

REFERENCE: U-6003

PROJECT: 47138

SEE SHEET 3 FOR PLAN SHEET LAYOUT  
AT TIME OF INVESTIGATION

**CONTENTS**

LINE	STATION	PLAN	PROFILE
-L-	11+69.67 - 62+49.70	4-8	9-12
-Y15-	12+10.00 - 21+50.00	4	13
-Y16-	11+40.00 - 16+77.00	4	14
-DR1-	10+60.00 - 11+27.63	5	15
-DR2-	10+20.00 - 11+21.02	5	16

**CROSS SECTIONS**

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-Y15-	12+10 - 21+50	67-76
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**LABORATORY TESTING**

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

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**ROADWAY**

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**SUBSURFACE INVESTIGATION**

COUNTY FORSYTH  
PROJECT DESCRIPTION KERNERSVILLE LOOP FROM  
SR 1969 (PINEY GROVE ROAD) TO NC 150 (NORTH  
MAIN STREET)

**INVENTORY**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6003	1	98

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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

B. SMITH, PG

B. WORLEY, PG

M. SHIPMAN, EI

A. GROSS, GIT

M.B. MOSELEY

C. BOWEN

INVESTIGATED BY B. SMITH, PG

DRAWN BY B. SMITH, PG

CHECKED BY B. WORLEY, PG

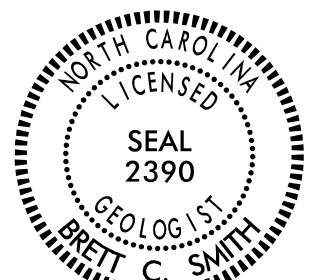
SUBMITTED BY B. SMITH, PG

DATE NOVEMBER, 2018

Prepared in the  
Office of:



NC FIRM LICENSE No: P-0339 and C-487  
504 Meadowlands Drive  
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(919) 732-3883  
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DocuSign by:

*[Signature]*

BE61A49304C542E 12/4/2018

SIGNATURE

DATE

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

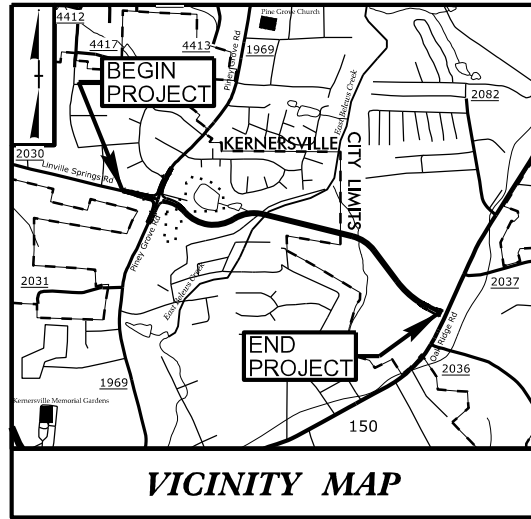


See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Symbols

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**FORSYTH COUNTY**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-6003	3	98
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
47138.1.1		PE	

**TIP PROJECT: U-6003**

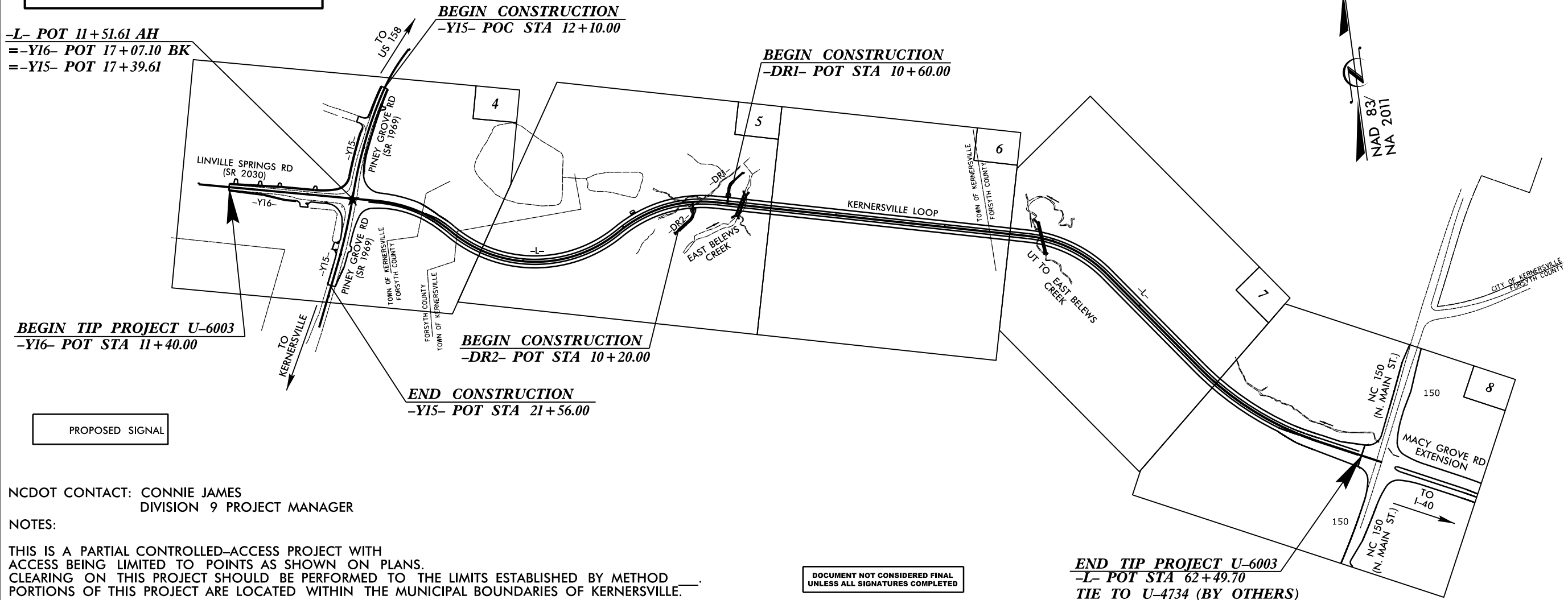


**VICINITY MAP**

**25% PLANS**

**LOCATION: KERNERSVILLE - KERNERSVILLE LOOP  
FROM SR 1969 (PINEY GROVE RD) TO NC 150  
(N. MAIN ST.)**

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



-L- POT 11+51.61 AH  
=-Y16- POT 17+07.10 BK  
=-Y15- POT 17+39.61

**BEGIN CONSTRUCTION**  
-Y15- POC STA 12+10.00

**BEGIN CONSTRUCTION**  
-DRI- POT STA 10+60.00

**BEGIN TIP PROJECT U-6003**  
-Y16- POT STA 11+40.00

**BEGIN CONSTRUCTION**  
-DR2- POT STA 10+20.00

**END CONSTRUCTION**  
-Y15- POT STA 21+56.00

PROPOSED SIGNAL

NCDOT CONTACT: CONNIE JAMES  
DIVISION 9 PROJECT MANAGER

NOTES:

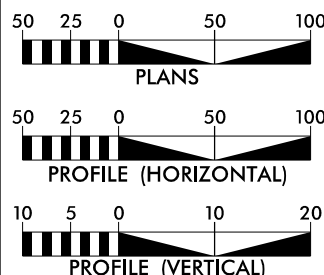
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON PLANS. CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD PORTIONS OF THIS PROJECT ARE LOCATED WITHIN THE MUNICIPAL BOUNDARIES OF KERNERSVILLE.

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**END TIP PROJECT U-6003**  
-L- POT STA 62+49.70  
TIE TO U-4734 (BY OTHERS)

**CONTRACT:**

**GRAPHIC SCALES**



**DESIGN DATA**

ADT (2019) = 5,400  
ADT (2039) = 10,100  
K = 10 %  
D = 55 %  
T = 3 % \*  
V = 40 MPH  
\* TTST = 1% DUAL 2%  
FUNC CLASS = ARTERIAL REGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT U-6003 = 1.073 MILES  
TOTAL LENGTH TIP PROJECT U-6003 = 1.073 MILES



Prepared In the Office of:  
HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
AUGUST 28, 2018

LETTING DATE:  
AUGUST 28, 2019

DENA C. SNEAD, PE  
PROJECT ENGINEER

ALEXANDER D. SNIDER, PE  
PROJECT DESIGN ENGINEER

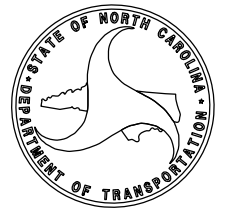
HYDRAULICS ENGINEER

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

ROADWAY DESIGN ENGINEER

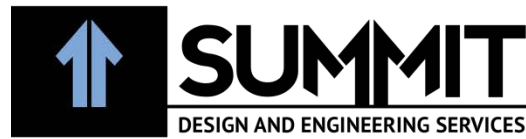
SIGNATURE: \_\_\_\_\_ P.E.

DIVISION OF HIGHWAYS



STATE OF NORTH CAROLINA

DATE: \$  
FILE: \$  
SERIAL: \$



919.732.3883 SUMMIT-ENGINEER.COM  
504 Meadowland Drive, Hillsborough, NC 27278

October 24, 2018

WBS Number: 47138.1.1  
TIP Number: U-6003  
County: Forsyth  
Description: Kernersville Loop from SR 1969 (Piney Grove Road) to NC 150 (North Main Street)

SUBJECT: Geotechnical Report - Roadway Subsurface Inventory

**Project Description**

The proposed 1.073-mile project is located both within and just outside of the city limits of Kernersville. The bulk of the project consists of 0.965 miles of new roadway alignment associated with the future “Kernersville Loop.” The project also involves work along Piney Grove Road (SR 1969) and Linville Springs Road (SR 2030) designed to improve traffic flow in association with the new roadway. Lastly, some minor work is proposed that is designed to maintain access to a small gravel road (Whispering Brook Road) intersecting the new roadway alignment. The proposed earthworks are significant in some areas of the project corridor. There are several proposed cut sections along the new roadway alignment with one large cut section surpassing 30 feet in depth. Roadway embankment heights vary greatly within the project corridor but in some areas are proposed as high as 20 feet. No structures are proposed on this project at the time of this report.

The geotechnical investigation was conducted from August 14, 2018 to September 19, 2018. Borings were advanced using a Diedrich D-50 drill machine equipped with an automatic hammer. Standard Penetration Tests (SPT) were performed at all planned boring locations to provide subsurface information for roadbed and slope design/construction. Rock soundings were performed in areas where Crystalline Rock was encountered above or within 6 feet of proposed grade. Representative soil samples were collected and submitted to Summit’s soils laboratory for classification and moisture content testing. Bulk samples were submitted to Geotechnics, Inc. for California Bearing Ratio (CBR) testing. Borings were left open for a minimum of 24 hours to collect groundwater data if they intercepted wet or saturated soils. They were also left open if they were deeper or drilled in less trafficked areas. Some borings in higher trafficked areas and/or containing only dry to moist soils were filled in immediately after drilling (FIAD). In these cases, if it was deemed that the borings did not come close to intercepting groundwater, the borings were indicated as “DRY” and not “FIAD” in the following report. All investigations and reporting were

performed in accordance with the NCDOT Geotechnical Engineering Unit’s 2016 “Geotechnical Investigation and Recommendations Manual.”

The following alignments were investigated for this project:

<b><u>Alignment</u></b>	<b><u>Station(±)</u></b>
-L-	11+69.67 - 62+49.70
-Y15-	12+10.00 – 21+50.00
-Y16-	11+40.00 – 16+77.00
-DR1-	10+60.00 – 11+27.63
-DR2-	10+20.00 – 11+21.02

**Physiography, Geography, and Geology**

The project corridor is located in north-central North Carolina in the Piedmont Physiographic Province. Topography in the region is characterized by gently rolling, well rounded hills and long low ridges with a few hundred feet of elevation difference between the hills and valleys. In general, the topography within the project corridor would fit this description. Elevations along the project range from approximately 916 feet to approximately 1,003 feet above sea level. The topographic high occurs near the intersection of Piney Grove Road (-Y15), and Linville Springs Road (-Y16-). The topographic low occurs within the floodplain of East Belews Creek.

The project corridor intersects East Belews Creek near its headwaters. The creek generally flows towards the northeast eventually emptying into the Dan River, and is a part of the Roanoke River Basin. Several unnamed tributaries associated with East Belews Creek are also present within the project corridor. In addition, two retention ponds are located north of the project corridor but are well outside of the proposed right of way.

Geologically, the project corridor is sandwiched in between the Milton and Carolina Terrane in an area of Late Paleozoic intrusions known as the Churchland Plutonic Suite. These rocks intruded the surrounding older rocks as giant blobs of molten rock (magma) during the formation of the Appalachian Mountain chain (approximately 280 to 320 million years ago). The intrusive rocks are mainly composed of the igneous rock Granite and Granodiorite. During the investigation, the project corridor was found to be underlain by Granite that has intruded into Biotite Gneiss and Schist.

**Soil Properties**

Residual soils, soils derived from the weathering of rock, are the dominant soil origin within the project corridor. In general, the Residual soils underlying the project follow the typical weathering profile observed throughout the piedmont. The clays, when present, are usually found closer to the ground surface. The silts and sands are typically found deeper and closer to the parent rock source. However, much like the parent rocks that they weather from, the Residual soils can vary significantly in some areas in both composition and vertical/horizontal distribution. The compositional boundaries (also known as contacts) within the Residual soils are shown in the graphical section of this report as dashed lines. However, in reality, the contacts are much more likely gradational in nature. Meaning that the



compositional changes between clay, silt, and sand occur gradually and over some vertical/horizontal distance.

Residual silty and sandy clays (A-7-5, A-7-6, and A-6) are prevalent throughout the project corridor and are typically present within 6 feet of the ground surface. They are generally not saprolitic and contain less visible mica than the silts and sands. Laboratory testing of the Residual clays revealed a range of liquid limits from 38 to 97 with an average of 63. Plasticity Index (PI) values varied from 11 to 57 with an average of 27. Moisture content ranged from 12.1% to 37.9% with an average of 24.7%. The majority of the samples tested were AASHTO classified as A-7-5. Several samples were classified as A-7-6 and a few were classified as A-6. SPT results in Residual clay strata showed soil densities typically range from medium stiff to stiff with some soft and very stiff areas. Softer areas typically corresponded with areas of higher moisture content. Many areas within the project corridor contain highly plastic clays (PI value greater than 26). Sieve analysis showed that the clays often have an increasing sand content with depth which also corresponds to PI values decreasing with depth. Almost all of the highly plastic clays encountered and tested were positioned from 0 – 3 feet within the subsurface. Areas containing highly plastic clays will be highlighted in the “Areas of Special Geotechnical Interest” section of this text report.

Residual clayey and sandy silts (A-5 and A-4) are common throughout the project corridor and typically underlie the clays. These soils can be saprolitic and are usually micaceous. They can also contain trace to little amounts of gravel-sized crystalline rock fragments. Laboratory analysis of the Residual silts indicated a range of liquid limits from 31 to 64 with an average of 52. PI values varied from 0 to 10 with an average of 5. Moisture content ranged from 14.2% to 41.7% with an average of 25.7%. All but one of the samples tested were AASHTO classified as A-5 with one sample resulting in an A-4 classification. SPT results in Residual silt strata showed soil densities that typically ranged from medium stiff to stiff with some soft and very stiff areas. Softer areas typically corresponded with areas of higher moisture content. Sieve analysis showed that the silts mostly had a very high sand content. Some trace amounts of Manganese Oxide (MnO) were observed within silts. Manganese Oxide will generate nearly frictionless surfaces of indeterminate orientation throughout the Residual soil profile, which can lead to slope stability issues. However, no significant amounts of Manganese Oxide were encountered during the geotechnical investigation. Areas containing soft fine-grained Residuals soils will be highlighted in the “Areas of Special Geotechnical Interest” section of this text report.

Residual clayey and silty sands (A-2-5, A-2-4, A-2-6, and A-2-7) are also common throughout the project corridor and typically underlie the clays and/or silts. The sands are generally saprolitic and micaceous with trace to little amounts of gravel-sized crystalline rock fragments. Laboratory testing of the Residual sands indicated a range of liquid limits from 34 to 52 with an average of 46. PI values varied from 0 to 15 with an average of 4. Moisture content ranged from 11.0% to 33.0% with an average of 18.4%. The majority of the samples tested were AASHTO classified as A-2-5. A few were classified as A-2-4, one A-2-6, and one A-2-7. SPT results in Residual sand strata showed soil densities of the sands typically range from loose to medium dense with some dense areas.

Alluvial soils, soils that have been transported and deposited by water, were encountered in the project corridor within the floodplains of East Belews creek and its associated tributaries. These topographically low areas are often very near or even below the water table and Alluvial soils are typically wet to saturated. As a consequence of their high moisture content and nature of deposition, alluvial soils typically exhibit very soft to soft/very loose to loose soil densities. Alluvial soils also often contain varying amounts of

organic matter, mica, and gravel. Approximate locations where these soils are believed to be present will be highlighted in the “Areas of Special Geotechnical Interest” section of this text report.

Alluvial silty, clayey, and fine to coarse sands (A-2-4, A-2-6, and A-1-b) are the most prevalent soil type within the floodplains of the project corridor. Laboratory testing of the alluvial sands indicated a range of liquid limits from 20 to 44 with an average of 32. PI values varied from 0 to 15 with an average of 5. Moisture content ranged from 10.5% to 35.0% with an average of 22.2%. The majority of the samples tested were AASHTO classified as A-2-4 with one A-2-6 and one A-1-b. SPT results in alluvial sand strata showed soil densities that typically ranged from very loose to loose with some medium dense areas.

Alluvial sandy silts (A-4) are also present within the floodplains of the project corridor. Laboratory testing of the alluvial silts indicated a range of liquid limits from 32 to 35 with an average of 34. PI values varied from 1 to 8 with an average of 5. Moisture content ranged from 19.4% to 22.5% with an average of 21.0%. All samples tested were AASHTO classified as A-4. SPT results in alluvial silt strata showed soil densities that typically ranged from very soft to soft.

While not encountered during the investigation, Alluvial clays are also likely present within the project corridor. These clays typically get deposited in the lower energy areas of the floodplain and usually have moderate to high PI values and organic content.

Roadway Embankment soils from the construction of existing Piney Grove Road (-Y15), Linville Springs Road (-Y16-), and Whispering Brook Road (-DR1-/-DR2-) are present within the project corridor. Due to access, traffic, and underground utility issues these soils were only sampled on a very limited basis during the investigation. One sample was obtained along Whispering Brooke Drive (-DR2-) and field classified as a moist, medium dense, clayey, silty sand (A-2-5). No Roadway Embankment soils were lab tested during this investigation. These soils are likely quite similar to the local Residual soils that they were sourced from. However, they often have a “reworked” appearance, with a large variation in grain size. They can contain little to trace amounts of organic material, gravel, cobbles, boulders and/or other types of debris. If properly compacted during construction, Roadway Embankment soils typically produce stiff/medium dense soil densities.

Engineered Artificial Fill soils from the development and construction of businesses along Piney Grove and Linville Springs Road are present within the project corridor. These soils were also sampled on a very limited basis. One sample was obtained along Piney Grove Road (-Y15-) and was associated with the construction of a nearby gas station. The sample was field classified as moist, medium dense, clayey, silty sand (A-2-5). Another area of Engineered Artificial Fill was observed right of and near the beginning of the mainline (-L-). This fill was associated with the construction of a nearby business. No Engineered Artificial Fill soils were lab tested during this investigation. These soils are also likely quite similar to the local Residual soils that they were sourced from and maintain a “reworked” appearance with a large variation in grain size. They can also contain little to trace amounts of organic material, gravel, cobbles, boulders and/or other types of debris. These soils are also engineered, and if properly compacted during construction typically produce stiff/medium dense soil densities.

**Rock Properties**

Biotite Gneiss and Schist underlies a large portion of the project corridor. This unit is believed to be Late Proterozoic-Cambrian in age which is approximately 570-900 million years old. This unit is deeply weathered and has undergone both ductile and brittle deformation. When you combine the deep weathering, compositional layering of the gneiss/schist, and the complex folds, faults, and joints from the deformation, you can get some highly irregular weathering patterns. Based on boring data within this unit, major areas of Crystalline Rock are unlikely to be encountered at or above grade. One area of Crystalline Rock well below proposed grade was encountered in a culvert boring. However, given the highly irregular weathering patterns, it should be assumed that unexpected minor areas of Crystalline Rock could be encountered within this unit. Residual soils developed from this unit generally consist of silty clays and sandy clays that transition to clayey silts, sandy silts, clayey sands and silty sands with depth. They are typically obviously saprolitic with metamorphic foliations still evident and highly micaceous. Some minor amounts of MnO occur within this unit in a few areas.

Approximately 245 – 320 million years ago and several miles below the earth’s surface, a series of magmas intruded and expanded into the above-mentioned older unit. The expansion into the surrounding rock was erratic and random, likely following fractures, faults, joints, and other weaknesses within the rock. These intrusions occurred on both a large scale where they can be measured in miles and on a small scale where they can be measured in inches. Over time this magma cooled and crystallized into what is now Granite. This Granite is more resistant to weathering than the Biotite Gneiss and Schist and was encountered in several areas of the project corridor above or within six feet of proposed grade. The Granite is also subject to some irregular weathering due to brittle deformation and the complex contacts between it and the less resistant rock unit surrounding it. This is evident in several areas of the project within this unit where Weathered and/or Crystalline Rock seems to abruptly appear then disappear. The rock lines drawn in the following report are a best interpretation given the information available. Given the irregular weathering patterns, some unexpected areas of Crystalline Rock should be anticipated in areas of proposed cut. The granite will likely require some blasting and should be suitable for rip rap, gravel, rock embankments, etc. Residual soils developed from this unit generally consist of silty clays and sandy clays that transition to clayey silts, sandy silts, clayey sands and silty sands with depth. These soils are typically saprolitic and have fairly high mica content. For specific information on the locations of near and above grade Crystalline Rock within this unit, refer to the “Areas of Special Geotechnical Interest” section of this text report.

**Groundwater Properties**

The field investigation as conducted during a period of near average to slightly above average rainfall. Groundwater was only encountered in thirteen borings. These borings were mostly located in the topographically lowest areas of the project and were typically within or near floodplains. Groundwater measurements varied from 916.5 feet to 956.1 feet above sea level. An average water table elevation of 922.7 feet above sea was calculated within the project corridor. Approximate locations where groundwater is present above or within six feet of proposed grade will be highlighted in the following section, “Areas of Special Geotechnical Interest.”

A visual reconnaissance for water wells was conducted throughout the project corridor. This was used in conjunction with the final survey file to attempt to identify water wells within or adjacent to the proposed right of way of the project. Properly abandoned wells are not included in the following list. Some water

well locations are well hidden, and it is possible that some wells were missed or misidentified by the final survey and/or visual reconnaissance. The following residential water wells were identified within or adjacent to the project corridor:

<b><u>Alignment</u></b>	<b><u>Station(±)</u></b>	<b><u>Offset</u></b>
-Y15-	15+95	72’RT
-Y15-	20+07	63’LT
-Y16-	12+35	79’LT

In addition to the residential wells, several monitoring wells associated with nearby gas stations were also observed. The following monitoring wells were identified within or adjacent to the project corridor:

<b><u>Alignment</u></b>	<b><u>Station(±)</u></b>	<b><u>Offset</u></b>
-Y15-	18+38	59’RT
-Y15-	18+57	93’RT
-Y15-	18+90	47’LT
-Y16-	15+57	72’RT
-Y16-	15+86	66’RT
-Y16-	15+93	49’RT
-Y16-	16+09	62’RT

Retention ponds, designed to handle storm water run-off, are located adjacent to the project corridor at the following locations:

<b><u>Alignment</u></b>	<b><u>Station(±)</u></b>	<b><u>Offset</u></b>
-L-	15+68 – 22+62	253’ – 294’LT
-L-	24+83 – 26+48	132’ – 241’LT

**Areas of Special Geotechnical Interest**

**Plastic Soils** - During the geotechnical investigation, highly plastic clays were encountered in many areas within the project corridor. Highly plastic soils can be problematic during and after construction. They can negatively affect embankment stability, embankment settlement, subgrade stability, and may not be suitable for use as embankment material. More detailed information on these soils can be found in the “Soil Properties” section of this text report. The following approximate locations listed below show areas where highly plastic clays are present within the project corridor:

<b><u>Alignment</u></b>	<b><u>Station(±)</u></b>	<b><u>Offset</u></b>
-L-	11+69.67 – 15+25	Left & Right
-L-	16+75 – 24+25	Left & Right
-L-	30+75 – 33+25	Left & Right
-L-	34+75 – 39+25	Left & Right
-L-	46+75 – 51+25	Left & Right

-L-	52+75 – 55+75	Left & Right
-L-	57+25 – 59+25	Left & Right
-L-	60+75 – 62+49.70	Left & Right
-Y15-	12+75 – 17+75	Left & Right
-Y16-	11+40 – 16+77	Left & Right

Alluvial Soils - During the geotechnical investigation, areas of Alluvial soils were observed and encountered. Alluvial soils can be problematic during and after construction. They can negatively impact embankment stability, embankment settlement, and subgrade stability. More detailed information on these soils can be found in the “Soil Properties” section of this text report. The following approximate locations listed below show areas where Alluvial soils are present within the project corridor:

<u>Alignment</u>	<u>Station(±)</u>	<u>Offset</u>
-L-	26+75 – 31+75	Left & Right
-L-	43+75 – 46+25	Left & Right
-L-	55+25 – 58+25	Left & Right

Soft Soils – During the geotechnical investigation, areas containing soft Residual soils were encountered. Soft soils can be problematic during and after construction. These soils can negatively impact embankment stability, embankment settlement, and subgrade stability. Especially when they are fine-grained and have a high moisture or mica content. More detailed information on these soils can be found in the “Soil Properties” section of this text report. The following approximate locations listed below show areas where soft Residual soils are present within the project corridor.

<u>Alignment</u>	<u>Station(±)</u>	<u>Offset</u>
-L-	13+25 – 16+75	Left & Right
-L-	20+75 – 24+25	Left & Right
-L-	27+25 – 29+25	Left & Right
-L-	30+25 – 31+75	Left & Right
-L-	56+25 – 59+25	Left & Right

Crystalline Rock - During the geotechnical investigation, Crystalline Rock was encountered in several areas. Crystalline Rock can present issues during construction with excavation and may require blasting. More detailed information on the rocks underlying the project corridor can be found in the “Rock Properties” section of this text report. The following approximate locations listed below show areas where Crystalline Rock is above or within 6 feet of proposed grade:

<u>Alignment</u>	<u>Station(±)</u>	<u>Offset</u>
-L-	40+25 – 43+25	Left & Right
-L-	48+75 – 52+75	Left

Groundwater - During the geotechnical investigation, groundwater was encountered in several areas. Groundwater can present issues during and after construction if not properly dealt with. More detailed information on the groundwater underlying the project corridor can be found in the “Groundwater Properties” section of this text report. The following approximate locations listed below show areas where groundwater is above or within 6 feet of proposed grade:

<u>Alignment</u>	<u>Station(±)</u>	<u>Offset</u>
-L-	31+25 – 32+75	Left & Right

**Appendix A**

Bulk Samples – California Bearing Ratio (CBR)

L3420R  
 (-L-) 34+20, 40°RT  
 0.0 – 30.5 ft.  
 S – 554

L4200R  
 (-L-) 42+00, 40°RT  
 0.0 – 15.0 ft.  
 S – 555

L5000L  
 (-L-) 50+00, 40°LT  
 0.0 – 8.2 ft.  
 S - 556

**References**

North Carolina Geological Survey, 1985, Geologic map of North Carolina: North Carolina Geological Survey, General Geologic Map, scale 1:500000.

The Geology of the Carolinas, J. Wright Horton, Jr., and Victor A. Zullo

Respectfully Submitted,

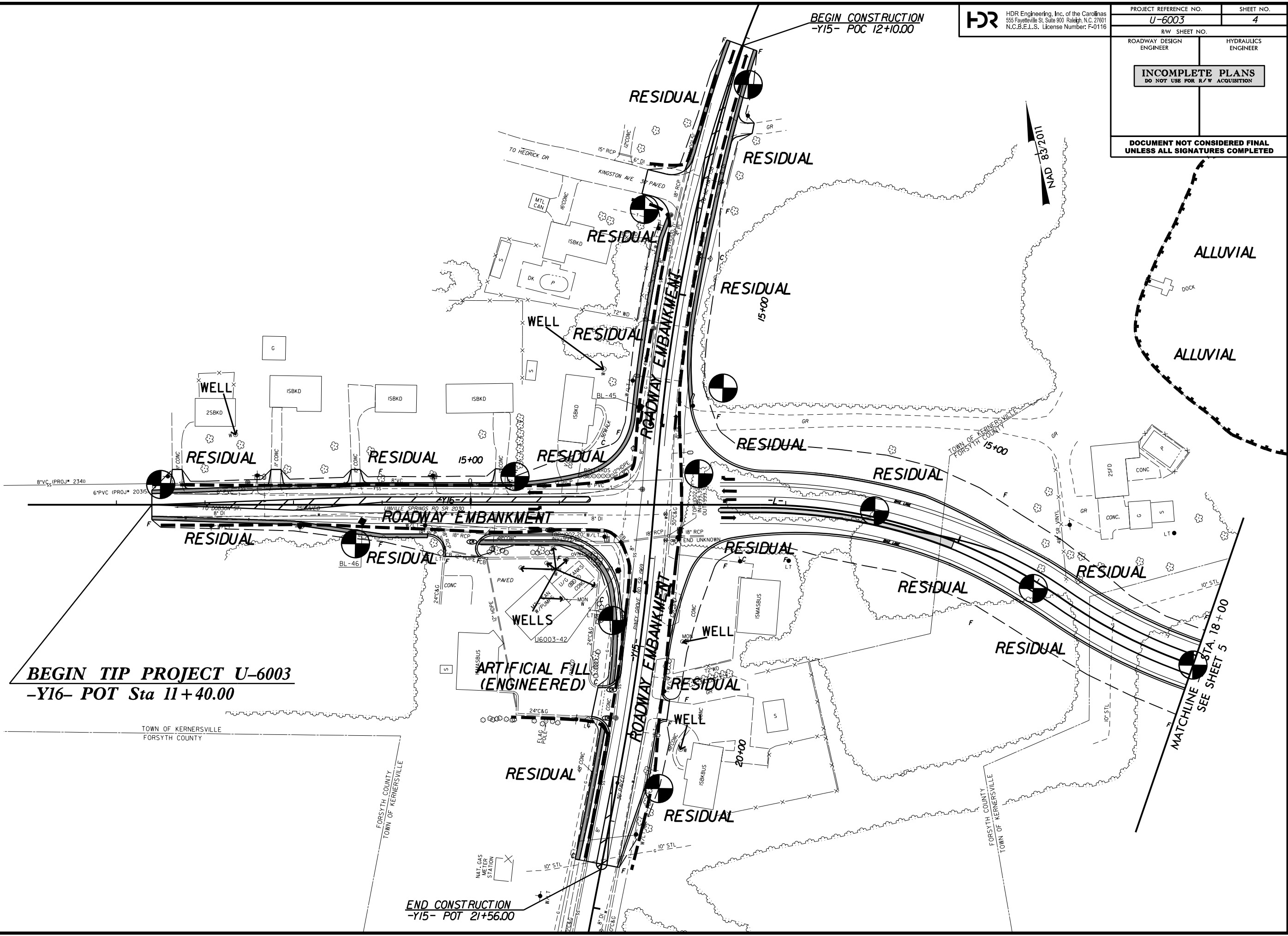


Brett Smith, PG  
 Project Geologist  
 Summit Design and Engineering Services, PLLC

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**HDR** HDR Engineering, Inc. of the Carolinas  
 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601  
 N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.	SHEET NO.
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<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	



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**BEGIN TIP PROJECT U-6003**  
 -Y16- POT Sta 11+40.00

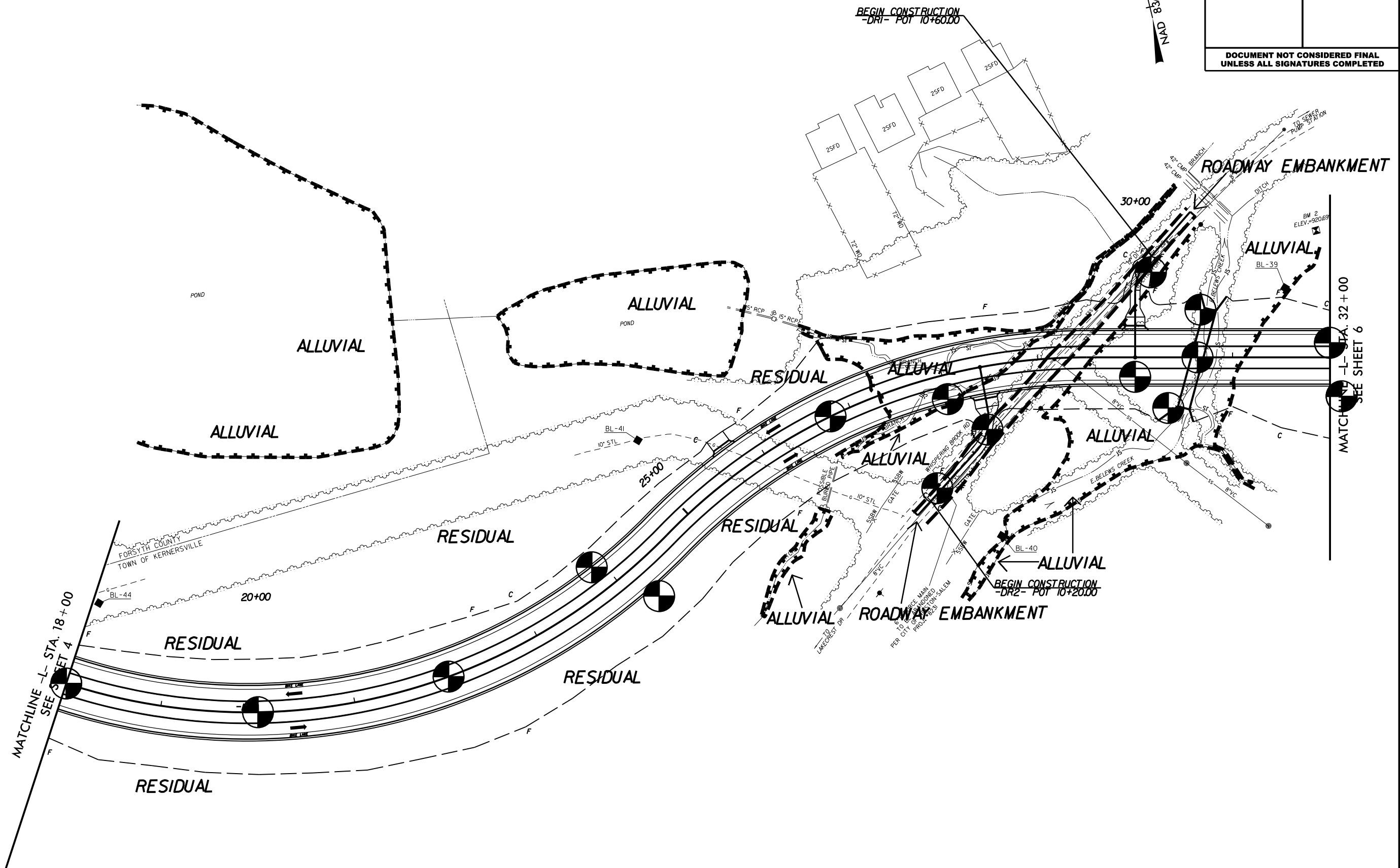
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MATCHLINE  
 STA. 18+00  
 SEE SHEET 5

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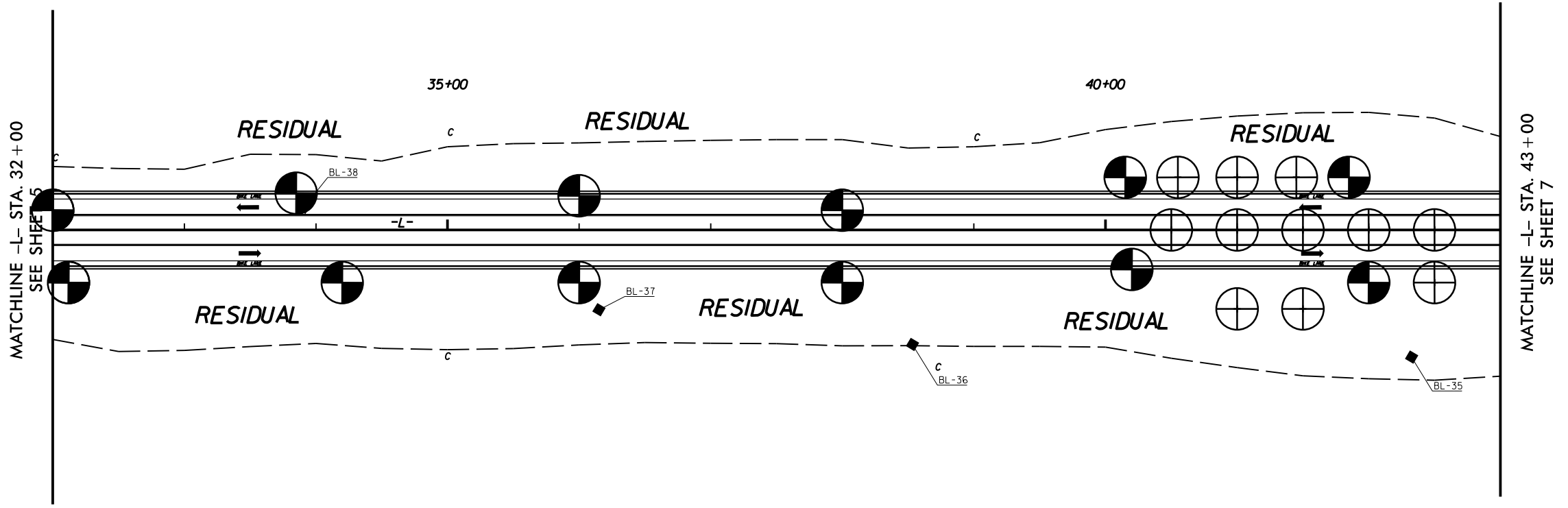
HDR HDR Engineering, Inc. of the Carolinas  
555 Fayetteville St, Suite 900, Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

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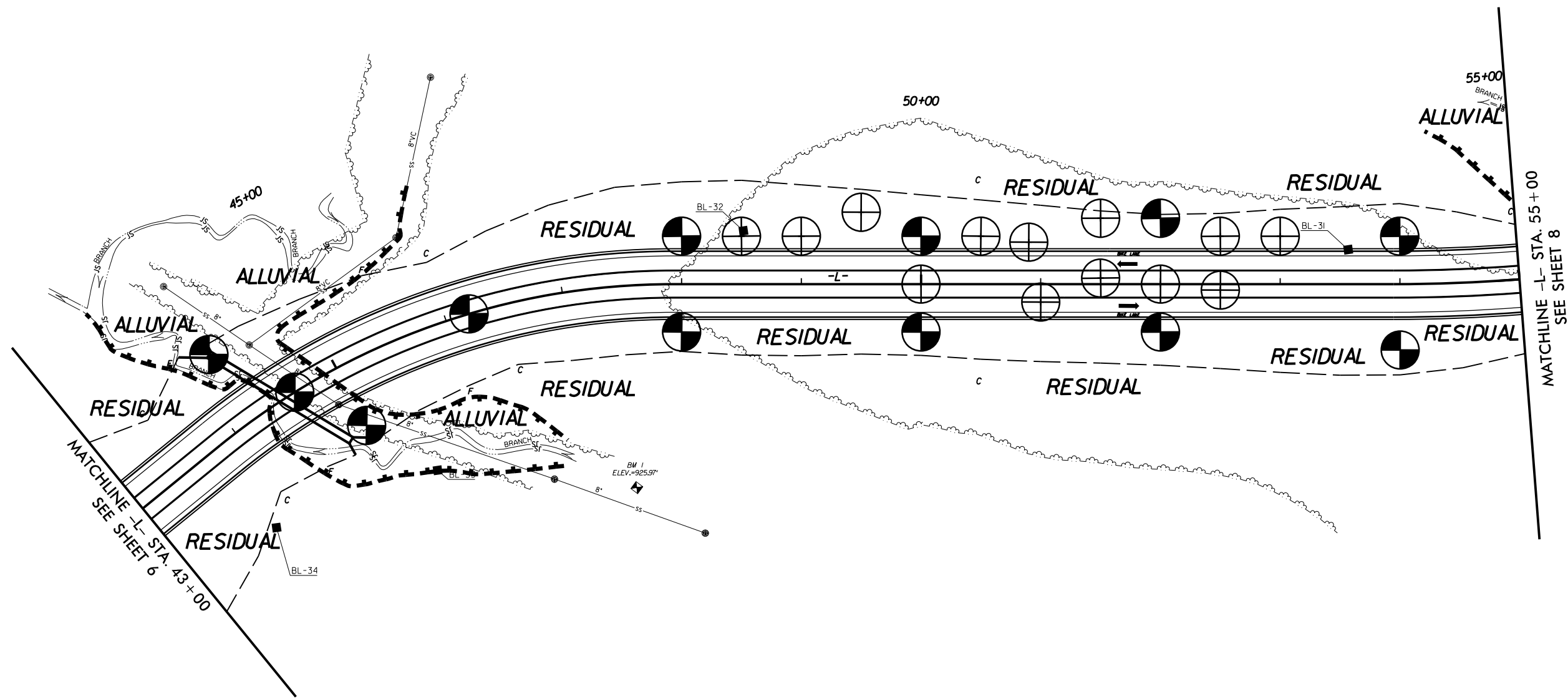
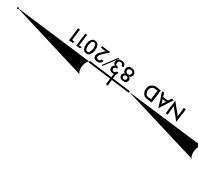
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555 Fayetteville St., Suite 900, Raleigh, N.C. 27601  
N.C.B.E.L.S. License Number: F-0116

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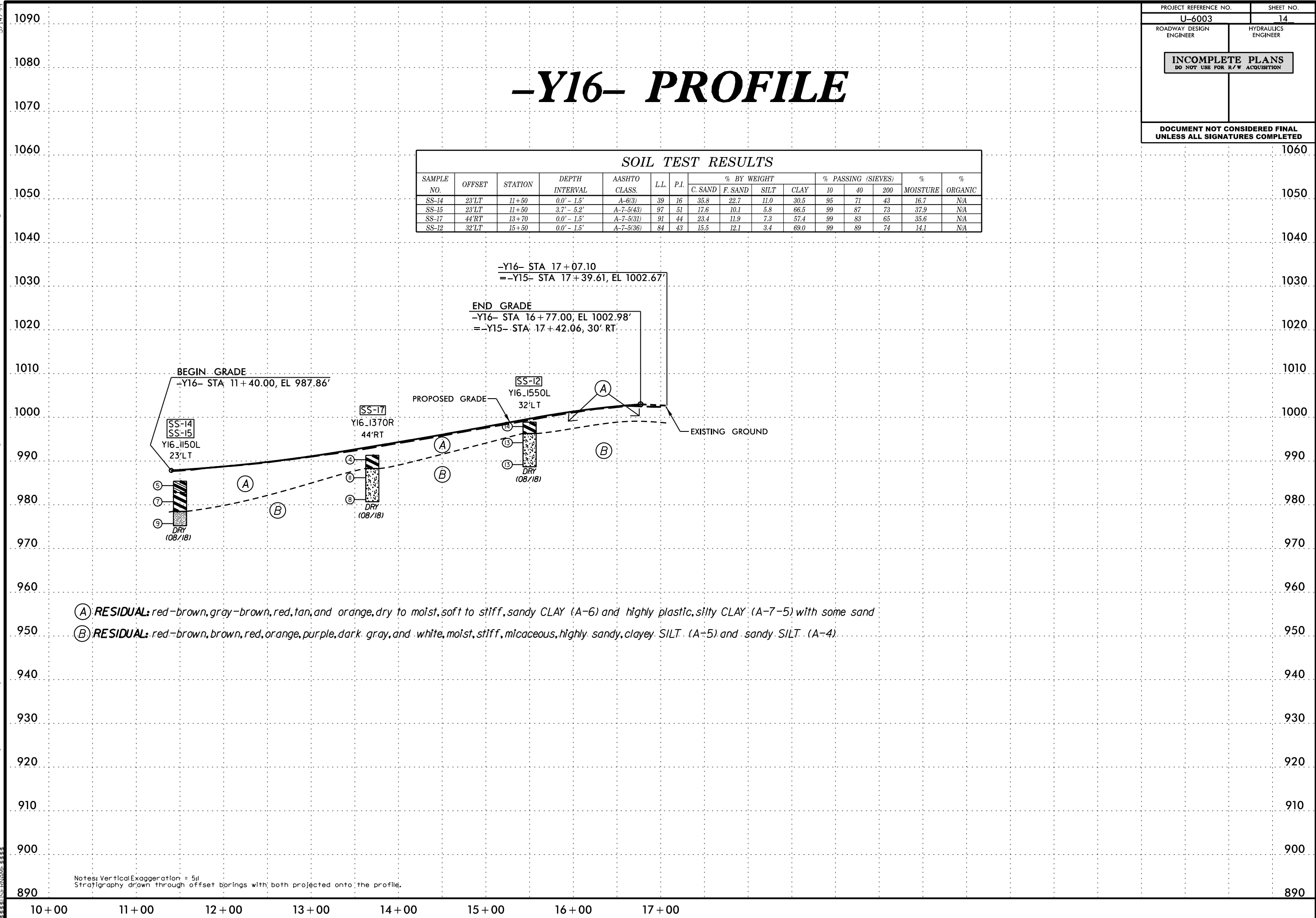






# -Y16- PROFILE

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-14	23'LT	11+50	0.0' - 1.5'	A-6(3)	39	16		
SS-15	23'LT	11+50	3.7' - 5.2'	A-7-5(43)	97	51	17.6	10.1	5.8	66.5	99	87	73	37.9	NA
SS-17	44'RT	13+70	0.0' - 1.5'	A-7-5(31)	91	44	23.4	11.9	7.3	57.4	99	83	65	35.6	NA
SS-12	32'LT	15+50	0.0' - 1.5'	A-7-5(36)	84	43	15.5	12.1	3.4	69.0	99	89	74	14.1	NA



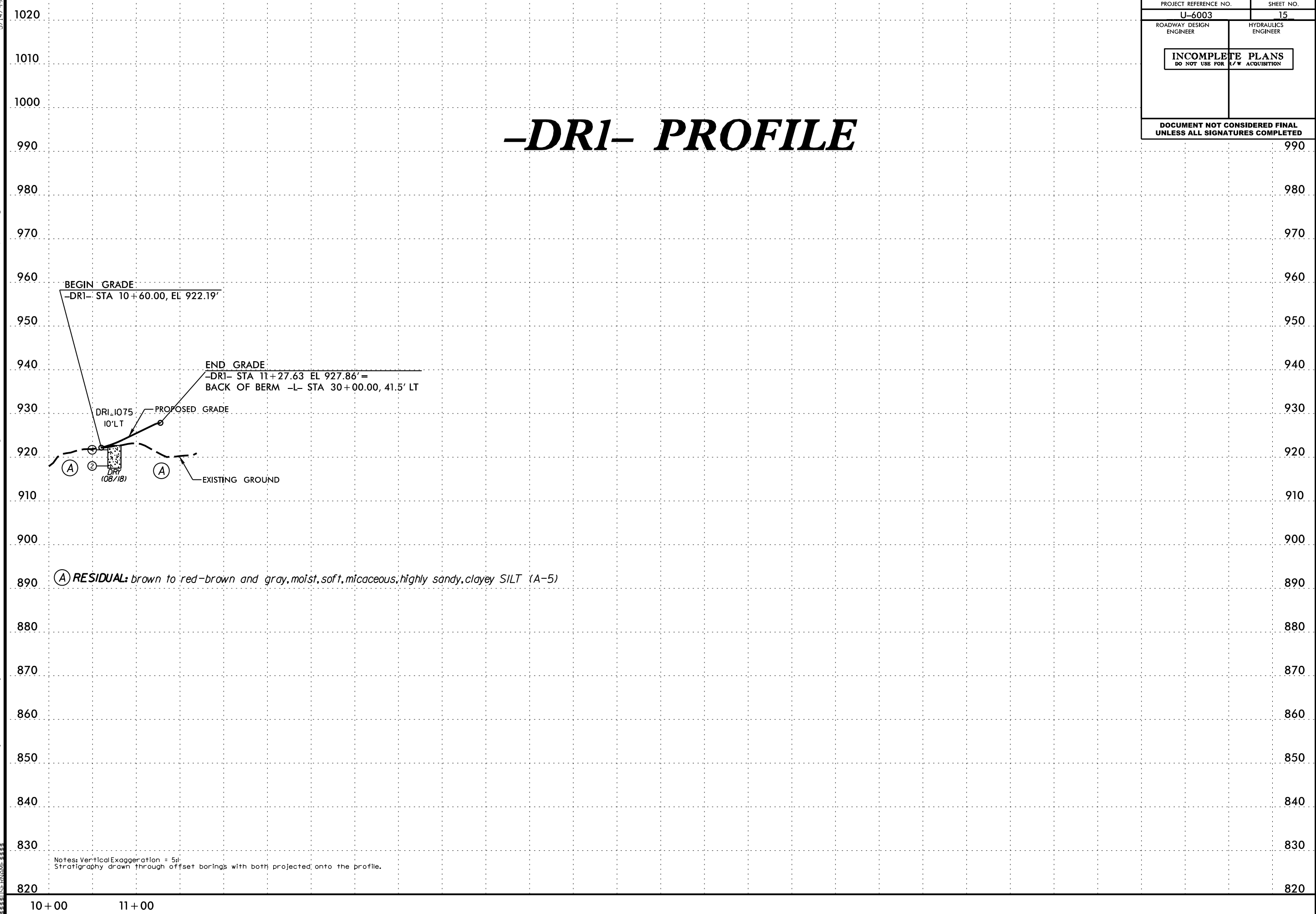
- (A) RESIDUAL: red-brown, gray-brown, red, tan, and orange, dry to moist, soft to stiff, sandy CLAY (A-6) and highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: red-brown, brown, red, orange, purple, dark gray, and white, moist, stiff, micaceous, highly sandy, clayey SILT (A-5) and sandy SILT (A-4)

Notes: Vertical Exaggeration = 5x  
Stratigraphy drawn through offset borings with both projected onto the profile.

