

REFERENCE: R-5705A

PROJECT: 46377

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

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

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY HARNETT
PROJECT DESCRIPTION NC 55 FROM SOUTH OF
SR 1532 (OAK GROVE CHURCH ROAD) TO
NORTH OF NC 210

INVENTORY

CONTENTS

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>
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-Y1-	11+78 to 14+16.97	6 to 7
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-Y5A-	10+50 to 12+50	143-144
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5705A	1	181

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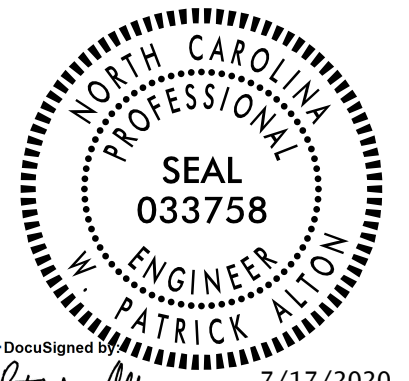
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PERSONNEL	
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INVESTIGATED BY F&R, Inc.
DRAWN BY M. ARNOLD
CHECKED BY C. WANG, P.E.
SUBMITTED BY P. ALTON, P.E.
DATE JUNE 2020

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Patrick Alton 7/17/2020
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SIGNATURE DATE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

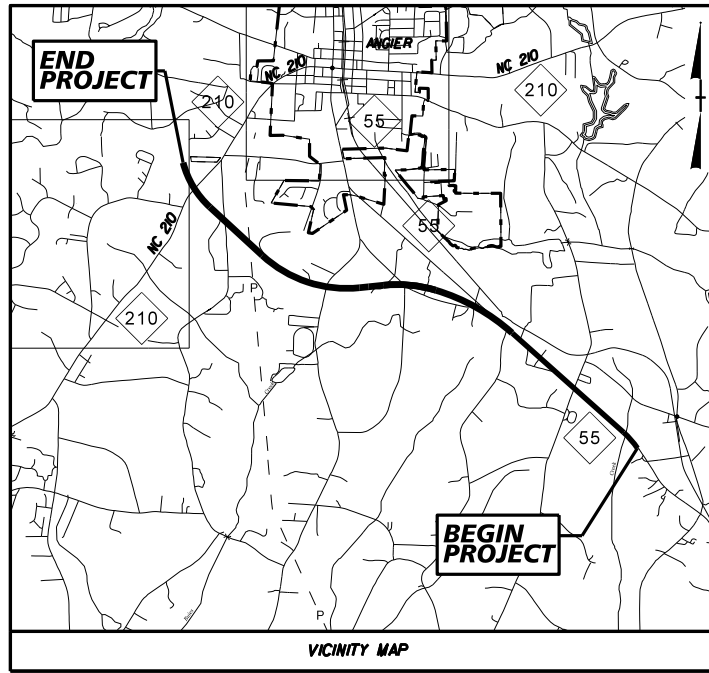
Table with multiple columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, MINERALOGICAL COMPOSITION, COMPRESSIBILITY, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, SOIL MOISTURE - CORRELATION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

09/08/99

TIP PROJECT: R-5705A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
HARNETT COUNTY

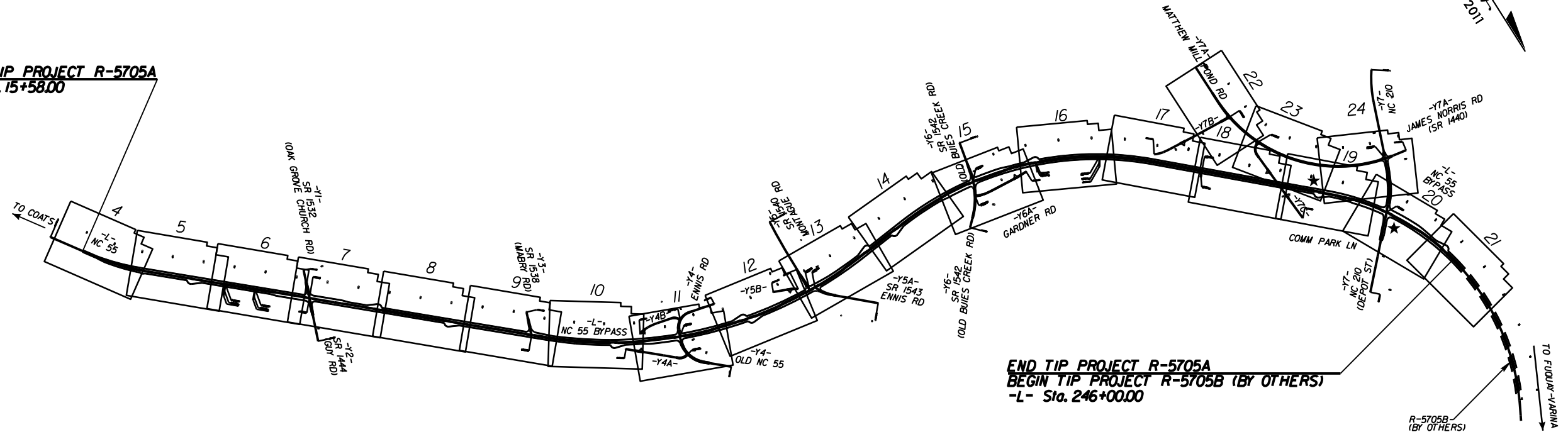
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5705A	3	181
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46377.1.2		P.E.	



25% APPROVED PLANS

LOCATION: NC 55 FROM SOUTH OF SR 1532 (OAK GROVE CHURCH ROAD) TO NORTH OF NC 210
TYPE OF WORK: GRADING, DRAINAGE, PAVING, SIGNING, SIGNALS, AND CULVERTS

BEGIN TIP PROJECT R-5705A
-L- Sta. 15+58.00



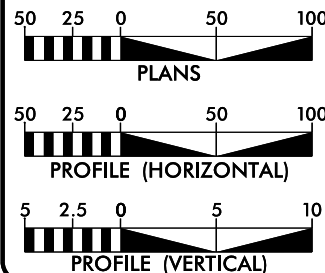
END TIP PROJECT R-5705A
BEGIN TIP PROJECT R-5705B (BY OTHERS)
-L- Sta. 246+00.00

★ TRAFFIC SIGNAL

THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS LIMITED TO POINTS AS SHOWN ON THE PLANS
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD

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

GRAPHIC SCALES



DESIGN DATA

AADT 2022 = 15,900
AADT 2045 = 27,100
K = 9%
D = 60%
T = 5%*
V = 50/60 MPH
* (TTST 1% + DUAL 3%)
FUNCTIONAL CLASSIFICATION:
URBAN ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-5705A = 4.364 MILES

PLANS PREPARED FOR THE NCDOT BY:

Kimley»Horn

INCORPORATING
PASTORVILLE STREET, SUITE 800
MELROSE, NORTH CAROLINA 27561
PHONE: (919) 677-2000

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

JANUARY 17, 2020

LETTING DATE:

JANUARY 18, 2022

JEFFREY W. MOORE, P.E.
PROJECT ENGINEER

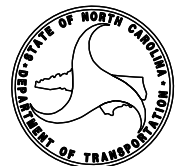
THOMAS MORNEAU, E.I.
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NCDOT PROJECT MANAGEMENT UNIT

HYDRAULICS ENGINEER

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ROADWAY DESIGN ENGINEER

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\$FILE\$

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CONTRACT:



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June 8, 2020

State Project No.: 46377.1.2
TIP No.: R-5705A
F.A. Number: N/A
County: Harnett
Description: NC 55 from south of SR 1532 (Oak Grove Church Road) to north of NC 210

SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of widening approximately 1.5 miles of NC 55 (-L-) approximately between its intersections with Doug Johnson Lane and Mabry Road in Angier, Harnett County, North Carolina. Approximately 3 miles of new alignment is proposed from about 1,000 feet northwest of Mabry Road (-L- station 98+00) in a general north and west direction, until crossing NC 210 about 900 feet northeast of its intersection with James Norris Road (-L- station 232+91.08). The project ends about 1,300 feet north of NC 210 in an agricultural field (-L- station 246+00.00). The project corridor consists of a 4-lane divided highway, which will contain 12-foot lanes, 4-foot paved shoulders, and a 15 to 30-foot median.

The project also consists of approximately ½ mile of new alignment (-Y7A-) connecting Matthew Mill Pond Road approximately 500 feet south of its intersection with Gardner Road (-Y7A- station 14+80.00) to NC 210 at its northern intersection with James Norris Road (-Y7A- station 47+90.00). The new alignment will typically consist of one northbound and one southbound lane. More-specifically, the typical section will incorporate 12-foot lanes and an 8-foot earth shoulder.

Two culverts are also proposed: one at -L- station 24+46 and a second at -L- station 198+61. More specifically, the recommended structures for each culvert are a 140 linear foot 6' x 7' reinforced concrete box culvert and 140 foot 7' x 7' reinforced concrete box culvert, respectively.

The geotechnical field investigation was performed from July 2019 to August 2019. During this time period, a total of 122 Standard Penetration Test (SPT) borings were advanced with ATV- and track-mounted CME-55 drill rigs with automatic hammers. In addition, 55 hand auger borings, 1 sounding rod, and 4 hand auger borings with sounding rods were completed due to restrictive drill rig access (primarily due to active agricultural fields). Representative soil samples were collected from the split spoon or hand auger cuttings for visual classification in the field and for analysis by F&R's testing laboratory.

The following alignments were investigated:

<u>Alignment</u>	<u>Station (±)</u>
-L-	15+58 to 246+00
-Y4-	13+61 to 25+77
-Y4B-	15+54 to 17+12
-Y5A-	10+00 to 13+64
-Y6-	13+41 to 22+44
-Y7-	23+30 to 37+60
-Y7A-	18+00 to 47+90
-Y7C-	10+00 to 12+75

The field investigation also included three sediment surveys that were performed at ponds located at about -L- stations 137+00, 181+00, and 198+00. Pond sediments were collected with a probe sampler, and a PVC pipe was used to determine the depth of the sediment. Representative sediment samples were collected from the probe sampler for visual classification in the field and for analysis by F&R's testing laboratory.

Groundwater Properties

Generally, groundwater measurements were attempted in a majority of the borings along the project immediately upon their completion and after a stabilization period of approximately 24 hours. Twenty-one borings were backfilled immediately after drilling. Immediately upon completion, 0-Hour groundwater was encountered in 71 borings at depths ranging from ground surface to 22.5 feet, and elevations ranging from about 241.7 to 314.1 feet. Stabilized groundwater was encountered in 97 borings at depths ranging from ground surface to 16.2 feet, and elevations ranging from 245.3 to 317.6 feet. Groundwater was not encountered in the remaining borings. It should be noted that the groundwater levels fluctuate depending upon seasonal factors such as precipitation and temperature.

The proposed road widening extends across several wetland areas that are delineated on the provided plans. Numerous ponds are present across the project, and the proposed construction extends through three ponds located at approximately -L- stations 137+00, 181+00, and 198+00.

Areas of Special Geotechnical Interest

- 1) Groundwater: The following areas exhibited groundwater within six feet of the proposed grade, which has the potential to cause subgrade problems during construction:

<u>Alignment</u>	<u>Station (±)</u>
-L-	19+50 to 20+50
-L-	25+75 to 31+50
-L-	46+50 to 47+50
-L-	53+00 to 54+00
-L-	68+00 to 86+00
-L-	98+00 to 100+00
-L-	135+50 to 139+00

-L-	155+50 to 158+50
-L-	177+50 to 190+00
-L-	222+50 to 224+00
-L-	236+00 to 239+00
-Y4-	20+00 to 23+50
-Y5A-	12+00 to 13+00
-Y7A-	27+00 to 28+00
-Y7A-	43+00 to 45+50

-Y5A-	12+00 to 13+00
-Y6-	14+25 to 22+50
-Y7-	24+25 to 37+50
-Y7-	28+25 to 29+25
-Y7-	33+25 to 35+75
-Y7A-	19+00 to 29+75
-Y7A-	31+25 to 40+25
-Y7A-	41+25 to 44+25
-Y7A-	46+50 to 47+50
-Y7C-	11+50 to 18+00

2) Soft, Loose and/or Wet Soils: The following areas contain relatively soft or loose (SPT N<6 bpf) and/or wet, near-surface soils that have the potential to cause subgrade problems during construction:

<u>Alignment</u>	<u>Station (±)</u>
-L-	23+50 to 43+50
-L-	54+50 to 72+00
-L-	84+50 to 89+50
-L-	107+00 to 160+50
-L-	167+50 to 184+50
-L-	191+50 to 208+00
-L-	218+50 to 233+00
-Y4-	20+00 to 23+50
-Y5A-	10+00 to 13+00
-Y6-	14+00 to 22+50
-Y7-	24+50 to 25+50
-Y7-	34+50 to 37+50
-Y7A-	23+00 to 44+00
-Y7C-	11+50 to 12+50

4) Cohesive Soils: The following areas contain deeper deposits of relatively soft cohesive soils (AASHTO A-5, A-6 & A-7 soils) that have the potential to cause embankment instability or long-term settlement problems:

<u>Alignment</u>	<u>Station (±)</u>
-L-	84+50 to 89+50
-L-	155+50 to 156+50
-L-	181+50 to 182+50
-L-	198+00 to 202+00
-L-	227+00 to 228+00
-Y7A-	30+50 to 32+00

5) Artificial Fill: The following areas contain artificial fill soils. These soils have the potential to be highly variable, which could cause subgrade problems during construction if undetected pockets of organics, debris, or soft/loose/wet soils are present. In addition, a majority of these soils are cohesive, which may cause embankment instability or long-term settlement problems.

<u>Alignment</u>	<u>Station (±)</u>
-L-	42+75 to 43+25, left
-Y7A-	41+60 to 41+77

3) Cohesive Soils: The following areas contain cohesive soils (AASHTO A-5, A-6 & A-7 soils) at existing subgrade in fill areas or at/near proposed subgrade in cut areas that have the potential to cause subgrade problems during construction:

<u>Alignment</u>	<u>Station (±)</u>
-L-	16+75 to 22+50
-L-	34+50 to 35+50
-L-	40+50 to 41+50
-L-	68+00 to 73+50
-L-	102+25 to 168+50
-L-	175+25 to 176+75
-L-	181+50 to 228+00
-L-	239+75 to 246+25
-Y4-	18+50 to 23+50

6) Unsuitable Unclassified Excavation: The following areas of unclassified excavation contain soils with plasticity indices (PI) more than 20:

<u>Alignment</u>	<u>Station (±)</u>
-L-	16+75 to 22+25
-L-	102+25 to 107+75
-L-	110+25 to 111+25
-L-	112+75 to 121+25
-L-	147+25 to 151+25
-L-	156+75 to 161+75
-L-	175+25 to 176+75

-L-	185+25 to 190+75
-L-	208+25 to 214+75
-L-	239+75 to 241+75
-Y7A-	20+75 to 29+25
-Y7A-	38+25 to 39+75

Physiography and Geology

The existing roads and proposed new alignment in the area of this project generally run in a southeast-to-northwest direction, and primarily through residential properties and undeveloped farmland areas. The existing ground surface along the proposed road generally slopes downward from an elevation (EL) of ±280 feet at the beginning of the project to EL ±260 feet near station -L- 25+00 (near the East Buies Creek culvert) and then upward to EL ±325 feet near station 61+00. The ground surface then generally slopes downward to EL ±251 feet near station 181+00 (near the West Buies Creek culvert). From there, the ground surface slopes upward to EL ±319 near station 237+00, and then downward to EL ±299 near the end of the project.

The following areas of unclassified excavation contain soils with plasticity indices (PI) of 16 through 20:

<u>Alignment</u>	<u>Station (±)</u>
-L-	70+25 to 72+25
-L-	143+25 to 146+75
-L-	242+75 to 246+00
-Y7-	33+75 to 35+75
-Y7A-	33+75 to 36+75

The project site is geologically located near the border of the Piedmont and Coastal Plain physiographic provinces of North Carolina. The boundary between the Piedmont and Coastal Plain is the Fall Zone. This zone represents the elevation break between the resistant rocks of the Piedmont and the more easily eroded sediments of the Coastal Plain. According to the Geologic Map of North Carolina (1985), the site is within an area mapped as Cretaceous period deposits and is comprised of sediments that are identified as being located within the Middendorf Formation. The Middendorf Formation is described as gray to pale gray with orange cast, mottled, and commonly found with iron-cemented concretions and cross-bedding.

7) **Ponds**: Three ponds are located within the proposed construction limits at the following locations:

<u>Alignment</u>	<u>Station (±)</u>
-L-	137+00
-L-	181+00
-L-	198+00

The western terminus of the project is located near the eastern edge of the Piedmont Physiographic Province of North Carolina within the Eastern Slate Belt. More-specifically, it is located near an area mapped as Phyllite and Schist (CZph). Soils weathered from the parent rock generally consisted of sandy and clayey silts. The in-situ soils are the residual product of in-place chemical weathering of rock that was similar to the rock presently underlying the site. The soils encountered at the site included variable coastal plain deposits overlying residual soils. The typical residual profile within the Piedmont consists of clayey soils near the surface, where soil weathering is more advanced, underlain by silts and sandy silts/silty sands.

8) **Moderately to Highly Organic Soils**: The following areas contain moderately (5%-10%) to highly organic soils (>10%), standing water, and soft/loose soils. These soils have the potential to cause subgrade problems during construction, embankment instability, and/or long-term settlement problems.

<u>Alignment</u>	<u>Station (±)</u>
-L-	227+75 to 229+25
-Y7A-	41+75 to 44+75

Soils Properties

Soils within the area of this project have been divided into five categories: roadway embankment, artificial fill, alluvial soils, coastal plain soils, and residual soils.

Pond Surveys

Pond surveys were performed near -L- stations 137+00, 181+00, and 198+00. Pond sediments were collected with a probe sampler, and a PVC pipe was used to determine the depth of the sediment. Representative sediment samples were collected from the probe sampler for visual classification in the field and for analysis by F&R's testing laboratory. The pond sediment thicknesses extended to depths ranging from 0.3 to 2.5 feet. These sediments were typically described as: saturated, very loose silty SAND (A-2-4); saturated, very soft to soft sandy SILT (A-4); and wet to saturated, very soft to medium stiff sandy and silty CLAY (A-6 and A-7). A majority of the soil samples contained trace organic matter.

Roadway Embankment: Roadway embankment (RE) soils were encountered at the surface of 6 borings. The RE was typically associated with existing NC 55 and Gardner Road. The RE extended to depths up to 12 feet on NC 55, and up to 3 feet on Gardner Road. The roadway embankment soil was variable and described as moist to wet, very loose to dense silty SAND (A-2-4) and soft to medium stiff sandy CLAY (A-7-6). Most samples contained trace organic matter and gravel.

Artificial Fill: Artificial fill (AF) was encountered at the surface of 3 borings (B-14, B-137, and B-174) and extended to depths up to 7 feet. The artificial fill was typically described as moist, loose silty SAND (A-2-4). The samples contained trace organic matter and gravel.

Alluvial Soil: Alluvial soils were encountered at the surface of 33 borings where they were associated with varying-sized drainage systems crossing the alignment. The alluvial soils extended to depths up to 10 feet. The alluvium was typically described as: moist to saturated, very loose to medium dense silty and clayey

SAND (A-2-4 & A-2-6); moist, soft to very stiff sandy and clayey SILT (A-4 & A-5); and soft to medium stiff, sandy CLAY (A-6). Alluvial soils were encountered under roadway embankment in three borings (B-15, B-40, and B-160). The alluvial soils extended to depths ranging from 3 to 17 feet. The alluvium at these locations was typically described as: saturated, very loose, silty and clayey SAND (A-2-4 & A-2-6); saturated, soft sandy SILT (A-4); and moist, soft sandy CLAY (A-7). Alluvial soils were encountered under artificial fill in two borings (B-137 and B-174). The alluvial soils at these borings extended to depths ranging from 1 to 12 feet. The alluvium was typically described as wet to saturated, very loose to loose clayey SAND (A-2-6). A majority of the soil samples contained trace to moderate organic matter and trace gravel.

Coastal Plain Soils: A majority of the soils encountered on this project were coastal plain soils. The coastal plain soils were typically described as: moist to saturated, very loose to very dense silty and clayey SAND (A-2-4 & A-2-6); moist to wet, soft to very stiff sandy SILT (A-4); and moist to saturated, very soft to very stiff sandy and silty CLAY (A-6 & A-7). Some of the samples contained trace amounts of organics. Some of the surficial loose/soft soils were located in the agricultural fields and most likely disturbed due to farming activities.

Residual Soils: Residual soils were encountered in 7 borings, all below coastal plain soils. The residual soils were typically described as moist, medium dense silty SAND (A-2-4) and moist to wet, soft to very stiff sandy and clayey SILT (A-4 & A-5). A majority of the samples contained trace mica and rock fragments.

We appreciate the opportunity to work with you on this project. Please contact us if you have any questions regarding this report or if we may be of further service.

Sincerely,
FROEHLING & ROBERTSON, INC.

Meredith Arnold, G.I.T.
 Staff Geologist

W. Patrick Alton, P.E.
 Transportation Services Manager

Appendix A

Bulk Samples

The following bulk samples were obtained and transported to our laboratory for testing to determine the engineering properties of the soil:

Sample No.	Boring No.	Line	Station	Offset	Depth (ft)	Test(s) Performed
CBR-1	B-10	-L-	35+00	60' Lt.	2.0-4.0	Standard Proctor, CBR
CBR-2	B-47	-L-	105+50	CL	2.0-4.0	Standard Proctor, CBR
CBR-3	B-95	-L-	211+50	20' Rt.	2.0-7.0	Standard Proctor, CBR
CBR-4	B-127	-Y7A-	21+50	10' Rt.	1.0-7.0	Standard Proctor, CBR
CBR-5	B-109	-L-	240+00	CL	0.2-2.0	Standard Proctor, CBR

Shelby Tubes

The following Shelby tubes were obtained and transported to our laboratory for potential testing to determine the engineering properties of the soil. A total of 7 Shelby tubes were attempted.

Sample No.	Boring No.	Line	Station	Offset	Depth (ft)	Test(s) Performed
ST-1	B-90	-L-	201+68	111' Rt.	8.0-10.0	AASHTO classification
ST-2					10.0-12.0	Not tested
ST-3	B-39	-L-	89+00	50' Rt.	8.0-10.0	Consolidation
ST-4	B-132	-Y7A-	31+50	CL	3.0-5.0	Consolidation
ST-5	B-83 (1)	-L-	181+95	40' Lt.	3.0-5.0	Consolidation, CU Triaxial
ST-6	B-58	-L-	127+69	17' Rt.	2.0-4.0	Consolidation
ST-7	B-137	-Y7A-	41+60	CL	3.0-5.0	AASHTO classification

5/14/99

NAD 83/NA 2011

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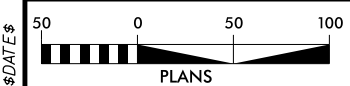
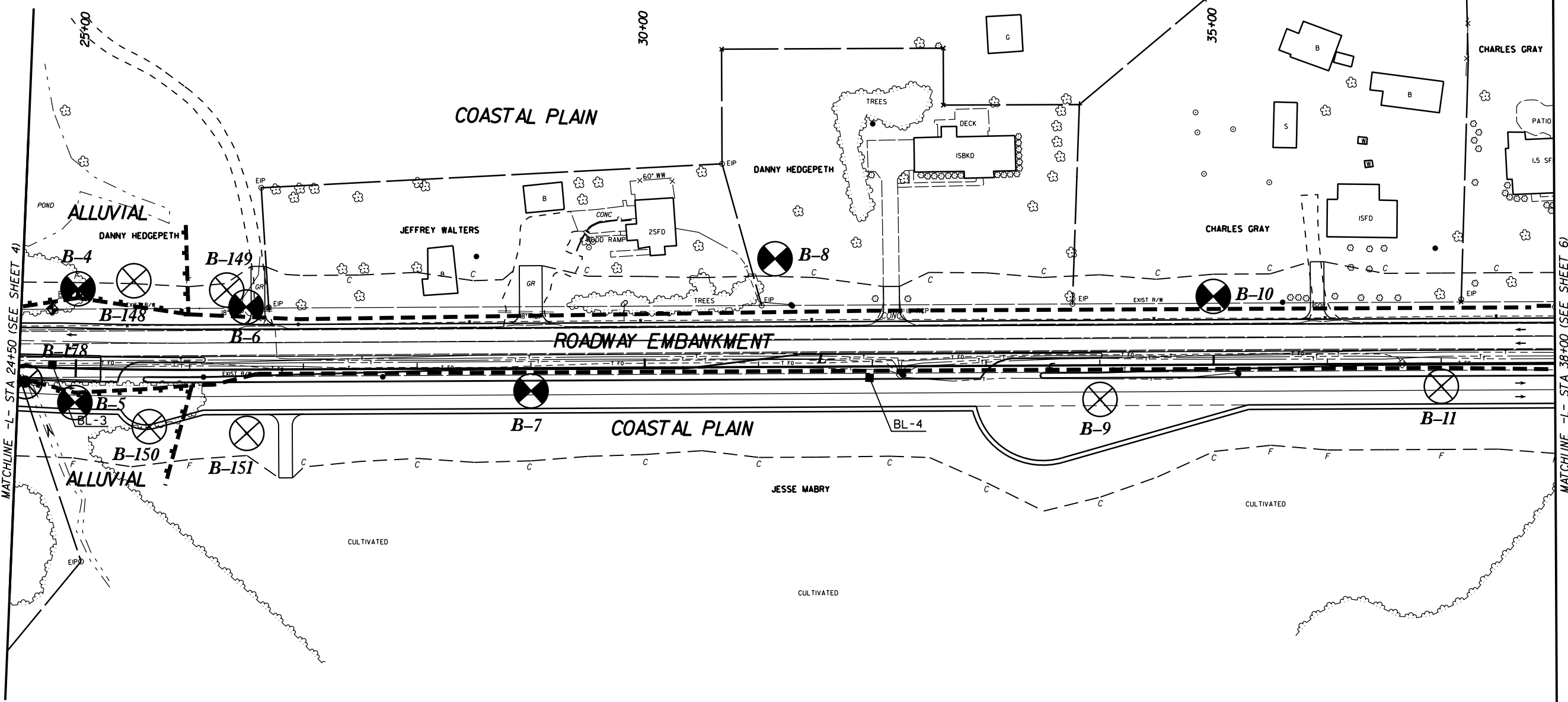
PROJECT REFERENCE NO. SHEET NO.
R-5705A 5

RW SHEET NO. HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER

INCOMPLETE PLANS
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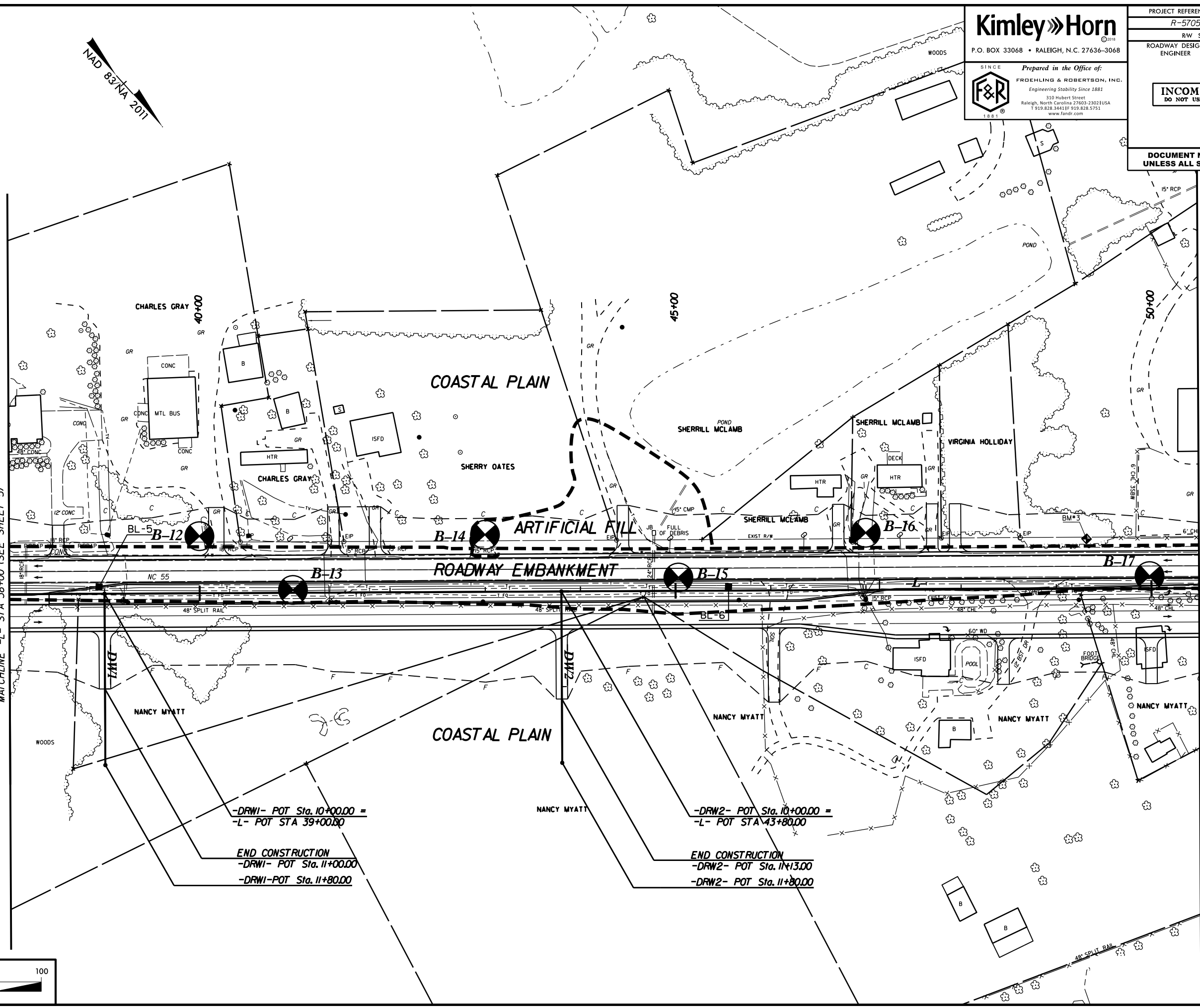
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PROJECT REFERENCE NO. R-5705A	SHEET NO. 6
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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MATCHLINE -L- STA 38+00 (SEE SHEET 5)

MATCHLINE -L- STA 50+50 (SEE SHEET 7)

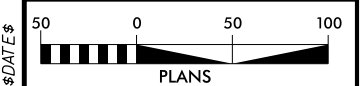


-DRW1- POT Sta. 10+00.00 =
 -L- POT STA 39+00.00

END CONSTRUCTION
 -DRW1- POT Sta. 11+00.00
 -DRW1-POT Sta. 11+80.00

-DRW2- POT Sta. 10+00.00 =
 -L- POT STA 43+80.00

END CONSTRUCTION
 -DRW2- POT Sta. 11+13.00
 -DRW2- POT Sta. 11+80.00

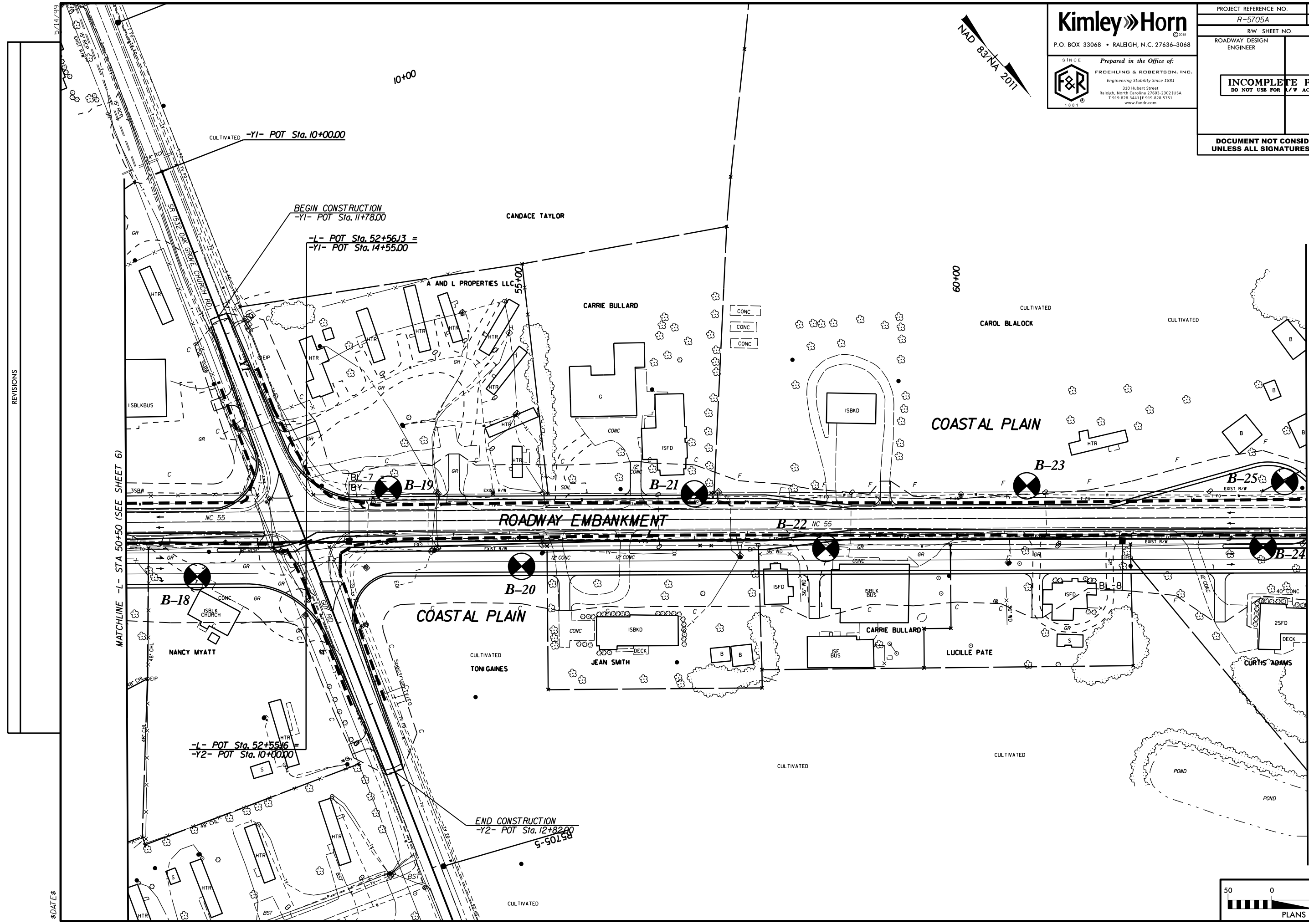
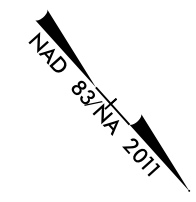


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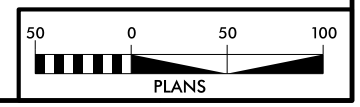
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
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MATCHLINE -L- STA 50+50 (SEE SHEET 6)

MATCHLINE -L- STA 64+00 (SEE SHEET 8)



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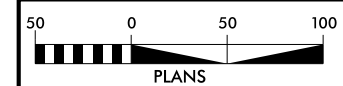
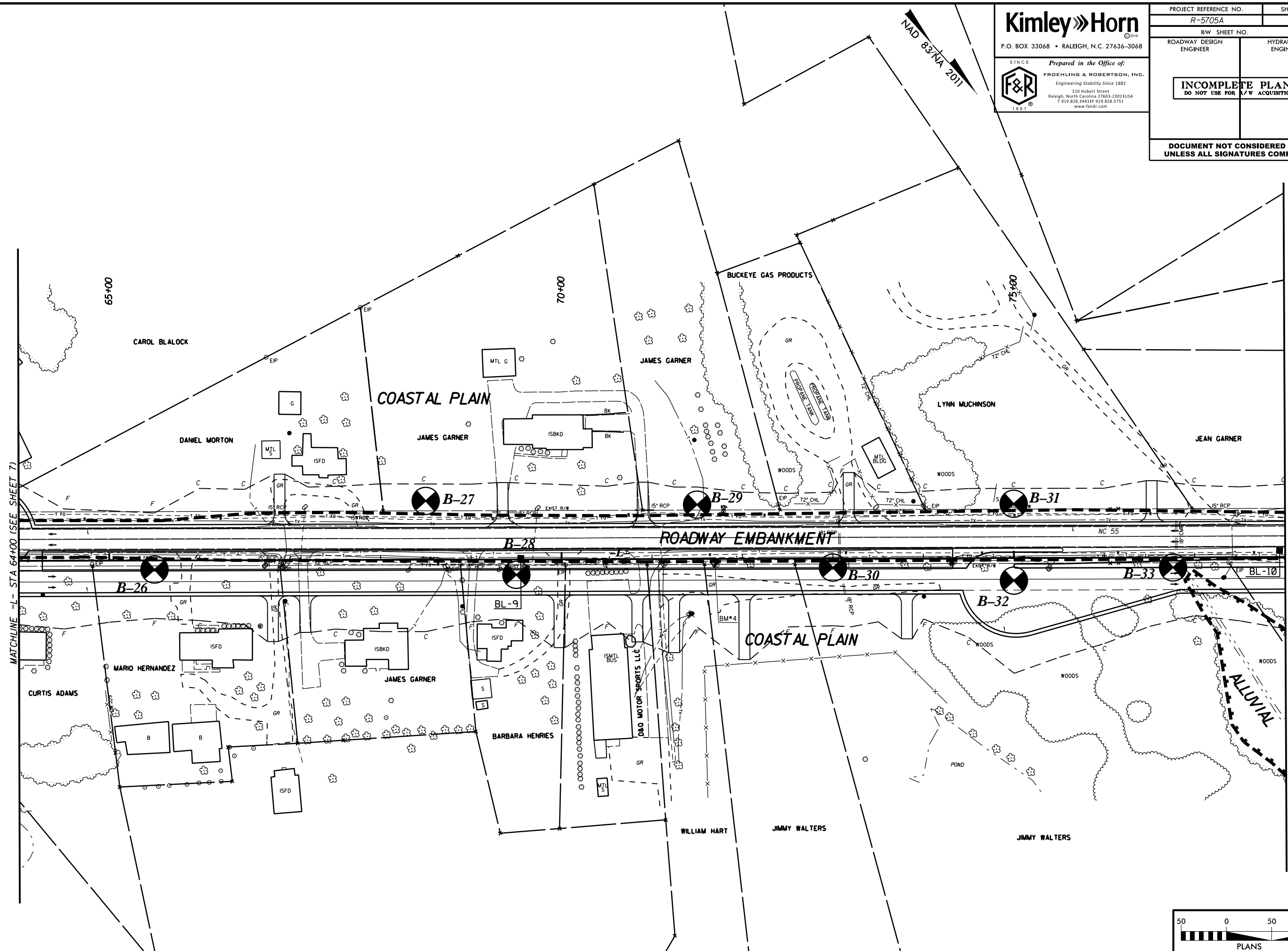
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PROJECT REFERENCE NO. R-5705A	SHEET NO. 8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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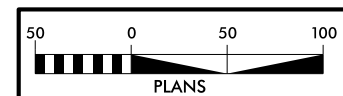
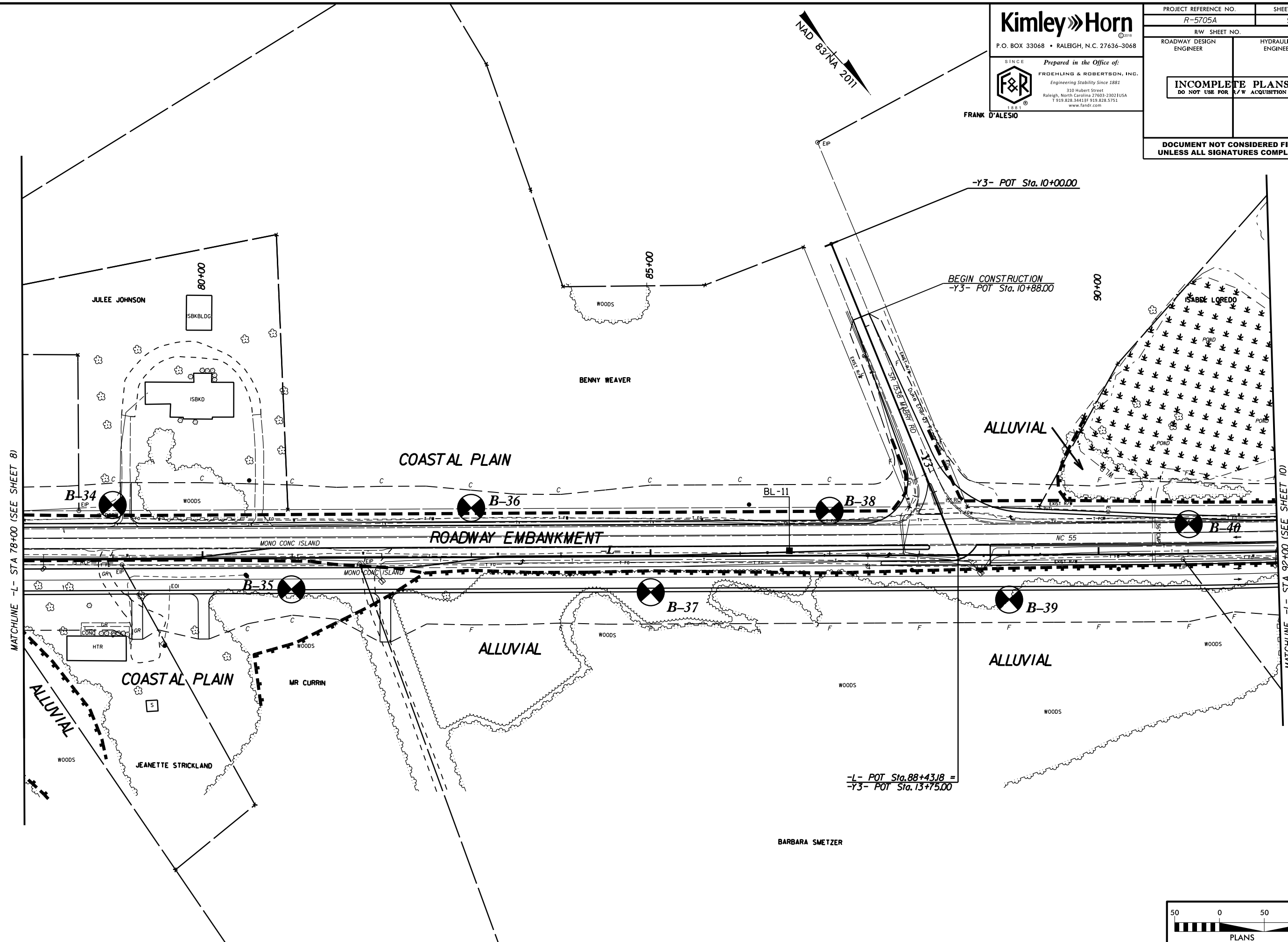
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PROJECT REFERENCE NO. R-5705A	SHEET NO. 9
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

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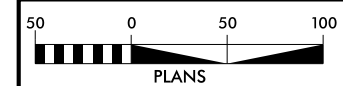
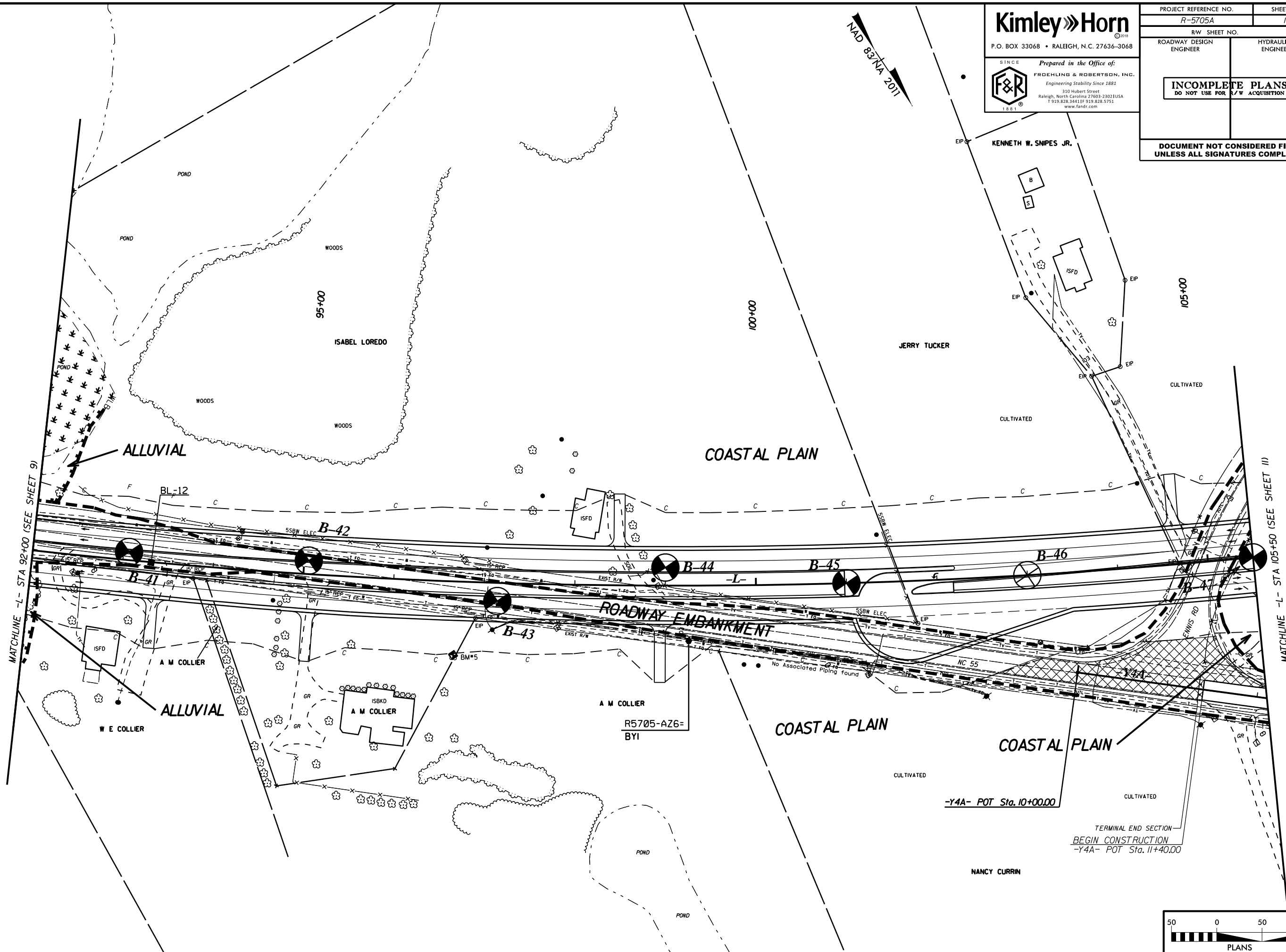
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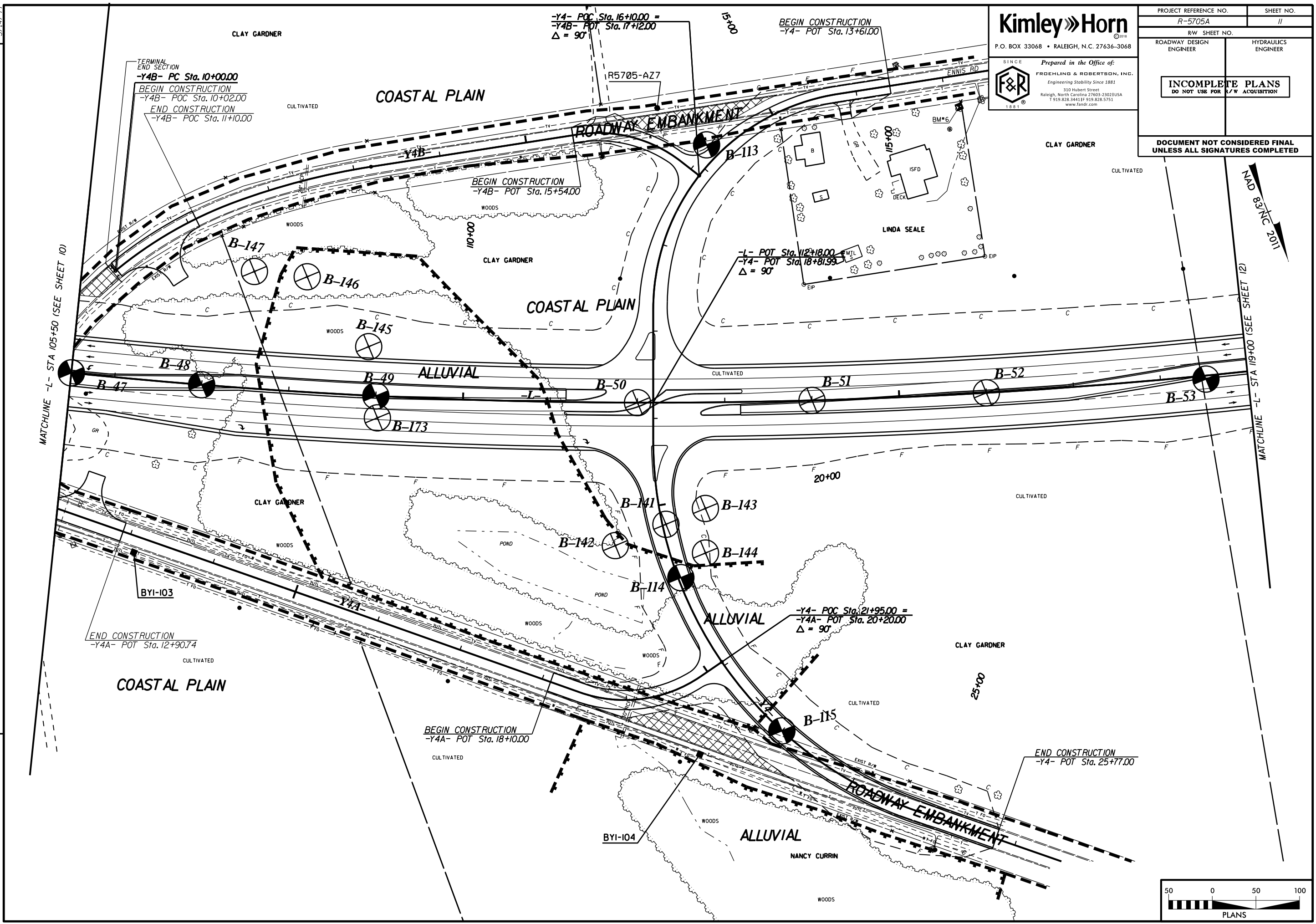
PROJECT REFERENCE NO. R-5705A	SHEET NO. 10
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
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PROJECT REFERENCE NO. R-5705A	SHEET NO. II
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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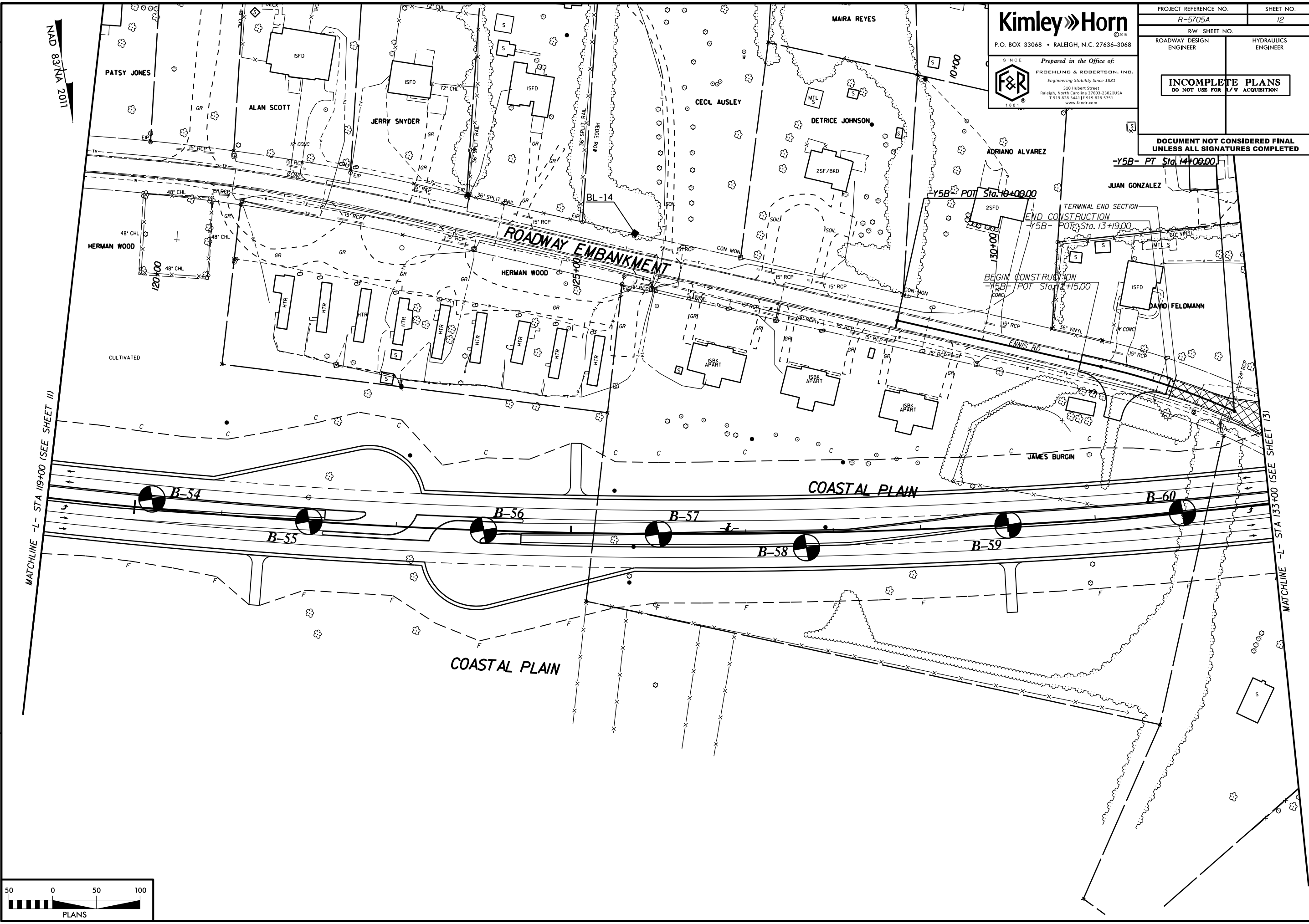
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PROJECT REFERENCE NO. R-5705A SHEET NO. 12

