STA. 19+50.00 SEE SHEET 06

MATCH LINE SEE SHEET 05



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1130 Situs Court, Suite 200, Raleigh NC, 27606

PROJECT REFERENCE NO.	SHEET NO.
1-5880	08
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

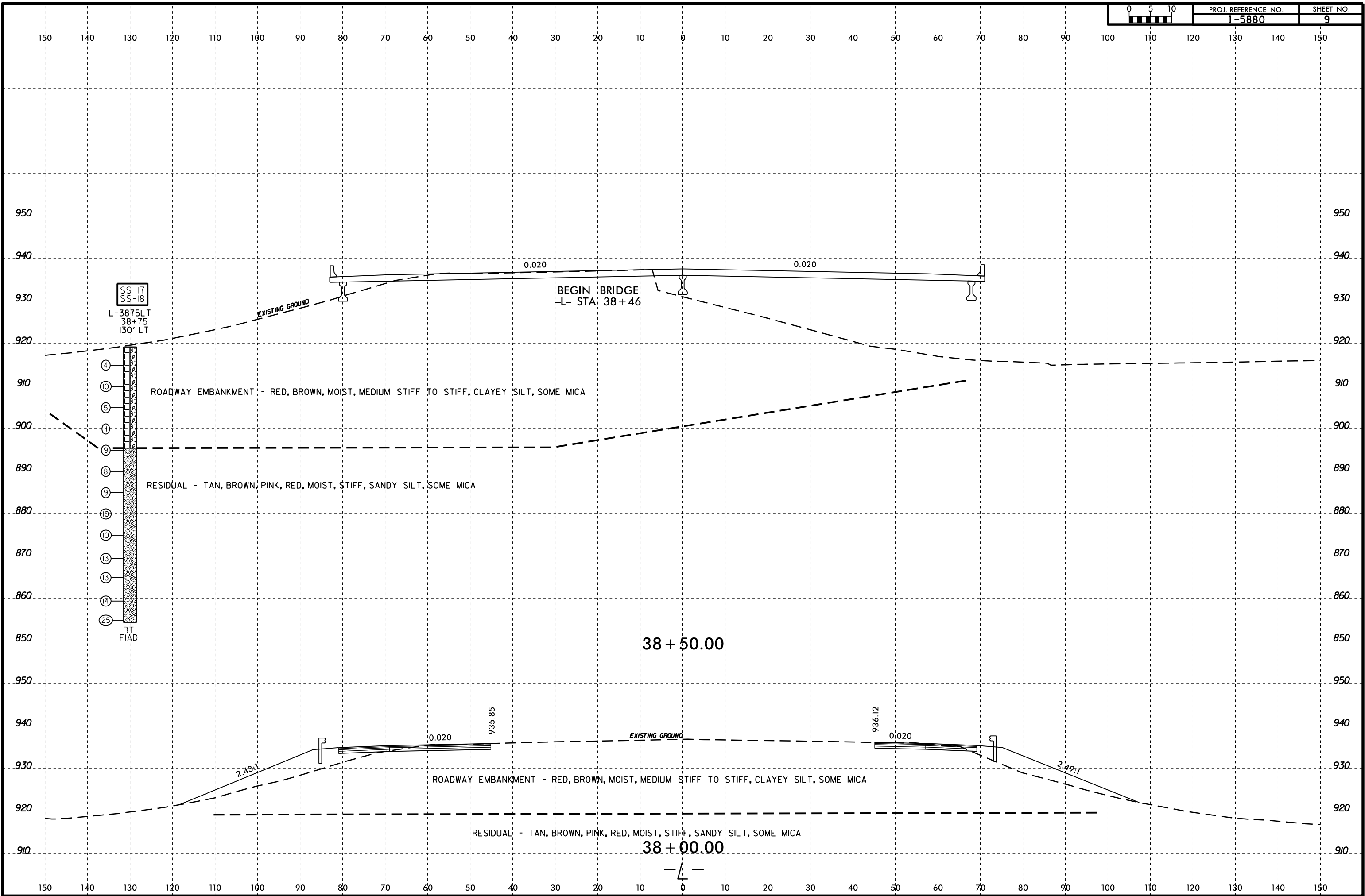


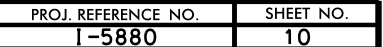
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PI Sta 10+99.71	PI Sta 13+60.90
$\Delta = 4'18'45.9''$ (LT)	$\Delta = 0'15'42.3''$ (LT)
$D = 2'09'49.2''$	$D = 0'04'51.6''$
$L = 199.33'$	$L = 323.15'$
$T = 99.71'$	$T = 161.58'$
$R = 2,648.09'$	$R = 70,732.96'$

-YI- NC 109	
PI Sta 38+49.60	
$\Delta = 0'31'38.0''$ (RT)	
$D = 1'12'04.2''$	
$L = 43.89'$	
$T = 21.95'$	
$R = 4,770.00'$	