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PROJECT REFERENCE NO.	SHEET NO.
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<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	

# -DRI- PROFILE



BEGIN GRADE  
-DRI- STA 10+60.00, EL 922.19'

END GRADE  
-DRI- STA 11+27.63 EL 927.86'=  
BACK OF BERM -L- STA 30+00.00, 41.5' LT

PROPOSED GRADE

EXISTING GROUND

DRI 10' LT  
DRY (08/18)

(A) RESIDUAL: brown to red-brown and gray, moist, soft, micaceous, highly sandy, clayey SILT (A-5)

Notes: Vertical Exaggeration = 5x  
Stratigraphy drawn through offset borings with both projected onto the profile.

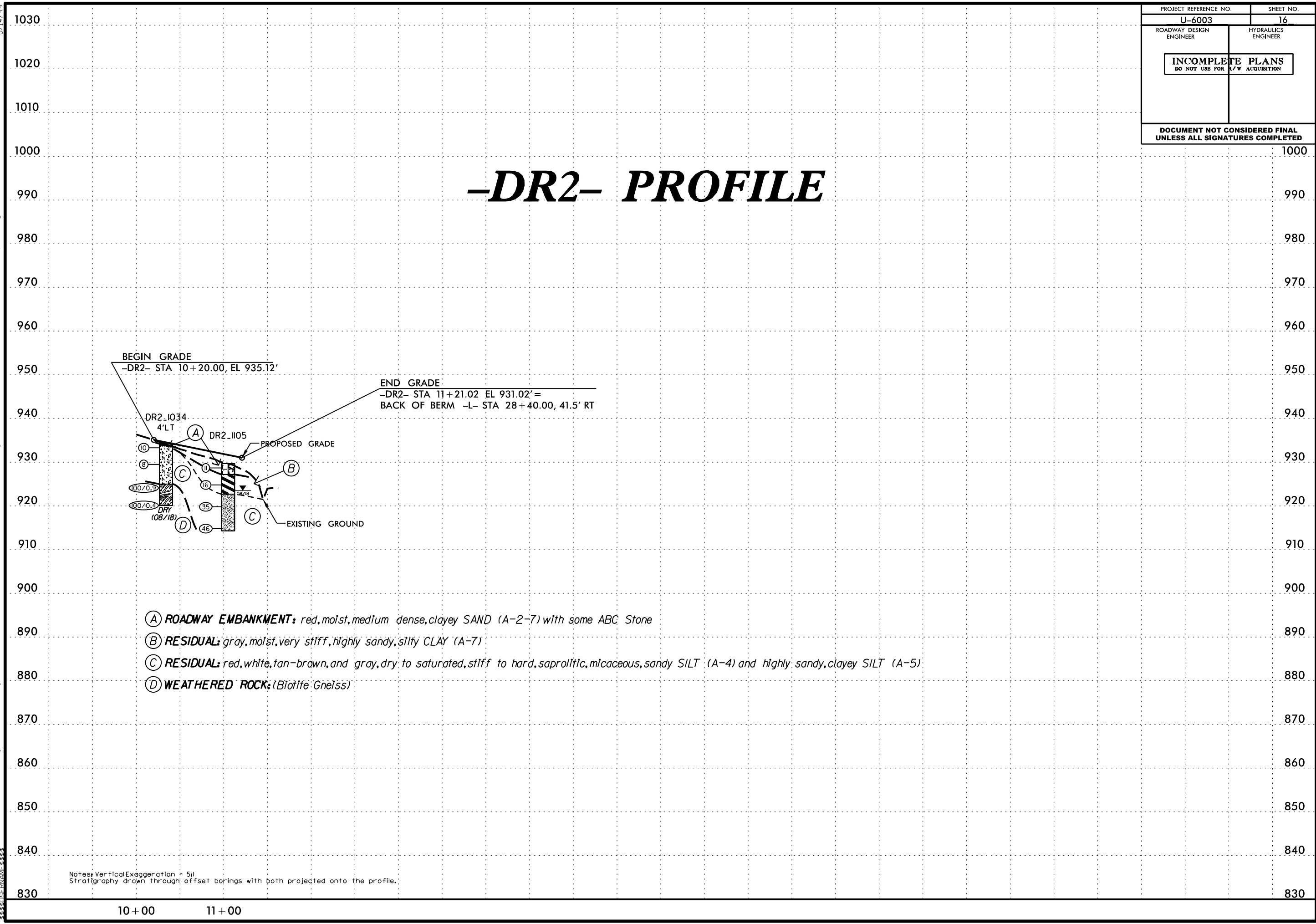
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PROJECT REFERENCE NO.	SHEET NO.
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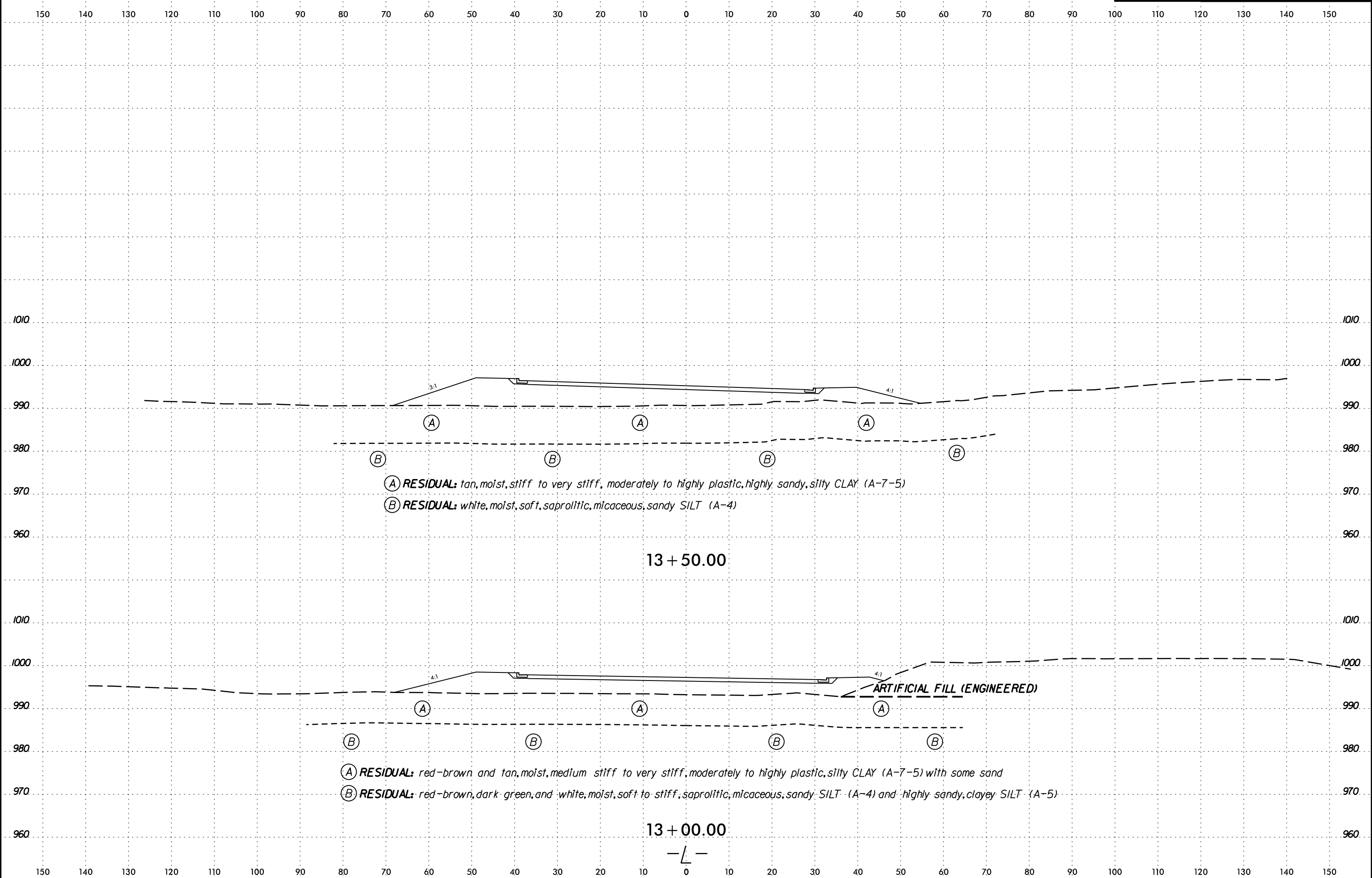
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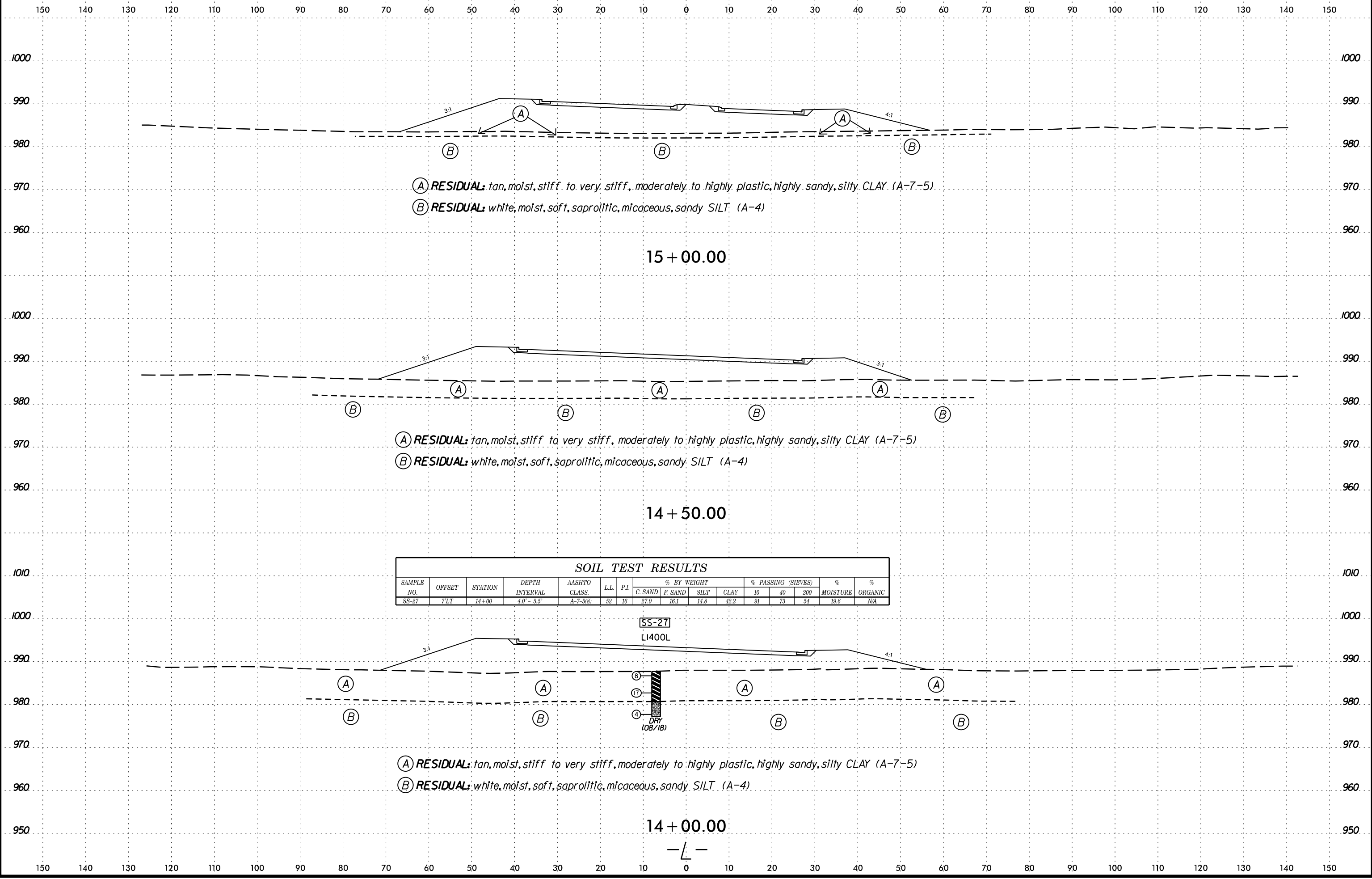
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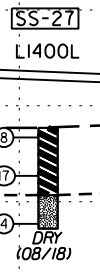
(A) RESIDUAL: tan, moist, stiff to very stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)  
 (B) RESIDUAL: white, moist, soft, saprolitic, micaceous, sandy SILT (A-4)

15 + 00.00

(A) RESIDUAL: tan, moist, stiff to very stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)  
 (B) RESIDUAL: white, moist, soft, saprolitic, micaceous, sandy SILT (A-4)

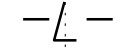
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-27	7'LT	14+00	4.0' - 5.5'	A-7-5(8)	52	16	27.0	16.1	14.8	42.2	91	73	54	19.6	N/A

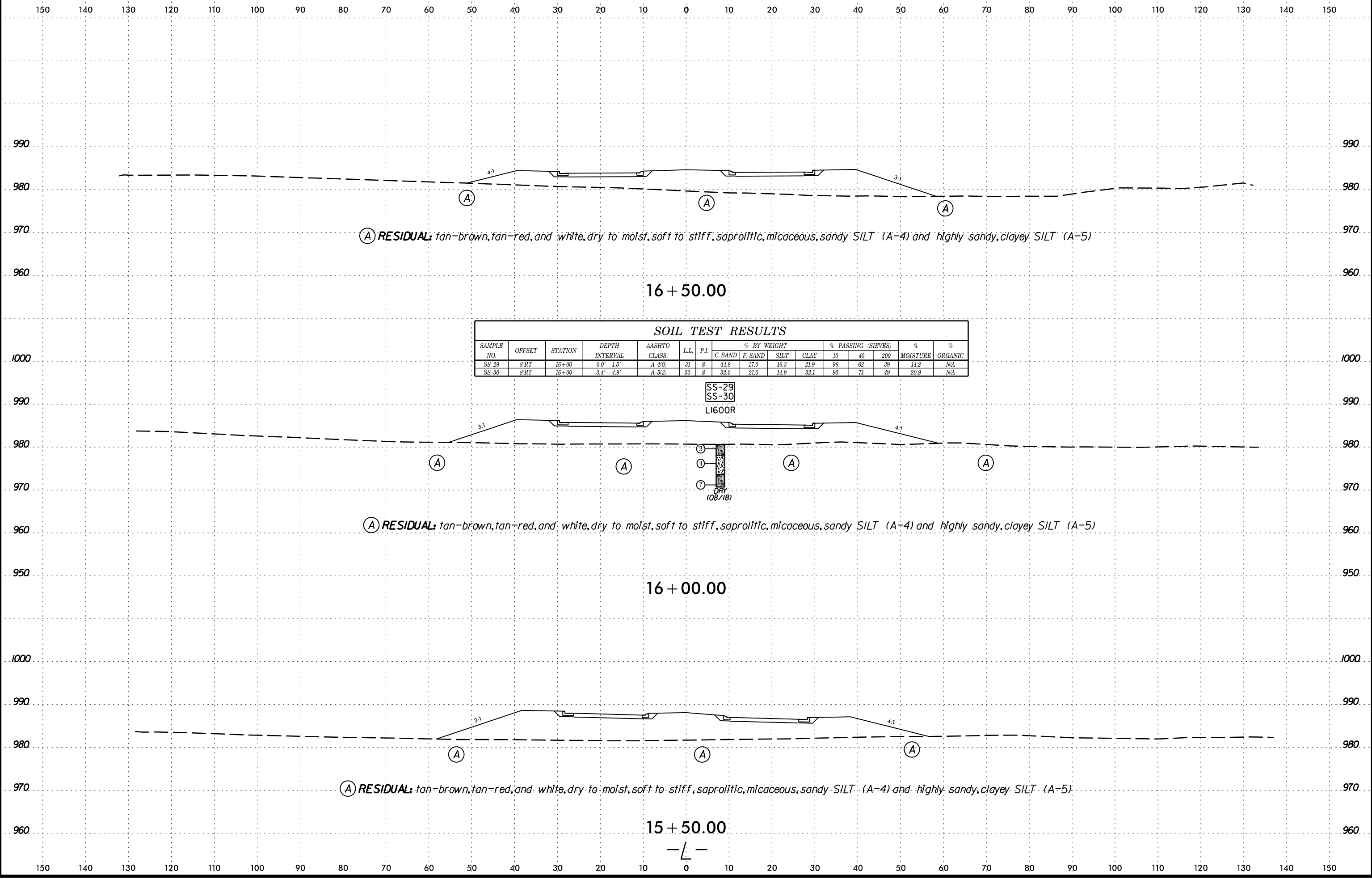


(A) RESIDUAL: tan, moist, stiff to very stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)  
 (B) RESIDUAL: white, moist, soft, saprolitic, micaceous, sandy SILT (A-4)

14 + 00.00



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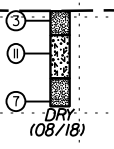
(A) RESIDUAL: tan-brown, tan-red, and white, dry to moist, soft to stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

16 + 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-29	8'RT	16+00	0.0' - 1.5'	A-4(0)	31	8	44.8	17.0	16.3	21.9	96	62	39	14.2	NA
SS-30	8'RT	16+00	3.4' - 4.9'	A-5(3)	53	8	32.0	21.0	14.9	32.1	95	71	49	20.9	NA

SS-29  
SS-30

LI600R



(A) RESIDUAL: tan-brown, tan-red, and white, dry to moist, soft to stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

16 + 00.00

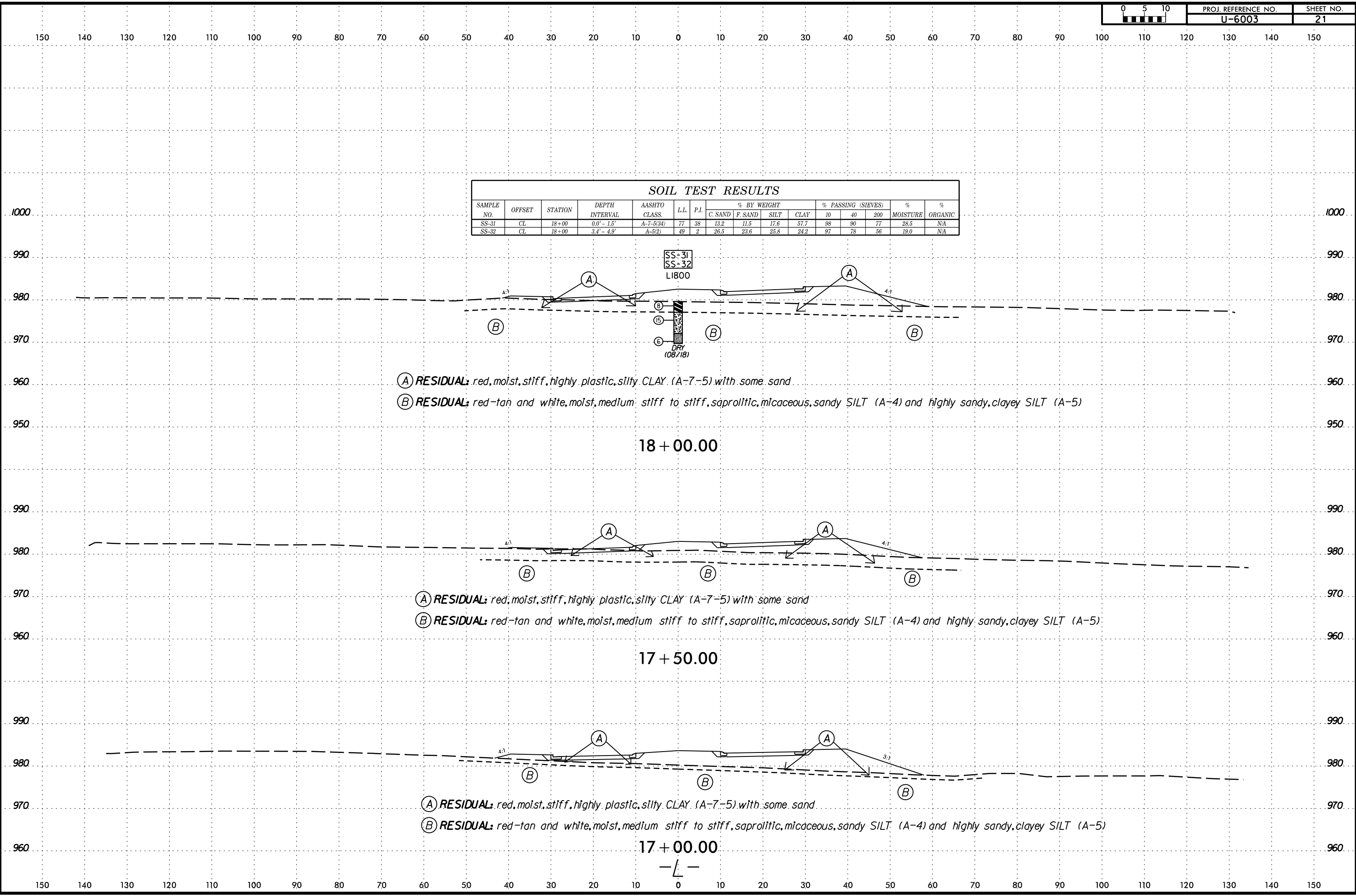
(A) RESIDUAL: tan-brown, tan-red, and white, dry to moist, soft to stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

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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-31	CL	18+00	0.0' - 1.5'	A-7-5(34)	77	38	13.2	11.5	17.6	57.7	98	90	77	28.5	NA
SS-32	CL	18+00	3.4' - 4.9'	A-5(2)	49	2	26.5	23.6	25.8	24.2	97	78	56	19.0	NA



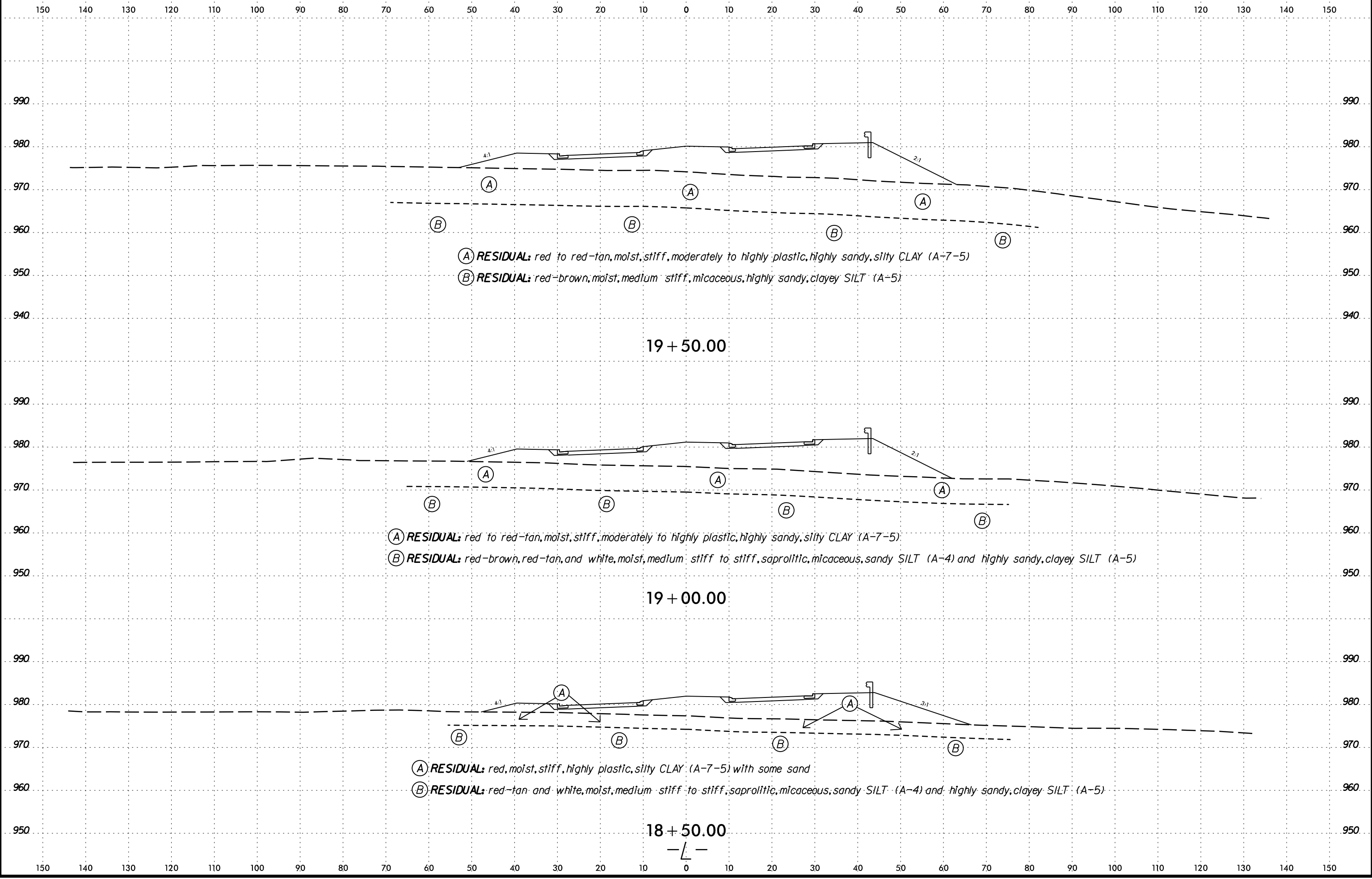
(A) **RESIDUAL:** red, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand  
 (B) **RESIDUAL:** red-tan and white, moist, medium stiff to stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

(A) **RESIDUAL:** red, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand  
 (B) **RESIDUAL:** red-tan and white, moist, medium stiff to stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

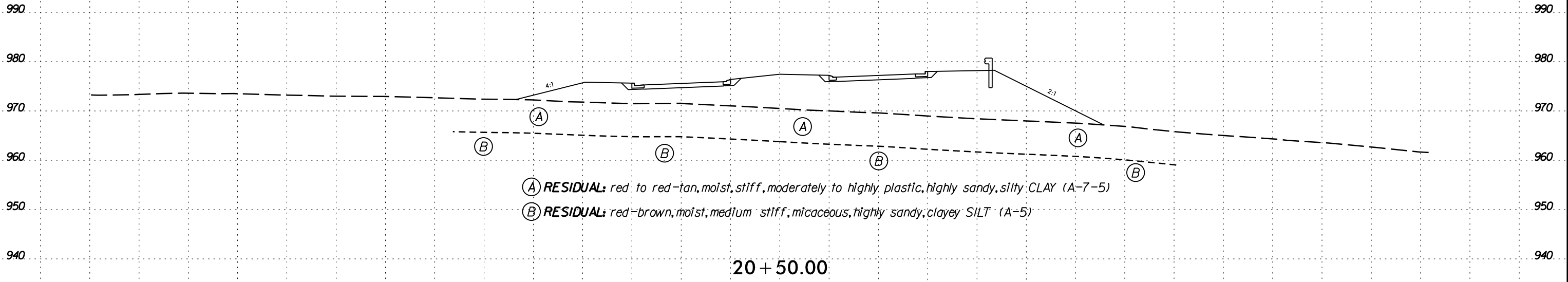
(A) **RESIDUAL:** red, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand  
 (B) **RESIDUAL:** red-tan and white, moist, medium stiff to stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

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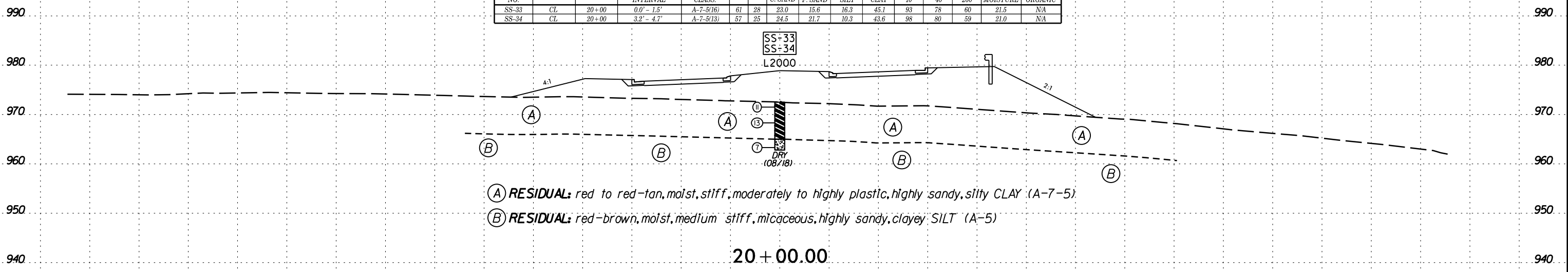


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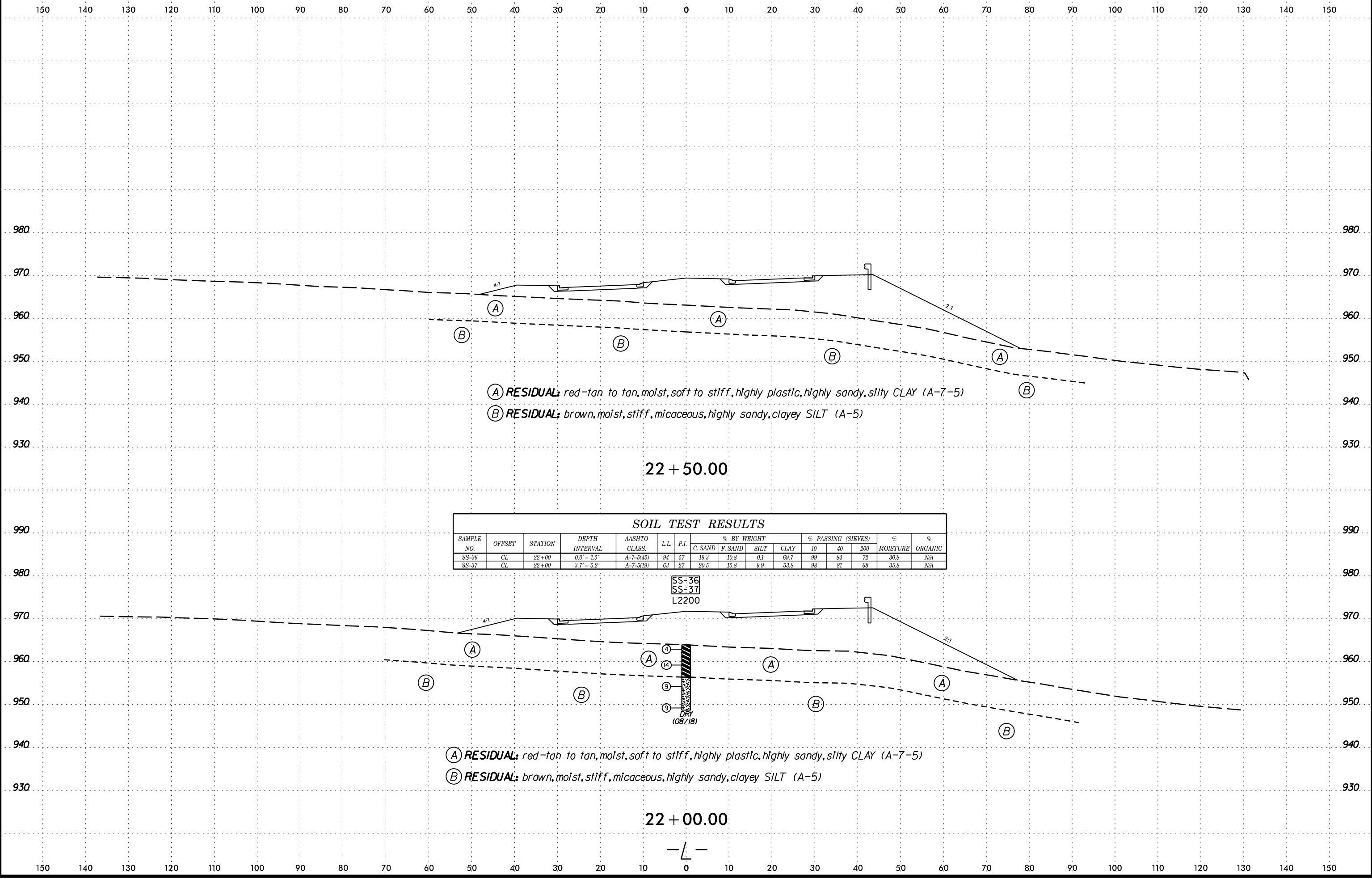
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-33	CL	20+00	0.0' - 1.5'	A-7-5(16)	61	28	23.0	15.6	16.3	45.1	93	78	60	21.5	NA
SS-34	CL	20+00	3.2' - 4.7'	A-7-5(13)	57	25	24.5	21.7	10.3	43.6	98	80	59	21.0	NA





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**SOIL TEST RESULTS**

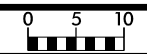
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-36	CL	22+00	0.0' - 1.5'	A-7-5(45)	94	57	19.3	10.8	0.1	69.7	99	84	72	30.8	NA
SS-37	CL	22+00	3.7' - 5.2'	A-7-5(19)	63	27	20.5	15.8	9.9	53.8	98	81	68	35.8	NA

SS-36  
 SS-37  
 L2200

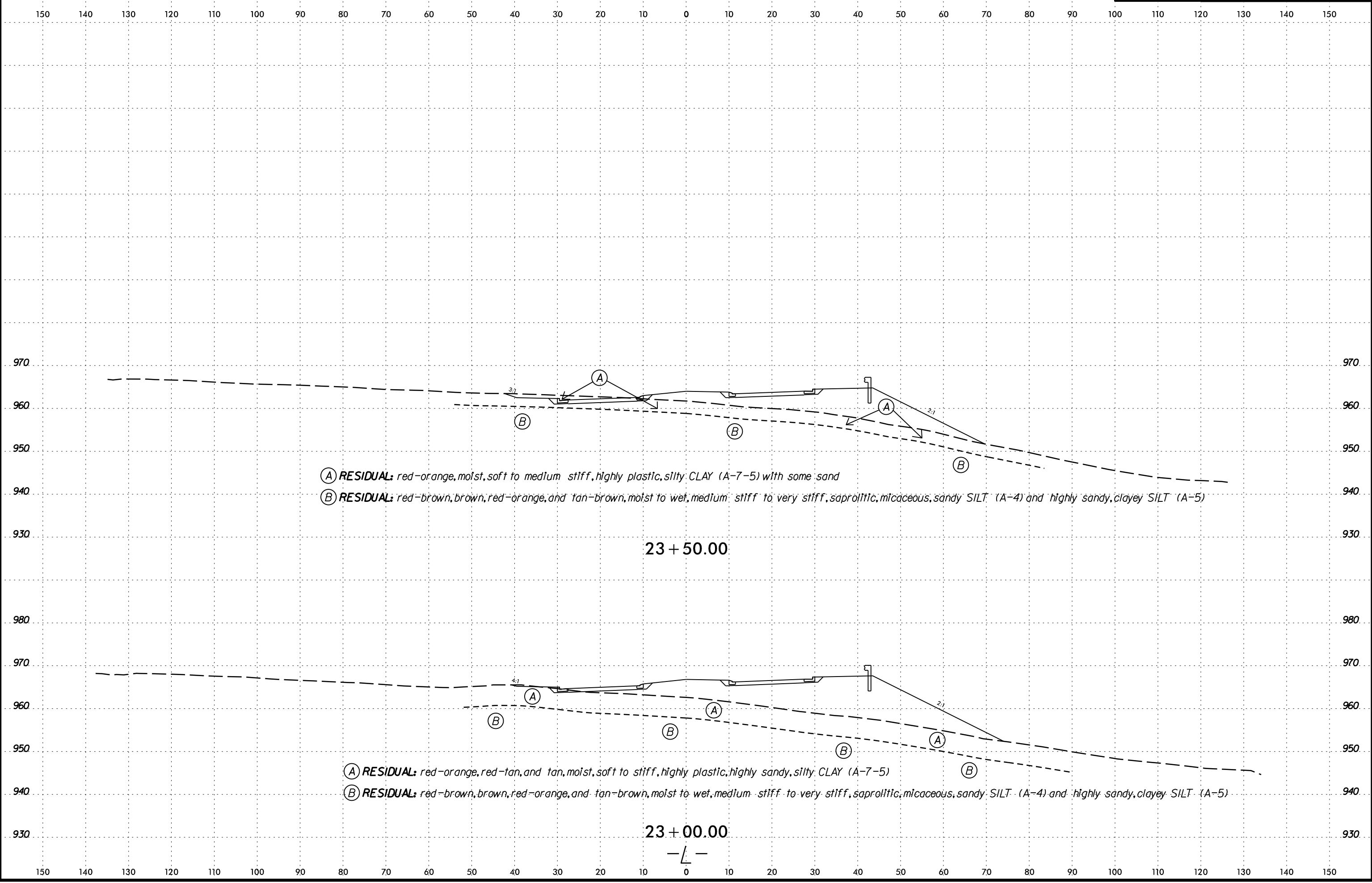
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U-6003	26

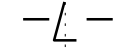


- (A) RESIDUAL: red-orange, moist, soft to medium stiff, highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: red-brown, brown, red-orange, and tan-brown, moist to wet, medium stiff to very stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

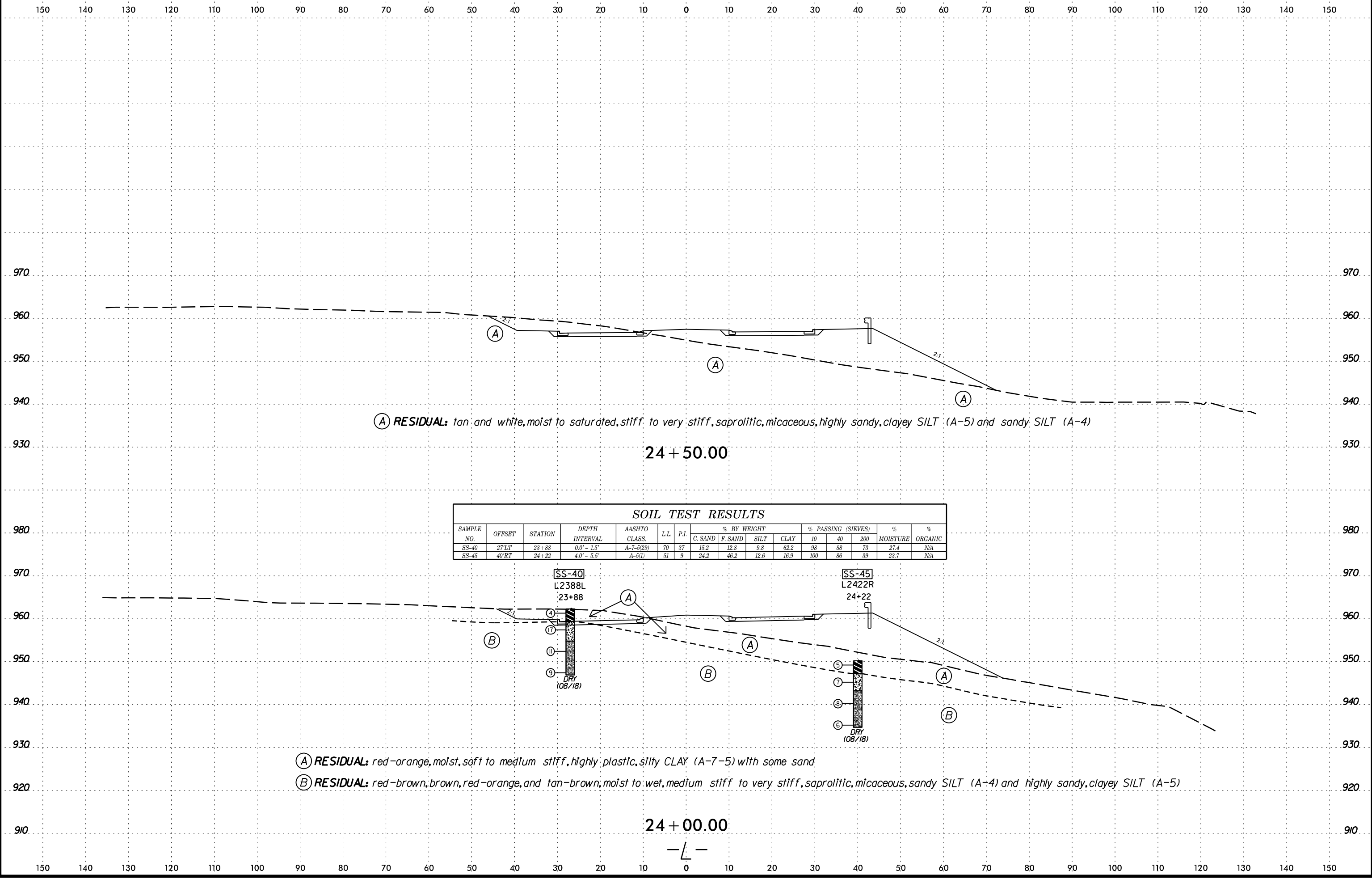
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- (A) RESIDUAL: red-orange, red-tan, and tan, moist, soft to stiff, highly plastic, highly sandy, silty CLAY (A-7-5)
- (B) RESIDUAL: red-brown, brown, red-orange, and tan-brown, moist to wet, medium stiff to very stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