RW SHEET NO. ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

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MATCHLINE -L- STA 119+00 (SEE SHEET 11)

MATCHLINE -L- STA 133+00 (SEE SHEET 13)



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PROJECT REFERENCE NO. R-5705A SHEET NO. 13

RW SHEET NO. ROADWAY DESIGN ENGINEER HYDRAULICS ENGINEER

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MATCHLINE -L- STA 133+00 (SEE SHEET 12)

MATCHLINE -L- STA 146+50 (SEE SHEET 14)

BEGIN CONSTRUCTION
-Y5- POT Sta. 19+76.00

135+00
-L- POT Sta. 134+22.65 =
-Y5- POT Sta. 22+62.00
Δ = 92° 05' 01.0"

-L- POC Sta. 135+19.00 =
-Y5A- POT Sta. 10+00.00
Δ = 79° 51' 06.0"

COASTAL PLAIN

ALLUVIAL

COASTAL PLAIN

END CONSTRUCTION
-Y5A- POT Sta. 13+64.00

ROADWAY EMBANKMENT

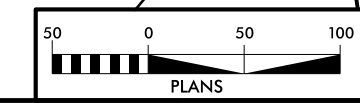
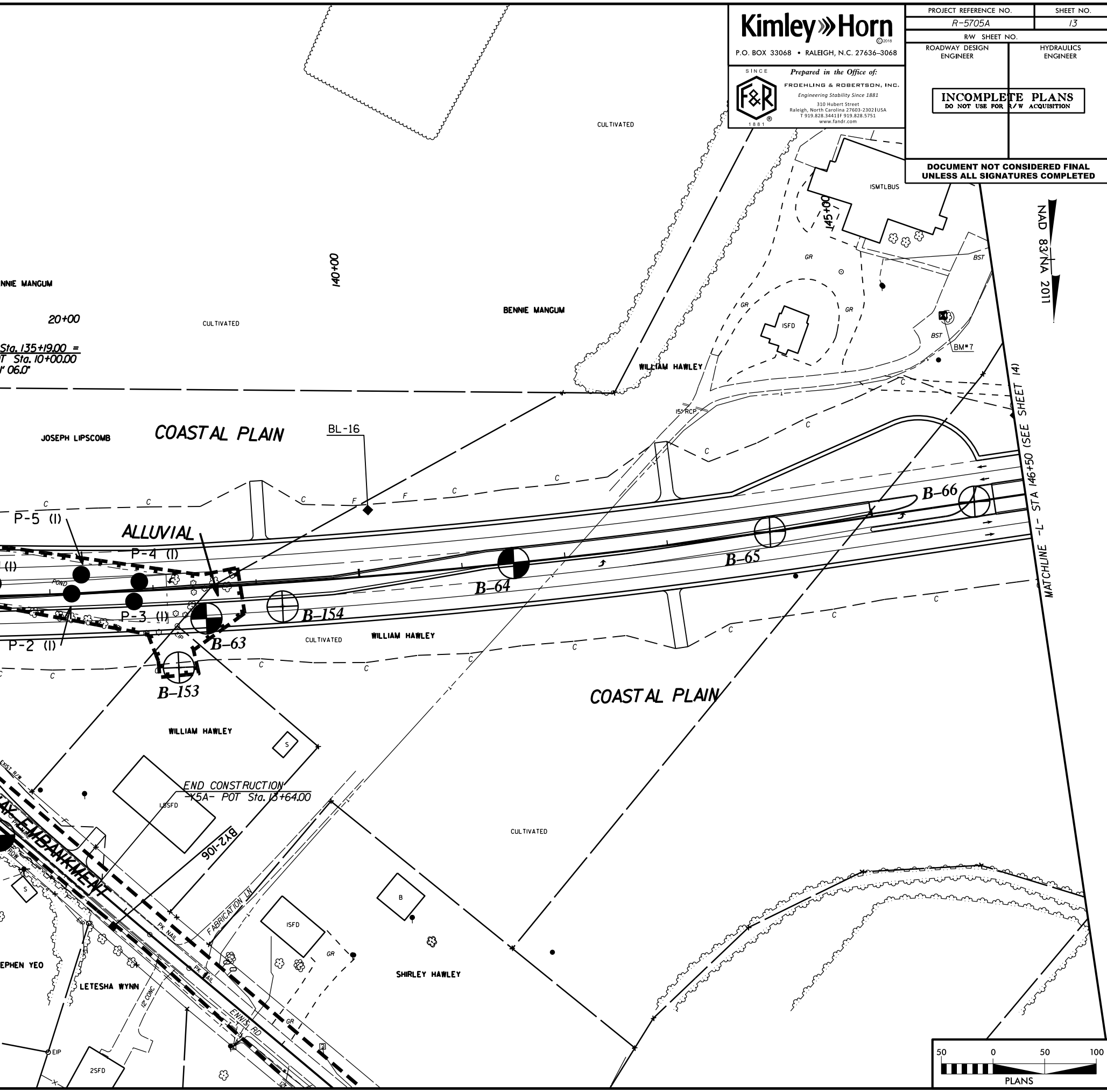
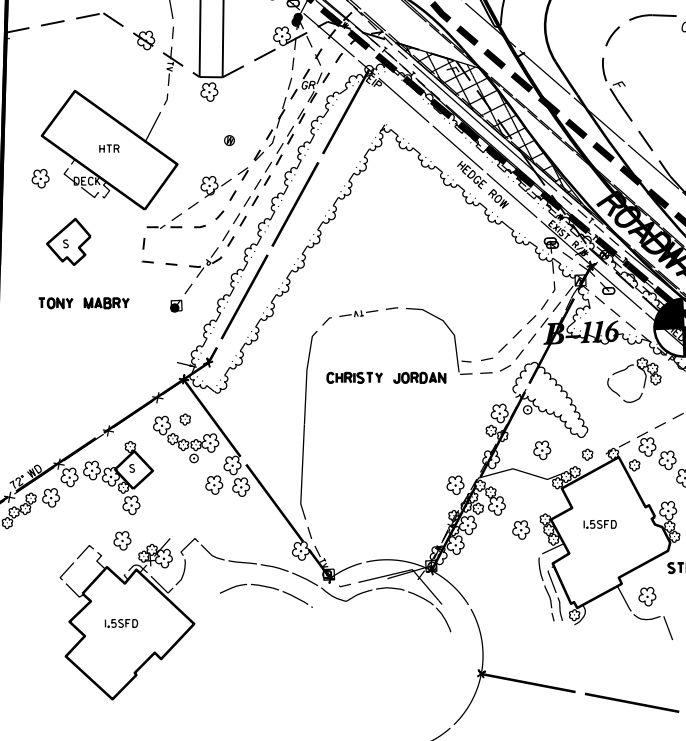
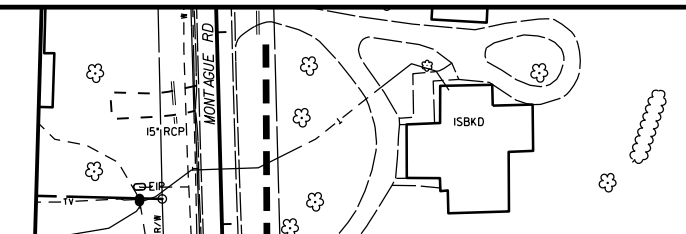
HTR
DECK
TONY MABRY

CHRISTY JORDAN

STEPHEN YEO

LETESHA WYNN

SHIRLEY HAWLEY



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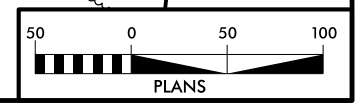
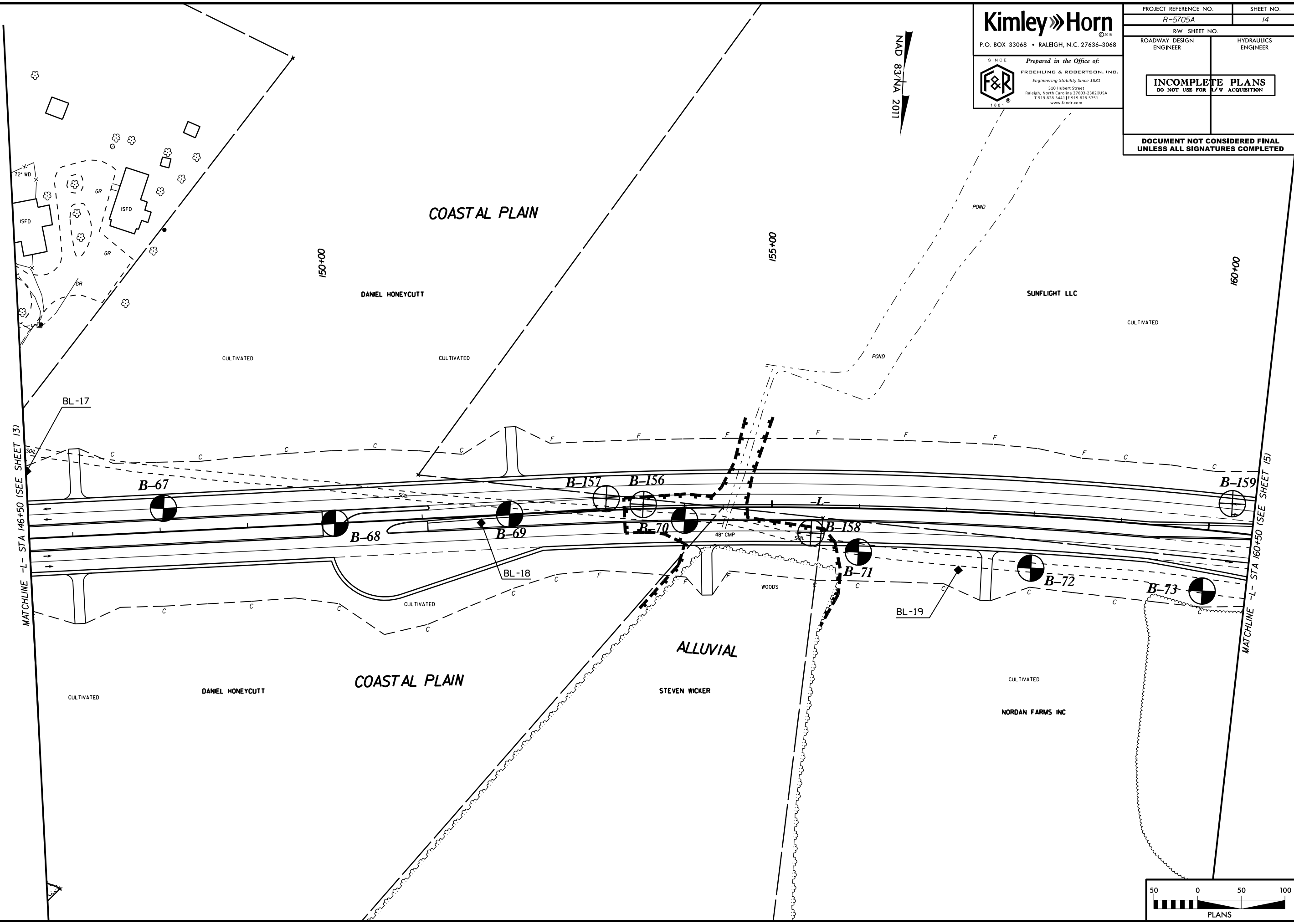
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PROJECT REFERENCE NO. R-5705A	SHEET NO. 14
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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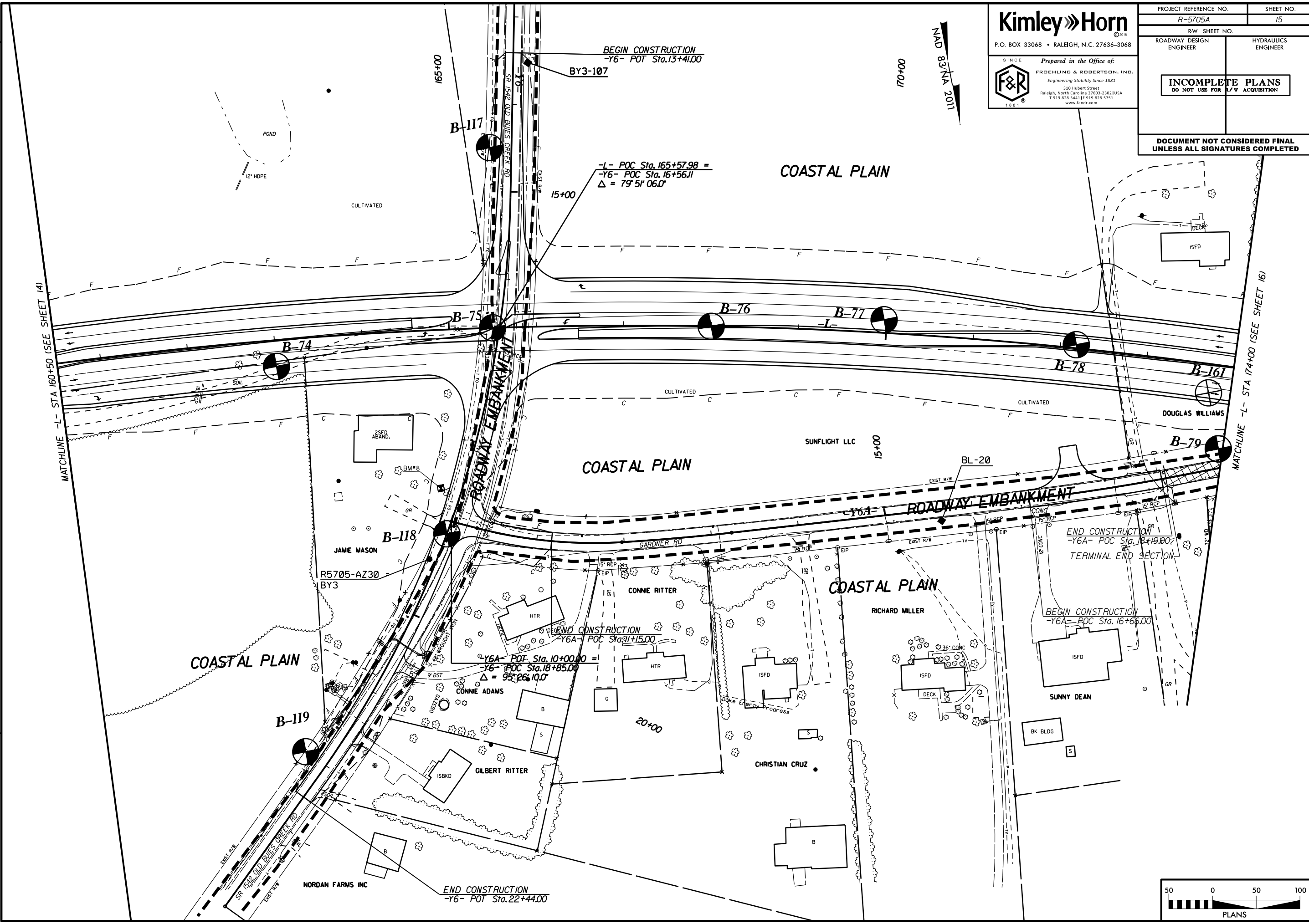
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PROJECT REFERENCE NO. R-5705A	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

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170+00



BEGIN CONSTRUCTION
-Y6- POT Sta. 13+41.00
BY3-107

-L- POC Sta. 165+57.98 =
-Y6- POC Sta. 16+56.11
 $\Delta = 79' 51" 06.0"$

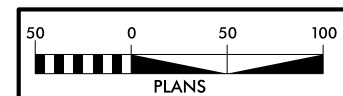
END CONSTRUCTION
-Y6A- POC Sta. 11+15.00

-Y6A- POT Sta. 10+00.00 =
-Y6- POC Sta. 18+85.00
 $\Delta = 95' 26" 10.0"$

END CONSTRUCTION
-Y6A- POC Sta. 17+19.00
TERMINAL END SECTION

BEGIN CONSTRUCTION
-Y6A- POC Sta. 16+66.00

END CONSTRUCTION
-Y6- POT Sta. 22+44.00



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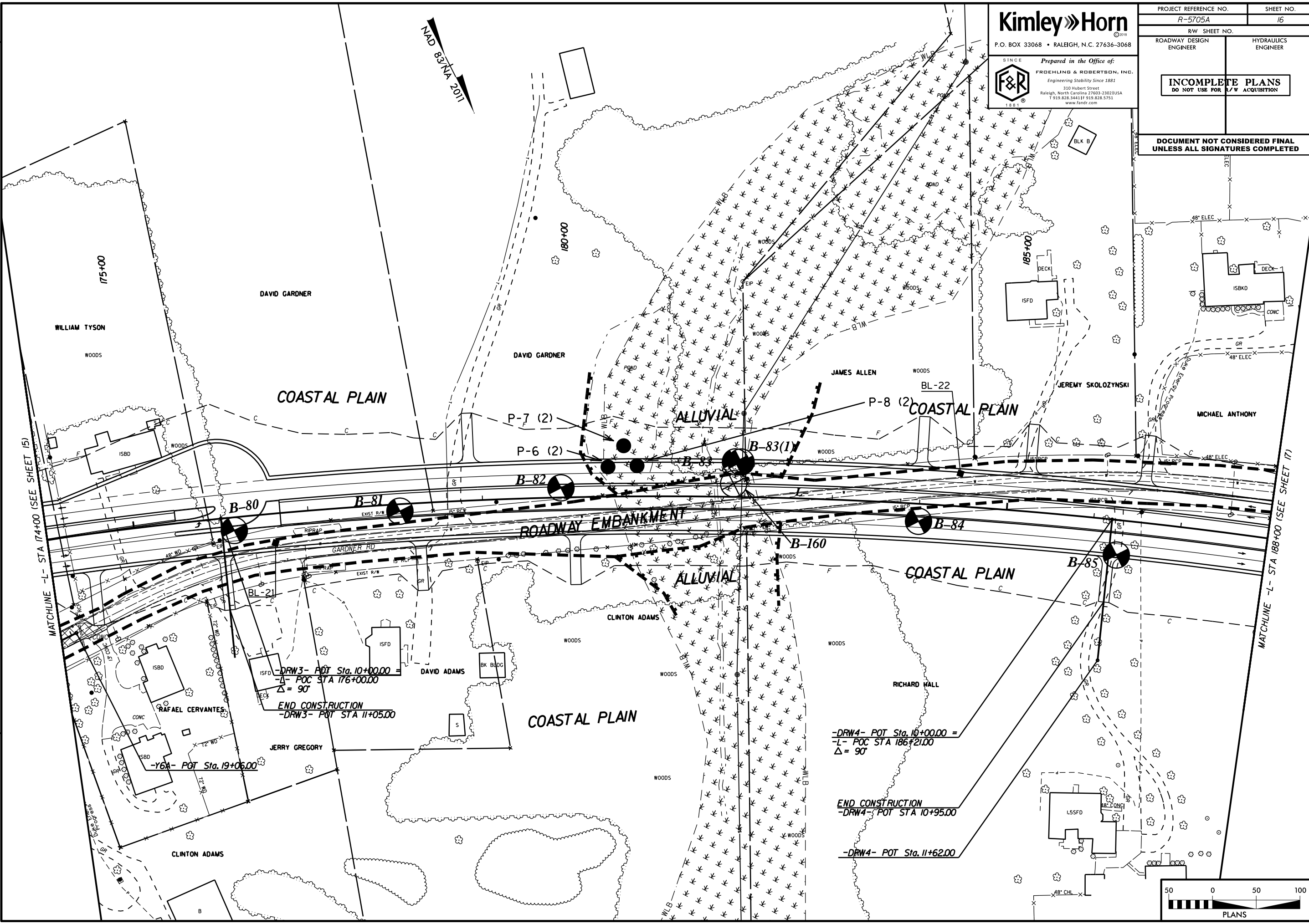
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PROJECT REFERENCE NO. R-5705A	SHEET NO. 16
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
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MATCHLINE -L- STA 174+00 (SEE SHEET 15)

MATCHLINE -L- STA 188+00 (SEE SHEET 17)

-DRW3- POT Sta. 10+00.00 =
 -L- POC STA 176+00.00
 $\Delta = 90^\circ$
 END CONSTRUCTION
 -DRW3- POT STA 11+05.00

-DRW4- POT Sta. 10+00.00 =
 -L- POC STA 186+21.00
 $\Delta = 90^\circ$

END CONSTRUCTION
 -DRW4- POT STA 10+95.00

-DRW4- POT Sta. 11+62.00

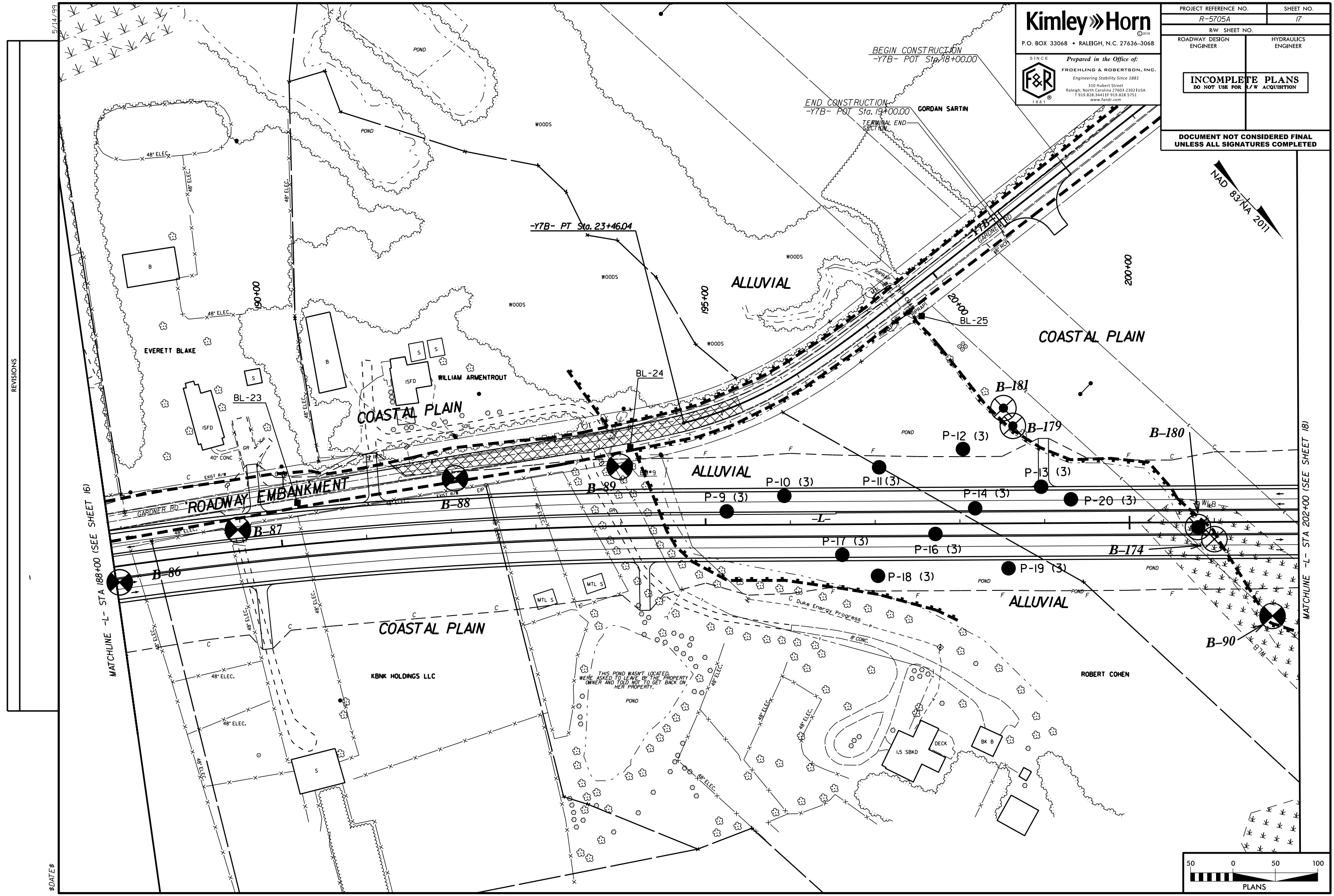


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PROJECT REFERENCE NO. R-5705A	SHEET NO. 17
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

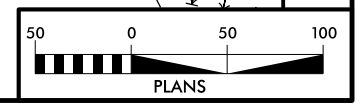


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MATCHLINE -L- STA 188+00 (SEE SHEET 16)

MATCHLINE -L- STA 202+00 (SEE SHEET 18)



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PROJECT REFERENCE NO. R-5705A	SHEET NO. 18
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

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MATCHLINE -L- STA 202+00 (SEE SHEET 17)

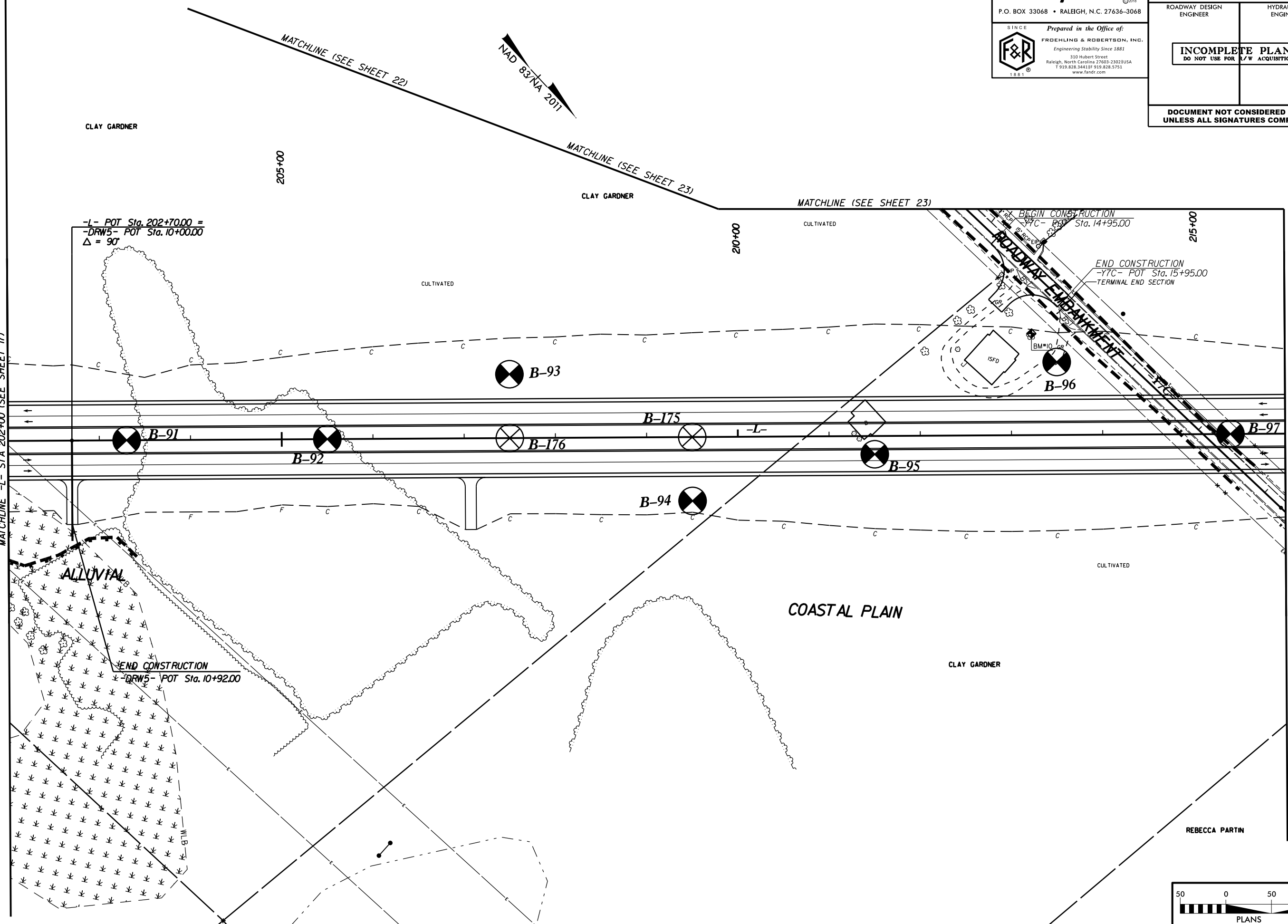
MATCHLINE -L- STA 216+00 (SEE SHEET 19)

-L- POT Sta. 202+70.00 =
-DRW5- POT Sta. 10+00.00
Δ = 90°

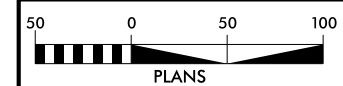
ALLUVIAL

END CONSTRUCTION
-DRW5- POT Sta. 10+92.00

BEGIN CONSTRUCTION
-Y7C- POT Sta. 14+95.00
END CONSTRUCTION
-Y7C- POT Sta. 15+95.00
- TERMINAL END SECTION



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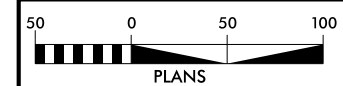
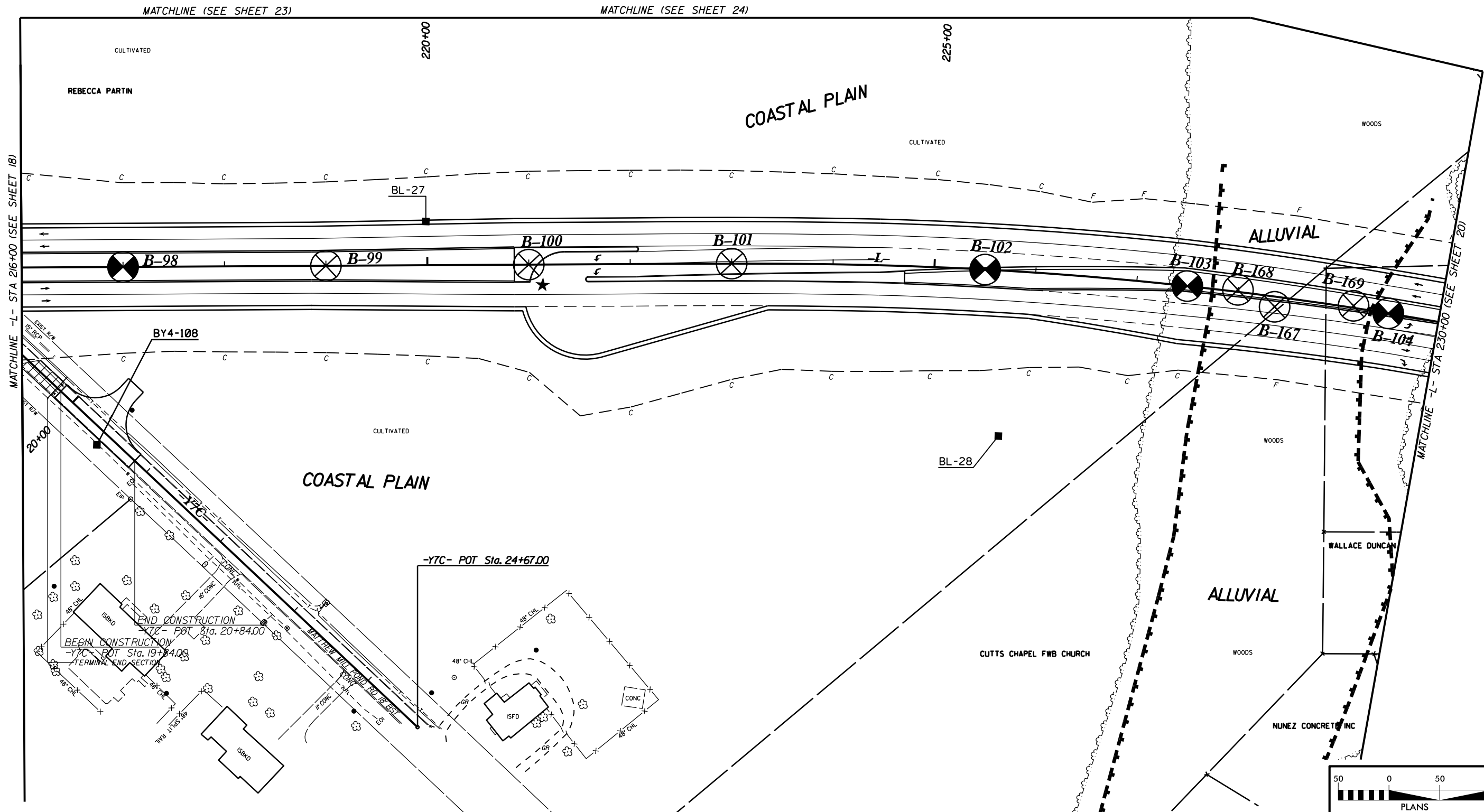
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PROJECT REFERENCE NO. R-5705A	SHEET NO. 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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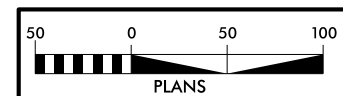
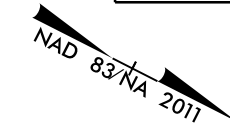
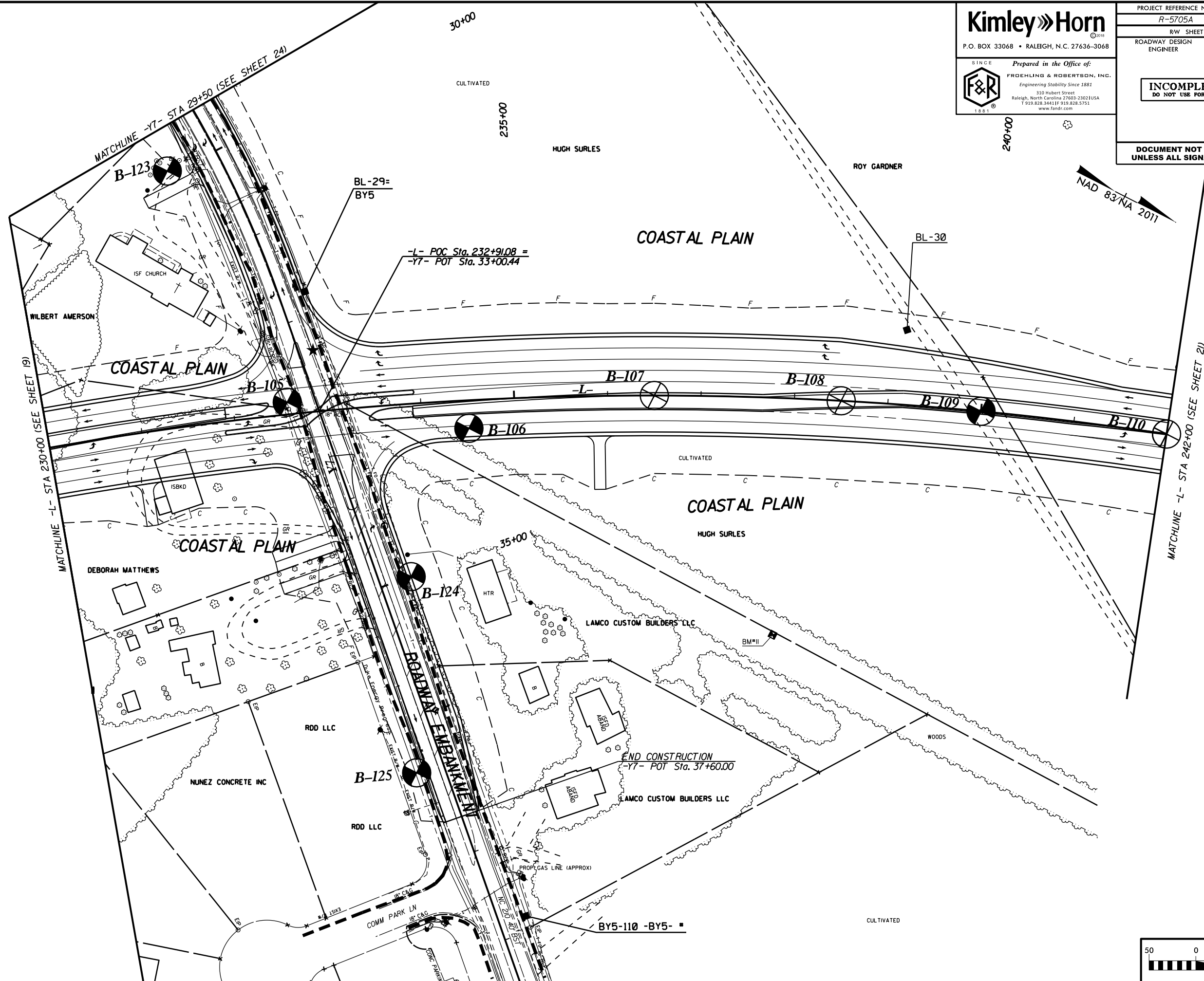
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PROJECT REFERENCE NO. R-5705A	SHEET NO. 20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
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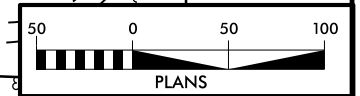
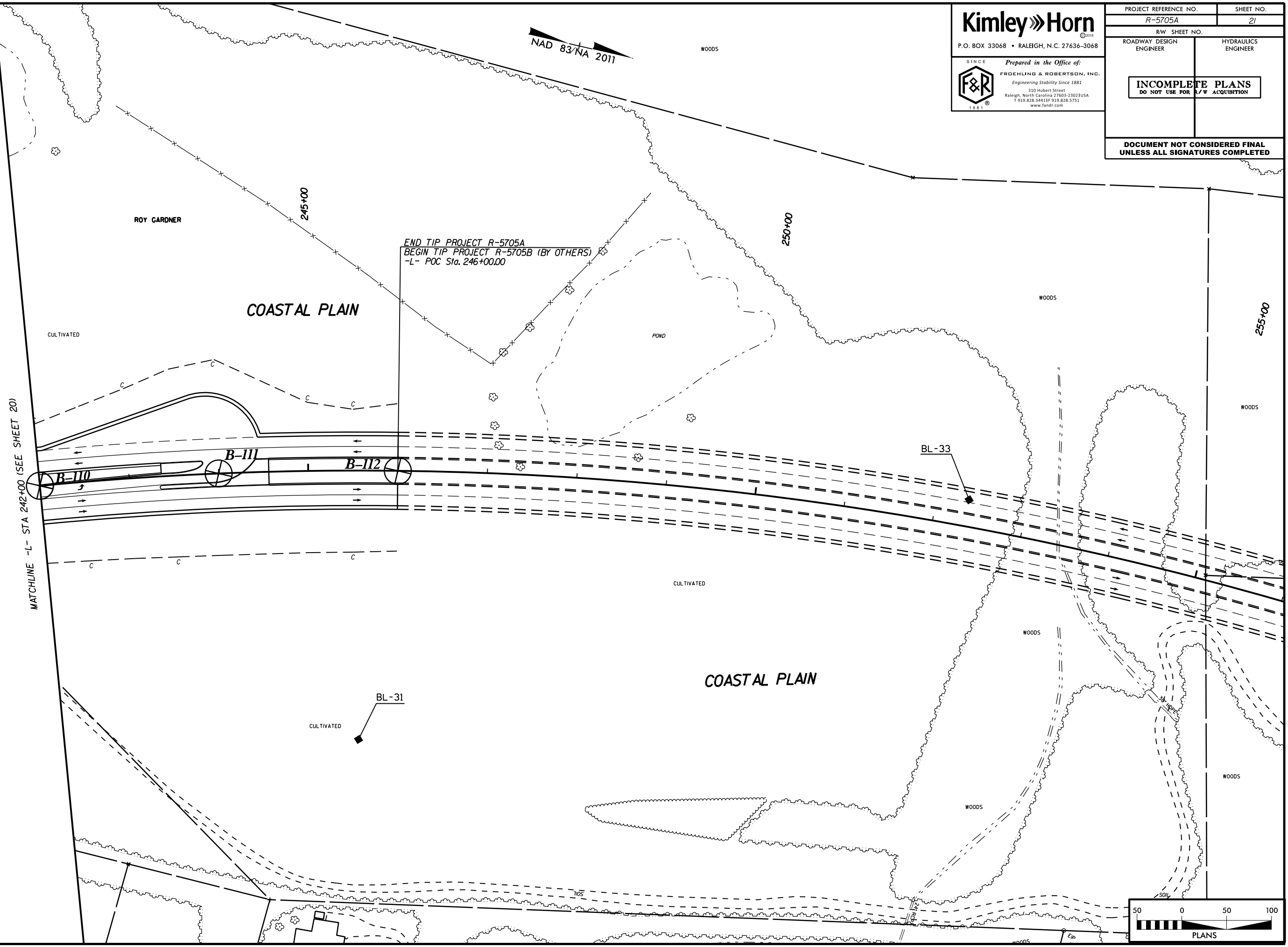
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PROJECT REFERENCE NO. R-5705A	SHEET NO. 21
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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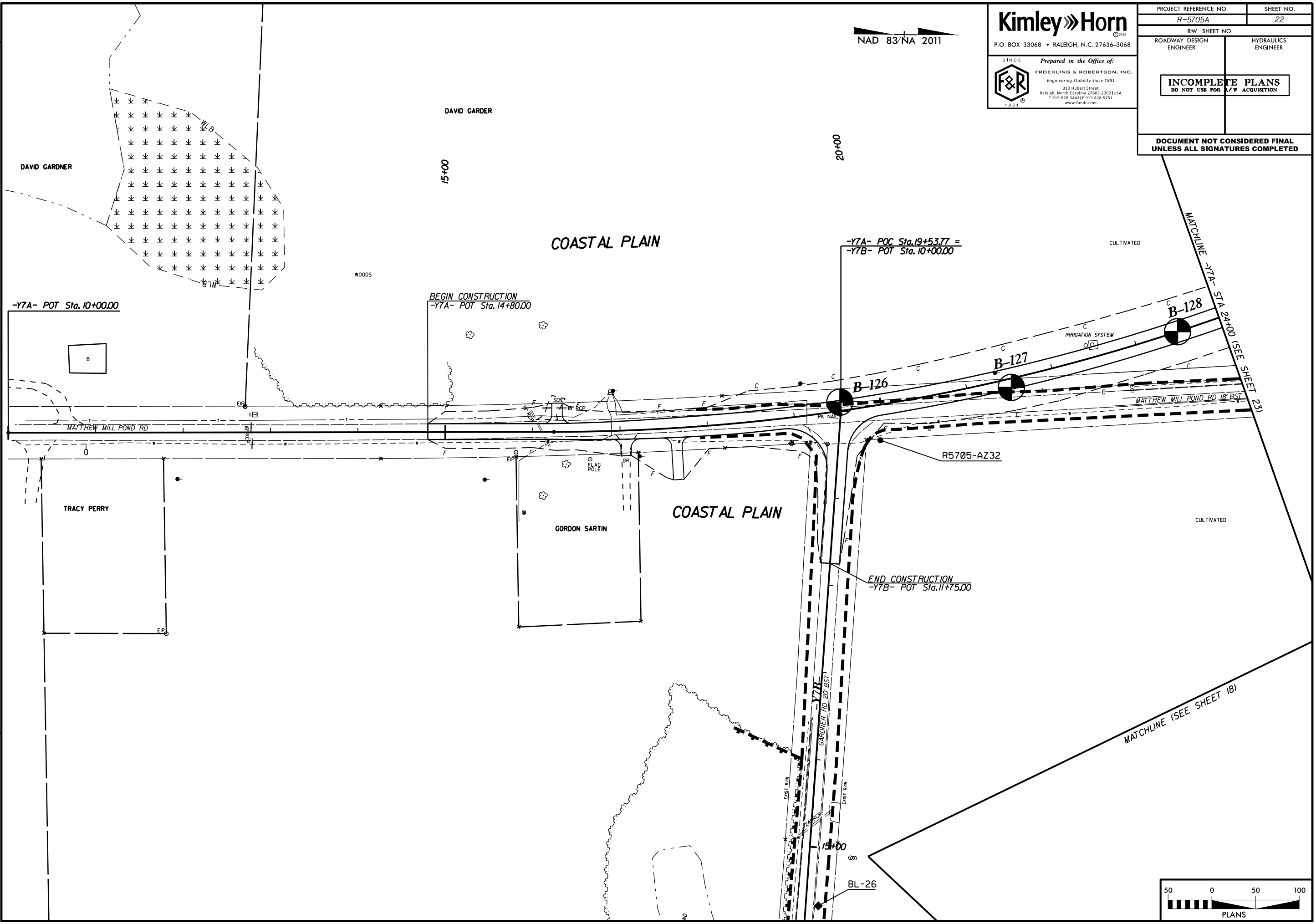
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PROJECT REFERENCE NO. R-5705A	SHEET NO. 22
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

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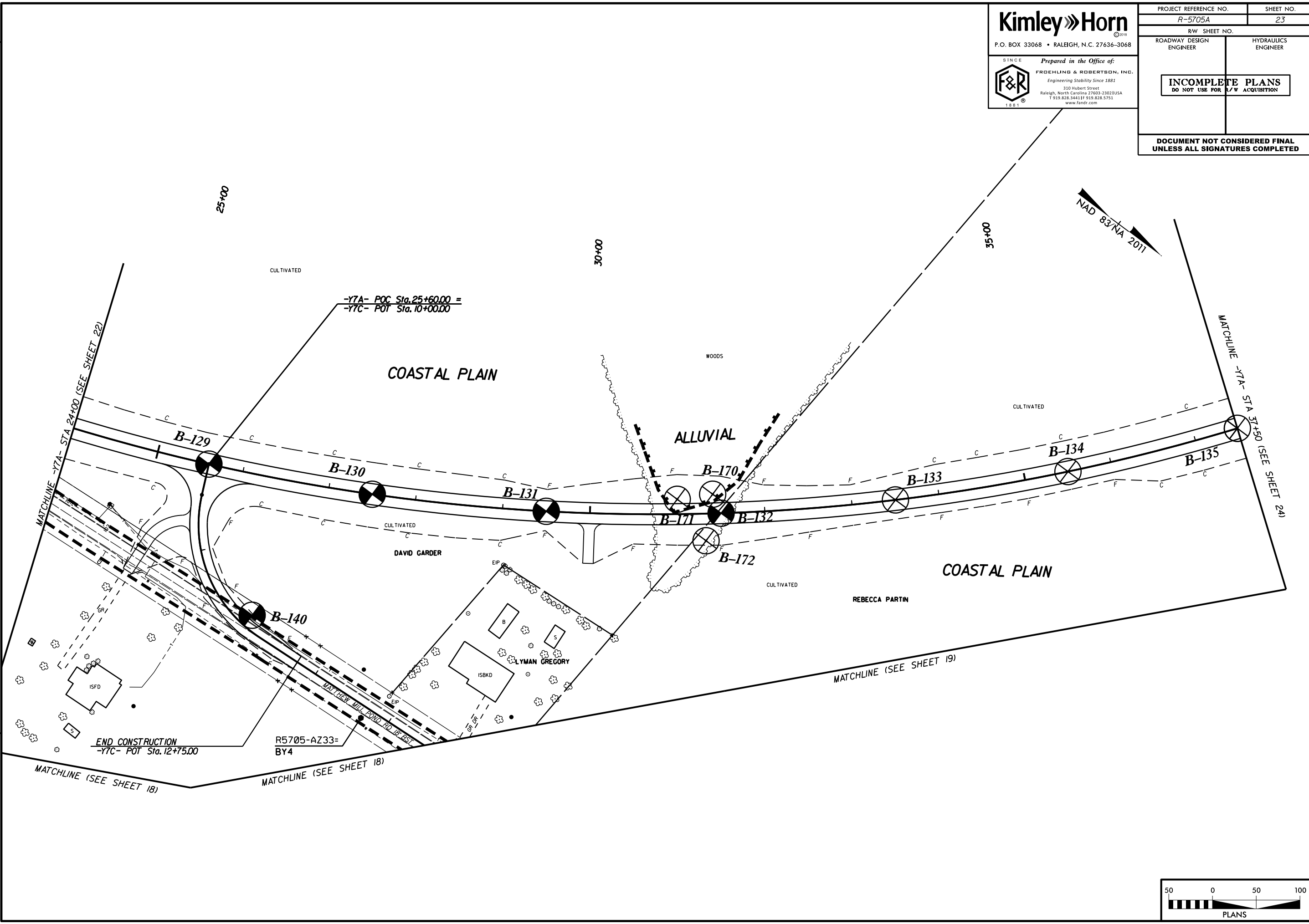
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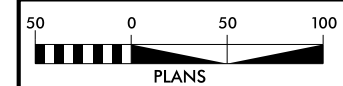
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-Y7A- POC Sta. 25+60.00 =
-Y7C- POT Sta. 10+00.00

END CONSTRUCTION
-Y7C- POT Sta. 12+75.00

R5705-AZ33=
BY4



5/14/99



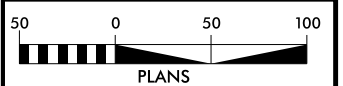
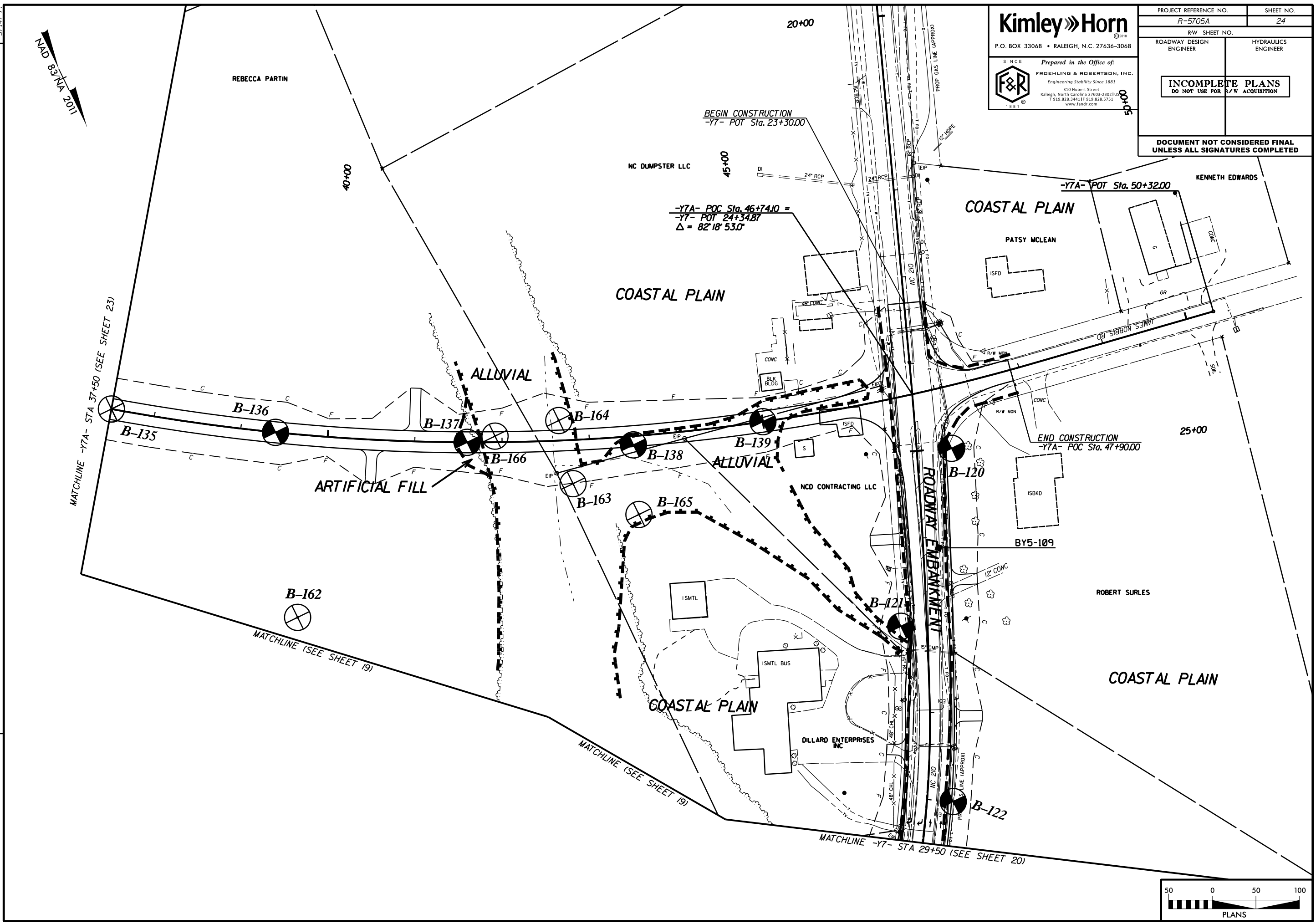
Kimley»Horn
 P.O. BOX 33068 • RALEIGH, N.C. 27636-3068