REVISIONS

8/17/99
01-JUN-2021 10:19
1-5880-08.dgn

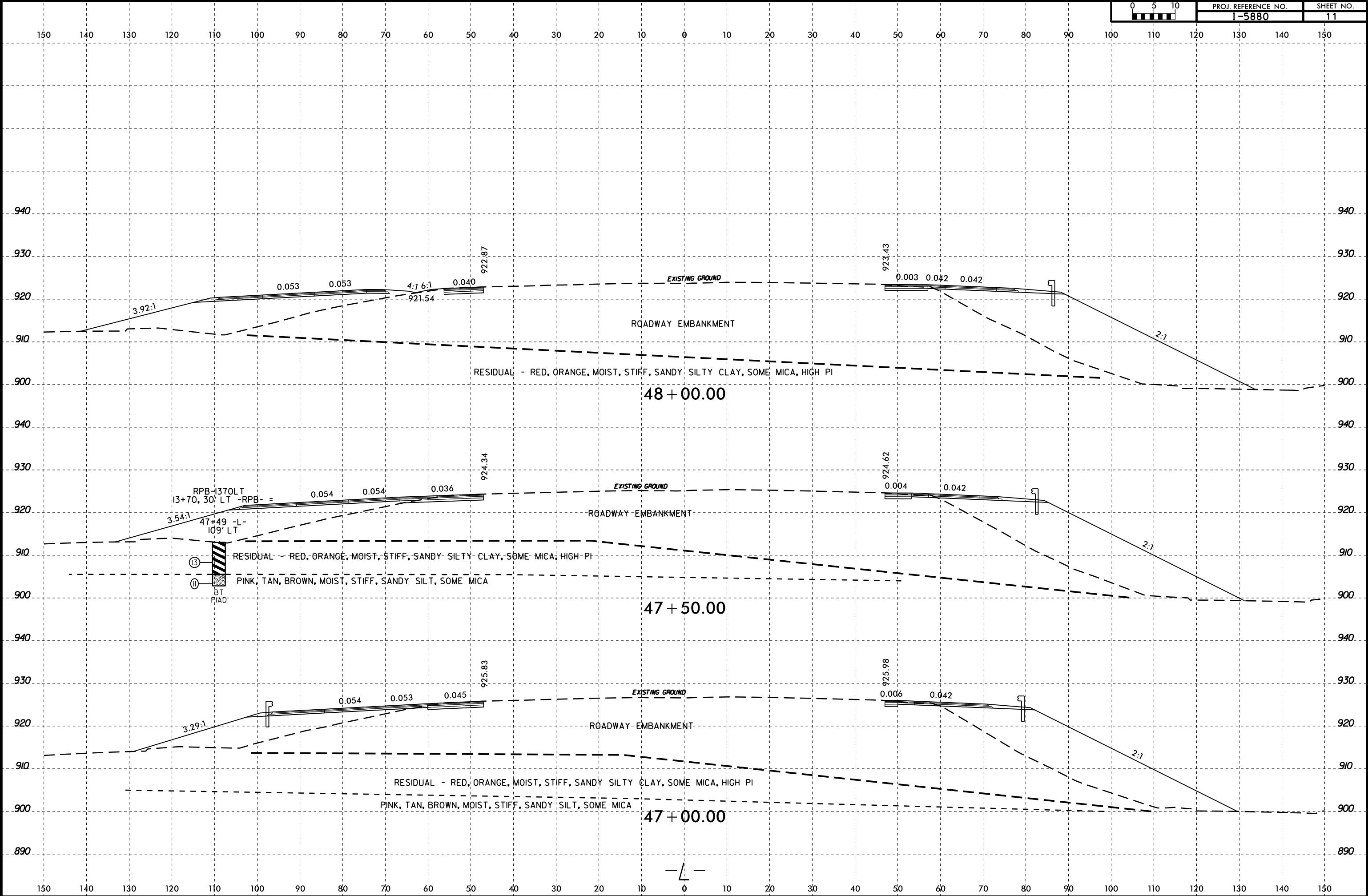




6/23/16



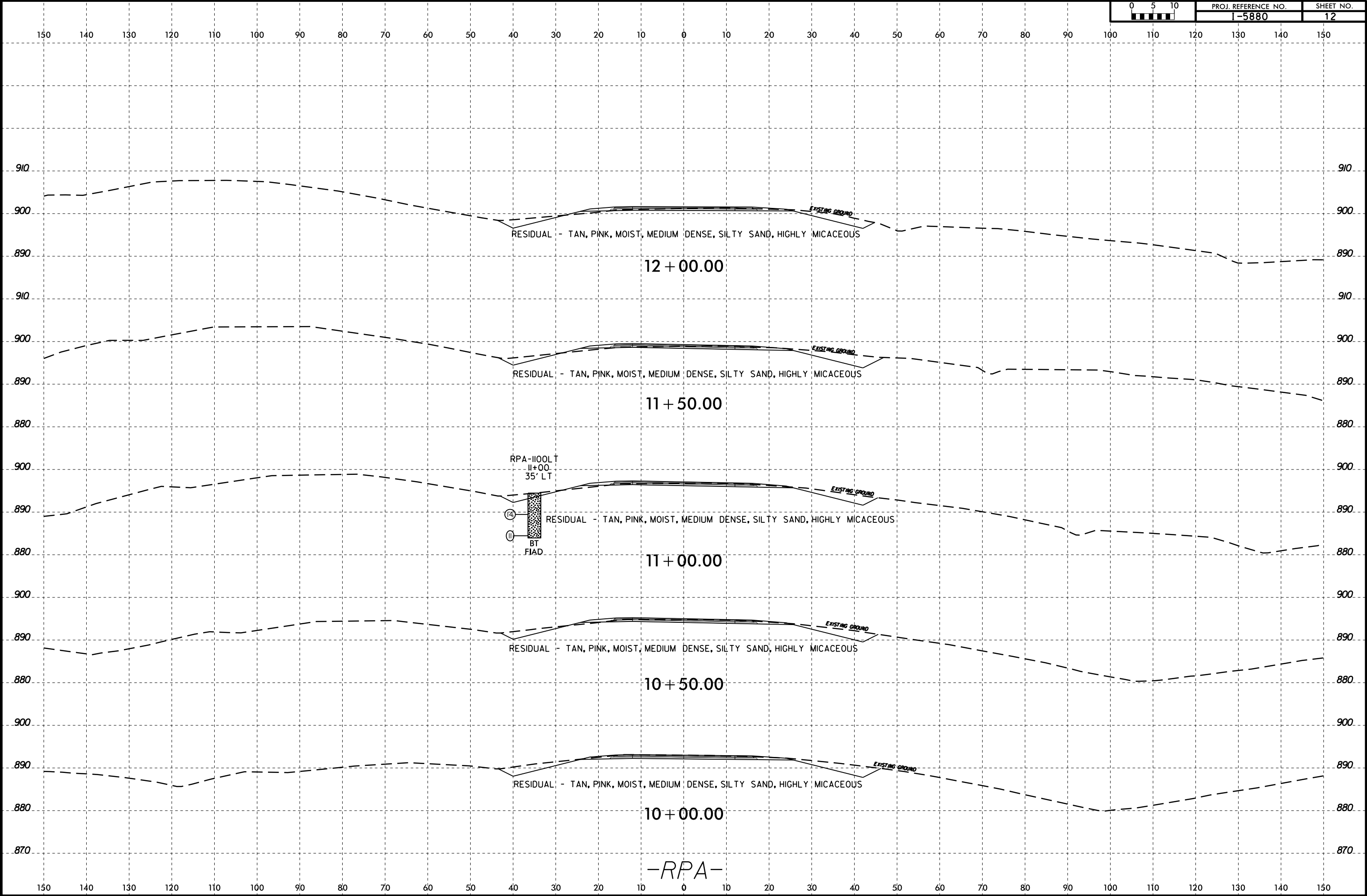
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-5880	11



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6/23/16

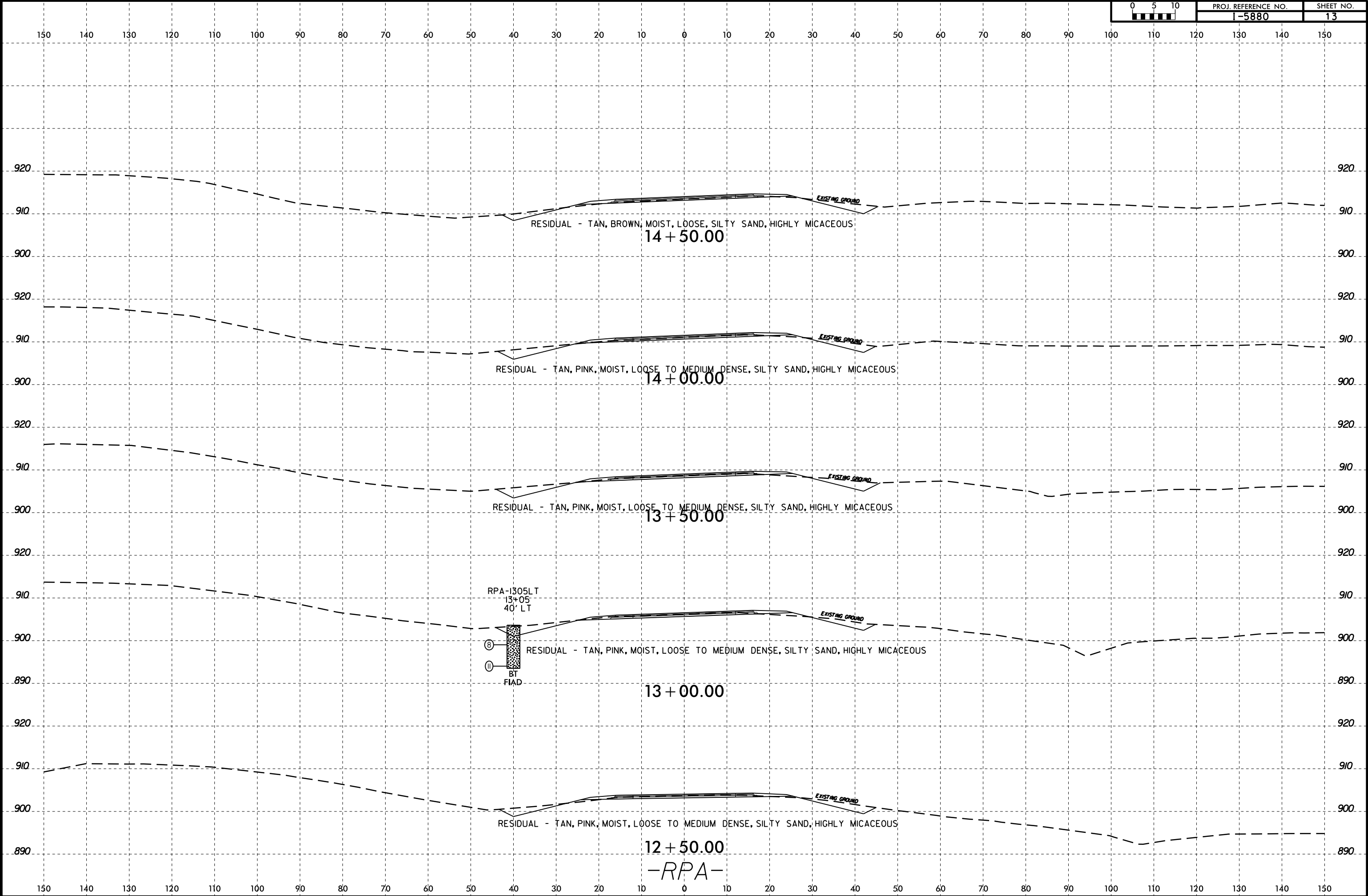
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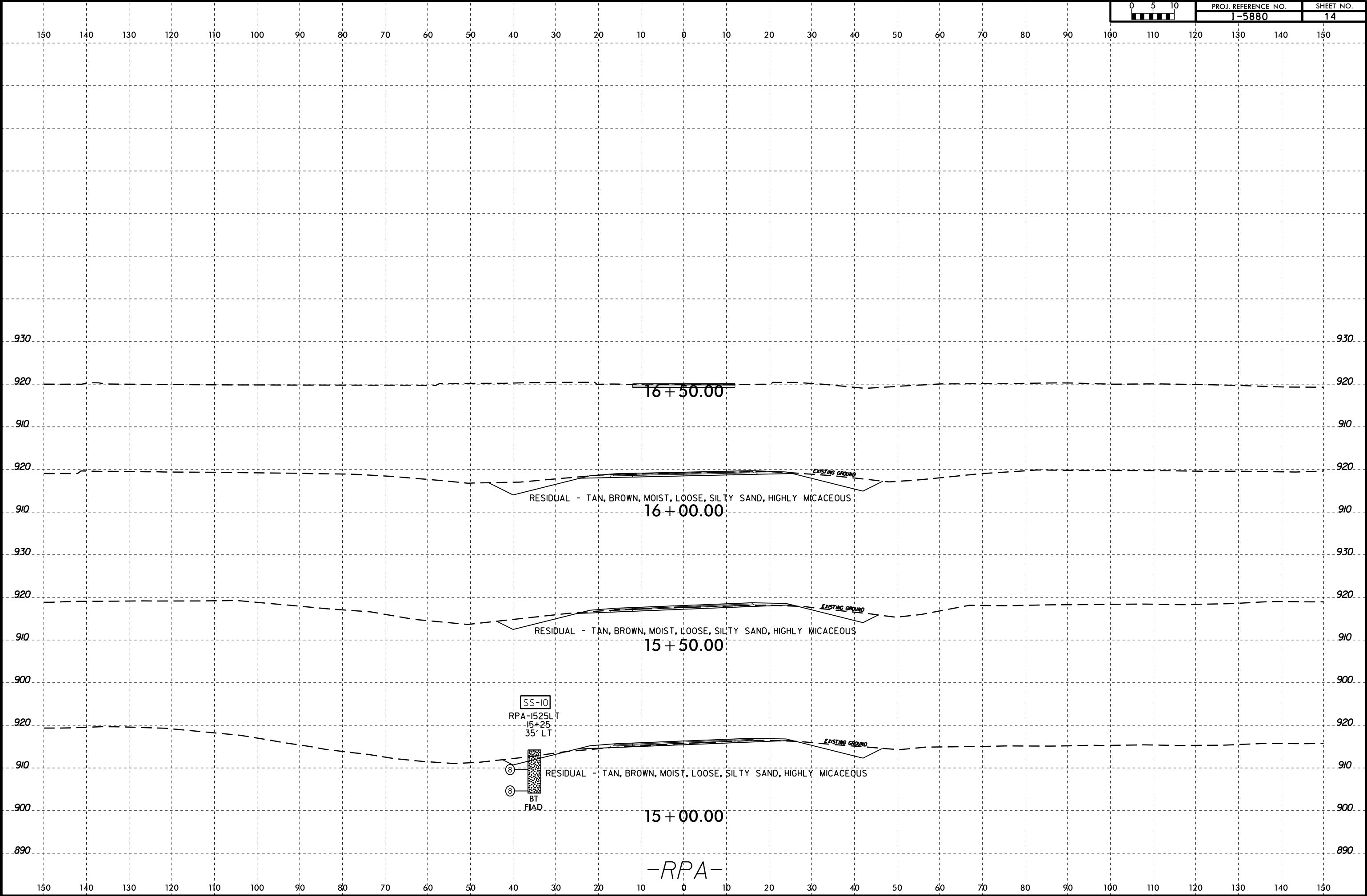
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			-5880	13