23 + 00.00



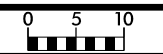
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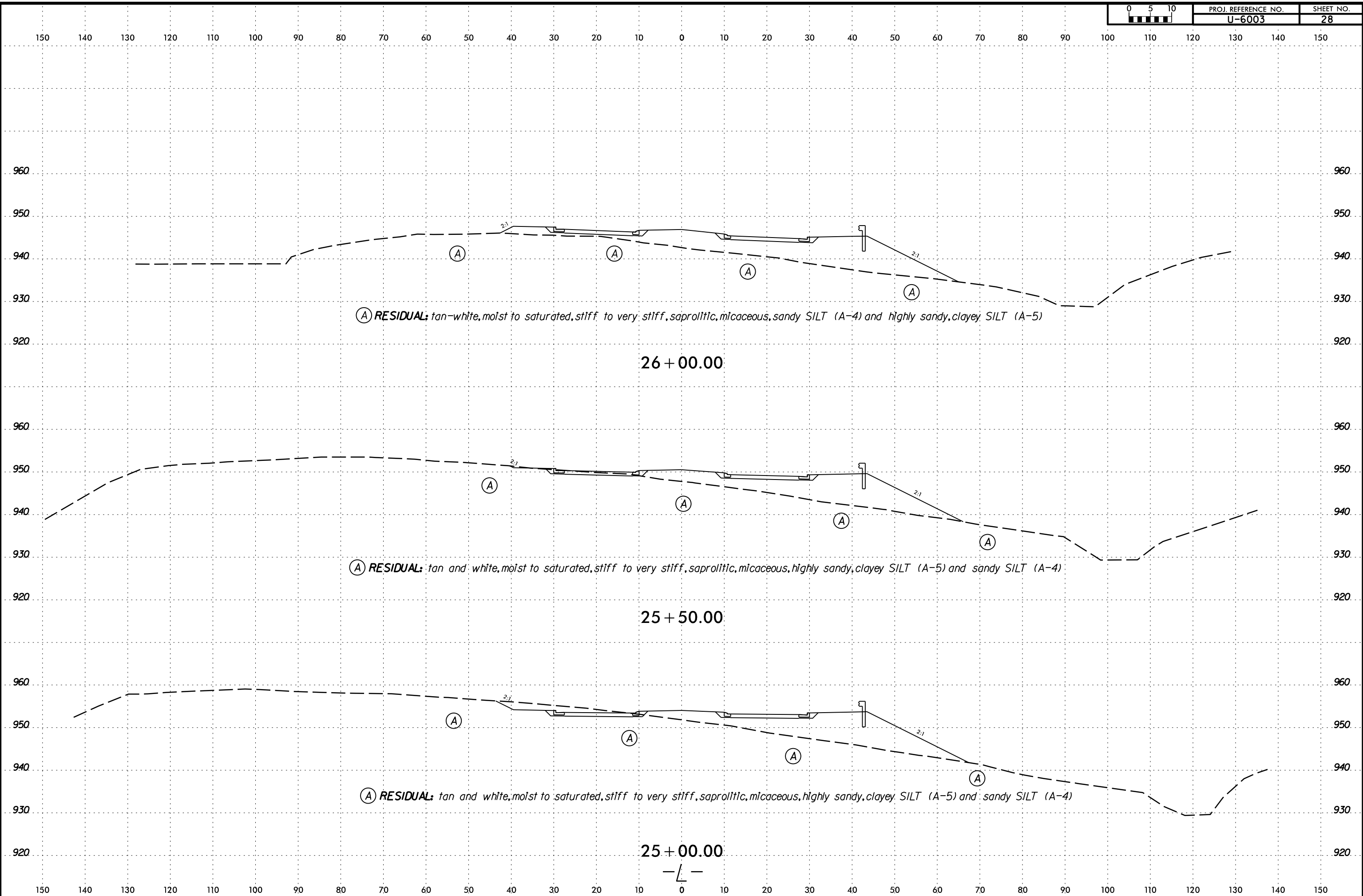
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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-40	27'LT	23+88	0.0' - 1.5'	A-7-5(29)	70	37	15.2	12.8	9.8	62.2	98	88	73	27.4	NA
SS-45	40'RT	24+22	4.0' - 5.5'	A-5(1)	51	9	24.2	46.2	12.6	16.9	100	86	39	23.7	NA

- (A) RESIDUAL: red-orange, moist, soft to medium stiff, highly plastic, silty CLAY (A-7-5) with some sand.
- (B) RESIDUAL: red-brown, brown, red-orange, and tan-brown, moist to wet, medium stiff to very stiff, saprolitic, micaceous, sandy SILT (A-4) and highly sandy, clayey SILT (A-5)

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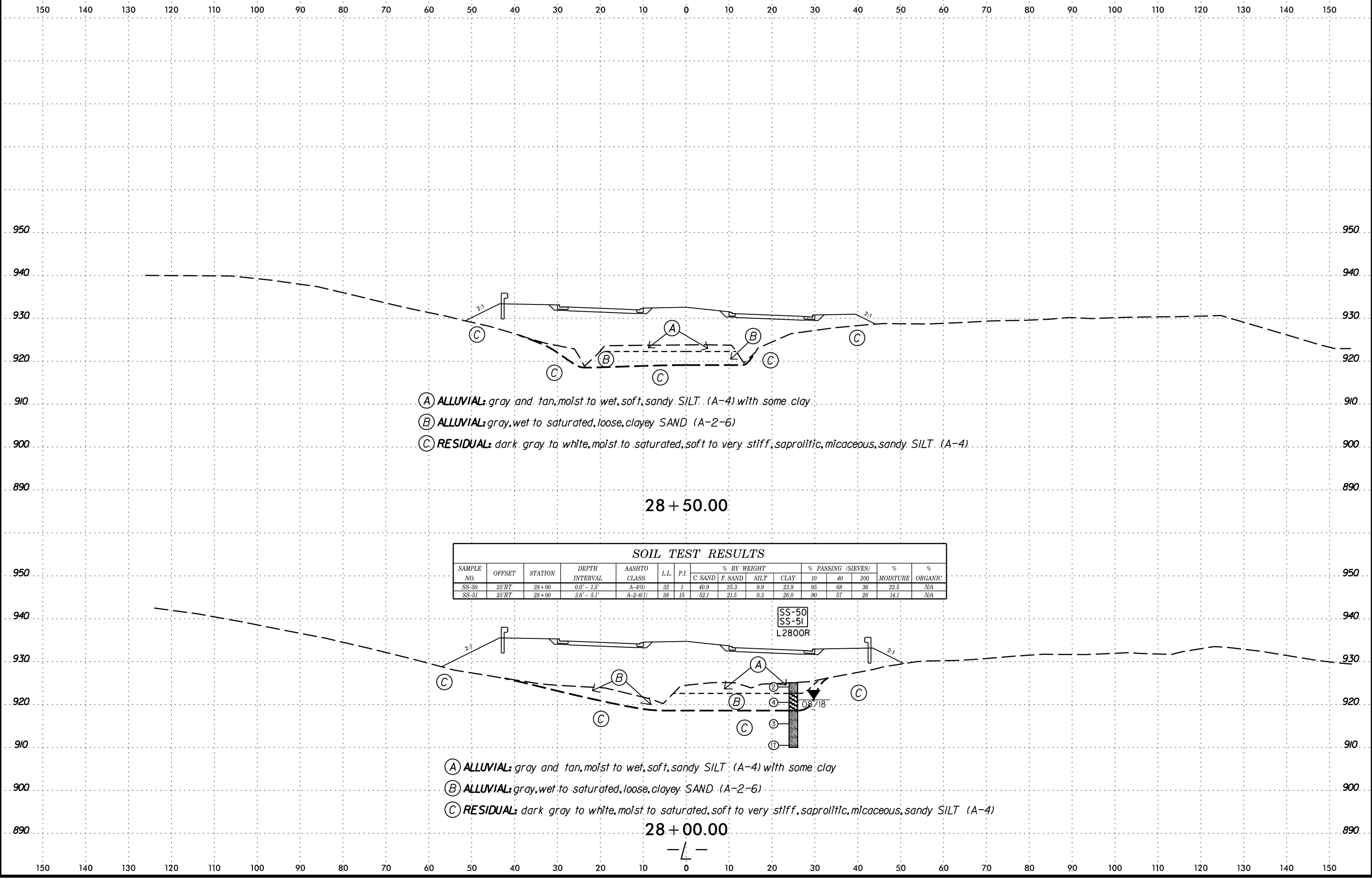
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U-6003	28







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 6/23/16



- (A) **ALLUVIAL:** gray and tan, moist to wet, soft, sandy SILT (A-4) with some clay
- (B) **ALLUVIAL:** gray, wet to saturated, loose, clayey SAND (A-2-6)
- (C) **RESIDUAL:** dark gray to white, moist to saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4)

28 + 50.00

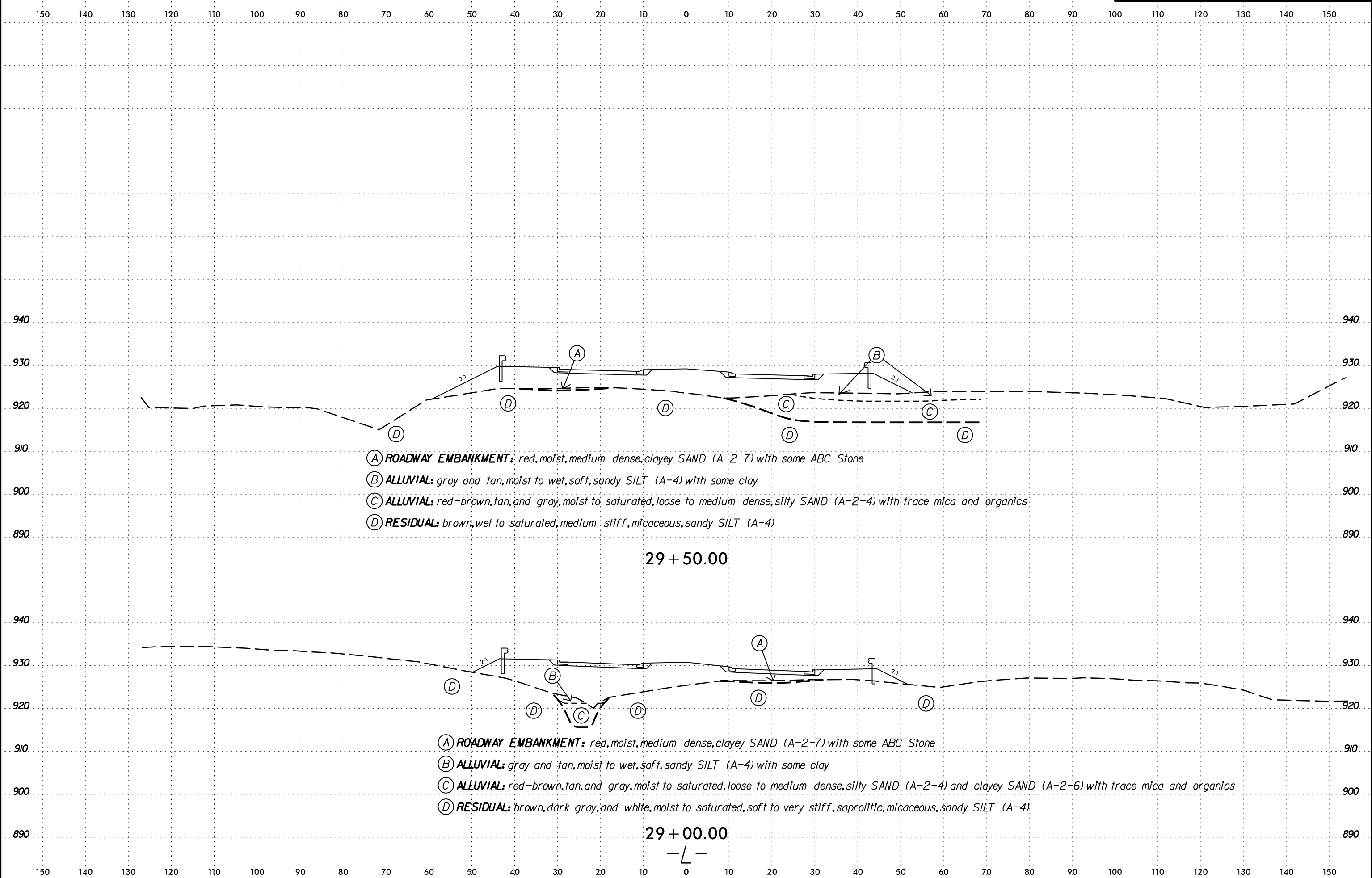
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-50	25'RT	28+00	0.0' - 1.5'	A-4(0)	32	1	40.9	25.3	9.9	23.9	95	68	36	22.5	NA
SS-51	25'RT	28+00	3.6' - 5.1'	A-2-6(1)	38	15	52.1	21.5	0.3	26.0	90	57	26	14.1	NA

SS-50  
 SS-51  
 L2800R

28 + 00.00

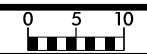
- (A) **ALLUVIAL:** gray and tan, moist to wet, soft, sandy SILT (A-4) with some clay
- (B) **ALLUVIAL:** gray, wet to saturated, loose, clayey SAND (A-2-6)
- (C) **RESIDUAL:** dark gray to white, moist to saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4)

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SUBSERIAL# 333

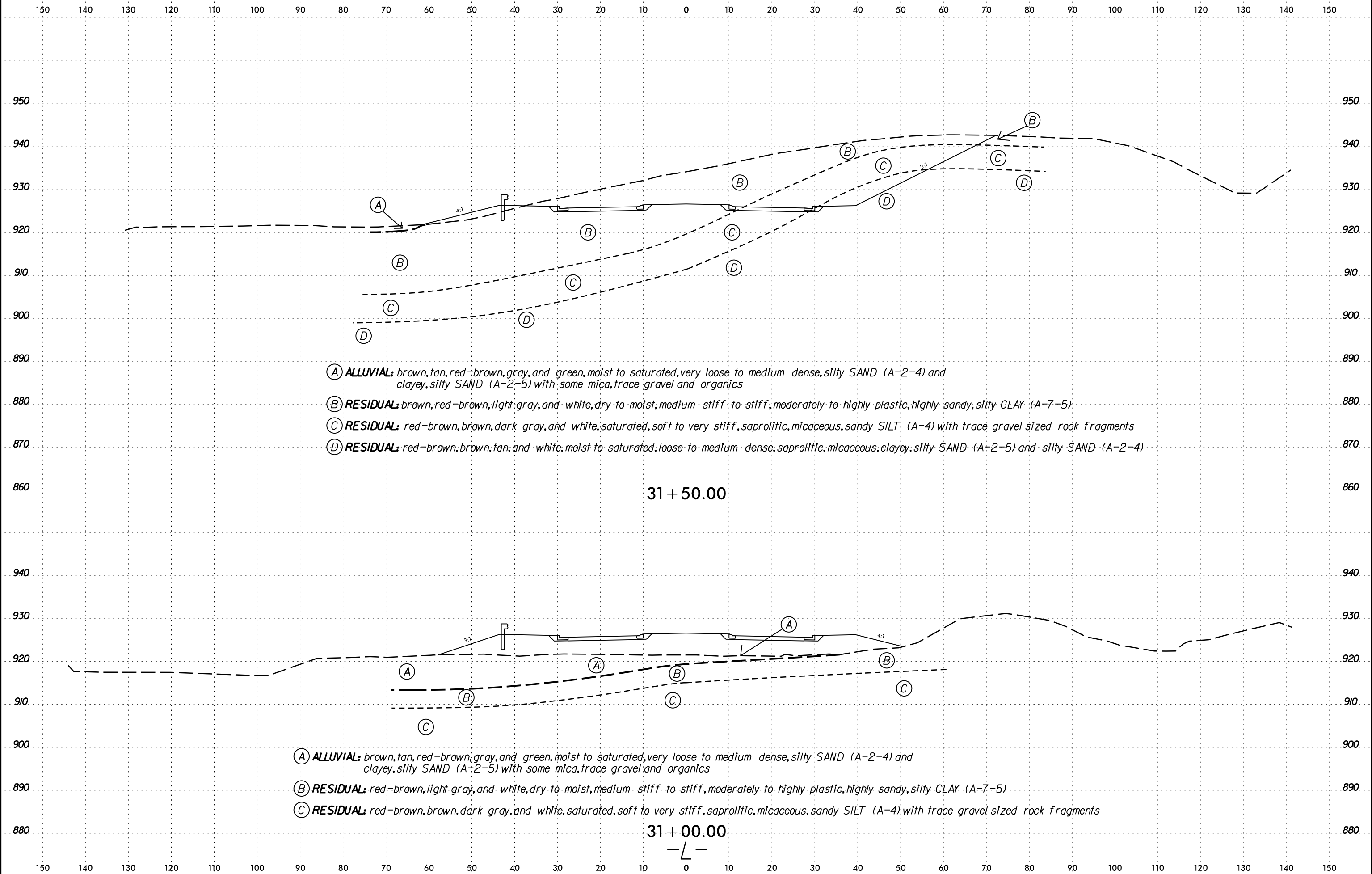




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33 SUBSEQUENT SHEETS



PROJ. REFERENCE NO.	SHEET NO.
U-6003	33



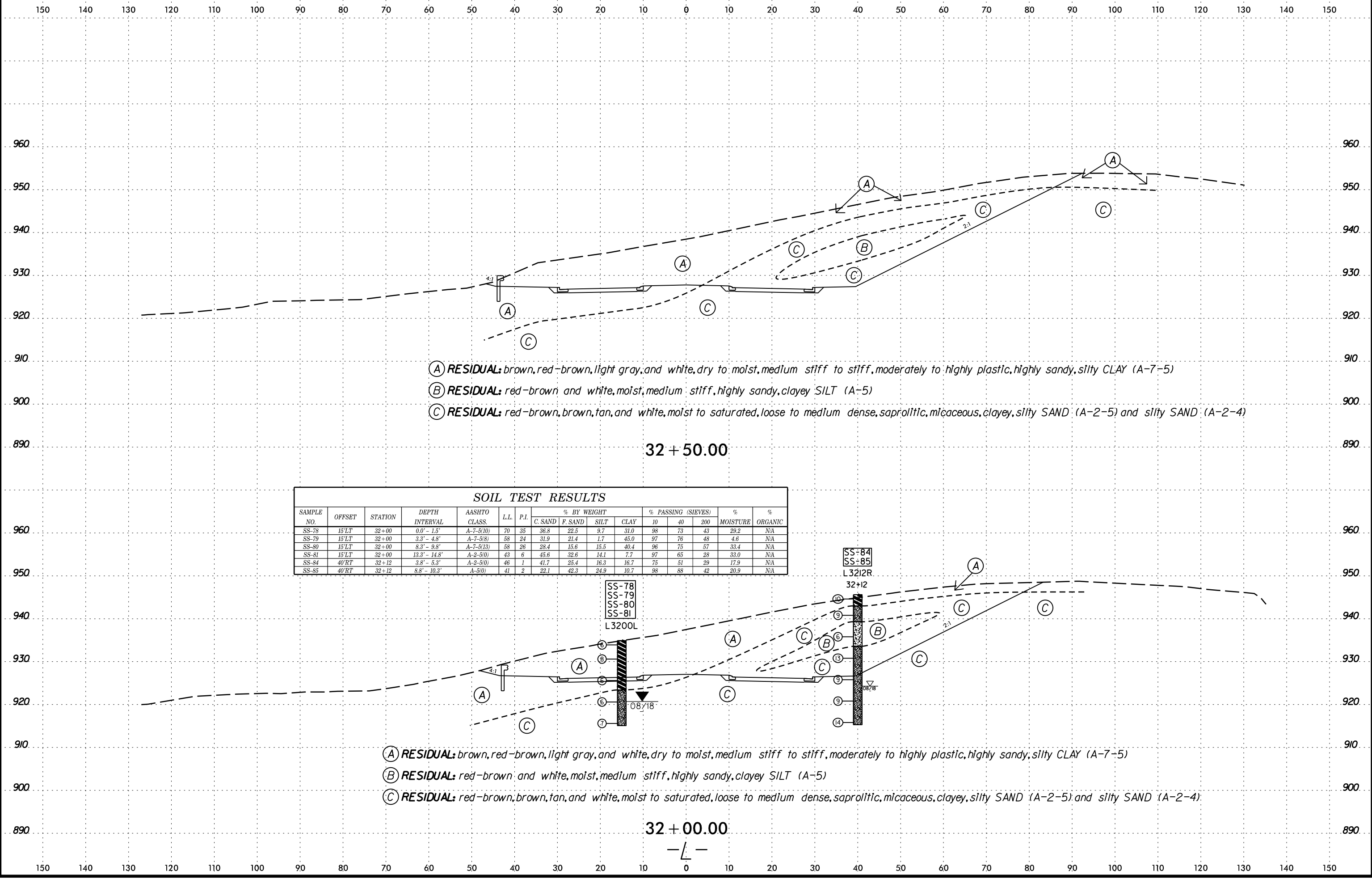
- (A) **ALLUVIAL:** brown, tan, red-brown, gray, and green, moist to saturated, very loose to medium dense, silty SAND (A-2-4) and clayey, silty SAND (A-2-5) with some mica, trace gravel and organics
- (B) **RESIDUAL:** brown, red-brown, light gray, and white, dry to moist, medium stiff to stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)
- (C) **RESIDUAL:** red-brown, brown, dark gray, and white, saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4) with trace gravel sized rock fragments
- (D) **RESIDUAL:** red-brown, brown, tan, and white, moist to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

31 + 50.00

- (A) **ALLUVIAL:** brown, tan, red-brown, gray, and green, moist to saturated, very loose to medium dense, silty SAND (A-2-4) and clayey, silty SAND (A-2-5) with some mica, trace gravel and organics
- (B) **RESIDUAL:** red-brown, light gray, and white, dry to moist, medium stiff to stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)
- (C) **RESIDUAL:** red-brown, brown, dark gray, and white, saturated, soft to very stiff, saprolitic, micaceous, sandy SILT (A-4) with trace gravel sized rock fragments

31 + 00.00

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 6/23/16



- (A) **RESIDUAL:** brown, red-brown, light gray, and white, dry to moist, medium stiff to stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)
- (B) **RESIDUAL:** red-brown and white, moist, medium stiff, highly sandy, clayey SILT (A-5)
- (C) **RESIDUAL:** red-brown, brown, tan, and white, moist to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

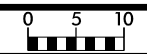
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-78	15'LT	32+00	0.0' - 1.5'	A-7-5(10)	70	35	36.8	22.5	9.7	31.0	98	73	43	29.2	NA
SS-79	15'LT	32+00	3.3' - 4.8'	A-7-5(8)	58	24	31.9	21.4	1.7	45.0	97	76	48	4.6	NA
SS-80	15'LT	32+00	8.3' - 9.8'	A-7-5(13)	58	26	28.4	15.6	15.5	40.4	96	75	57	33.4	NA
SS-81	15'LT	32+00	13.3' - 14.8'	A-2-5(0)	43	6	45.6	32.6	14.1	7.7	97	65	28	33.0	NA
SS-84	40'RT	32+12	3.8' - 5.3'	A-2-5(0)	46	1	41.7	25.4	16.3	16.7	75	51	29	17.9	NA
SS-85	40'RT	32+12	8.8' - 10.3'	A-5(0)	41	2	22.1	42.3	24.9	10.7	98	88	42	20.9	NA

SS-78  
SS-79  
SS-80  
SS-81  
L3200L

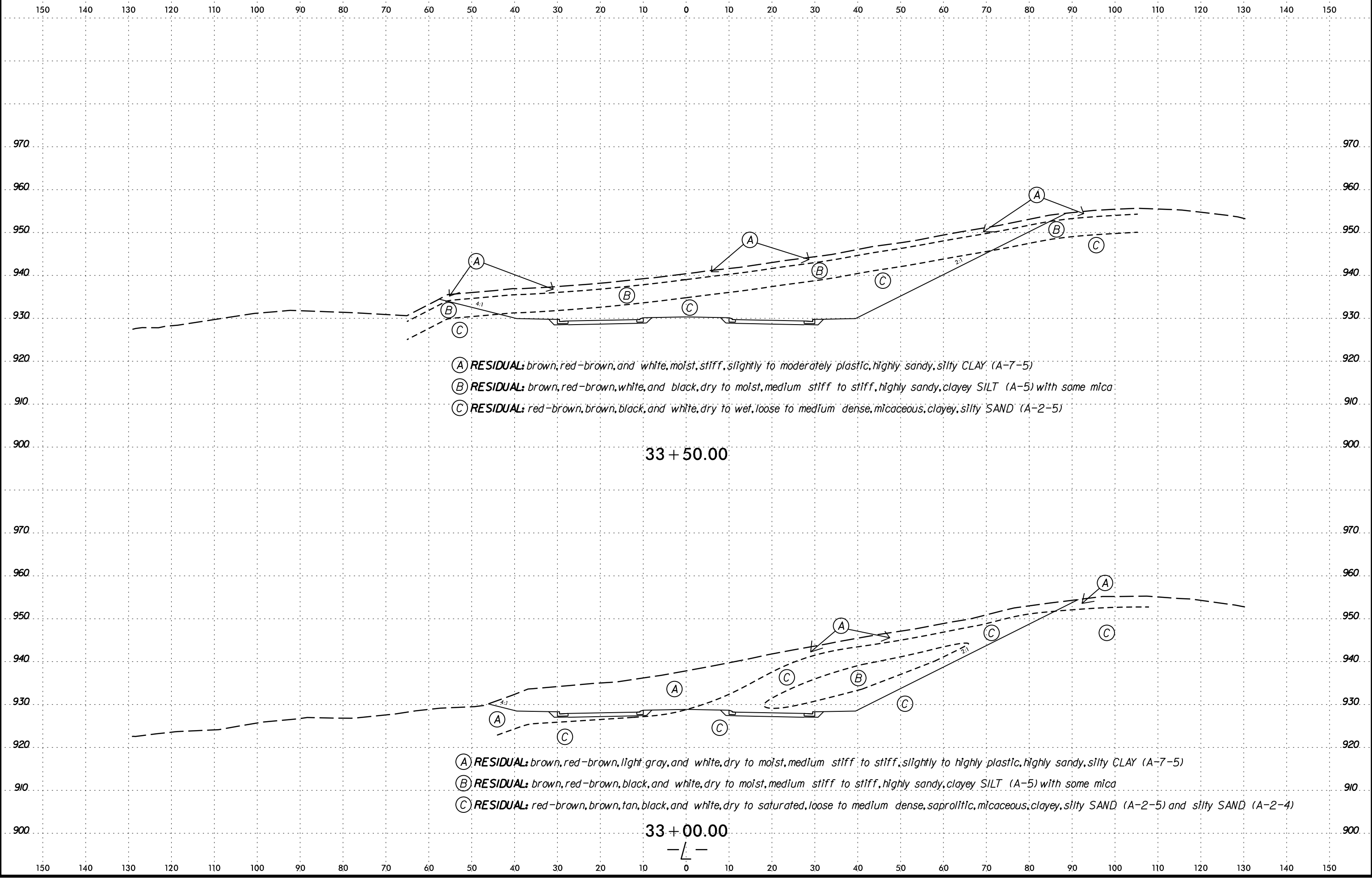
SS-84  
SS-85  
L3212R

- (A) **RESIDUAL:** brown, red-brown, light gray, and white, dry to moist, medium stiff to stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5)
- (B) **RESIDUAL:** red-brown and white, moist, medium stiff, highly sandy, clayey SILT (A-5)
- (C) **RESIDUAL:** red-brown, brown, tan, and white, moist to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

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SUBSTRATE



PROJ. REFERENCE NO.	SHEET NO.
U-6003	35

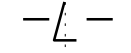


- (A) RESIDUAL: brown, red-brown, and white, moist, stiff, slightly to moderately plastic, highly sandy, silty CLAY (A-7-5)
- (B) RESIDUAL: brown, red-brown, white, and black, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with some mica
- (C) RESIDUAL: red-brown, brown, black, and white, dry to wet, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

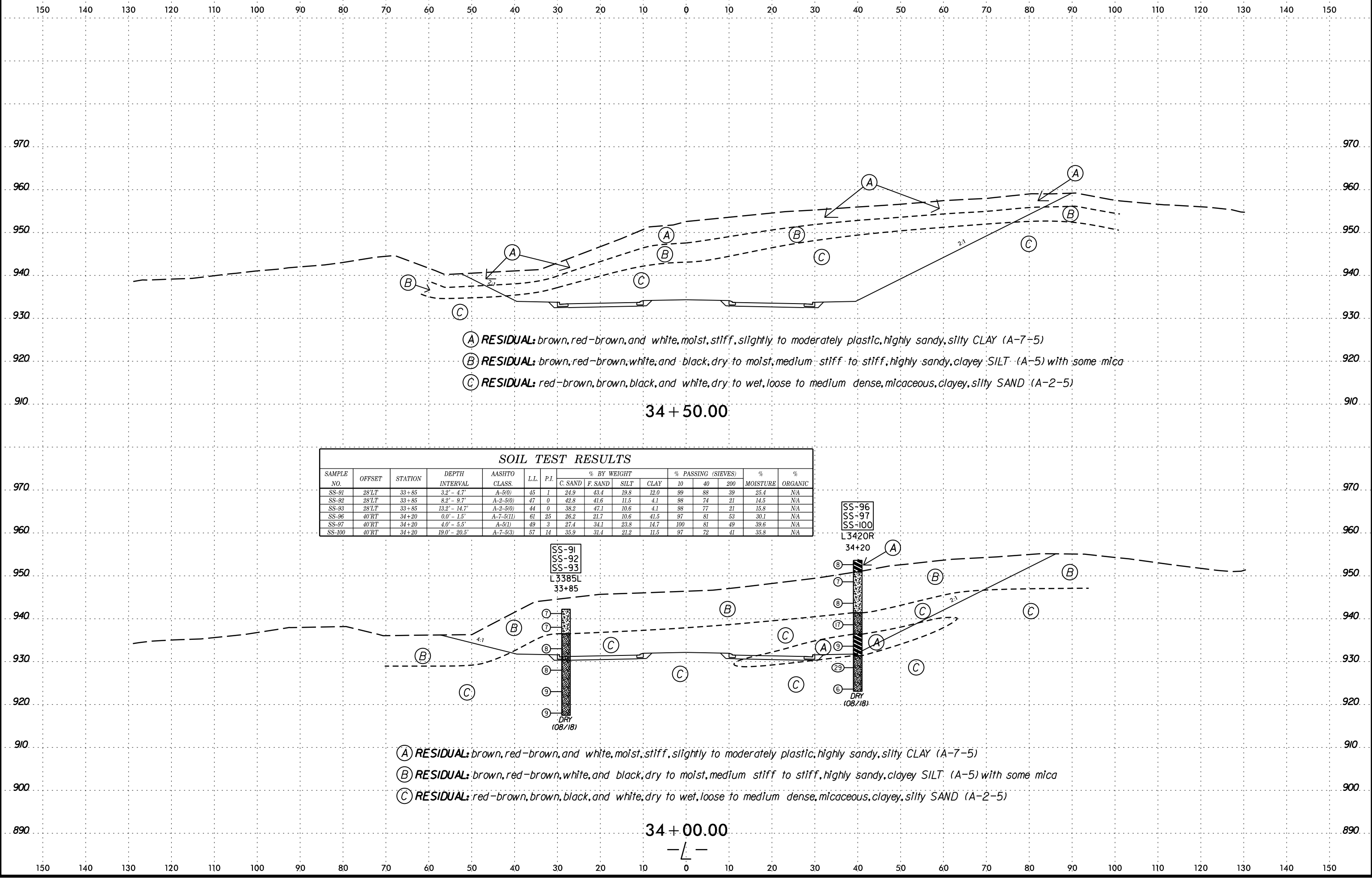
33 + 50.00

- (A) RESIDUAL: brown, red-brown, light gray, and white, dry to moist, medium stiff to stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5)
- (B) RESIDUAL: brown, red-brown, black, and white, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with some mica
- (C) RESIDUAL: red-brown, brown, tan, black, and white, dry to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

33 + 00.00

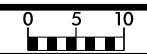


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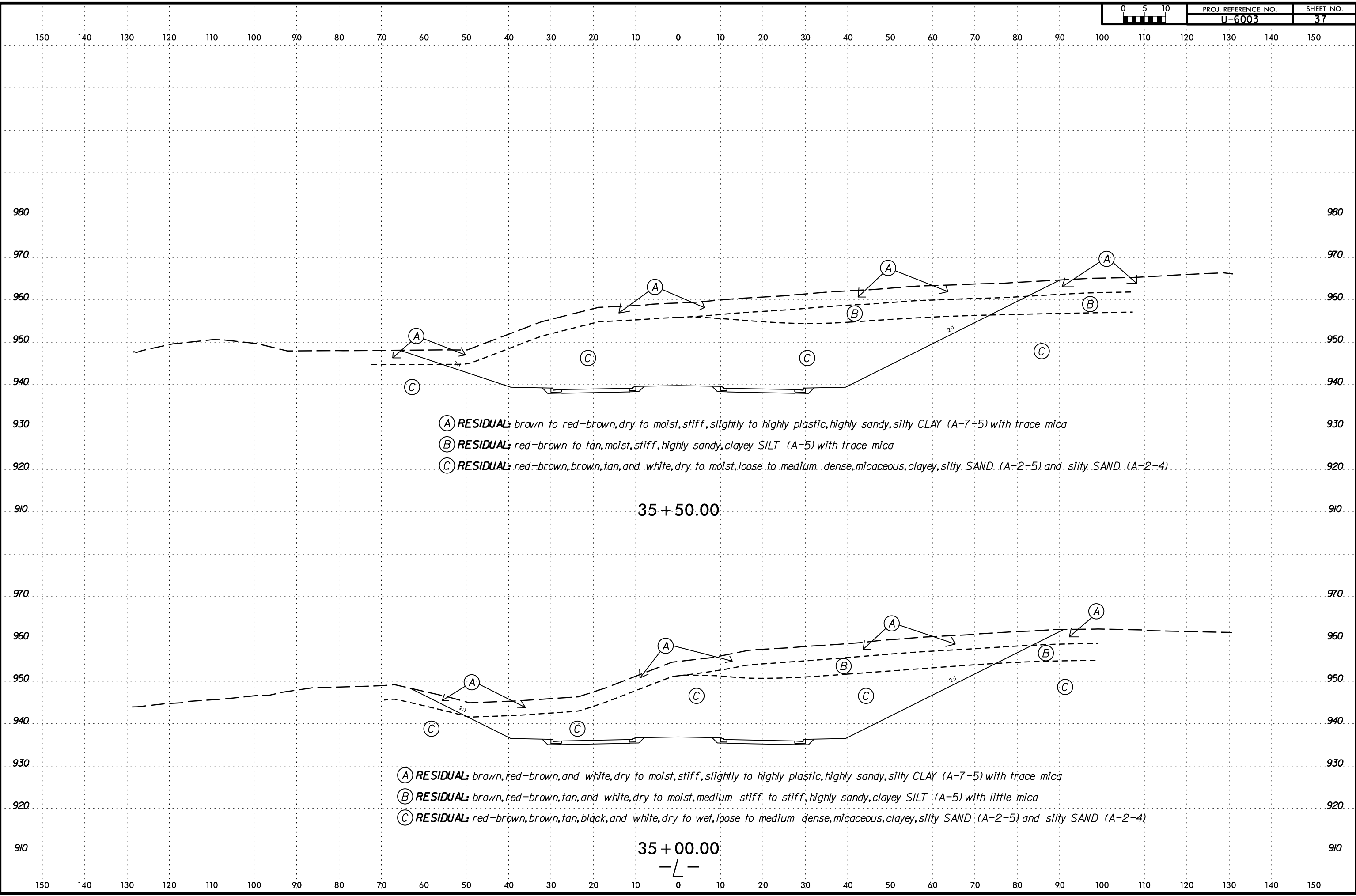




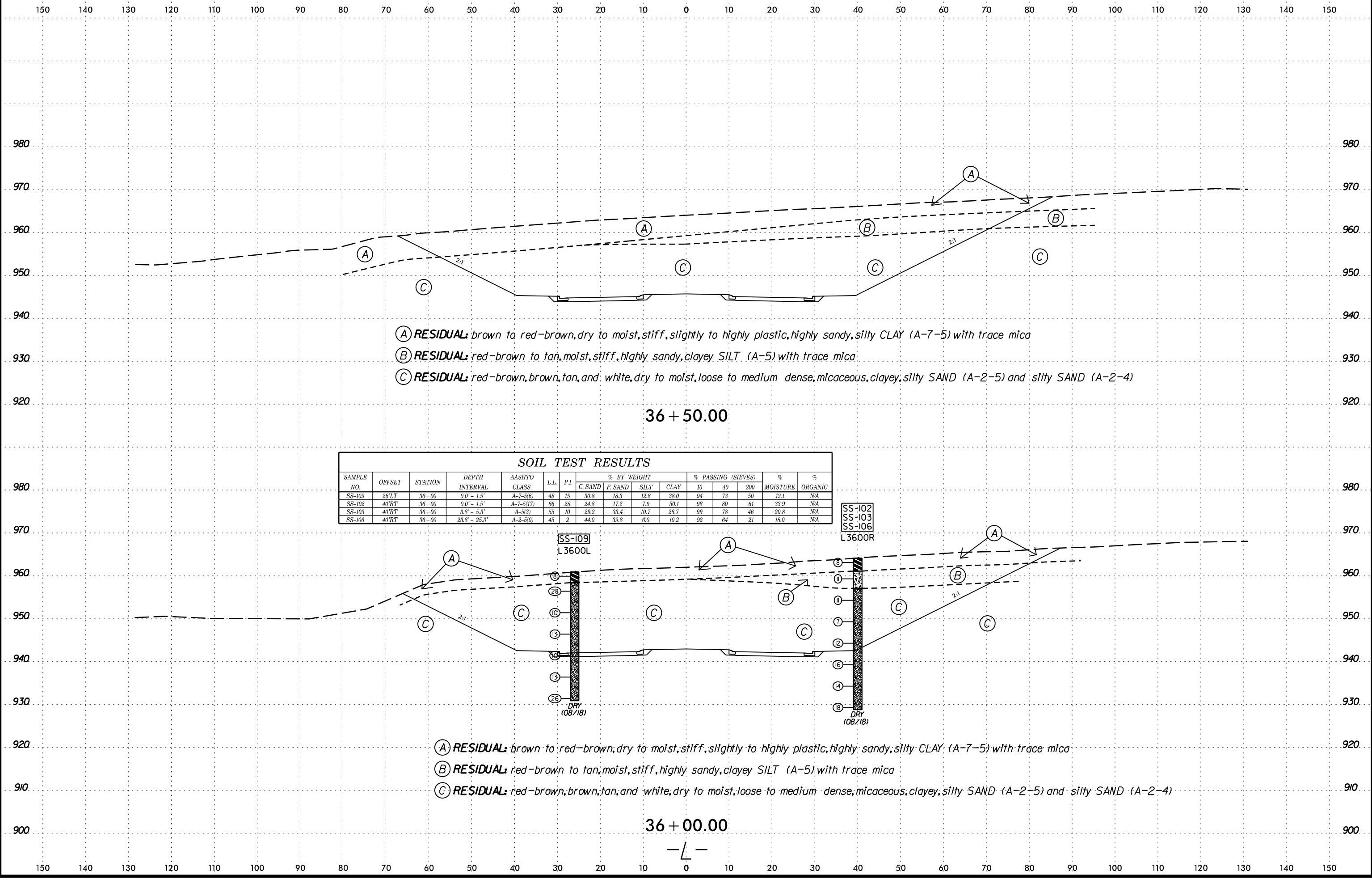
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PROJ. REFERENCE NO.	SHEET NO.
U-6003	37



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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-109	26'LT	36+00	0.0' - 1.5'	A-7-5(6)	48	15	30.8	18.3	12.8	38.0	94	73	50	12.1	N/A
SS-102	40'RT	36+00	0.0' - 1.5'	A-7-5(17)	66	28	24.8	17.2	7.9	50.1	98	80	61	33.9	N/A
SS-103	40'RT	36+00	3.8' - 5.3'	A-5(3)	55	10	29.2	33.4	10.7	26.7	99	78	46	20.8	N/A
SS-106	40'RT	36+00	23.8' - 25.3'	A-2-5(0)	45	2	44.0	39.8	6.0	10.2	92	64	21	18.0	N/A

SS-109  
 L3600L  
 26'  
 28'  
 10'  
 13'  
 13'  
 26'  
 DRY  
 (08/18)

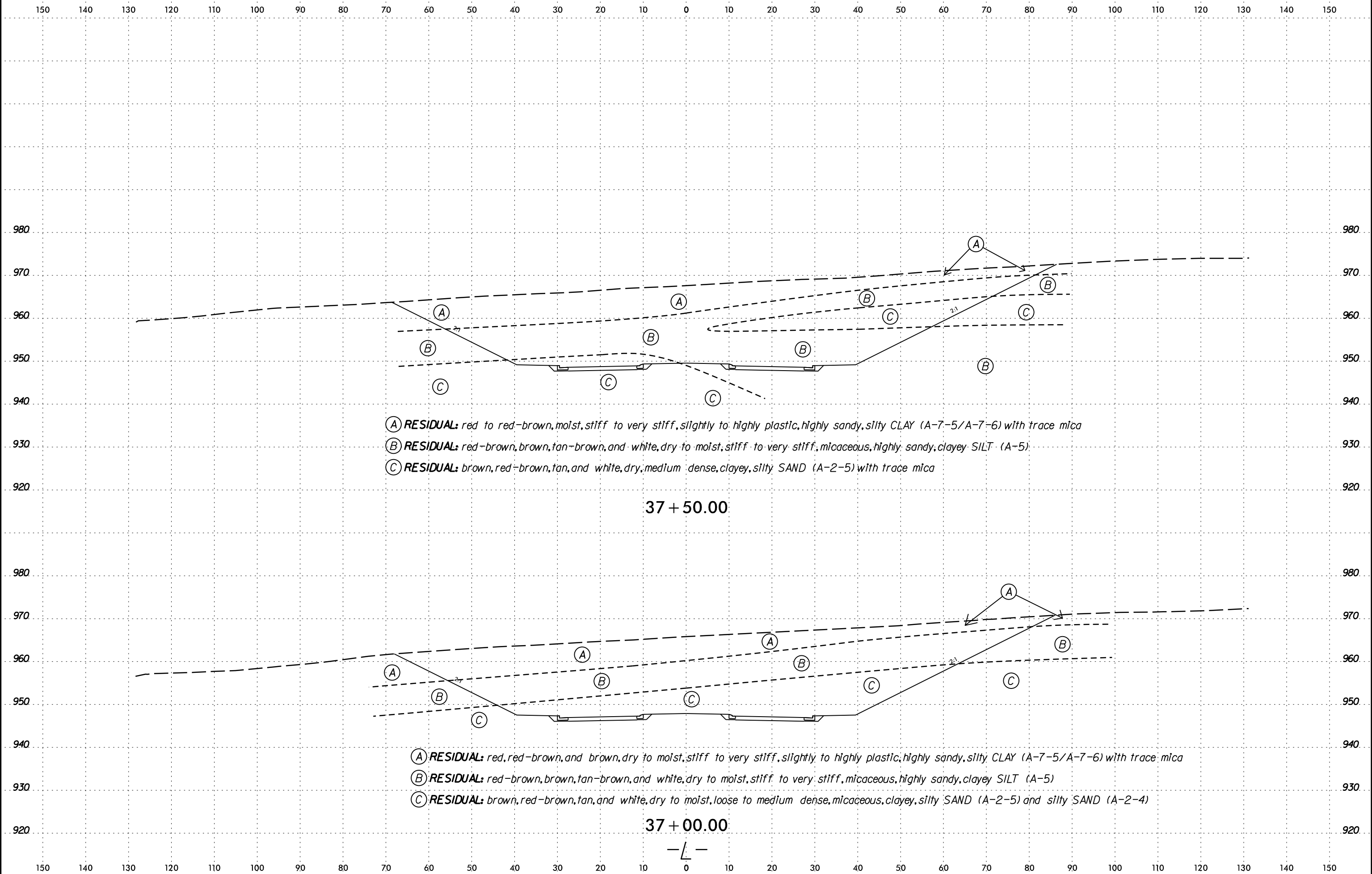
SS-102  
 SS-103  
 SS-106  
 L3600R  
 0'  
 0'  
 0'  
 12'  
 16'  
 14'  
 18'  
 DRY  
 (08/18)

- (A) RESIDUAL: brown to red-brown, dry to moist, stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5) with trace mica
- (B) RESIDUAL: red-brown to tan, moist, stiff, highly sandy, clayey SILT (A-5) with trace mica
- (C) RESIDUAL: red-brown, brown, tan, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