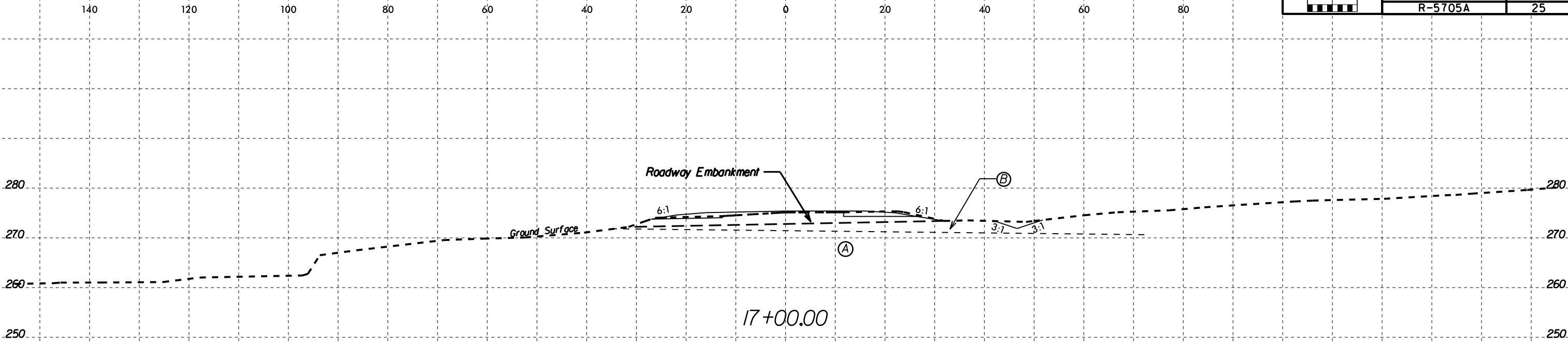
SINCE 1881 Prepared in the Office of:
F&R FROELING & ROBERTSON, INC.
 Engineering & Robertson, Inc.
 Engineering Stability Since 1881
 310 Hubert Street
 Raleigh, North Carolina 27603-2302 USA
 T 919.828.3441 F 919.828.5751
 www.fandri.com

PROJECT REFERENCE NO. R-5705A	SHEET NO. 24
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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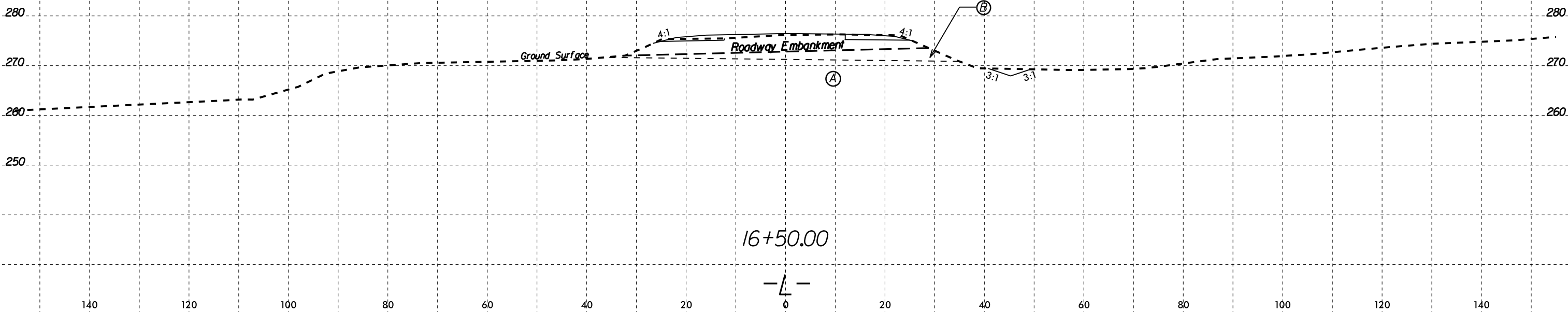
REVISIONS

\$DATE\$

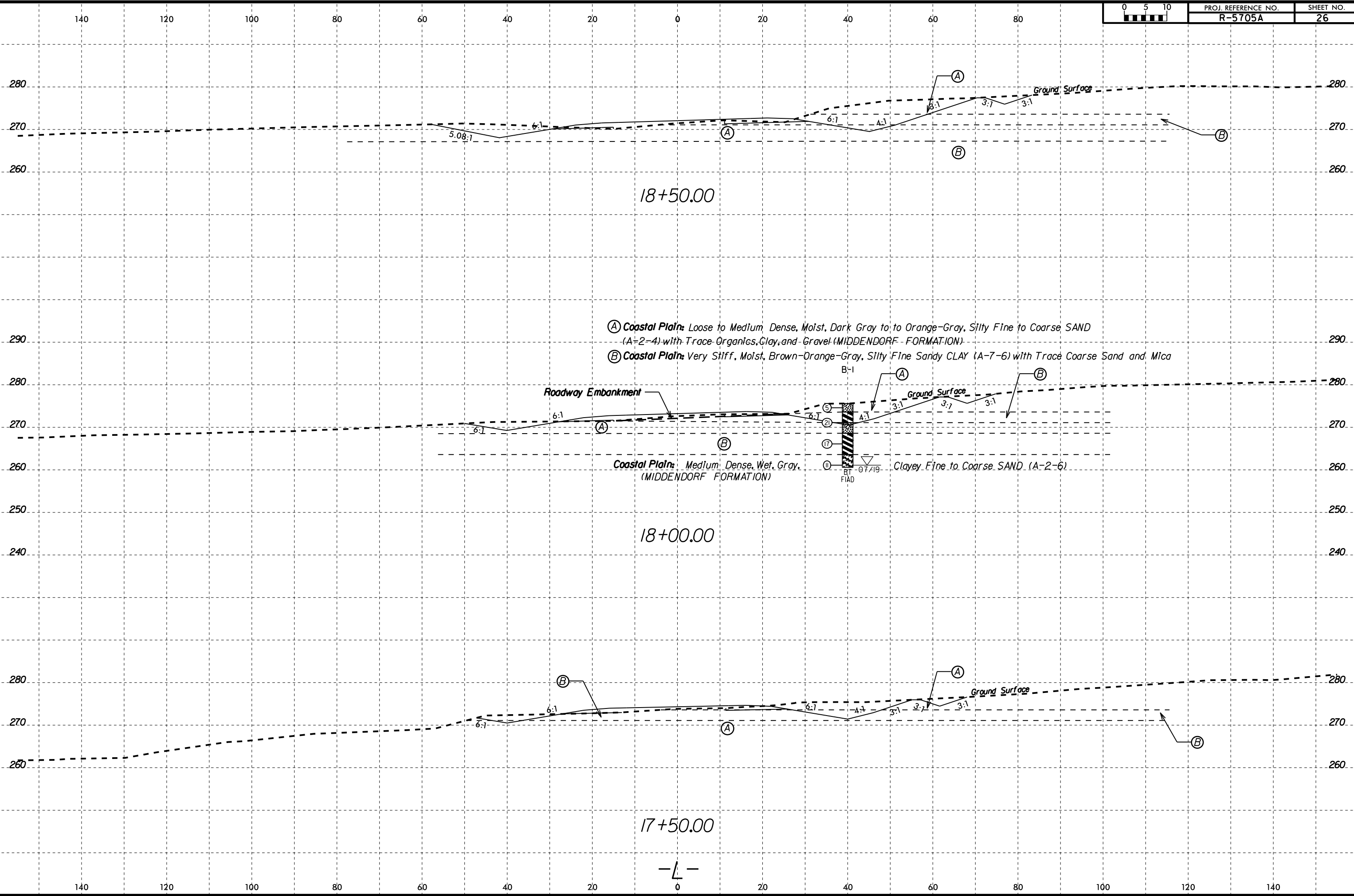




- Ⓐ Coastal Plain: Loose to Medium Dense, Moist, Dark Gray to to Orange-Gray, Silty Fine to Coarse SAND (A-2-4) with Trace Organics, Clay, and Gravel (MIDDENDORF FORMATION).
- Ⓑ Coastal Plain: Very Stiff, Moist, Brown-Orange-Gray, Silty Fine Sandy CLAY (A-7-6) with Trace Coarse Sand and Mica



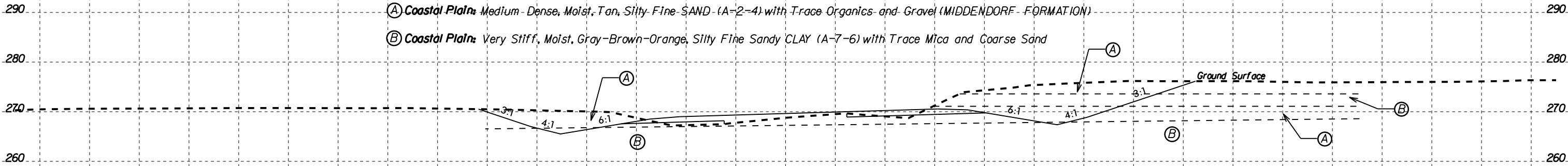
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Walker-A 66026102



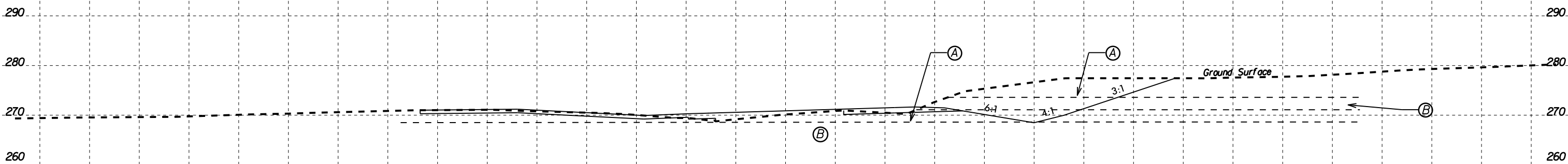
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19+50.00

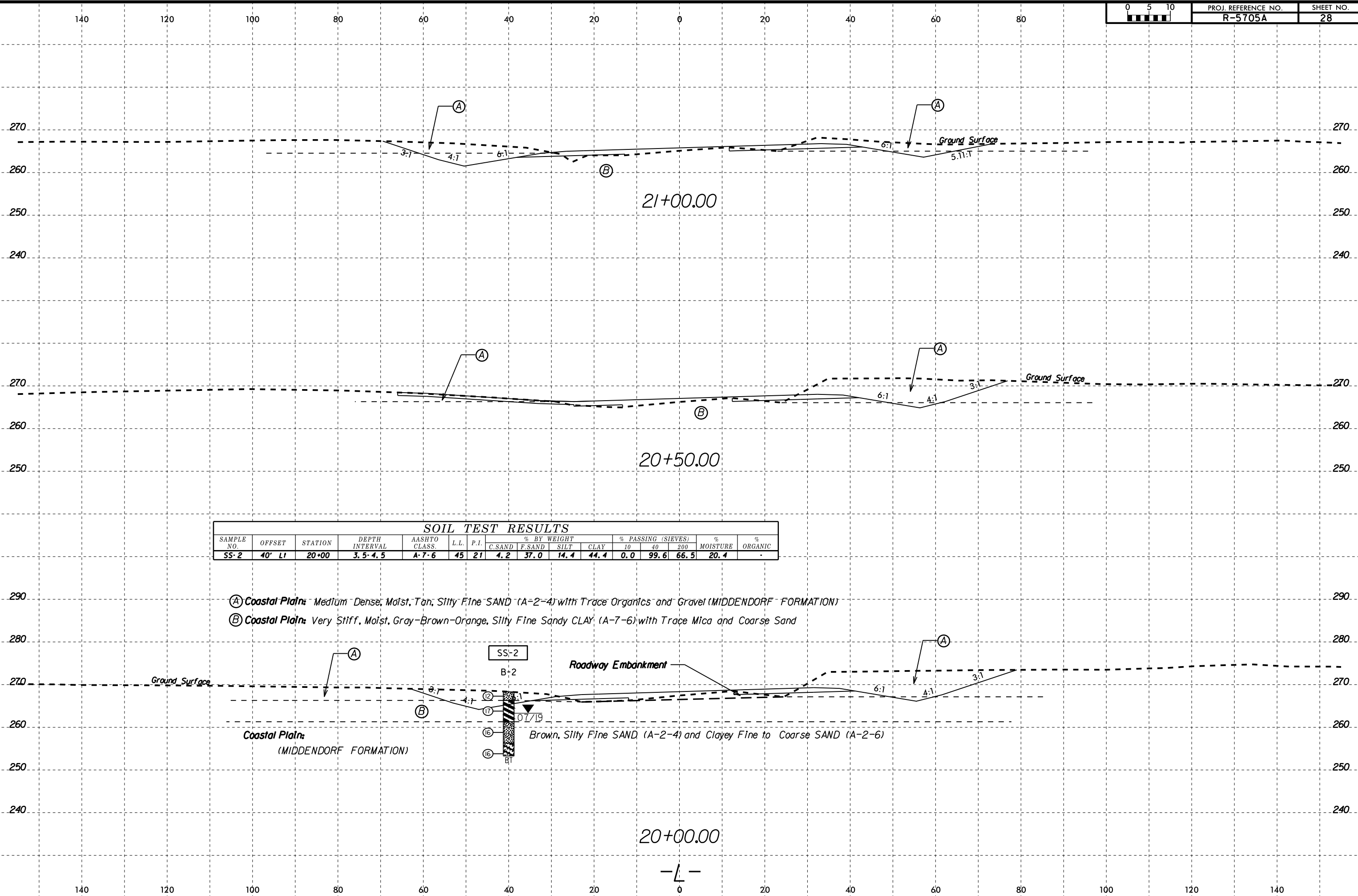


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 Walker A 68026102



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	40' Lt	20+00	3.5-4.5	A-7-6	45	21	4.2	37.0	14.4	44.4	0.0	99.6	66.5	20.4	-

- (A) Coastal Plain: Medium Dense, Moist, Tan, Silty Fine SAND (A-2-4) with Trace Organics and Gravel (MIDDENDORF FORMATION)
- (B) Coastal Plain: Very Stiff, Moist, Gray-Brown-Orange, Silty Fine Sandy CLAY (A-7-6) with Trace Mica and Coarse Sand

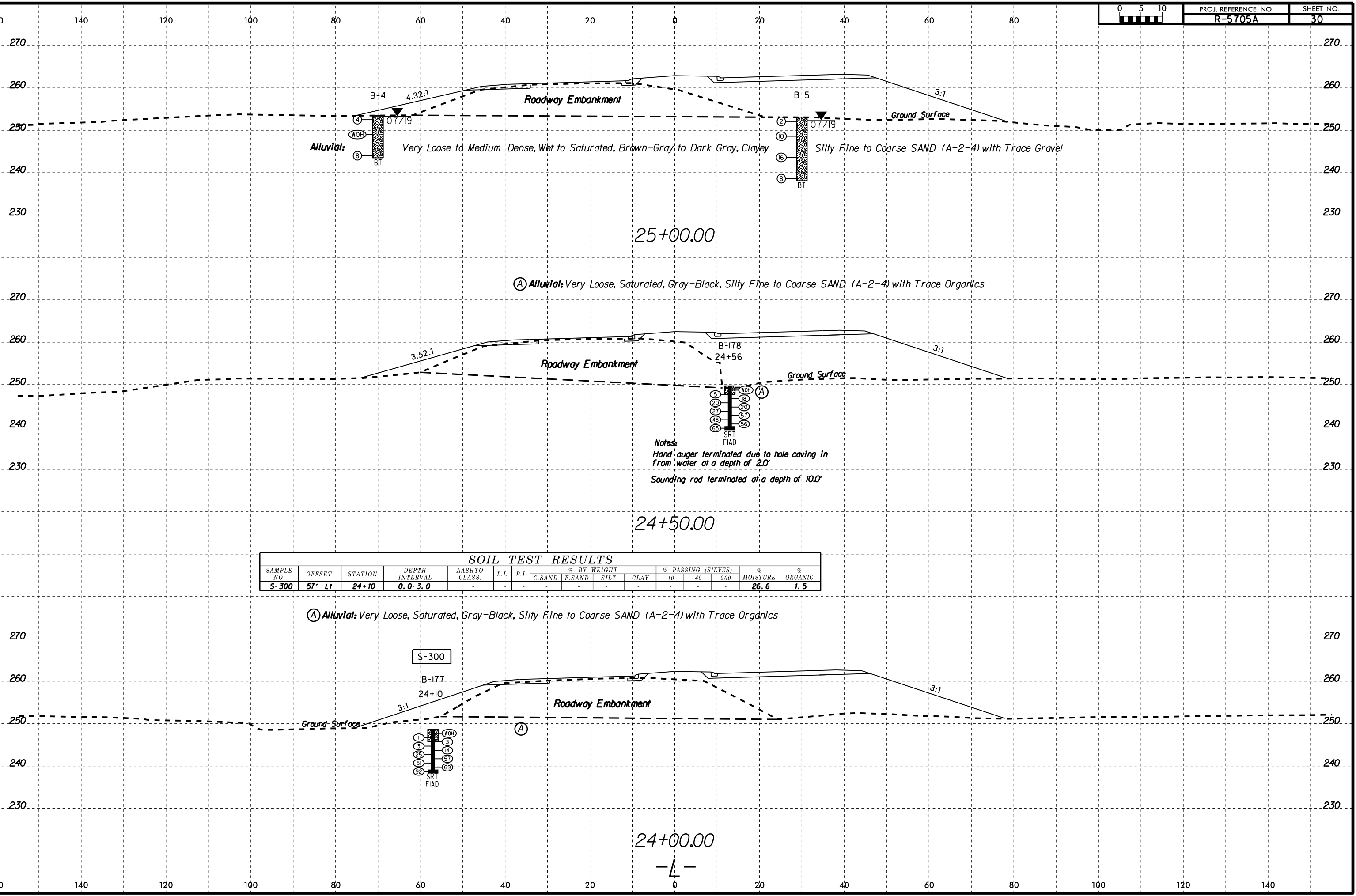
Coastal Plain:
(MIDDENDORF FORMATION)

Brown, Silty Fine SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6)

20+00.00

-L-

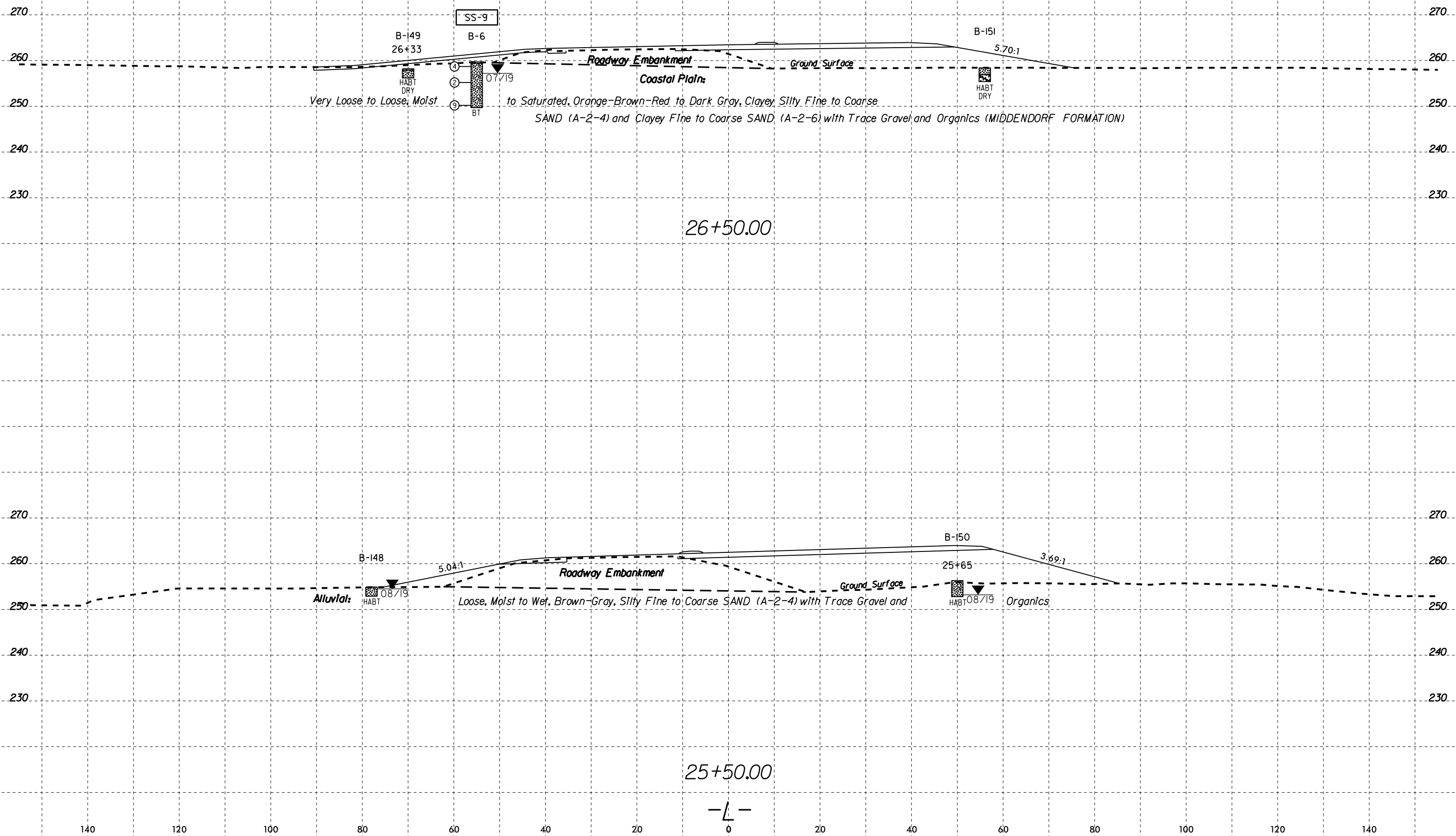
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 6/23/16
 68026102



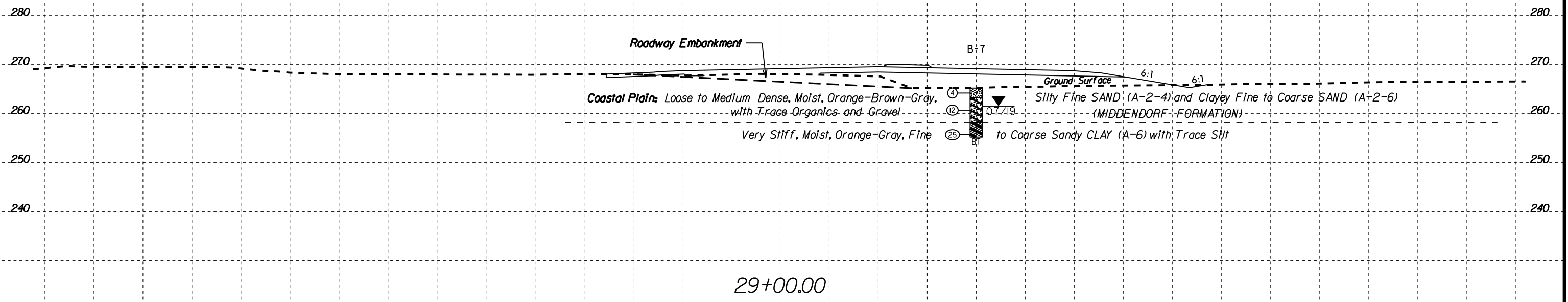
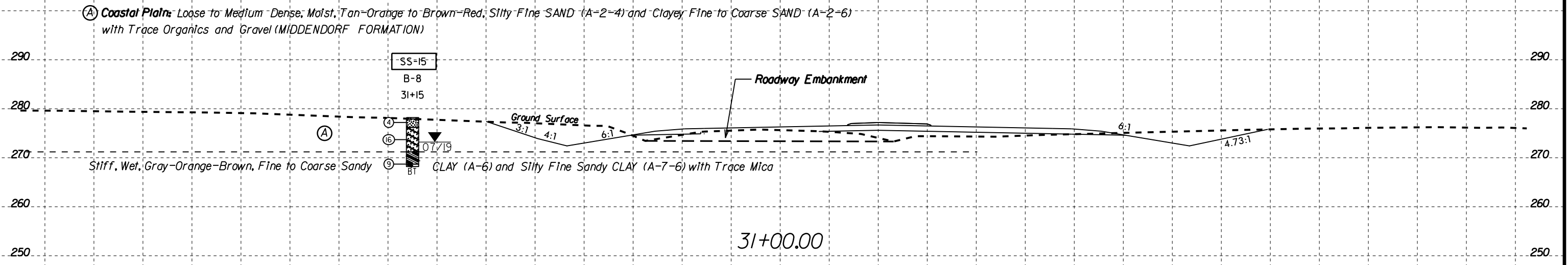
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-300	57' L1	24+10	0.0-3.0	-	-	-	-	-	-	-	-	-	-	26.6	1.5

Notes:
 Hand auger terminated due to hole caving in from water at a depth of 2.0'
 Sounding rod terminated at a depth of 10.0'

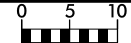
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-9	55' Lt	26+50	3.5-5.0	A-2-4	-	-	40.4	29.0	11.9	18.7	0.0	98.8	34.2	24.4	-



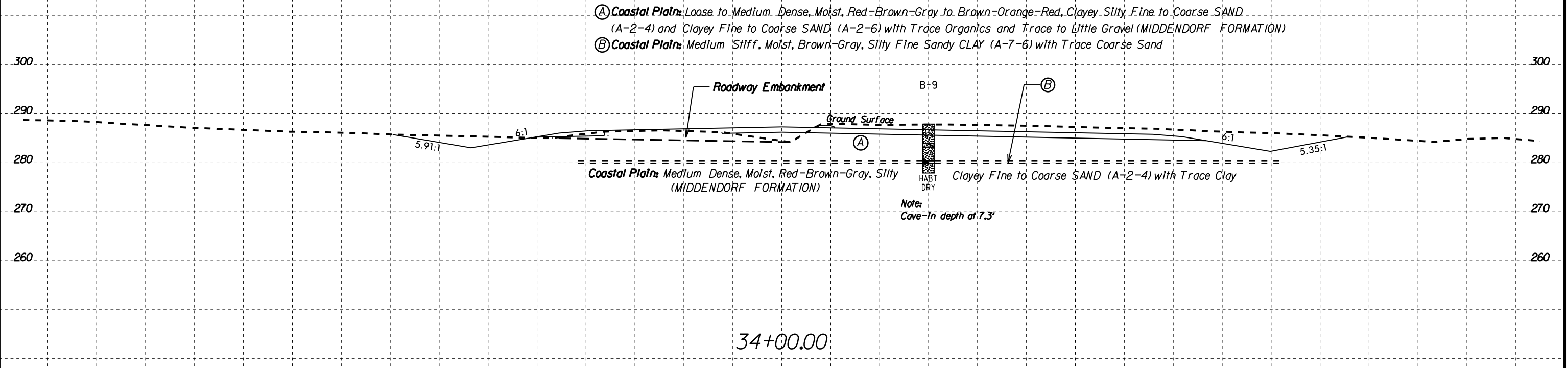
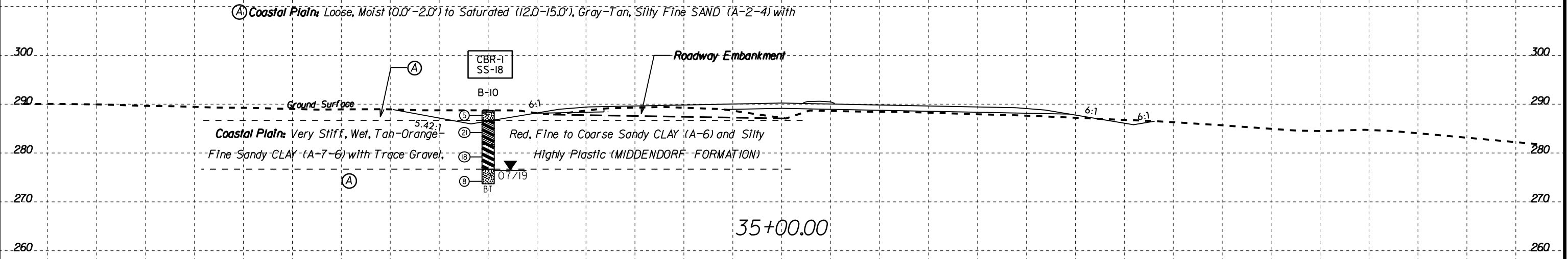
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-15	95' LI	31+15	8.5-9.5	A-6	40	22	29.8	31.0	3.8	35.4	0.0	99.3	40.7	15.9	-



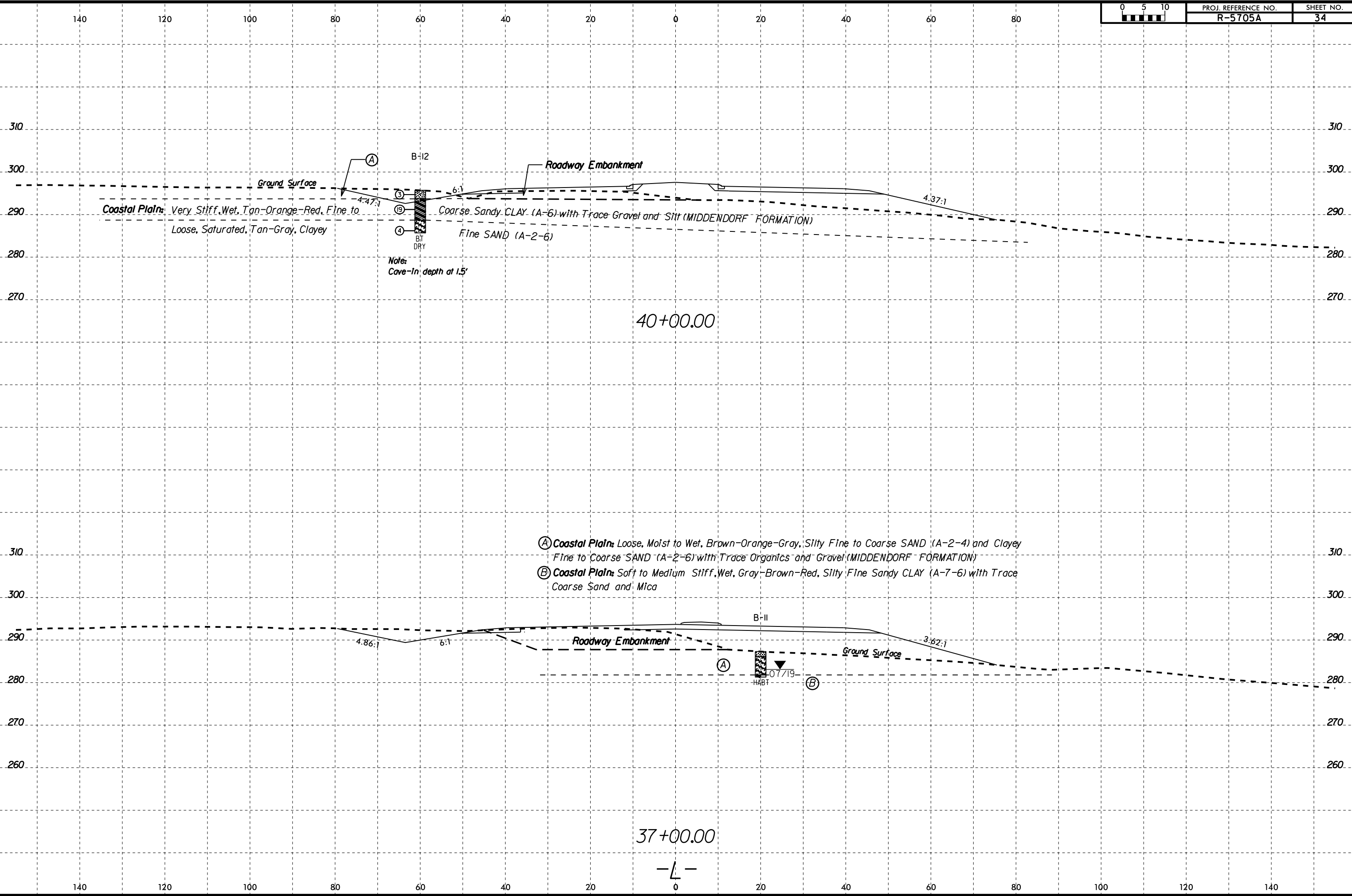
6/23/16



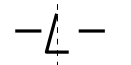
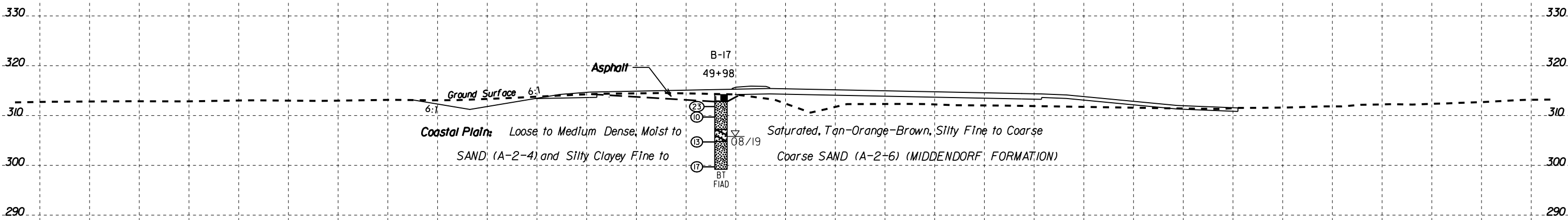
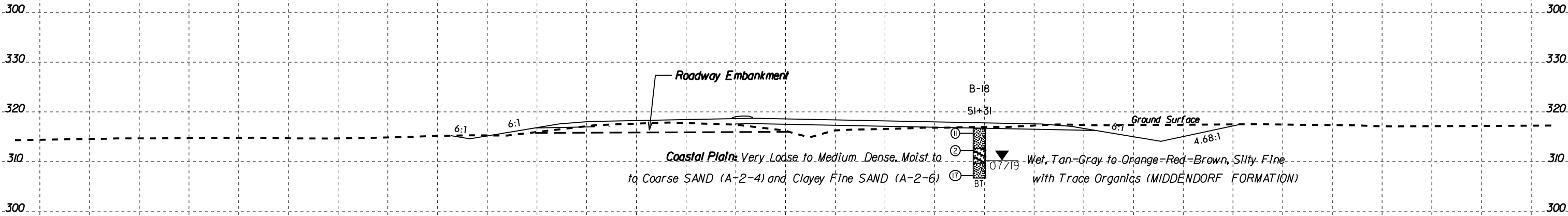
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
CBR-1	60' LI	35+00	2.0-4.0	A-6	34	17	38.1	28.4	5.9	27.6	0.0	98.5	37.0	11.7	-
SS-18	60' LI	35+00	8.5-10.0	A-7-6	53	34	9.2	21.9	16.1	52.8	0.0	100.0	73.0	14.1	-



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140

120

100

80

60

40

20

0

20

40

60

80

340

330

320

310

300

340

330

320

310

300

55+00.00

340

330

320

310

300

290

340

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290

53+50.00

-L-

140

120

100

80

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20

40

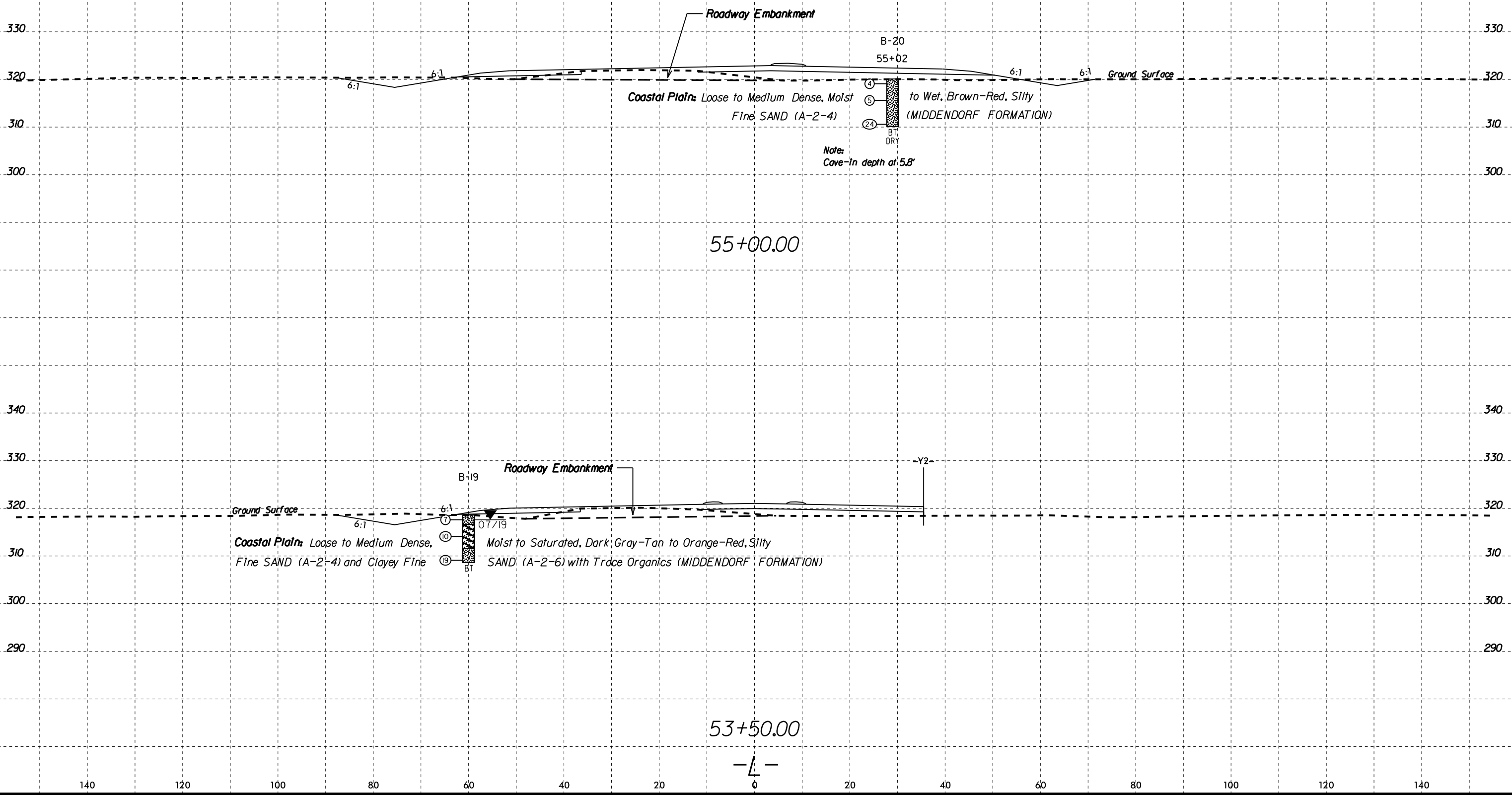
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60

80

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-35	6' LI	60+80	9.0-9.5	A-7-6	44	25	23.1	38.9	4.0	44.0	0.0	99.4	51.3	17.6	-

350

340

330

320

310

300

290

350

340

330

320

310

300

290

Ⓐ Coastal Plain: Very Stiff, Moist, Tan-Gray-Red, Fine to Coarse Sandy CLAY (A-7-6) with Trace Silt (MIDDENDORF FORMATION)

SS-35

B-23

60+80

Roadway Embankment

Ground Surface

Coastal Plain: Loose to Dense, Moist, Tan-Gray

6:1

to Brown-Orange-Red, Silty Fine

(MIDDENDORF FORMATION)

SAND (A-2-4) with Trace Clay

Medium Dense, Moist, Brown-Orange-Red,

Silty Fine SAND (A-2-4)

Ⓐ

Ⓐ

Note:
Cave-In depth at 2.5'

61+00.00

—L—

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

140 120 100 80 60 40 20 0 20 40 60 80

350 350

340 340

330 330

320 320

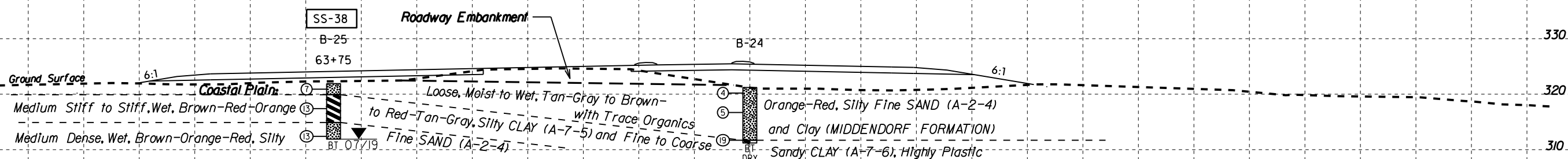
310 310

300 300

290 290

280 280

SOIL TEST RESULTS															
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-38	65' L1	63+75	3.5-4.5	A-7-6	52	30	28.6	28.5	0.8	42.1	0.0	98.8	45.0	20.0	-



63+50.00

-L-

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140

140

120

100

80

60

40

20

0

20

40

60

80

330

320

310

300

290

330

320

310

300

290

Ground Surface

Roadway Embankment

B-26

6:1

6:1

Coastal Plains: Loose to Medium Dense, Moist to
to Coarse SAND (A-2-4) and Clayey Fine
(MIDDENDORF FORMATION)

4
8
25
BT
DRY

Wet, Tan-Gray to Red-Orange-Brown, Silty, Fine
SAND (A-2-6) with Trace Organics and Gravel

Note:
Cave-In depth at 7.0'

65+50.00

-L-

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

140

120

100

80

60

40

20

0

20

40

60

80

(A) Coastal Plain: Very Loose to Loose, Moist to Wet, Brown-Orange-Gray-Purple, Clayey, Silty Fine SAND (A-2-4) with Trace Organics and Gravel (MIDDENDORF FORMATION)

B-27

Roadway Embankment

320

Ground Surface

3:1

6:1

6:1

5:1

320

(A)

Coastal Plain: Very Stiff to Hard, Moist (A-6) and Silty CLAY (A-7-5)

Purple-Orange-Gray, Fine Sandy Silty CLAY (MIDDENDORF FORMATION)

310

9

29

6

BT

0.7/19

310

300

290

280

270

300

290

280

270

68+50.00

-L-

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

140

120

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80

60

40

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320

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320

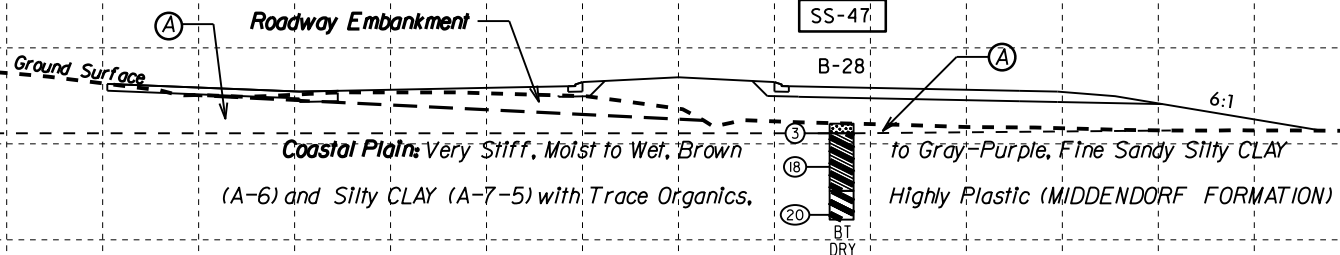
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300

290

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							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-47	17' Rt	69+50	8.5-10.0	A-7-5	67	37	0.5	3.7	21.6	74.2	0.0	100.0	98.4	22.0	-

(A) Coastal Plain: Very Loose, Wet, Tan-Gray, Silty Fine SAND (A-2-4) with Trace Organics



Note:
Cave-In depth of 6.0'

69+50.00

-L-

140

120

100

80

60

40

20

0

20

40

60

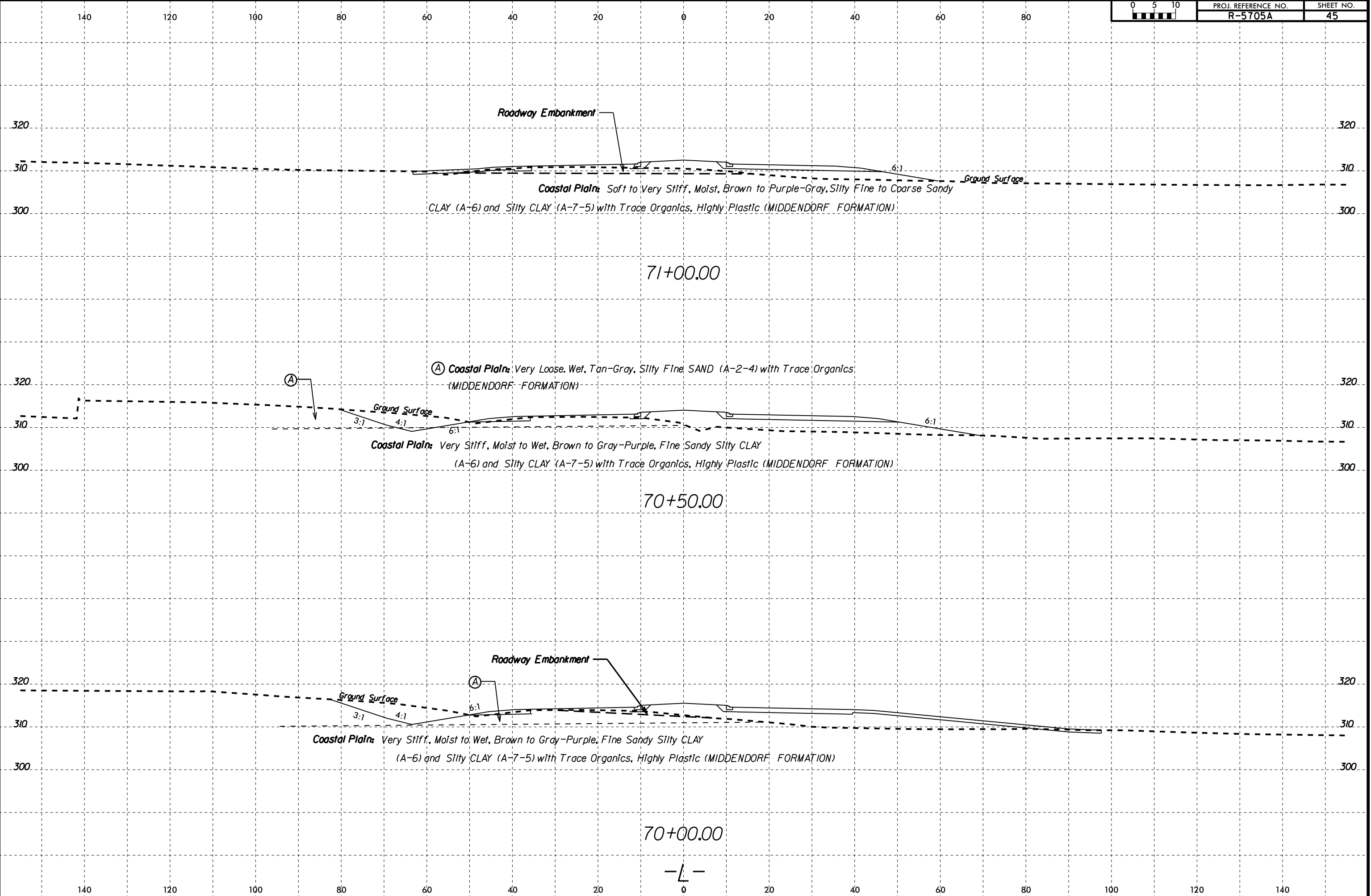
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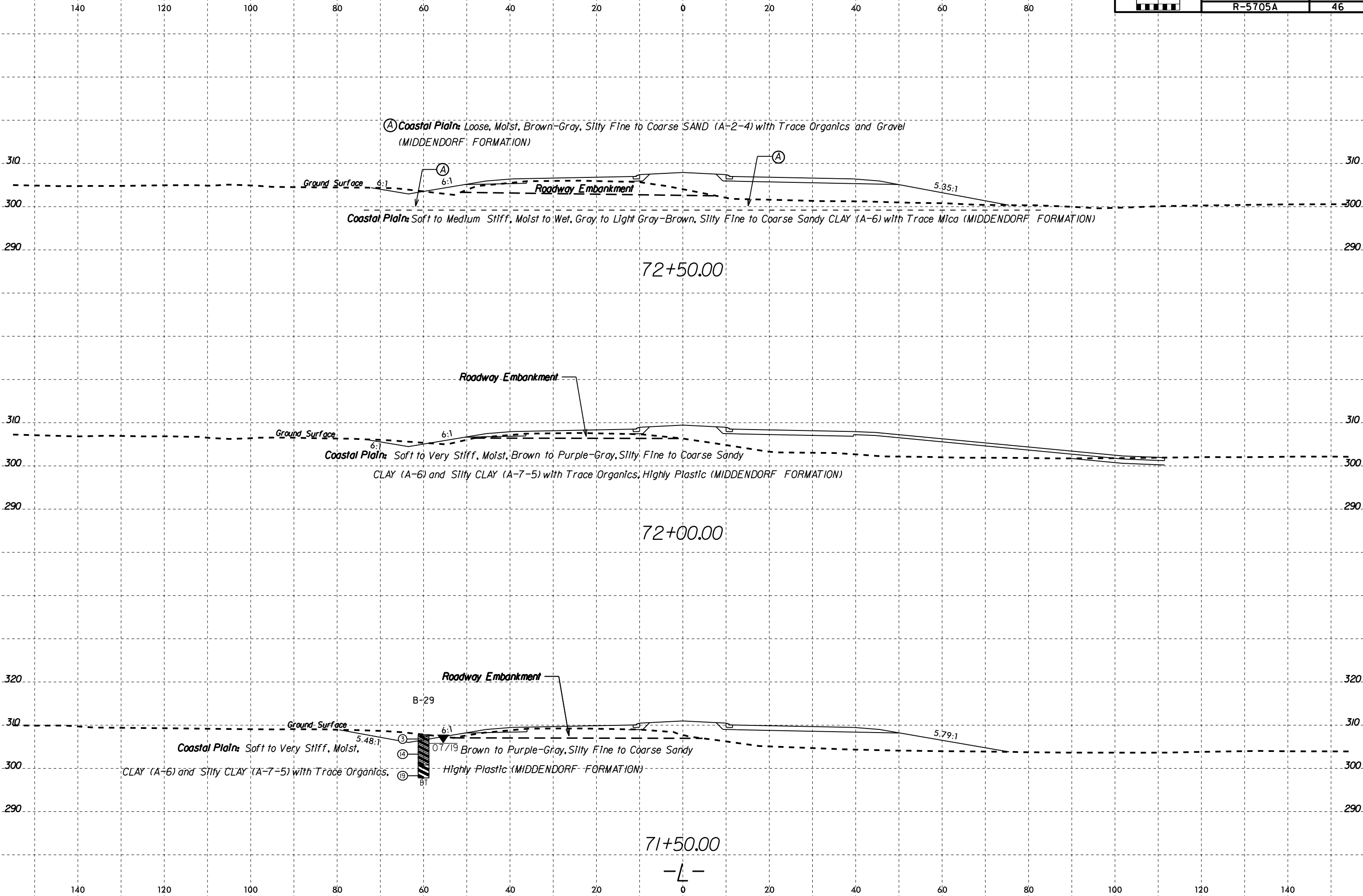
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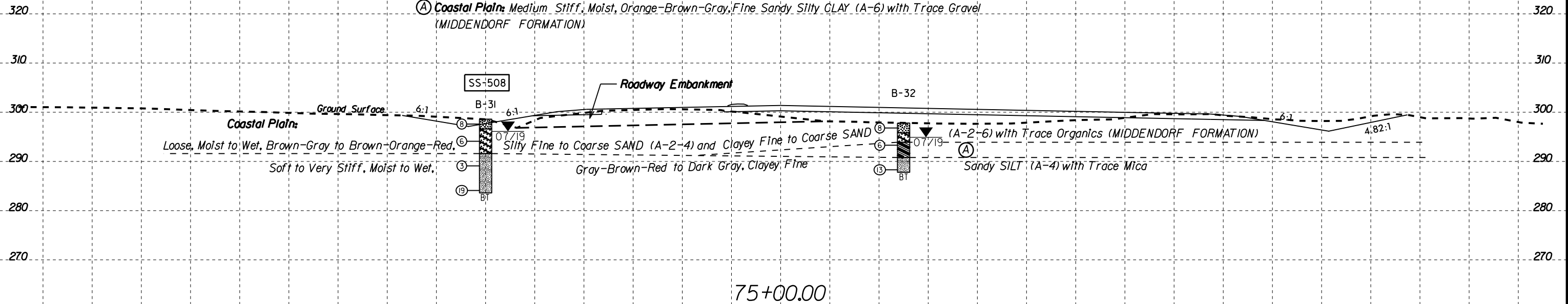