6/23/16

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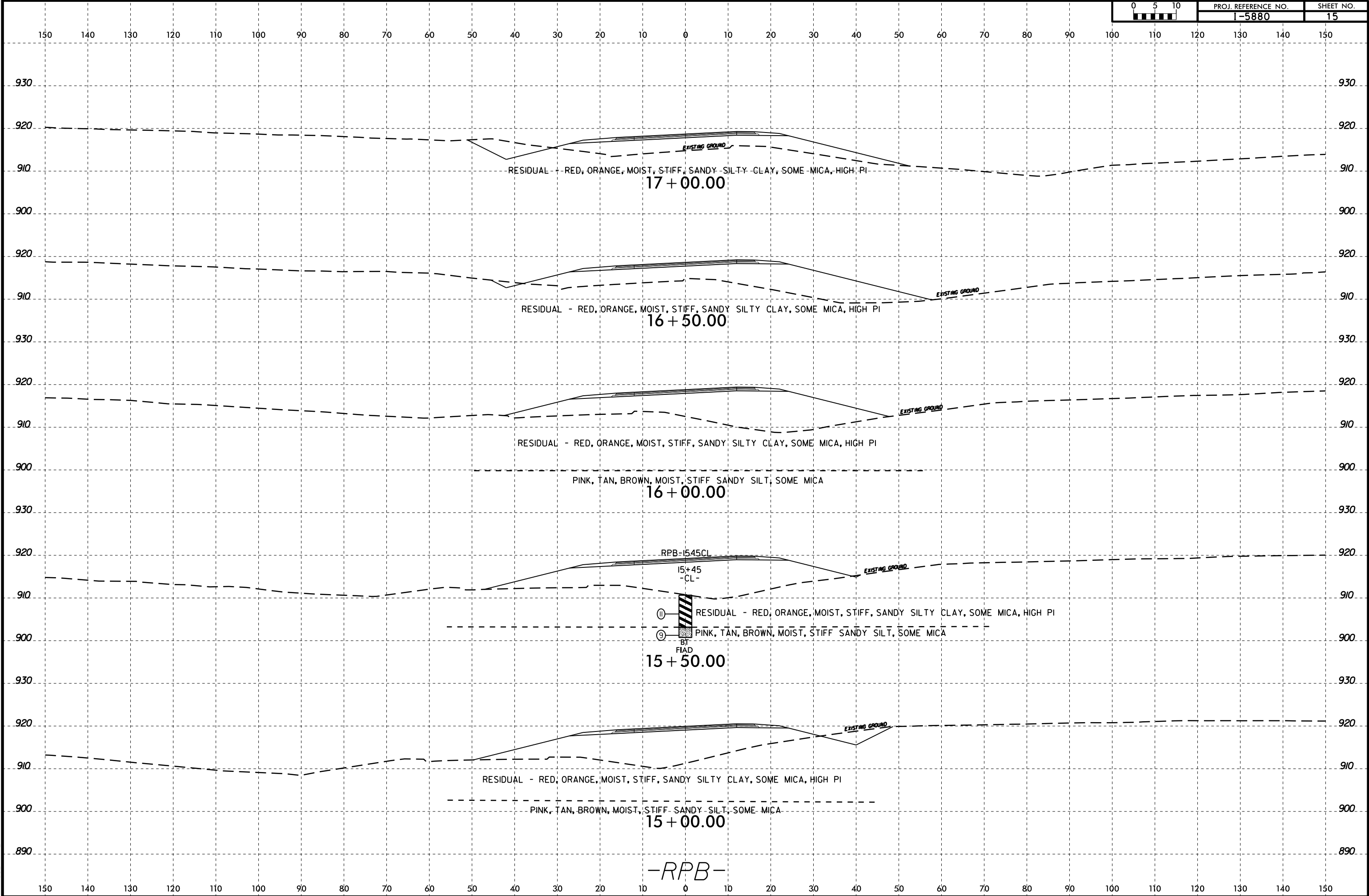
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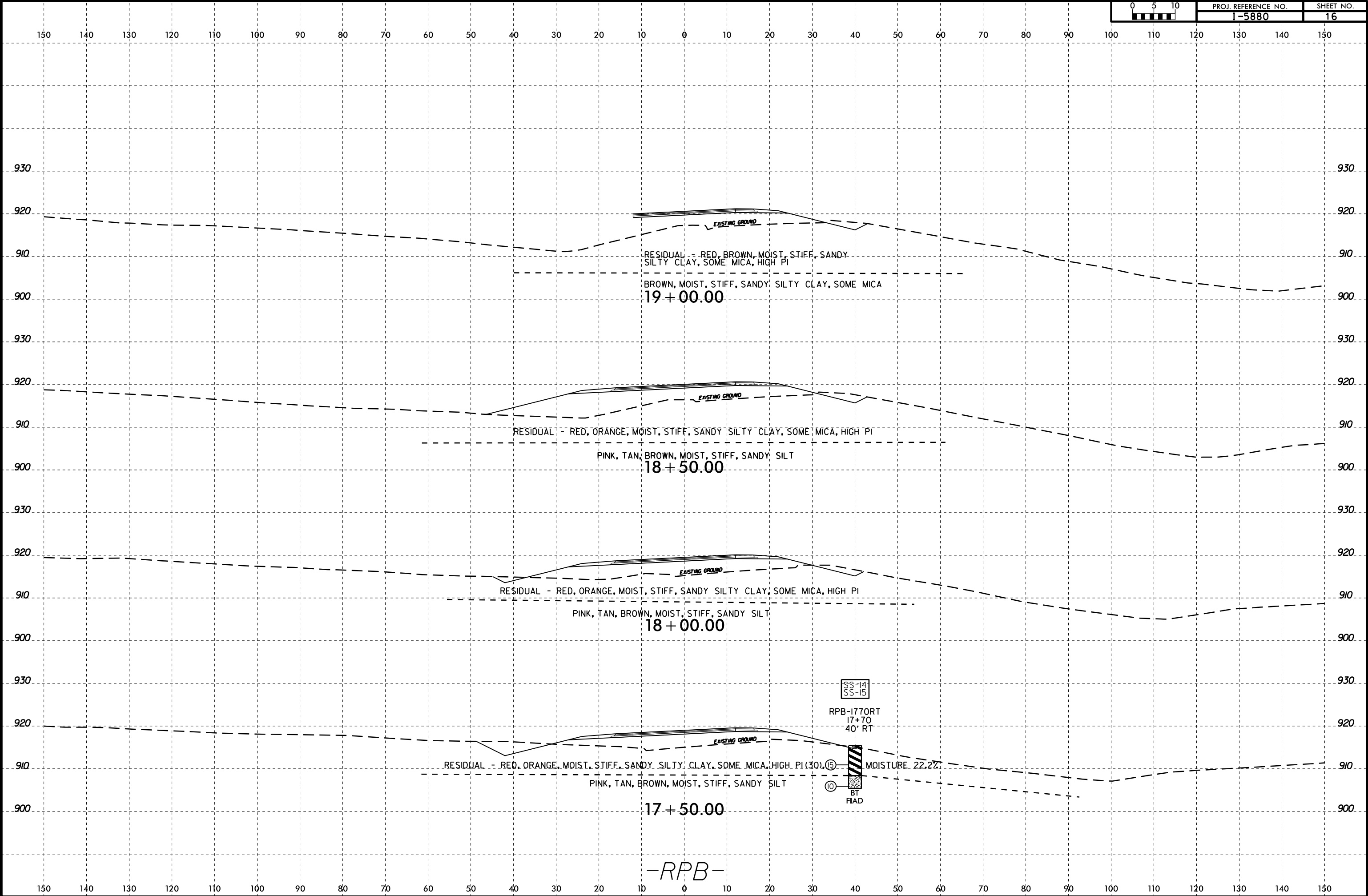
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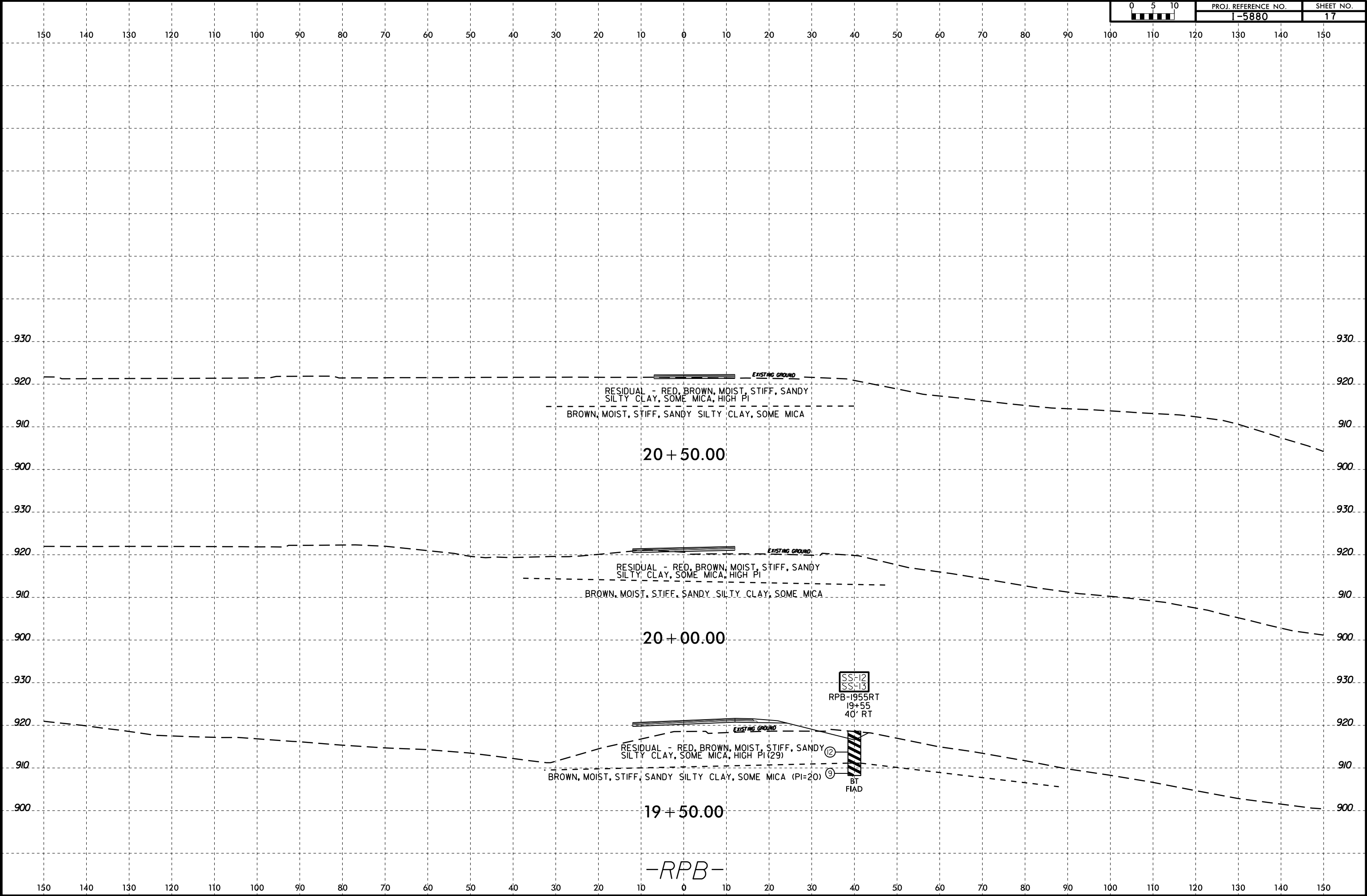