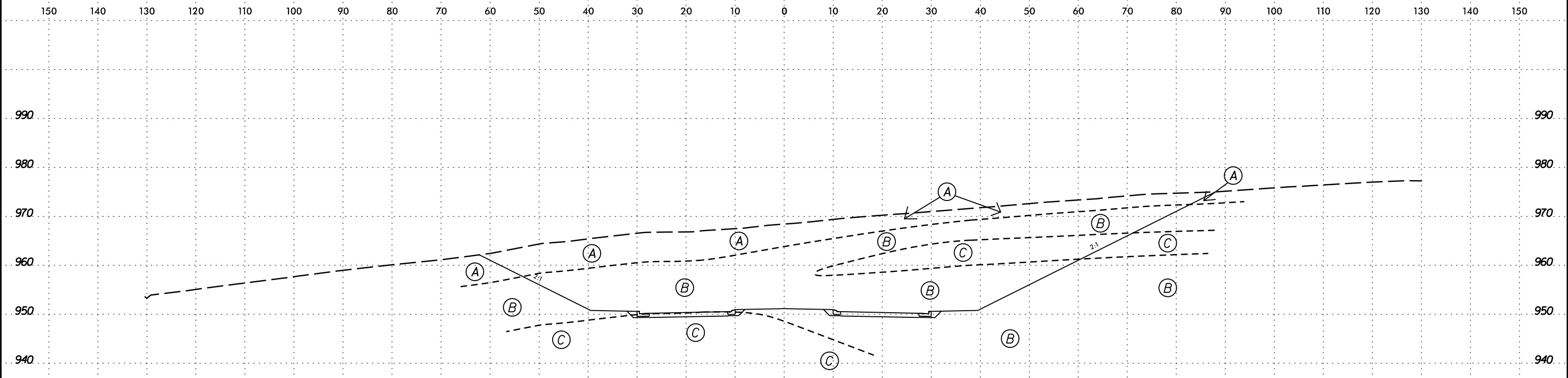
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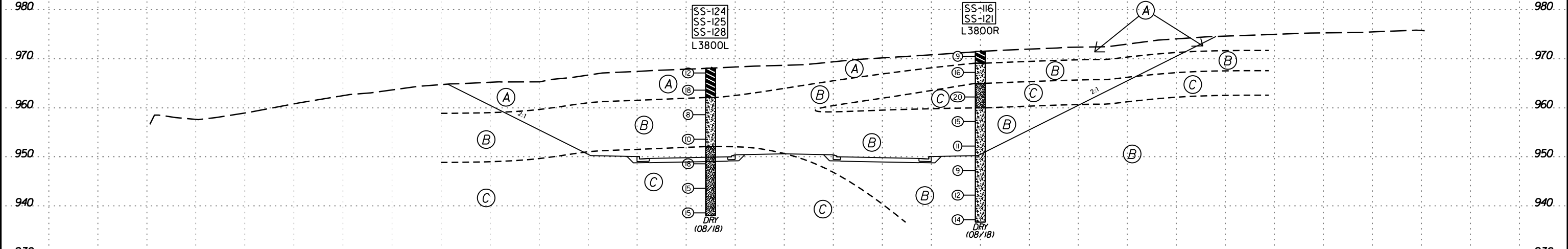
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- (A) RESIDUAL: red to red-brown, moist, stiff to very stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica
- (B) RESIDUAL: red-brown, brown, tan-brown, and white, dry to moist, stiff to very stiff, micaceous, highly sandy, clayey SILT (A-5)
- (C) RESIDUAL: brown, red-brown, tan, and white, dry, medium dense, clayey, silty SAND (A-2-5) with trace mica

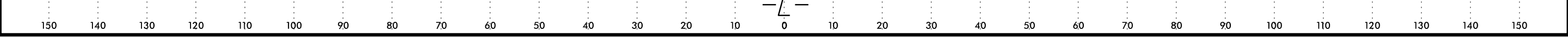
38 + 50.00

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	15'LT	38+00	0.0' - 1.5'	A-7-6(5)	46	20	32.9	24.6	5.4	37.1	98	77	45	18.7	NA
SS-125	15'LT	38+00	3.5' - 5.0'	A-7-6(5)	50	12	21.0	33.4	8.9	36.6	100	88	52	20.0	NA
SS-128	15'LT	38+00	18.5' - 20.0'	A-2-5(0)	43	3	35.3	40.8	12.9	11.1	99	77	31	14.9	NA
SS-116	40'RT	38+00	0.0' - 1.5'	A-7-5(14)	65	26	26.8	17.6	9.3	46.3	99	81	58	34.4	NA
SS-121	40'RT	38+00	23.3' - 24.8'	A-5(0)	61	2	33.7	30.0	21.5	14.9	92	72	39	41.7	NA

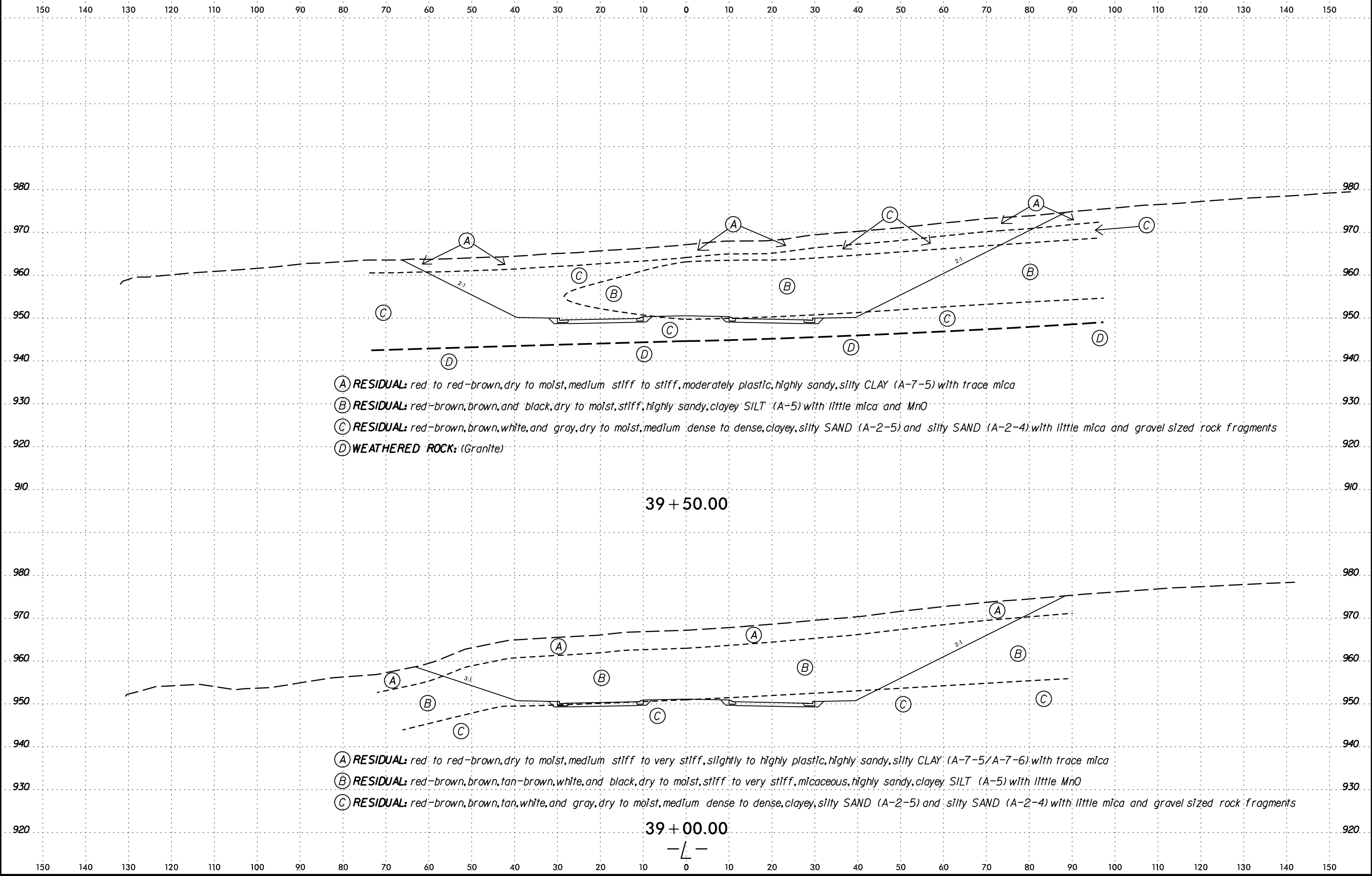


- (A) RESIDUAL: red to red-brown, moist, stiff to very stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica
- (B) RESIDUAL: red-brown, brown, tan-brown, and white, dry to moist, stiff to very stiff, micaceous, highly sandy, clayey SILT (A-5)
- (C) RESIDUAL: brown, red-brown, tan, and white, dry, medium dense, clayey, silty SAND (A-2-5) with trace mica

38 + 00.00



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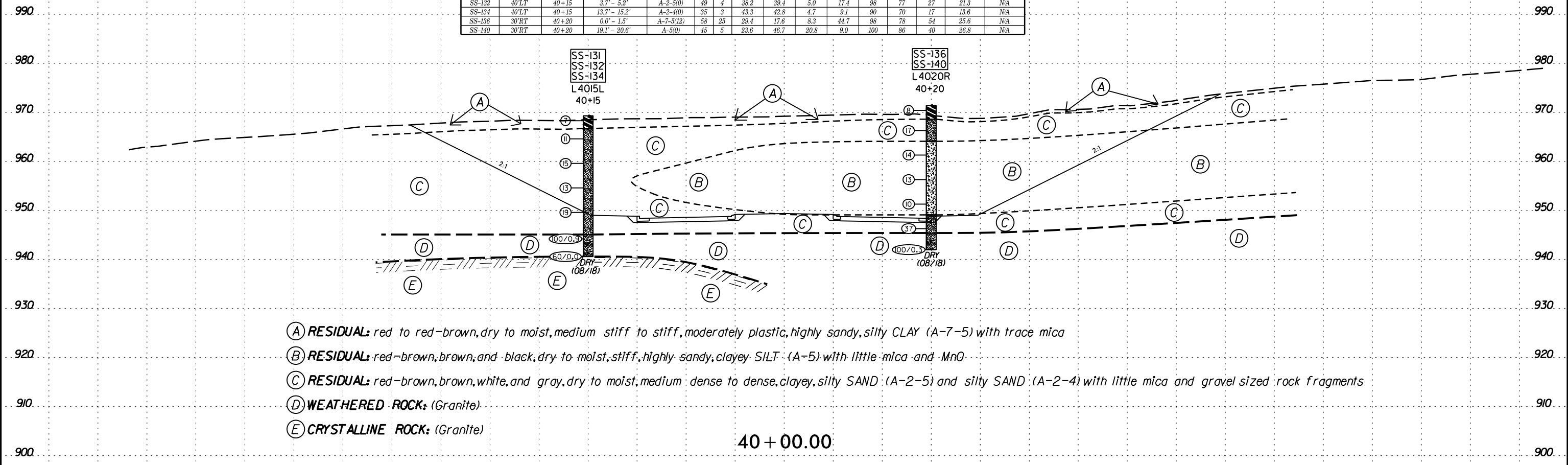
- (A) RESIDUAL: red to red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica
- (B) RESIDUAL: red-brown, brown, and black, dry to moist, stiff, highly sandy, clayey SILT (A-5) with little mica and MnO
- (C) RESIDUAL: red-brown, brown, white, and gray, dry to moist, medium dense to dense, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) with little mica and gravel sized rock fragments
- (D) WEATHERED ROCK: (Granite)

- (A) RESIDUAL: red to red-brown, dry to moist, medium stiff to very stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica
- (B) RESIDUAL: red-brown, brown, tan-brown, white, and black, dry to moist, stiff to very stiff, micaceous, highly sandy, clayey SILT (A-5) with little MnO
- (C) RESIDUAL: red-brown, brown, tan, white, and gray, dry to moist, medium dense to dense, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) with little mica and gravel sized rock fragments

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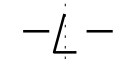
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-131	40LT	40+15	0.0' - 1.5'	A-7-5(9)	55	24	28.5	20.5	11.2	39.8	94	76	51	18.7	N/A
SS-132	40LT	40+15	3.7' - 5.2'	A-2-5(0)	49	4	38.2	39.4	5.0	17.4	98	77	27	21.3	N/A
SS-134	40LT	40+15	13.7' - 15.2'	A-2-4(0)	35	3	43.3	42.8	4.7	9.1	90	70	17	13.6	N/A
SS-136	30RT	40+20	0.0' - 1.5'	A-7-5(12)	58	25	29.4	17.6	8.3	44.7	98	78	54	25.6	N/A
SS-140	30RT	40+20	19.1' - 20.6'	A-5(0)	45	5	23.6	46.7	20.8	9.0	100	86	40	26.8	N/A



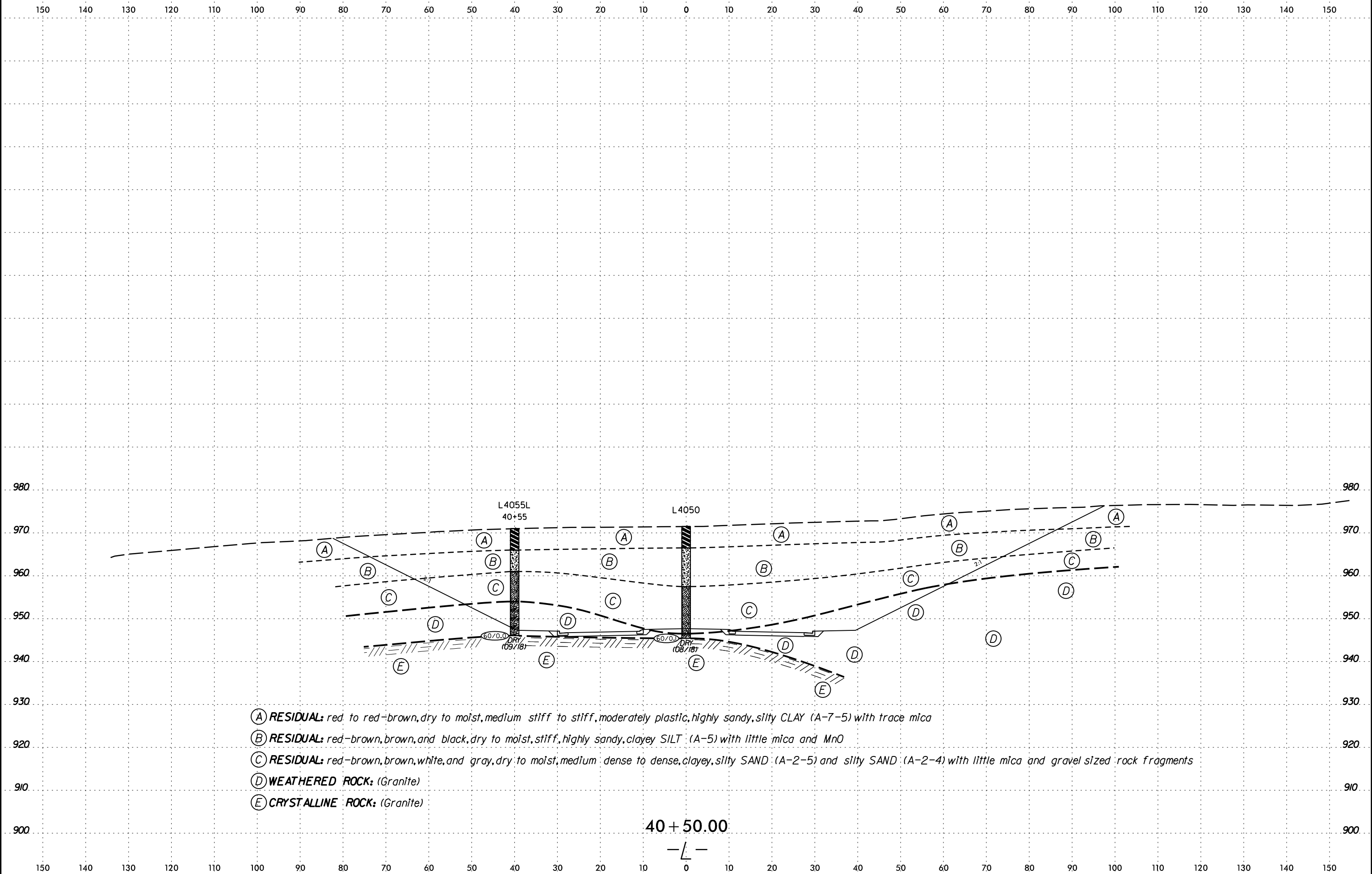
- (A) RESIDUAL: red to red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica
- (B) RESIDUAL: red-brown, brown, and black, dry to moist, stiff, highly sandy, clayey SILT (A-5) with little mica and MnO
- (C) RESIDUAL: red-brown, brown, white, and gray, dry to moist, medium dense to dense, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) with little mica and gravel sized rock fragments
- (D) WEATHERED ROCK: (Granite)
- (E) CRYSTALLINE ROCK: (Granite)

40 + 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

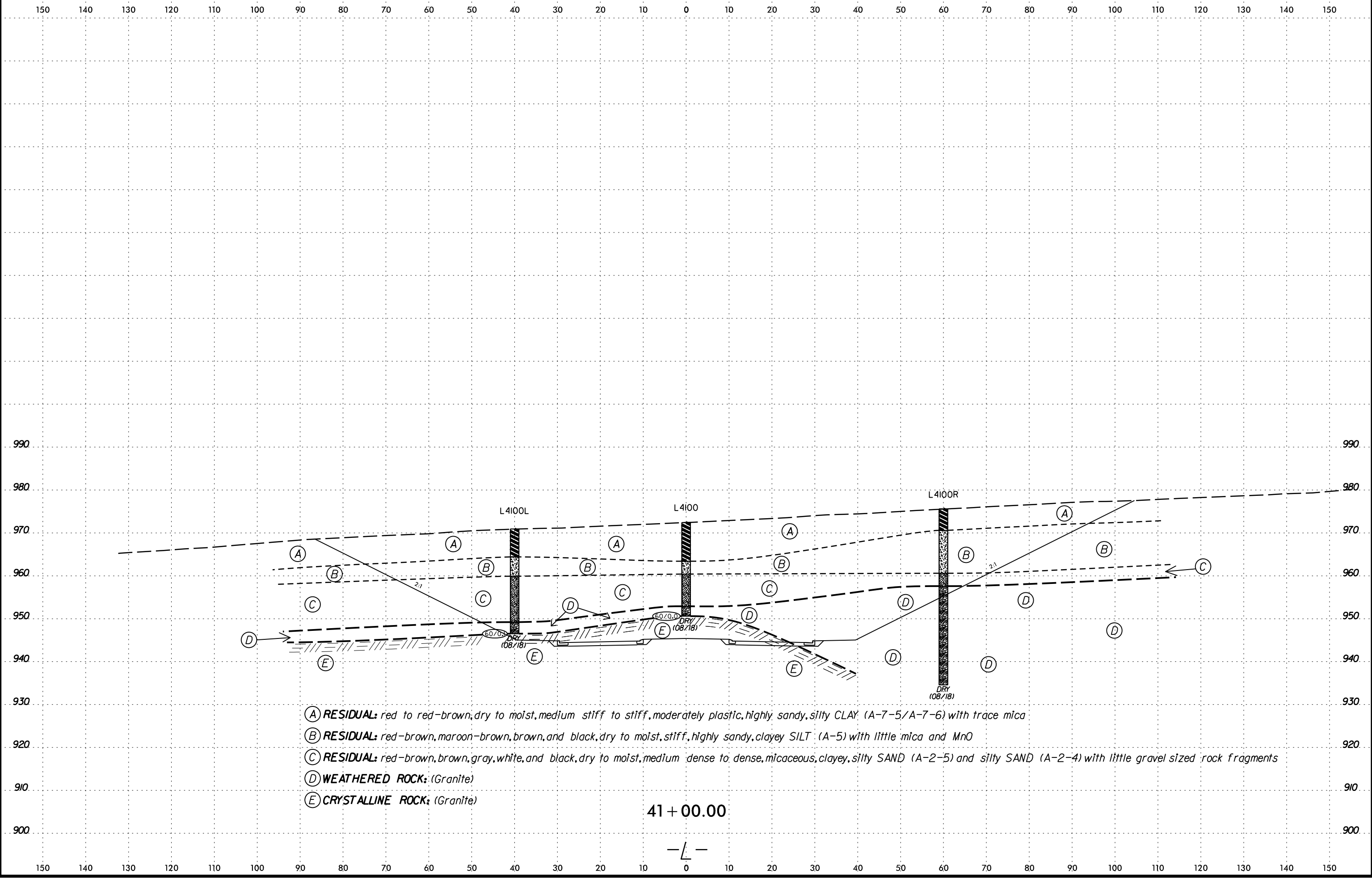
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- (A) RESIDUAL: red to red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica
- (B) RESIDUAL: red-brown, brown, and black, dry to moist, stiff, highly sandy, clayey SILT (A-5) with little mica and MnO
- (C) RESIDUAL: red-brown, brown, white, and gray, dry to moist, medium dense to dense, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) with little mica and gravel sized rock fragments
- (D) WEATHERED ROCK: (Granite)
- (E) CRYSTALLINE ROCK: (Granite)

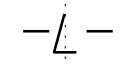
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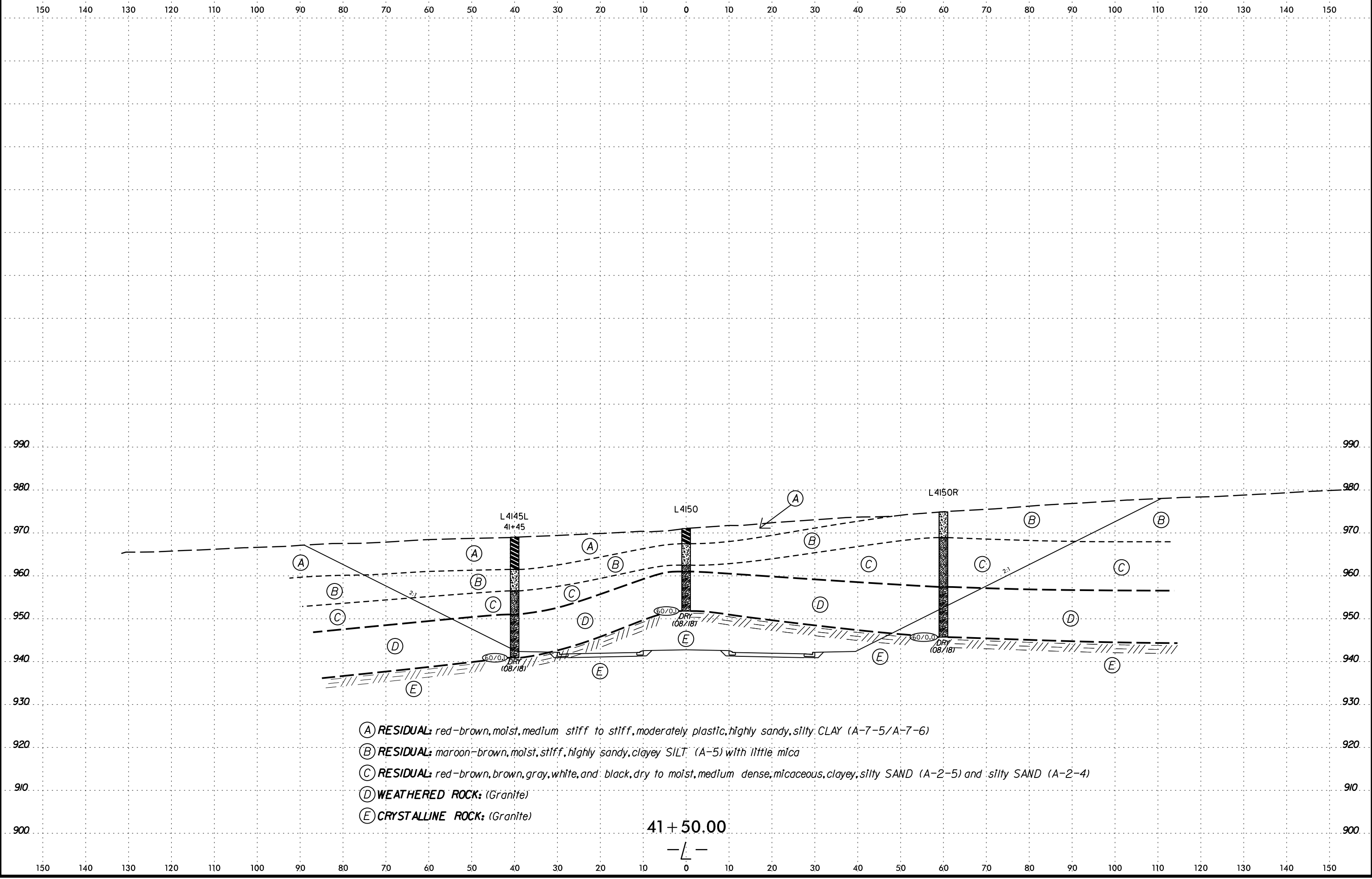
- (A) **RESIDUAL:** red to red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica
- (B) **RESIDUAL:** red-brown, maroon-brown, brown, and black, dry to moist, stiff, highly sandy, clayey SILT (A-5) with little mica and MnO
- (C) **RESIDUAL:** red-brown, brown, gray, white, and black, dry to moist, medium dense to dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4) with little gravel sized rock fragments
- (D) **WEATHERED ROCK:** (Granite)
- (E) **CRYSTALLINE ROCK:** (Granite)

41 + 00.00





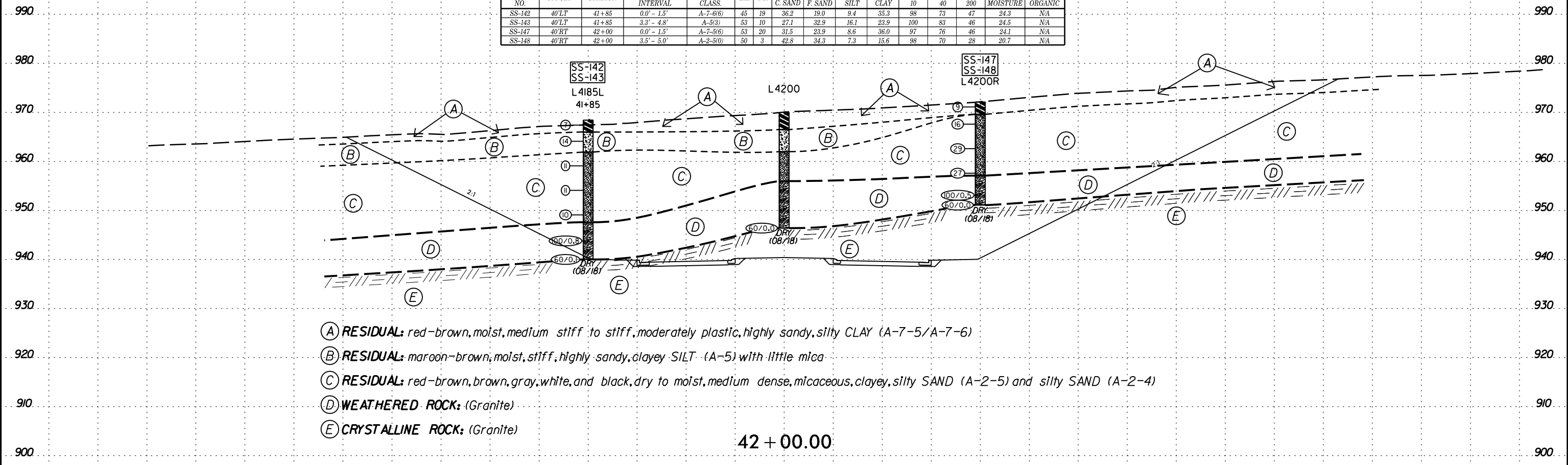
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150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

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-142	40'LT	41+85	0.0' - 1.5'	A-7-6(6)	45	19	36.2	19.0	9.4	35.3	98	73	47	24.3	NA
SS-143	40'LT	41+85	3.3' - 4.8'	A-5(3)	53	10	27.1	32.9	16.1	23.9	100	83	46	24.5	NA
SS-147	40'RT	42+00	0.0' - 1.5'	A-7-5(6)	53	20	31.5	23.9	8.6	36.0	97	76	46	24.1	NA
SS-148	40'RT	42+00	3.5' - 5.0'	A-2-5(0)	50	3	42.8	34.3	7.3	15.6	98	70	28	20.7	NA

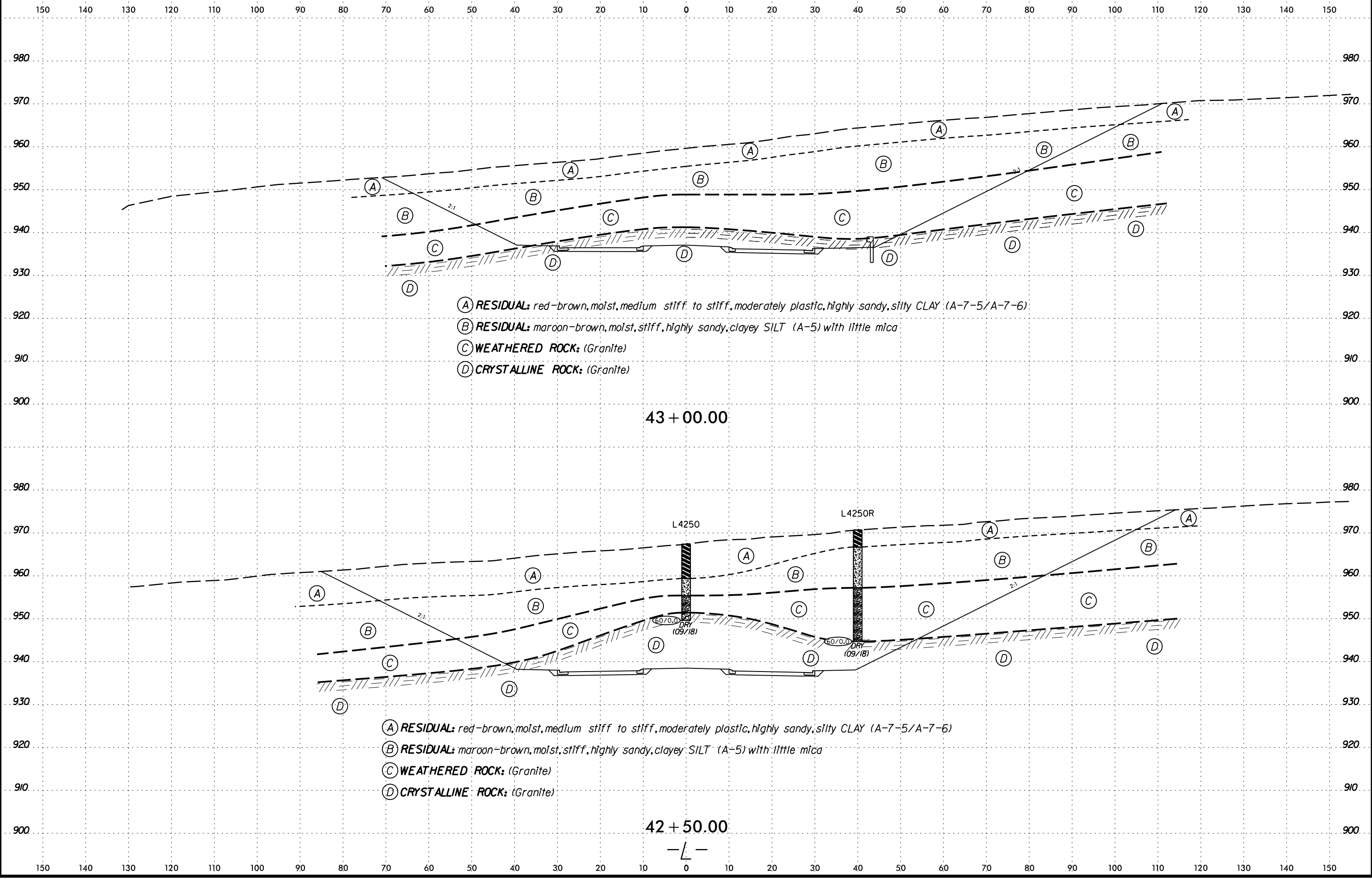
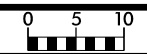


- (A) RESIDUAL: red-brown, moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6)
- (B) RESIDUAL: maroon-brown, moist, stiff, highly sandy, clayey SILT (A-5) with little mica
- (C) RESIDUAL: red-brown, brown, gray, white, and black, dry to moist, medium dense, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)
- (D) WEATHERED ROCK: (Granite)
- (E) CRYSTALLINE ROCK: (Granite)

42 + 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

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SUBSERIAL# 5333



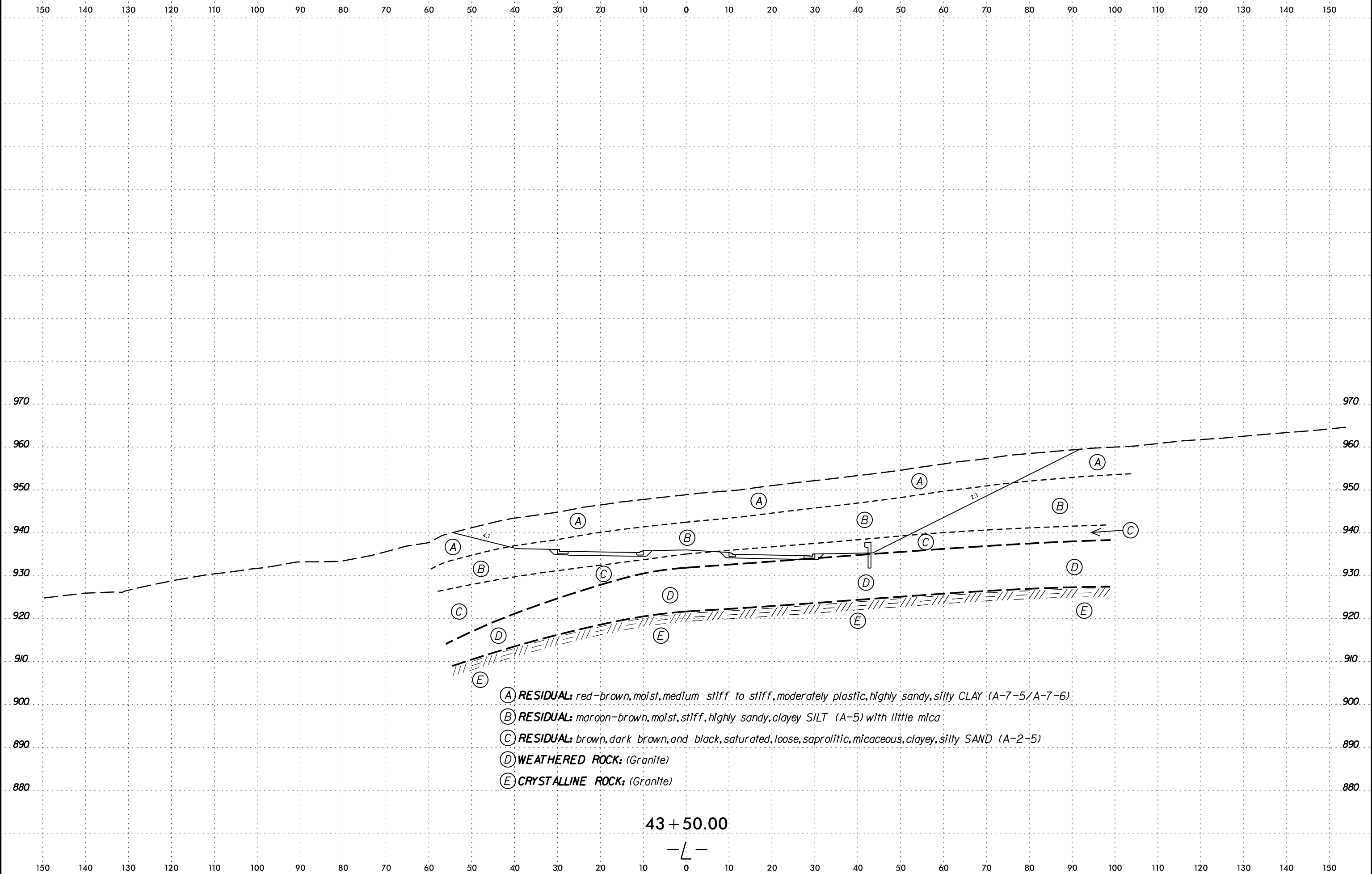
- (A) RESIDUAL: red-brown, moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6)
- (B) RESIDUAL: maroon-brown, moist, stiff, highly sandy, clayey SILT (A-5) with little mica
- (C) WEATHERED ROCK: (Granite)
- (D) CRYSTALLINE ROCK: (Granite)

43 + 00.00

- (A) RESIDUAL: red-brown, moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6)
- (B) RESIDUAL: maroon-brown, moist, stiff, highly sandy, clayey SILT (A-5) with little mica
- (C) WEATHERED ROCK: (Granite)
- (D) CRYSTALLINE ROCK: (Granite)

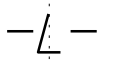
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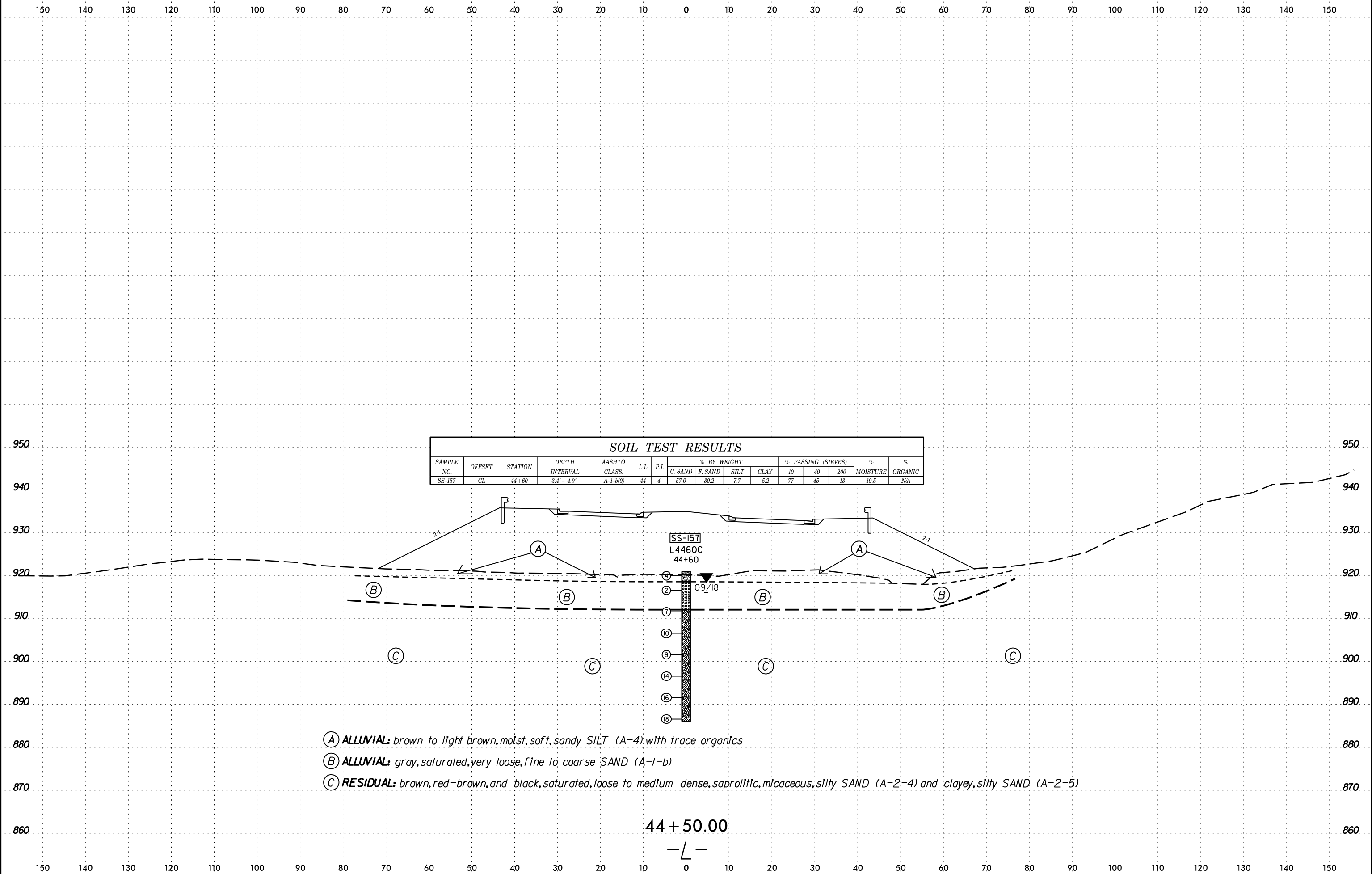
- (A) **RESIDUAL:** red-brown, moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5/A-7-6)
- (B) **RESIDUAL:** maroon-brown, moist, stiff, highly sandy, clayey SILT (A-5) with little mica
- (C) **RESIDUAL:** brown, dark brown, and black, saturated, loose, saprolitic, micaceous, clayey, silty SAND (A-2-5)
- (D) **WEATHERED ROCK:** (Granite)
- (E) **CRYSTALLINE ROCK:** (Granite)

43 + 50.00





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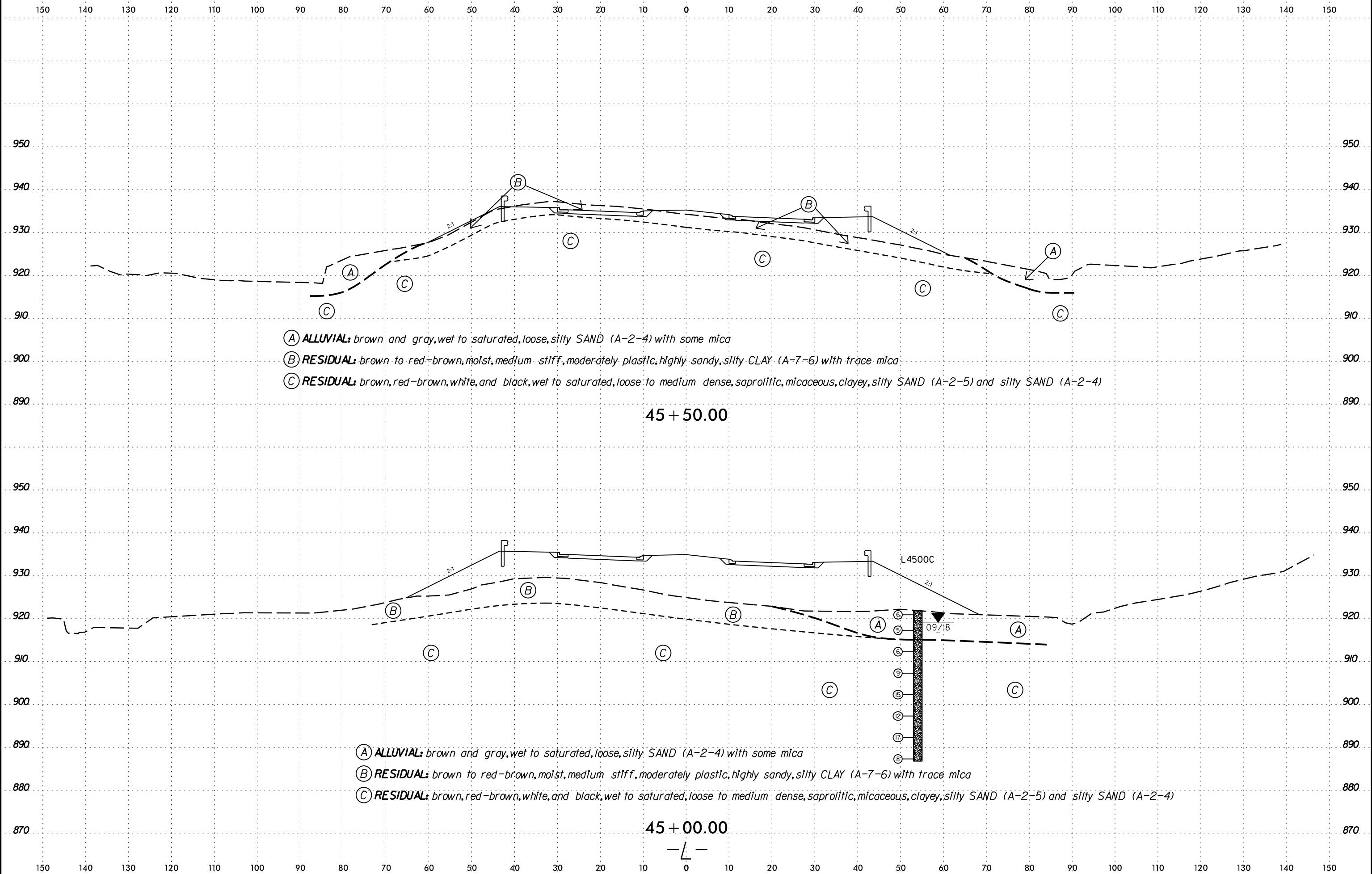
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-157	CL	44+60	3.4' - 4.9'	A-1-b(0)	44	4	57.0	30.2	7.7	5.2	77	45	13	10.5	NA

SS-157  
 L4460C  
 44+60  
 09/18

- (A) **ALLUVIAL:** brown to light brown, moist, soft, sandy SILT (A-4) with trace organics
- (B) **ALLUVIAL:** gray, saturated, very loose, fine to coarse SAND (A-1-b)
- (C) **RESIDUAL:** brown, red-brown, and black, saturated, loose to medium dense, saprolitic, micaceous, silty SAND (A-2-4) and clayey, silty SAND (A-2-5)