6/23/16

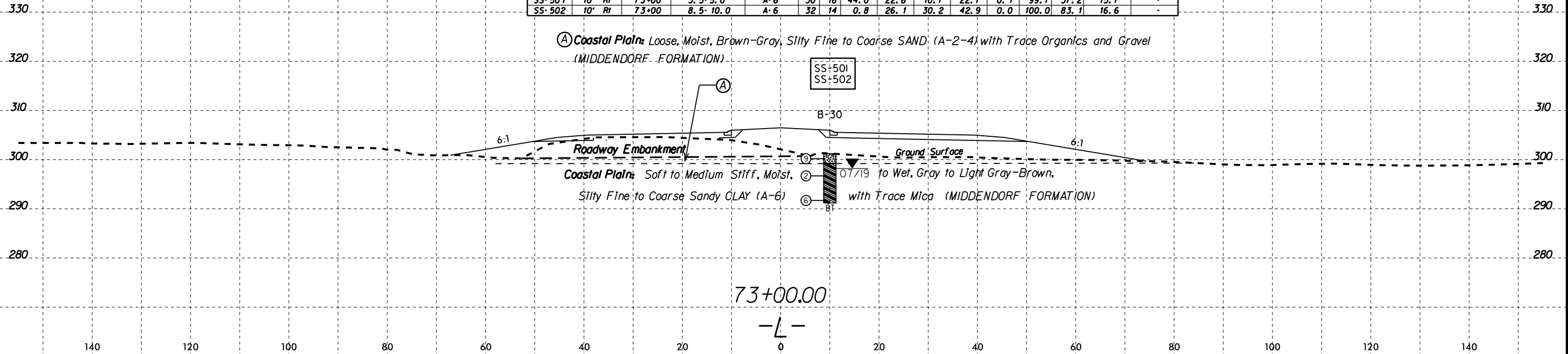


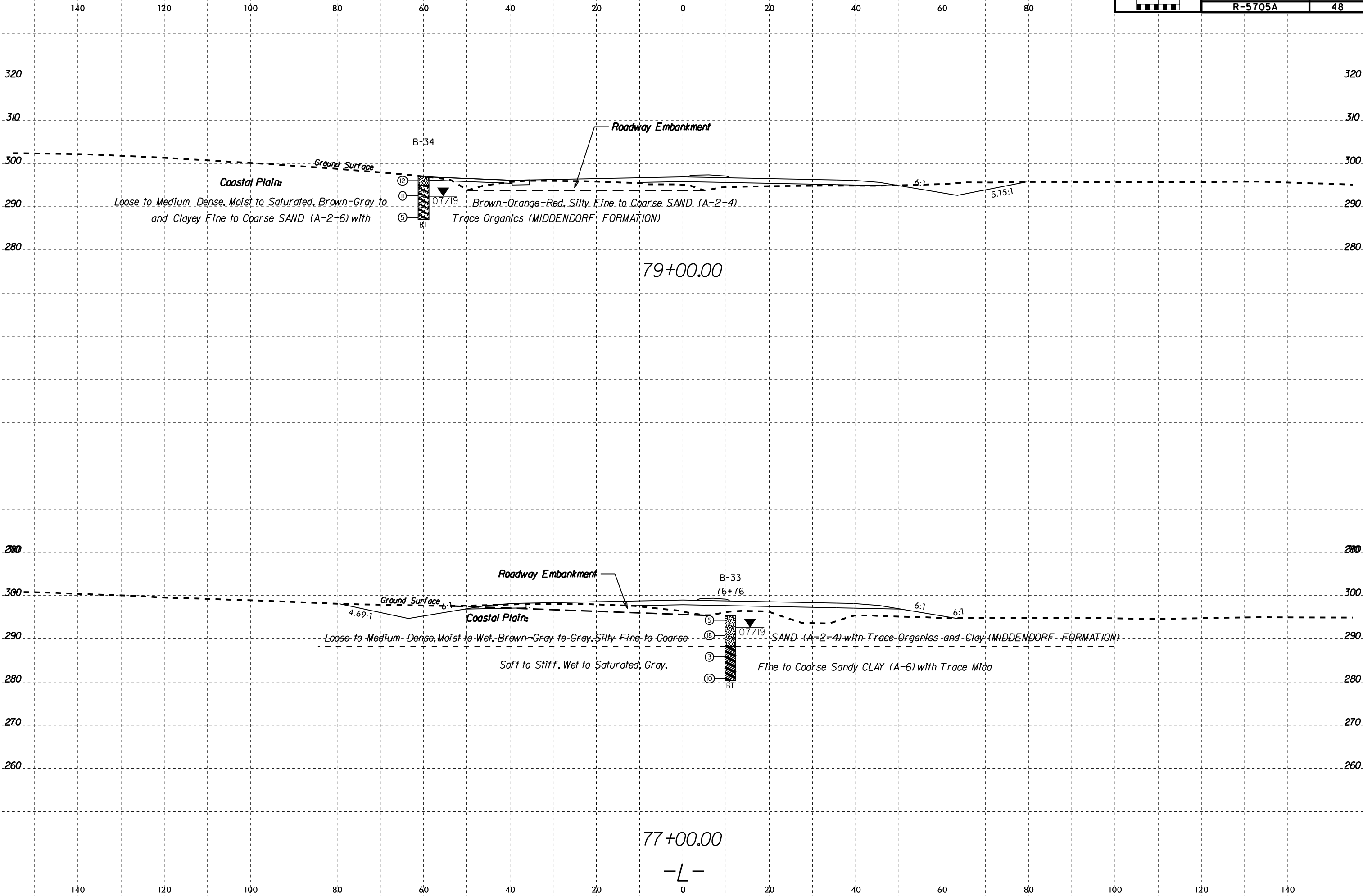
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 T.Walker
 6/23/16

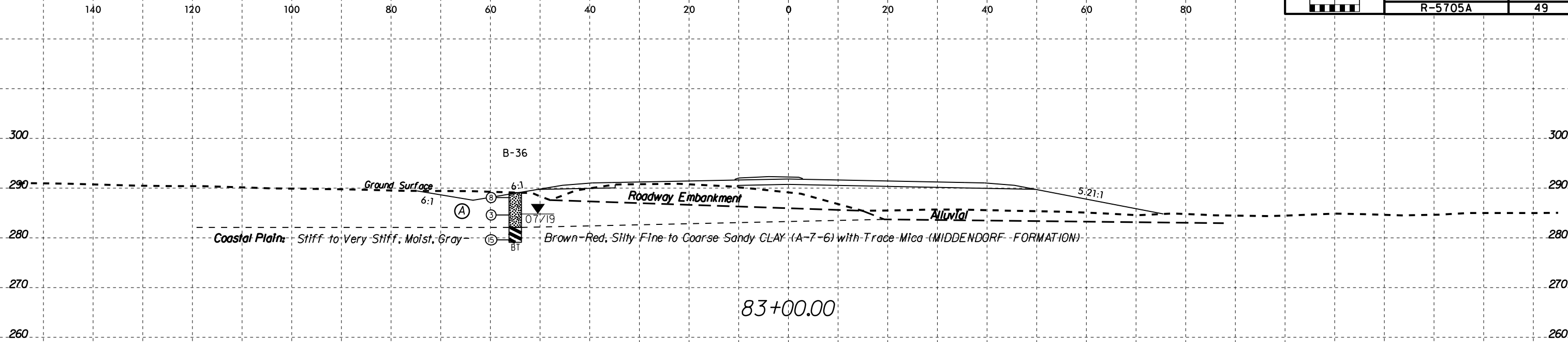
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-508	60' LI	75+00	8.5-10.0	A-4	25	7	1.1	49.4	21.8	27.7	0.0	100.0	61.3	20.0	-



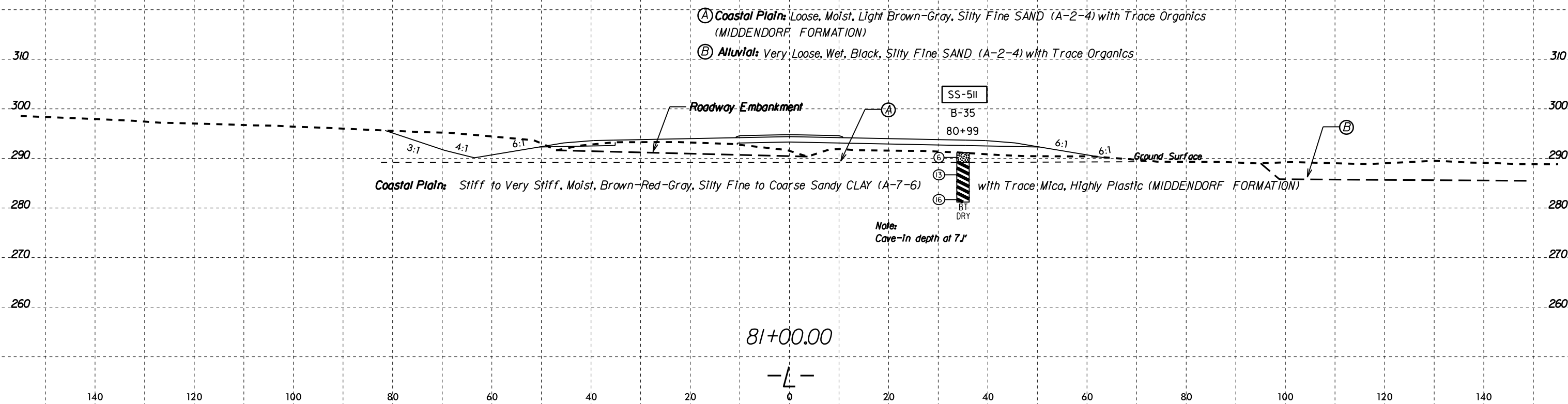
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-501	10' RI	73+00	3.5-5.0	A-6	30	16	44.0	22.6	10.7	22.7	0.1	99.7	37.2	15.7	-
SS-502	10' RI	73+00	8.5-10.0	A-6	32	14	0.8	26.1	30.2	42.9	0.0	100.0	83.1	16.6	-

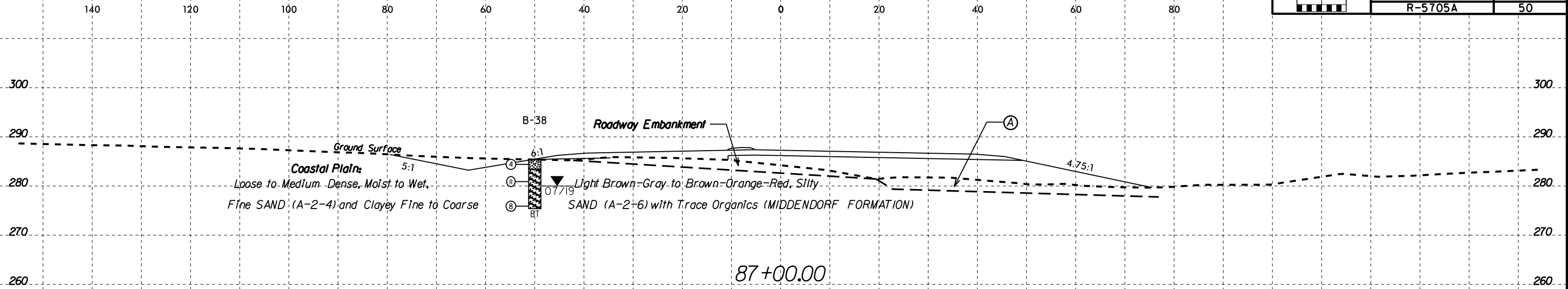






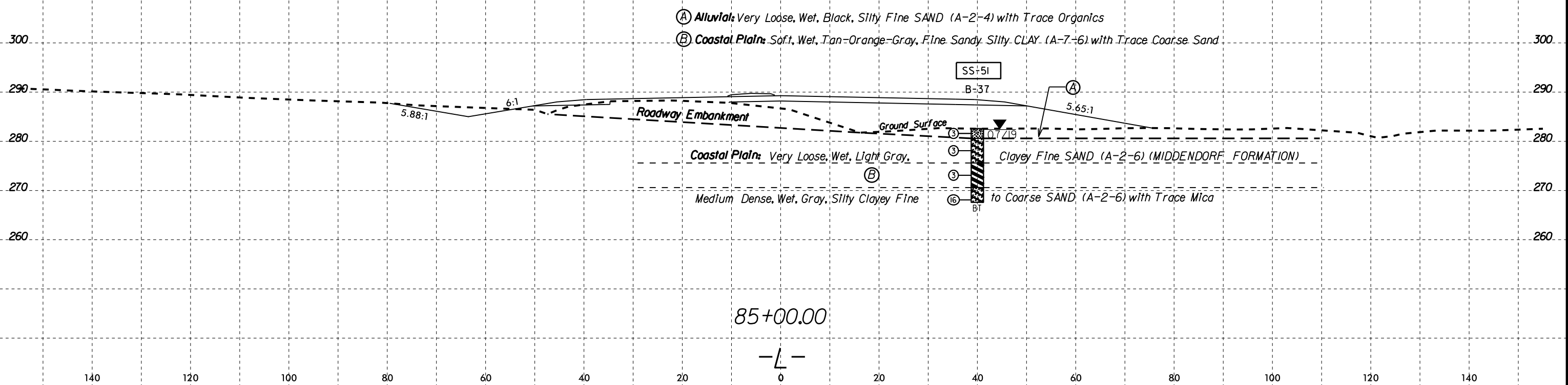
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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-511	35' Rt	80+99	3.5-5.0	A-7-6	54	32	28.1	14.6	13.9	43.4	0.0	99.3	60.8	15.1	-





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-51	40' Rt	85+00	0.2- 1.5	-	-	-	-	-	-	-	-	-	-	14.8	2.3

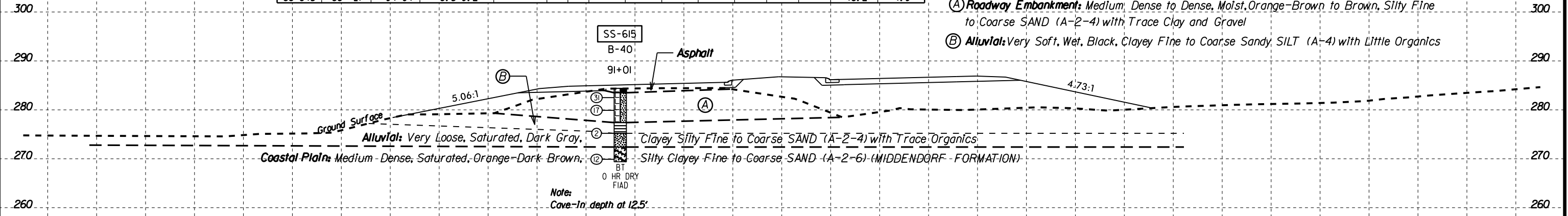


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6/23/16

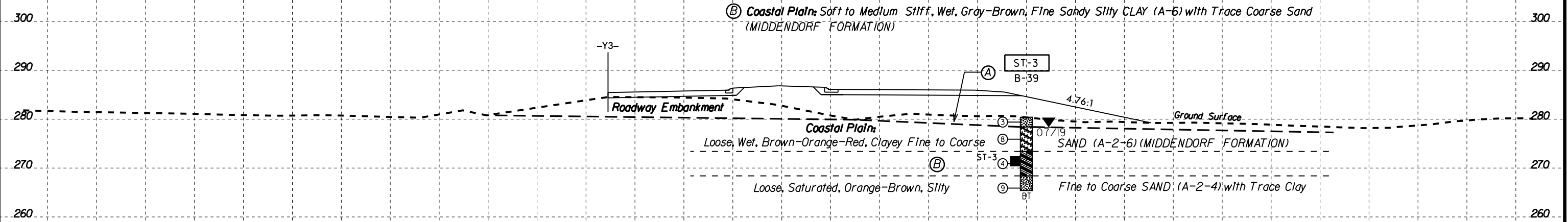


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-615	33' Lt	91+01	8.5-9.2	-	-	-	-	-	-	-	-	-	-	43.2	4.9



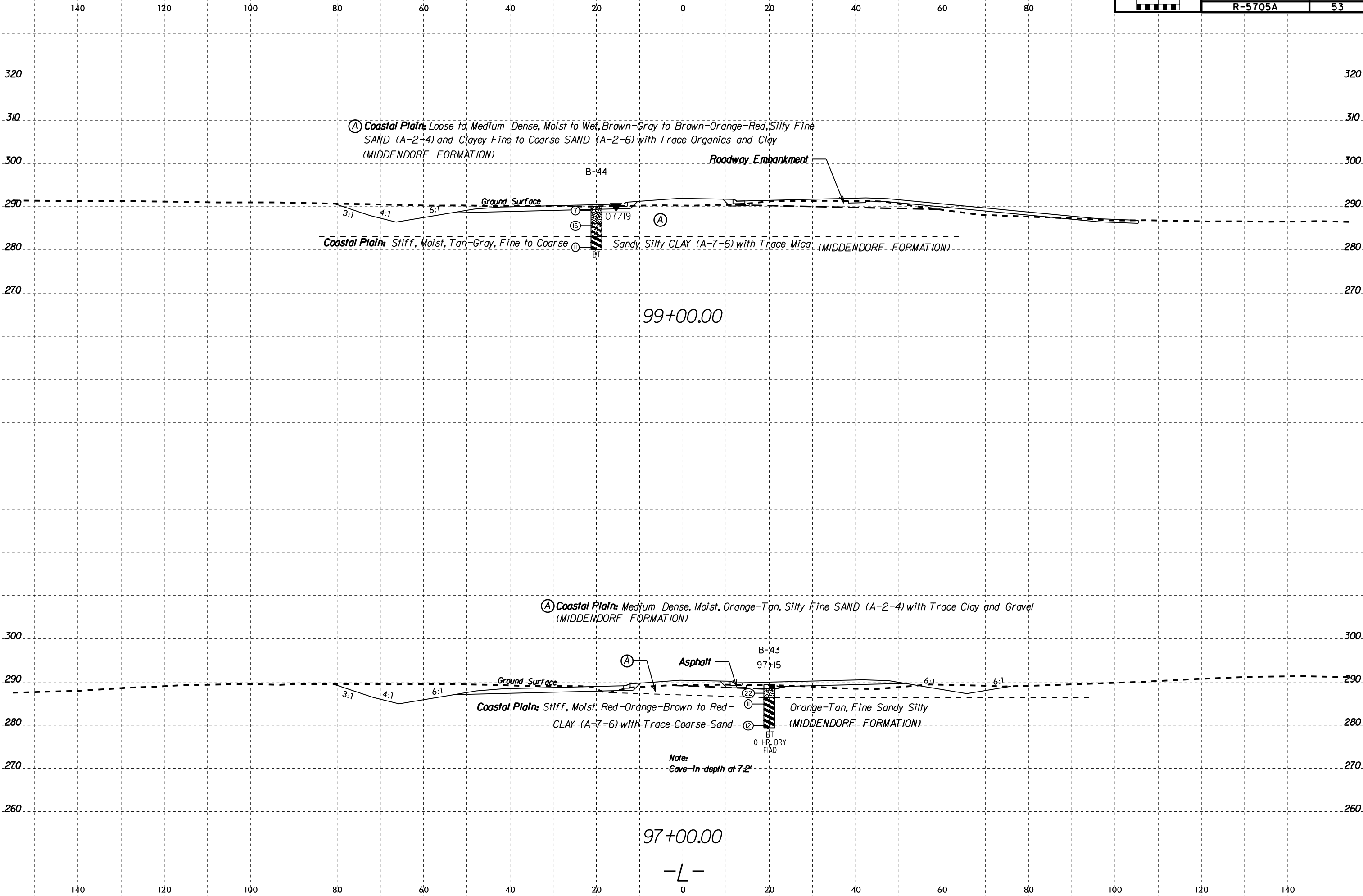
- (A) Roadway Embankment: Medium, Dense to Dense, Moist, Orange-Brown to Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Clay and Gravel
- (B) Alluvial: Very Soft, Wet, Black, Clayey Fine to Coarse Sandy SILT (A-4) with Little Organics

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		
ST-3	50' Rt	89+00	8.0-10.0	A-6	40	22	1.2	10.6	42.9	45.3	0.0	100.0	90.8	20.6	-



- (A) Alluvial: Very Loose, Wet, Black to Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics
- (B) Coastal Plain: Soft to Medium Stiff, Wet, Gray-Brown, Fine Sandy Silty CLAY (A-6) with Trace Coarse Sand (MIDDENDORF FORMATION)

9-MAY-2020 14:31:56 \\s6k\038 (NCDDOT - R-5705A Harnett County)\Projects\895705A_GEO\RDW\CADD_GEO\TECH\SSC\R5705A_geo_xsl.L 1.dgn



140

120

100

80

60

40

20

0

20

40

60

80

310

300

290

280

270

310

300

290

280

270

(A) Coastal Plain: Medium Stiff, to Stiff, Moist, Gray-Brown-Red, Fine to Coarse Sandy Silty CLAY (A-7-6)
(MIDDENDORF FORMATION)

B-45

Roadway Embankment

Ground Surface

8:1

4:1

6:1

8:1

25:1

(A)

Coastal Plain: Loose, Moist, Brown-Gray to SAND (A-2-4) and Clayey Fine to Coarse

(6)

(8)

(8)

Brown -Orange-Red, Silty Fine SAND: (A-2-6) with Trace Organics

Coarse SAND (A-2-4) with Trace Clay

(A)

101+00.00

-L-

140

120

100

80

60

40

20

0

20

40

60

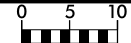
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100

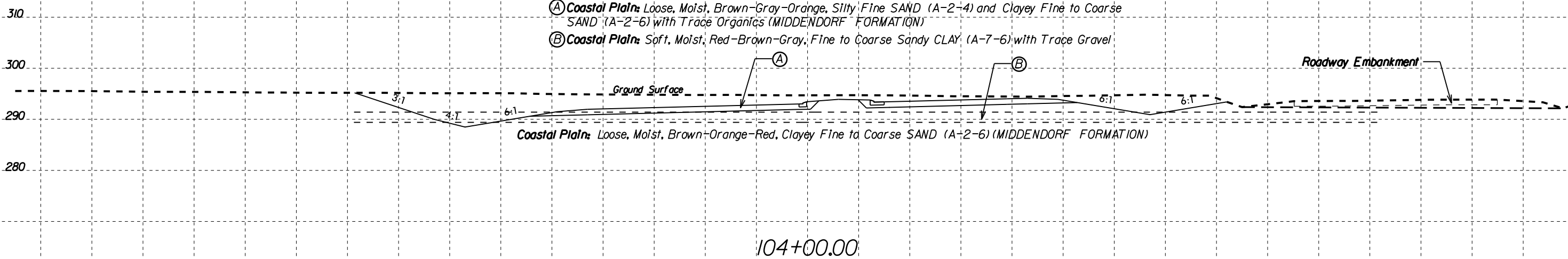
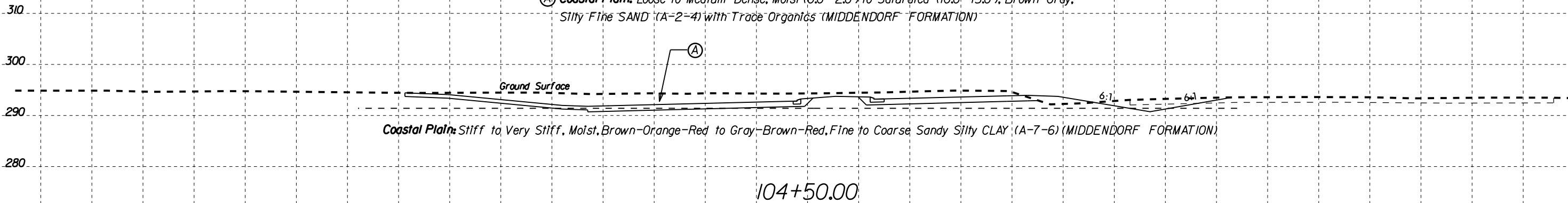
120

140

6/23/16



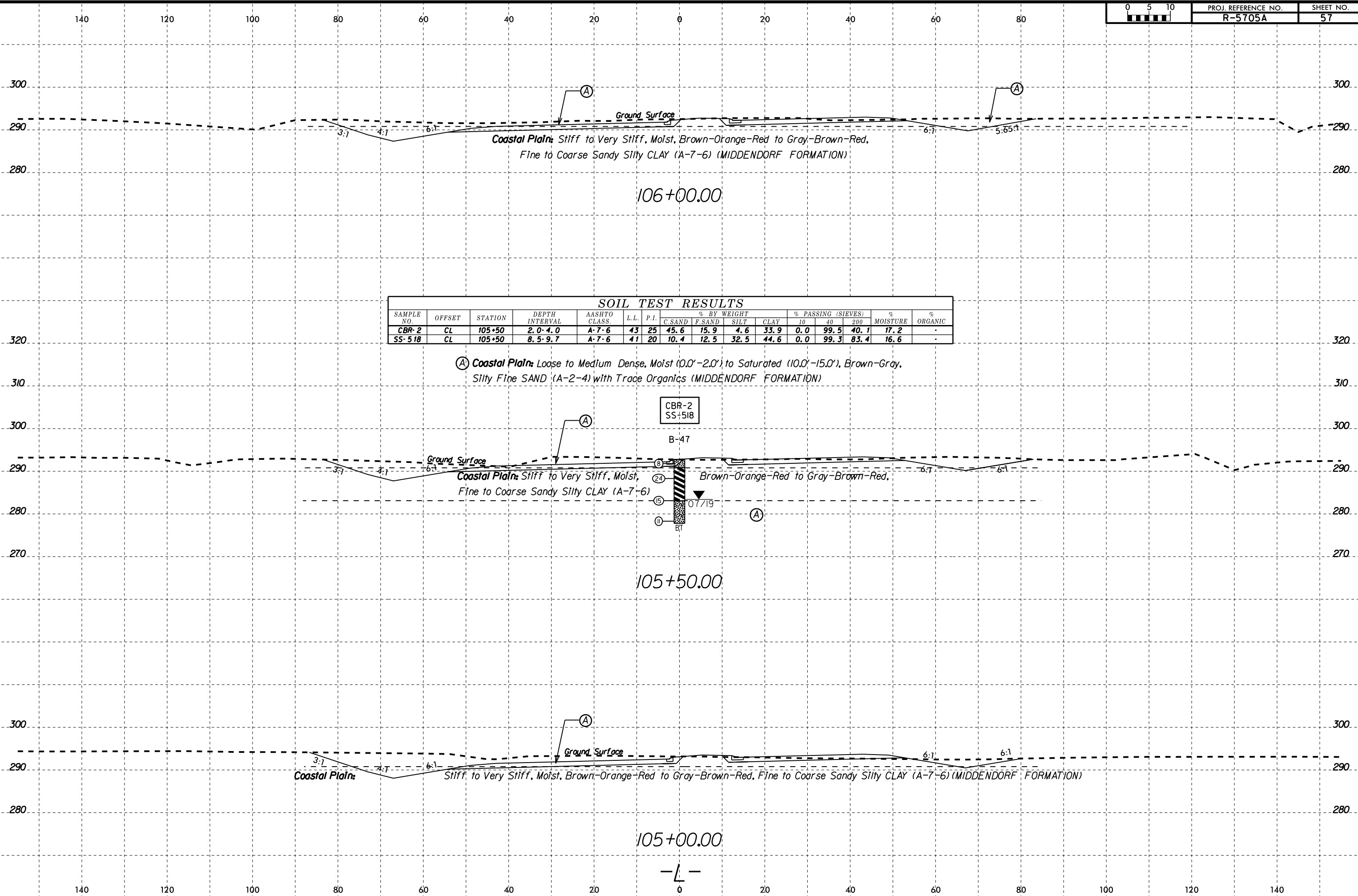
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-L-

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140

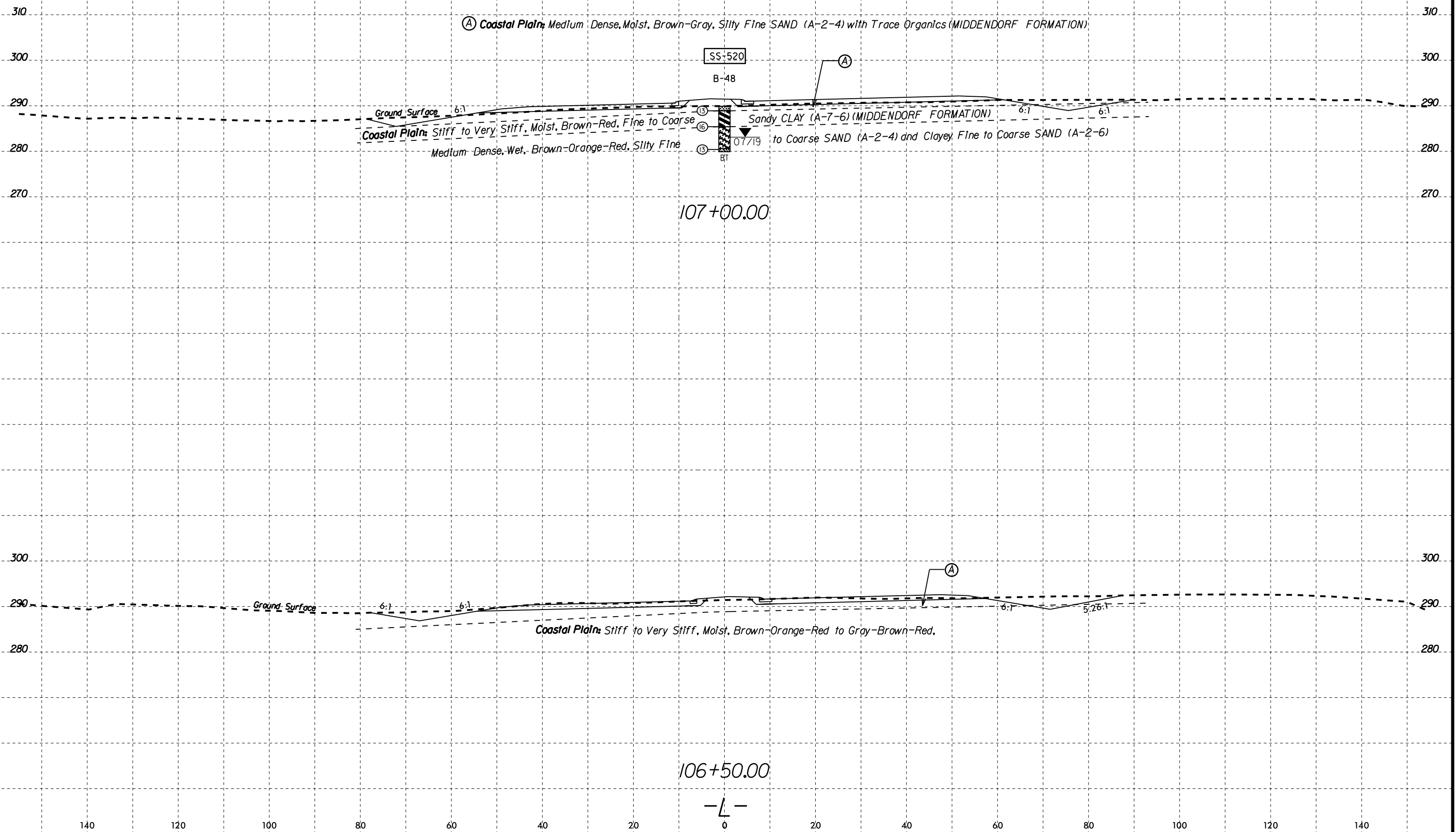
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SOIL TEST RESULTS

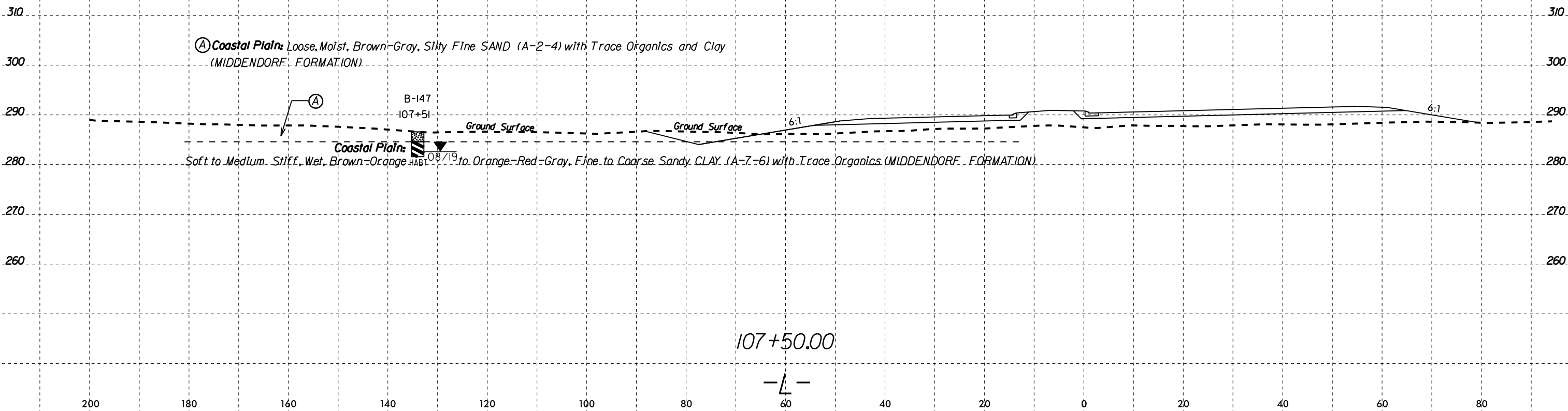
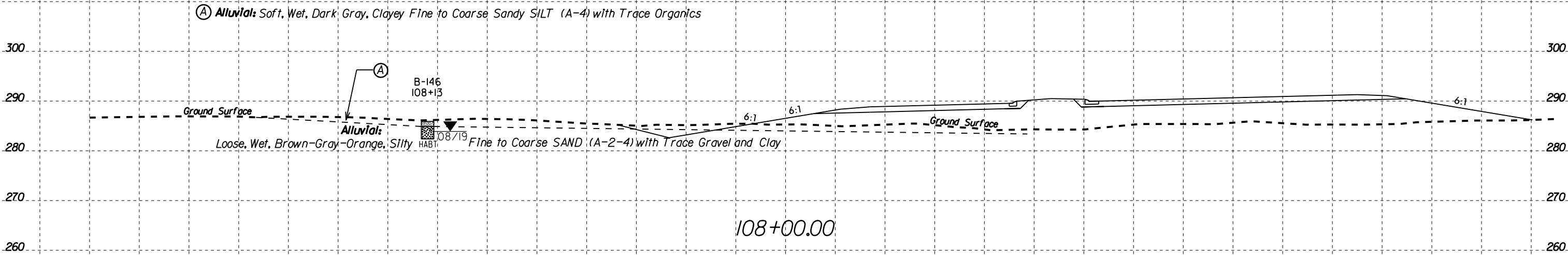
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
CBR-2	CL	105+50	2.0'-4.0'	A-7-6	43	25	45.6	15.9	4.6	33.9	0.0	99.5	40.1	17.2	-
SS-518	CL	105+50	8.5'-9.7'	A-7-6	41	20	10.4	12.5	32.5	44.6	0.0	99.3	83.4	16.6	-

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-520	CL	107+00	1.0-1.5	A-7-6	43	21	30.2	23.8	0.9	45.1	0.0	100.0	47.3	18.4	-



05-APP-2020_2009
 P:\Projects\65X\65X-0138 NCDOT - R-5705A Harnett County\GEO\RDWY\CADD\GEO\TECH\SSC\R5705A_geo_xsl.L 2.dgn
 Walker

200 180 160 140 120 100 80 60 40 20 0 20



140

120

100

80

60

40

20

0

20

40

60

80

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-525	CL	109+00	0.0-0.4	-	-	-	-	-	-	-	-	-	-	31.4	9.0
SS-526	CL	109+00	3.5-4.0	-	-	-	-	-	-	-	-	-	-	63.1	15.3
S-621	25' Rt	109+03	3.5-4.0	A-4	-	-	33.1	28.7	20.8	17.4	0.0	100.0	42.3	31.3	-

- (A) **Alluvial:** Very Soft to Soft, Saturated, Black-Dark Brown, Clayey Fine to Coarse Sandy SILT (A-4) and Fine Sandy Clayey SILT (A-5) with Little to Moderate Organics
- (B) **Alluvial:** Very Loose to Loose, Wet to Saturated, Dark Brown-Gray, Clayey Silty Fine to Coarse SAND (A-2-4) with Trace Organics
- (C) **Coastal Plain:** Very Loose to Loose, Saturated, Gray-Tan to Brown-Black, Silty Fine to Coarse SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) with Trace Organics (MIDDENDORF FORMATION)
- (D) **Coastal Plain:** Medium Stiff, Moist, Gray, Fine to Coarse Sandy Silty CLAY (A-7-6) with Trace Organics and Mica

310

300

290

280

270

260

310

300

290

280

270

260

Ground Surface

B-145
108+89

6:1

HABT

08/19

SS-525
SS-526

B-49

07/19

HABT

BT

3

4

7

5

3

S-621

B-173

109+03

HABT

FIAD

08/19

3.53:1

109+00.00

-L-

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

140

120

100

80

60

40

20

0

20

40

60

80

310

300

290

280

270

310

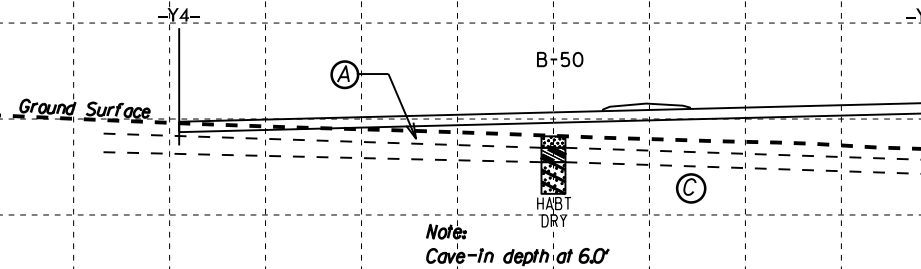
300

290

280

270

- (A) Coastal Plain: Loose, Moist, Brown-Gray-Orange, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)
- (B) Coastal Plain: Soft, Moist, Brown, Fine to Coarse Sandy CLAY (A-6)
- (C) Coastal Plain: Loose, Moist, Brown-Gray-Orange, Clayey Fine to Coarse SAND (A-2-6) with Trace Organics



112+00.00

300

290

280

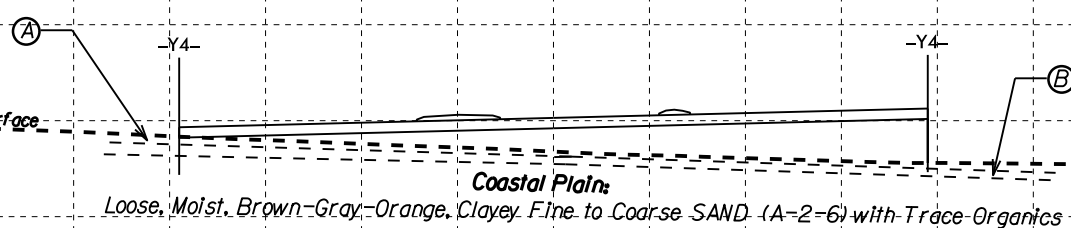
270

300

290

280

270



113+50.00



140

120

100

80

60

40

20

0

20

40

60

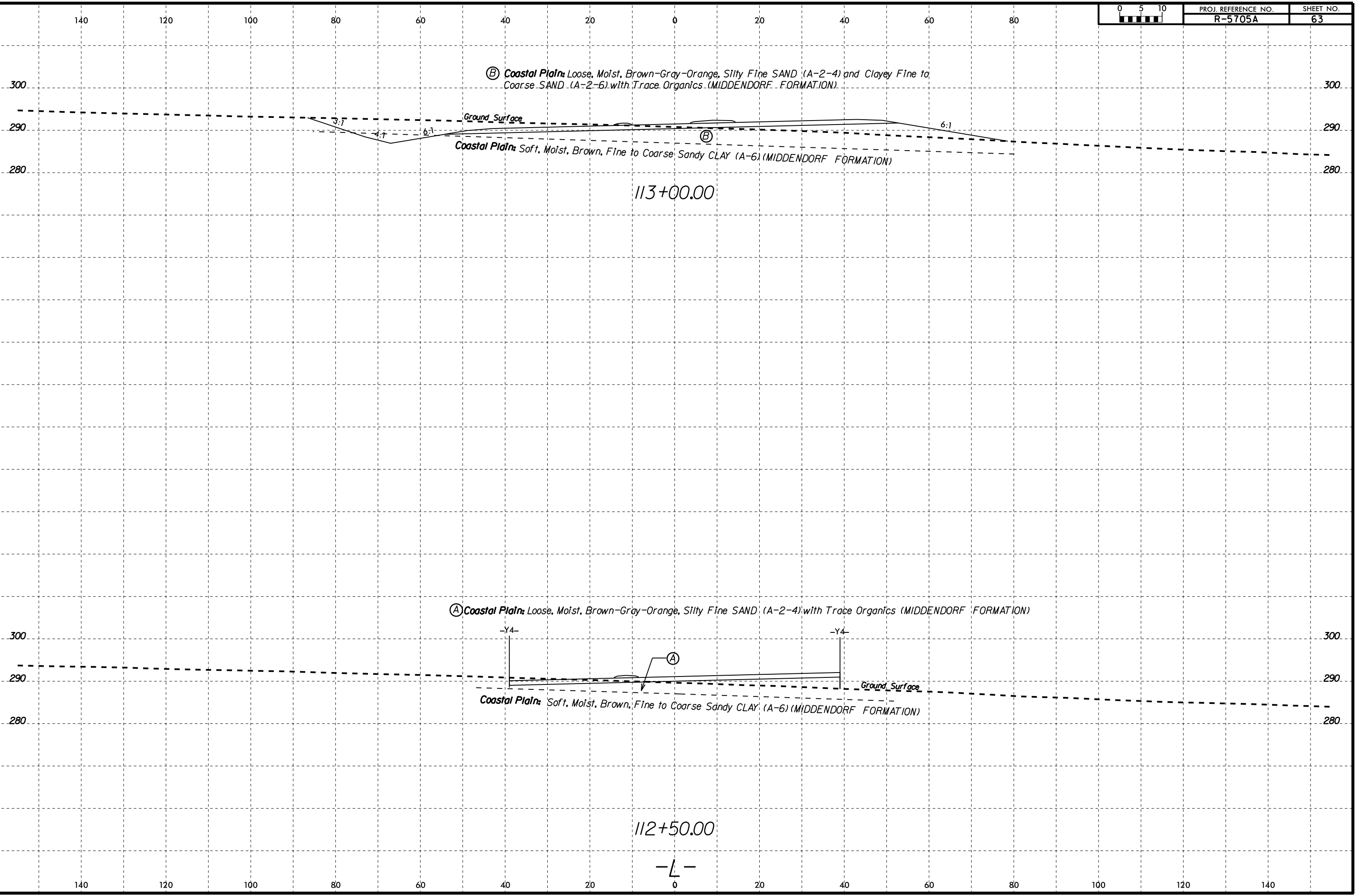
80

100

120

140

6/23/16
05-APP-2020_2040
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Walker-A 68026102



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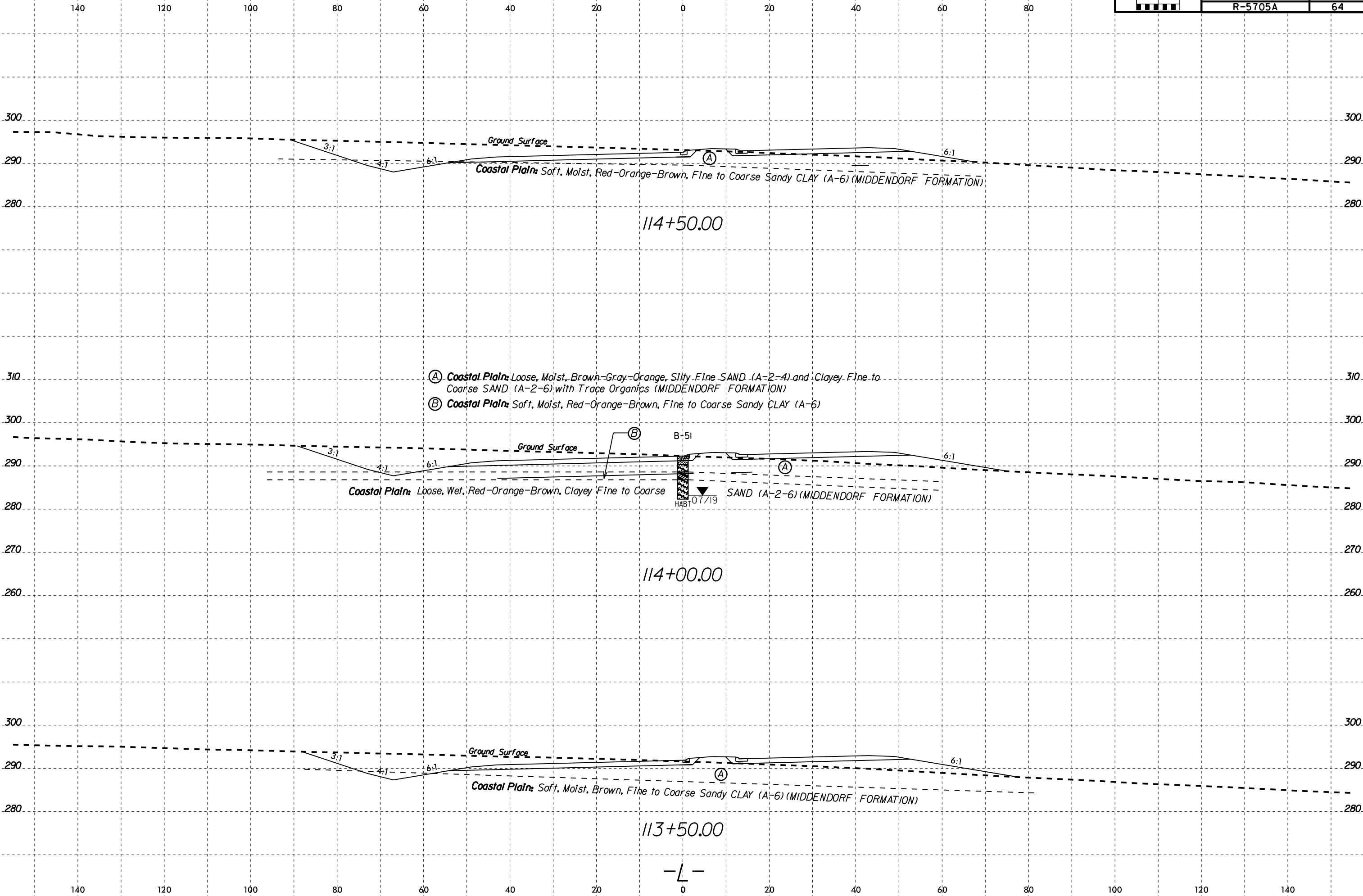
300 290 280

300 290 280

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140

300 290 280

300 290 280



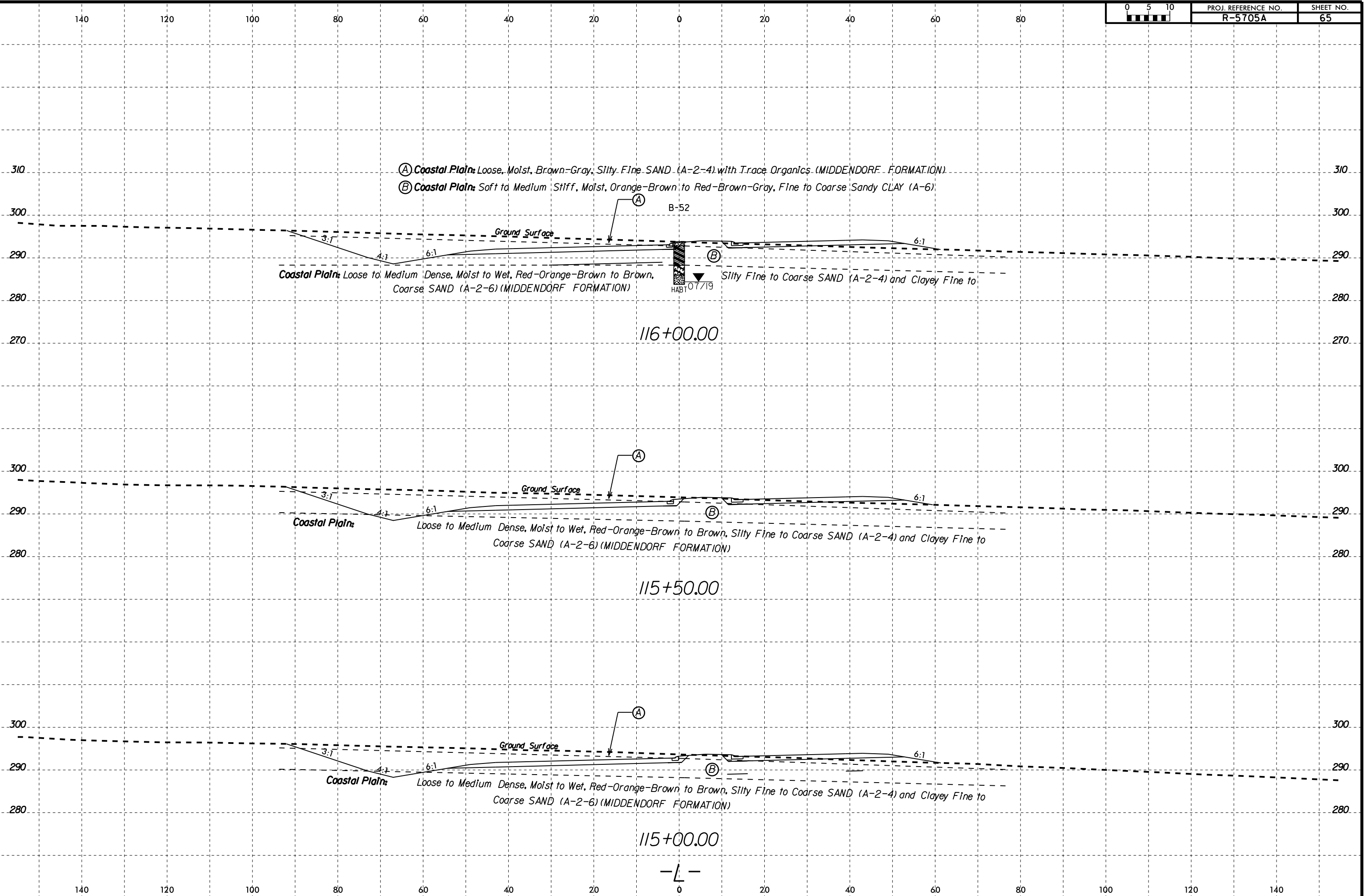
- (A) Coastal Plain: Loose, Moist, Brown-Gray-Orange, Silty Fine SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) with Trace Organics (MIDDENDORF FORMATION)
- (B) Coastal Plain: Soft, Moist, Red-Orange-Brown, Fine to Coarse Sandy CLAY (A-6)

Coastal Plain: Loose, Wet, Red-Orange-Brown, Clayey Fine to Coarse SAND (A-2-6) (MIDDENDORF FORMATION)

Coastal Plain: Soft, Moist, Brown, Fine to Coarse Sandy CLAY (A-6) (MIDDENDORF FORMATION)



05-APP-2020_2010
 F:\Projects\65X\65X-0138 (NCDDOT - R-5705A Harnett County)\CADD\GEO\RDWY\CADD_GEO\RDWY\5705A_geo_xst.L 2.dgn
 T.Walker
 6/23/16



140

120

100

80

60

40

20

0

20

40

60

80

300

290

280

300

290

280

(A) Coastal Plain: Loose, Moist, Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

(A)

Ground Surface

Coastal Plain:

Soft to Stiff, Moist to Saturated, Red-Brown-Gray, Fine to Coarse Sandy CLAY (A-6) with Trace Organics and Mica (MIDDENDORF FORMATION)

118+00.00

300

290

300

290

Coastal Plain:

Soft to Stiff, Moist to Saturated, Red-Brown-Gray, Fine to Coarse Sandy CLAY (A-6) with Trace Organics and Mica (MIDDENDORF FORMATION)

117+50.00

300

290

300

290

Coastal Plain: Loose to Medium Dense, Moist to Wet, Red-Orange-Brown to Brown, Silty Fine to Coarse SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) (MIDDENDORF FORMATION)

117+00.00

(B) Coastal Plain: Soft to Medium Stiff, Moist, Orange-Brown to Red-Brown-Gray, Fine to Coarse Sandy CLAY (A-6)

(A)

Ground Surface

Coastal Plain: Loose to Medium Dense, Moist to Wet, Red-Orange-Brown to Brown, Silty Fine to Coarse SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) (MIDDENDORF FORMATION)

116+50.00

-L-

140

120

100

80

60

40

20

0

20

40

60

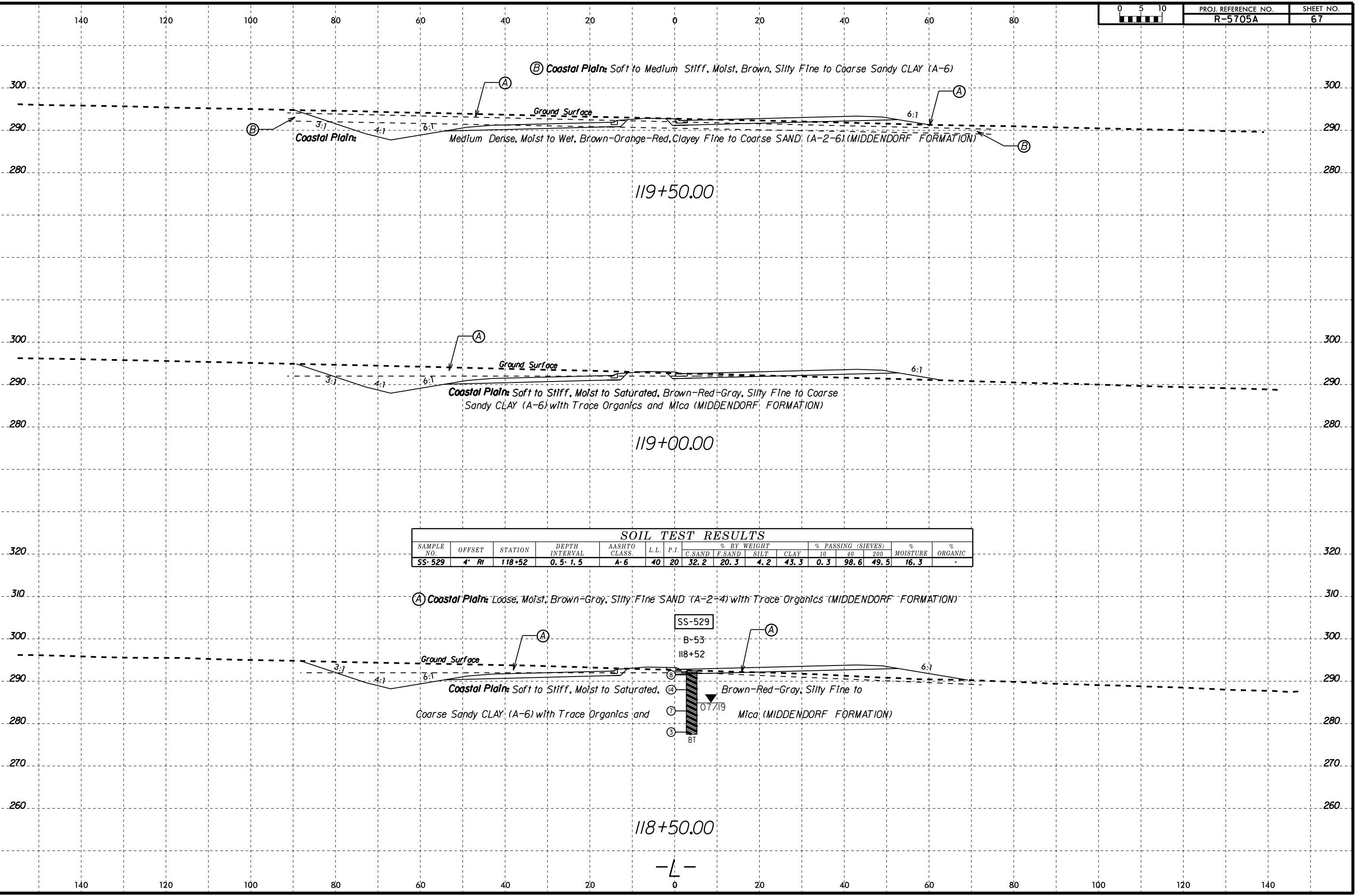
80

100

120

140

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 Walker-A 66026102



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-529	4' Rt	118+52	0.5' - 1.5'	A-6	40	20	32.2	20.3	4.2	43.3	0.3	98.6	49.5	16.3	-