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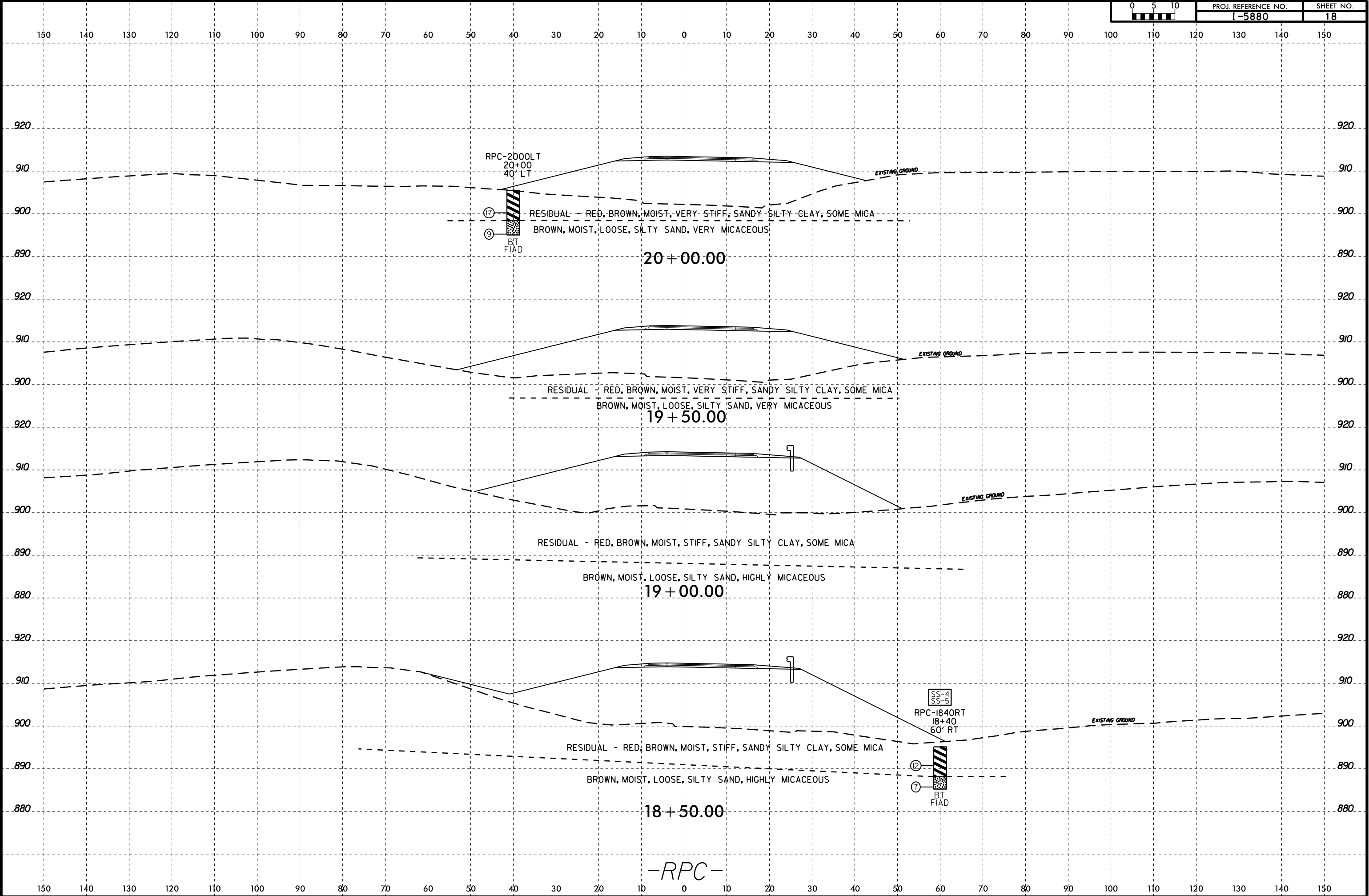