44 + 50.00  
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SUBSERIAL#533



- (A) ALLUVIAL: brown and gray, wet to saturated, loose, silty SAND (A-2-4) with some mica
- (B) RESIDUAL: brown to red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-6) with trace mica
- (C) RESIDUAL: brown, red-brown, white, and black, wet to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

- (A) ALLUVIAL: brown and gray, wet to saturated, loose, silty SAND (A-2-4) with some mica
- (B) RESIDUAL: brown to red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-6) with trace mica
- (C) RESIDUAL: brown, red-brown, white, and black, wet to saturated, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and silty SAND (A-2-4)

L4500C

09/18

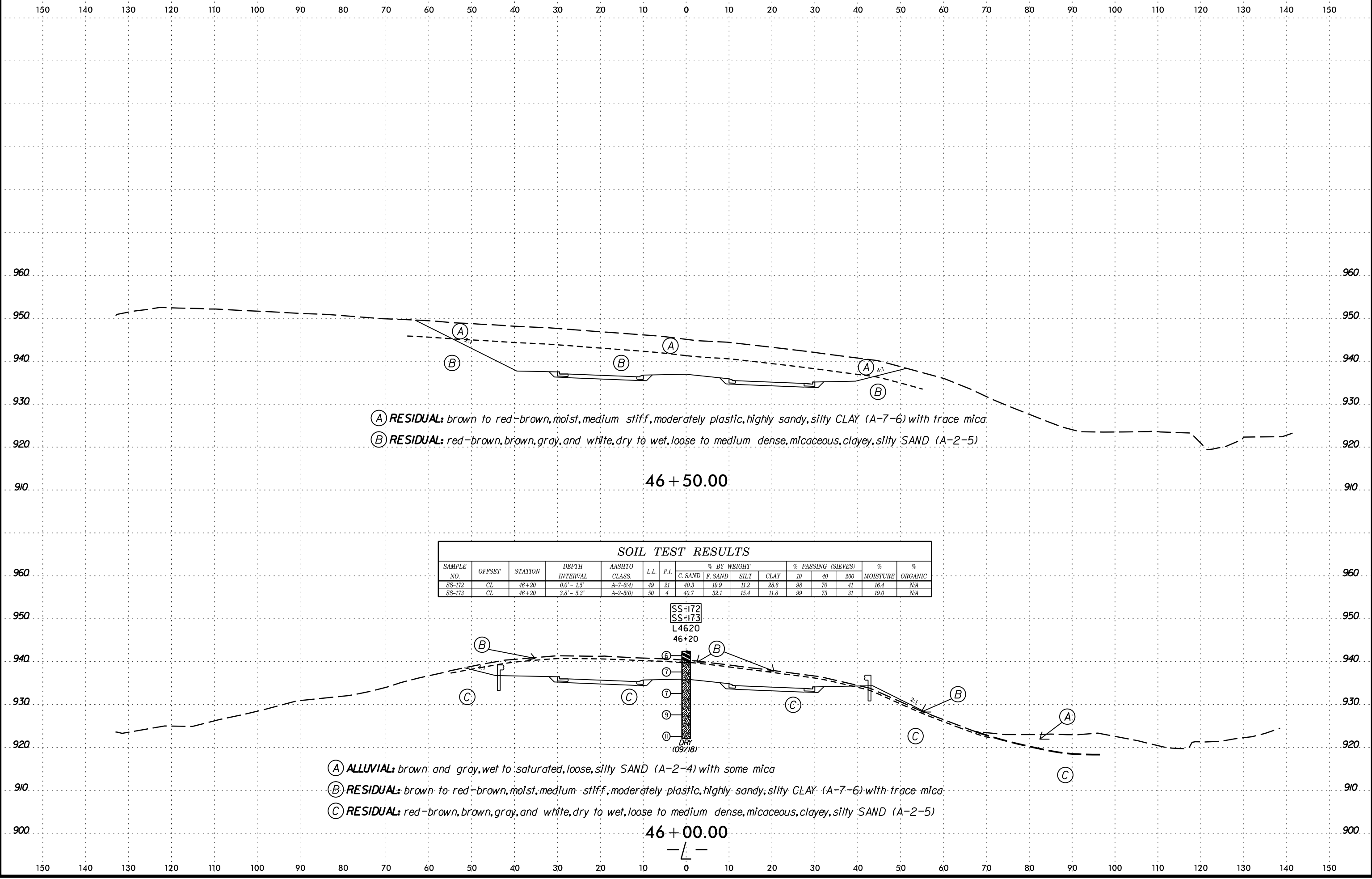
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 6/23/16



(A) RESIDUAL: brown to red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-6) with trace mica  
 (B) RESIDUAL: red-brown, brown, gray, and white, dry to wet, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

46 + 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-172	CL	46+20	0.0' - 1.5'	A-7-6(4)	49	21	40.3	19.9	11.2	28.6	98	70	47	16.4	NA
SS-173	CL	46+20	3.8' - 5.3'	A-2-5(0)	50	4	40.7	32.1	15.4	11.8	99	73	31	19.0	NA

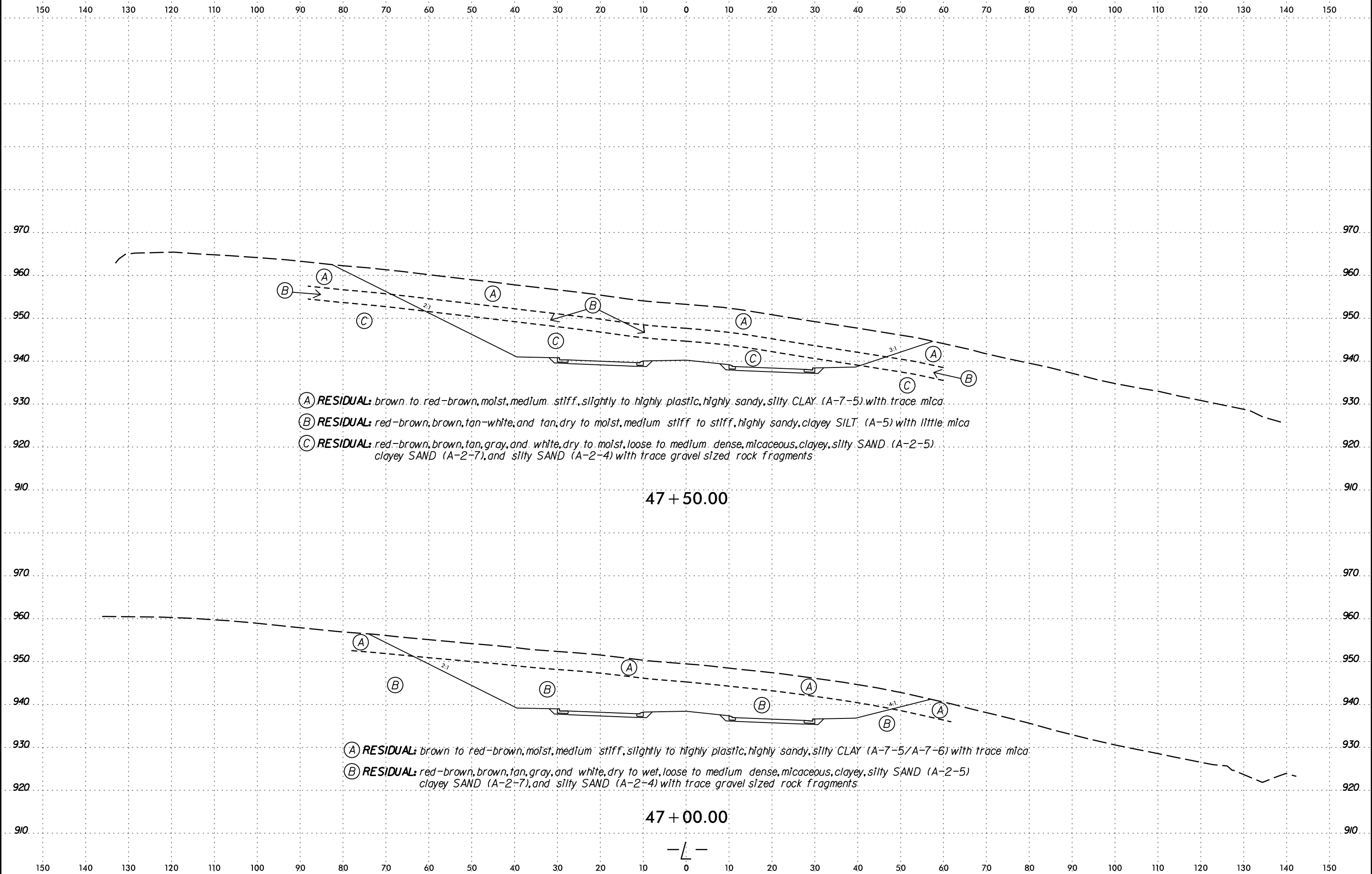
SS-172  
 SS-173  
 L4620  
 46+20  
 DRY  
 (109/18)

(A) ALLUVIAL: brown and gray, wet to saturated, loose, silty SAND (A-2-4) with some mica  
 (B) RESIDUAL: brown to red-brown, moist, medium stiff, moderately plastic, highly sandy, silty CLAY (A-7-6) with trace mica  
 (C) RESIDUAL: red-brown, brown, gray, and white, dry to wet, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

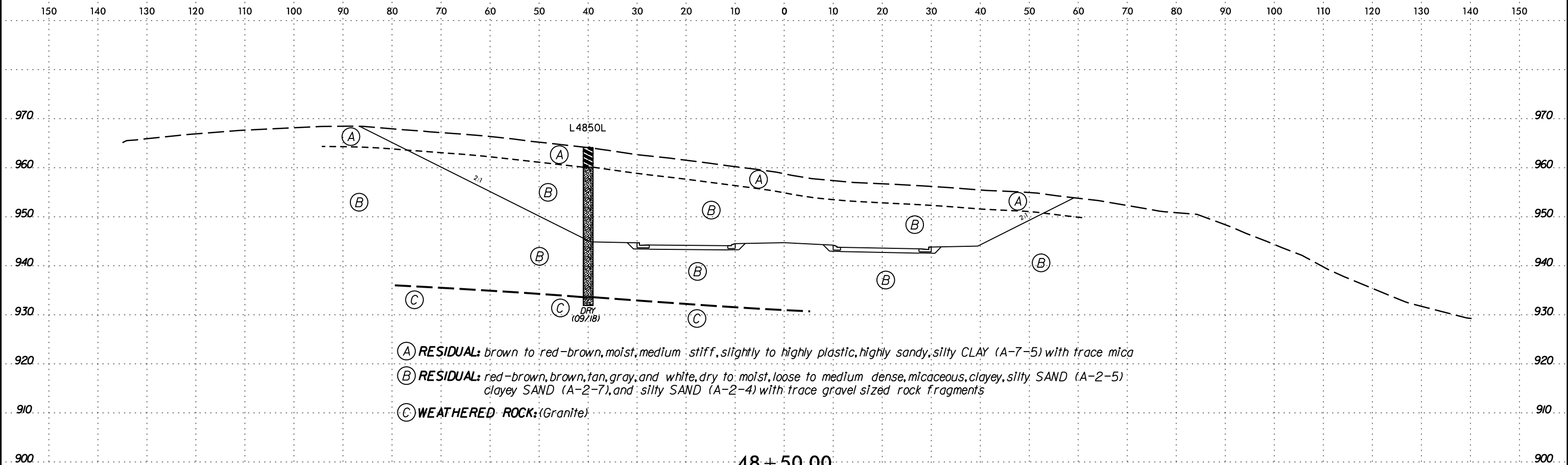
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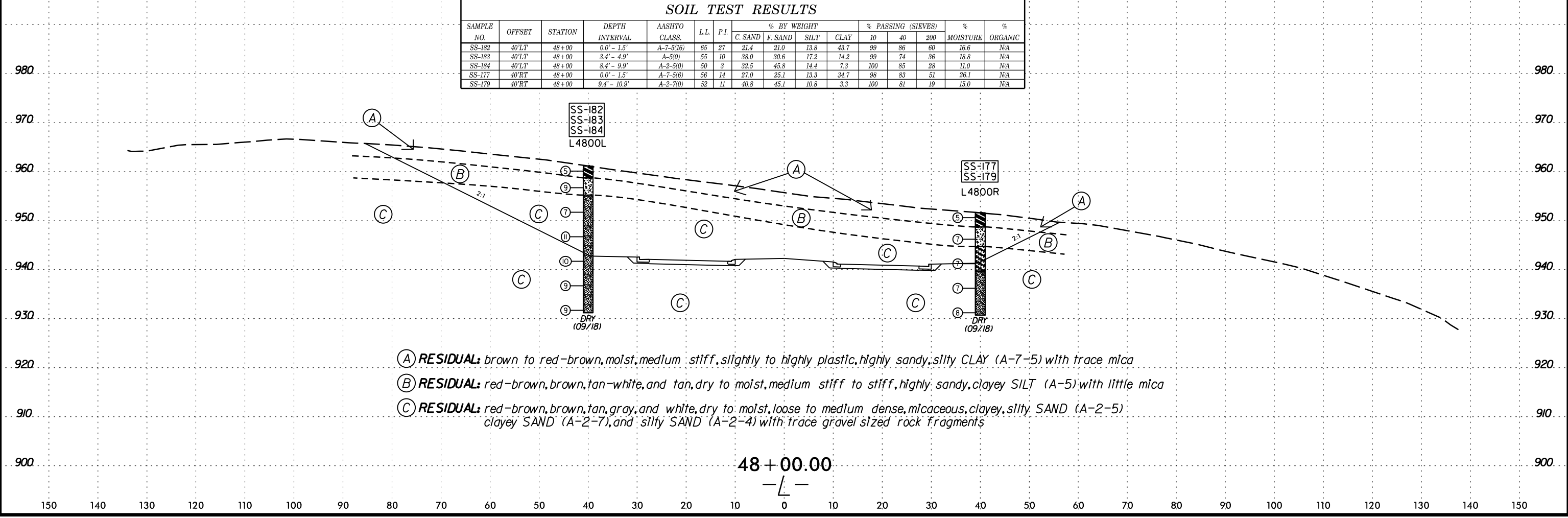
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- (A) RESIDUAL: brown to red-brown, moist, medium stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5) with trace mica
- (B) RESIDUAL: red-brown, brown, tan, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5), clayey SAND (A-2-7), and silty SAND (A-2-4) with trace gravel sized rock fragments
- (C) WEATHERED ROCK: (Granite)

48 + 50.00

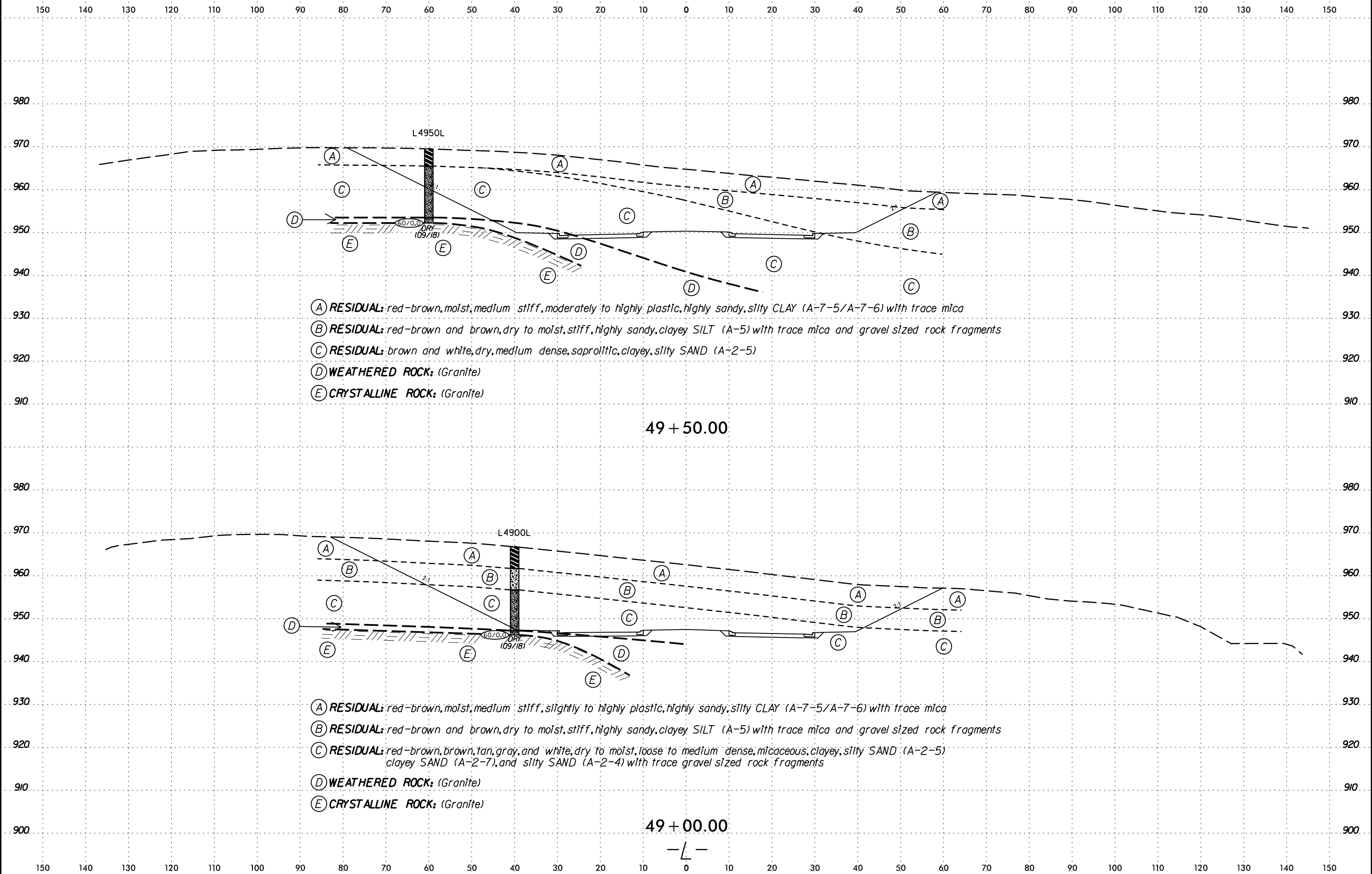
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-182	40'LT	48+00	0.0' - 1.5'	A-7-5(16)	65	27	21.4	21.0	13.8	43.7	99	86	60	16.6	NA
SS-183	40'LT	48+00	3.4' - 4.9'	A-5(0)	55	10	38.0	30.6	17.2	14.2	99	74	36	18.8	NA
SS-184	40'LT	48+00	8.4' - 9.9'	A-2-5(0)	50	3	32.5	45.8	14.4	7.3	100	85	28	11.0	NA
SS-177	40'RT	48+00	0.0' - 1.5'	A-7-5(6)	56	14	27.0	25.1	13.3	34.7	98	83	51	26.1	NA
SS-179	40'RT	48+00	9.4' - 10.9'	A-2-7(0)	52	11	40.8	45.1	10.8	3.3	100	81	19	15.0	NA



- (A) RESIDUAL: brown to red-brown, moist, medium stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5) with trace mica
- (B) RESIDUAL: red-brown, brown, tan-white, and tan, dry to moist, medium stiff to stiff, highly sandy, clayey SILT (A-5) with little mica
- (C) RESIDUAL: red-brown, brown, tan, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5), clayey SAND (A-2-7), and silty SAND (A-2-4) with trace gravel sized rock fragments

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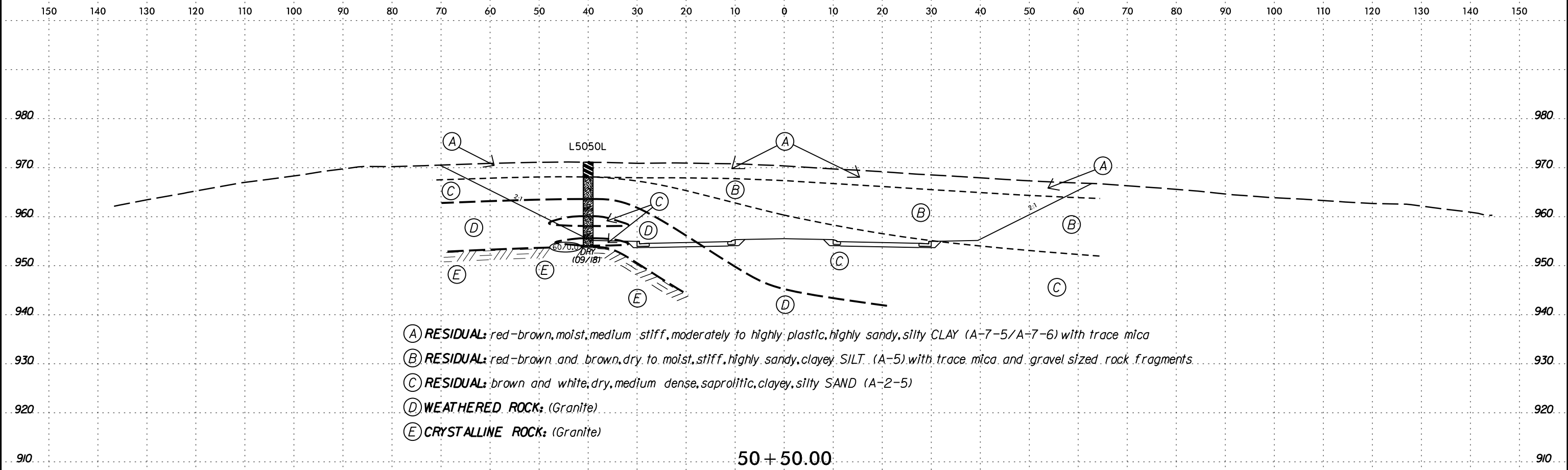
- (A) RESIDUAL: red-brown, moist, medium stiff, moderately to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica
- (B) RESIDUAL: red-brown and brown, dry to moist, stiff, highly sandy, clayey SILT (A-5) with trace mica and gravel sized rock fragments
- (C) RESIDUAL: brown and white, dry, medium dense, saprolitic, clayey, silty SAND (A-2-5)
- (D) WEATHERED ROCK: (Granite)
- (E) CRYSTALLINE ROCK: (Granite)

- (A) RESIDUAL: red-brown, moist, medium stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6) with trace mica
- (B) RESIDUAL: red-brown and brown, dry to moist, stiff, highly sandy, clayey SILT (A-5) with trace mica and gravel sized rock fragments
- (C) RESIDUAL: red-brown, brown, tan, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5) clayey SAND (A-2-7), and silty SAND (A-2-4) with trace gravel sized rock fragments
- (D) WEATHERED ROCK: (Granite)
- (E) CRYSTALLINE ROCK: (Granite)

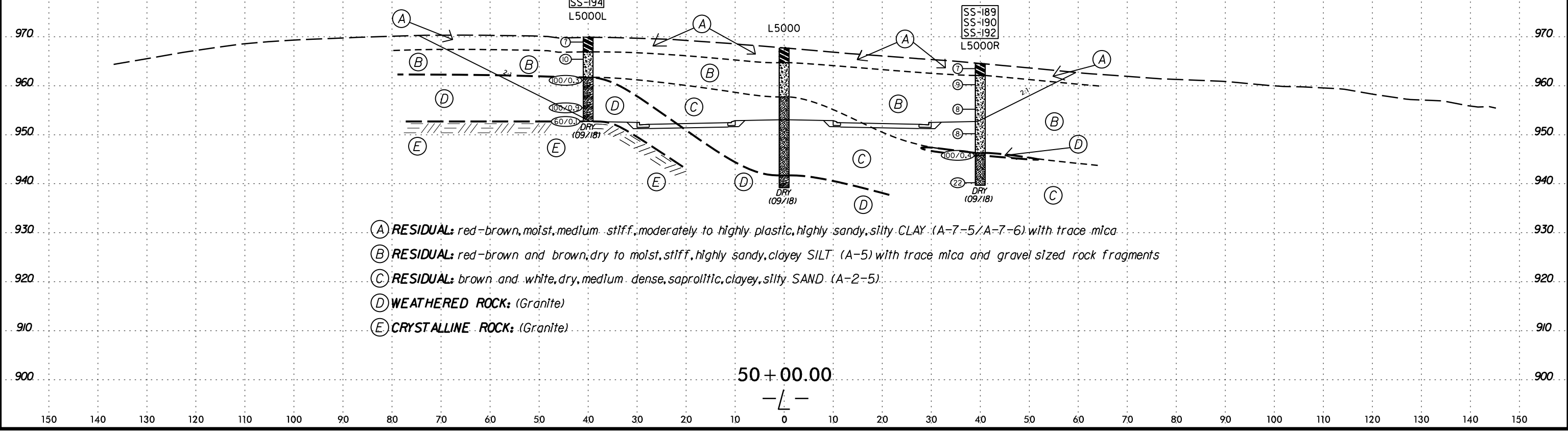
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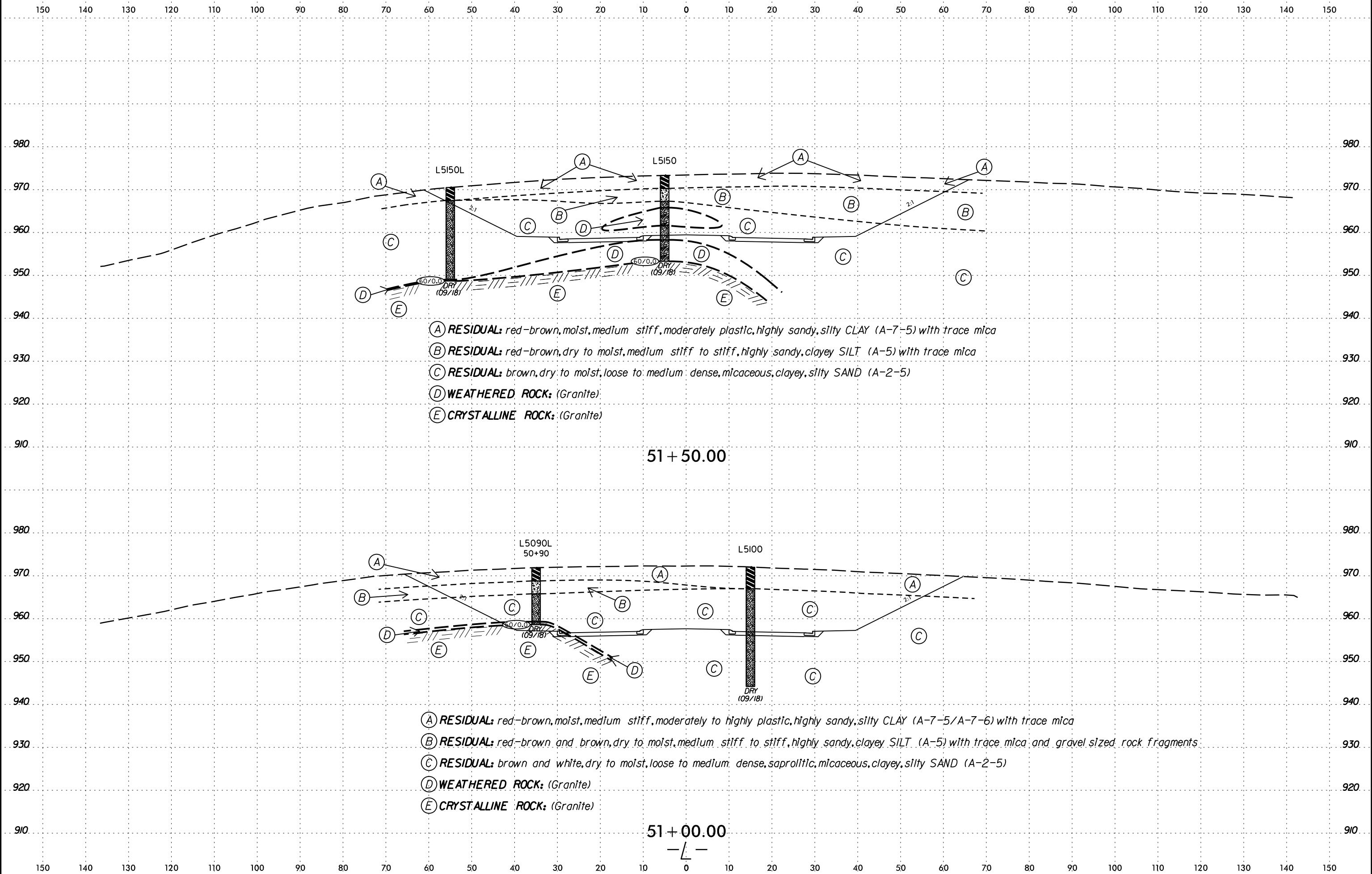
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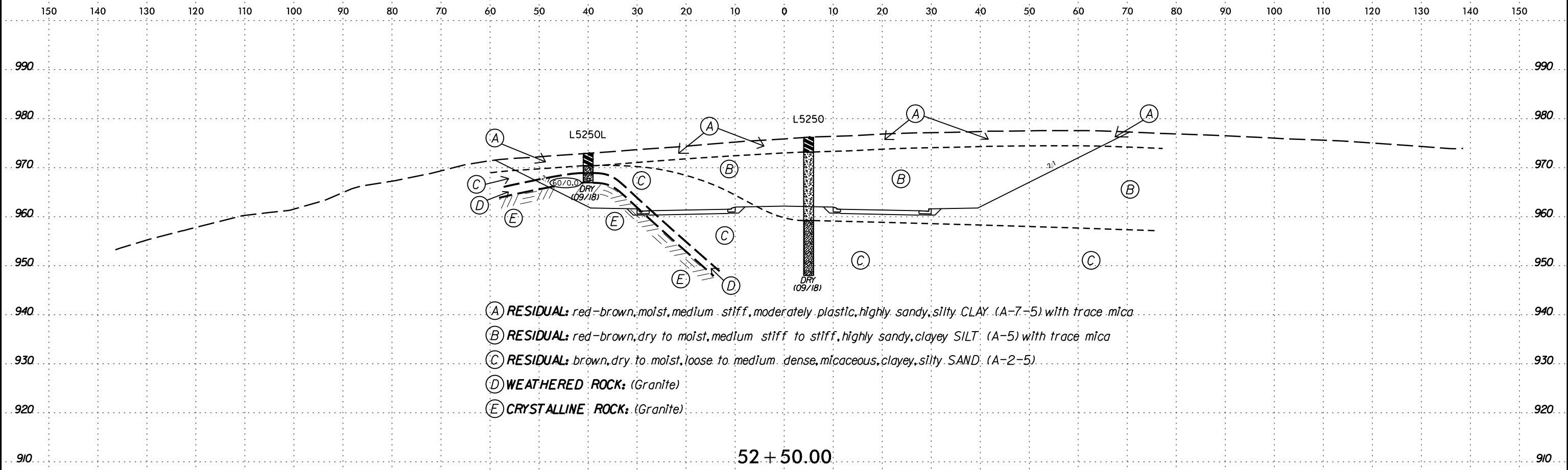
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-194	40'LT	50+00	0.0' - 1.5'	A-7-6(12)	60	31	28.5	19.2	13.0	39.4	91	74	50	29.3	NA
SS-189	40'RT	50+00	0.0' - 1.5'	A-7-5(9)	61	16	27.1	20.7	12.5	39.8	98	80	55	26.4	NA
SS-190	40'RT	50+00	3.3' - 4.8'	A-5(0)	64	5	38.0	32.0	13.3	16.7	100	76	36	26.3	NA
SS-192	40'RT	50+00	13.3' - 14.8'	A-5(1)	60	8	39.3	26.1	24.3	10.3	97	69	41	21.9	NA



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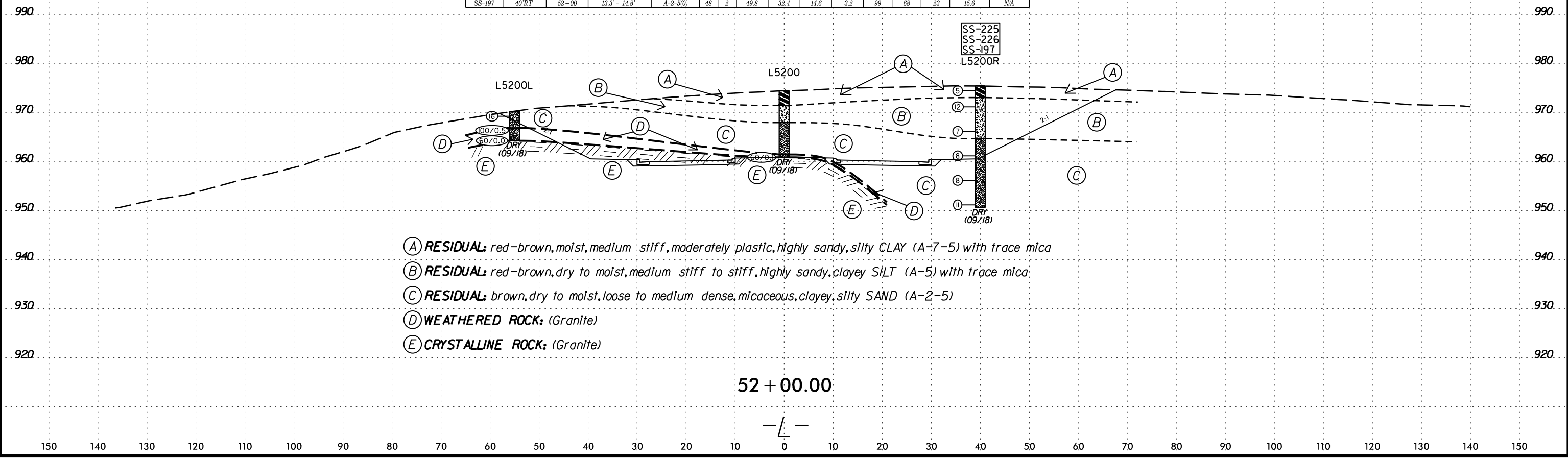


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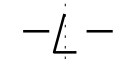


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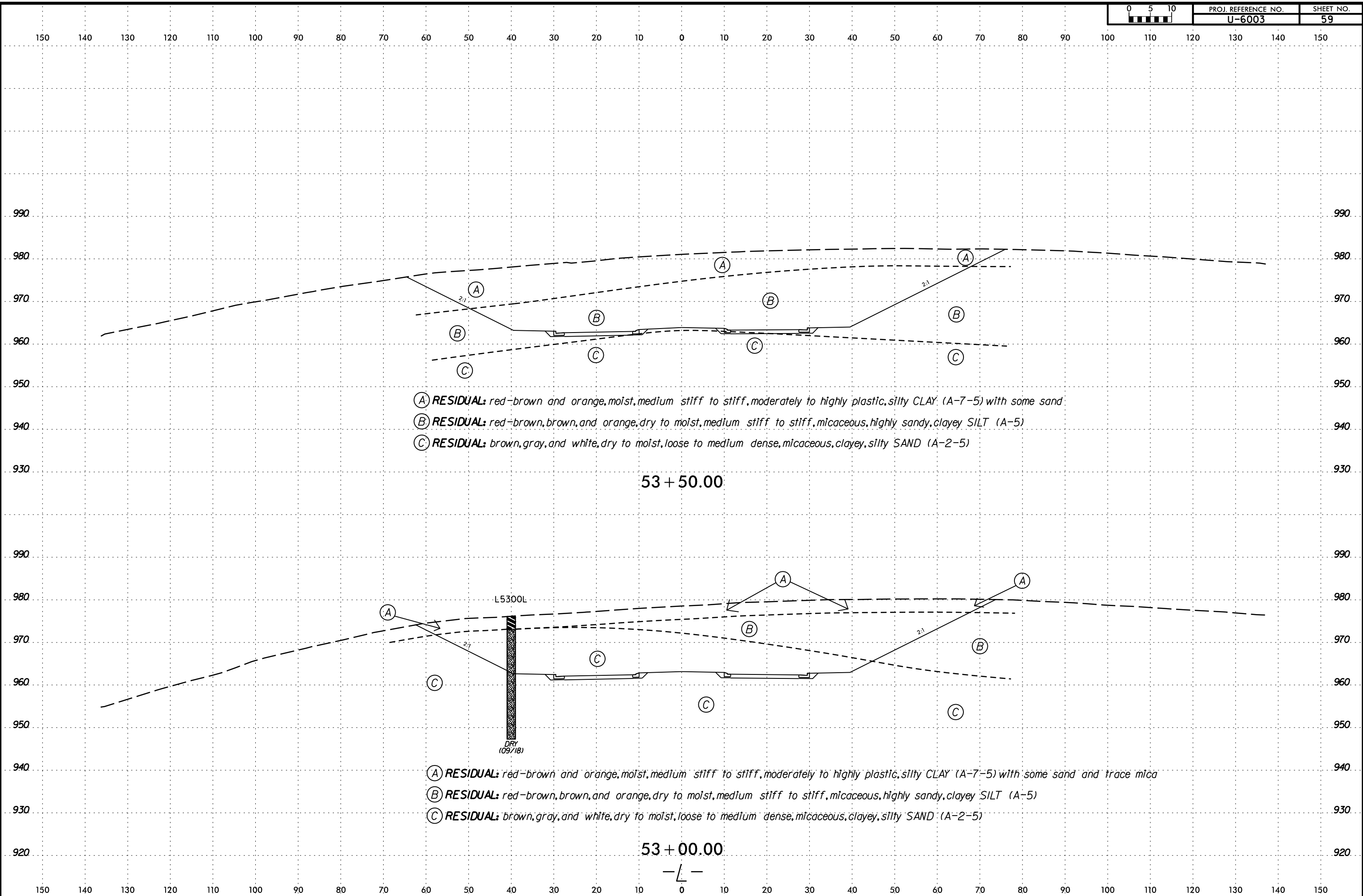
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-225	40'RT	52+00	0.0' - 1.5'	A-7-5(17)	57	25	22.9	13.5	19.0	44.6	99	83	66	15.7	NA
SS-226	40'RT	52+00	3.3' - 4.8'	A-5(3)	59	3	28.2	21.6	35.5	14.6	100	80	54	16.7	NA
SS-197	40'RT	52+00	13.3' - 14.8'	A-2-5(0)	48	2	49.8	32.4	14.6	3.2	99	68	23	15.6	NA



52 + 00.00



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SUBSERIAL#533



- (A) RESIDUAL: red-brown and orange, moist, medium stiff to stiff, moderately to highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: red-brown, brown, and orange, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)
- (C) RESIDUAL: brown, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

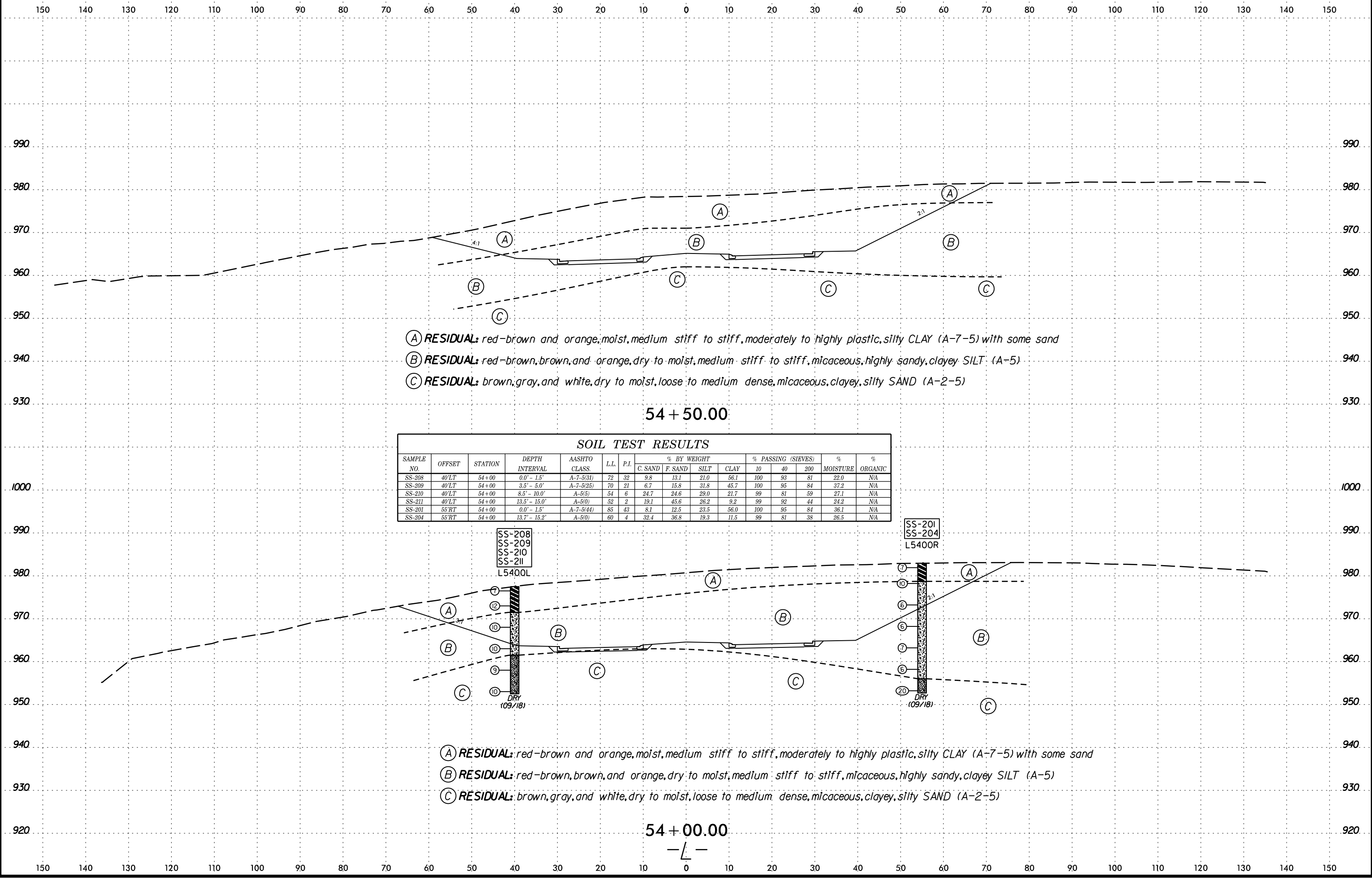
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- (A) RESIDUAL: red-brown and orange, moist, medium stiff to stiff, moderately to highly plastic, silty CLAY (A-7-5) with some sand and trace mica
- (B) RESIDUAL: red-brown, brown, and orange, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)
- (C) RESIDUAL: brown, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

53 + 00.00

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- (A) RESIDUAL: red-brown and orange, moist, medium stiff to stiff, moderately to highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: red-brown, brown, and orange, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)
- (C) RESIDUAL: brown, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

54 + 50.00

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		
SS-208	40'LT	54+00	0.0' - 1.5'	A-7-5(31)	72	32	9.8	13.1	21.0	56.1	100	93	81	22.0	NA
SS-209	40'LT	54+00	3.5' - 5.0'	A-7-5(25)	70	21	6.7	15.8	31.8	45.7	100	95	84	37.2	NA
SS-210	40'LT	54+00	8.5' - 10.0'	A-5(5)	54	6	24.7	24.6	29.0	21.7	99	81	59	27.1	NA
SS-211	40'LT	54+00	13.5' - 15.0'	A-5(0)	52	2	19.1	45.6	26.2	9.2	99	92	44	24.2	NA
SS-201	55'RT	54+00	0.0' - 1.5'	A-7-5(4)	85	43	8.1	12.5	23.5	56.0	100	95	84	36.1	NA
SS-204	55'RT	54+00	13.7' - 15.2'	A-5(0)	60	4	32.4	36.8	19.3	11.5	99	81	38	26.5	NA