-L-

140

120

100

80

60

40

20

0

20

40

60

80

310

300

290

280

270

310

300

290

280

270

Ⓐ Coastal Plain: Loose, Moist, Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

Ⓑ Coastal Plain: Soft to Medium Stiff, Moist, Brown, Silty Fine to Coarse SANDY CLAY (A-6)

Ground Surface

Ⓑ

B-54
120+19

Ⓐ

Coastal Plain: Medium Dense, Moist to Coarse SAND (A-2-6)

Very Stiff, Wet, Gray-Brown, Silty Fine SANDY CLAY

16

17

BT

Wet, Brown-Orange-Red, Clayey Fine to (MIDDENDORF FORMATION)

(A-6) with Trace Coarse Sand and Mica

6:1

120+00.00

-L-

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

140

120

100

80

60

40

20

0

20

40

60

80

300

290

280

270

300

290

280

270

Ground Surface

3:1

4:1

6:1

Coastal Plain: Very Loose to Loose, Moist to Saturated, Black-Gray to Gray-Brown, Silty
Fine SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) with Trace Organics (MIDDENDORF FORMATION)

121+50.00

300

290

280

300

290

280

Ground Surface

3:1

4:1

6:1

Coastal Plain: Medium Dense, Moist to Wet, Brown-Orange-Red, Clayey Fine to Coarse SAND (A-2-6) (MIDDENDORF FORMATION)

121+00.00

(A) **Coastal Plain:** Loose, Moist, Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

(B) **Coastal Plain:** Soft to Medium Stiff, Moist, Brown, Silty Fine to Coarse Sandy CLAY (A-6)

300

290

280

300

290

280

Ground Surface

3:1

4:1

6:1

Coastal Plain: Medium Dense, Moist to Wet, Brown-Orange-Red, Clayey Fine to Coarse SAND (A-2-6) (MIDDENDORF FORMATION)

120+50.00

-L-

140

120

100

80

60

40

20

0

20

40

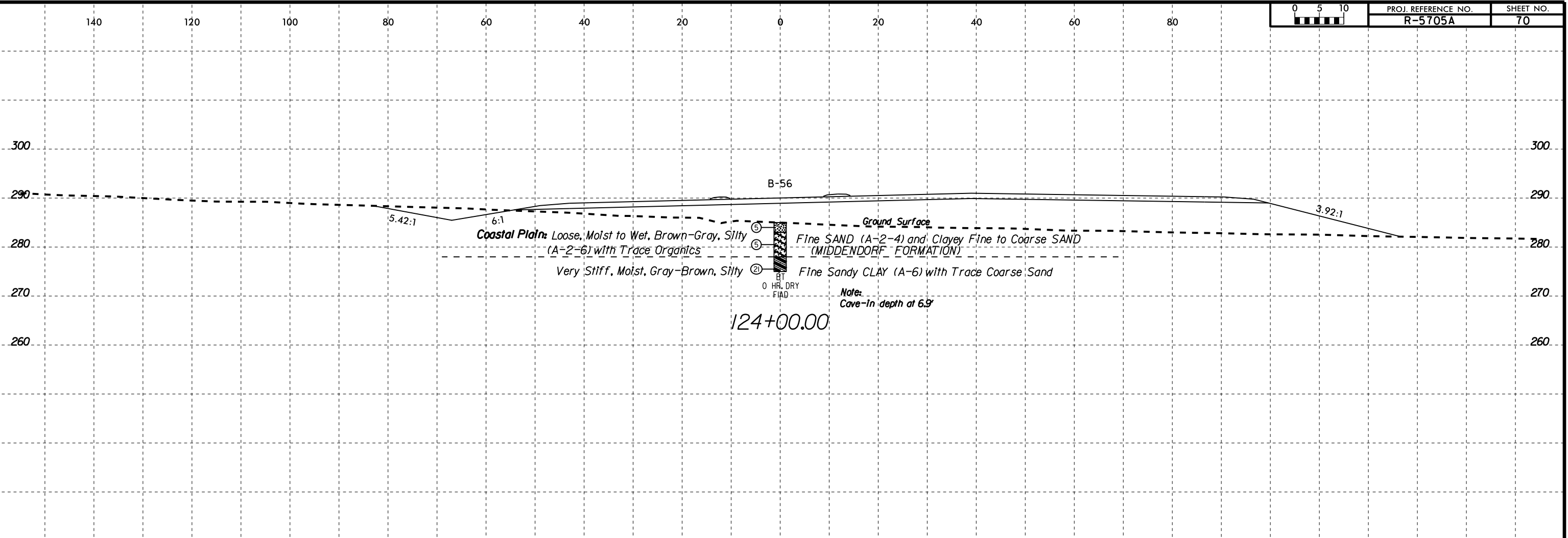
60

80

100

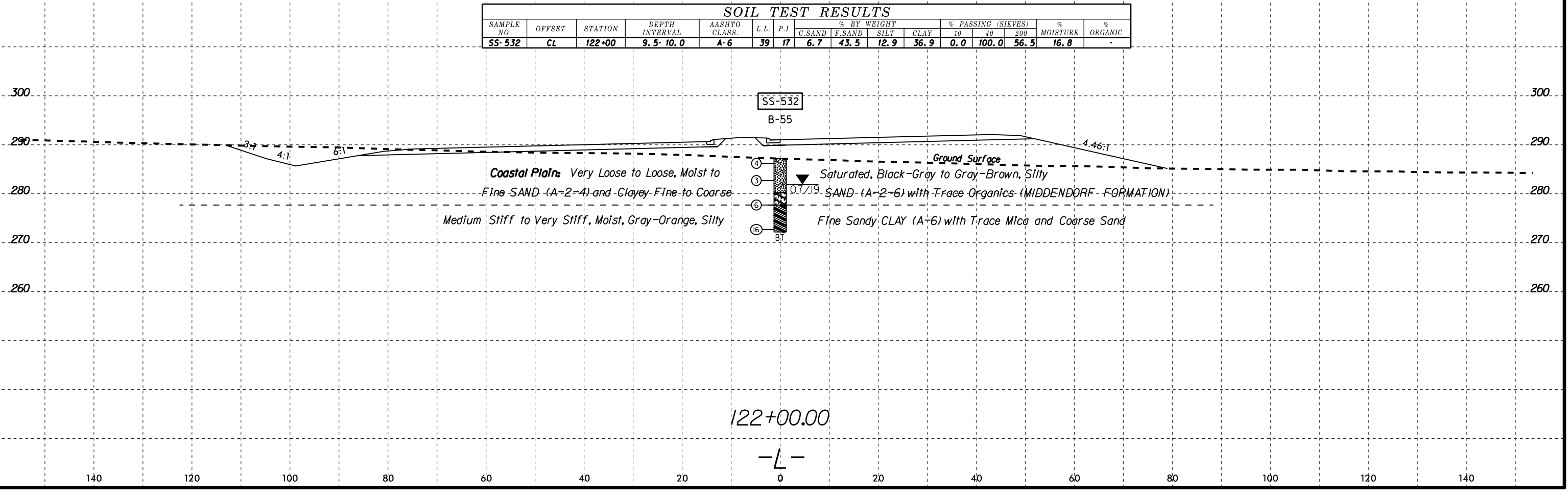
120

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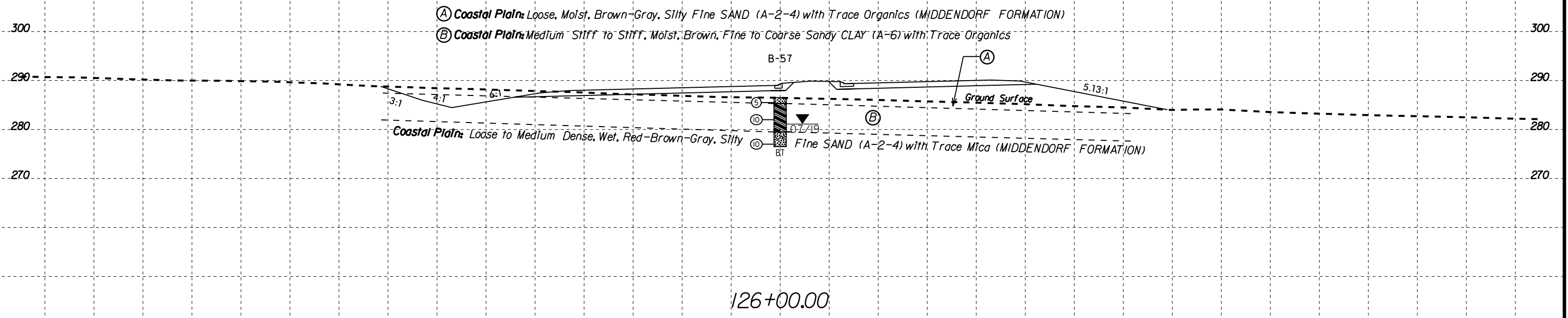
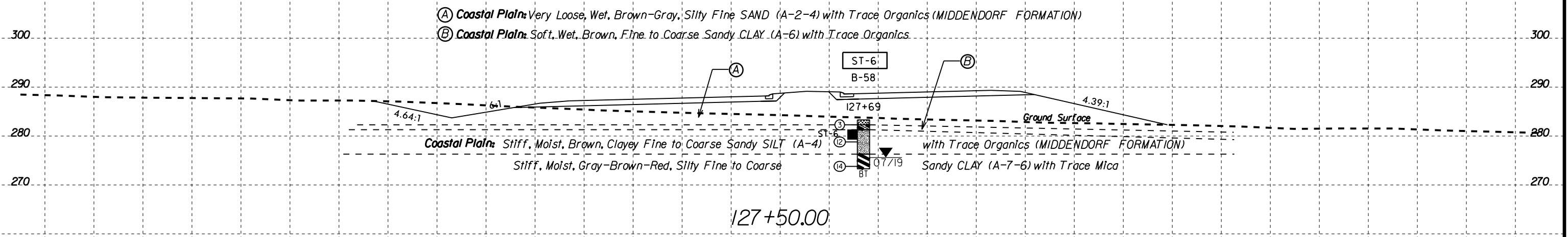


SOIL TEST RESULTS

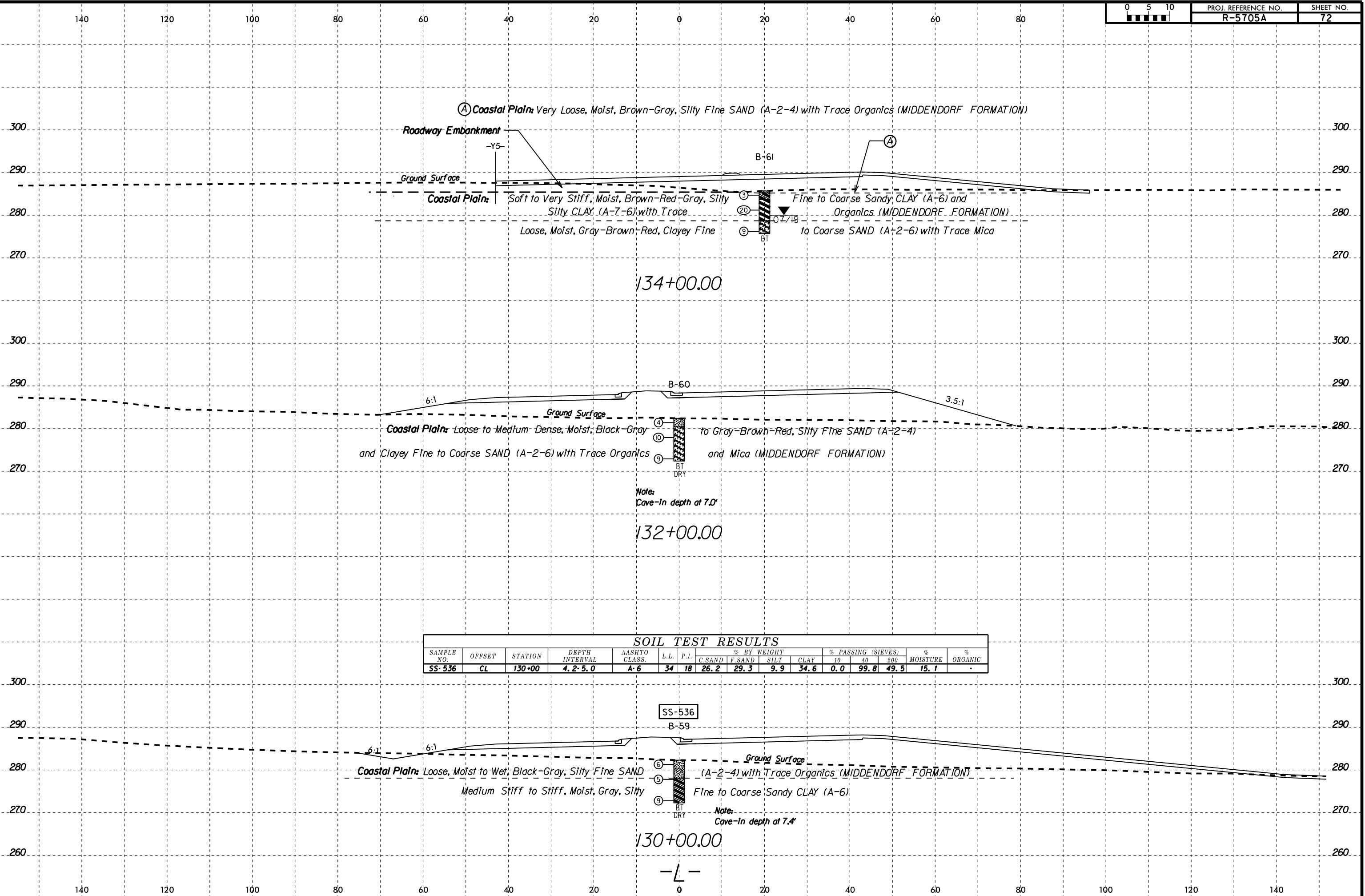
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							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-532	CL	122+00	9.5-10.0	A-6	39	17	6.7	43.5	12.9	36.9	0.0	100.0	56.5	16.8	-



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		
ST-6	17' Rt	127+69	2.0-4.0	A-4	20	8	33.5	32.3	9.6	24.6	0.0	99.6	38.0	13.2	-



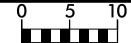
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Walker



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-536	CL	130+00	4.2-5.0	A-6	34	18	26.2	29.3	9.9	34.6	0.0	99.8	49.5	15.1	-

6/23/16



140 120 100 80 60 40 20 0 20 40 60 80

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-1	12' LI	136+45	0.0-0.3	-	-	-	40.7	24.5	18.0	16.8	0.0	99.7	38.0	101.7	-

Ⓒ Alluvial: Very Soft, Saturated, Dark Gray, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Organics

S-1

P-1 (H)

Water Surface 07/25/19 136+45

Coastal Plain: Soft to Stiff, Saturated, Gray-Red-Brown, Silty Fine to Coarse Sandy CLAY (A-6) (MIDDENDORF FORMATION)

136+50.00

320 310 300 290 280 270 260

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-56	CL	136+00	8.5-10.0	A-7-6	49	27	1.4	6.2	33.8	58.6	0.0	100.0	94.7	18.5	-

Ⓐ Alluvial: Very Loose, Moist, Black, Silty Fine SAND (A-2-4)
Ⓑ Coastal Plain: Very Stiff, Wet, Red-Orange-Gray, Silty CLAY (A-7-6) with Trace Fine to Coarse Sand, Highly Plastic (MIDDENDORF FORMATION)

SS-56

B-62

B-55

135+91

Coastal Plain: Loose, Moist, Light Gray, Silty Fine

Ground Surface

SAND (A-2-4) (MIDDENDORF FORMATION)

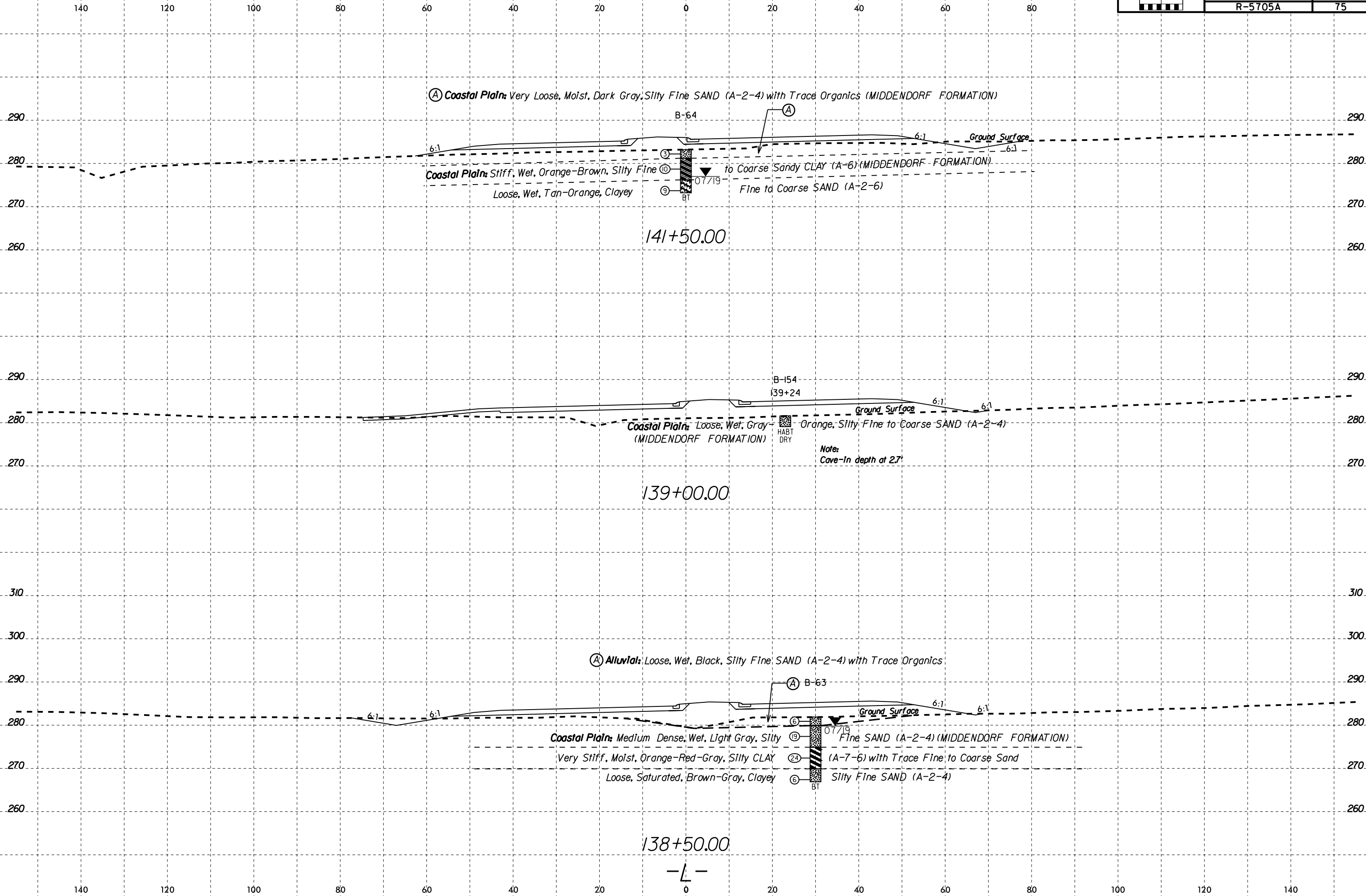
Medium Dense, Saturated, Tan-Orange, Silty Fine SAND (A-2-4)

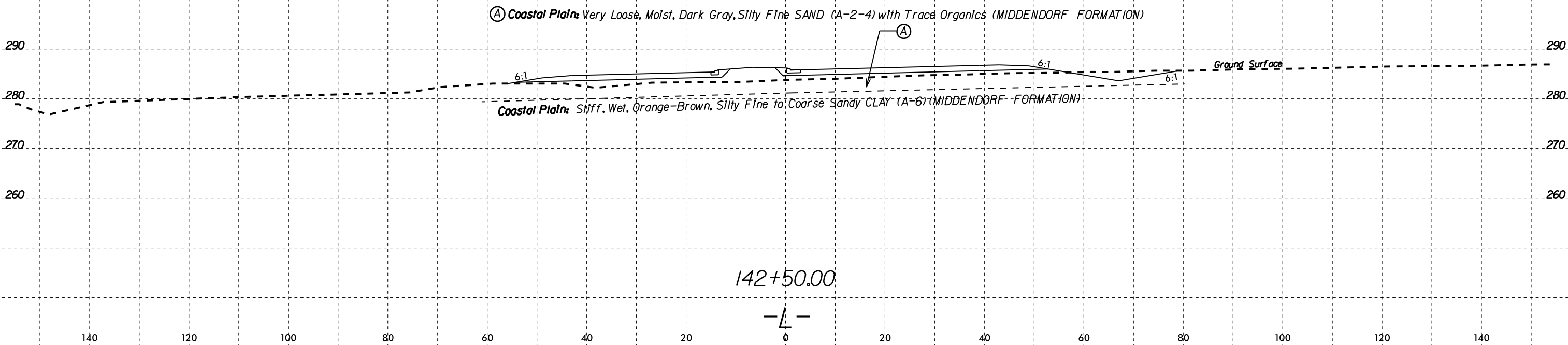
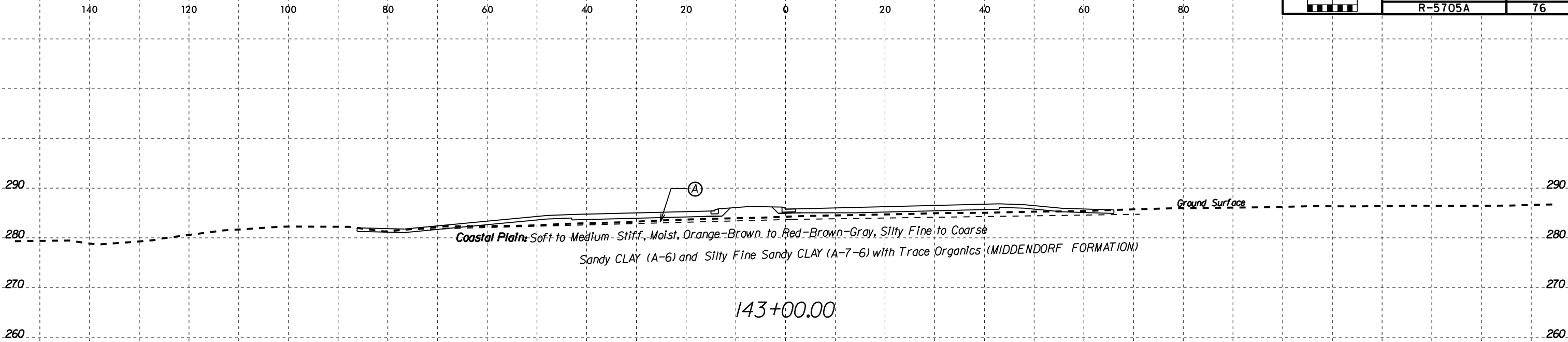
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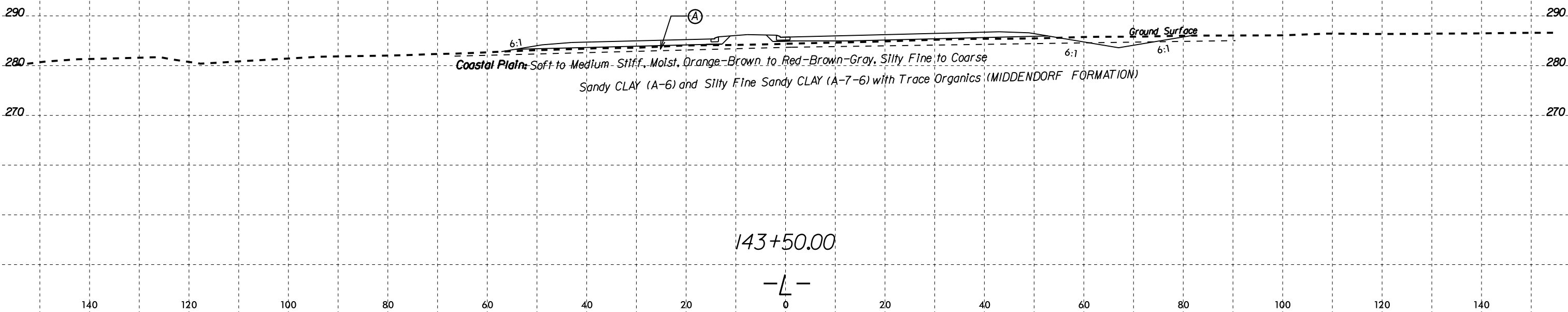
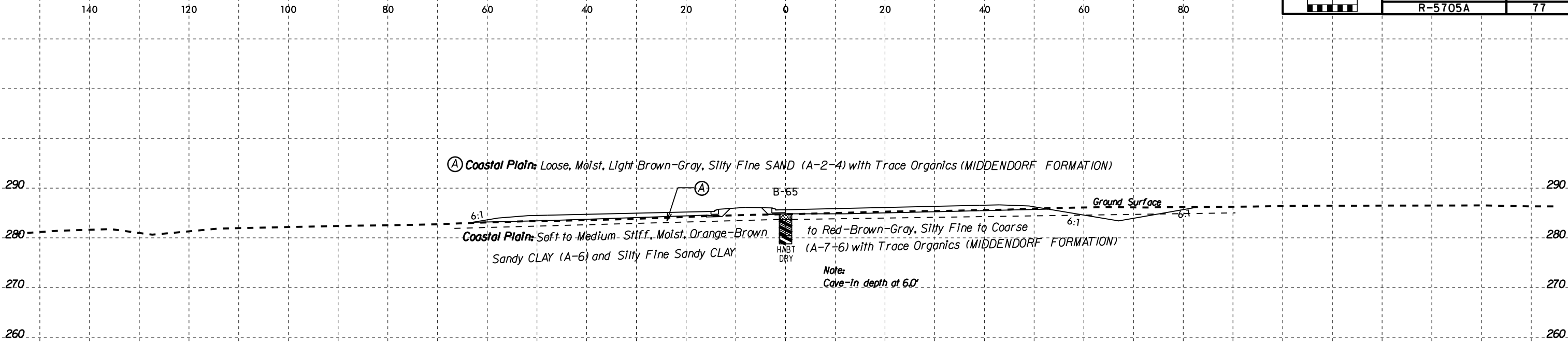
-L-

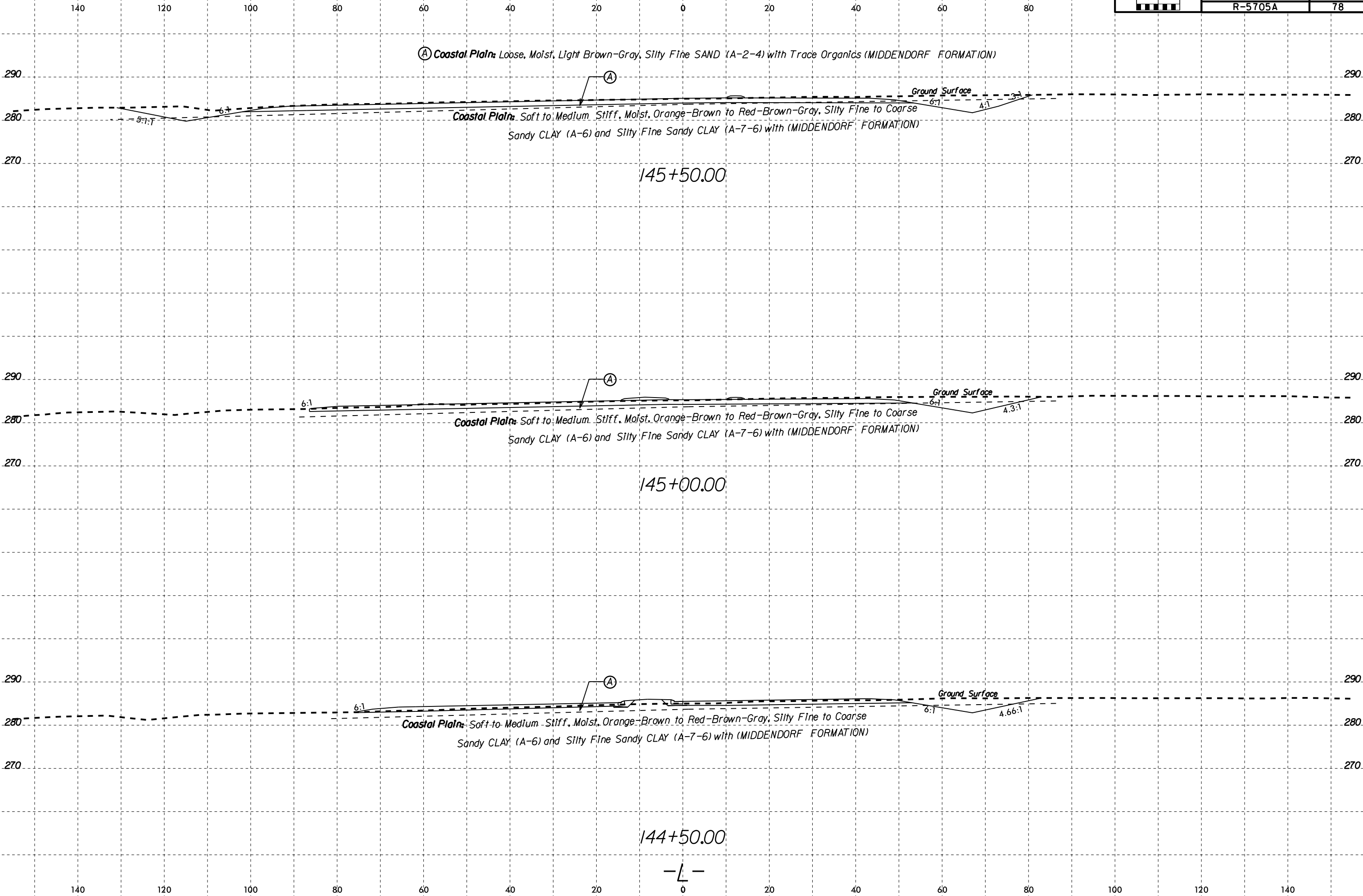
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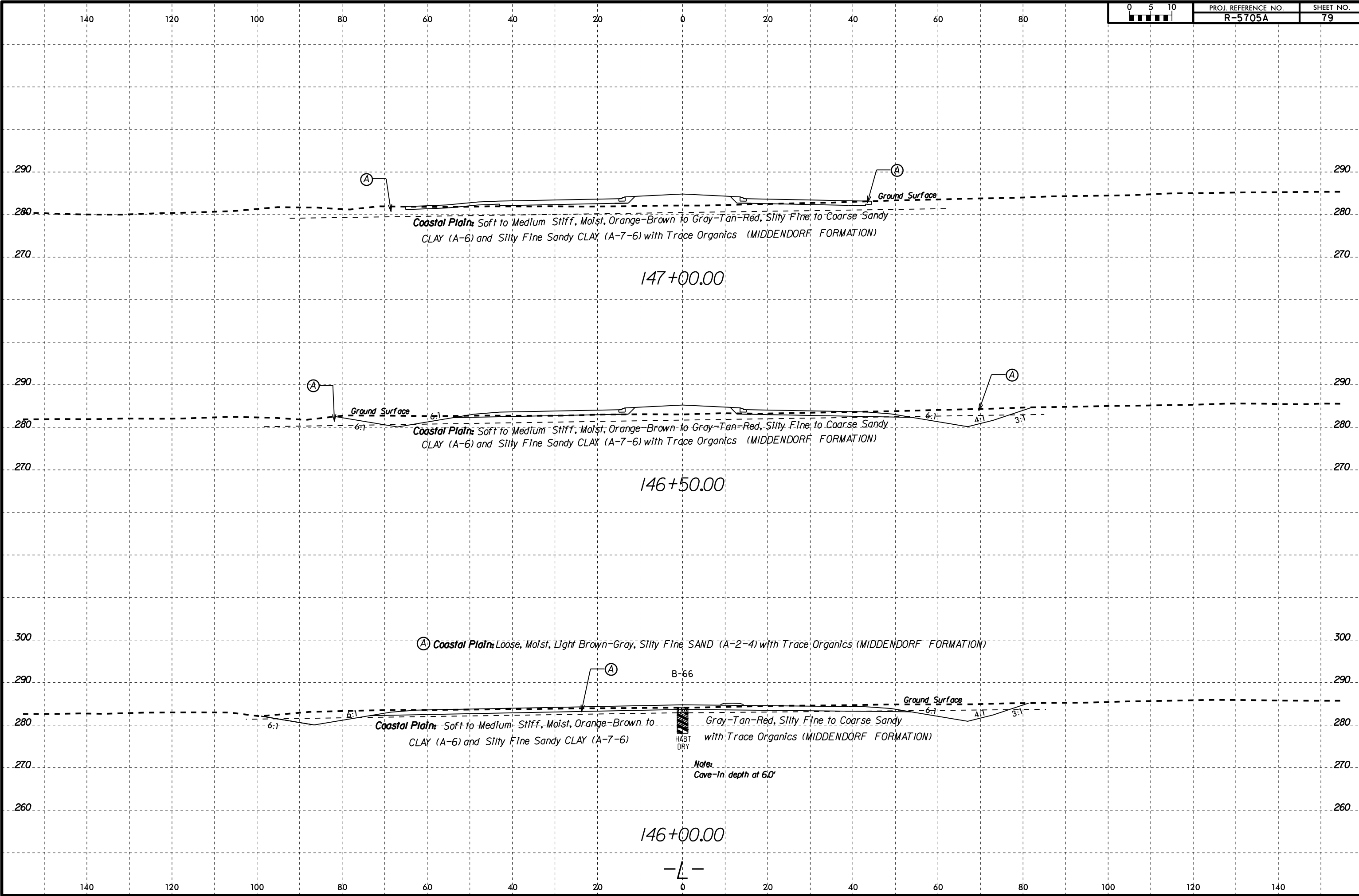
21-MAY-2020 10:08 AM Project: R-5705A-geo.dwg User: j... 2.dgn











Coastal Plain: Soft to Medium Stiff, Moist, Orange-Brown to Gray-Tan-Red, Silty Fine to Coarse Sandy CLAY (A-6) and Silty Fine Sandy CLAY (A-7-6) with Trace Organics (MIDDENDORF FORMATION)

147+00.00

Coastal Plain: Soft to Medium Stiff, Moist, Orange-Brown to Gray-Tan-Red, Silty Fine to Coarse Sandy CLAY (A-6) and Silty Fine Sandy CLAY (A-7-6) with Trace Organics (MIDDENDORF FORMATION)

146+50.00

Coastal Plain: Loose, Moist, Light Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

Coastal Plain: Soft to Medium Stiff, Moist, Orange-Brown to Gray-Tan-Red, Silty Fine to Coarse Sandy CLAY (A-6) and Silty Fine Sandy CLAY (A-7-6) with Trace Organics (MIDDENDORF FORMATION)

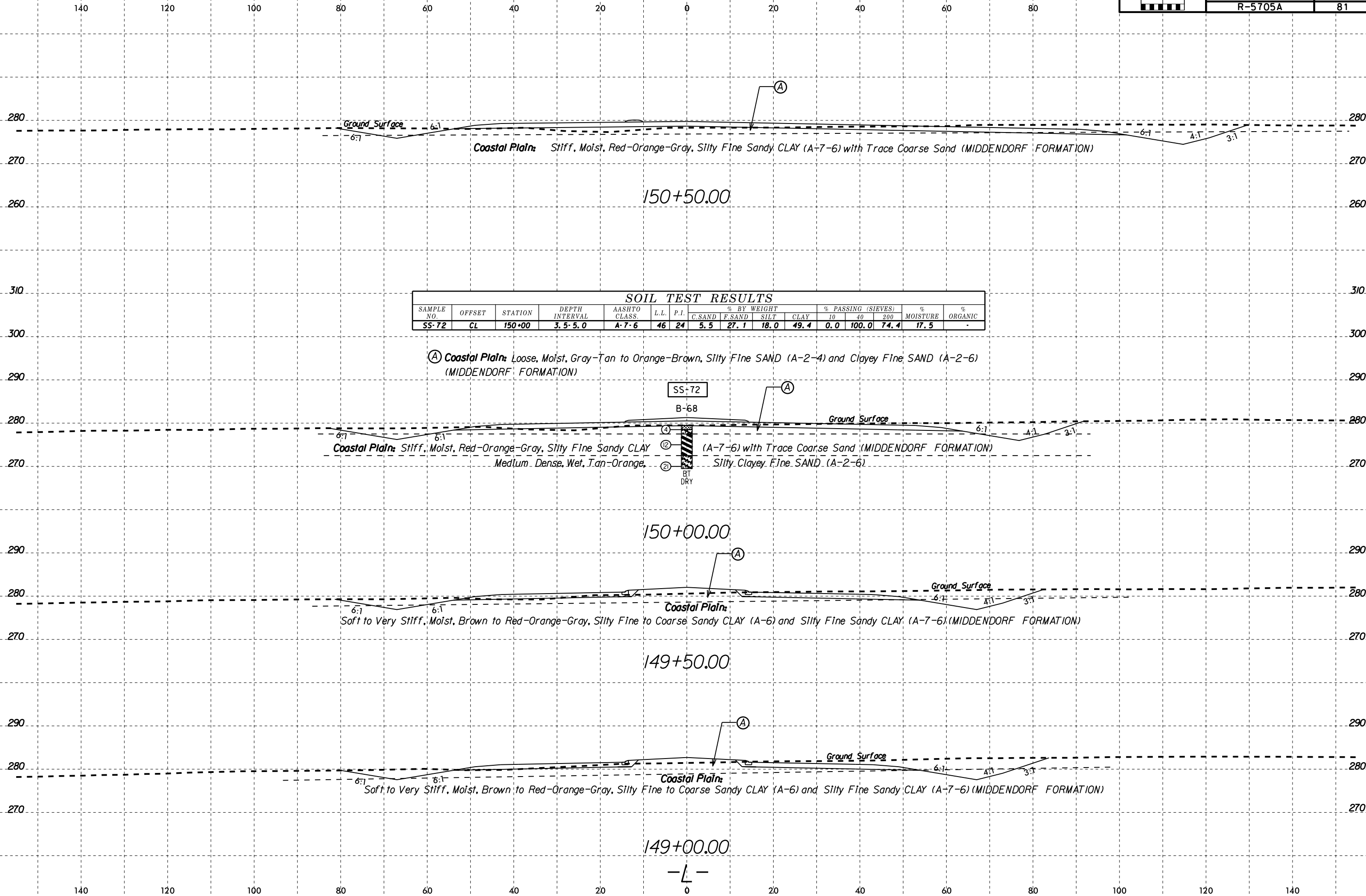
B-66

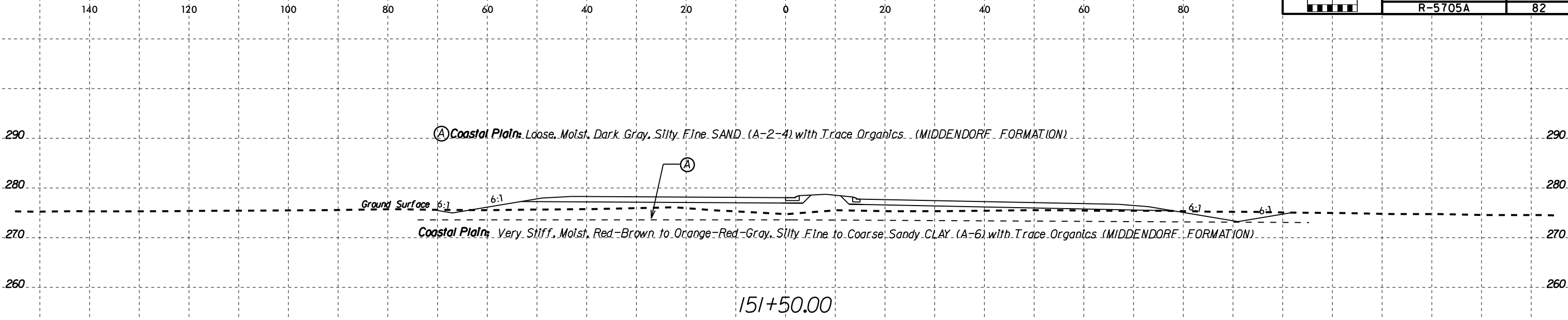
HARD DRY

Note: Cave-In, depth at 60'

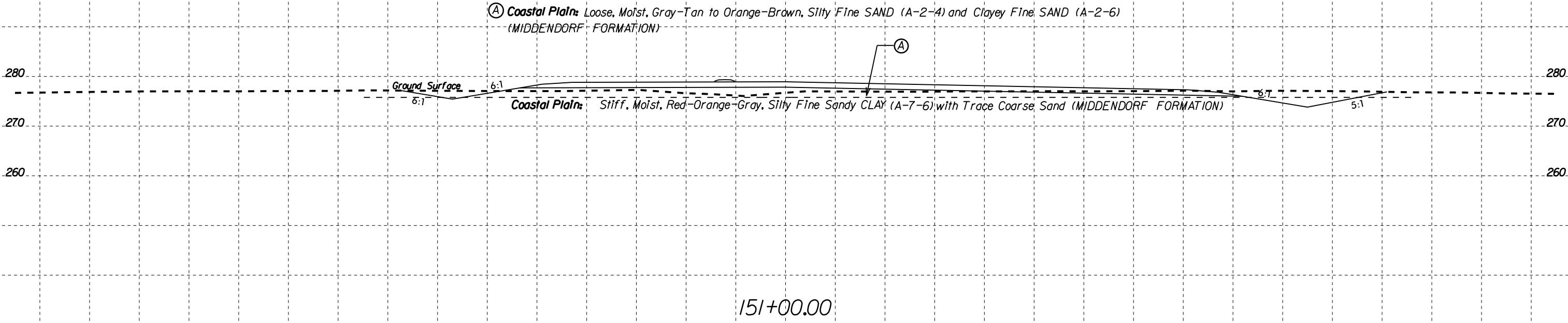
146+00.00

— L —

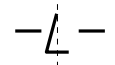




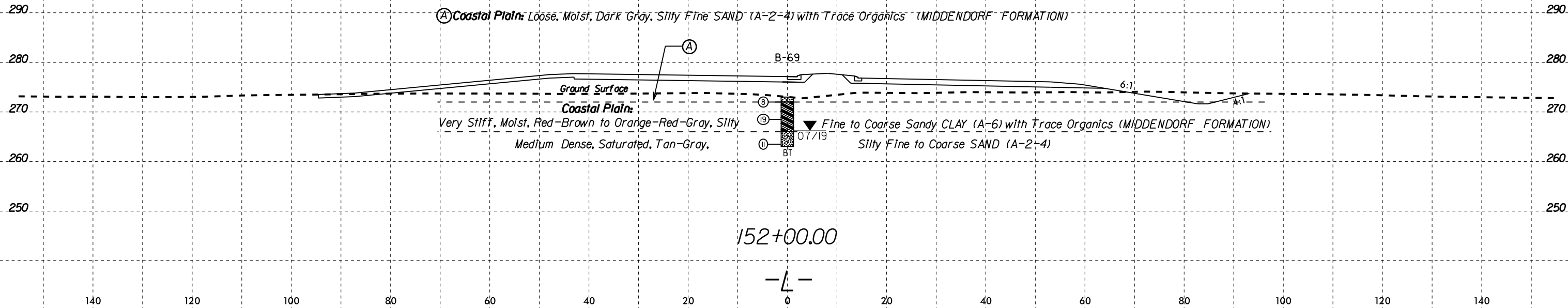
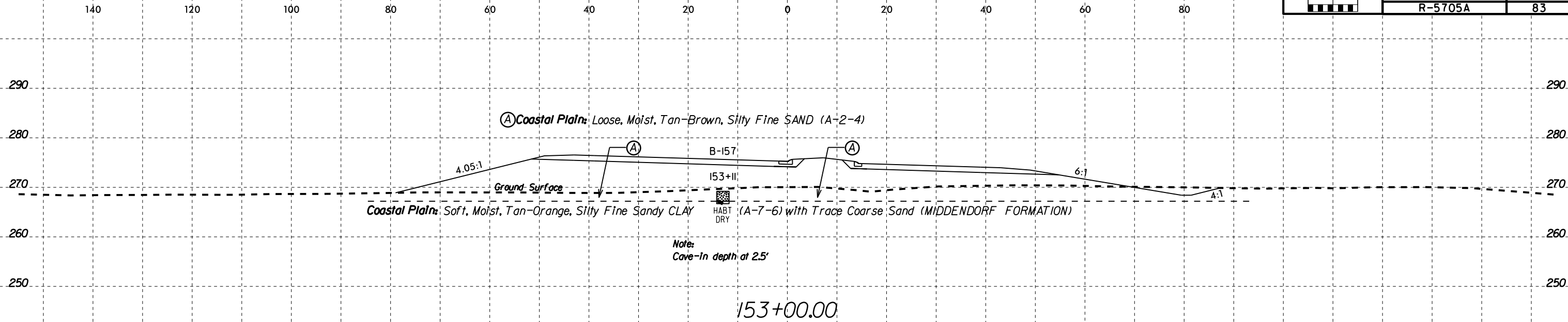
151+50.00



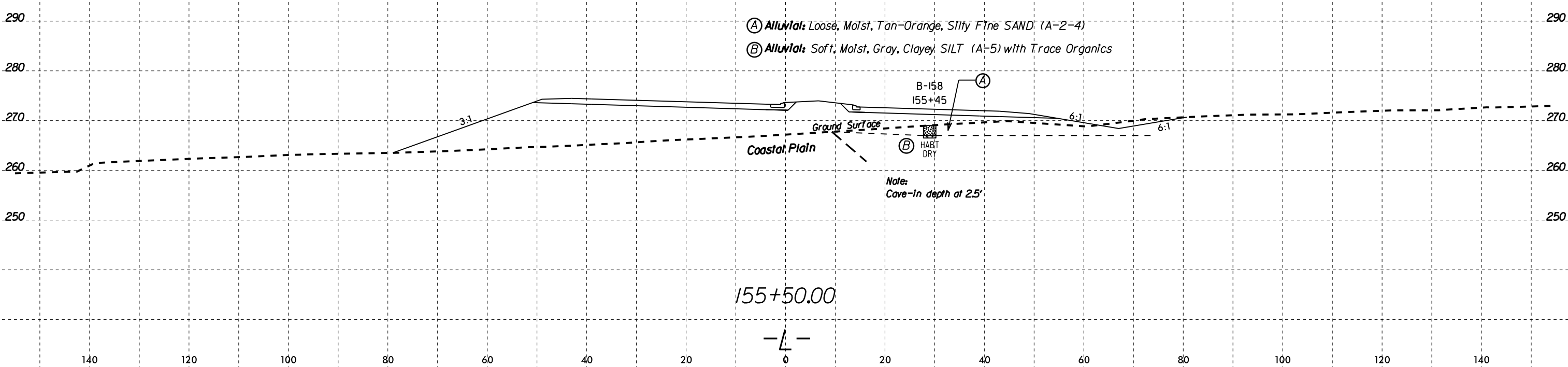
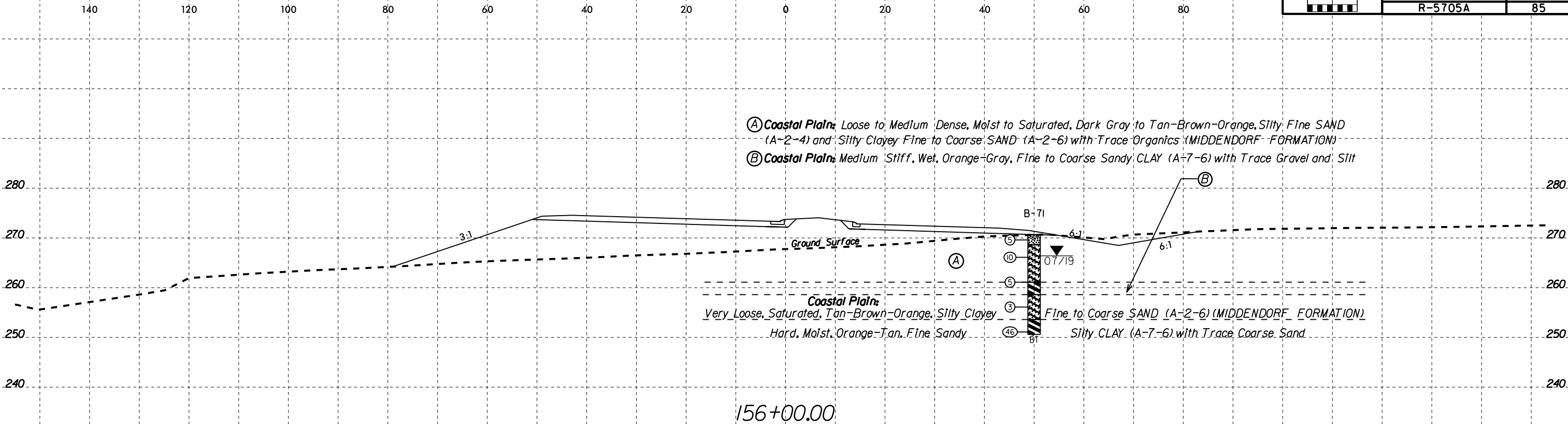
151+00.00



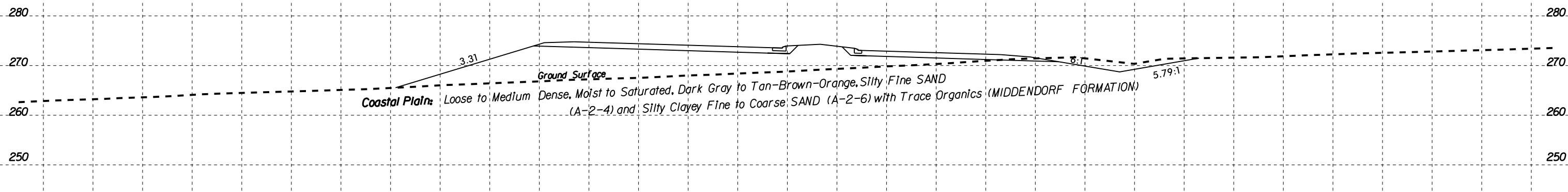
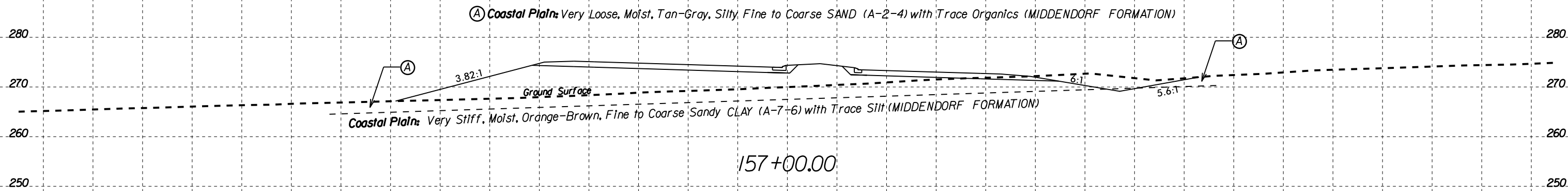
6/23/16



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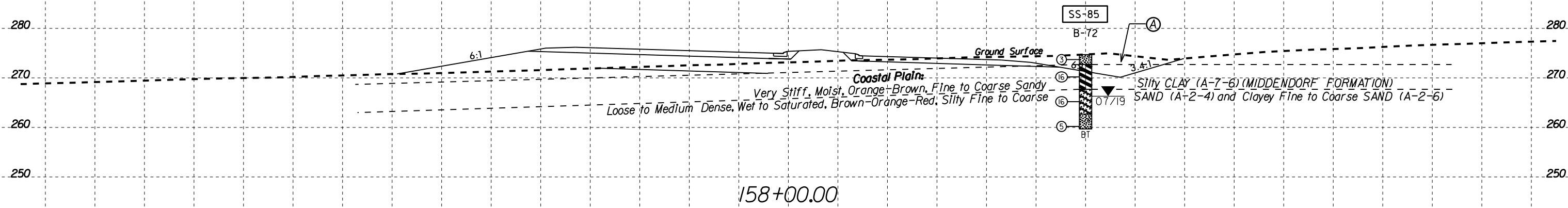
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140 120 100 80 60 40 20 0 20 40 60 80 100 120 140