-RPB-



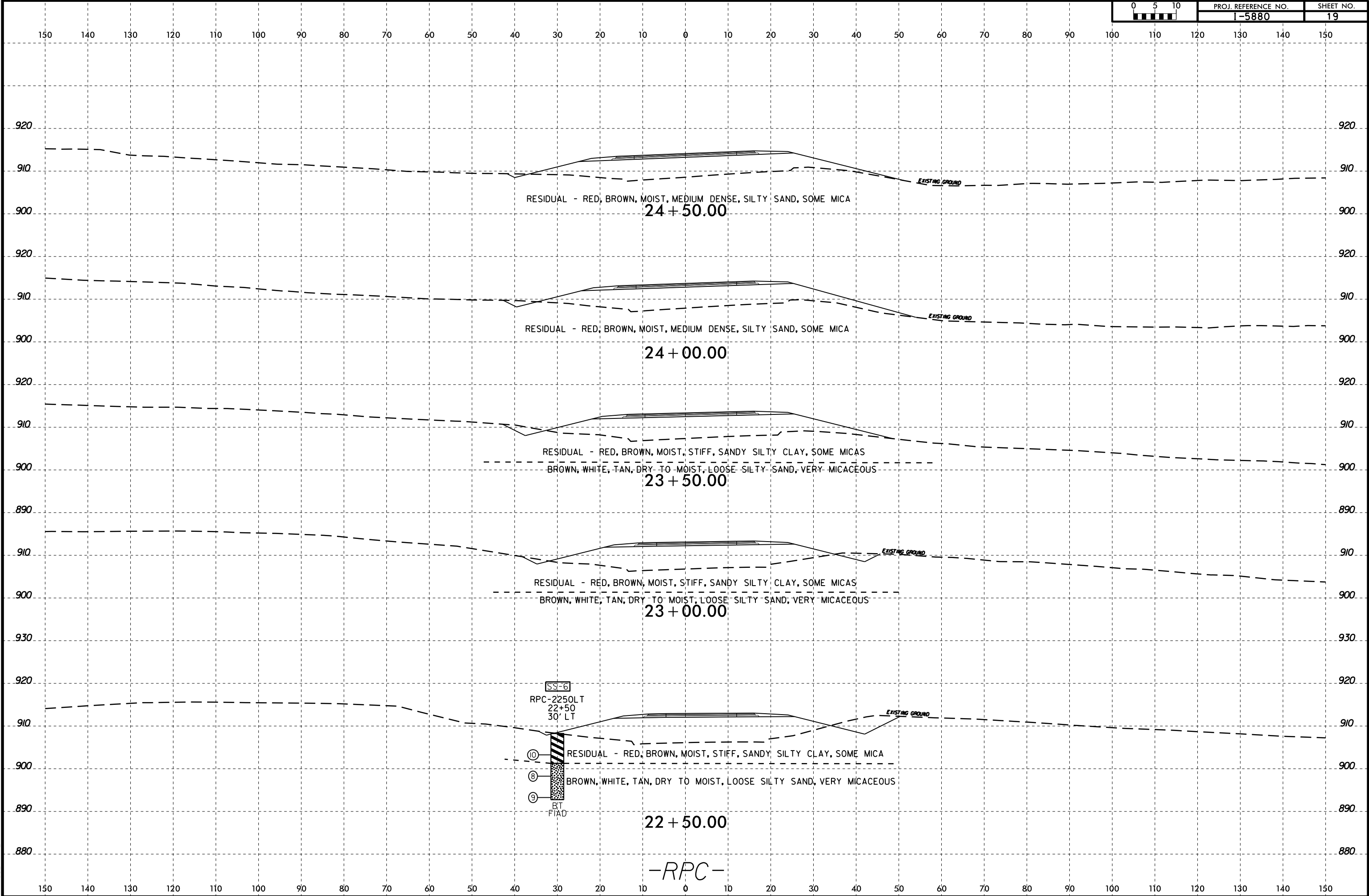
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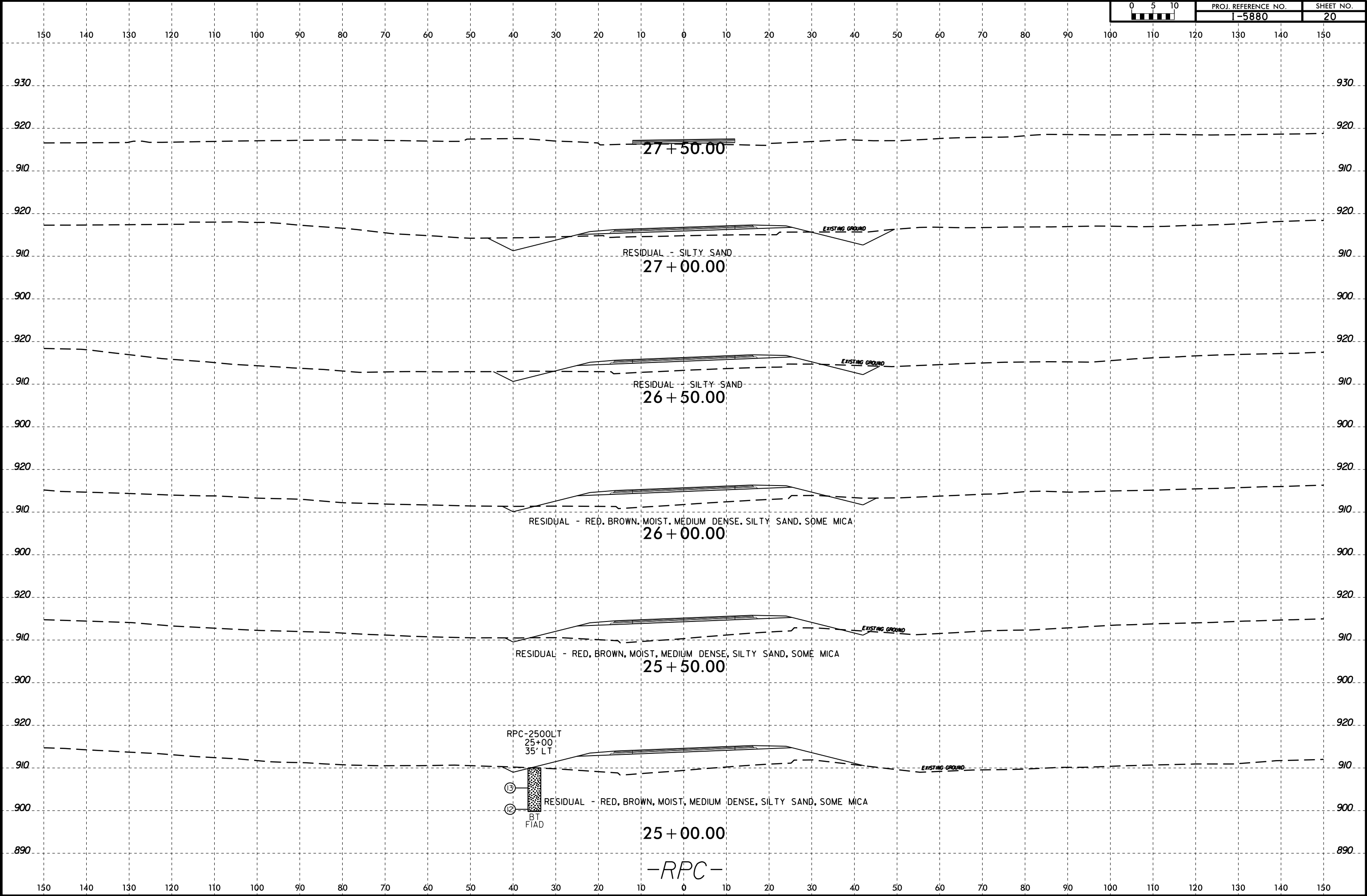
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	-5880	20



6/23/16



PROJ. REFERENCE NO.	SHEET NO.
-5880	21

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910 910

900 900

890 890

880 880

870 870

910 910

900 900

890 890

880 880

870 870

920 920

910 910

900 900

890 890

880 880

870 870

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

RESIDUAL - BLACK, WHITE, DRY, MEDIUM DENSE TO VERY DENSE, CLAYEY SILTY SAND, SOME MICA

12 + 50.00

RPD-1185 LT
11+85
35' LT

65
25
BT
FIAD

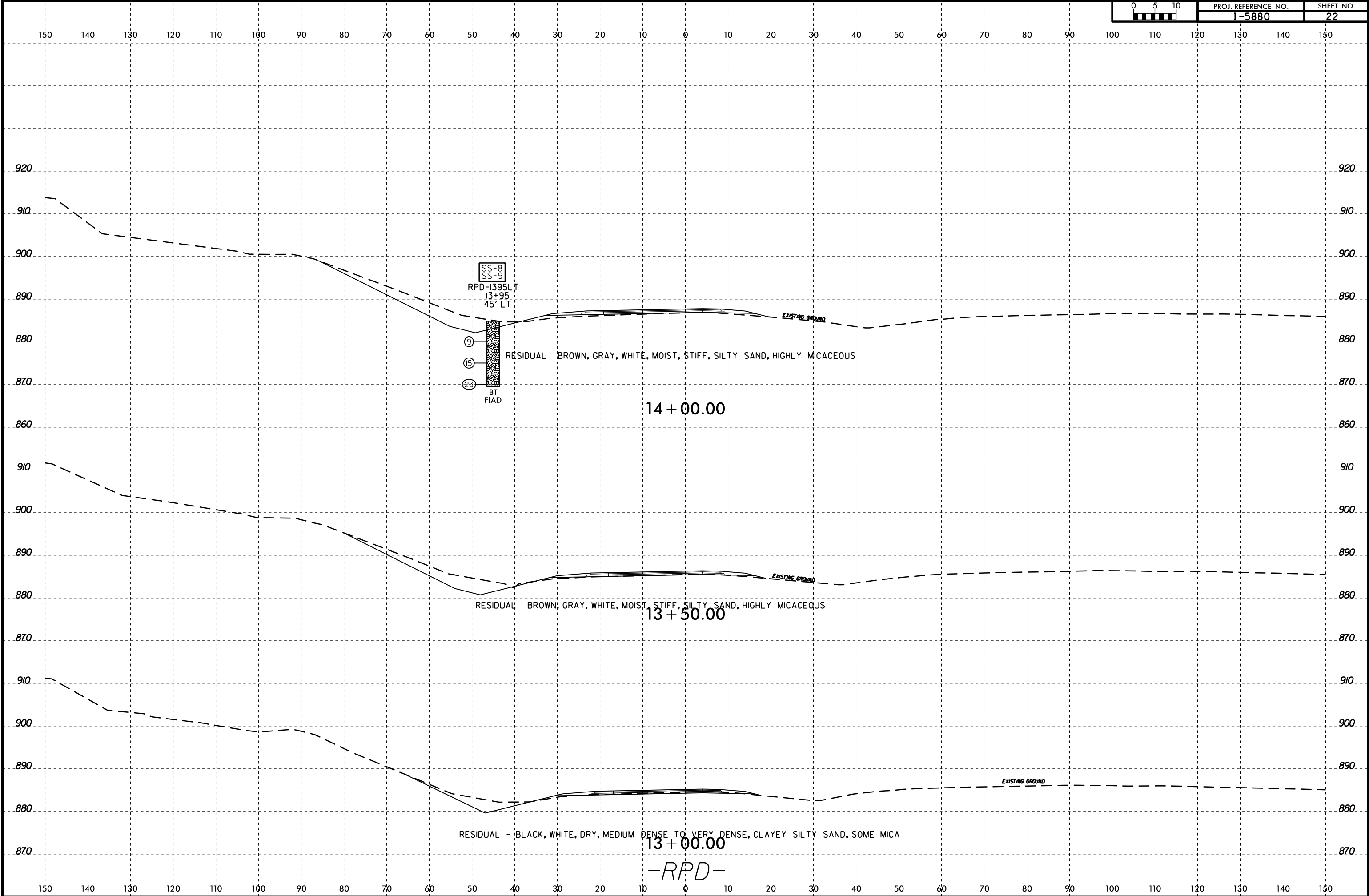
RESIDUAL - BLACK, WHITE, DRY, MEDIUM DENSE TO VERY DENSE, CLAYEY SILTY SAND, SOME MICA