SS-208  
 SS-209  
 SS-210  
 SS-211  
 L5400L  
 DRY  
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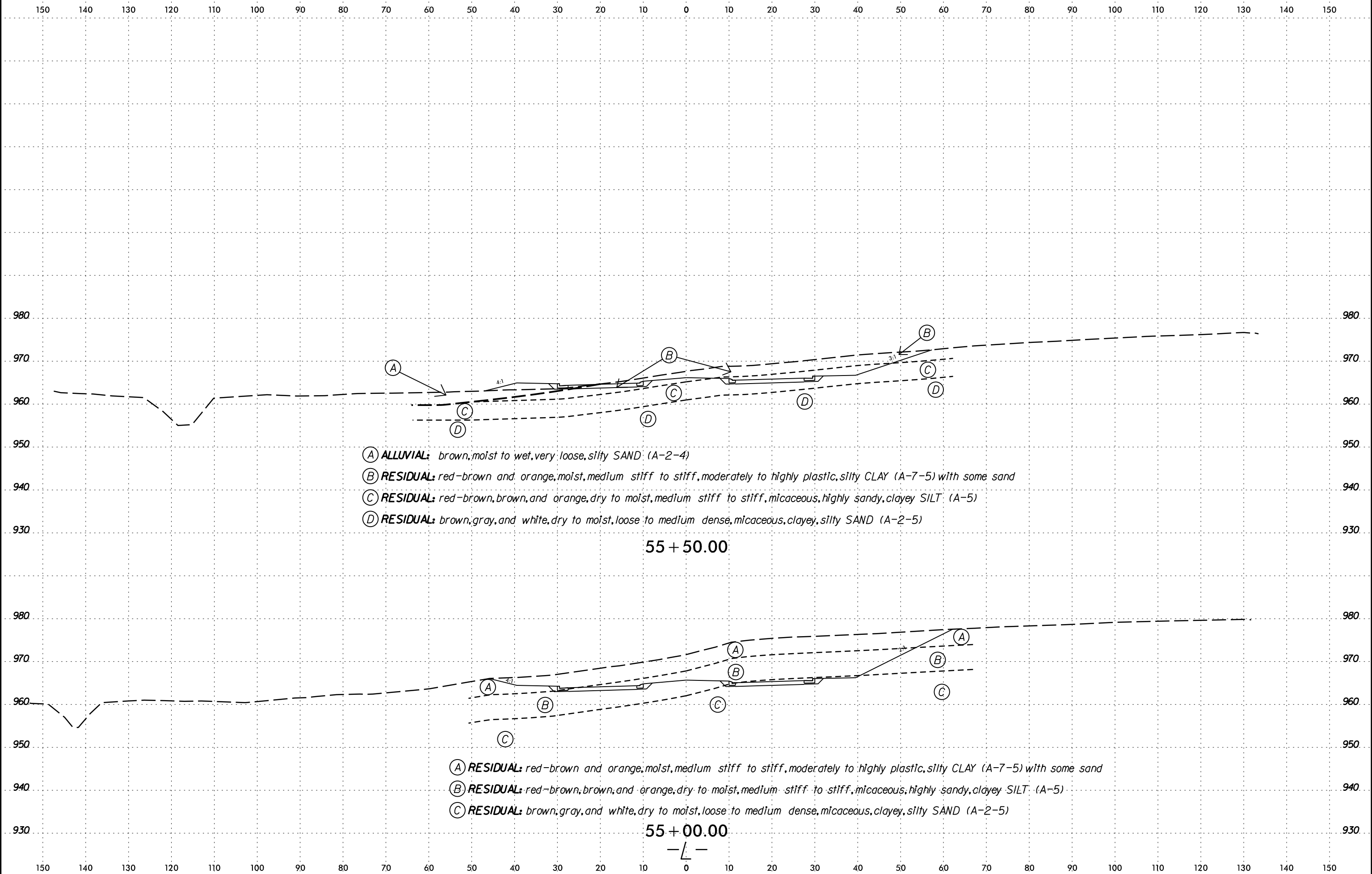
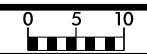
SS-201  
 SS-204  
 L5400R  
 DRY  
 (09/18)

- (A) RESIDUAL: red-brown and orange, moist, medium stiff to stiff, moderately to highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: red-brown, brown, and orange, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)
- (C) RESIDUAL: brown, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

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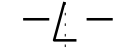


- (A) **ALLUVIAL:** brown, moist to wet, very loose, silty SAND (A-2-4)
- (B) **RESIDUAL:** red-brown and orange, moist, medium stiff to stiff, moderately to highly plastic, silty CLAY (A-7-5) with some sand
- (C) **RESIDUAL:** red-brown, brown, and orange, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)
- (D) **RESIDUAL:** brown, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

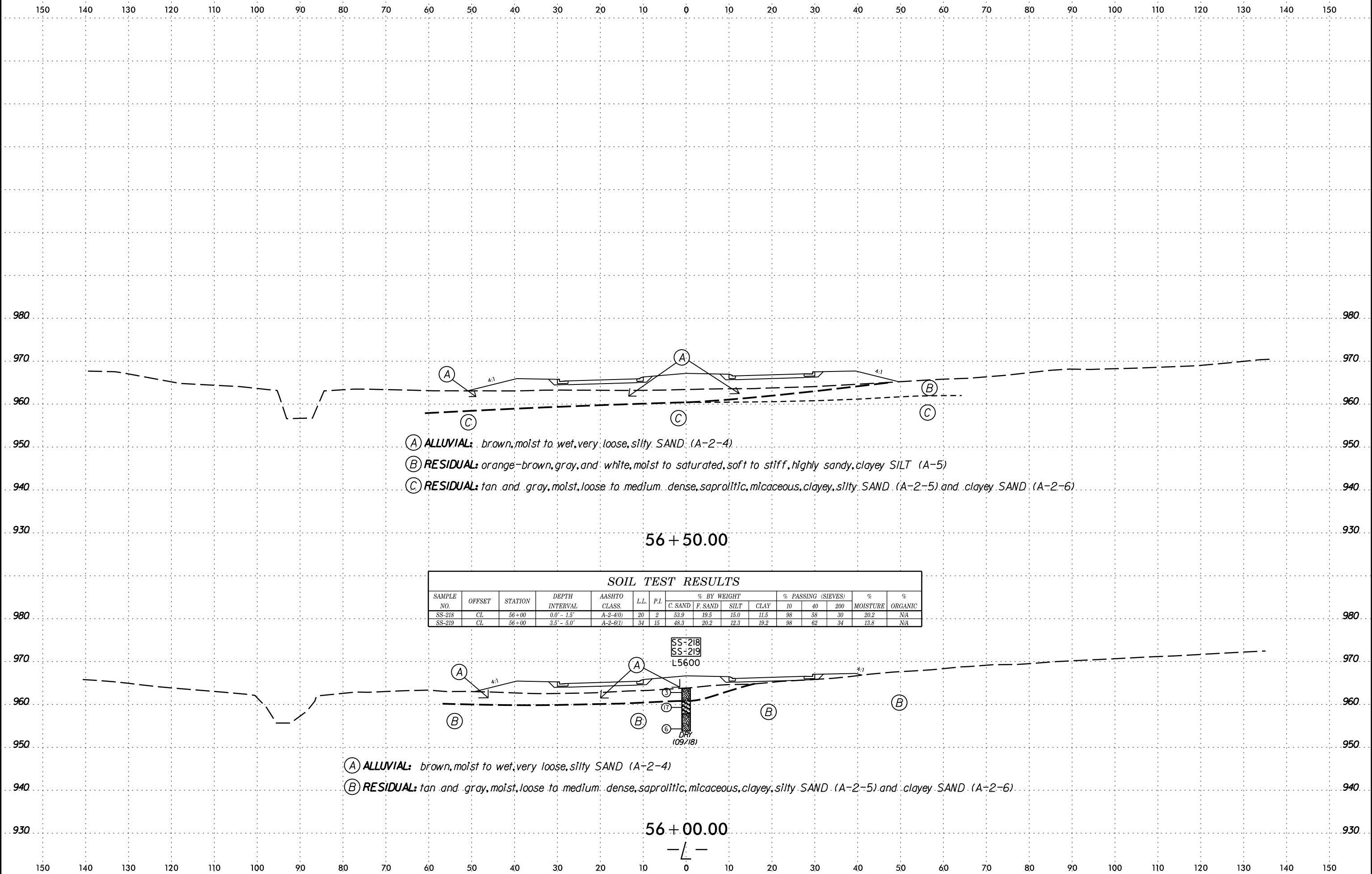
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- (A) **RESIDUAL:** red-brown and orange, moist, medium stiff to stiff, moderately to highly plastic, silty CLAY (A-7-5) with some sand
- (B) **RESIDUAL:** red-brown, brown, and orange, dry to moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)
- (C) **RESIDUAL:** brown, gray, and white, dry to moist, loose to medium dense, micaceous, clayey, silty SAND (A-2-5)

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- (A) **ALLUVIAL:** brown, moist to wet, very loose, silty SAND (A-2-4)
- (B) **RESIDUAL:** orange-brown, gray, and white, moist to saturated, soft to stiff, highly sandy, clayey SILT (A-5)
- (C) **RESIDUAL:** tan and gray, moist, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and clayey SAND (A-2-6)

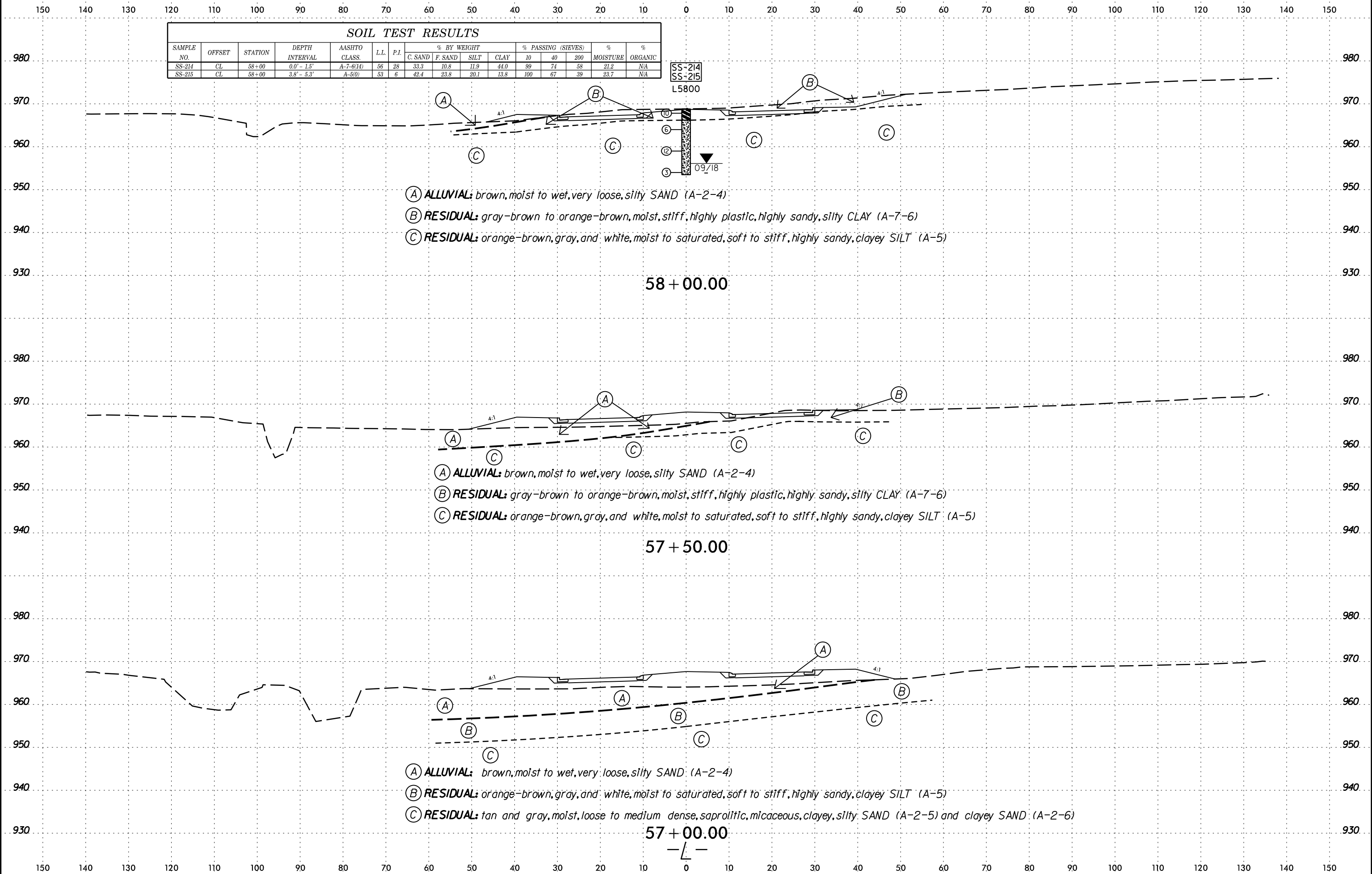
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-218	CL	56+00	0.0' - 1.5'	A-2-4(0)	20	2	53.9	19.5	15.0	11.5	98	58	30	20.2	NA
SS-219	CL	56+00	3.5' - 5.0'	A-2-6(1)	34	15	48.3	20.2	12.3	19.2	98	62	34	13.8	NA

SS-218  
 SS-219  
 L5600  
 DRY (09/18)

- (A) **ALLUVIAL:** brown, moist to wet, very loose, silty SAND (A-2-4)
- (B) **RESIDUAL:** tan and gray, moist, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and clayey SAND (A-2-6)

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 SSUBSERIAL#333

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-214	CL	58+00	0.0' - 1.5'	A-7-6(14)	56	28	33.3	10.8	11.9	44.0	99	74	58	21.2	NA
SS-215	CL	58+00	3.8' - 5.3'	A-5(0)	53	6	42.4	23.8	20.1	13.8	100	67	39	23.7	NA

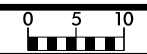


- (A) **ALLUVIAL:** brown, moist to wet, very loose, silty SAND (A-2-4)
- (B) **RESIDUAL:** gray-brown to orange-brown, moist, stiff, highly plastic, highly sandy, silty CLAY (A-7-6)
- (C) **RESIDUAL:** orange-brown, gray, and white, moist to saturated, soft to stiff, highly sandy, clayey SILT (A-5)

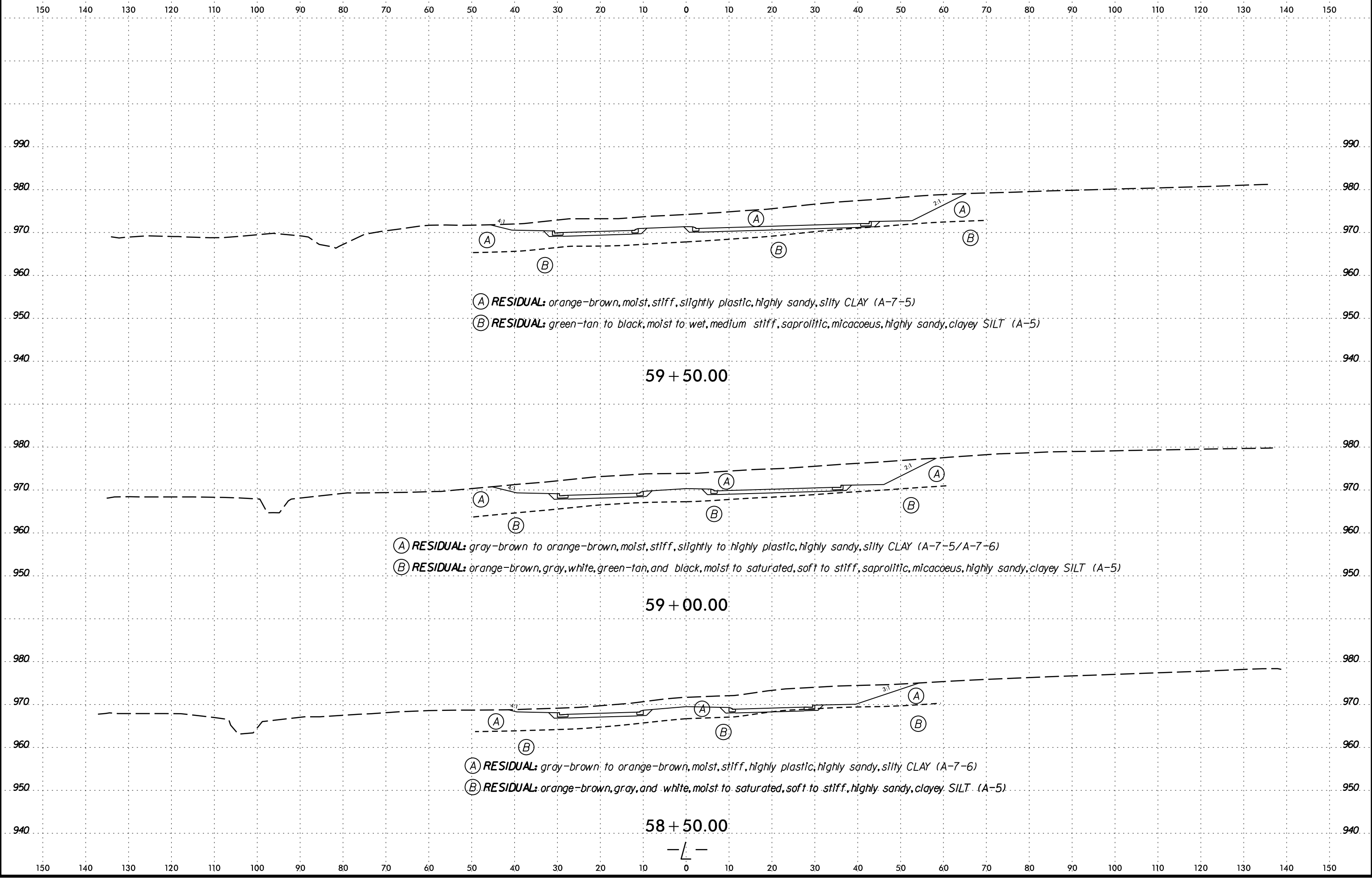
- (A) **ALLUVIAL:** brown, moist to wet, very loose, silty SAND (A-2-4)
- (B) **RESIDUAL:** gray-brown to orange-brown, moist, stiff, highly plastic, highly sandy, silty CLAY (A-7-6)
- (C) **RESIDUAL:** orange-brown, gray, and white, moist to saturated, soft to stiff, highly sandy, clayey SILT (A-5)

- (A) **ALLUVIAL:** brown, moist to wet, very loose, silty SAND (A-2-4)
- (B) **RESIDUAL:** orange-brown, gray, and white, moist to saturated, soft to stiff, highly sandy, clayey SILT (A-5)
- (C) **RESIDUAL:** tan and gray, moist, loose to medium dense, saprolitic, micaceous, clayey, silty SAND (A-2-5) and clayey SAND (A-2-6)

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SUBSERIAL# 533



PROJ. REFERENCE NO.	SHEET NO.
U-6003	64



- (A) RESIDUAL: orange-brown, moist, stiff, slightly plastic, highly sandy, silty CLAY (A-7-5)
- (B) RESIDUAL: green-tan to black, moist to wet, medium stiff, saprolitic, micaceous, highly sandy, clayey SILT (A-5)

- (A) RESIDUAL: gray-brown to orange-brown, moist, stiff, slightly to highly plastic, highly sandy, silty CLAY (A-7-5/A-7-6)
- (B) RESIDUAL: orange-brown, gray, white, green-tan, and black, moist to saturated, soft to stiff, saprolitic, micaceous, highly sandy, clayey SILT (A-5)

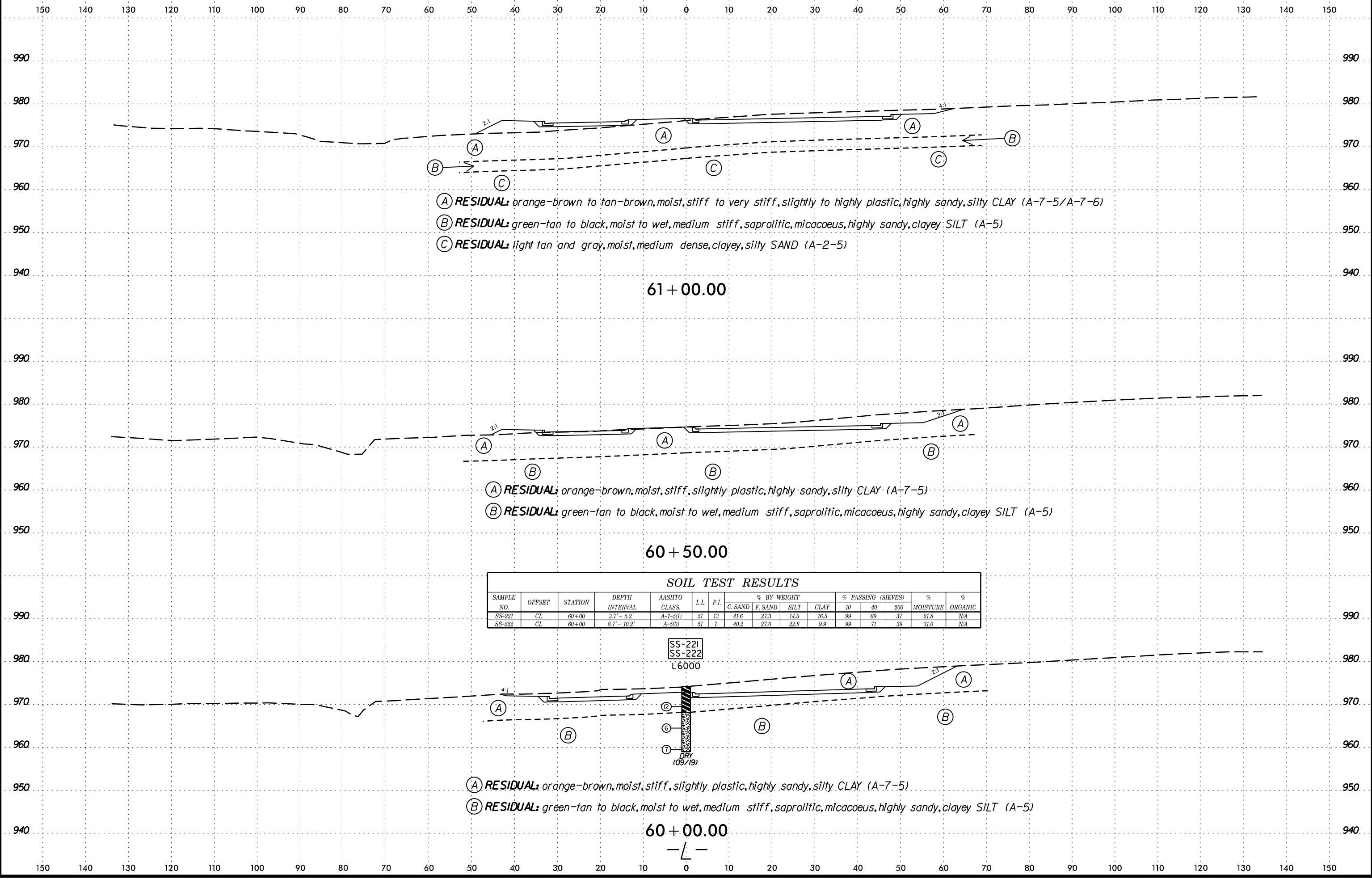
- (A) RESIDUAL: gray-brown to orange-brown, moist, stiff, highly plastic, highly sandy, silty CLAY (A-7-6)
- (B) RESIDUAL: orange-brown, gray, and white, moist to saturated, soft to stiff, highly sandy, clayey SILT (A-5)

58 + 50.00

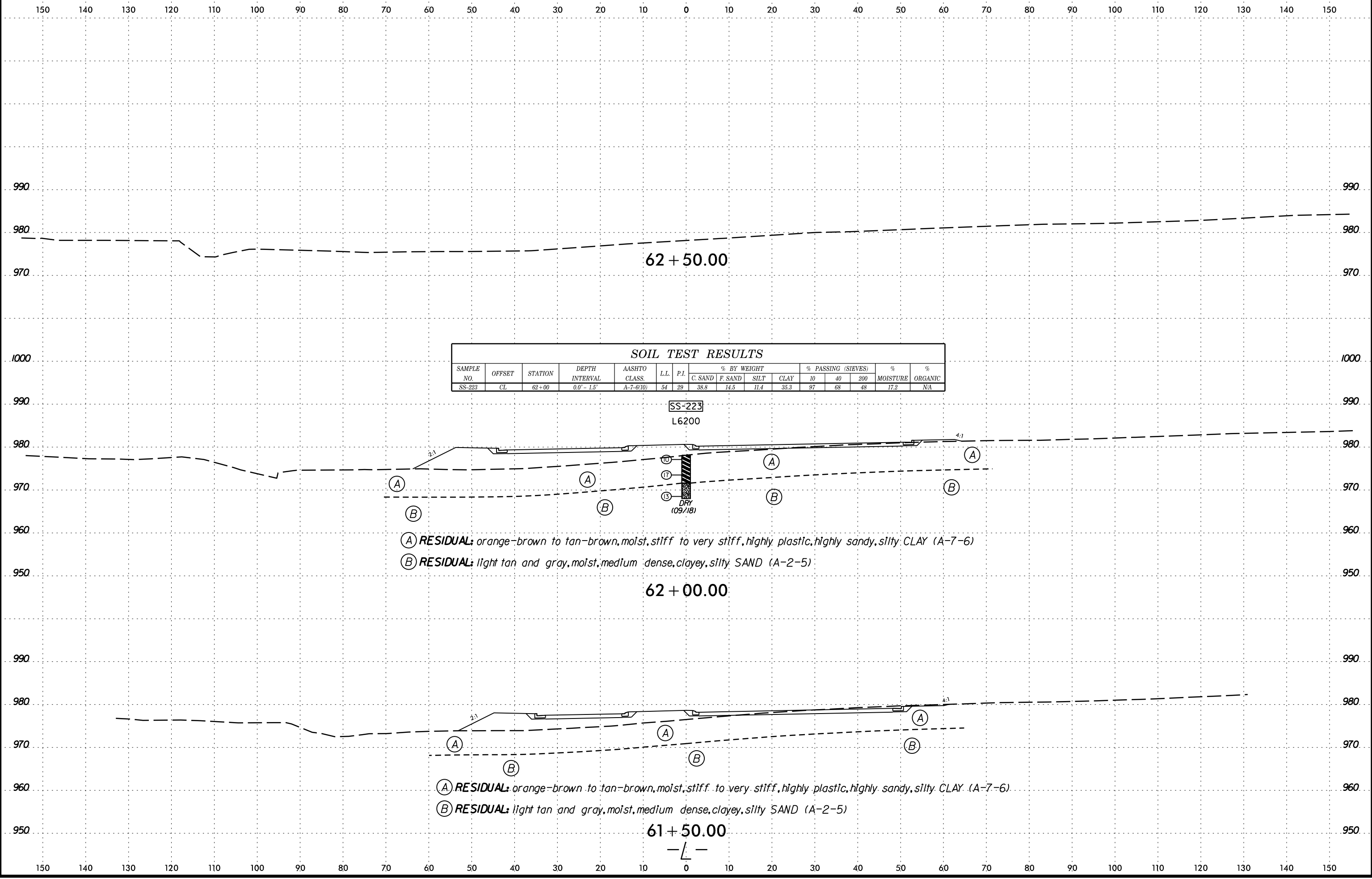
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 3350SERIAL#333



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		
SS-223	CL	62+00	0.0' - 1.5'	A-7-6(10)	54	29	38.8	14.5	11.4	35.3	97	68	48	17.2	NA

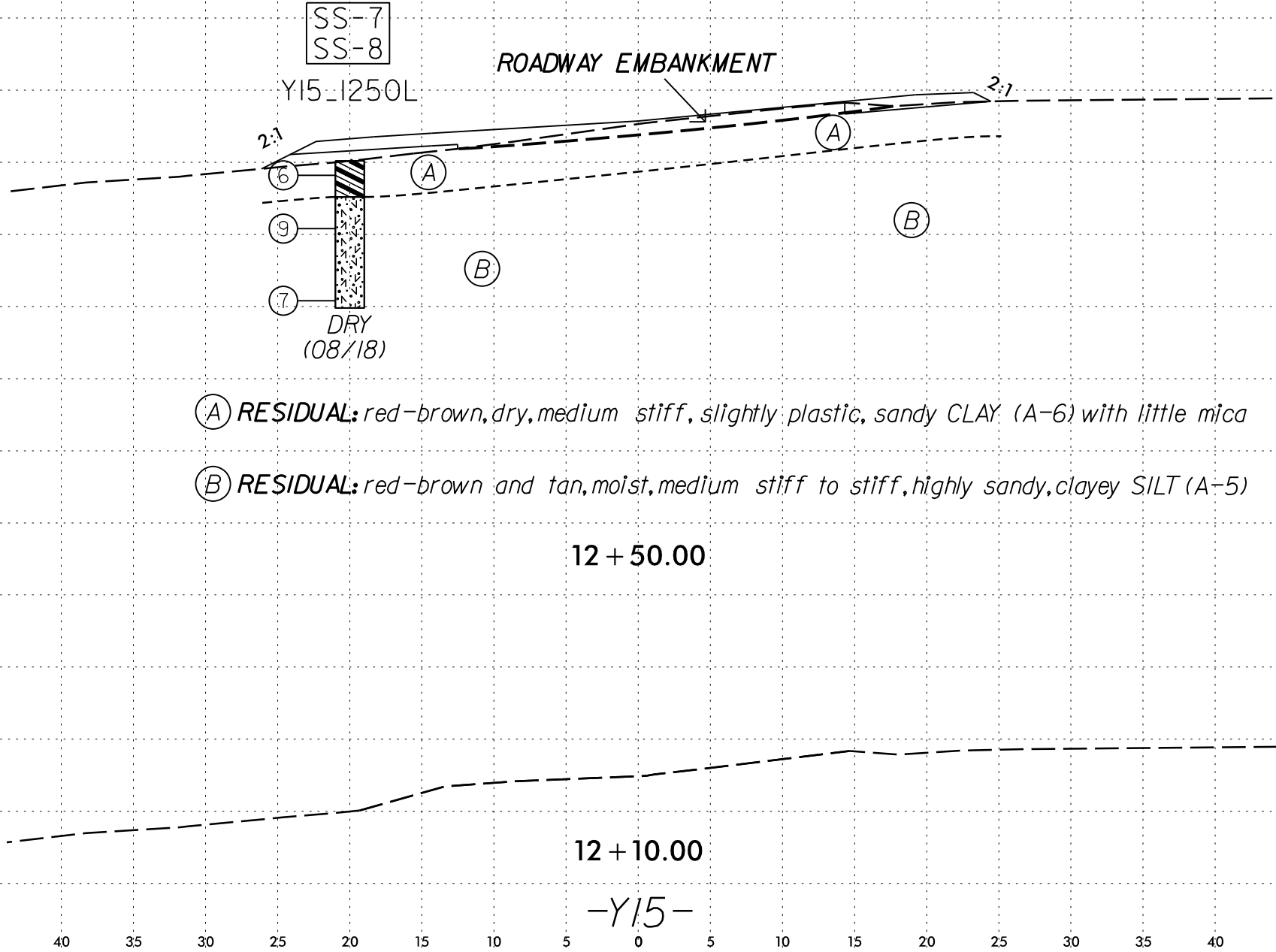
SS-223  
L6200

(A) RESIDUAL: orange-brown to tan-brown, moist, stiff to very stiff, highly plastic, highly sandy, silty CLAY (A-7-6)  
 (B) RESIDUAL: light tan and gray, moist, medium dense, clayey, silty SAND (A-2-5)

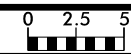
(A) RESIDUAL: orange-brown to tan-brown, moist, stiff to very stiff, highly plastic, highly sandy, silty CLAY (A-7-6)  
 (B) RESIDUAL: light tan and gray, moist, medium dense, clayey, silty SAND (A-2-5)

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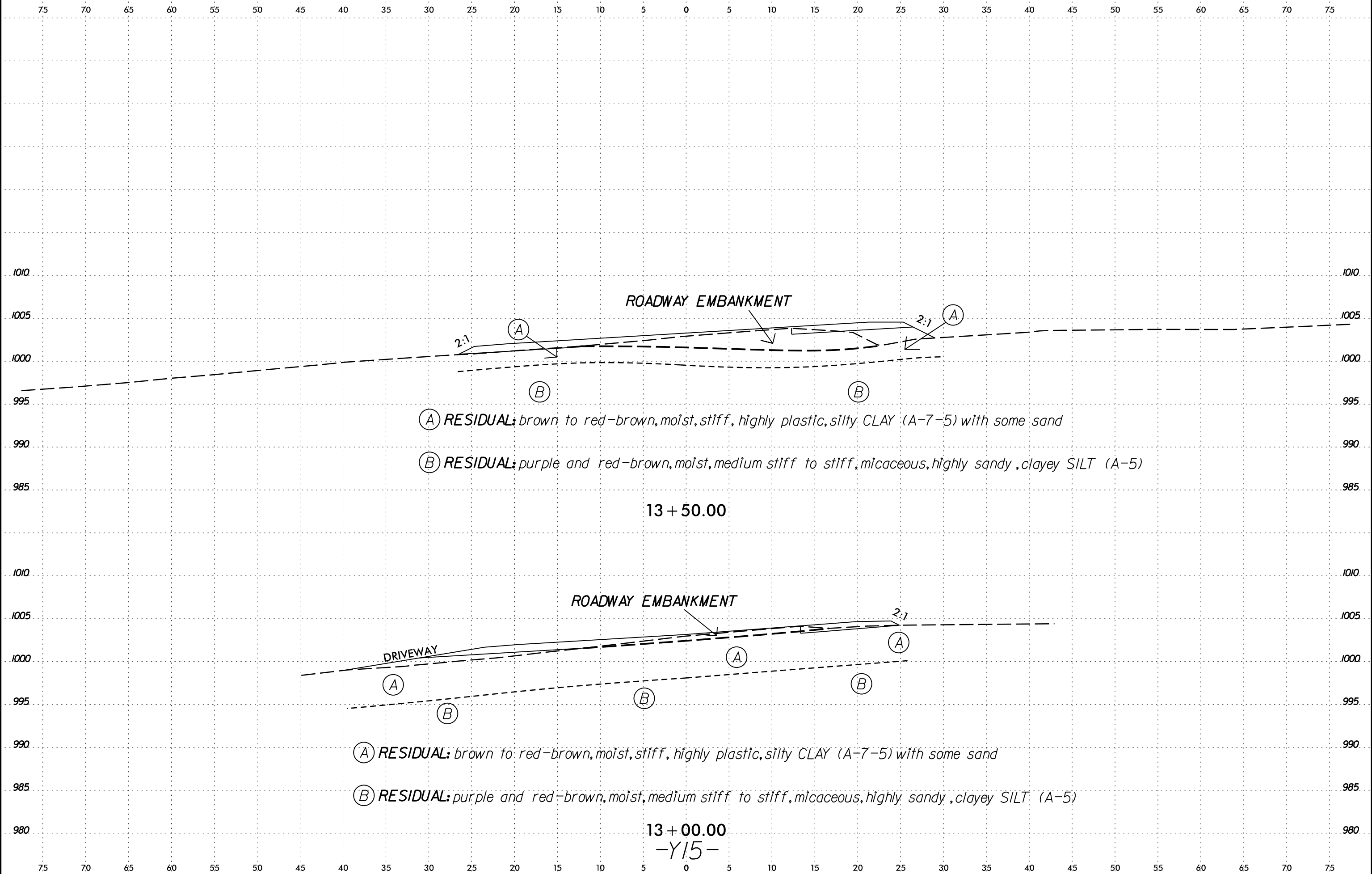
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-7	20'LT	12+50	0.0' - 1.5'	A-6(2)	38	11	32.9	22.6	13.7	30.9	93	74	45	18.0	N/A
SS-8	20'LT	12+50	3.7' - 5.2'	A-5(3)	53	5	26.9	25.7	7.4	40.0	100	84	56	31.9	N/A



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PROJ. REFERENCE NO.	SHEET NO.
U-6003	68



ROADWAY EMBANKMENT

2:1

2:1

- (A) RESIDUAL: brown to red-brown, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: purple and red-brown, moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)

13 + 50.00

ROADWAY EMBANKMENT

DRIVEWAY

2:1

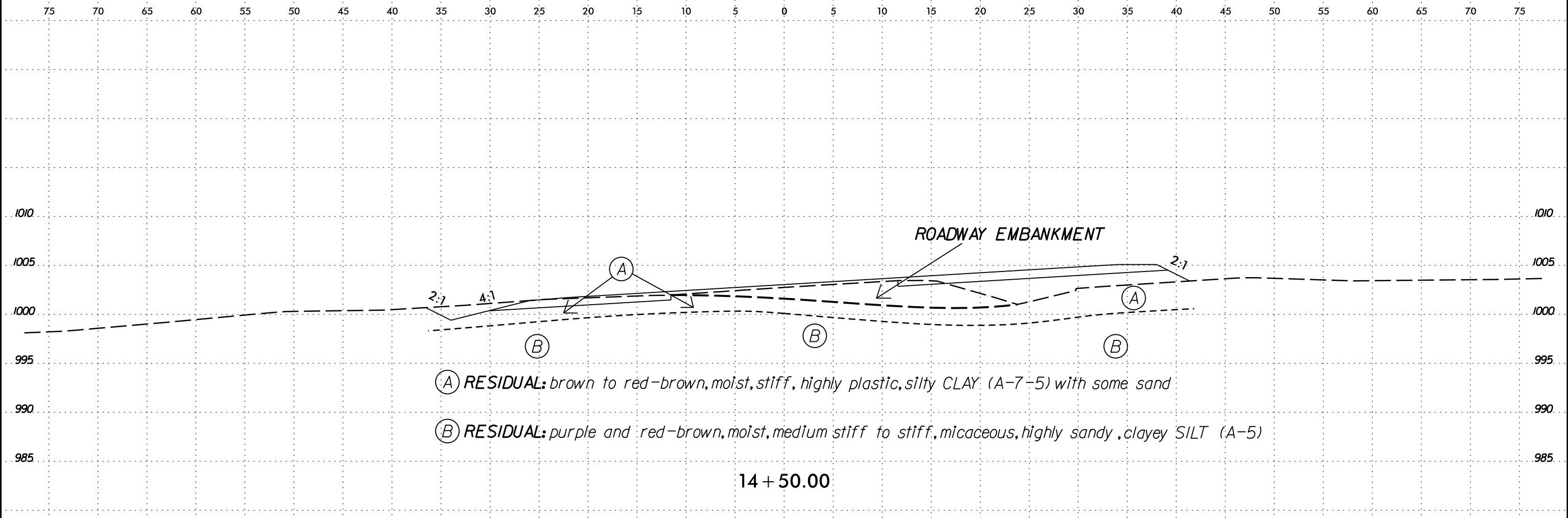
- (A) RESIDUAL: brown to red-brown, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: purple and red-brown, moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)

13 + 00.00

-Y15-

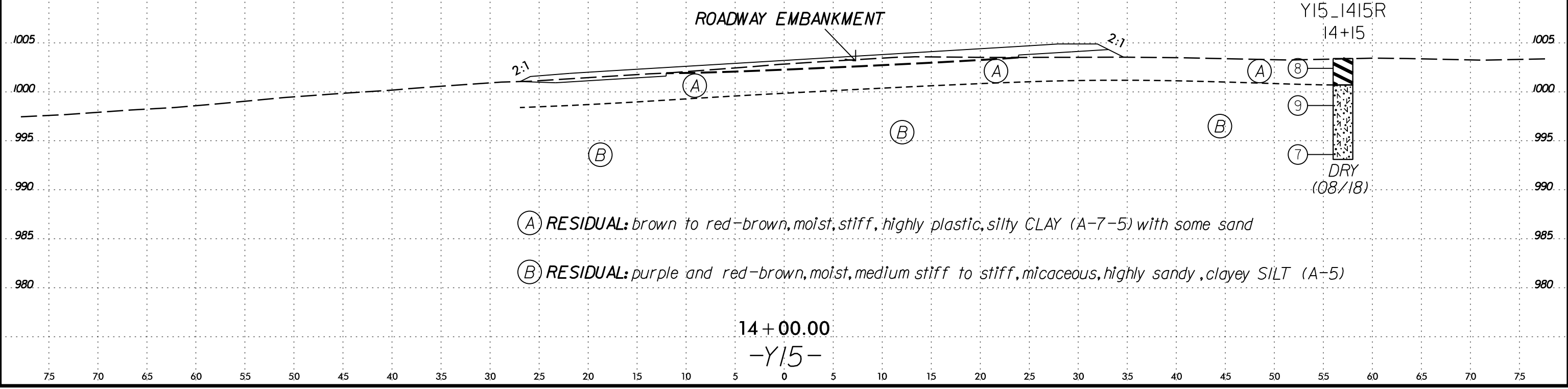


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 6/23/16



- (A) RESIDUAL: brown to red-brown, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: purple and red-brown, moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)

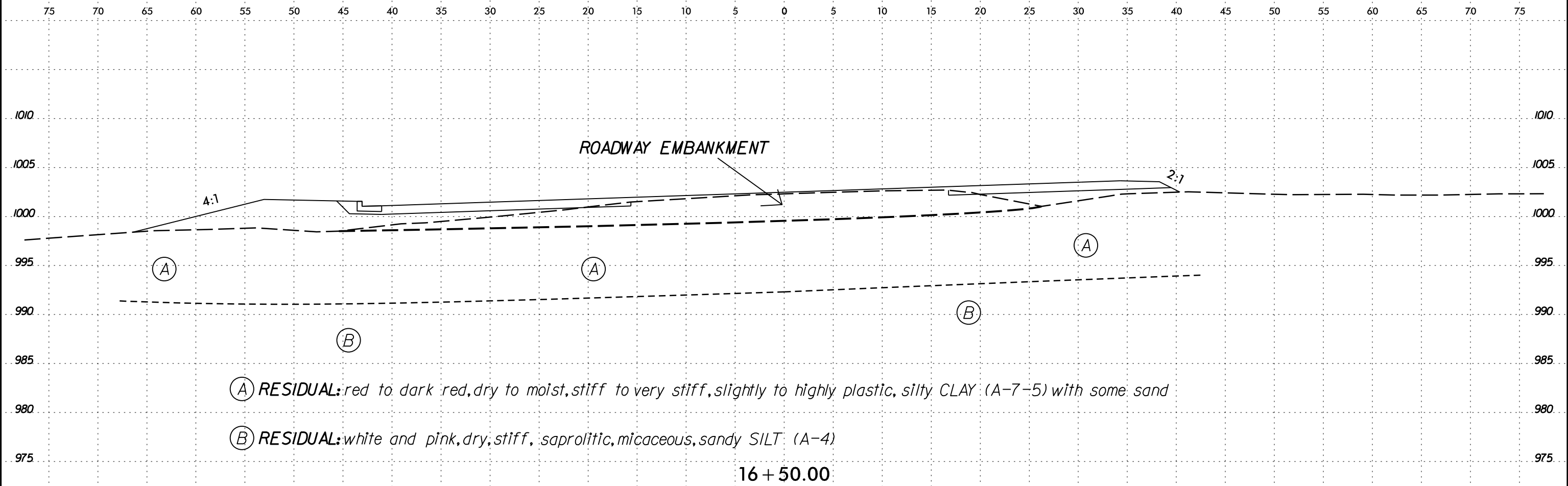
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-10	57'RT	14+15	0.0' - 1.5'	A-7-5(24)	68	32	17.3	14.3	6.4	62.0	98	88	69	32.2	NA



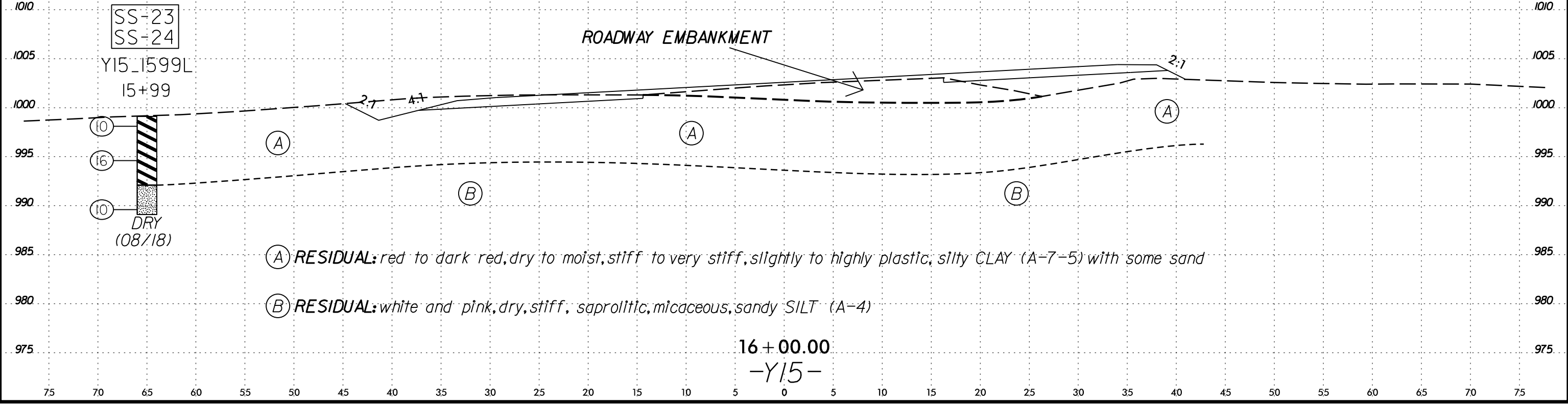
- (A) RESIDUAL: brown to red-brown, moist, stiff, highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: purple and red-brown, moist, medium stiff to stiff, micaceous, highly sandy, clayey SILT (A-5)



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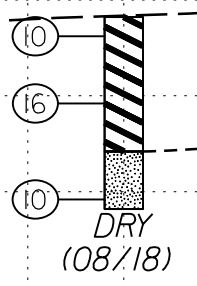


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-23	65'LT	15+99	0.0' - 1.5'	A-7-5(26)	71	38	22.4	11.8	6.8	59.0	99	84	67	26.1	N/A
SS-24	65'LT	15+99	3.5' - 5.0'	A-7-5(8)	58	14	27.1	25.9	14.2	32.8	100	80	56	16.8	N/A