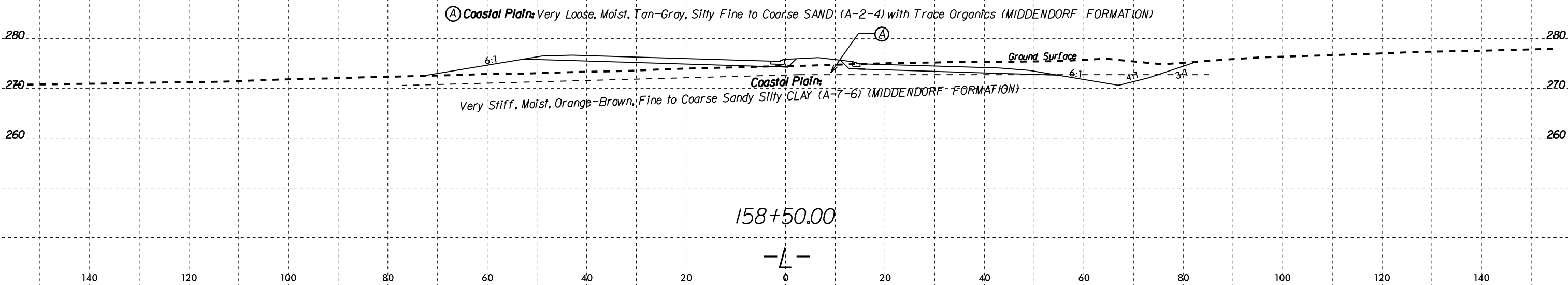
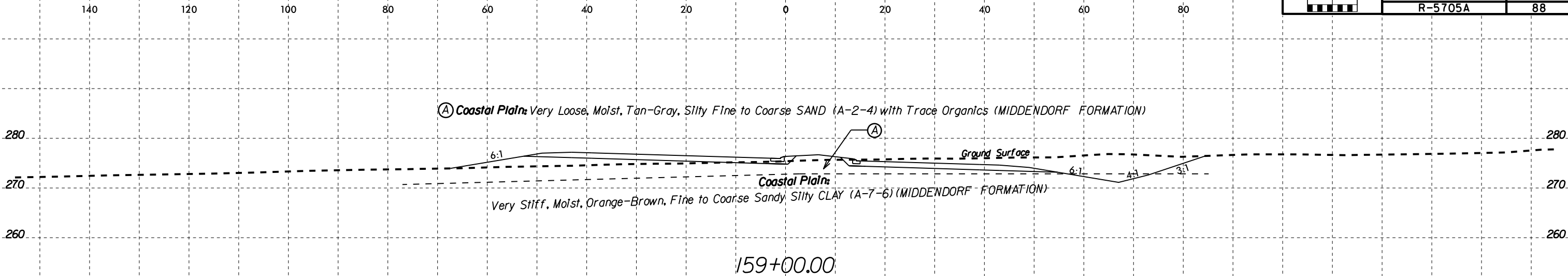
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-85	60' Rt	158+00	3.5-5.0	A-7-6	47	21	20.7	32.6	9.7	37.0	0.0	99.8	50.1	20.2	-

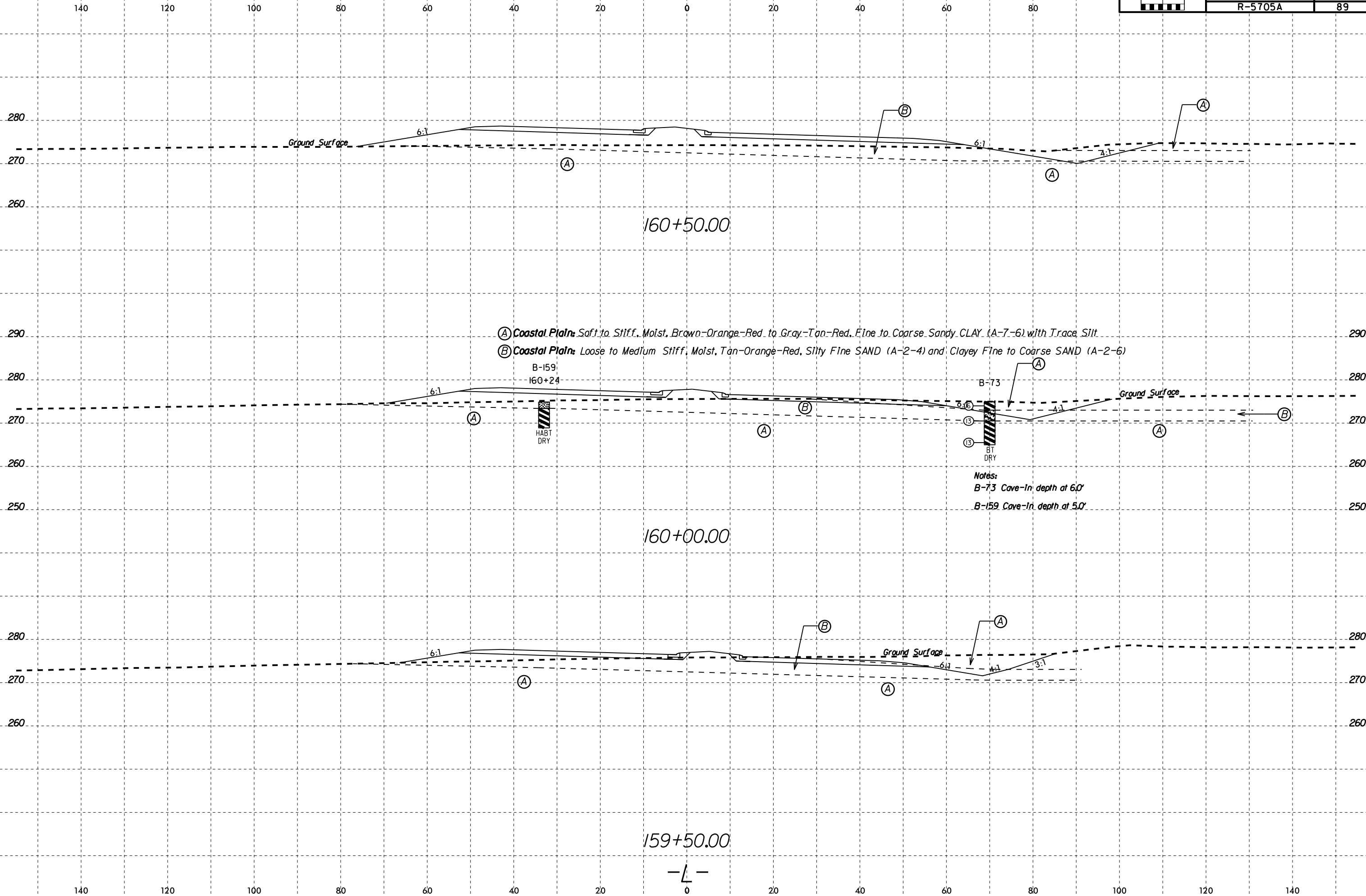
(A) Coastal Plain: Very Loose, Moist, Tan-Gray, Silty Fine to Coarse SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

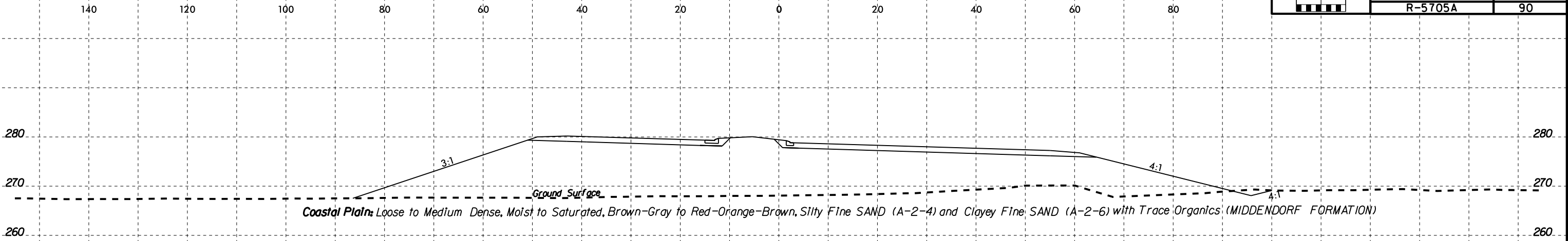


157+50.00

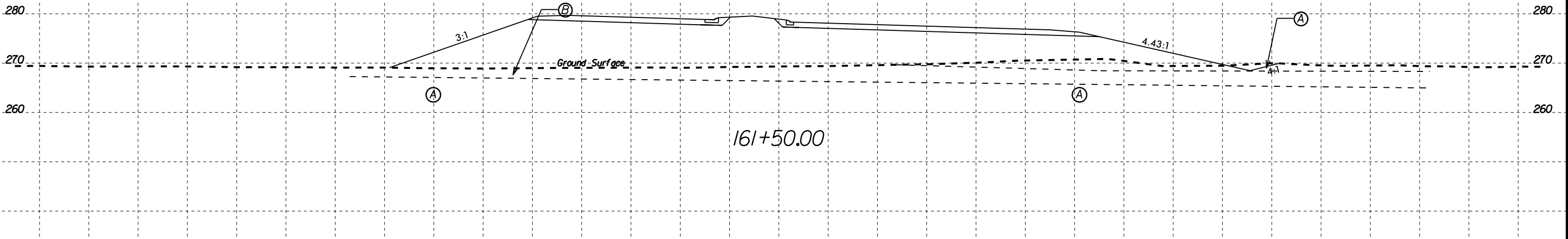
-L-



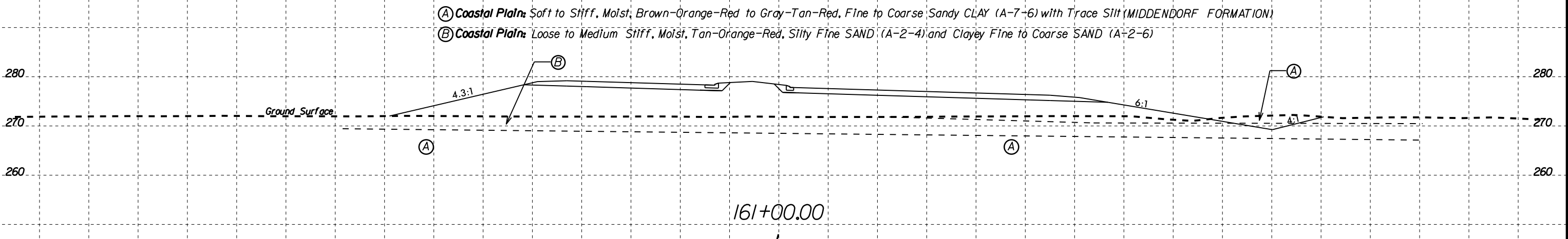




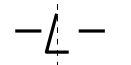
162+00.00



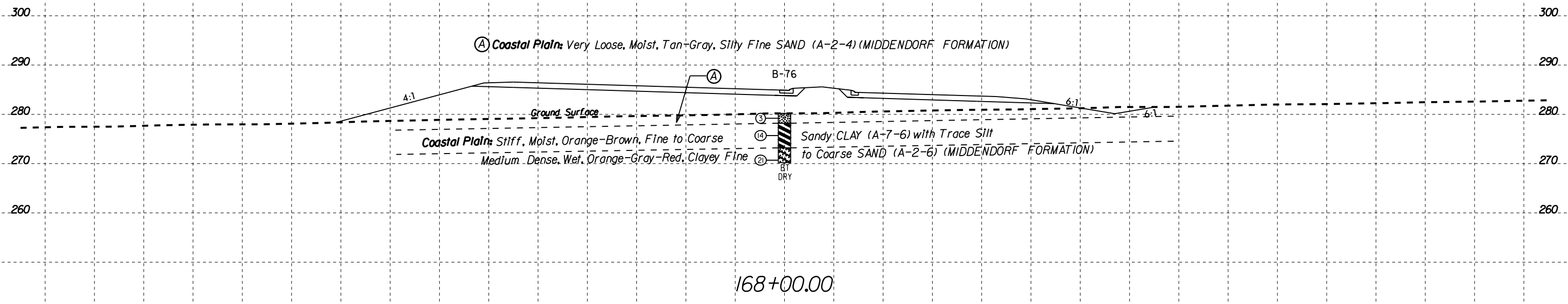
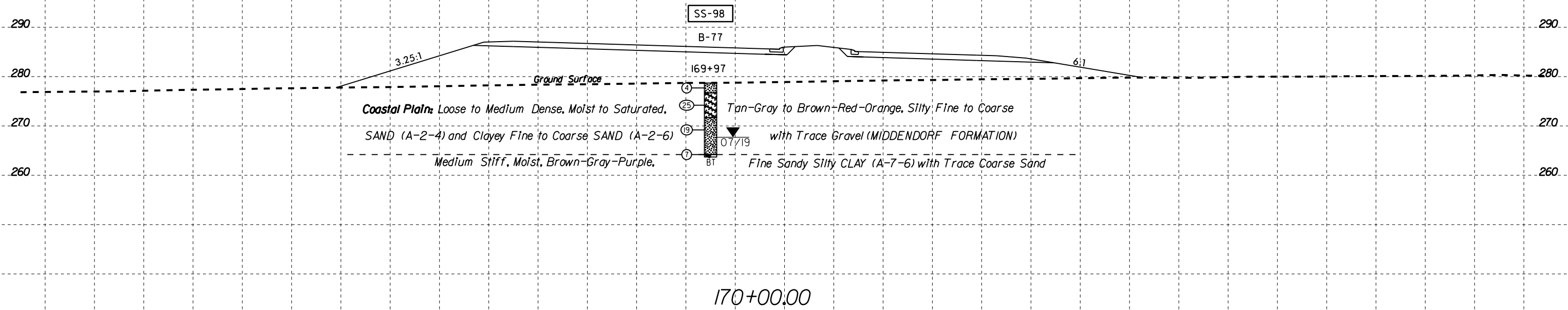
161+50.00

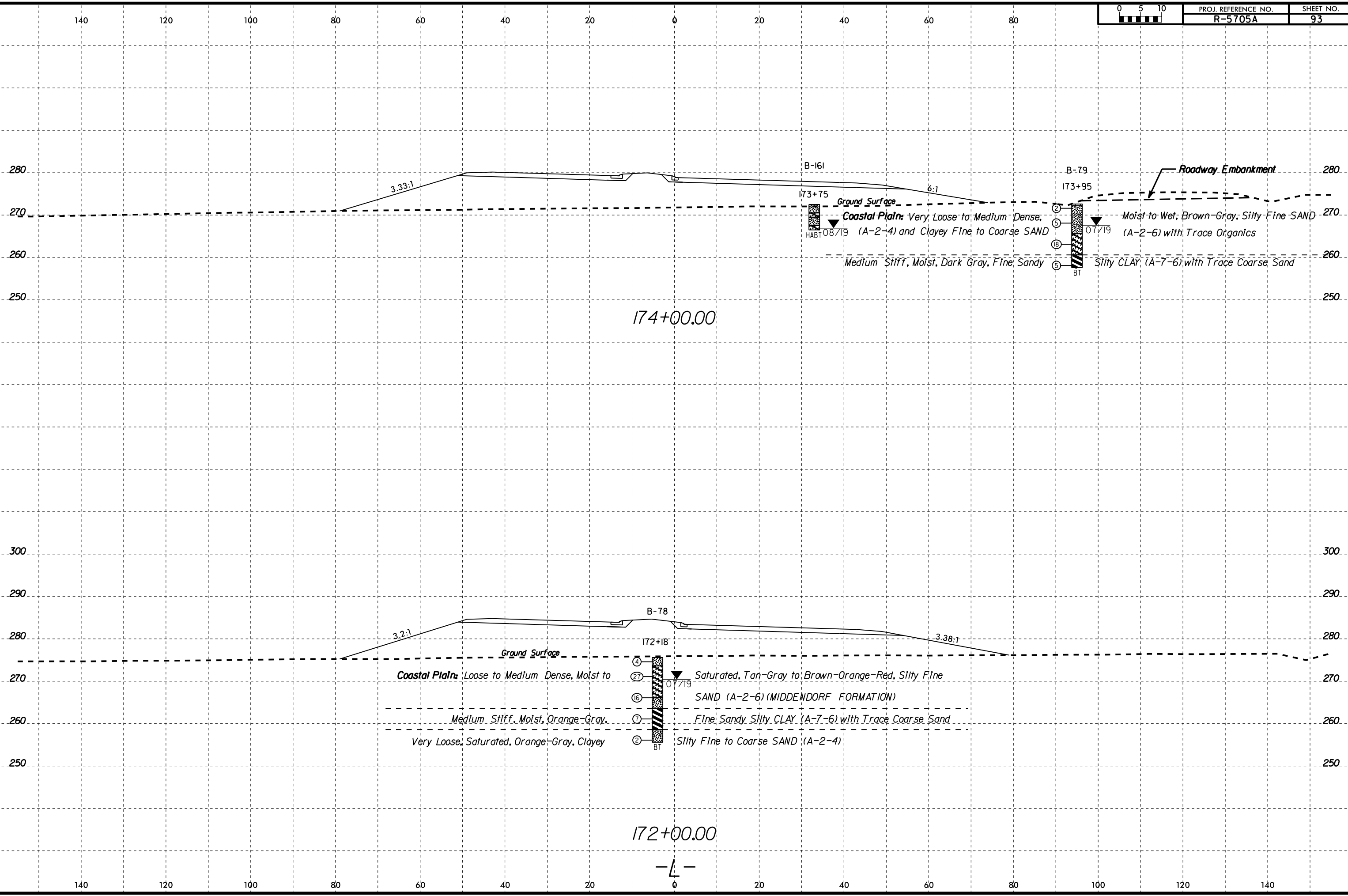


161+00.00



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-98	15' LI	169+97	14.5-15.0	A-7-6	52	32	7.2	19.6	28.6	44.6	0.0	100.0	79.7	18.0	-





05-APP-2020_20134
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 T.Walker
 6/23/16

6/23/16



PROJ. REFERENCE NO.
R-5705A

SHEET NO.
94

140

120

100

80

60

40

20

0

20

40

60

80

280

270

260

250

280

270

260

250

Ground Surface

Coastal Plain: Very Loose to Medium-Dense, Moist to Wet, Brown-Gray, Silty Fine SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) with Trace Organics (MIDDENDORF FORMATION)

Roadway Embankment

6:1

6:1

4:1

3:1

175+00.00



140

120

100

80

60

40

20

0

20

40

60

80

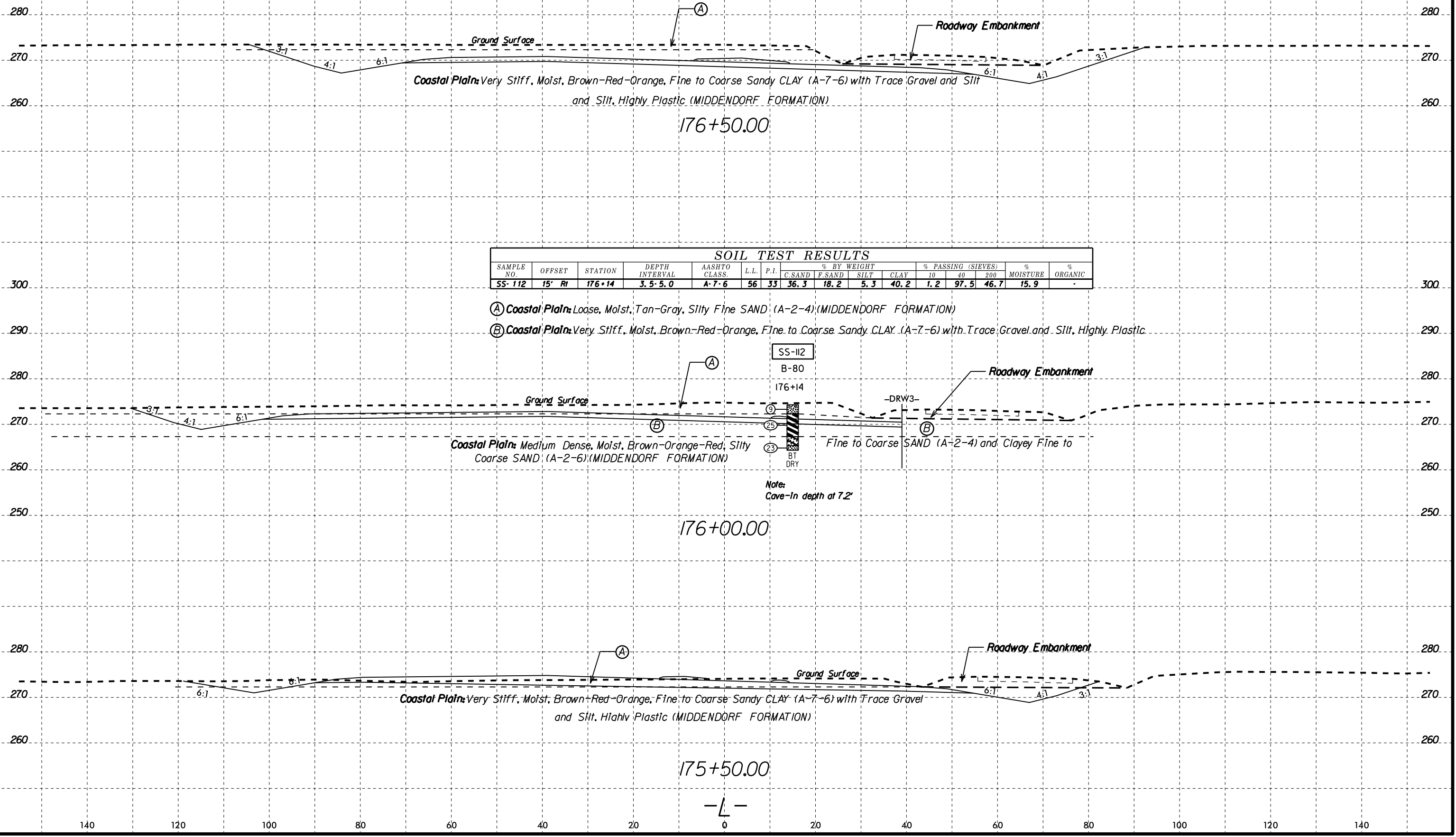
100

120

140

05-APP-2020_20134
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T\Walker-A

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 T.Walker



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-112	15' Rl	176+14	3.5-5.0	A-7-6	56	33	36.3	18.2	5.3	40.2	1.2	97.5	46.7	15.9	-

140

120

100

80

60

40

20

0

20

40

60

80

280

270

260

250

280

270

260

250

05-APP-2020_20134
F:\Projects\65X\66X-0138 NCDOT - R-5705A Harnett County\RDWY\CADD\GEO\RDWY\CADD_GEO\RDWY\5705A_geo_xst.L 3.dgn
Walker A 68026102

Coastal Plains:

Loose to Medium Dense, Moist to Wet, Dark Brown to Orange-Brown, Silty Fine to Coarse SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) with Trace Gravel (MIDDENDORF FORMATION)

Ground Surface

Roadway Embankment

3:1

4:1

6:1

6:1

4:1

3:1

177+00.00



140

120

100

80

60

40

20

0

20

40

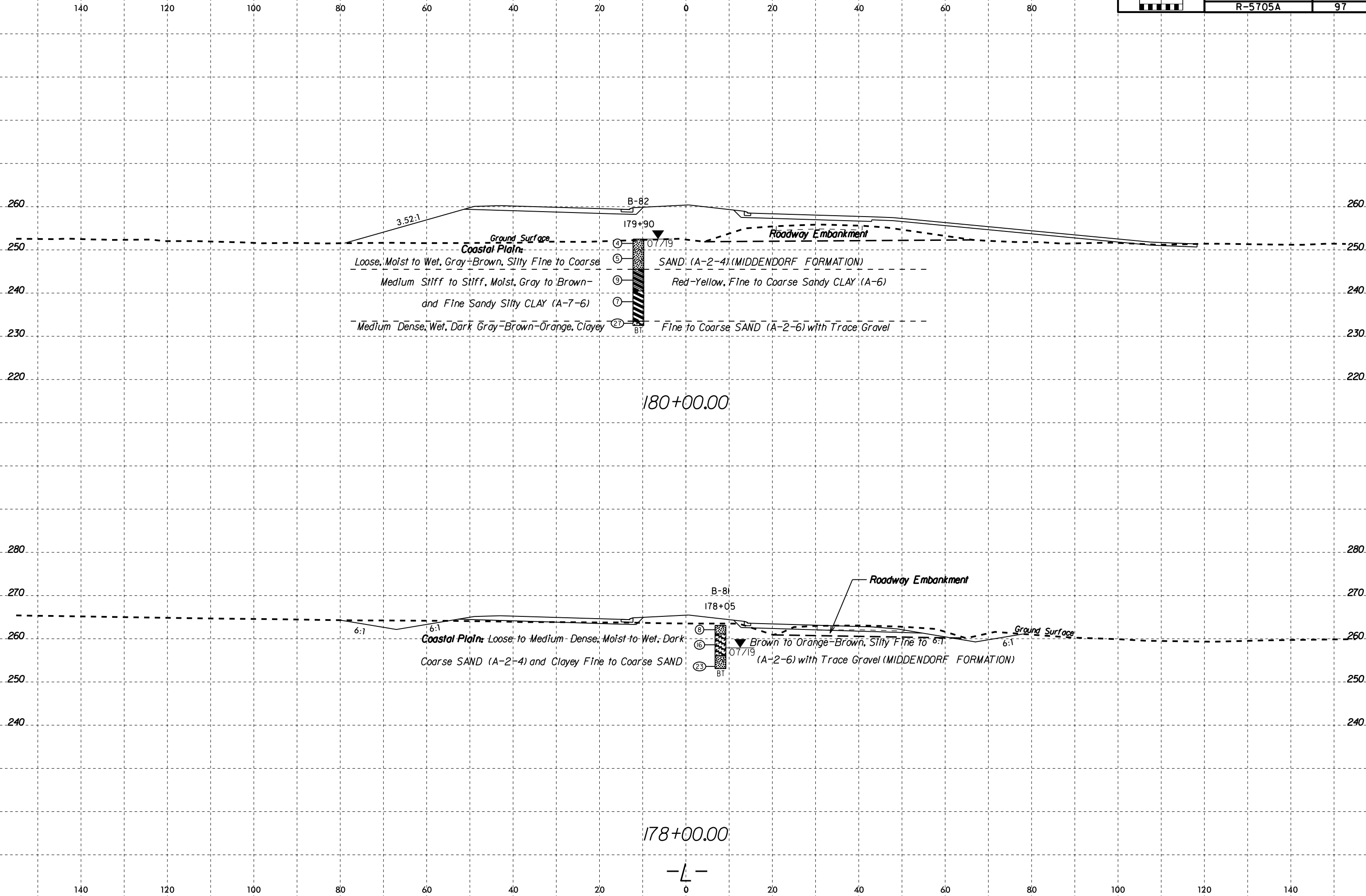
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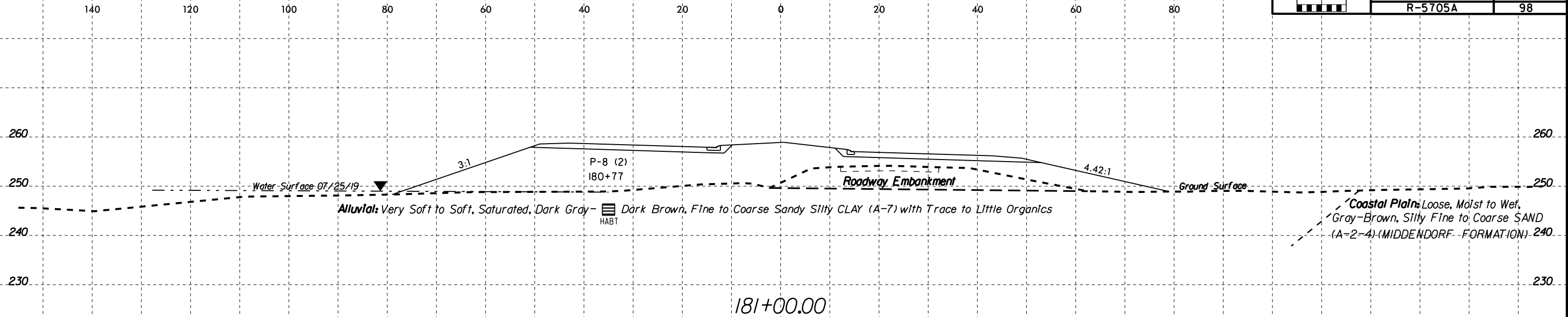
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100

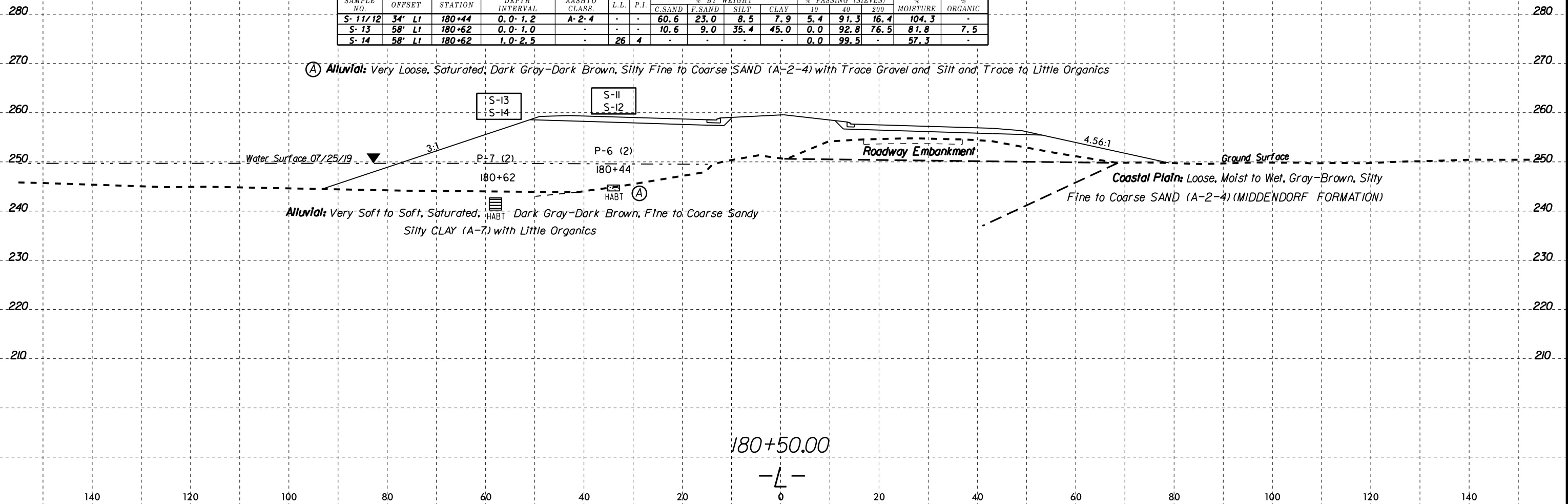
120

140

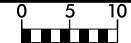




SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-11/12	34' LI	180+44	0.0-1.2	A-2-4	-	-	60.6	23.0	8.5	7.9	5.4	91.3	16.4	104.3	-
S-13	58' LI	180+62	0.0-1.0	-	-	-	10.6	9.0	35.4	45.0	0.0	92.8	76.5	81.8	7.5
S-14	58' LI	180+62	1.0-2.5	-	26	4	-	-	-	-	0.0	99.5	-	57.3	-

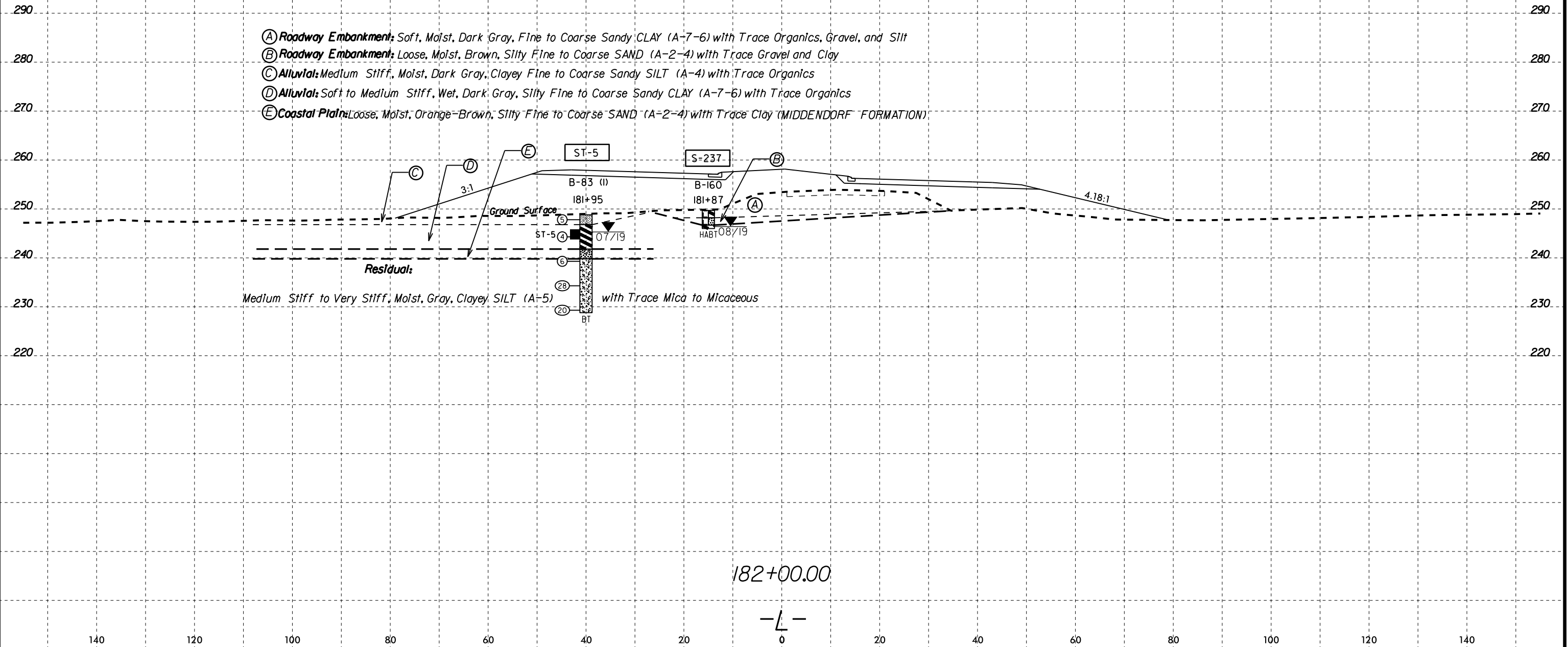


6/23/16

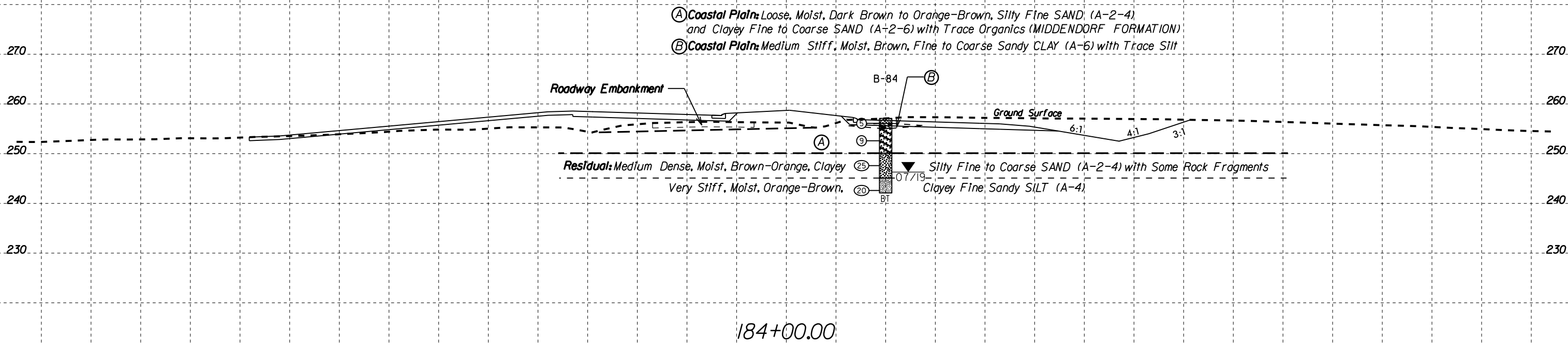
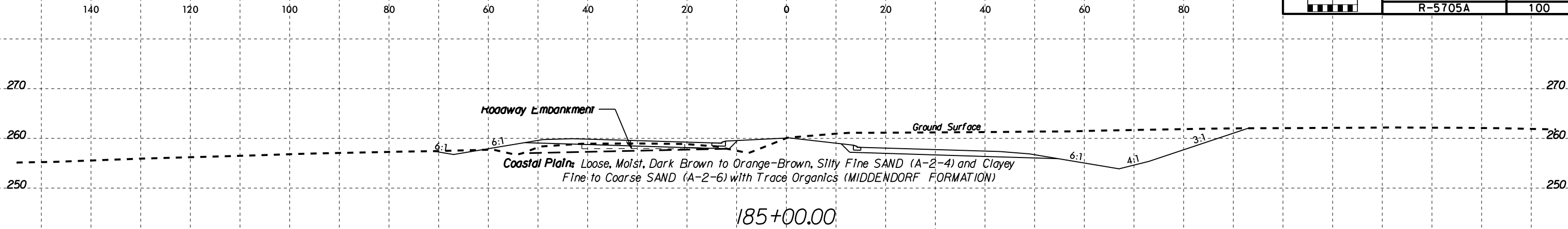


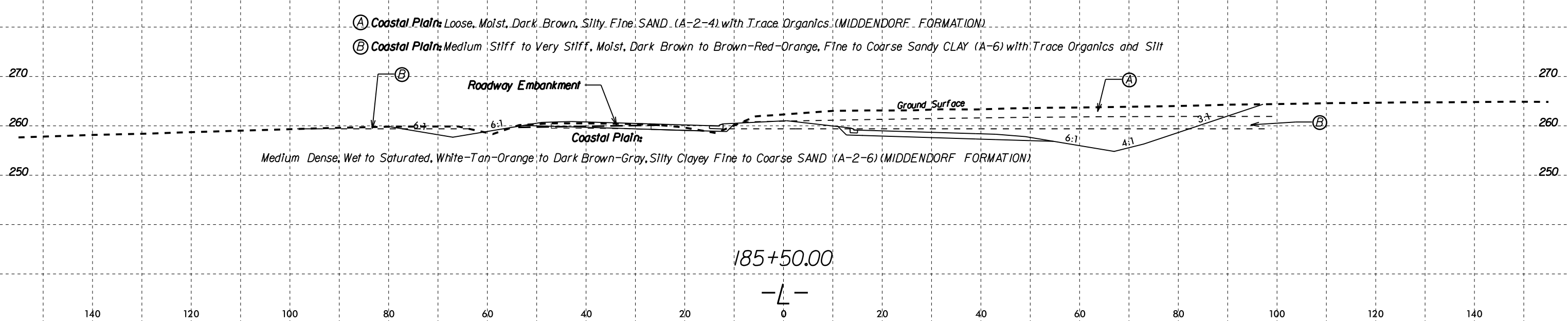
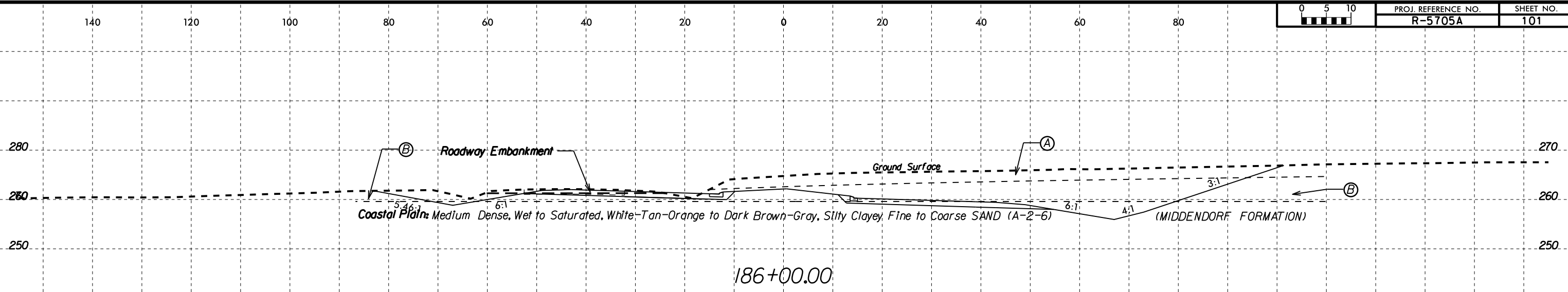
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-237	15' LI	181+87	3.0-3.7	A-7-6	44	17	18.4	32.3	12.1	37.2	0.0	98.8	52.7	37.1	8.5
ST-5	40' LI	181+95	3.0-5.0	A-7-6	41	17	20.1	30.2	15.8	33.9	0.7	98.3	52.7	38.7	-

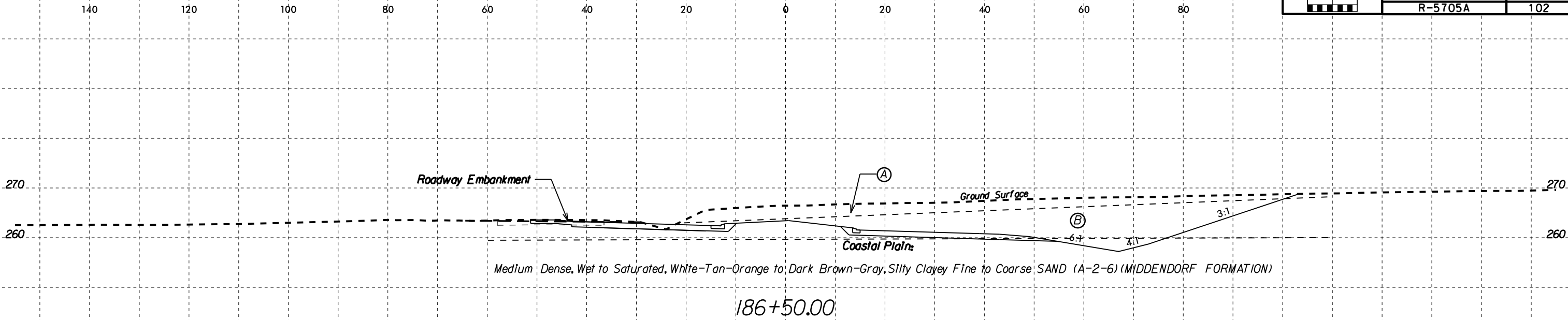
- (A) Roadway Embankment: Soft, Moist, Dark Gray, Fine to Coarse Sandy CLAY (A-7-6) with Trace Organics, Gravel, and Silt
- (B) Roadway Embankment: Loose, Moist, Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Gravel and Clay
- (C) Alluvial: Medium Stiff, Moist, Dark Gray, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Organics
- (D) Alluvial: Soft to Medium Stiff, Wet, Dark Gray, Silty Fine to Coarse Sandy CLAY (A-7-6) with Trace Organics
- (E) Coastal Plain: Loose, Moist, Orange-Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Clay (MIDDENDORF FORMATION)



29-MAY-2020 16:10 L:\Projects\6361\6361.dwg (NCDDT - R-5705A Harnett County)\R5705A_GEO\RDW\CADD_GEO\TECH\XSC\R5705A_geo_xsl.L 3.dgn

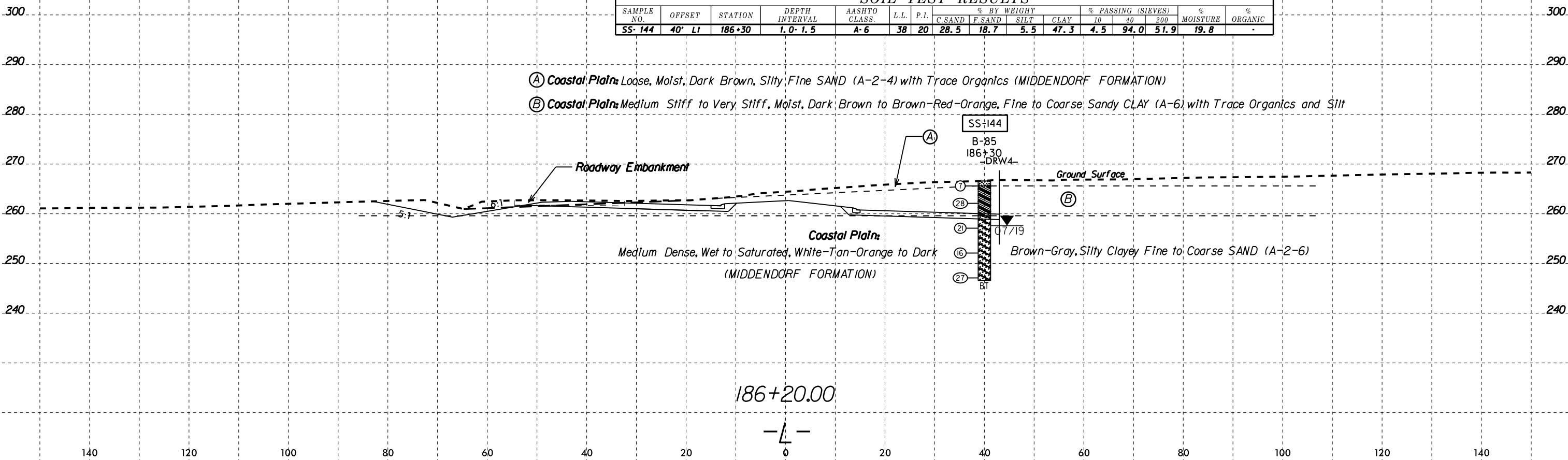


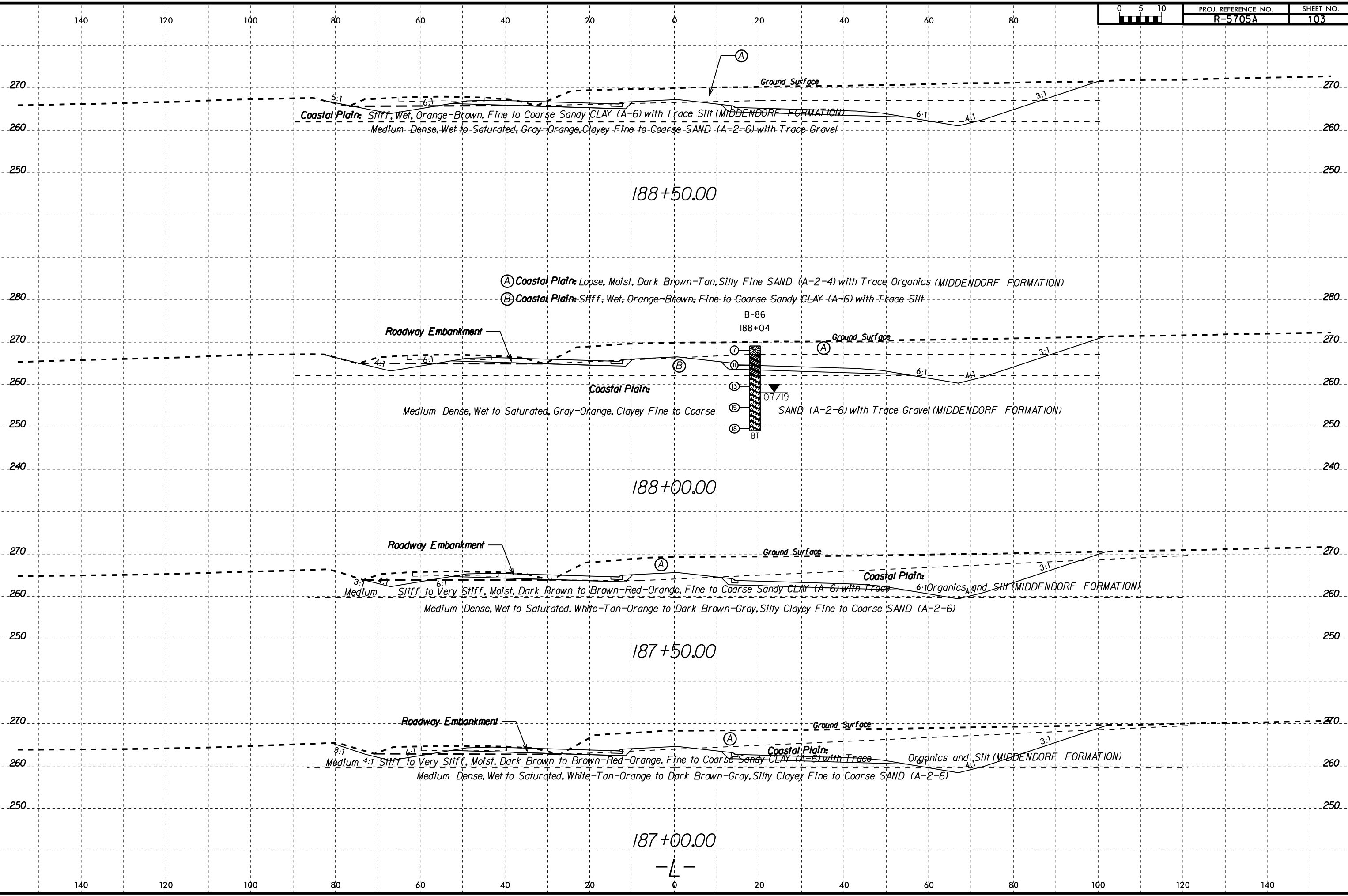


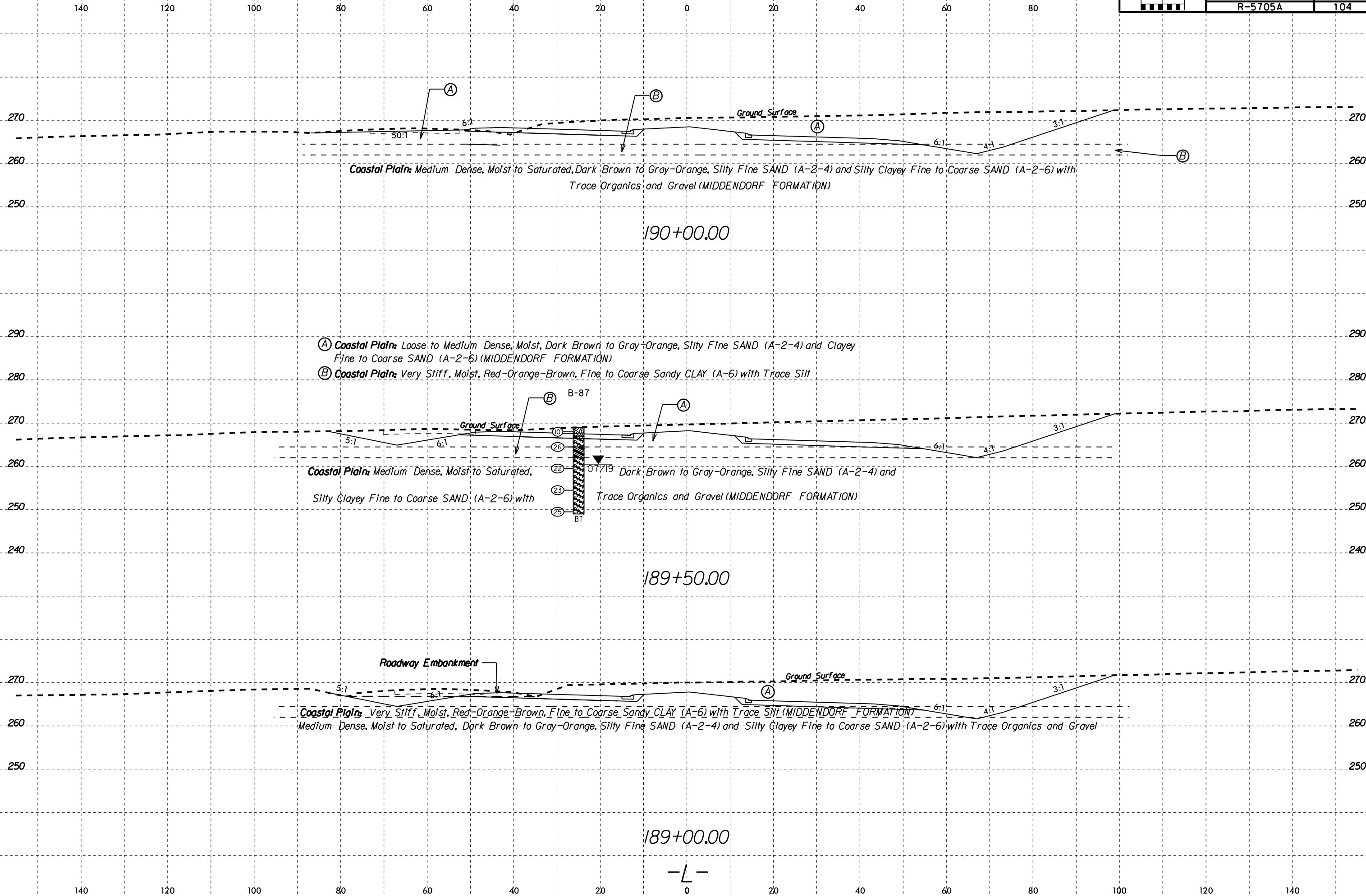


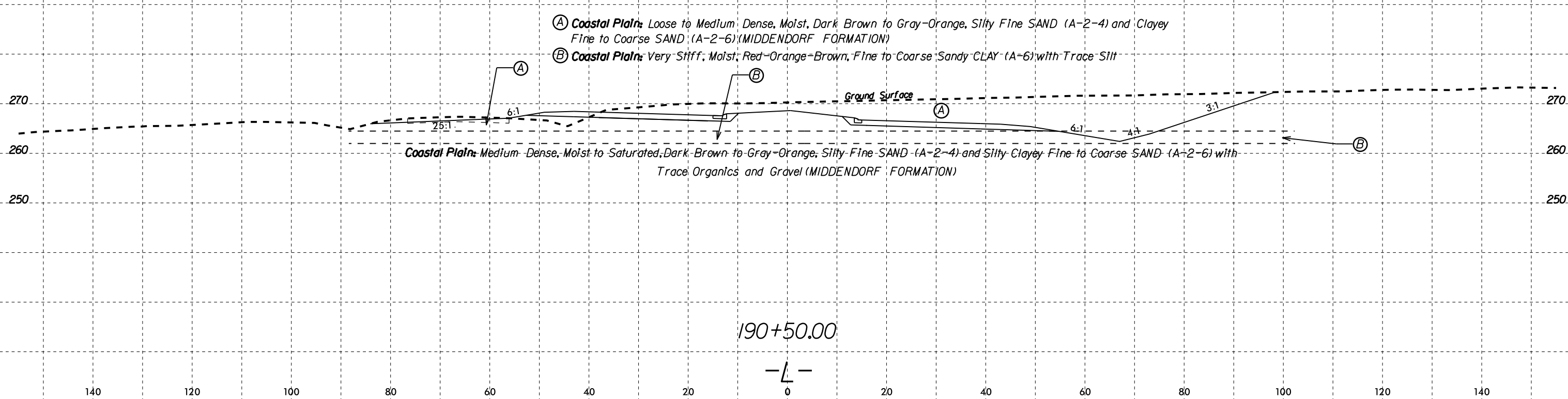
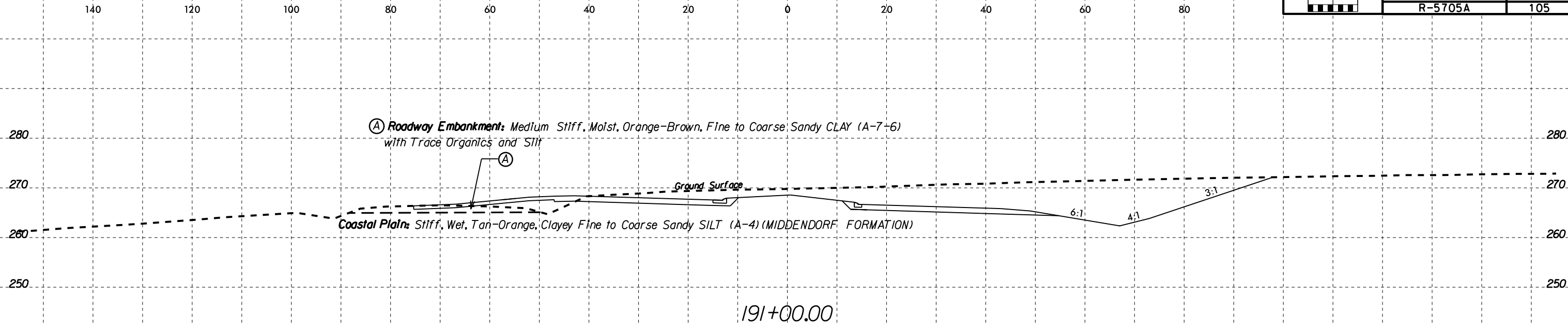
SOIL TEST RESULTS