12 + 00.00

11 + 50.00

-RPD-

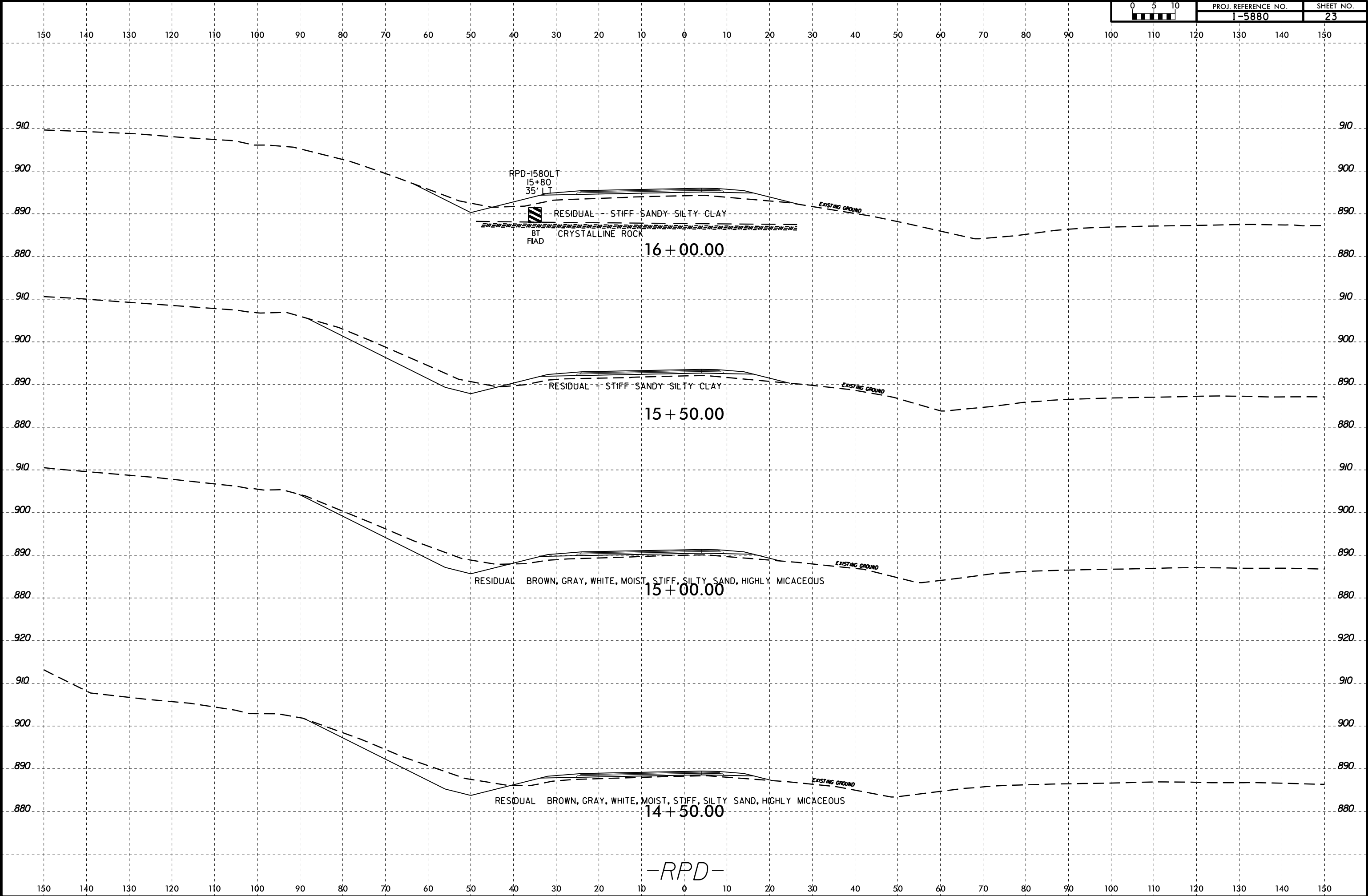
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6/23/16

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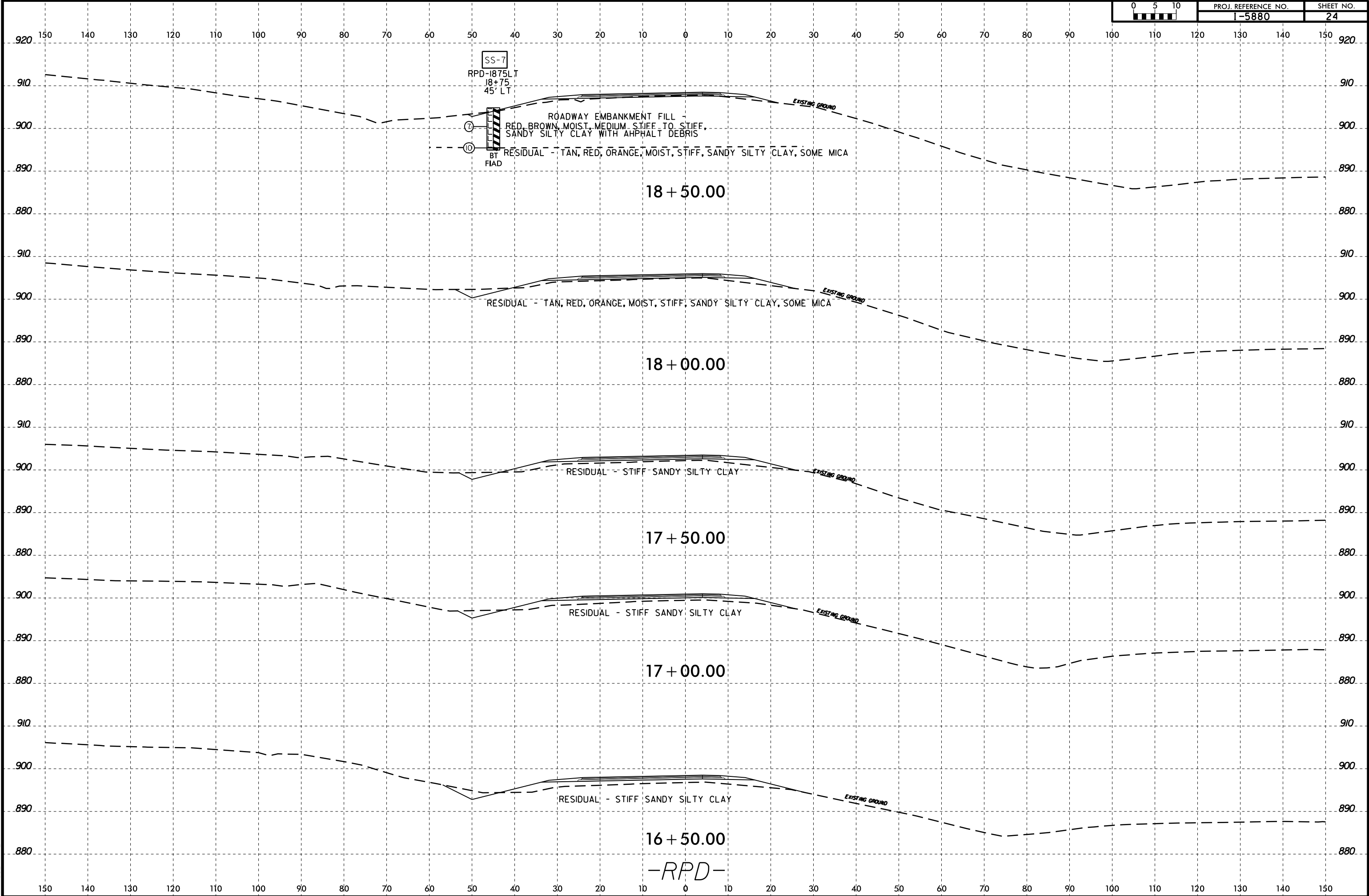