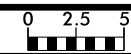


SS-23  
SS-24

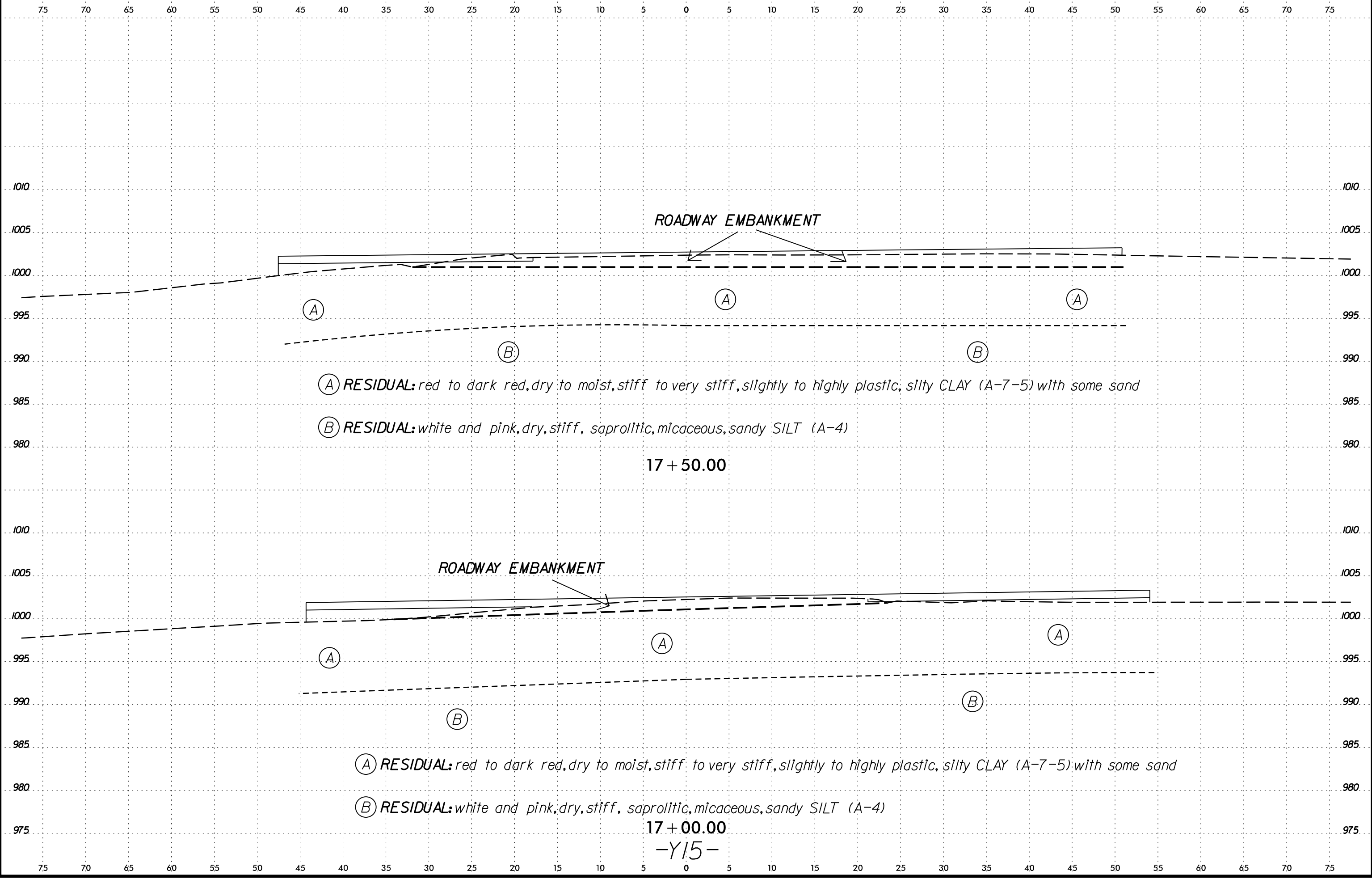
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33SUBSERIAL#533



PROJ. REFERENCE NO.	SHEET NO.
U-6003	72



ROADWAY EMBANKMENT

- (A) RESIDUAL: red to dark red, dry to moist, stiff to very stiff, slightly to highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: white and pink, dry, stiff, saprolitic, micaceous, sandy SILT (A-4)

17 + 50.00

ROADWAY EMBANKMENT

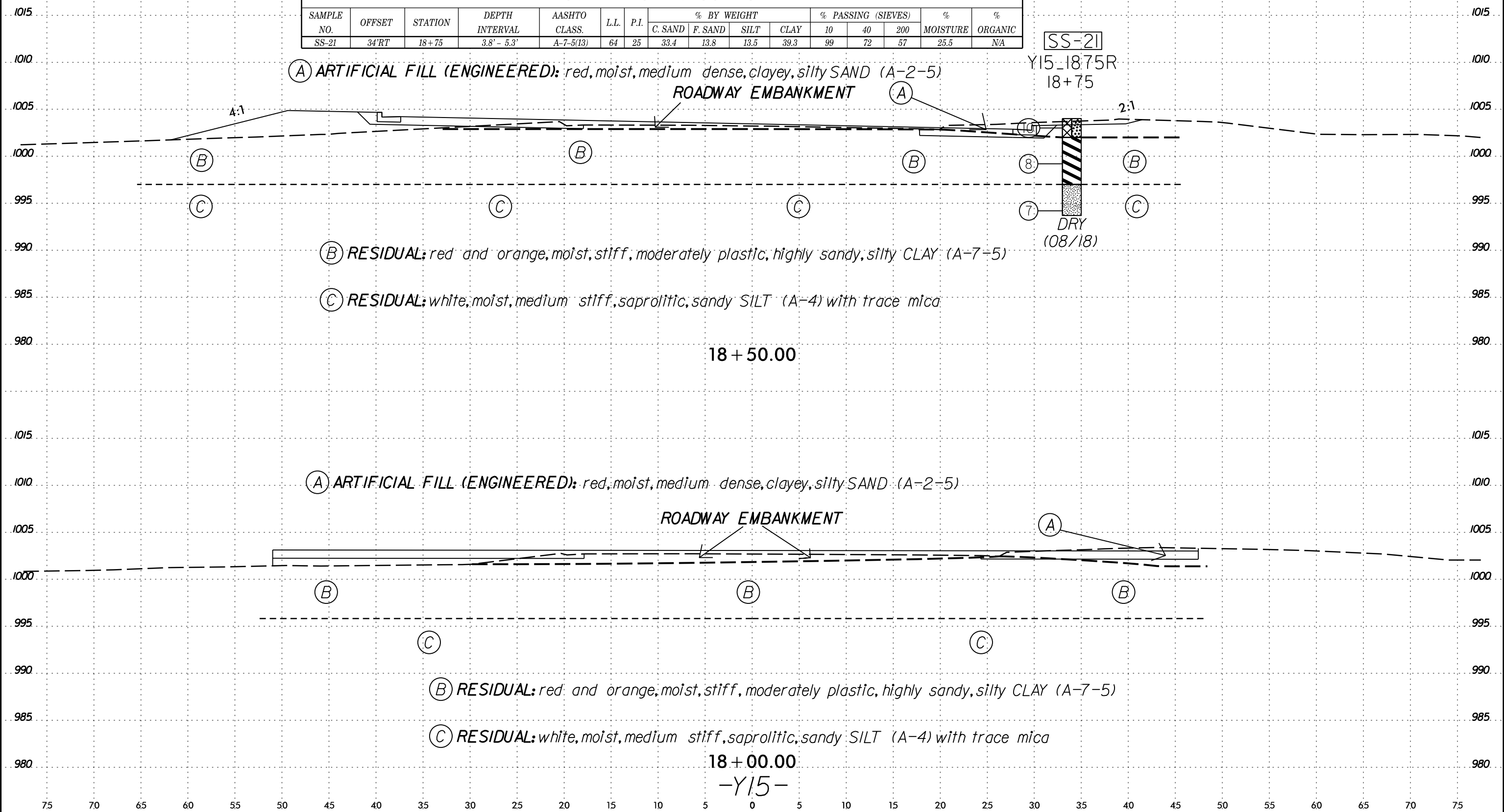
- (A) RESIDUAL: red to dark red, dry to moist, stiff to very stiff, slightly to highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: white and pink, dry, stiff, saprolitic, micaceous, sandy SILT (A-4)

17 + 00.00

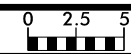
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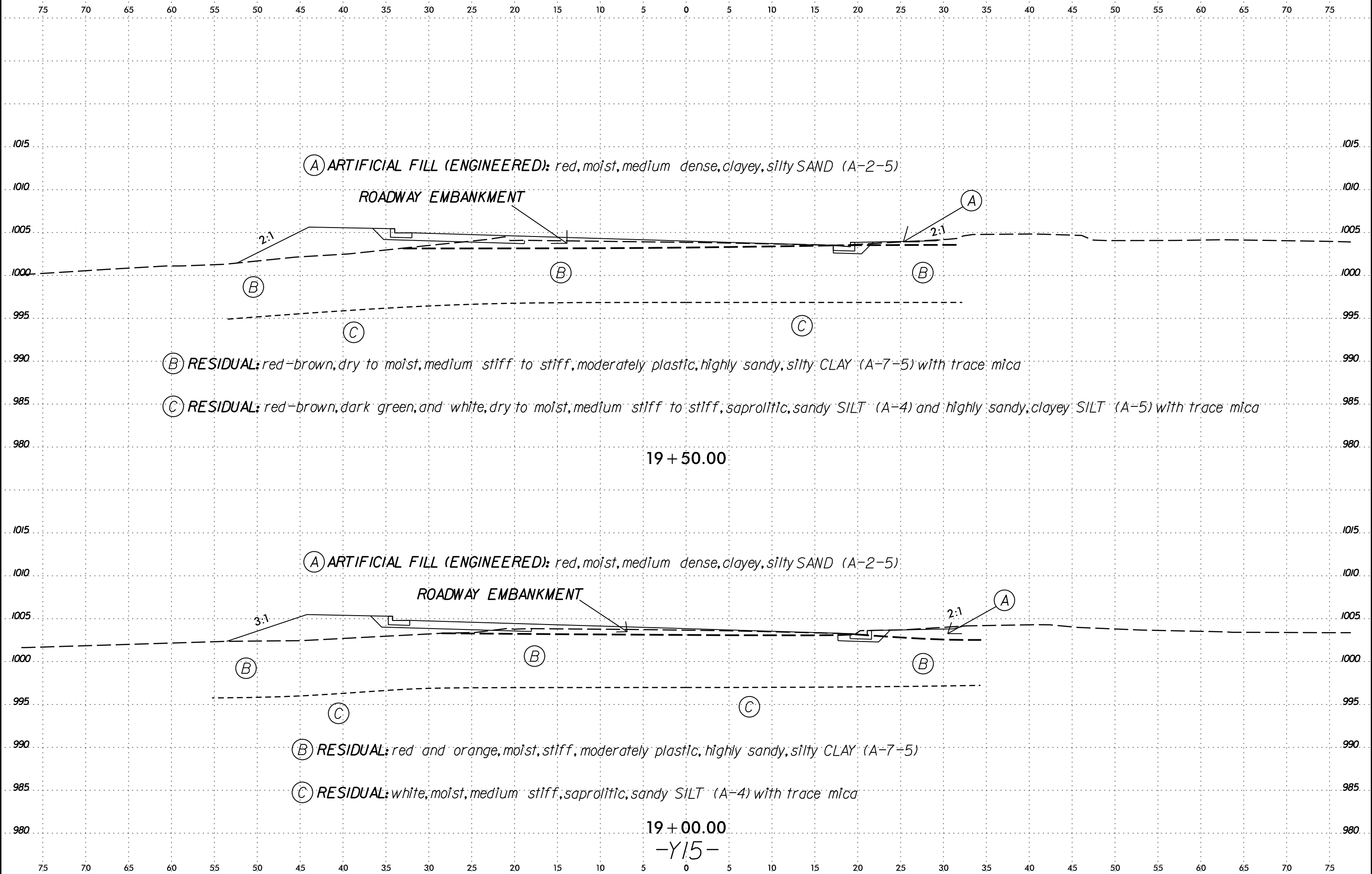
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-21	34'RT	18+75	3.8' - 5.3'	A-7-5(13)	64	25	33.4	13.8	13.5	39.3	99	72	57	25.5	NA



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SUBSEQUENT



PROJ. REFERENCE NO.	SHEET NO.
U-6003	74



(A) ARTIFICIAL FILL (ENGINEERED): red, moist, medium dense, clayey, silty SAND (A-2-5)

ROADWAY EMBANKMENT

(B) RESIDUAL: red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica

(C) RESIDUAL: red-brown, dark green, and white, dry to moist, medium stiff to stiff, saprolitic, sandy SILT (A-4) and highly sandy, clayey SILT (A-5) with trace mica

19 + 50.00

(A) ARTIFICIAL FILL (ENGINEERED): red, moist, medium dense, clayey, silty SAND (A-2-5)

ROADWAY EMBANKMENT

(B) RESIDUAL: red and orange, moist, stiff, moderately plastic, highly sandy, silty CLAY (A-7-5)

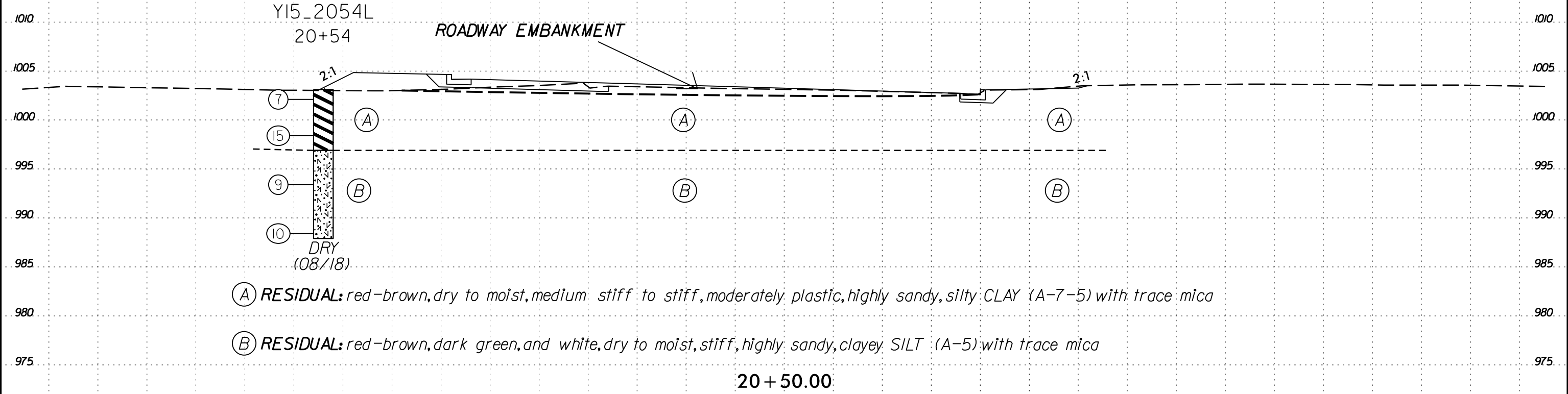
(C) RESIDUAL: white, moist, medium stiff, saprolitic, sandy SILT (A-4) with trace mica

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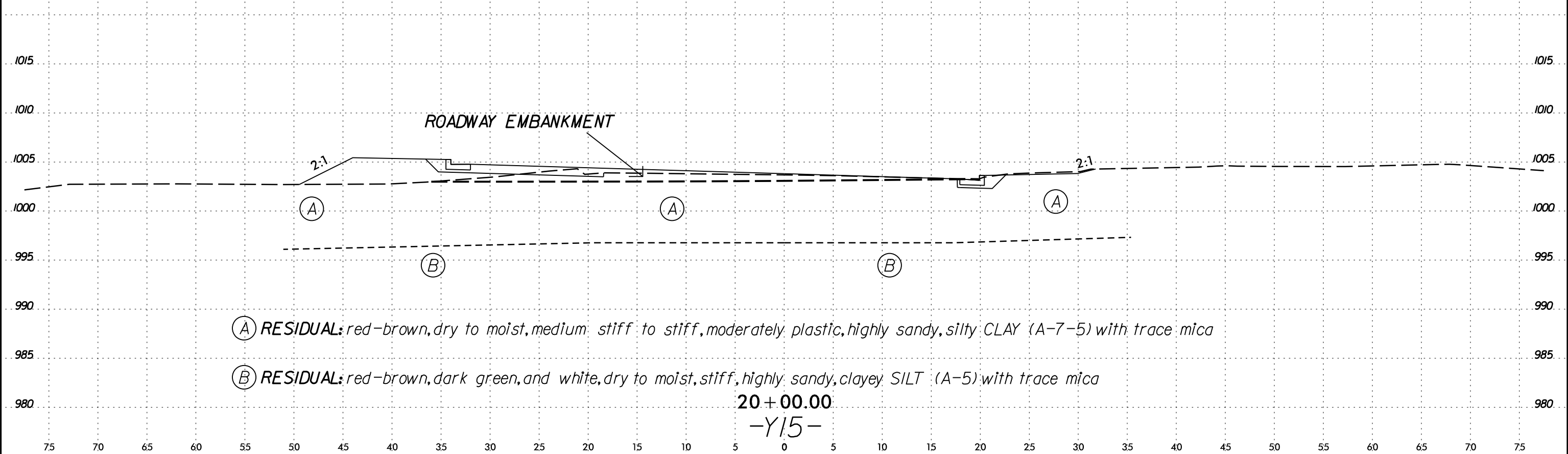
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2	47'LT	20+54	3.7' - 5.2'	A-7-5(12)	61	22	32.4	16.5	15.1	36.0	100	72	56	12.8	N/A



- (A) RESIDUAL: red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica
- (B) RESIDUAL: red-brown, dark green, and white, dry to moist, stiff, highly sandy, clayey SILT (A-5) with trace mica



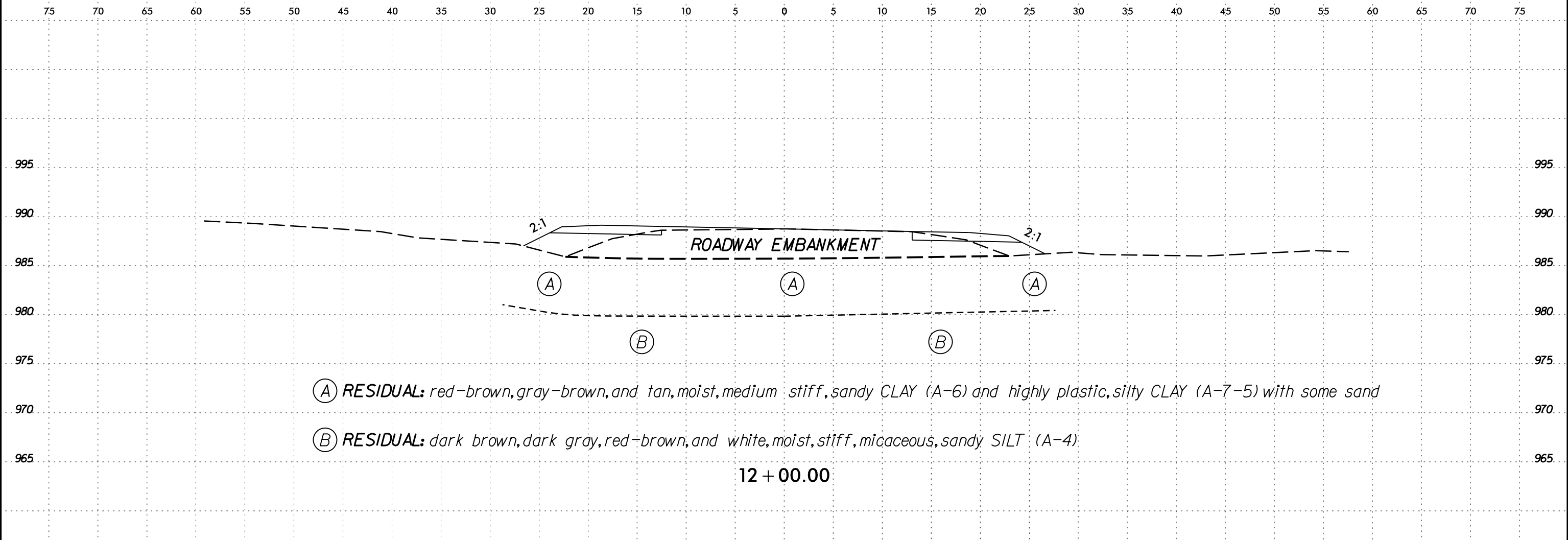
- (A) RESIDUAL: red-brown, dry to moist, medium stiff to stiff, moderately plastic, highly sandy, silty CLAY (A-7-5) with trace mica
- (B) RESIDUAL: red-brown, dark green, and white, dry to moist, stiff, highly sandy, clayey SILT (A-5) with trace mica

20+00.00  
-Y15-





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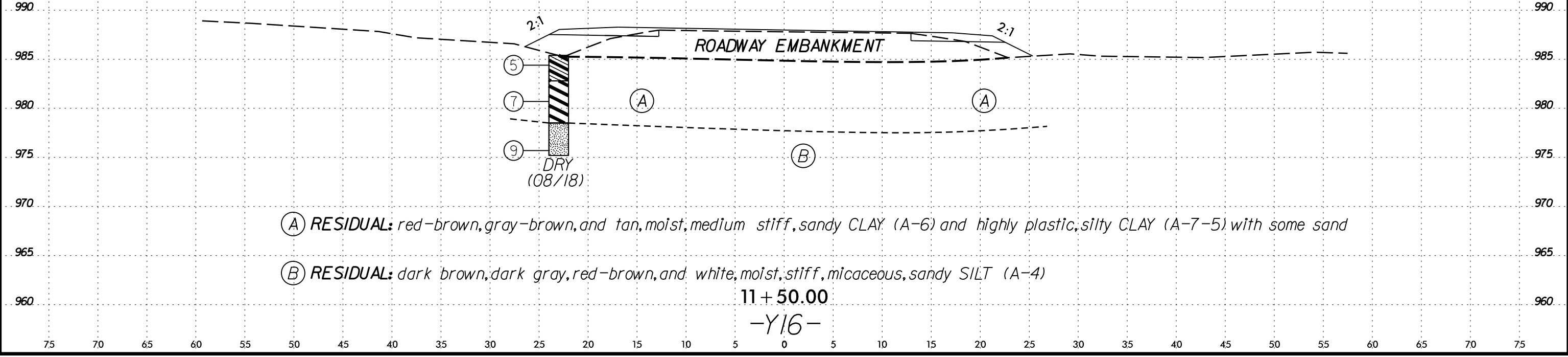


- (A) RESIDUAL: red-brown, gray-brown, and tan, moist, medium stiff, sandy CLAY (A-6) and highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: dark brown, dark gray, red-brown, and white, moist, stiff, micaceous, sandy SILT (A-4)

SOIL TEST RESULTS																
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C. SAND	F. SAND	SILT	CLAY	10	40	200			
SS-14	23'LT	11+50	0.0' - 1.5'	A-6(3)	39	16	35.8	22.7	11.0	30.5	95	71	43	16.7	NA	
SS-15	23'LT	11+50	3.7' - 5.2'	A-7-5(43)	97	51	17.6	10.1	5.8	66.5	99	87	73	37.9	NA	

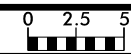
SS-14  
SS-15

Y16\_1150L

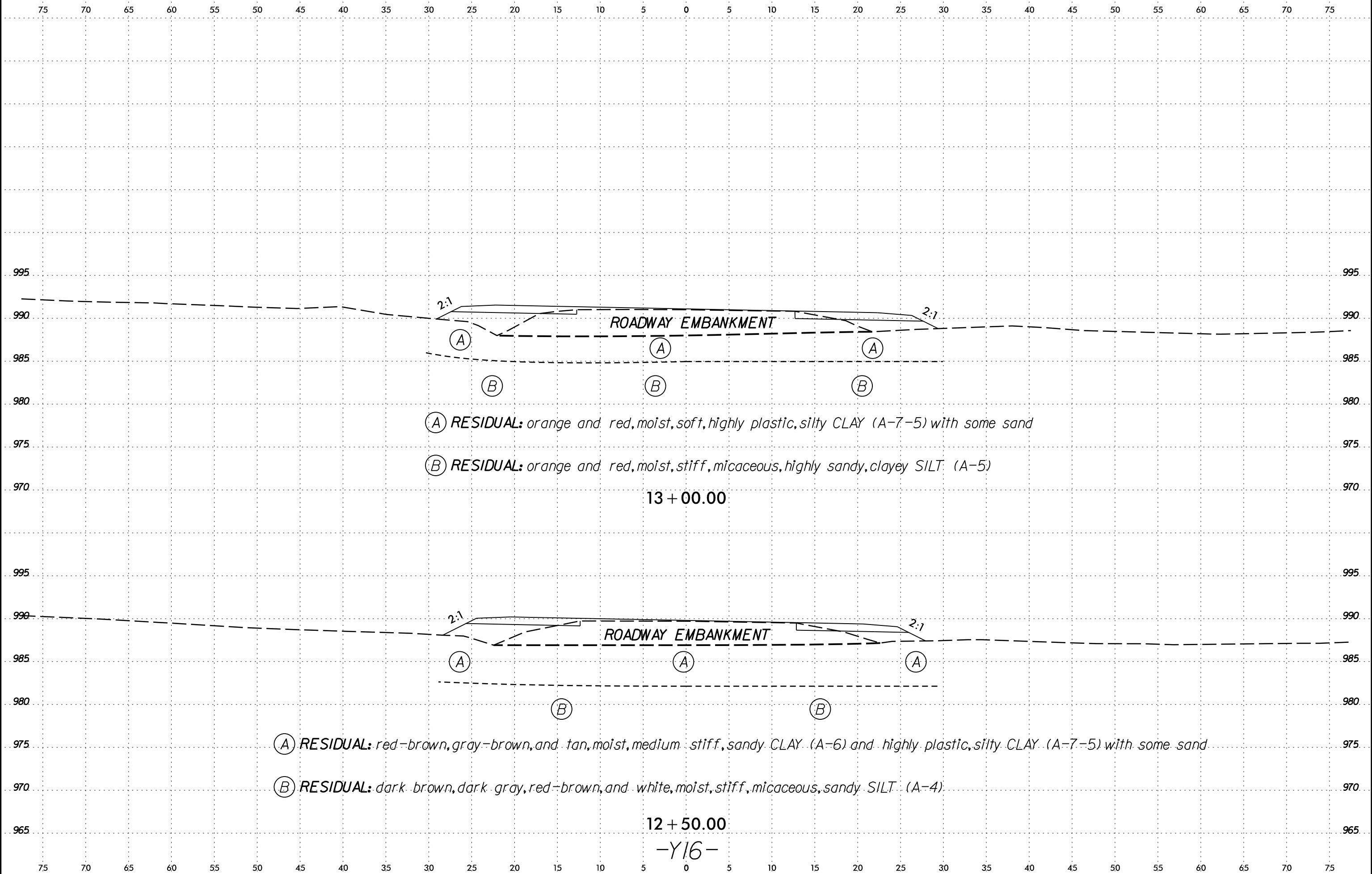


- (A) RESIDUAL: red-brown, gray-brown, and tan, moist, medium stiff, sandy CLAY (A-6) and highly plastic, silty CLAY (A-7-5) with some sand
- (B) RESIDUAL: dark brown, dark gray, red-brown, and white, moist, stiff, micaceous, sandy SILT (A-4)

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PROJ. REFERENCE NO.	SHEET NO.
U-6003	78



(A) RESIDUAL: orange and red, moist, soft, highly plastic, silty CLAY (A-7-5) with some sand

(B) RESIDUAL: orange and red, moist, stiff, micaceous, highly sandy, clayey SILT (A-5)

13 + 00.00

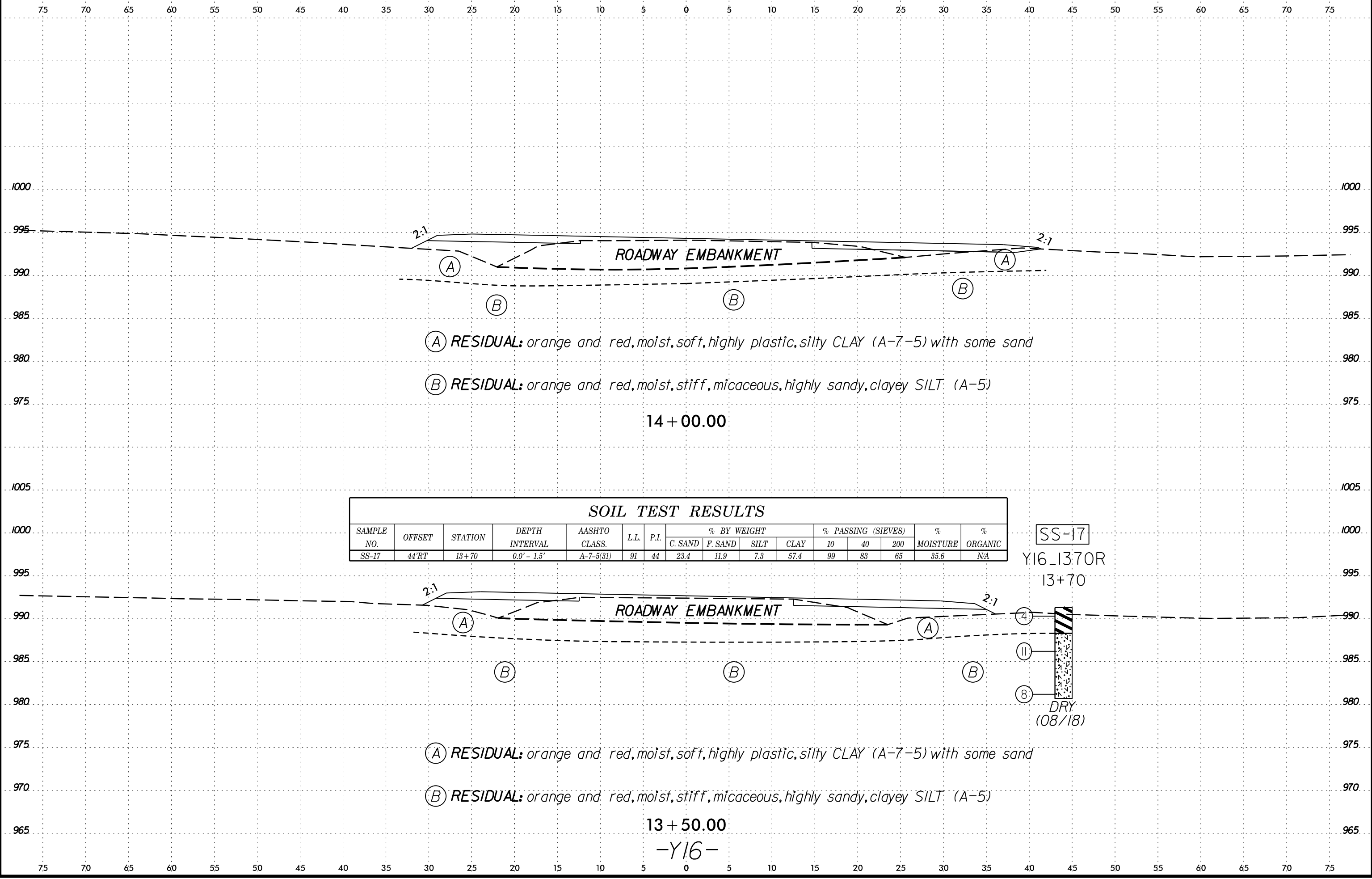
(A) RESIDUAL: red-brown, gray-brown, and tan, moist, medium stiff, sandy CLAY (A-6) and highly plastic, silty CLAY (A-7-5) with some sand

(B) RESIDUAL: dark brown, dark gray, red-brown, and white, moist, stiff, micaceous, sandy SILT (A-4)

12 + 50.00

-Y16-

19-OCT-2018 14:41  
 C:\Users\jgsmith\Documents\NCDOT Projects\Active Projects\U-6003 RDWY For NCDOT GEU\U6003-GEO-RDWY-Inventor-DRAFT\_Summit\CADD-GEO-TECH\XSC\U6003-GEO.XSL-Y16.dgn  
 6/23/16



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% ORGANIC	
							C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-17	44'RT	13+70	0.0' - 1.5'	A-7-5(31)	91	44	23.4	11.9	7.3	57.4	99	83	65	35.6	NA

(A) RESIDUAL: orange and red, moist, soft, highly plastic, silty CLAY (A-7-5) with some sand

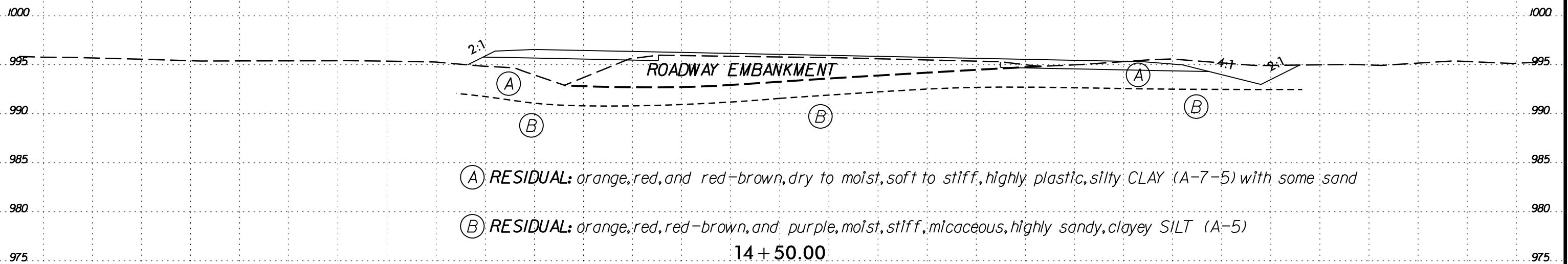
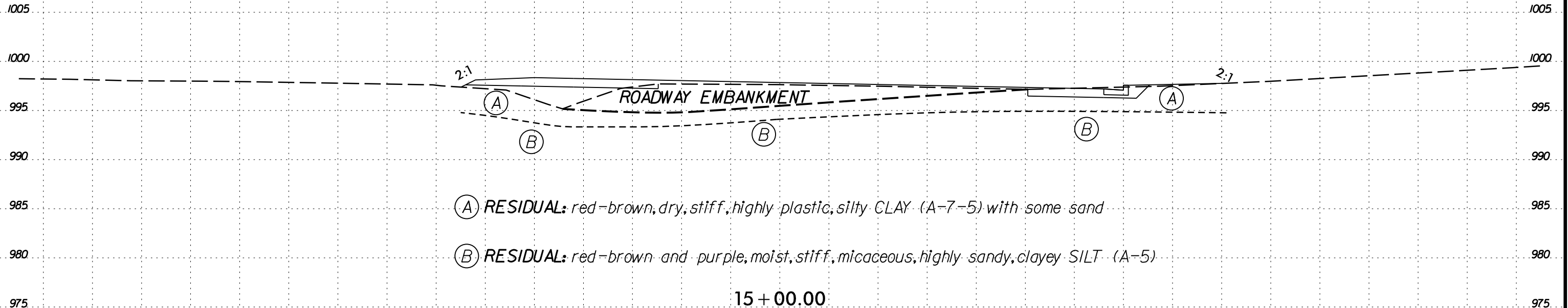
(B) RESIDUAL: orange and red, moist, stiff, micaceous, highly sandy, clayey SILT (A-5)

(A) RESIDUAL: orange and red, moist, soft, highly plastic, silty CLAY (A-7-5) with some sand

(B) RESIDUAL: orange and red, moist, stiff, micaceous, highly sandy, clayey SILT (A-5)

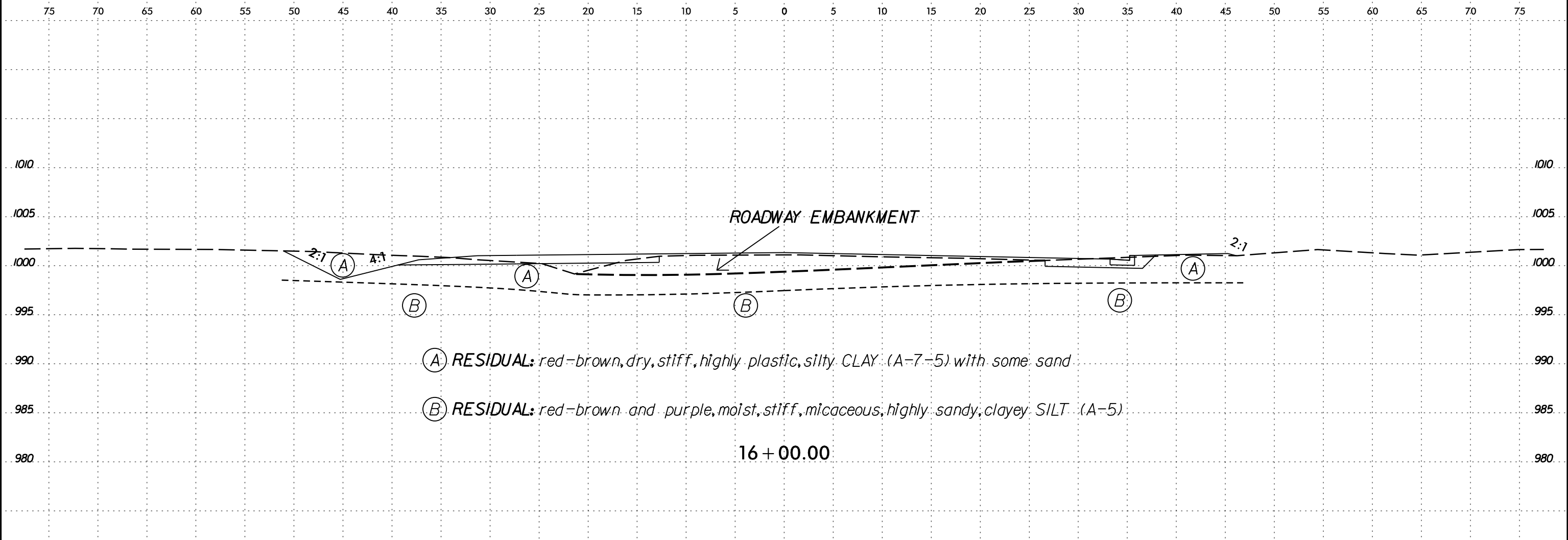


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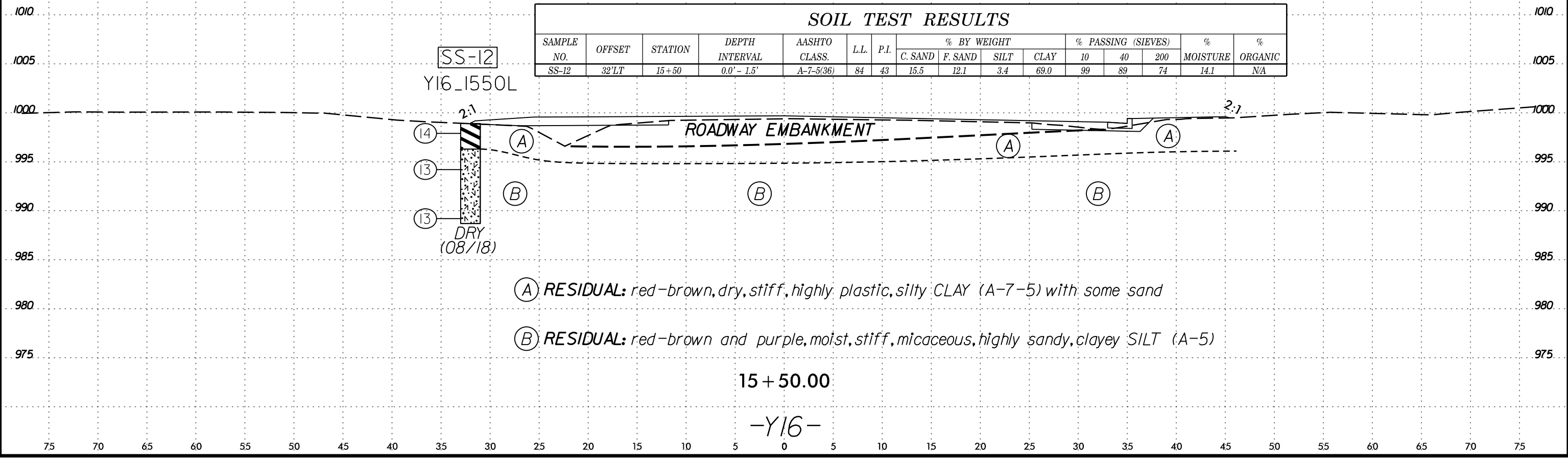


75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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 6/23/16



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		
SS-12	32'LT	15+50	0.0' - 1.5'	A-7-5(36)	84	43	15.5	12.1	3.4	69.0	99	89	74	14.1	NA





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T. I. P. No. U-6003

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**REPORT ON SAMPLES OF** Kernersville Loop from SR 1969 to NC 150

**REPORT ON SAMPLES OF** Kernersville Loop from SR 1969 to NC 150

**Project** 47138.1.1 **County** Forsyth **Owner** Geotech  
**Date: Sampled** August, 2018 **Received** 8/17/18 **Reported** 8/29/18  
**Sampled from** Roadway Investigation **By** Geotech  
**Submitted by** B. Smith 2008 Standard Specifications

**Project** 47138.1.1 **County** Forsyth **Owner** Geotech  
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8/29/18

8/29/18

**TEST RESULTS**

Proj. Sample No.	SS-7	SS-8	SS-10	SS-23	SS-24	SS-21
Boring No.	Y15_1250L	Y15_1250L	Y15_1415R	Y15_1599L	Y15_1599L	Y15_1875R
Retained #4 Sieve	% 3	0	1	0	0	0
Passing #10 Sieve	% 93	100	98	99	100	99
Passing #40 Sieve	% 74	84	88	84	80	72
Passing #200 Sieve	% 45	56	69	67	56	57

**TEST RESULTS**

Proj. Sample No.	SS-2	SS-14	SS-15	SS-17	SS-12	SS-5
Boring No.	Y15_2054L	Y16_1150L	Y16_1150L	Y16_1370R	Y16_1550L	L1202L
Retained #4 Sieve	% 0	2	0	0	0	0
Passing #10 Sieve	% 100	95	99	99	99	99
Passing #40 Sieve	% 72	71	87	83	89	89
Passing #200 Sieve	% 56	43	73	65	74	82

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 32.9	26.9	17.3	22.4	27.1	33.4
Fine Sand Ret - #270	% 22.6	25.7	14.3	11.8	25.9	13.8
Silt 0.05 - 0.005 mm	% 13.7	7.4	6.4	6.8	14.2	13.5
Clay < 0.005 mm	% 30.9	40.0	62.0	59.0	32.8	39.3
Passing #40 Sieve	% 79.3	84.1	89.4	84.1	80.7	72.5
Passing #200 Sieve	% 48.2	55.7	70.5	67.7	55.7	57.4

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 32.4	35.8	17.6	23.4	15.5	12.9
Fine Sand Ret - #270	% 16.5	22.7	10.1	11.9	12.1	6.1
Silt 0.05 - 0.005 mm	% 15.1	11.0	5.8	7.3	3.4	0.2
Clay < 0.005 mm	% 36.0	30.5	66.5	57.4	69.0	80.8
Passing #40 Sieve	% 72.7	74.8	87.3	84.4	89.9	90.0
Passing #200 Sieve	% 56.4	45.6	74.0	66.0	74.6	82.5

L. L.	38	53	68	71	58	64
P. I.	11	5	32	38	14	25
AASHTO Classification	A-6	A-5	A-7-5	A-7-5	A-7-5	A-7-5
Group Index	2	3	24	26	8	13
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	12+50	12+50	14+15	15+99	15+99	18+75
OFFSET	20'LT	20'LT	57'RT	65'LT	65'LT	34'RT
ALIGNMENT	-Y15-	-Y15-	-Y15-	-Y15-	-Y15-	-Y15-
Depth (Ft)	0.0	3.7	0.0	0.0	3.5	3.8
to	1.5	5.2	1.5	1.5	5.0	5.3
Natural Moisture %	18.0	31.9	32.2	26.1	16.8	25.5

L. L.	61	39	97	91	84	97
P. I.	22	16	51	44	43	51
AASHTO Classification	A-7-5	A-6	A-7-5	A-7-5	A-7-5	A-7-5
Group Index	12	3	43	31	36	50
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	20+54	11+50	11+50	13+70	15+50	12+02
OFFSET	47'LT	23'LT	23'LT	44'RT	32'LT	35'LT
ALIGNMENT	-Y15-	-Y16-	-Y16-	-Y16-	-Y16-	-L-
Depth (Ft)	3.7	0.0	3.7	0.0	0.0	0.0
to	5.2	1.5	5.2	1.5	1.5	1.5
Natural Moisture %	12.8	16.7	37.9	35.6	14.1	26.1

*Arnon Hackett*  
Soils Engineer

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**TEST RESULTS**

Proj. Sample No.	SS-27	SS-29	SS-30	SS-31	SS-32	SS-33
Boring No.	L1400L	L1600	L1600	L1800	L1800	L2000
Retained #4 Sieve	% 2	0	0	0	0	0
Passing #10 Sieve	% 91	96	95	98	97	93
Passing #40 Sieve	% 73	62	71	90	78	78
Passing #200 Sieve	% 54	39	49	77	56	60

**TEST RESULTS**

Proj. Sample No.	SS-34	SS-36	SS-37			
Boring No.	L2000	L2200	L2200			
Retained #4 Sieve	% 0	0	0			
Passing #10 Sieve	% 98	99	98			
Passing #40 Sieve	% 80	84	81			
Passing #200 Sieve	% 59	72	68			

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 27.0	44.8	32.0	13.2	26.5	23.0
Fine Sand Ret - #270	% 16.1	17.0	21.0	11.5	23.6	15.6
Silt 0.05 - 0.005 mm	% 14.8	16.3	14.9	17.6	25.8	16.3
Clay < 0.005 mm	% 42.2	21.9	32.1	57.7	24.2	45.1
Passing #40 Sieve	% 80.2	65.2	74.8	91.2	80.0	83.7
Passing #200 Sieve	% 60.0	41.1	51.2	78.5	57.3	64.8

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 24.5	19.3	20.5			
Fine Sand Ret - #270	% 21.7	10.8	15.8			
Silt 0.05 - 0.005 mm	% 10.3	0.1	9.9			
Clay < 0.005 mm	% 43.6	69.7	53.8			
Passing #40 Sieve	% 81.2	84.8	83.3			
Passing #200 Sieve	% 60.5	73.0	69.8			