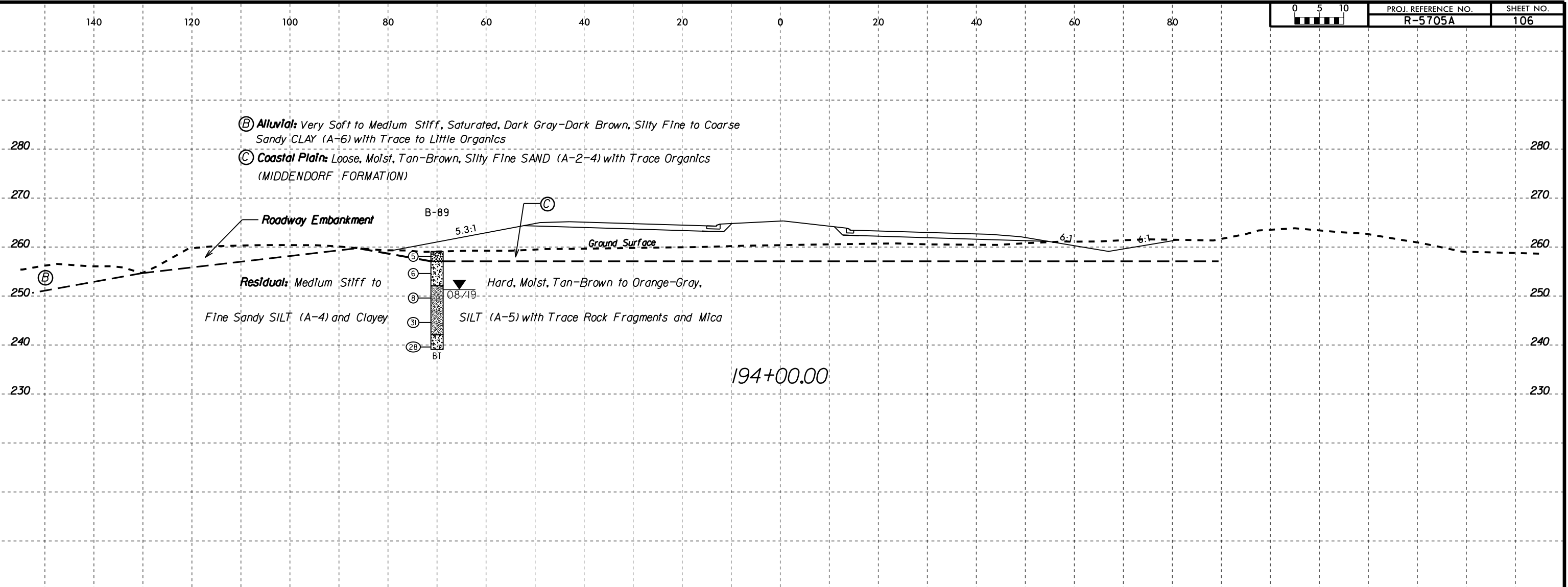
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-144	40' LI	186+30	1.0-1.5	A-6	38	20	28.5	18.7	5.5	47.3	4.5	94.0	51.9	19.8	-



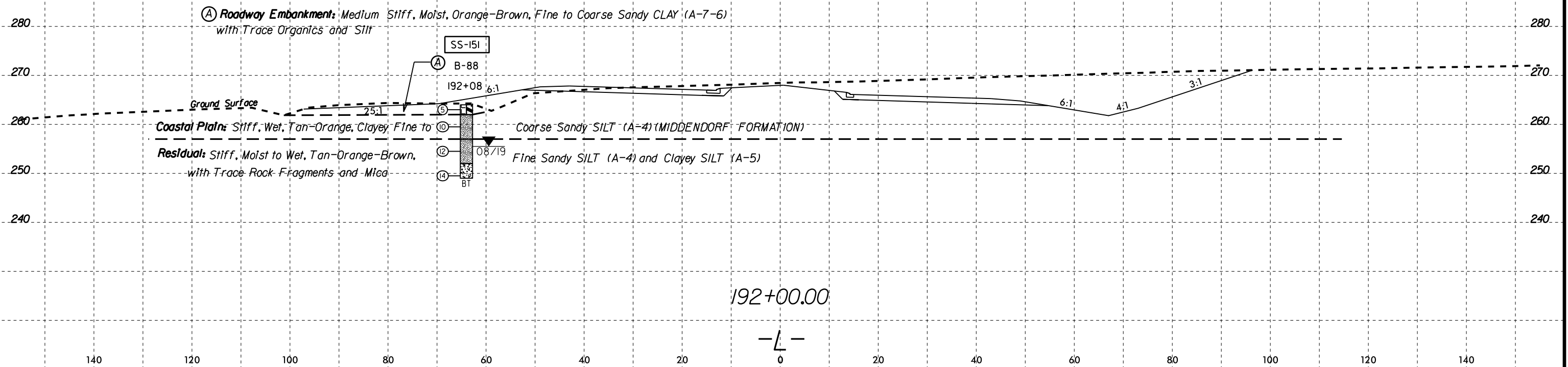




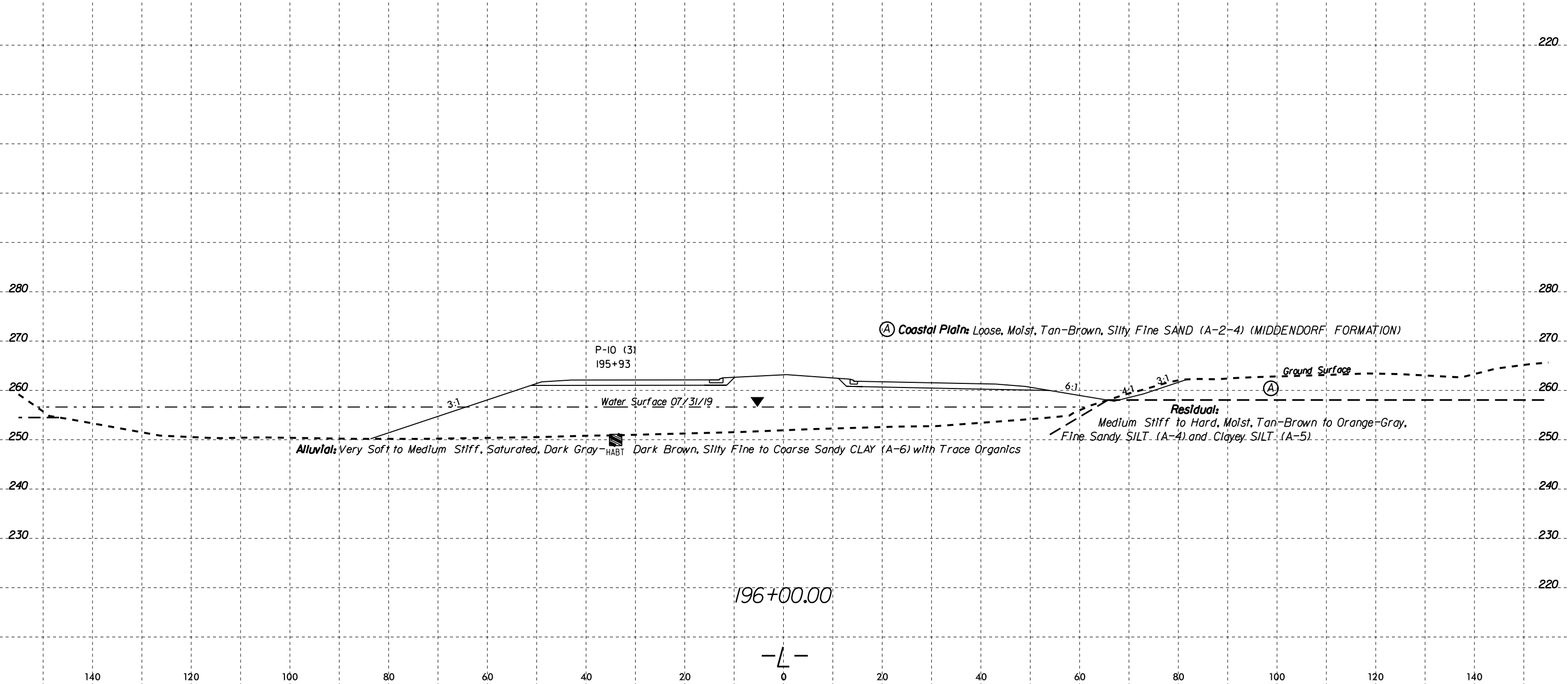
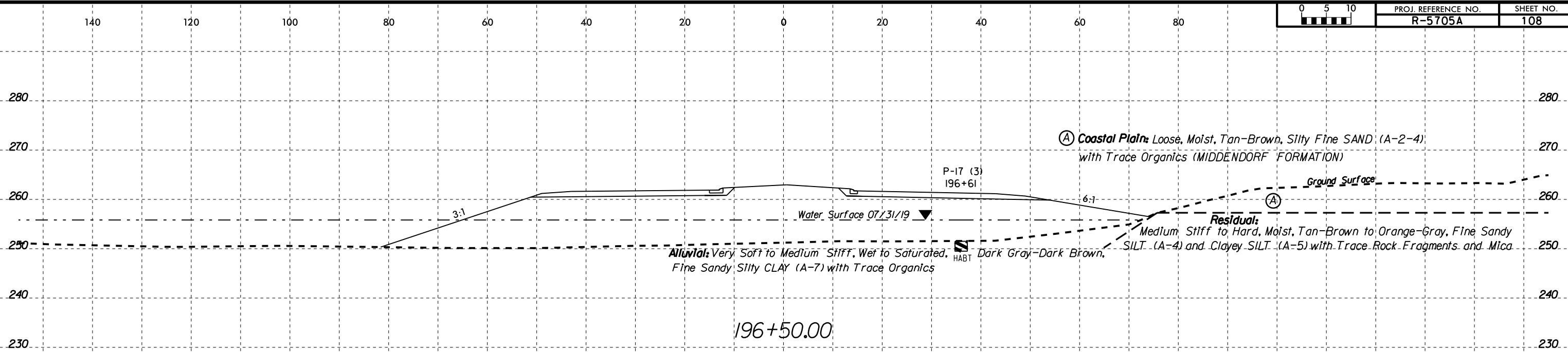




SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-151	64' LI	192+08	0.2-1.5	A-7-6	47	20	33.9	13.9	5.2	47.0	2.5	95.0	51.5	17.9	-



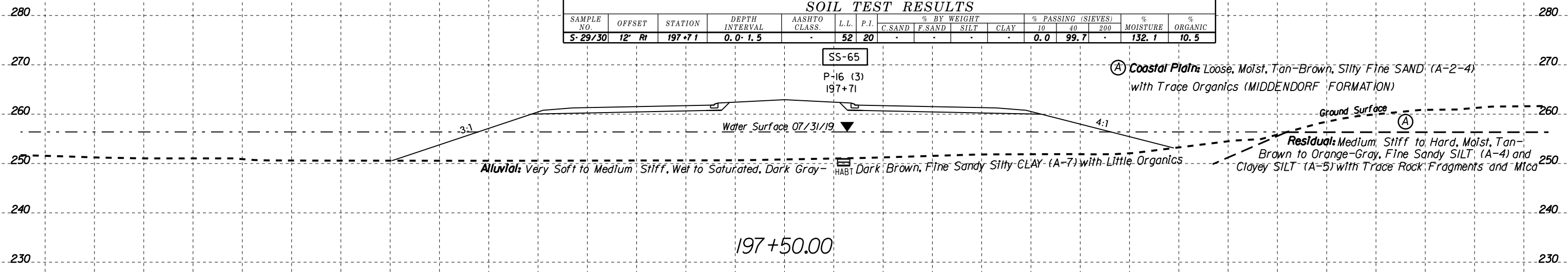
6/23/16



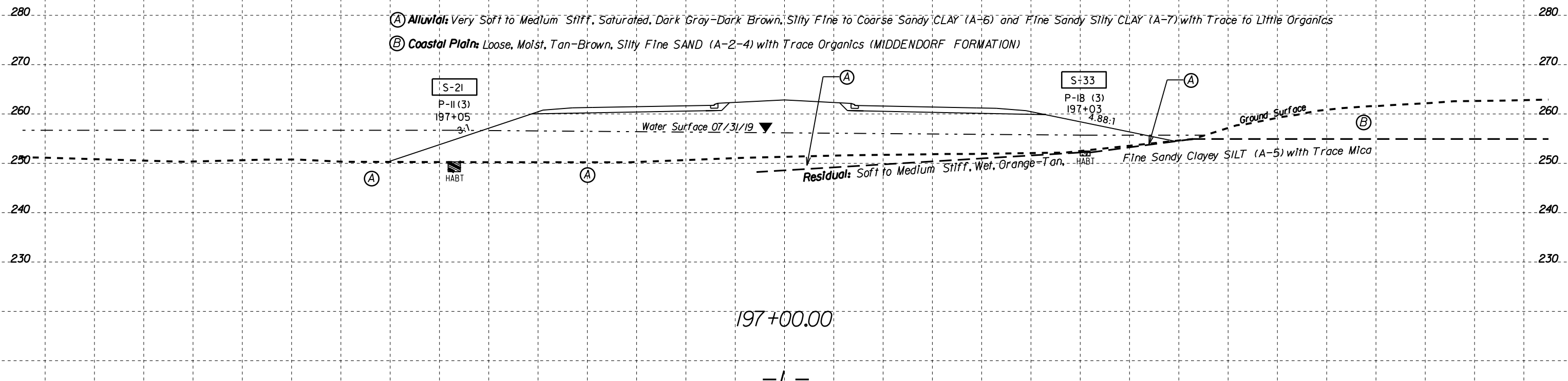
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SOIL TEST RESULTS																
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C.SAND	F.SAND	SILT	CLAY	10	40	200			
S-29/30	12' Rt	197+71	0.0-1.5	-	52	20	-	-	-	-	-	0.0	99.7	-	132.1	10.5



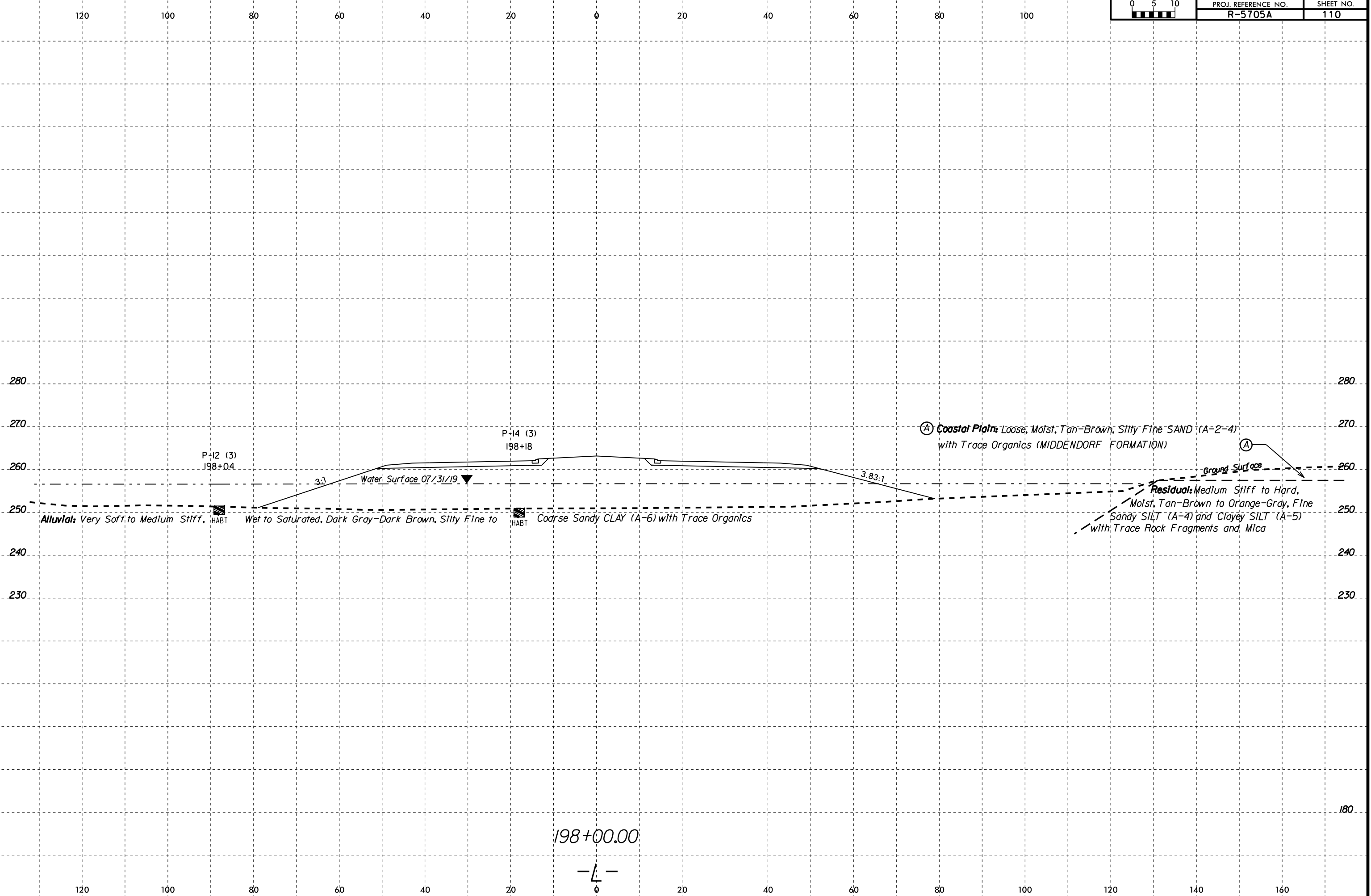
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-21	16' Lt	195+25	0.0-2.3	A-6	36	12	24.5	12.9	29.3	33.3	0.3	98.1	63.6	99.5	5.0
S-33	6' Rt	197+03	0.0-0.3	-	-	-	-	-	-	-	-	-	224.4	10.1	



6/23/16



05-APP-2020_2037
F:\Projects\66X\66X-0138 NCDOT - R-5705A Harnett County\RDWY\CADD\GEO\RDWY\CADD_GEO\RDWY\5705A_geo_xst.L 3.dgn
Walker A 66026102



198+00.00

-L-

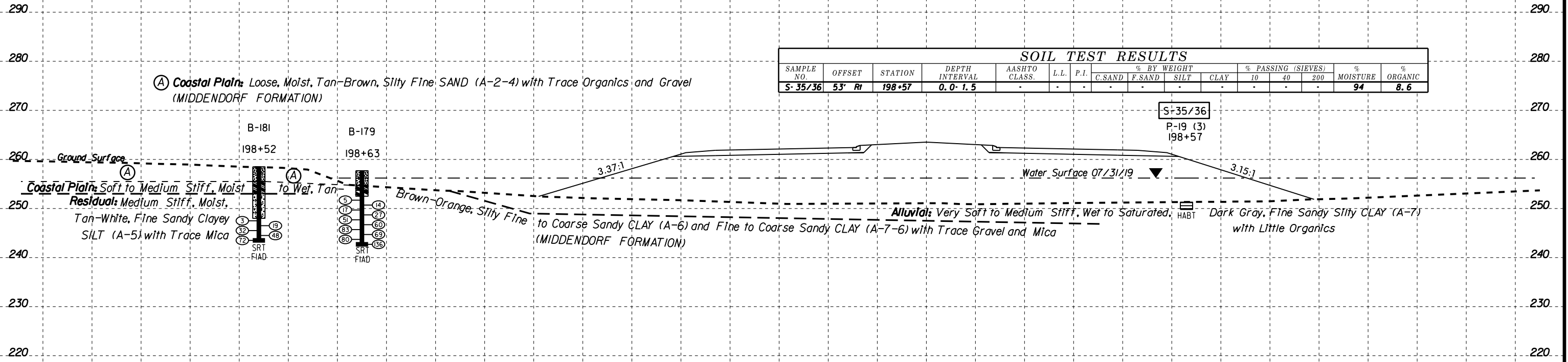
Ⓐ Coastal Plains: Loose, Moist, Tan-Brown, Silty Fine SAND (A-2-4)
with Trace Organics (MIDDENDORF FORMATION)

Alluvial: Very Soft to Medium Stiff, Wet to Saturated, Dark Gray-Dark Brown, Silty Fine to Coarse Sandy CLAY (A-6) with Trace Organics

Ⓐ Residual: Medium Stiff to Hard, Moist, Tan-Brown to Orange-Gray, Fine Sandy SILT (A-4) and Clayey SILT (A-5) with Trace Rock Fragments and Mica

Ground Surface

180 160 140 120 100 80 60 40 20 0 20 40 60



(A) Coastal Plain: Loose, Moist, Tan-Brown, Silty Fine SAND (A-2-4) with Trace Organics and Gravel (MIDDENDORF FORMATION)

Coastal Plain: Soft to Medium Stiff, Moist to Wet, Tan Residual: Medium Stiff, Moist, Tan-White, Fine Sandy Clayey SILT (A-5) with Trace Mica

Brown-Orange, Silty Fine to Coarse Sandy CLAY (A-6) and Fine to Coarse Sandy CLAY (A-7-6) with Trace Gravel and Mica (MIDDENDORF FORMATION)

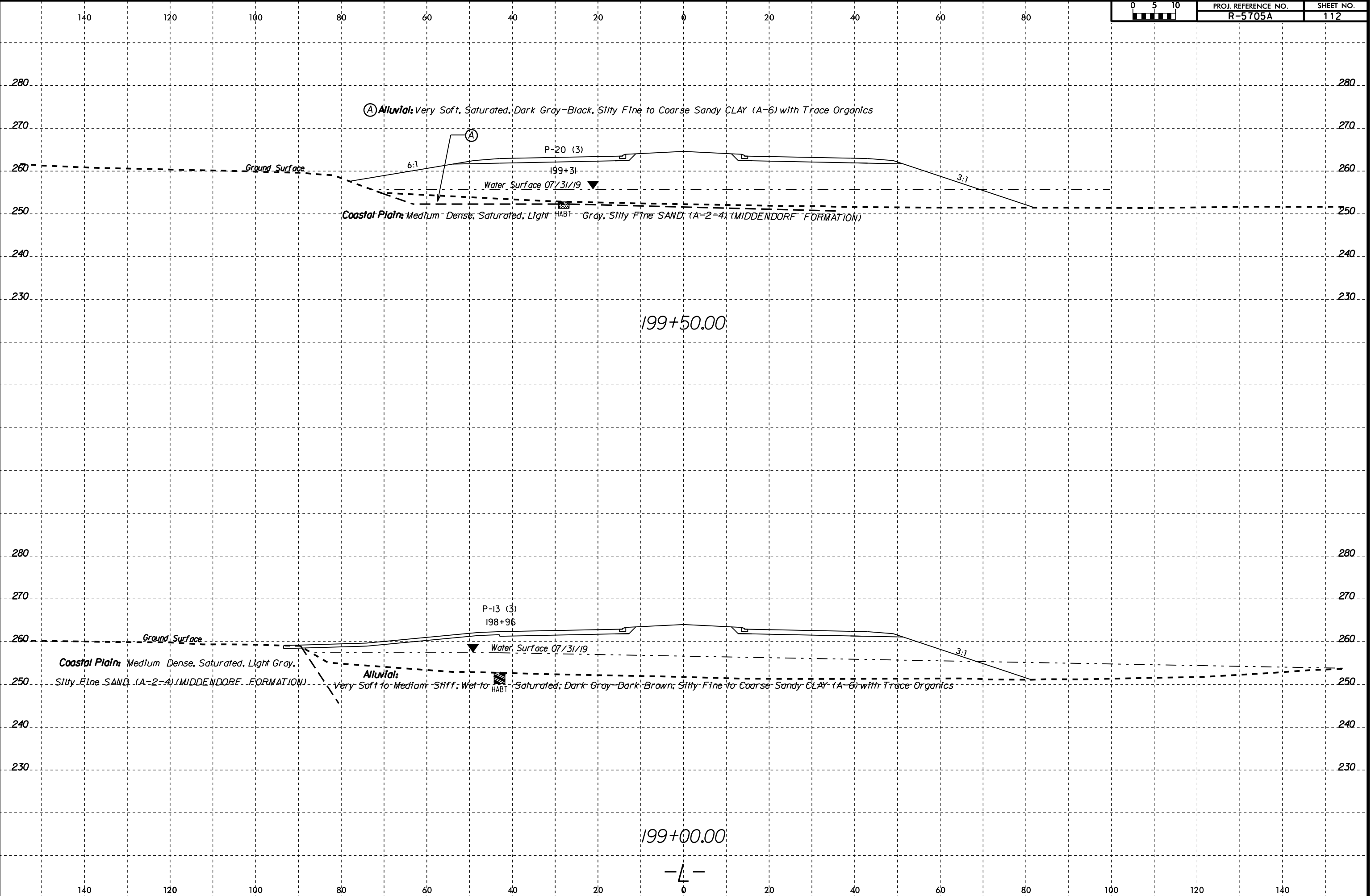
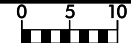
Alluvial: Very Soft to Medium Stiff, Wet to Saturated, Dark Gray, Fine Sandy Silty CLAY (A-7) with Little Organics

198+50.00

-L-

180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120

6/23/16



(A) Alluvial: Very Soft, Saturated, Dark Gray-Black, Silty Fine to Coarse Sandy CLAY (A-6) with Trace Organics

(A)

P-20 (3)

Ground Surface

6:1

Water Surface 07/31/19

3:1

Coastal Plain: Medium Dense, Saturated, Light Gray, Silty Fine SAND (A-2-4) (MIDDENDORF FORMATION)

199+50.00

P-13 (3)

198+96

Ground Surface

Water Surface 07/31/19

3:1

Coastal Plain: Medium Dense, Saturated, Light Gray, Silty Fine SAND (A-2-4) (MIDDENDORF FORMATION)

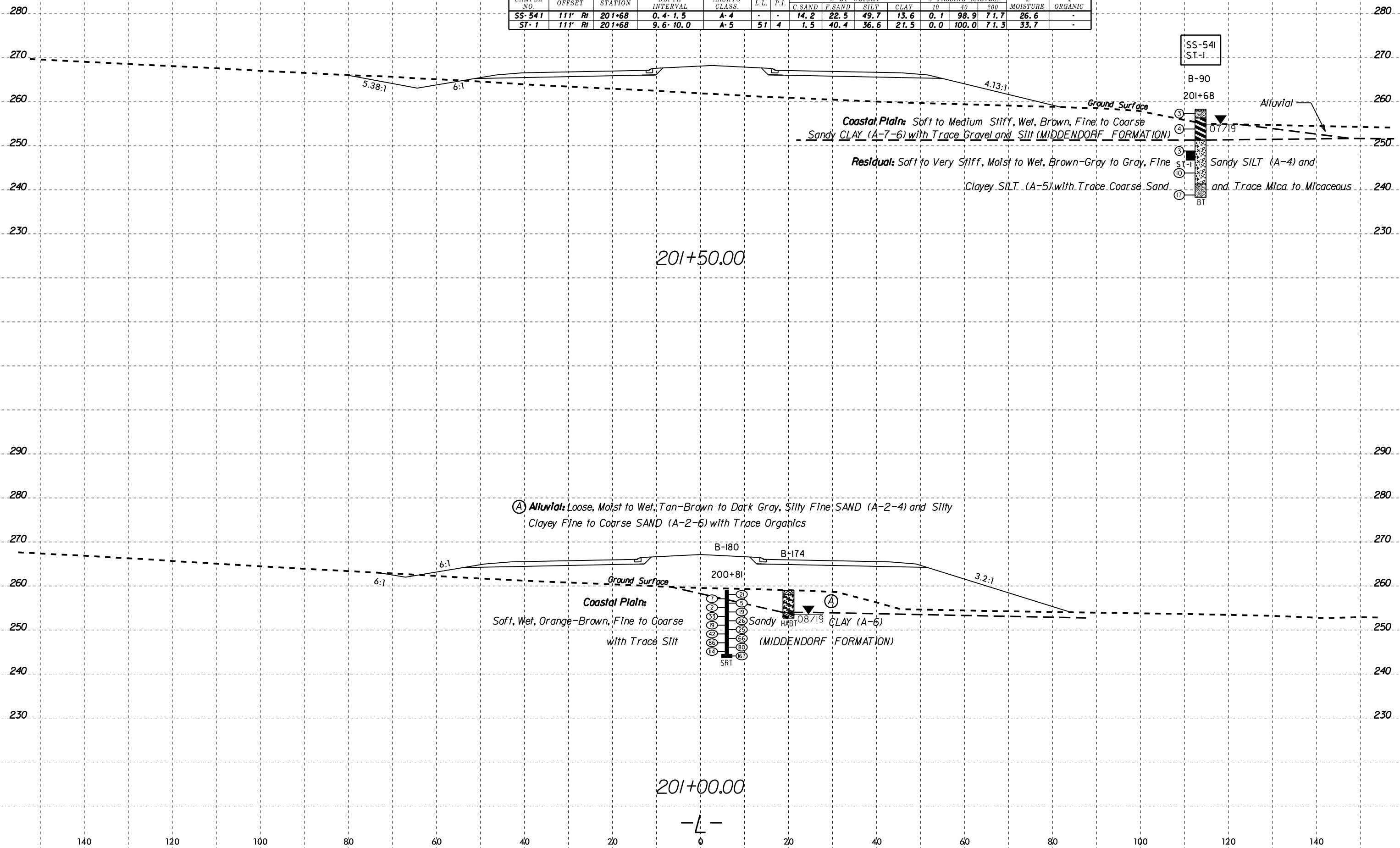
Alluvial: Very Soft to Medium Stiff; Wet to Saturated; Dark Gray-Dark Brown, Silty Fine to Coarse Sandy CLAY (A-6) with Trace Organics

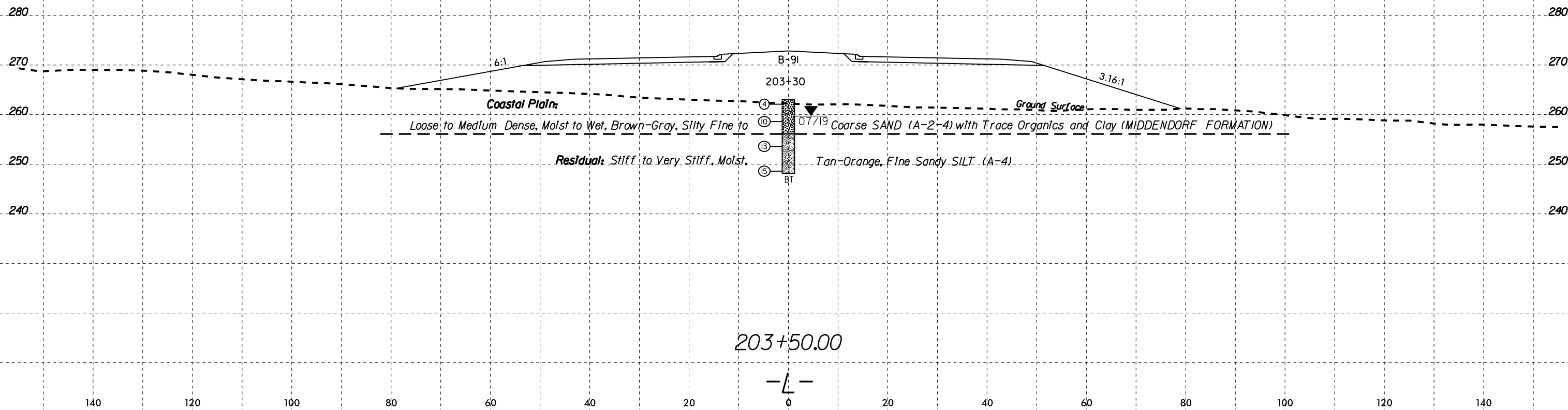
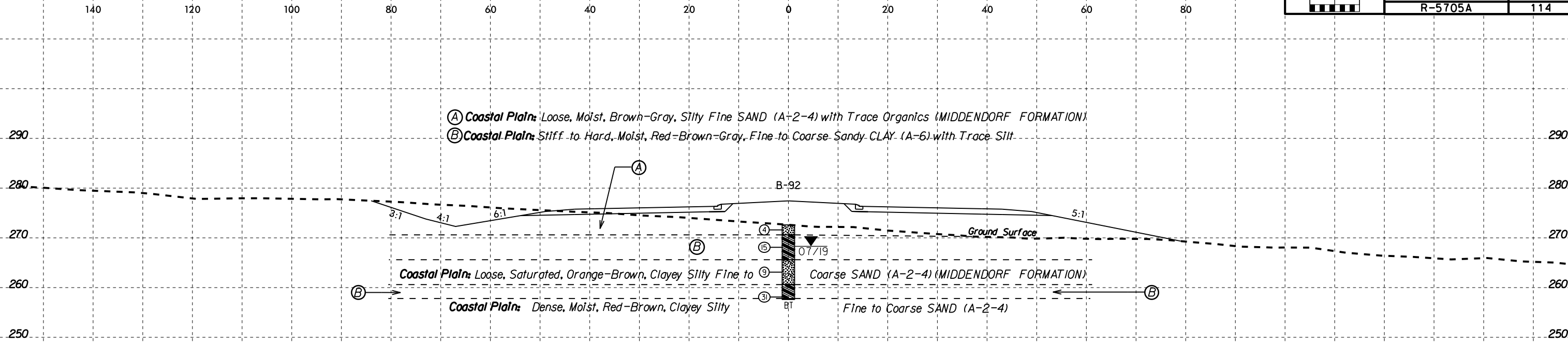
199+00.00

-L-

19-MAY-2020 14:52 C:\Users\Harnett\OneDrive\Documents\Projects\19-MAY-2020 14:52 C:\Users\Harnett\OneDrive\Documents\Projects\19-MAY-2020 14:52 C:\Users\Harnett\OneDrive\Documents\Projects\19-MAY-2020 14:52

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-541	111' Rt	201+68	0.4-1.5	A-4	-	-	14.2	22.5	49.7	13.6	0.1	98.9	71.7	26.6	-
ST-1	111' Rt	201+68	9.6-10.0	A-5	51	4	1.5	40.4	36.6	21.5	0.0	100.0	71.3	33.7	-





6/23/16



PROJ. REFERENCE NO.
R-5705A

SHEET NO.
115

140

120

100

80

60

40

20

0

20

40

60

80

300

290

280

270

260

250

290

280

270

260

250

3:1

4:1

6:1

6:1

Ground Surface

Coastal Plains

Loose, Moist, Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

206+50.00



140

120

100

80

60

40

20

0

20

40

60

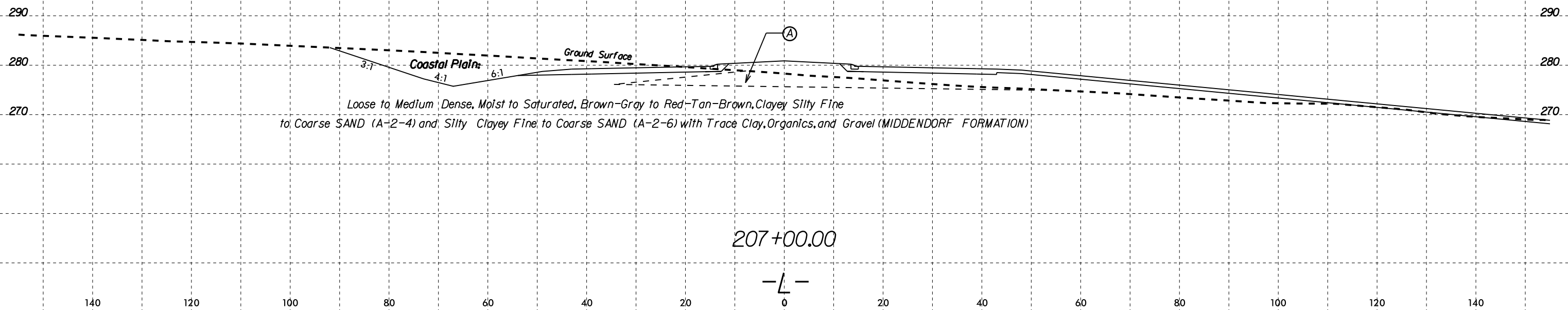
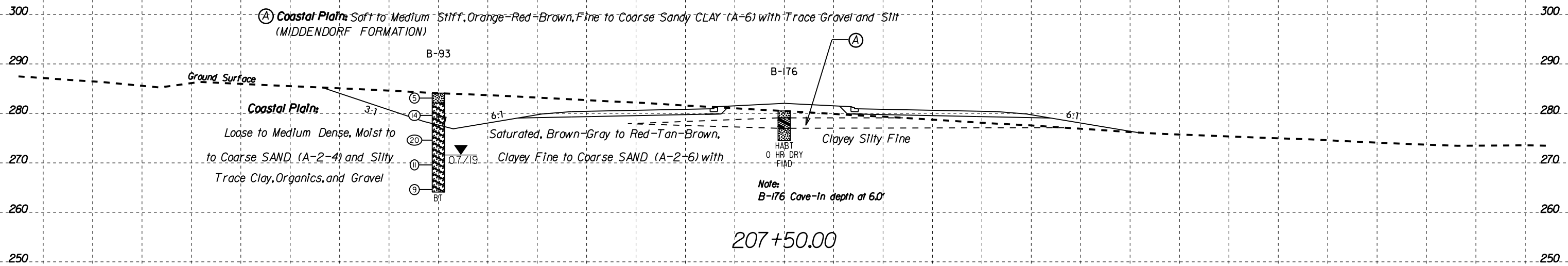
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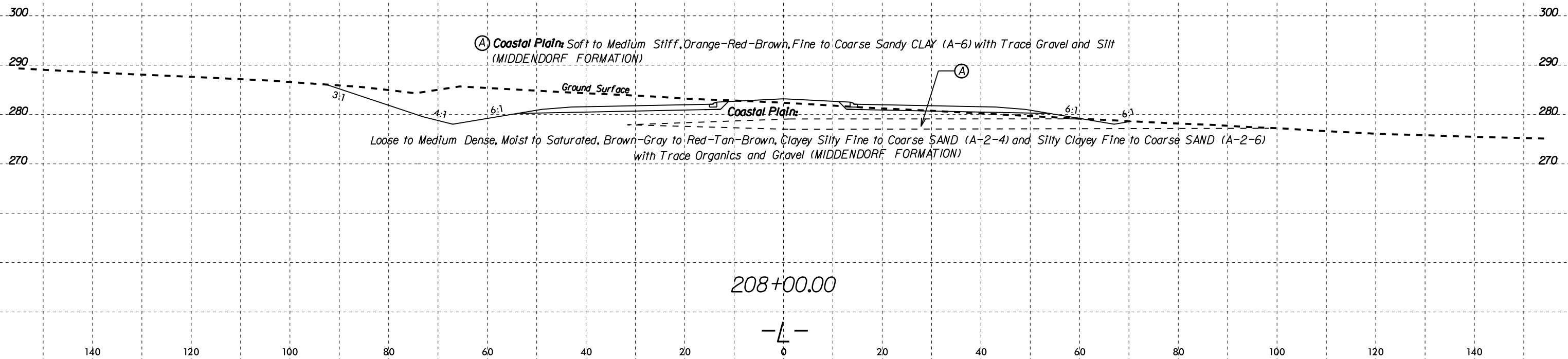
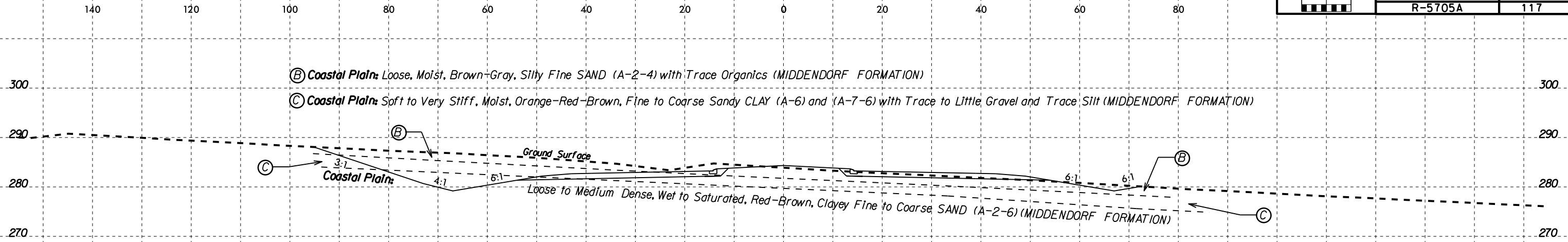
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120

140

05-APP-2020_20138
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Walker-A 66026102

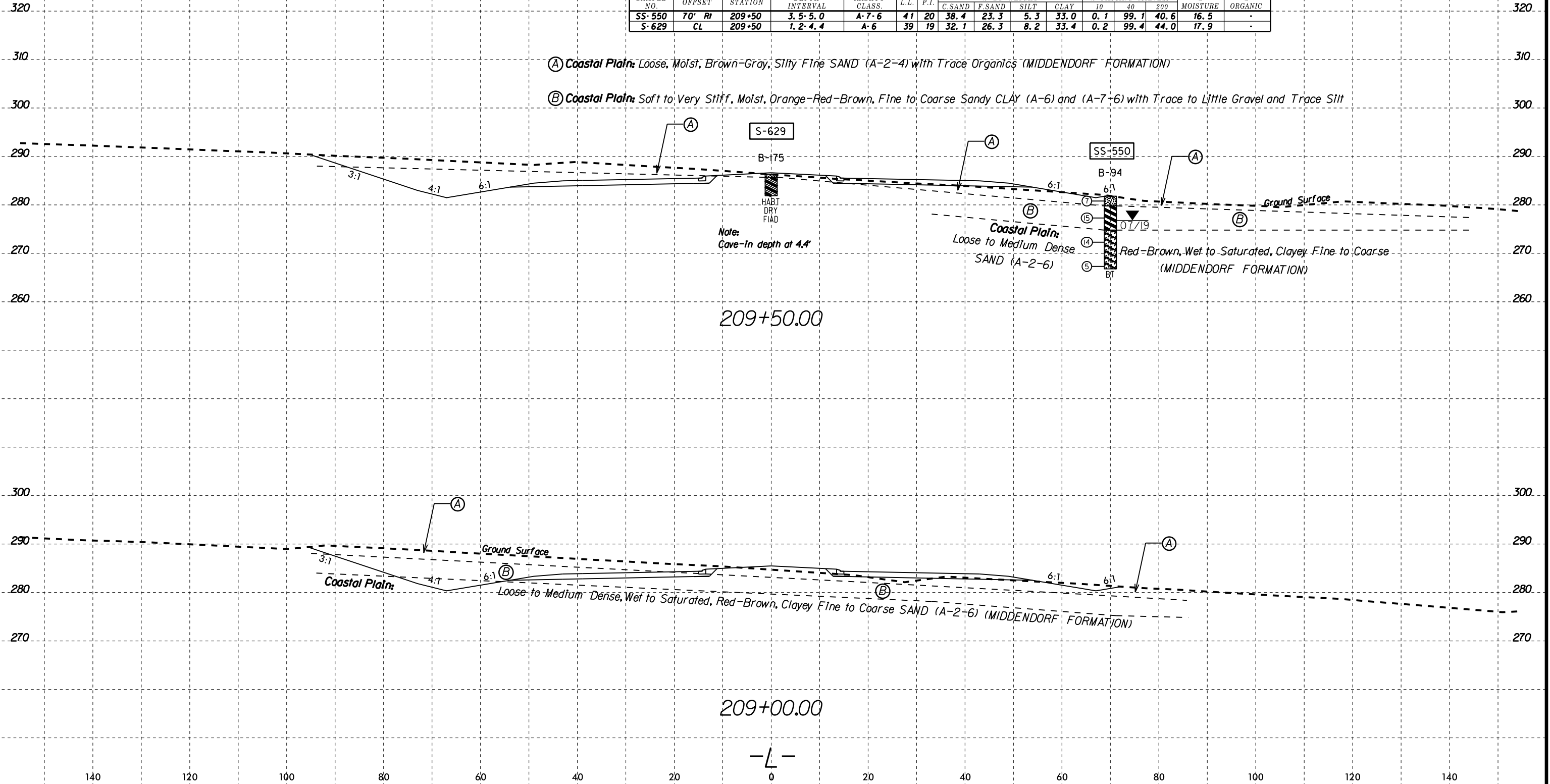




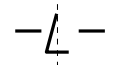
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-550	70' Rt	209+50	3.5-5.0	A-7-6	41	20	38.4	23.3	5.3	33.0	0.1	99.1	40.6	16.5	-
S-629	CL	209+50	1.2-4.4	A-6	39	19	32.1	26.3	8.2	33.4	0.2	99.4	44.0	17.9	-

(A) Coastal Plain: Loose, Moist, Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

(B) Coastal Plain: Soft to Very Stiff, Moist, Orange-Red-Brown, Fine to Coarse Sandy CLAY (A-6) and (A-7-6) with Trace to Little Gravel and Trace Silt

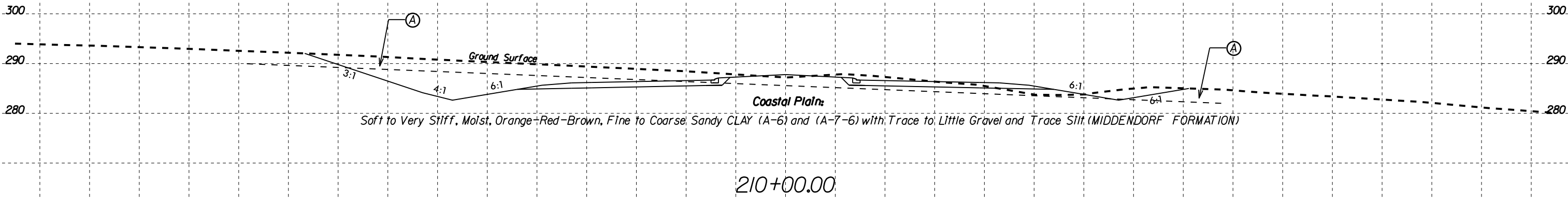
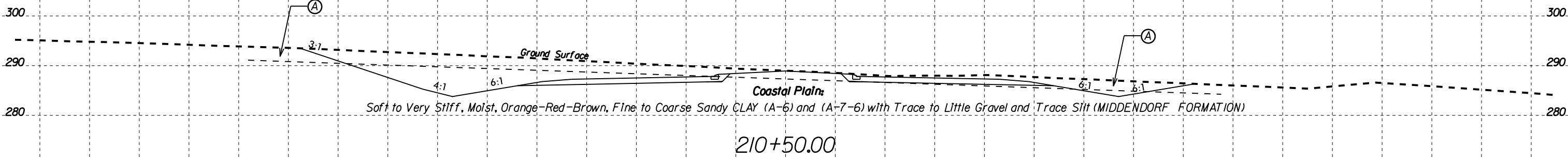
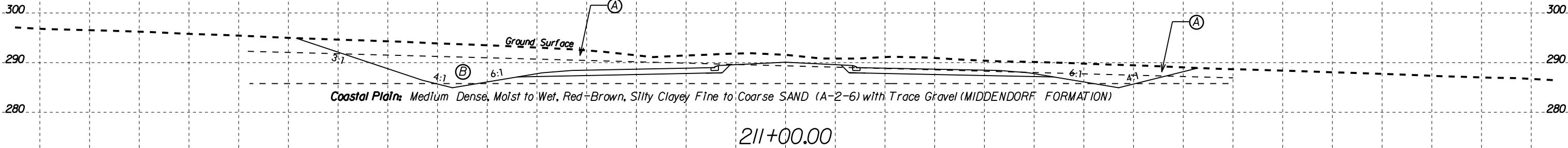


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 T.Walker
 6/23/16

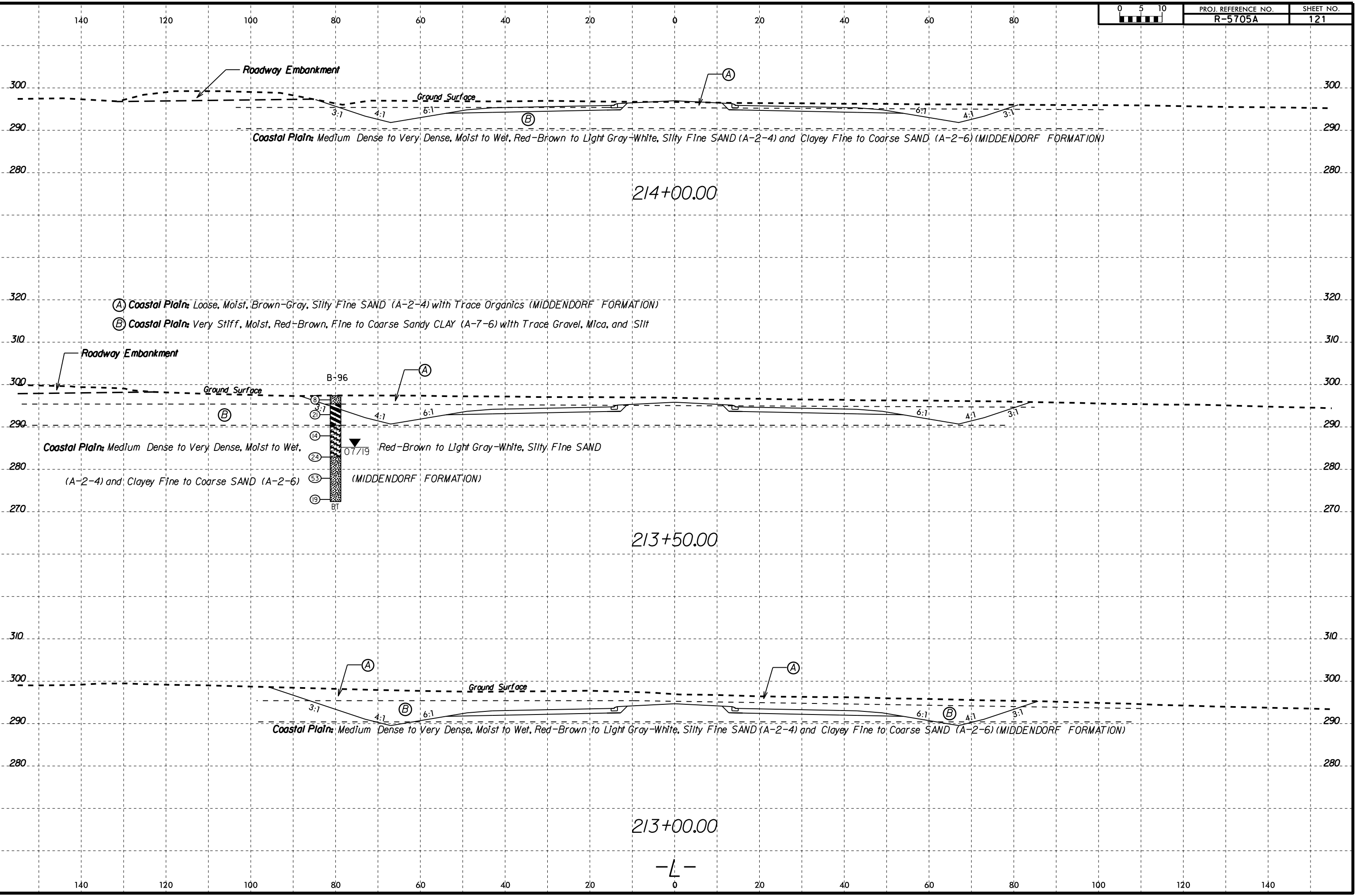


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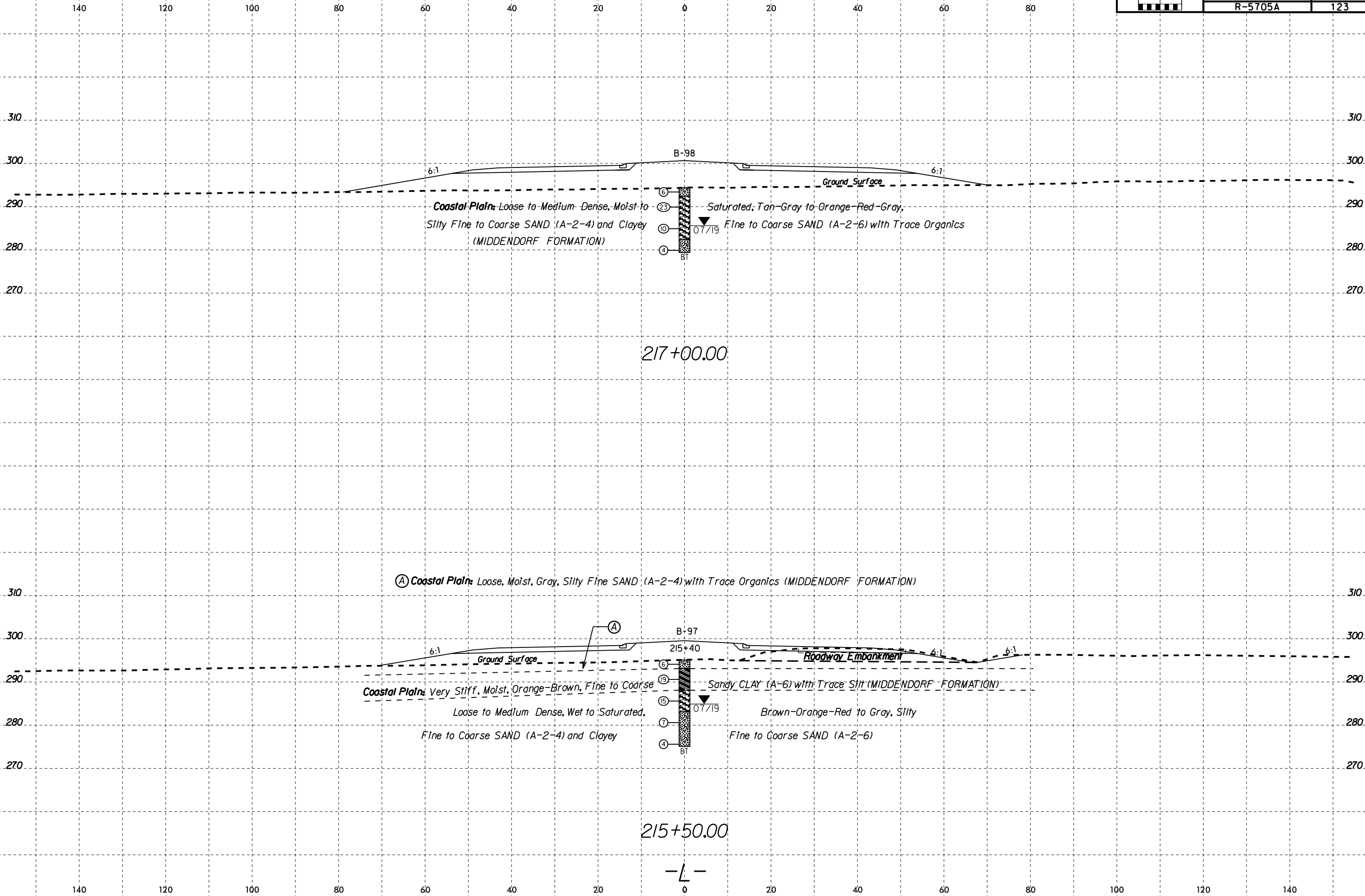
- (A) Coastal Plain: Loose, Moist, Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)
- (B) Coastal Plain: Very Stiff, Moist, Orange-Red-Brown, Fine to Coarse Sandy CLAY (A-7-6)