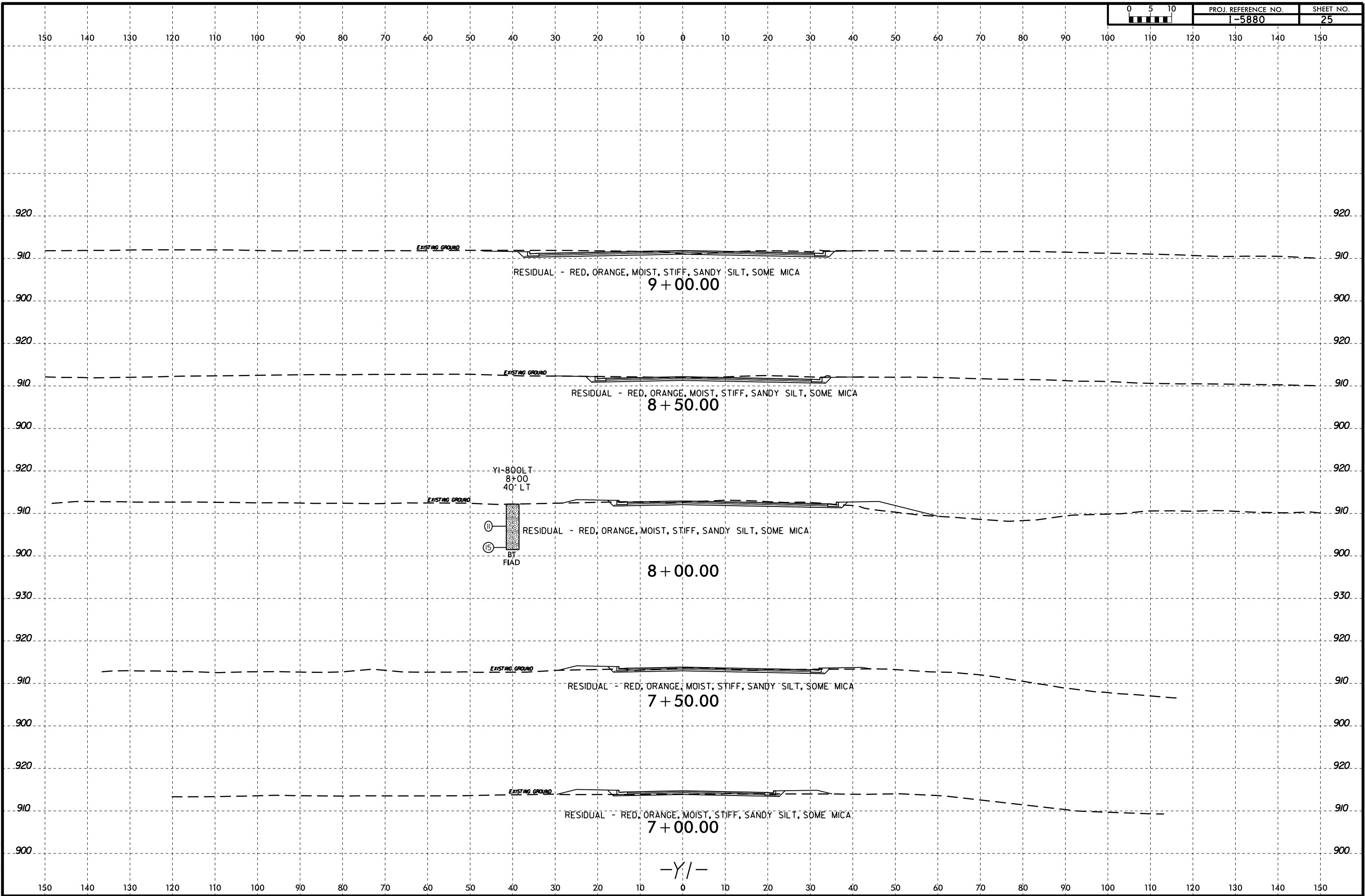
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6/23/16

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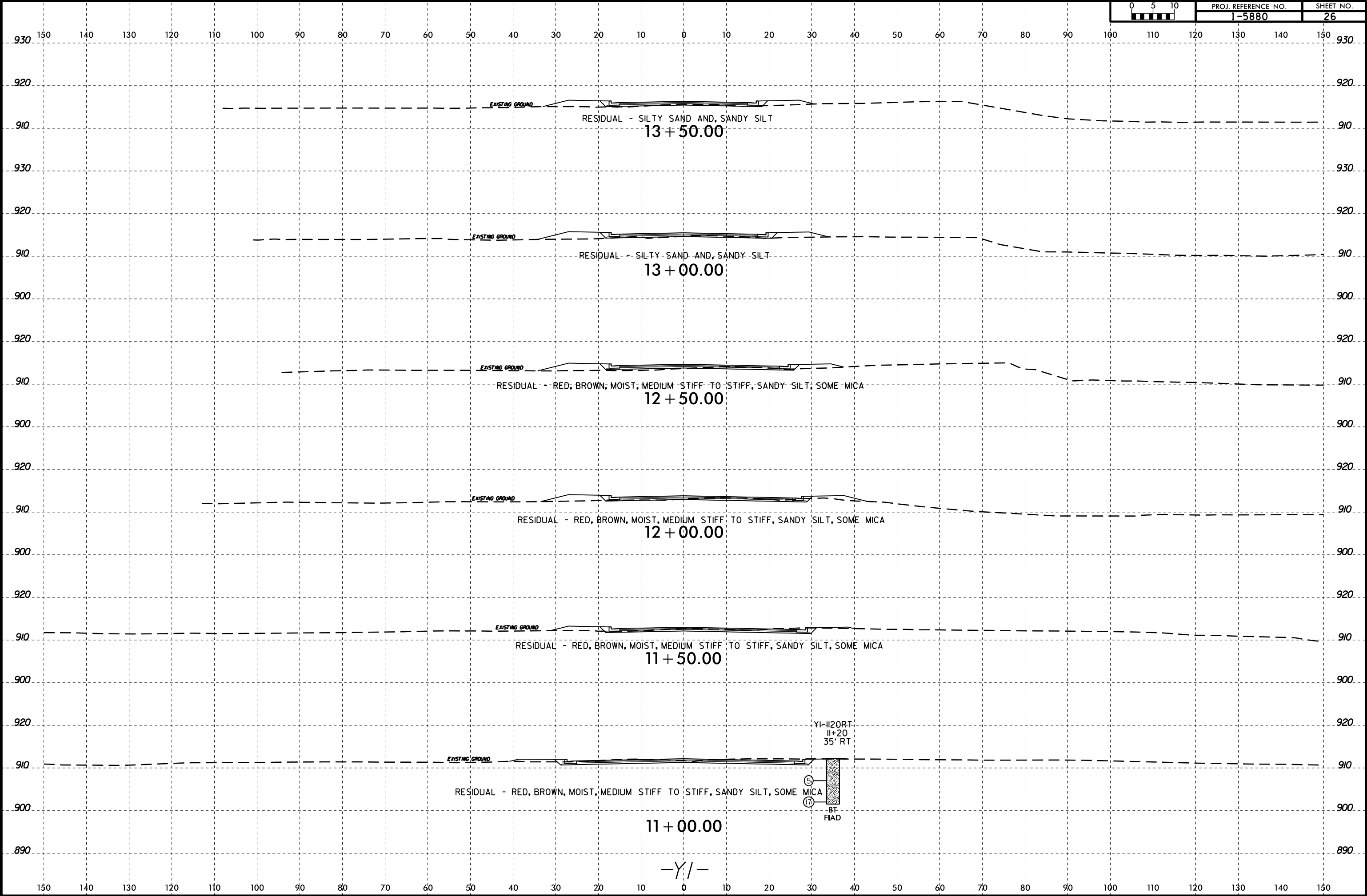
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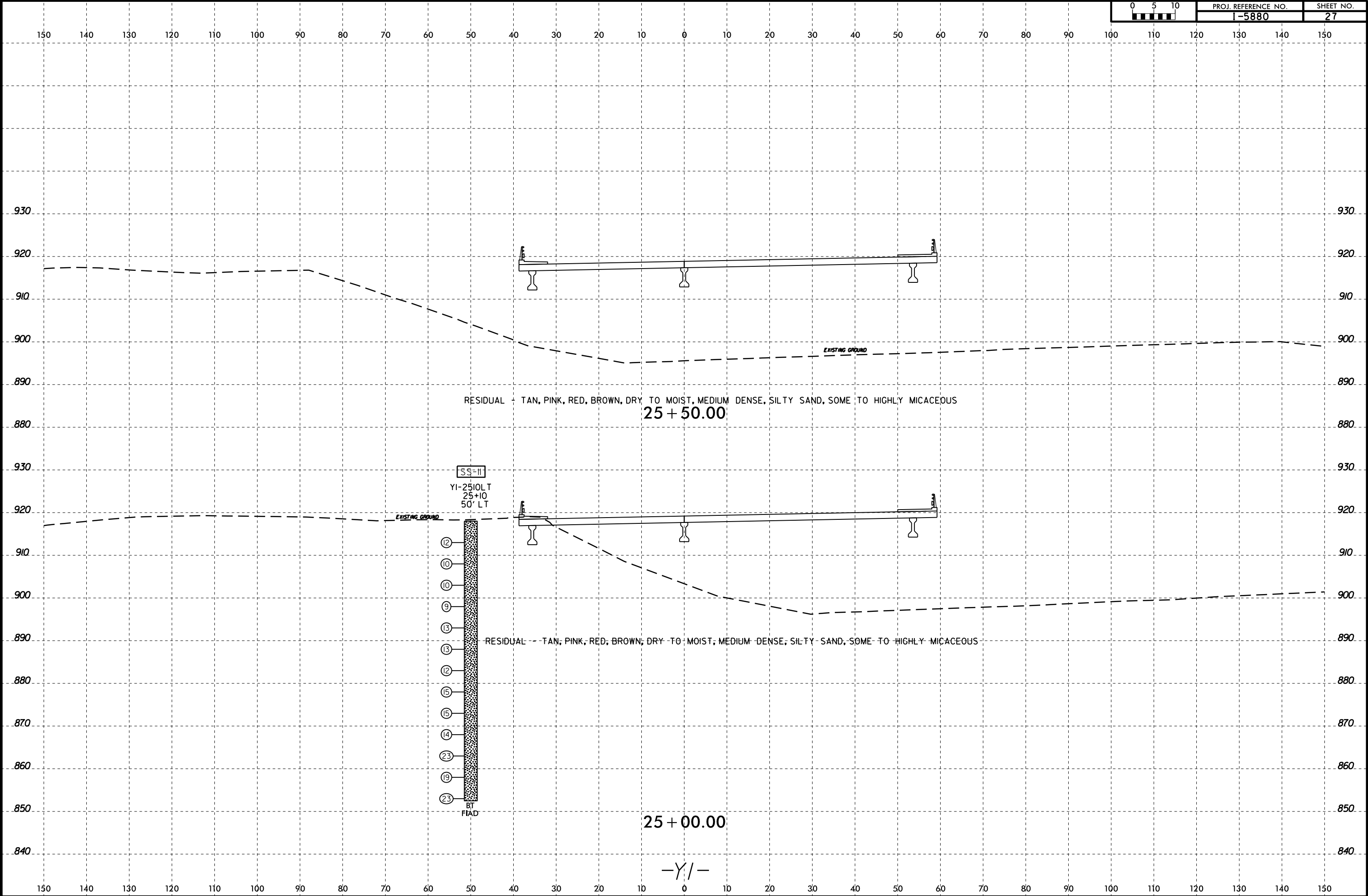
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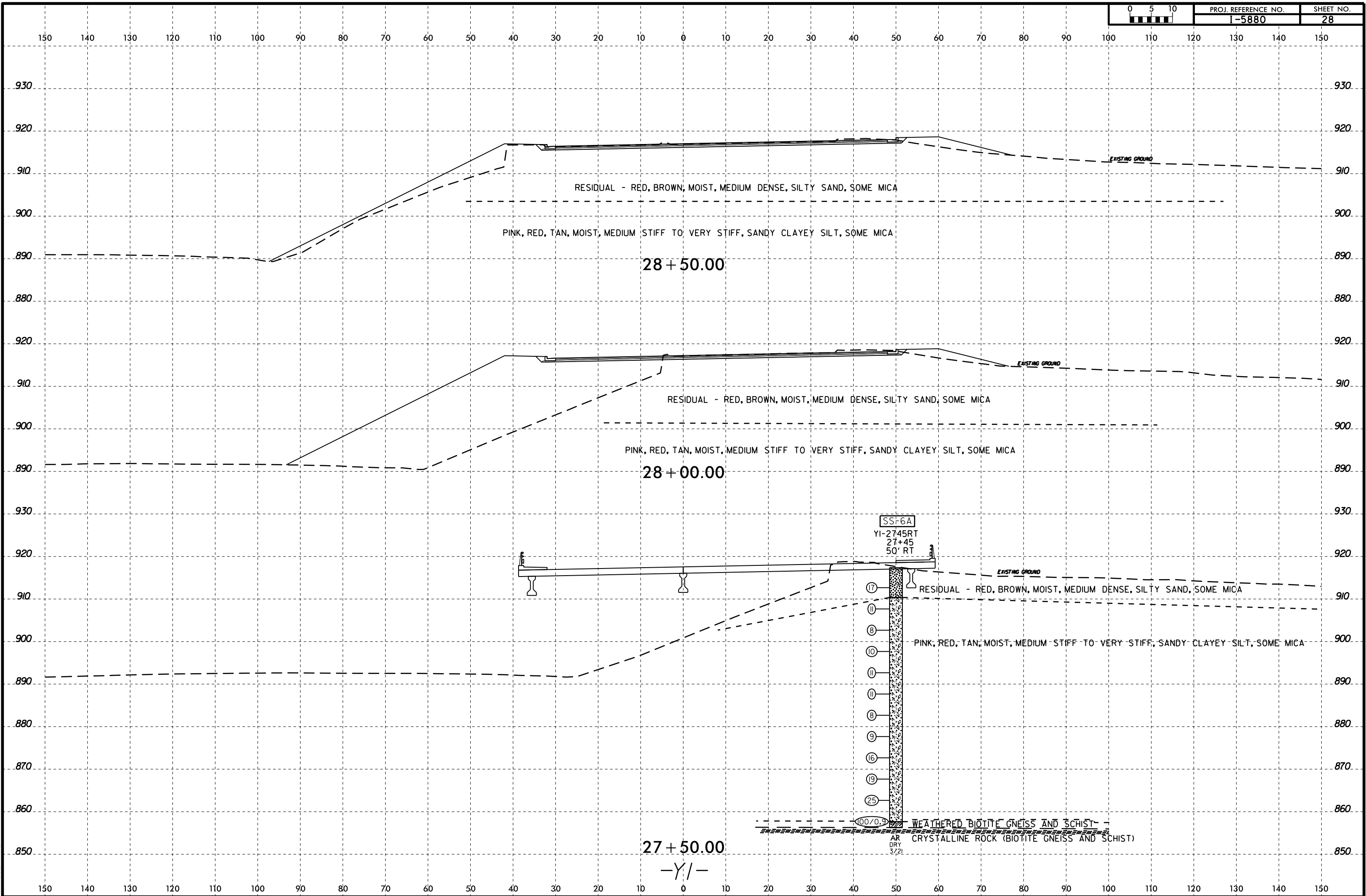
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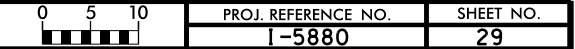