L. L.	52	31	53	77	49	61
P. I.	16	8	8	38	2	28
AASHTO Classification	A-7-5	A-4	A-5	A-7-5	A-5	A-7-5
Group Index	8	0	3	34	2	16
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	14+00	16+00	16+00	18+00	18+00	20+00
OFFSET	7'LT	8'RT	8'RT	CL	CL	CL
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	4.0	0.0	3.4	0.0	3.4	0.0
to	5.5	1.5	4.9	1.5	4.9	1.5
Natural Moisture %	19.6	14.2	20.9	28.5	19.0	21.5

L. L.	57	94	63			
P. I.	25	57	27			
AASHTO Classification	A-7-5	A-7-5	A-7-5			
Group Index	13	45	19			
pH	N/A	N/A	N/A			
Station	20+00	22+00	22+00			
OFFSET	CL	CL	CL			
ALIGNMENT	-L-	-L-	-L-			
Depth (Ft)	3.2	0.0	3.7			
to	4.7	1.5	5.2			
Natural Moisture %	21.0	30.8	35.8			

*Aaron Hackett*  
Soils Engineer

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**TEST RESULTS**

Proj. Sample No.	SS-40	SS-45	SS-48	SS-50	SS-51	SS-71
Boring No.	L2388L	L2422R	L2678	L2800R	L2800R	L3034C
Retained #4 Sieve	% 2	0	0	2	5	1
Passing #10 Sieve	% 98	100	98	95	90	98
Passing #40 Sieve	% 88	86	79	68	57	73
Passing #200 Sieve	% 73	39	45	36	26	34

9/5/18

**TEST RESULTS**

Proj. Sample No.	SS-67	SS-61	SS-78	SS-79	SS-80	SS-81
Boring No.	L3064C	L3067C	L3200L	L3200L	L3200L	L3200L
Retained #4 Sieve	% 0	0	0	0	0	1
Passing #10 Sieve	% 100	99	98	97	96	97
Passing #40 Sieve	% 94	78	73	76	75	65
Passing #200 Sieve	% 28	29	43	48	57	28

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 15.2	24.2	30.3	40.9	52.1	42.8
Fine Sand Ret - #270	% 12.8	46.2	30.6	25.3	21.5	25.1
Silt 0.05 - 0.005 mm	% 9.8	12.6	12.3	9.9	0.3	10.9
Clay < 0.005 mm	% 62.2	16.9	26.9	23.9	26.0	21.2
Passing #40 Sieve	% 89.7	85.8	80.7	71.7	63.0	74.4
Passing #200 Sieve	% 74.9	39.3	46.2	37.4	28.6	34.8

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 22.3	34.6	36.8	31.9	28.4	45.6
Fine Sand Ret - #270	% 53.6	42.2	22.5	21.4	15.6	32.6
Silt 0.05 - 0.005 mm	% 7.1	11.7	9.7	1.7	15.5	14.1
Clay < 0.005 mm	% 17.0	11.5	31.0	45.0	40.4	7.7
Passing #40 Sieve	% 94.4	79.3	74.7	78.0	78.4	67.0
Passing #200 Sieve	% 27.9	29.5	43.7	49.2	59.7	28.3

L. L.	70	51	51	32	38	35
P. I.	37	9	0	1	15	8
AASHTO Classification	A-7-5	A-5	A-5	A-4	A-2-6	A-2-4
Group Index	29	1	0	0	1	0
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	23+88	24+22	26+78	28+00	28+00	30+34
OFFSET	27'LT	40'RT	CL	25'RT	25'RT	52'RT
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	0.0	4.0	0.0	0.0	3.6	0.0
to	1.5	5.5	1.5	1.5	5.1	1.5
Natural Moisture %	27.4	23.7	39.7	22.5	14.1	35.0

L. L.	26	51	70	58	58	43
P. I.	0	9	35	24	26	6
AASHTO Classification	A-2-4	A-2-5	A-7-5	A-7-5	A-7-5	A-2-5
Group Index	0	0	10	8	13	0
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	30+64	30+67	32+00	32+00	32+00	32+00
OFFSET	CL	49'LT	15'LT	15'LT	15'LT	15'LT
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	3.8	8.5	0.0	3.3	8.3	13.3
to	5.3	10.0	1.5	4.8	9.8	14.8
Natural Moisture %	31.4	32.4	29.2	4.6	33.4	33.0

*Aaron Hackett*  
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**TEST RESULTS**

Proj. Sample No.	SS-84	SS-85	SS-91	SS-92	SS-93	SS-96
Boring No.	L3212R	L3212R	L3385L	L3385L	L3385L	L3420R
Retained #4 Sieve	% 14	1	0	0	0	1
Passing #10 Sieve	% 75	98	99	98	98	97
Passing #40 Sieve	% 51	88	88	74	77	81
Passing #200 Sieve	% 29	42	39	21	21	53

9/5/18

**TEST RESULTS**

Proj. Sample No.	SS-97	SS-100	SS-102	SS-103	SS-106
Boring No.	L3420R	L3420R	L3600R	L3600R	L3600R
Retained #4 Sieve	% 0	2	0	0	3
Passing #10 Sieve	% 100	97	98	99	92
Passing #40 Sieve	% 81	72	80	78	64
Passing #200 Sieve	% 49	41	61	46	21

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 41.7	22.1	24.9	42.8	38.2	26.2
Fine Sand Ret - #270	% 25.4	42.3	43.4	41.6	47.1	21.7
Silt 0.05 - 0.005 mm	% 16.3	24.9	19.8	11.5	10.6	10.6
Clay < 0.005 mm	% 16.7	10.7	12.0	4.1	4.1	41.5
Passing #40 Sieve	% 68.9	90.4	88.4	75.1	77.8	83.5
Passing #200 Sieve	% 39.2	43.4	39.0	21.0	21.0	54.7

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%					
Coarse Sand Ret - #60	% 27.4	35.9	24.8	29.2	44.0
Fine Sand Ret - #270	% 34.1	31.4	17.2	33.4	39.8
Silt 0.05 - 0.005 mm	% 23.8	21.2	7.9	10.7	6.0
Clay < 0.005 mm	% 14.7	11.5	50.1	26.7	10.2
Passing #40 Sieve	% 81.4	73.7	81.8	79.5	69.3
Passing #200 Sieve	% 49.4	42.0	61.9	47.1	23.1

L. L.	46	41	45	47	44	61
P. I.	1	2	1	0	0	25
AASHTO Classification	A-2-5	A-5	A-5	A-2-5	A-2-5	A-7-5
Group Index	0	0	0	0	0	11
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	32+12	32+12	33+85	33+85	33+85	34+20
OFFSET	40'RT	40'RT	28'LT	28'LT	28'LT	40'RT
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	3.8	8.8	3.2	8.2	13.2	0.0
to	5.3	10.3	4.7	9.7	14.7	1.5
Natural Moisture %	17.9	20.9	25.4	14.5	15.8	30.1

L. L.	49	57	66	55	45
P. I.	3	14	28	10	2
AASHTO Classification	A-5	A-7-5	A-7-5	A-5	A-2-5
Group Index	1	3	17	3	0
pH	N/A	N/A	N/A	N/A	N/A
Station	34+20	34+20	36+00	36+00	36+00
OFFSET	40'RT	40'RT	40'RT	40'RT	40'RT
ALIGNMENT	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	4.0	19.0	0.0	3.8	23.8
to	5.5	20.5	1.5	5.3	25.3
Natural Moisture %	39.6	35.8	33.9	20.8	18.0

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**Project** 47138.1.1 **County** Forsyth **Owner** Geotech  
**Date: Sampled** August, 2018 **Received** 8/17/18 **Reported** 9/13/18  
**Sampled from** Roadway Investigation **By** Geotech  
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**TEST RESULTS**

Proj. Sample No.	SS-109	SS-124	SS-125	SS-128	SS-116	SS-121
Boring No.	L3600L	L3800L	L3800L	L3800L	L3800R	L3800R
Retained #4 Sieve	% 4	0	0	0	1	1
Passing #10 Sieve	% 94	98	100	99	99	92
Passing #40 Sieve	% 73	77	88	77	81	72
Passing #200 Sieve	% 50	45	52	31	58	39

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**TEST RESULTS**

Proj. Sample No.	SS-131	SS-132	SS-134	SS-136	SS-140	SS-142
Boring No.	L4015L	L4015L	L4015L	L4020R	L4020R	L4185L
Retained #4 Sieve	% 4	0	9	0	0	0
Passing #10 Sieve	% 94	98	90	98	100	98
Passing #40 Sieve	% 76	77	70	78	86	73
Passing #200 Sieve	% 51	27	17	54	40	47

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 30.8	32.9	21.0	35.3	26.8	33.7
Fine Sand Ret - #270	% 18.3	24.6	33.4	40.8	17.6	30.0
Silt 0.05 - 0.005 mm	% 12.8	5.4	8.9	12.9	9.3	21.5
Clay < 0.005 mm	% 38.0	37.1	36.6	11.1	46.3	14.9
Passing #40 Sieve	% 77.4	78.5	88.2	77.8	81.7	78.3
Passing #200 Sieve	% 53.9	46.0	52.1	31.6	58.5	42.9

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 28.5	38.2	43.3	29.4	23.6	36.2
Fine Sand Ret - #270	% 20.5	39.4	42.8	17.6	46.7	19.0
Silt 0.05 - 0.005 mm	% 11.2	5.0	4.7	8.3	20.8	9.4
Clay < 0.005 mm	% 39.8	17.4	9.1	44.7	9.0	35.3
Passing #40 Sieve	% 80.8	79.4	76.9	79.6	86.4	74.4
Passing #200 Sieve	% 53.8	27.5	18.8	55.3	39.6	47.5

L. L.	48	46	50	43	65	61
P. I.	15	20	12	3	26	2
AASHTO Classification	A-7-5	A-7-6	A-7-5	A-2-5	A-7-5	A-5
Group Index	6	5	5	0	14	0
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	36+00	38+00	38+00	38+00	38+00	38+00
OFFSET	26'LT	15'LT	15'LT	15'LT	40'RT	40'RT
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	0.0	0.0	3.5	18.5	0.0	23.3
to	1.5	1.5	5.0	20.0	1.5	24.8
Natural Moisture %	12.1	18.7	20.0	14.9	34.4	41.7

L. L.	55	49	35	58	45	45
P. I.	24	4	3	25	5	19
AASHTO Classification	A-7-5	A-2-5	A-2-4	A-7-5	A-5	A-7-6
Group Index	9	0	0	12	0	6
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	40+15	40+15	40+15	40+20	40+20	41+85
OFFSET	40'LT	40'LT	40'LT	30'RT	30'RT	40'LT
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	0.0	3.7	13.7	0.0	19.1	0.0
to	1.5	5.2	15.2	1.5	20.6	1.5
Natural Moisture %	18.7	21.3	13.6	25.6	26.8	24.3

*Aaron Hackett*

Soils Engineer

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T. I. P. No. U-6003

T. I. P. No. U-6003

**REPORT ON SAMPLES OF** Kernersville Loop from SR 1969 to NC 150

**REPORT ON SAMPLES OF** Kernersville Loop from SR 1969 to NC 150

**Project** 47138.1.1 **County** Forsyth **Owner** Geotech  
**Date: Sampled** August, 2018 **Received** 8/17/18 **Reported** 9/13/18  
**Sampled from** Roadway Investigation **By** Geotech  
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**TEST RESULTS**

Proj. Sample No.	SS-143	SS-147	SS-148			
Boring No.	L4185L	L4200R	L4200R			
Retained #4 Sieve	% 0	2	0			
Passing #10 Sieve	% 100	97	98			
Passing #40 Sieve	% 83	76	70			
Passing #200 Sieve	% 46	46	28			

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**TEST RESULTS**

Proj. Sample No.	SS-151	SS-157	SS-172	SS-173	SS-177	SS-179
Boring No.	L4420C	L4460C	L4620	L4620	L4800R	L4800R
Retained #4 Sieve	% 0	12	0	0	0	0
Passing #10 Sieve	% 100	77	98	99	98	100
Passing #40 Sieve	% 93	45	70	73	83	81
Passing #200 Sieve	% 42	13	41	31	51	19

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	%	27.1	31.5	42.8		
Fine Sand Ret - #270	%	32.9	23.9	34.3		
Silt 0.05 - 0.005 mm	%	16.1	8.6	7.3		
Clay < 0.005 mm	%	23.9	36.0	15.6		
Passing #40 Sieve	%	83.4	78.2	70.7		
Passing #200 Sieve	%	46.2	48.0	28.2		

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	20.2	57.0	40.3	40.7	27.0	40.8
Fine Sand Ret - #270	%	44.6	30.2	19.9	32.1	25.1	45.1
Silt 0.05 - 0.005 mm	%	23.0	7.7	11.2	15.4	13.3	10.8
Clay < 0.005 mm	%	12.3	5.2	28.6	11.8	34.7	3.3
Passing #40 Sieve	%	93.3	58.4	72.1	74.1	84.0	81.4
Passing #200 Sieve	%	41.6	17.2	42.3	31.0	51.7	19.3

L. L.	53	53	50			
P. I.	10	20	3			
AASHTO Classification	A-5	A-7-5	A-2-5			
Group Index	3	6	0			
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	41+85	42+00	42+00			
OFFSET	40'LT	40'RT	40'RT			
ALIGNMENT	-L-	-L-	-L-			
Depth (Ft)	3.3	0.0	3.5			
to	4.8	1.5	5.0			
Natural Moisture %	24.5	24.1	20.7			

L. L.	35	44	49	50	56	52
P. I.	8	4	21	4	14	11
AASHTO Classification	A-4	A-1-b	A-7-6	A-2-5	A-7-5	A-2-7
Group Index	1	0	4	0	6	0
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	44+20	44+60	46+20	46+20	48+00	48+00
OFFSET	66'LT	CL	CL	CL	40'RT	40'RT
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	0.0	3.4	0.0	3.8	0.0	9.4
to	1.5	4.9	1.5	5.3	1.5	10.9
Natural Moisture %	19.4	10.5	16.4	19.0	26.1	15.0

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**REPORT ON SAMPLES OF** Kernersville Loop from SR 1969 to NC 150

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**Project** 47138.1.1 **County** Forsyth **Owner** Geotech  
**Date: Sampled** August 2018 **Received** 8/17/18 **Reported** 9/13/18  
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**Submitted by** B. Smith 2008 Standard Specifications

**Project** 47138.1.1 **County** Forsyth **Owner** Geotech  
**Date: Sampled** 8/1/18 **Received** 8/17/18 **Reported** 9/13/18  
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10/3/18

**TEST RESULTS**

Proj. Sample No.	SS-182	SS-183	SS-184	SS-152		
Boring No.	L4800L	L4800L	L4800L	L4420C		
Retained #4 Sieve	% 1	0	0	6		
Passing #10 Sieve	% 99	99	100	88		
Passing #40 Sieve	% 86	74	85	66		
Passing #200 Sieve	% 60	36	28	18		

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**TEST RESULTS**

Proj. Sample No.	SS-194	SS-189	SS-190	SS-192	SS-225	SS-226
Boring No.	L5000L	L5000R	L5000R	L5000R	L5200R	L5200R
Retained #4 Sieve	% 0	1	0	1	0	0
Passing #10 Sieve	% 91	98	100	97	99	100
Passing #40 Sieve	% 74	80	76	69	83	80
Passing #200 Sieve	% 50	55	36	41	66	54

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 21.4	38.0	32.5	45.9		
Fine Sand Ret - #270	% 21.0	30.6	45.8	37.4		
Silt 0.05 - 0.005 mm	% 13.8	17.2	14.4	10.9		
Clay < 0.005 mm	% 43.7	14.2	7.3	5.8		
Passing #40 Sieve	% 86.9	75.4	85.2	74.2		
Passing #200 Sieve	% 60.9	36.8	28.2	19.8		

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 28.5	27.1	38.0	39.3	22.9	28.2
Fine Sand Ret - #270	% 19.2	20.7	32.0	26.1	13.5	21.6
Silt 0.05 - 0.005 mm	% 13.0	12.5	13.3	24.3	19.0	35.5
Clay < 0.005 mm	% 39.4	39.8	16.7	10.3	44.6	14.6
Passing #40 Sieve	% 81.9	81.5	75.9	71.2	84.2	80.7
Passing #200 Sieve	% 55.5	56.2	35.7	42.0	66.5	54.7

L. L.	65	55	50	28		
P. I.	27	10	3	1		
AASHTO Classification	A-7-5	A-5	A-2-5	A-2-4		
Group Index	16	0	0	0		
pH	N/A	N/A	N/A	N/A		
Station	48+00	48+00	48+00	44+20		
OFFSET	40'LT	40'LT	40'LT	66'LT		
ALIGNMENT	-L-	-L-	-L-	-L-		
Depth (Ft)	0.0	3.4	8.4	2.9		
	to	1.5	4.9	9.9	4.4	
Natural Moisture %	16.6	18.8	11.0	N/A		

L. L.	60	61	64	60	57	59
P. I.	31	16	5	8	25	3
AASHTO Classification	A-7-6	A-7-5	A-5	A-5	A-7-5	A-5
Group Index	12	9	0	1	17	3
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	50+00	50+00	50+00	50+00	52+00	52+00
OFFSET	40'LT	40'RT	40'RT	40'RT	40'RT	40'RT
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	0.0	0.0	3.3	13.3	0.0	3.3
	to	1.5	1.5	4.8	14.8	1.5
Natural Moisture %	29.3	26.4	26.3	21.9	15.7	16.7

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**REPORT ON SAMPLES OF** Kernersville Loop from SR 1969 to NC 150

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**Project** 47138.1.1 **County** Forsyth **Owner** \_\_\_\_\_  
**Date: Sampled** 8/1/18 **Received** 8/17/18 **Reported** \_\_\_\_\_  
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**Project** 47138.1.1 **County** Forsyth **Owner** \_\_\_\_\_  
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10/3/18

**TEST RESULTS**

Proj. Sample No.	SS-197	SS-201	SS-204	SS-208	SS-209	SS-210
Boring No.	L5200R	L5400R	L5400R	L5400L	L5400L	L5400L
Retained #4 Sieve	% 0	0	0	0	0	0
Passing #10 Sieve	% 99	100	99	100	100	99
Passing #40 Sieve	% 68	95	81	93	95	81
Passing #200 Sieve	% 23	84	38	81	84	59

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**TEST RESULTS**

Proj. Sample No.	SS-211	SS-214	SS-215	SS-218	SS-219	SS-221
Boring No.	L5400L	L5800	L5800	L5600	L5600	L6000
Retained #4 Sieve	% 0	0	0	0	0	0
Passing #10 Sieve	% 99	99	100	98	98	99
Passing #40 Sieve	% 92	74	67	58	62	69
Passing #200 Sieve	% 44	58	39	30	34	37

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 49.8	8.1	32.4	9.8	6.7	24.7
Fine Sand Ret - #270	% 32.4	12.5	36.8	13.1	15.8	24.6
Silt 0.05 - 0.005 mm	% 14.6	23.5	19.3	21.0	31.8	29.0
Clay < 0.005 mm	% 3.2	56.0	11.5	56.1	45.7	21.7
Passing #40 Sieve	% 68.6	95.0	82.1	93.2	95.2	81.4
Passing #200 Sieve	% 23.2	84.0	38.3	81.6	84.2	59.5

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	% 19.1	33.3	42.4	53.9	48.3	41.6
Fine Sand Ret - #270	% 45.6	10.8	23.8	19.5	20.2	27.3
Silt 0.05 - 0.005 mm	% 26.2	11.9	20.1	15.0	12.3	14.5
Clay < 0.005 mm	% 9.2	44.0	13.8	11.5	19.2	16.5
Passing #40 Sieve	% 92.6	74.5	67.6	59.0	63.6	69.3
Passing #200 Sieve	% 44.6	58.0	39.2	30.8	35.0	37.7

L. L.	48	85	60	72	70	54
P. I.	2	43	4	32	21	6
AASHTO Classification	A-2-5	A-7-5	A-5	A-7-5	A-7-5	A-5
Group Index	0	44	0	31	25	5
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	52+00	54+00	54+00	54+00	54+00	54+00
OFFSET	40'RT	55'RT	55'RT	40'LT	40'LT	40'LT
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	13.3	0.0	13.7	0.0	3.5	8.5
to	14.8	1.5	15.2	1.5	5.0	10.0
Natural Moisture %	15.6	36.1	26.5	22.0	37.2	27.1

L. L.	52	56	53	20	34	51
P. I.	2	28	6	2	15	13
AASHTO Classification	A-5	A-7-6	A-5	A-2-4	A-2-6	A-7-5
Group Index	0	14	0	0	1	1
pH	N/A	N/A	N/A	N/A	N/A	N/A
Station	54+00	58+00	58+00	56+00	56+00	60+00
OFFSET	40'LT	CL	CL	CL	CL	CL
ALIGNMENT	-L-	-L-	-L-	-L-	-L-	-L-
Depth (Ft)	13.5	0.0	3.8	0.0	3.5	3.7
to	15.0	1.5	5.3	1.5	5.0	5.2
Natural Moisture %	24.2	21.2	23.7	20.2	13.8	21.8

*Aaron Hackett*  
Soils Engineer

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T. I. P. No. U-6003  
**REPORT ON SAMPLES OF** Kernersville Loop from SR 1969 to NC 150  
**Project** 47138.1.1 **County** Forsyth **Owner** \_\_\_\_\_  
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**Date: Sampled** \_\_\_\_\_ **Received** \_\_\_\_\_ **Reported** 11/14/18  
**Sampled from** Roadway Investigation **By** Geotech  
**Submitted by** Brad Worley 2008 Standard Specifications

10/3/18

**TEST RESULTS**

Proj. Sample No.	SS-222	SS-223				
Boring No.	<b>L6000</b>	<b>L6200</b>				
Retained #4 Sieve	% <b>0</b>	% <b>0</b>				
Passing #10 Sieve	% <b>99</b>	% <b>97</b>				
Passing #40 Sieve	% <b>71</b>	% <b>68</b>				
Passing #200 Sieve	% <b>39</b>	% <b>48</b>				

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	%	<b>40.2</b>	<b>38.8</b>			
Fine Sand Ret - #270	%	<b>27.0</b>	<b>14.5</b>			
Silt 0.05 - 0.005 mm	%	<b>22.8</b>	<b>11.4</b>			
Clay < 0.005 mm	%	<b>9.9</b>	<b>35.3</b>			
Passing #40 Sieve	%	<b>72.5</b>	<b>69.6</b>			
Passing #200 Sieve	%	<b>39.3</b>	<b>49.0</b>			

L. L.	<b>51</b>	<b>54</b>				
P. I.	<b>7</b>	<b>29</b>				
AASHTO Classification	<b>A-5</b>	<b>A-7-6</b>				
Group Index	<b>0</b>	<b>10</b>				
pH	<b>N/A</b>	<b>N/A</b>				
Station	<b>60+00</b>	<b>62+00</b>				
OFFSET	<b>-L-</b>	<b>-L-</b>				
ALIGNMENT	<b>-L-</b>	<b>-L-</b>				
Depth (Ft)	<b>8.7</b>	<b>0.0</b>				
to	<b>10.2</b>	<b>1.5</b>				
Natural Moisture %	<b>31.0</b>	<b>17.2</b>				

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Soils Engineer

11/14/18

**TEST RESULTS**

Proj. Sample No.	S-554	S-555	S-556			
Boring No.	<b>L3420R</b>	<b>L4200R</b>	<b>L5000L</b>			
Retained #4 Sieve	% <b>0</b>	% <b>0</b>	% <b>0</b>			
Passing #10 Sieve	% <b>91</b>	% <b>96</b>	% <b>95</b>			
Passing #40 Sieve	% <b>68</b>	% <b>71</b>	% <b>72</b>			
Passing #200 Sieve	% <b>44</b>	% <b>31</b>	% <b>36</b>			

**MINUS NO. 10 FRACTION**

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	%	<b>34.3</b>	<b>38.8</b>	<b>37.2</b>		
Fine Sand Ret - #270	%	<b>23.3</b>	<b>35.6</b>	<b>32.1</b>		
Silt 0.05 - 0.005 mm	%	<b>18.4</b>	<b>14.4</b>	<b>13.2</b>		
Clay < 0.005 mm	%	<b>24.0</b>	<b>11.2</b>	<b>17.5</b>		
Passing #40 Sieve	%	<b>74.9</b>	<b>74.4</b>	<b>75.9</b>		
Passing #200 Sieve	%	<b>48.1</b>	<b>32.8</b>	<b>37.2</b>		

L. L.	<b>52</b>	<b>44</b>	<b>30</b>			
P. I.	<b>14</b>	<b>11</b>	<b>3</b>			
AASHTO Classification	<b>A-7-5</b>	<b>A-2-7</b>	<b>A-4</b>			
Group Index	<b>4</b>	<b>0</b>	<b>0</b>			
pH	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>			
Station	<b>34+20</b>	<b>42+00</b>	<b>50+00</b>			
OFFSET	<b>40'RT</b>	<b>40'RT</b>	<b>40'LT</b>			
ALIGNMENT	<b>-L-</b>	<b>-L-</b>	<b>-L-</b>			
Depth (Ft)	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>			
to	<b>30.5</b>	<b>15.0</b>	<b>8.2</b>			
Natural Moisture %	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>			

*Aaron Hackett*  
Soils Engineer

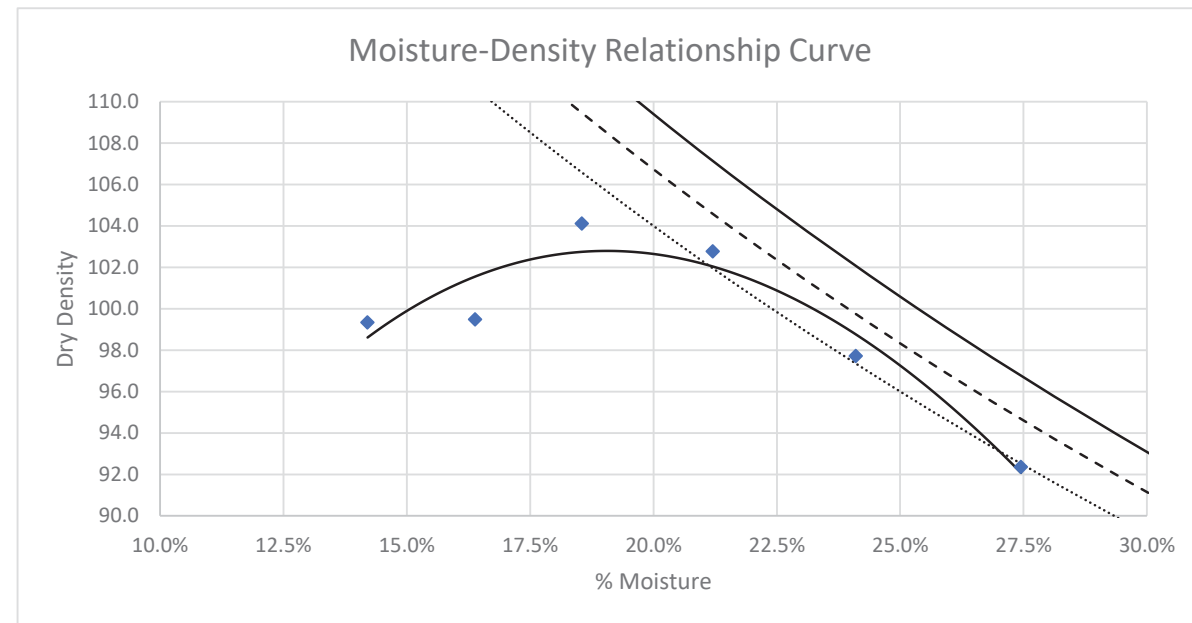


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### Standard Moisture-Density Relationship Report

ASTM D698

Project Number	<b>18-0173.141</b>	Date	<b>11/9/2018</b>
Project Name	<b>U-6003</b>	Sample Number	<b>S-554</b>
Client	<b>NCDOT</b>		
Sample Description	<b>A-7-5</b>	Maximum Dry Density	<b>102.8</b>
Sample Location	<b>L3420R</b>	Optimum Moisture	<b>19.0%</b>



Natural Moisture:  
Specific Gravity: **2.60 (Assumed)**  
Liquid Limit: **52**  
Plasticity Index: **14**  
% Fines: **44.0%**  
% Sand: **56.0%**  
% Gravel: **0.0%**

Rammer Type: **Manual**  
Preparation Method: **Dry**  
Method: **A**  
Oversize Correction: **Not Required**

Aaron Hackett, EI  
Lab Manager

Jeff Elliott, PE  
CMT & SI Department Manager



### Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<b>11/14/2018</b>	Project Name	<b>U-6003</b>
Sample No.	<b>S-554</b>	Project No.	<b>18-0173.141</b>
Sample Location	<b>L3420R</b>	Client	<b>NCDOT</b>

**Proctor and Classification Data**

Sample Description	<b>N/A</b>
Classification	<b>A-7-5</b>
Max. Dry Density	<b>102.8</b>
Optimum Moisture	<b>19.0%</b>

**CBR Preparation Data**

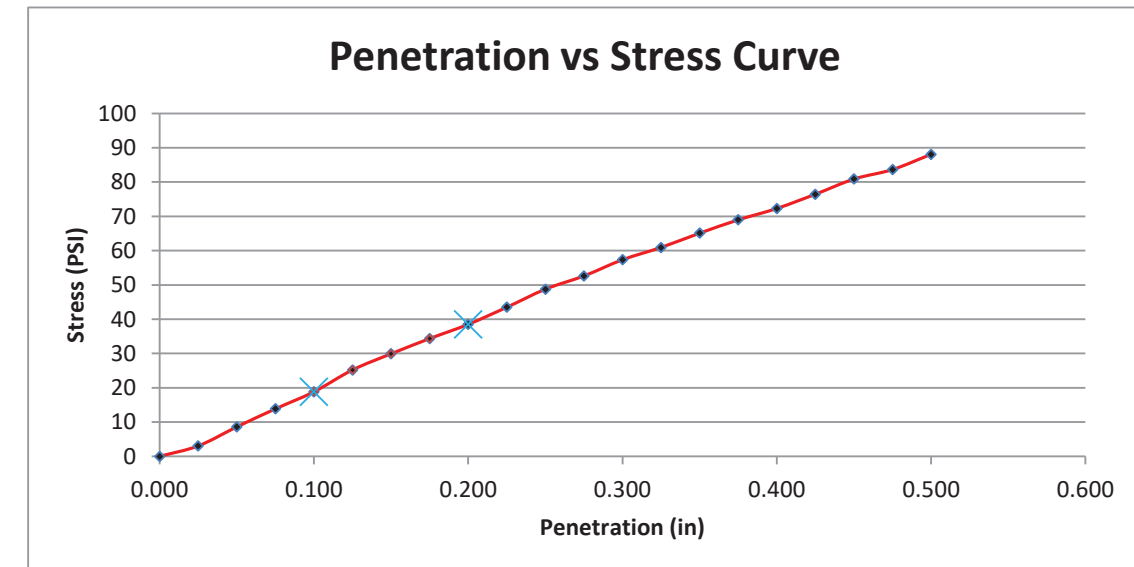
Rammer Used	<b>5.5 lbs, 12" Drop</b>
Compaction Method	<b>3 Layers, 56 Blows</b>
Surcharge Amount	<b>10 lbs</b>
Soaked/Unsoaked	<b>Soaked</b>

**CBR Results**

Compaction Moisture Content	<b>22.4%</b>	Dry unit weight (lbs/cu.ft)	<b>101.5</b>
Moisture Content of Top 1"		Percent of Max. Dry Density	<b>98.7%</b>
After Soaking	<b>25.8%</b>		
Swell	<b>0.3%</b>		

<b>CBR Values</b>		
Penetration (in)	<b>0.100</b>	<b>0.200</b>
Stress (psi)	<b>18.84</b>	<b>38.50</b>
CBR	<b>1.9</b>	<b>2.6</b>



Remarks: No zero-point correction.

Aaron Hackett  
Lab Manager

Jeff Elliott, P.E.  
CMT & SI Dept. Manager



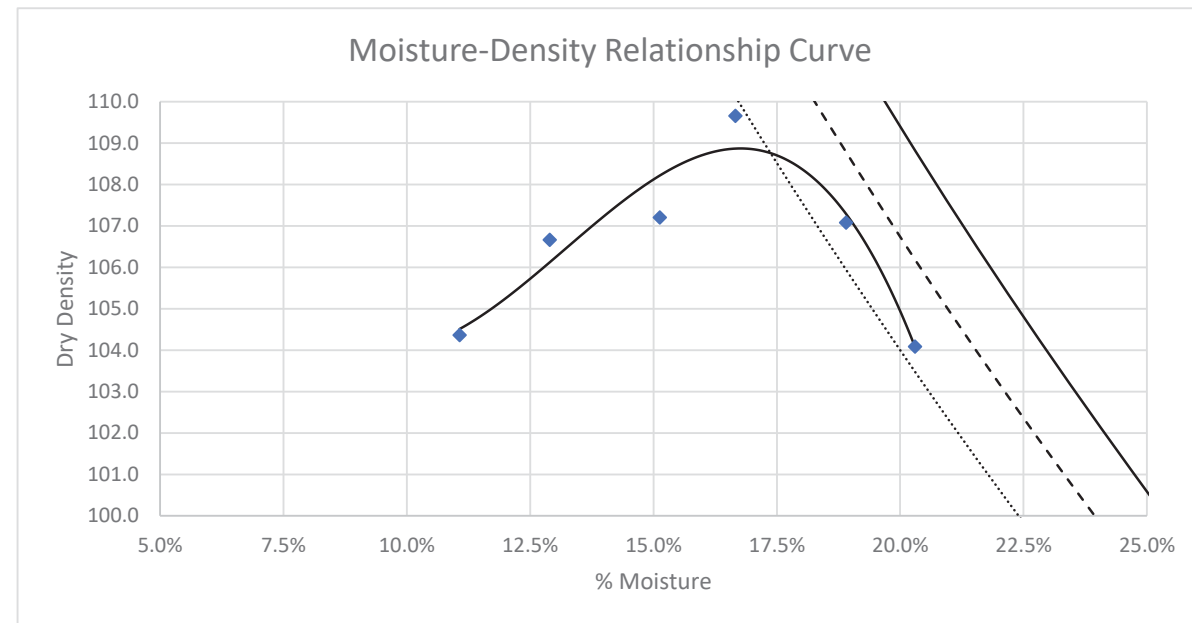


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### Standard Moisture-Density Relationship Report

ASTM D698

Project Number	<b>18-0173.I41</b>	Date	<b>11/8/2018</b>
Project Name	<b>U-6003</b>	Sample Number	<b>S-555</b>
Client	<b>NCDOT</b>		
Sample Description	<b>A-2-7</b>	Maximum Dry Density	<b>108.9</b>
Sample Location	<b>L4200R</b>	Optimum Moisture	<b>16.8%</b>



Natural Moisture:  
Specific Gravity: **2.60 (Assumed)**  
Liquid Limit: **44**  
Plasticity Index: **11**  
% Fines: **31.0%**  
% Sand: **69.0%**  
% Gravel: **0.0%**

Rammer Type: **Manual**  
Preparation Method: **Dry**  
Method: **A**  
Oversize Correction: **Not Required**

Aaron Hackett, EI  
Lab Manager

Jeff Elliott, PE  
CMT & SI Department Manager



### Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<b>11/14/2018</b>	Project Name	<b>U-6003</b>
Sample No.	<b>S-555</b>	Project No.	<b>18-0173.I41</b>
Sample Location	<b>L4200R</b>	Client	<b>NCDOT</b>

**Proctor and Classification Data**

Sample Description	<b>N/A</b>
Classification	<b>A-2-7</b>
Max. Dry Density	<b>108.9</b>
Optimum Moisture	<b>16.8%</b>

**CBR Preparation Data**

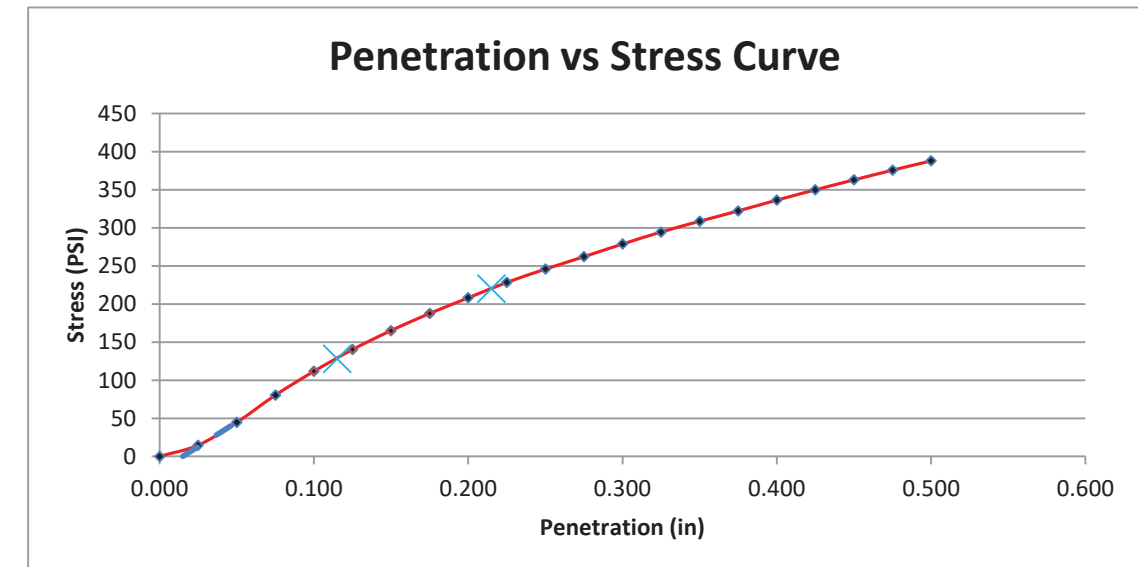
Rammer Used	<b>5.5 lbs, 12" Drop</b>
Compaction Method	<b>3 Layers, 56 Blows</b>
Surcharge Amount	<b>10 lbs</b>
Soaked/Unsoaked	<b>Soaked</b>

**CBR Results**

Compaction Moisture Content	<b>15.0%</b>	Dry unit weight (lbs/cu.ft)	<b>109.3</b>
Moisture Content of Top 1"		Percent of Max. Dry Density	<b>100.4%</b>
After Soaking	<b>21.5%</b>		
Swell	<b>0.4%</b>		

CBR Values		
Penetration (in)	<b>0.115</b>	<b>0.215</b>
Stress (psi)	<b>128.00</b>	<b>220.00</b>
CBR	<b>12.8</b>	<b>14.7</b>



Remarks: Zero-point correction applied.

Aaron Hackett  
Lab Manager

Jeff Elliott, P.E.  
CMT & SI Dept. Manager

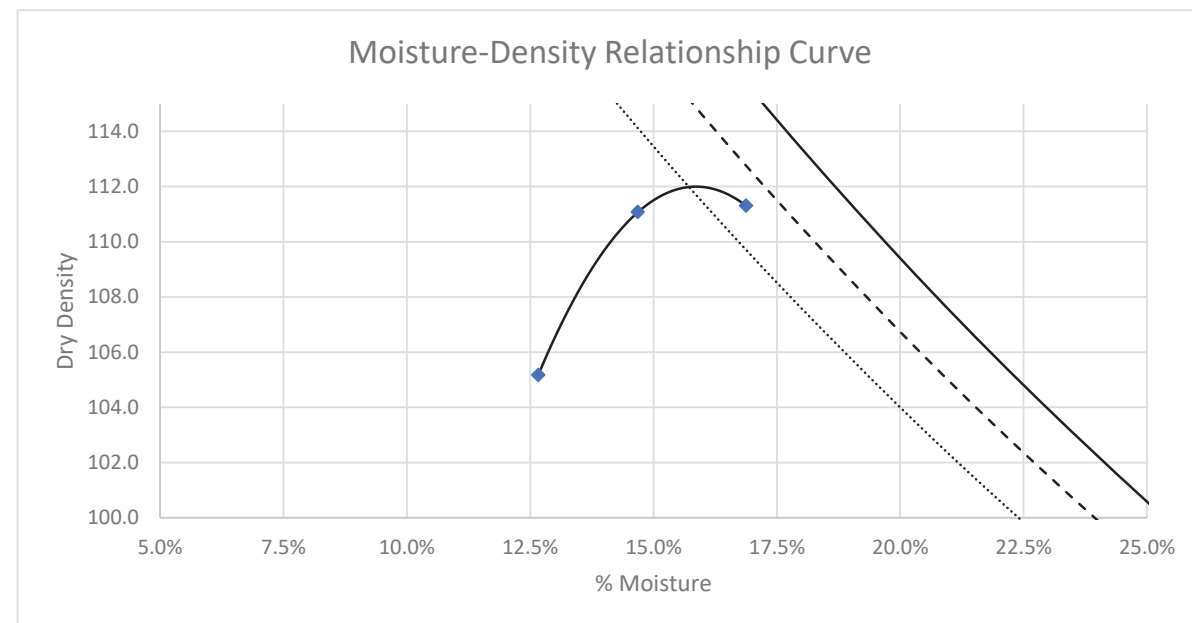


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### Standard Moisture-Density Relationship Report

ASTM D698

Project Number	<b>18-0173.I41</b>	Date	<b>11/14/2018</b>
Project Name	<b>U-6003</b>	Sample Number	<b>S-556</b>
Client	<b>NCDOT</b>		
Sample Description	<b>A-4</b>	Maximum Dry Density	<b>112.0</b>
Sample Location	<b>L5000L</b>	Optimum Moisture	<b>15.9%</b>



Natural Moisture:  
Specific Gravity: **2.60 (Assumed)**  
Liquid Limit: **30**  
Plasticity Index: **3**  
% Fines: **36.0%**  
% Sand: **64.0%**  
% Gravel: **0.0%**

Rammer Type: **Manual**  
Preparation Method: **Dry**  
Method: **A**  
Oversize Correction: **Not Required**

Aaron Hackett, EI  
Lab Manager

Jeff Elliott, PE  
CMT & SI Department Manager



### Report on California Bearing Ratio (ASTM D 1883/AASHTO T 193)

Date	<b>11/14/2018</b>	Project Name	<b>U-6003</b>
Sample No.	<b>S-556</b>	Project No.	<b>18-0173.I41</b>
Sample Location	<b>L5000L</b>	Client	<b>NCDOT</b>

**Proctor and Classification Data**

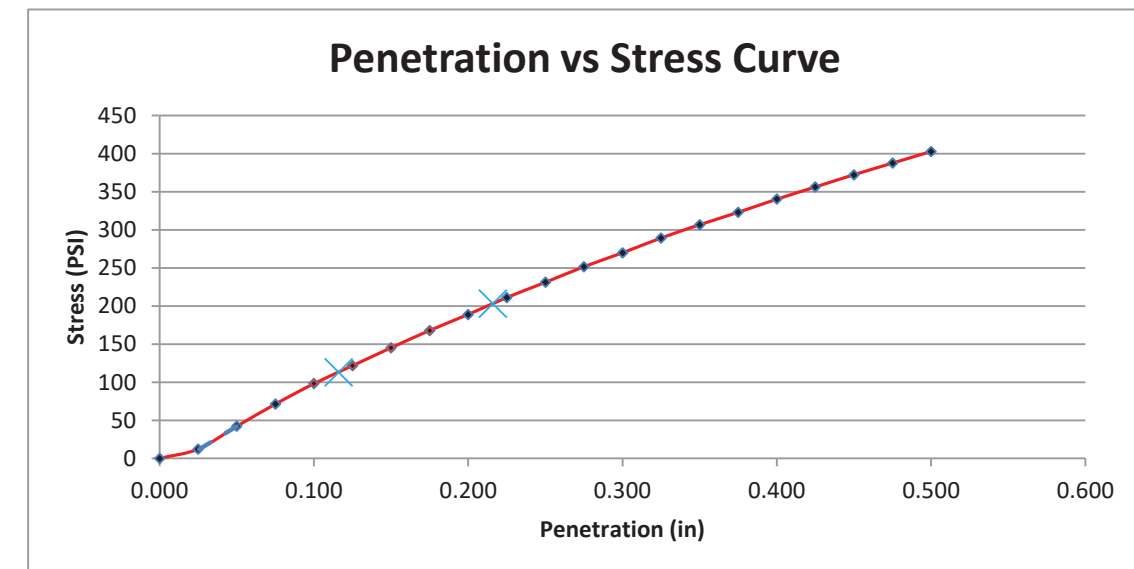
Sample Description	<b>N/A</b>
Classification	<b>A-4</b>
Max. Dry Density	<b>112.0</b>
Optimum Moisture	<b>15.9%</b>

**CBR Preparation Data**

Rammer Used	<b>5.5 lbs, 12" Drop</b>
Compaction Method	<b>3 Layers, 56 Blows</b>
Surcharge Amount	<b>10 lbs</b>
Soaked/Unsoaked	<b>Soaked</b>

**CBR Results**

Compaction Moisture Content	<b>15.1%</b>	Dry unit weight (lbs/cu.ft)	<b>111.9</b>
Moisture Content of Top 1" After Soaking	<b>20.1%</b>	Percent of Max. Dry Density	<b>99.9%</b>
Swell	<b>0.1%</b>	<b>CBR Values</b>	
		Penetration (in)	<b>0.116    0.216</b>
		Stress (psi)	<b>113.00    203.00</b>
		CBR	<b>11.3    13.5</b>



Remarks: Zero-point correction applied

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Lab Manager

Jeff Elliott, P.E.  
CMT & SI Dept. Manager