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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. I-5880

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 53080.1.1 County FORSYTH Owner
Date: Sampled 4/8/21 Received 4/15/21 Reported 4/19/21
Sampled from ROADWAY By K B MILLER
Submitted by JLP 2012 Standard Specifications

814456 TO 814472
10/19/21

TEST RESULTS

Proj. Sample No.	SS-2	SS-3	SS-4	SS-5	SS-6	SS-6A
Lab. Sample No.	814456	814457	814458	814459	814460	814461
Retained #4 Sieve %	-	-	-	-	-	-
Passing #10 Sieve %	100	97	98	95	100	98
Passing #40 Sieve %	92	79	80	69	80	83
Passing #200 Sieve %	72	38	43	17	27	44

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	16.7	28.4	29.4	48.6	36.9	27.8
Fine Sand Ret - #270 %	12.9	39.9	32.1	38.1	42.7	36.3
Silt 0.05 - 0.005 mm %	11.9	17.5	14.3	7.3	14.3	21.8
Clay < 0.005 mm %	58.5	14.1	24.2	6.0	6.0	14.1
Passing #40 Sieve %	-	-	-	-	-	-
Passing #200 Sieve %	-	-	-	-	-	-

L. L.	65	48	64			52
P. I.	31	5	16	NP	NP	9
AASHTO Classification	A-7-5(24)	A-5(0)	A-7-5(4)	A-2-4(0)	A-2-4(0)	A-5(2)
Station	39+55	39+55	18+40	18+40	22+50	27+45
Offset	87' RT	87' RT	60' RT	60' RT	30' LT	50' RT
Alignment	-L-	-L-	-RPC-	-RPC-	-RPC-	-Y1-
Location						
Depth (Ft)	9.10	19.10	3.40	8.40	14.00	8.70
to	10.60	20.60	4.90	9.90	15.50	10.20
% Moisture						

cc: K B MILLER

Soils Engineer

T. I. P. No. I-5880

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 53080.1.1 County FORSYTH Owner
Date: Sampled 4/8/21 Received 4/15/21 Reported 4/19/21
Sampled from ROADWAY By K B MILLER
Submitted by JLP 2012 Standard Specifications

814456 TO 814472
10/19/21

TEST RESULTS

Proj. Sample No.	SS-7	SS-8	SS-9	SS-10	SS-12	SS-13
Lab. Sample No.	814462	814463	814464	814465	814466	814467
Retained #4 Sieve %	-	-	-	-	-	-
Passing #10 Sieve %	97	99	98	95	95	96
Passing #40 Sieve %	78	74	68	73	80	65
Passing #200 Sieve %	40	20	15	26	57	44

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	32.5	45.0	51.0	41.7	25.4	41.5
Fine Sand Ret - #270 %	30.2	40.3	37.7	35.1	18.1	13.9
Silt 0.05 - 0.005 mm %	9.1	8.7	5.2	15.1	12.1	10.3
Clay < 0.005 mm %	28.2	6.0	6.0	8.1	44.4	34.3
Passing #40 Sieve %	-	-	-	-	-	-
Passing #200 Sieve %	-	-	-	-	-	-

L. L.	43				63	45
P. I.	11	NP	NP	NP	29	20
AASHTO Classification	A-7-5(1)	A-2-4(0)	A-2-4(0)	A-2-4(0)	A-7-5(15)	A-7-6(5)
Station	18+75	13+95	13+95	15+25	19+55	19+55
Offset	45' LT	45' LT	45' LT	35' LT	40' RT	40' RT
Alignment	-RPD-	-RPD-	-RPD-	-RPA-	-RPB-	-RPB-
Location						
Depth (Ft)	3.40	3.80	8.80	3.60	3.90	8.90
to	4.90	5.30	10.30	5.10	5.40	10.40
% Moisture	21.4					

cc: K B MILLER

Soils Engineer

T. I. P. No. I-5880

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 53080.1.1 County FORSYTH Owner
Date: Sampled 4/8/21 Received 4/15/21 Reported 4/19/21
Sampled from ROADWAY By K B MILLER
Submitted by JLP 2012 Standard Specifications

814456 TO 814472
10/19/21

TEST RESULTS

Proj. Sample No.	SS-14	SS-15	SS-16	SS-17	SS-18	
Lab. Sample No.	814468	814469	814470	814471	814472	
Retained #4 Sieve %	-	-	-	-	-	
Passing #10 Sieve %	95	98	99	96	97	
Passing #40 Sieve %	77	82	81	78	78	
Passing #200 Sieve %	57	39	42	46	42	

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	27.2	27.0	31.7	29.8	30.2	
Fine Sand Ret - #270 %	15.7	40.1	30.4	26.0	34.5	
Silt 0.05 - 0.005 mm %	10.7	18.7	15.7	13.9	17.1	
Clay < 0.005 mm %	46.4	14.1	22.2	30.2	18.1	
Passing #40 Sieve %	-	-	-	-	-	
Passing #200 Sieve %	-	-	-	-	-	

L. L.	65			55		
P. I.	30	NP	NP	9	NP	
AASHTO Classification	A-7-5(16)	A-4(0)	A-4(0)	A-5(3)	A-4(0)	
Station	17+70	17+70	17+40	38+75	38+75	
Offset	40' RT	40' RT	40' LT	130' LT	130' LT	
Alignment	-RPB-	-RPB-	-Y2-	-L-	-L-	
Location						
Depth (Ft)	3.50	8.50	3.80	3.30	23.30	
to	5.00	10.00	5.30	4.80	24.80	
% Moisture	22.2		32.3			

cc: K B MILLER

Soils Engineer