140 120 100 80 60 40 20 0 20 40 60 80 100 120 140



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Walker



140

120

100

80

60

40

20

0

20

40

60

80

320

310

300

290

280

320

310

300

290

280

Ⓐ Coastal Plain: Loose to Medium Dense, Moist, Red-Brown-Gray, Silty Fine SAND (A-2-4) and Silty Clayey Fine to Coarse SAND (A-2-6) with Trace Organics (MIDDENDORF FORMATION)

Ⓑ Coastal Plain: Soft to Medium Stiff, Moist, Red-Brown-Gray, Fine to Coarse Sandy CLAY (A-6) with Trace Silt

Coastal Plain: Loose to Medium Dense, Moist, Red-Brown-Gray, (MIDDENDORF FORMATION)

Silty Clayey Fine to Coarse SAND (A-2-6) with Trace Mica



6:1

6:1

6:1

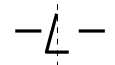
6:1

Ground Surface

Ⓐ

Ⓑ

219+00.00



140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

140

120

100

80

60

40

20

0

20

40

60

80

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

310

300

290

280

310

300

290

280

Ⓐ Coastal Plain: Loose to Dense, Moist, Brown-Gray to Red-Brown, Silty Fine SAND (A-2-4) and Silty Clayey Fine to Coarse SAND (A-2-6) with Trace Organics and Mica (MIDDENDORF FORMATION)

Ⓐ B-100

Ground Surface

Coastal Plain: Soft to Medium Stiff, Moist, Brown CLAY (A-6) with Trace Silt and Mica
Medium Dense to Dense, Moist, Red-Brown, Silty

to Red-Brown-Gray, Fine to Coarse Sandy (MIDDENDORF FORMATION)
Clayey Fine to Coarse SAND (A-2-6) with Trace Mica

H&BT

DRY

Note:
Cave-In depth at 100'

3:1

4:1

6:1

6:1

4:1

3:1

221+00.00



140

120

100

80

60

40

20

0

20

40

60

80

310

300

290

280

310

300

290

280

Ⓐ Coastal Plain: Loose, Moist, Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

Ⓑ Coastal Plain: Soft to Medium Stiff, Moist, Orange-Brown to Red-Brown-Gray, Fine to Coarse Sandy CLAY (A-6) with Trace Silt and Mica

Ground Surface

3:1

4:1

6:1

Ⓐ

B-101

HABT 08/19

Ⓑ

Coastal Plain: Medium Dense to Dense, Saturated, Red-Brown, Silty Clayey Fine to Coarse SAND (A-2-6) with Trace Mica (MIDDENDORF FORMATION)

223+00.00

-L-

140

120

100

80

60

40

20

0

20

40

60

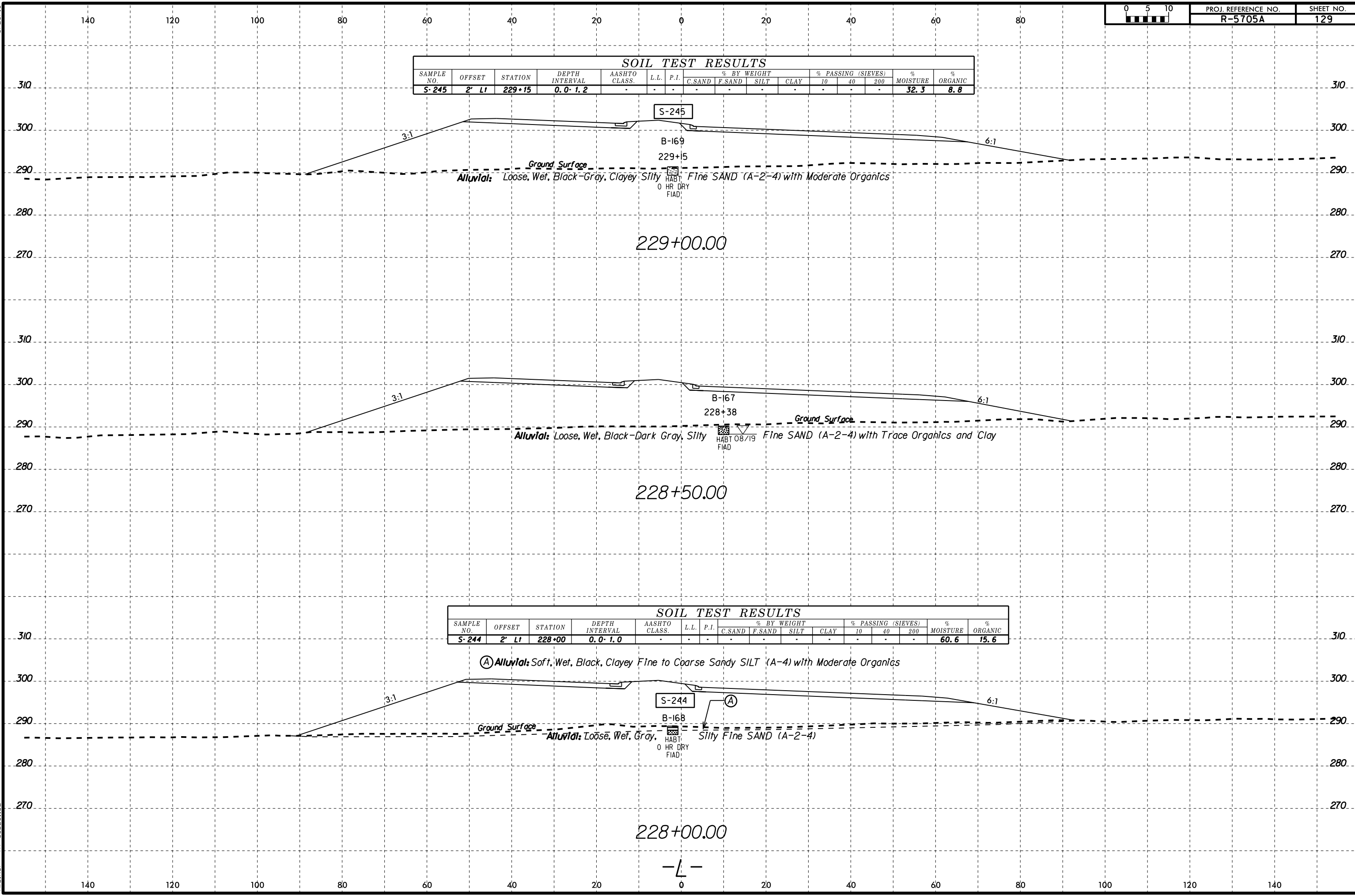
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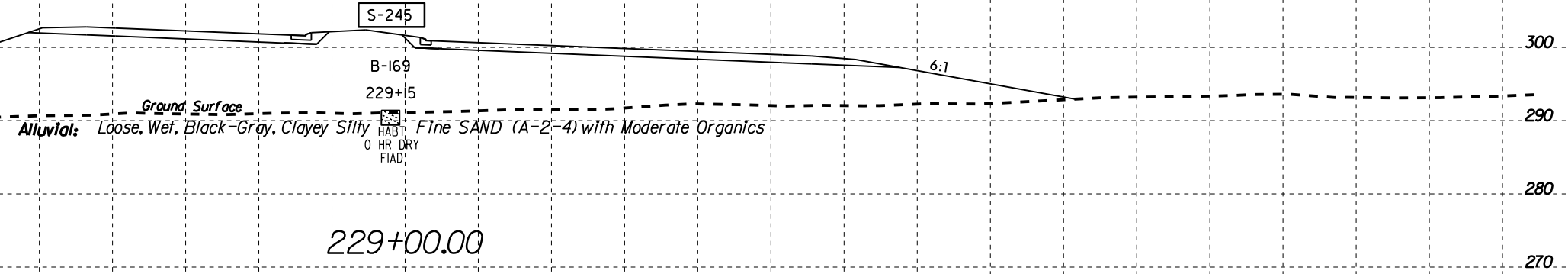
120

140

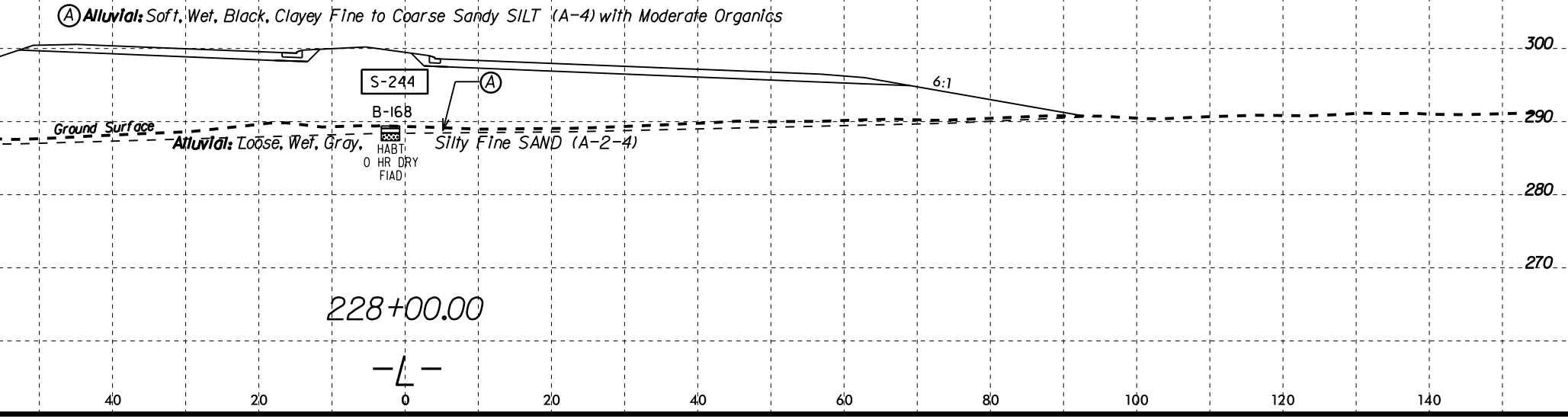
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 Walker-A 68026102

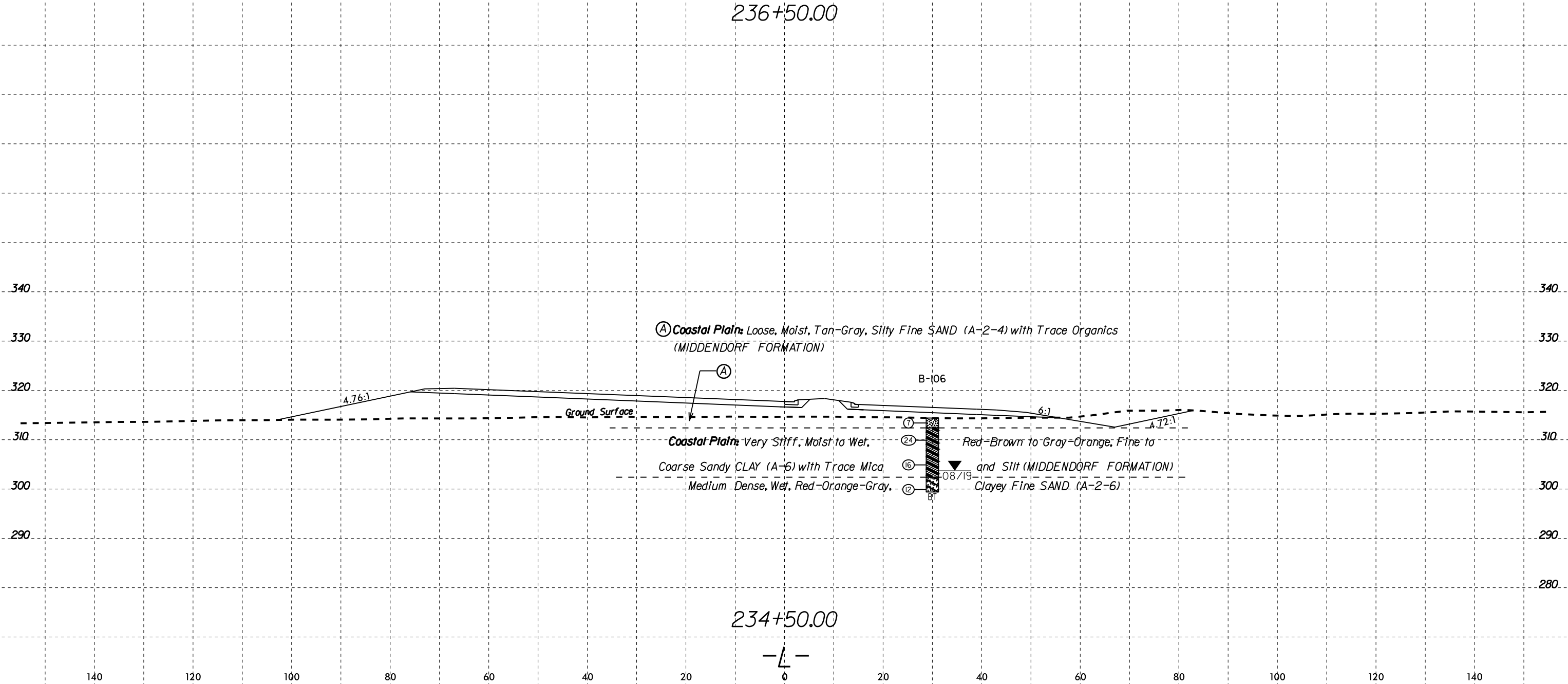
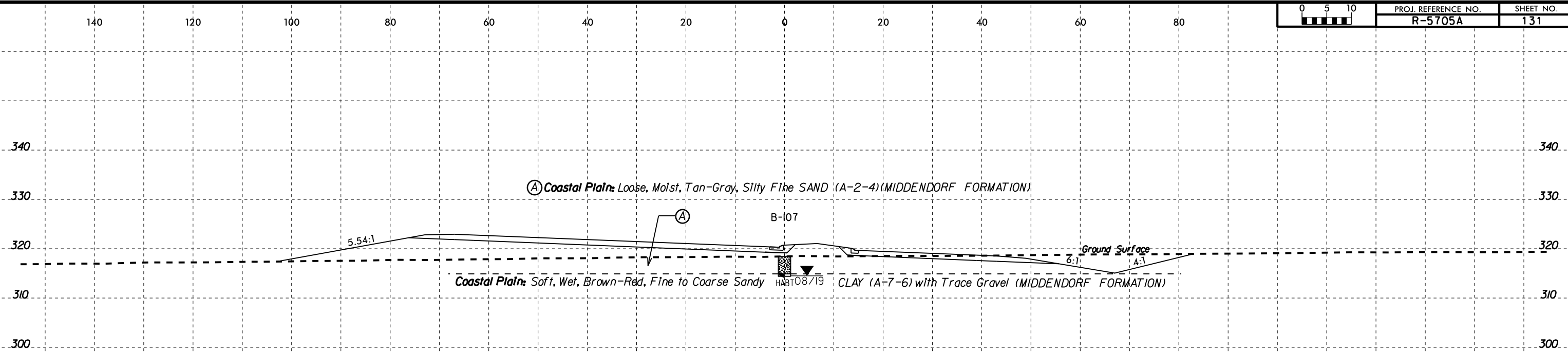


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-245	2' LI	229+15	0.0-1.2	-	-	-	-	-	-	-	-	-	-	32.3	8.8



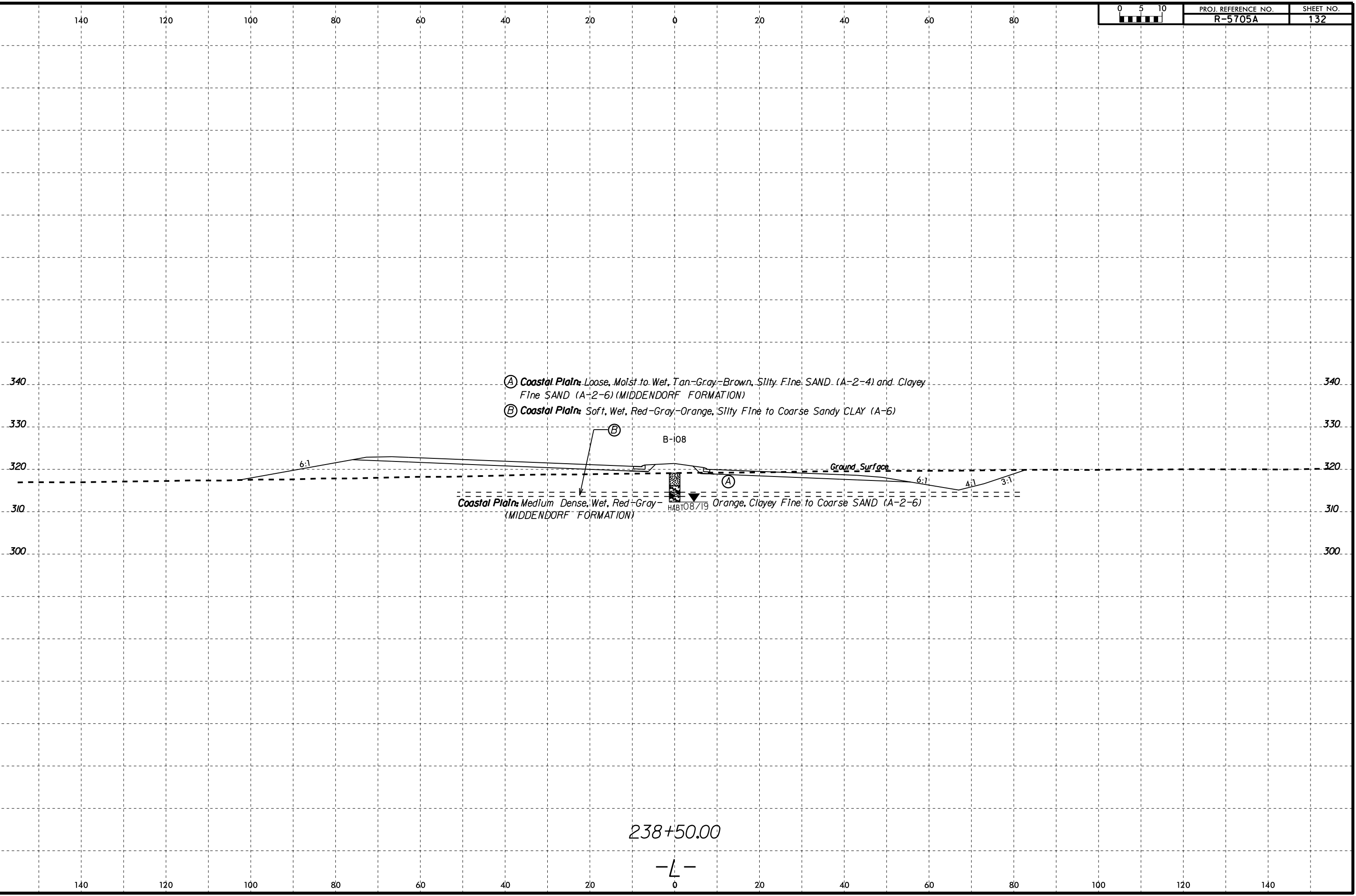
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-244	2' LI	228+00	0.0-1.0	-	-	-	-	-	-	-	-	-	-	60.6	15.6



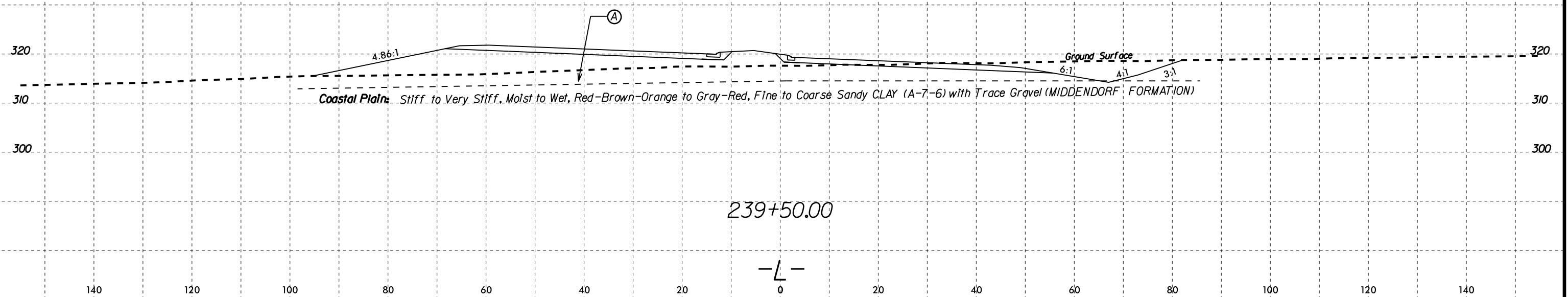
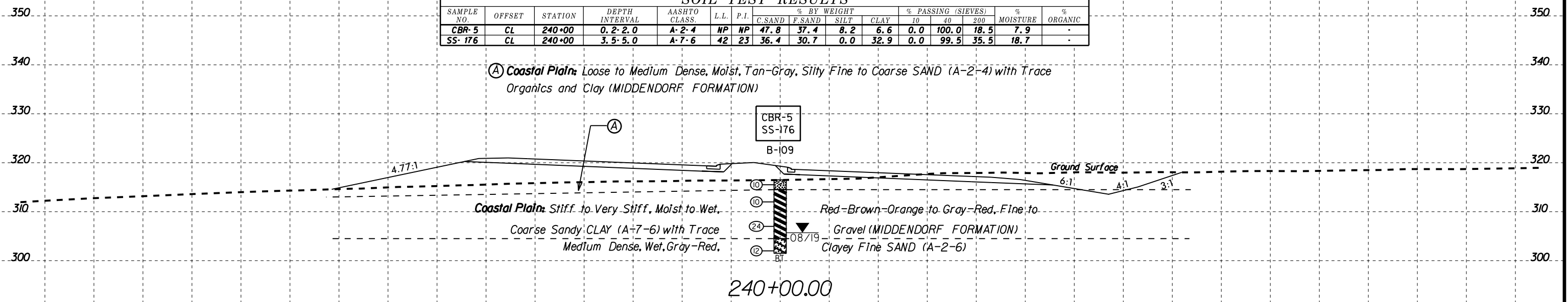


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Walker

6/23/16
29-MAY-2020 15:29
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Walker-A 68026102



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		
CBR-5	CL	240+00	0.2-2.0	A-2-4	NP	NP	47.8	37.4	8.2	6.6	0.0	100.0	18.5	7.9	-
SS-176	CL	240+00	3.5-5.0	A-7-6	42	23	36.4	30.7	0.0	32.9	0.0	99.5	35.5	18.7	-



140

120

100

80

60

40

20

0

20

40

60

80

320

310

300

320

310

300

6:1

Coastal Plain: Stiff to Very Stiff, Moist to Wet, Red-Brown-Orange to Gray-Red, Fine to Coarse Sandy CLAY (A-7-6) with Trace Gravel (MIDDENDORF FORMATION)

Ground Surface

6:1

4:1

3:1

241+00.00

Ⓐ Coastal Plain: Loose to Medium Dense, Moist, Tan-Gray, Silty Fine to Coarse SAND (A-2-4) with Trace Organics and Clay (MIDDENDORF FORMATION)

320

310

300

290

320

310

300

290

5.48:1

Coastal Plain: Stiff to Very Stiff, Moist to Wet, Red-Brown-Orange to Gray-Red, Fine to Coarse Sandy CLAY (A-7-6) with Trace Gravel (MIDDENDORF FORMATION)

Ground Surface

6:1

4:1

3:1

240+50.00

-L-

140

120

100

80

60

40

20

0

20

40

60

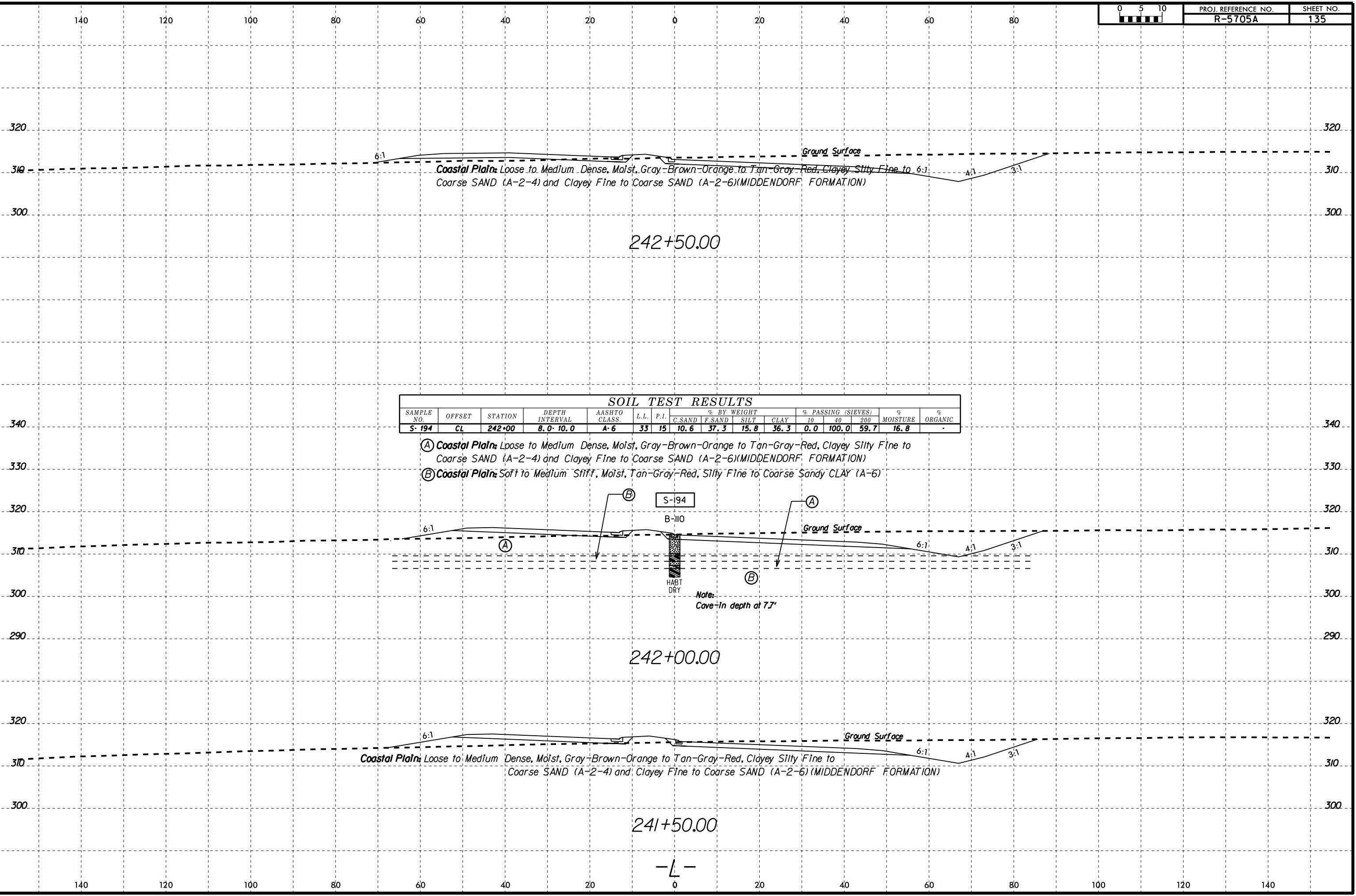
80

100

120

140

6/23/16
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 Walker

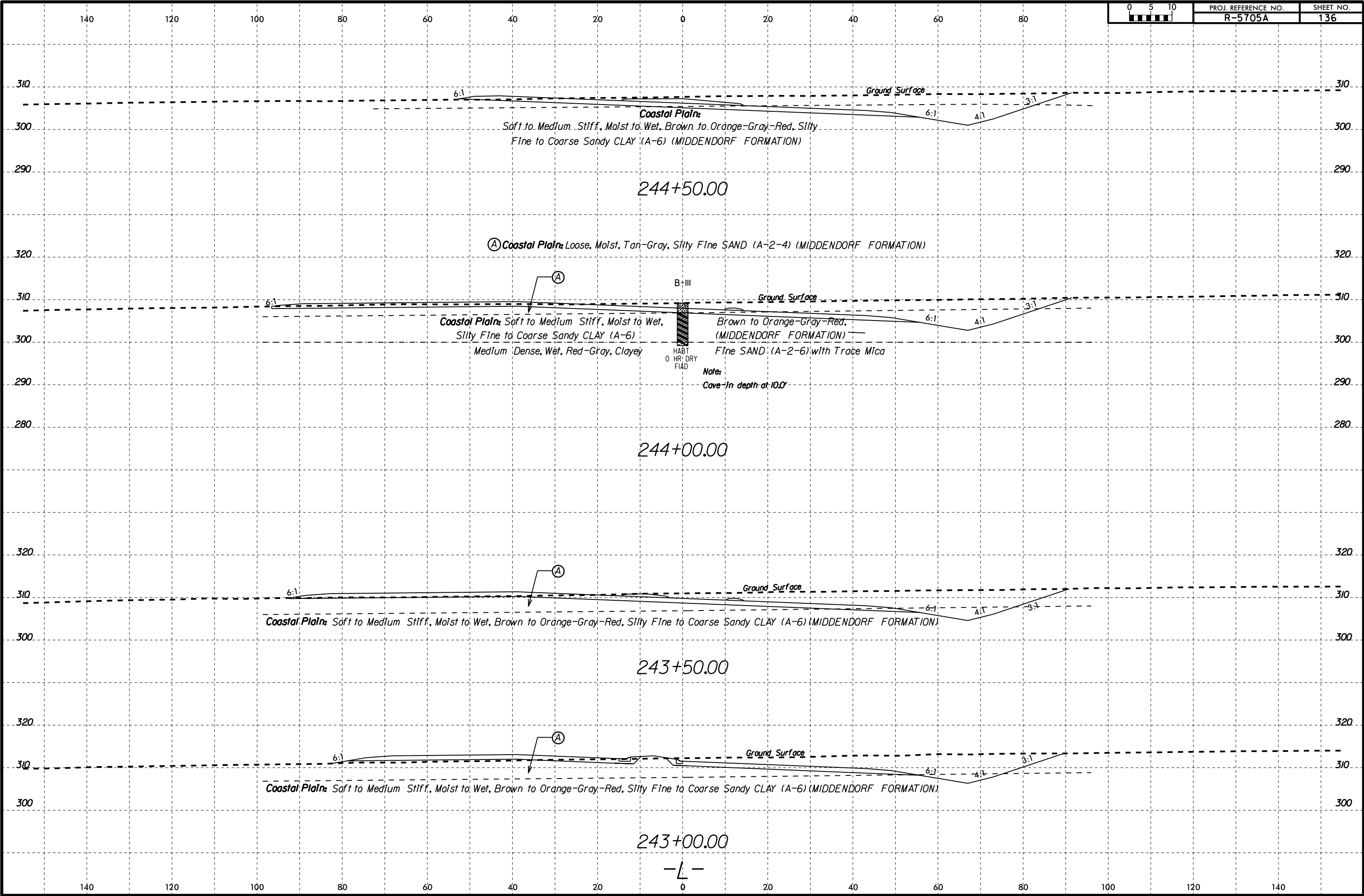


SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-194	CL	242+00	8.0-10.0	A-6	33	15	10.6	37.3	15.8	36.3	0.0	100.0	59.7	16.8	-

- Ⓐ Coastal Plain: Loose to Medium Dense, Moist, Gray-Brown-Orange to Tan-Gray-Red, Clayey Silty Fine to Coarse SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6)(MIDDENDORF FORMATION)
- Ⓑ Coastal Plain: Soft to Medium Stiff, Moist, Tan-Gray-Red, Silty Fine to Coarse Sandy CLAY (A-6)

Note:
Cave-In depth at 7.7'

-L-



6/23/16



PROJ. REFERENCE NO.
R-5705A

SHEET NO.
140

140

120

100

80

60

40

20

0

20

40

60

80

310

300

290

280

270

260

250

310

300

290

280

270

260

250

Coastal Plains
Loose, Moist to Saturated, Dark Gray

B-143

20+14



08/19

284.32
Tan, Silty Fine SAND (A-2-4)

Soft, Moist

B-141

0.026



0.026
and Clayey Fine to Coarse SAND (A-2-6)
Brown-Orange, Fine to Coarse Sand CLAY (A-6)

20+00.00

-Y4-

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140

120

100

80

60

40

20

0

20

40

60

80

100

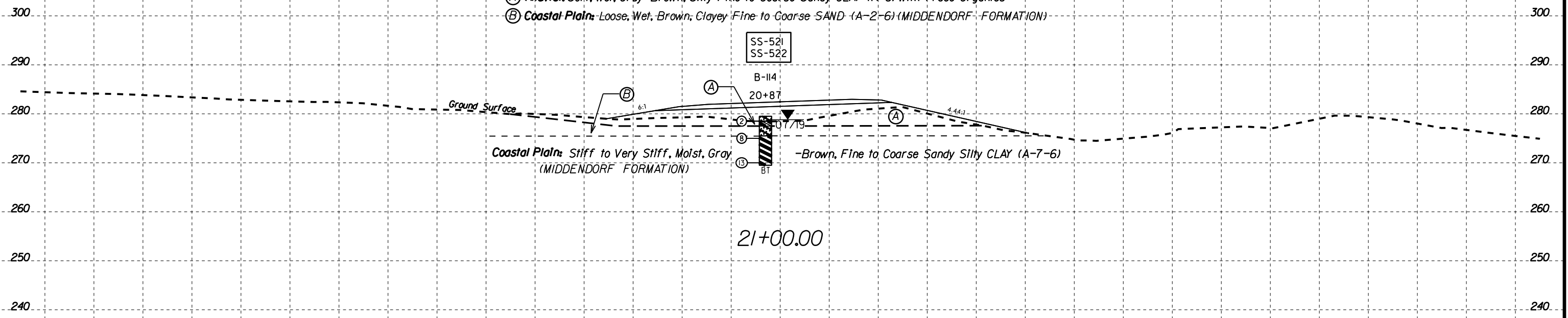
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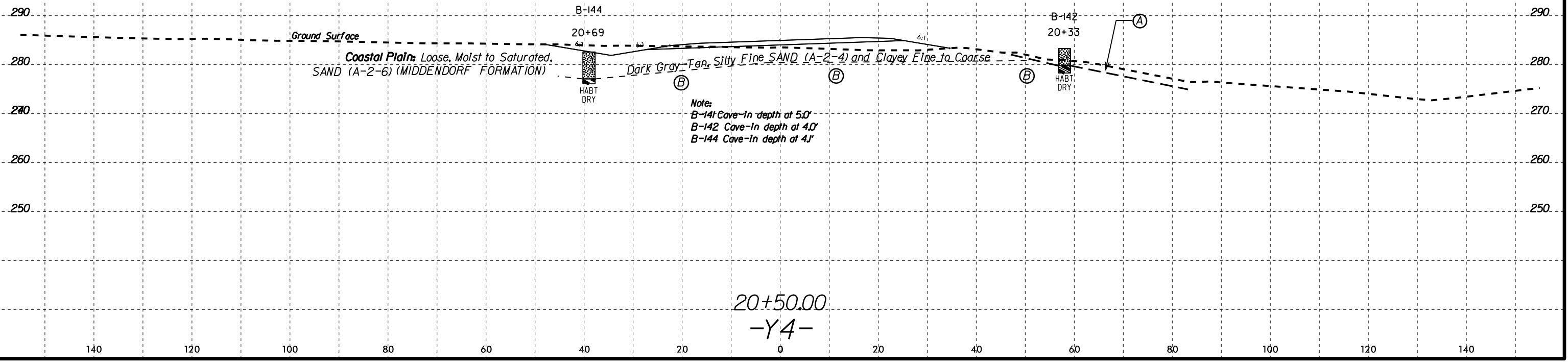
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 T.Walker

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-521	3' LI	20+87	0.2-1.0											25.1	3.8
SS-522	3' LI	20+87	1.0-1.5	A-6	35	16	20.2	22.1	26.6	31.1	0.0	99.7	63.0	31.0	-

- (A) Alluvial: Soft, Wet, Gray-Brown, Silty Fine to Coarse Sandy CLAY (A-6) with Trace Organics
- (B) Coastal Plain: Loose, Wet, Brown, Clayey Fine to Coarse SAND (A-2-6) (MIDDENDORF FORMATION)



- (A) Alluvial: Loose, Moist, Dark Gray-Tan, Silty Fine SAND (A-2-4)
- (B) Coastal Plain: Soft, Brown-Orange, Fine to Coarse Sandy CLAY (A-6) and Fine to Coarse Sandy Silty CLAY (A-7-6) (MIDDENDORF FORMATION)



140

120

100

80

60

40

20

0

20

40

60

80

310

300

290

280

270

260

250

240

230

310

300

290

280

270

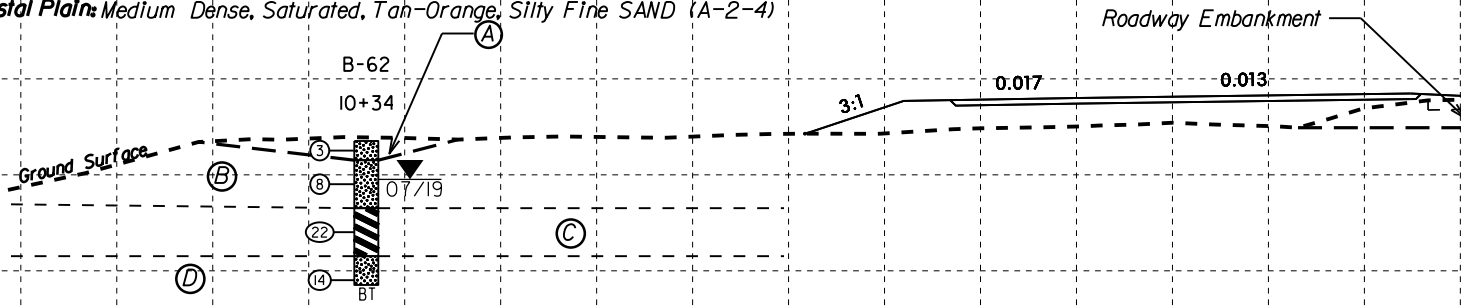
260

250

240

230

- (A) Alluvial: Very Loose, Moist, Black, Silty Fine SAND (A-2-4)
- (B) Coastal Plain: Loose, Moist, Light Gray, Silty Fine SAND (A-2-4) (MIDDENDORF FORMATION)
- (C) Coastal Plain: Very Stiff, Wet, Red-Orange-Gray, Silty CLAY (A-7-6) with Trace Fine to Coarse Sand
- (D) Coastal Plain: Medium Dense, Saturated, Tan-Orange, Silty Fine SAND (A-2-4)



10+50.00

-Y5A-

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

140

120

100

80

60

40

20

0

20

40

60

80

310

300

290

280

270

260

250

310

300

290

280

270

260

250

Ⓐ Coastal Plain: Loose, Moist, Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

Roadway Embankment

3:1

Ⓐ

B-116
12+61

3:1

Ground Surface

Coastal Plain: Stiff, Moist, Red-Brown-Gray, Silty CLAY (A-7-6) with Trace Fine to Coarse Sand (MIDDENDORF FORMATION)

Ⓔ

Ⓕ

BT

Fine to Coarse SAND (A-2-6) with Trace Mica

Medium Dense, Moist, Gray-Brown-Red, Clayey

12+50.00

-Y5A-

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

140

120

100

80

60

40

20

0

20

40

60

80

(A) Coastal Plain: Very Loose, Moist, Tan-Gray, Silty Fine SAND (A-2-4) and Clayey Fine SAND (A-2-6) with Trace Organics (MIDDENDORF FORMATION)

(B) Coastal Plain: Very Stiff, Moist, Red-Brown-Orange, Fine to Coarse Sandy CLAY (A-7-6) with Trace Silt

Roadway Embankment

B-II7

280

280

Ground Surface

270

270

Coastal Plain: Medium Dense, Saturated, Brown-Orange-Red, Clayey Fine to Coarse SAND (A-2-6) (MIDDENDORF FORMATION)

Note:
Cave-In depth at 0.5'

260

260

250

250

240

240

14+50.00

-Y6-

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

140

120

100

80

60

40

20

0

20

40

60

80

300

290

280

270

260

300

290

280

270

260

(A) Coastal Plain: Medium Dense, Moist, Tan-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

(A)

B-75

16+58

Ground Surface

Coastal Plain:

Medium Stiff, Wet, Orange-Brown, Fine to Coarse

Medium Dense, Moist, Red-Orange-Gray

(B)

(7)

(26)

BT

DRY

Sandy CLAY (A-7) with Trace Silt

Clayey Fine to Coarse SAND (A-2-6) (MIDDENDORF FORMATION)

Note:

Cave-In: depth at 9.5'

16+50.00

-Y6-

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

140

120

100

80

60

40

20

0

20

40

60

80

300

290

280

270

260

250

240

300

290

280

270

260

250

240

Roadway Embankment

-Y6A-

B-118

Ground Surface

Coastal Plain: Loose to Medium Dense, Moist, Tan-Gray-Brown to
SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) with
Very Stiff, Moist, Red-Orange-Gray, Fine Sandy Silty

Red-Orange-Gray, Silty Fine
Trace Organics (MIDDENDORF FORMATION)

CLAY (A-7-6) with Trace Coarse Sand

Note:
Cave-In depth at 5'

19+00.00

-Y6-

140

120

100

80

60

40

20

0

20

40

60

80

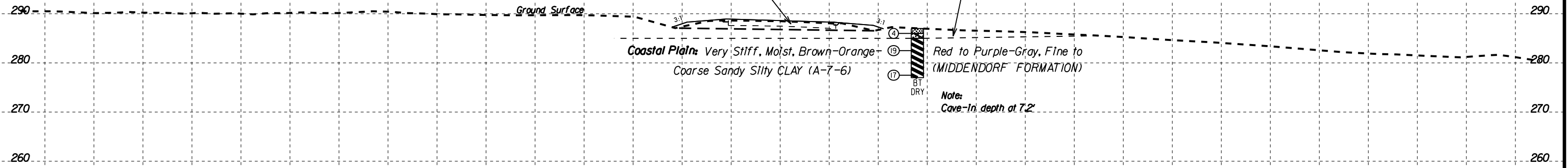
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120

140

6/23/16
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Walker-A

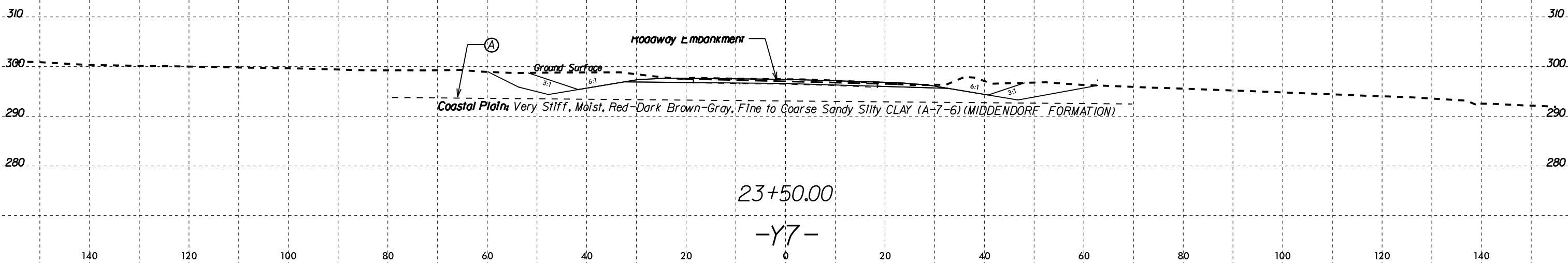
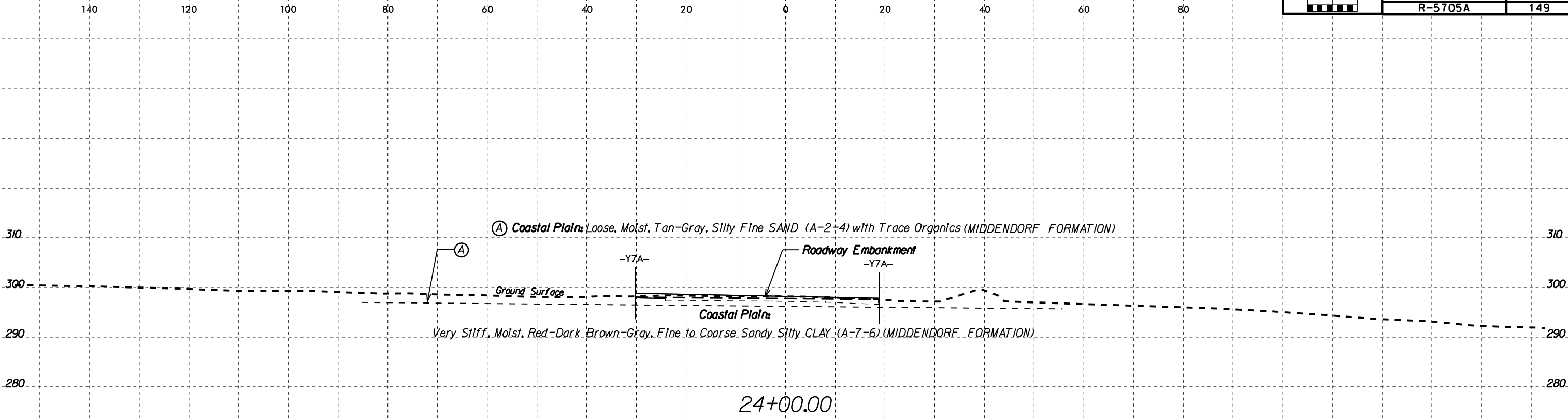
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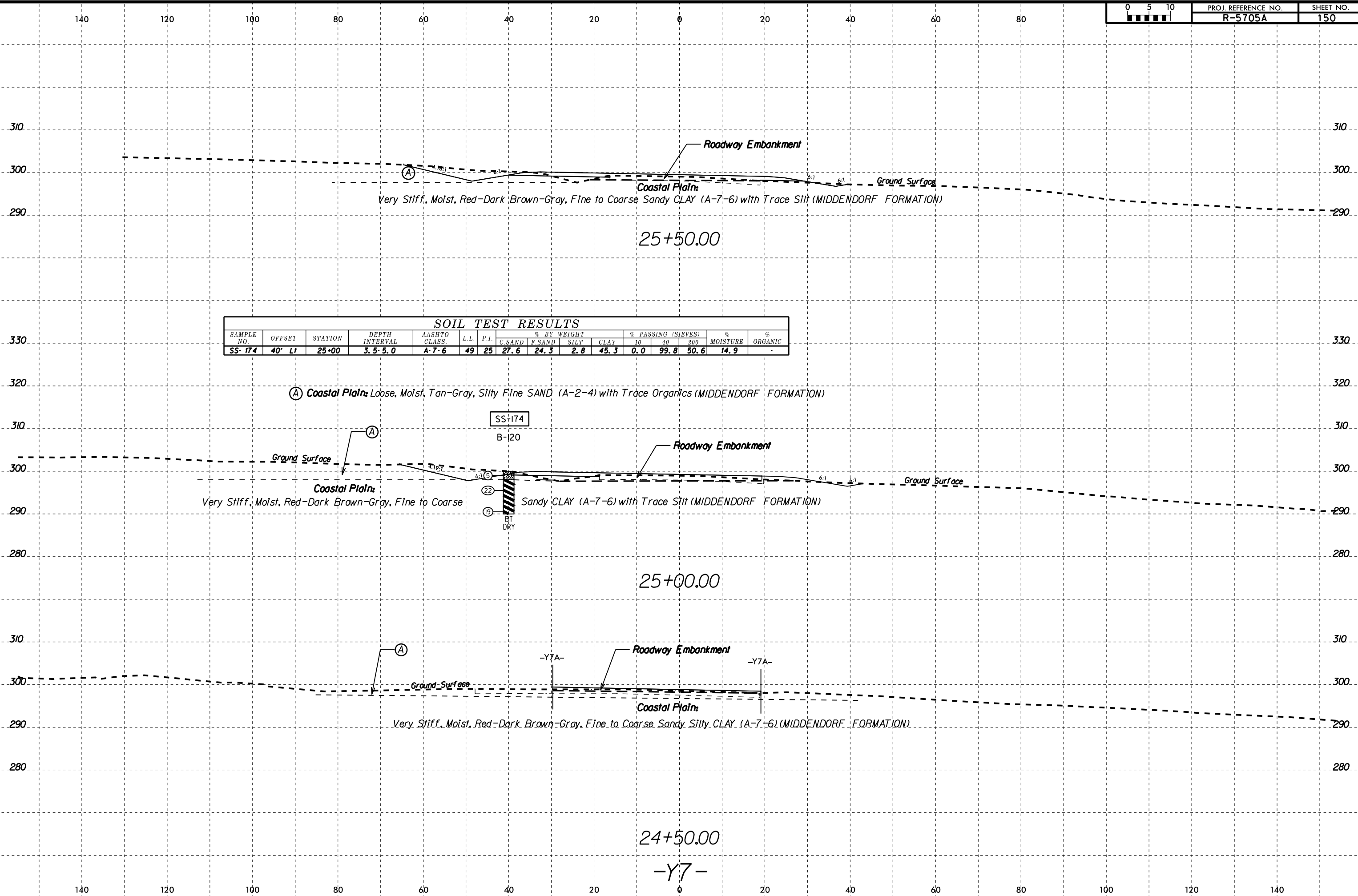


22+00.00

-Y6-

140 120 100 80 60 40 20 0 20 40 60 80 100 120 140





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-174	40' LI	25+00	3.5-5.0	A-7-6	49	25	27.6	24.3	2.8	45.3	0.0	99.8	50.6	14.9	-

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140

120

100

80

60

40

20

0

20

40

60

80

310

300

290

280

270

260

310

300

290

280

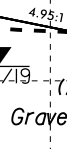
270

260

Roadway Embankment

B-121

Coastal Plain: Loose to Medium Dense, Moist to Saturated,
Brown-Tan-Gray, Silty Fine to Coarse SAND
(A-2-6) with Trace Organics,



(A-2-4) and Clayey Fine to Coarse SAND
Gravel, and Mica (MIDDENDORF FORMATION)

Ground Surface

27+00.00

-Y7-

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140



140

120

100

80

60

40

20

0

20

40

60

80

310

300

290

280

310

300

290

280

Roadway Embankment

Coastal Plains

Loose to Medium Dense, Moist to Saturated, Brown-Tan-Gray, Silty Fine to Coarse SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) with Trace Organics, Gravel, and Mica (MIDDENDORF FORMATION)

Ground Surface

1.7%

6:1

6:1

28+00.00

-Y7-

140

120

100

80

60

40

20

0

20

40

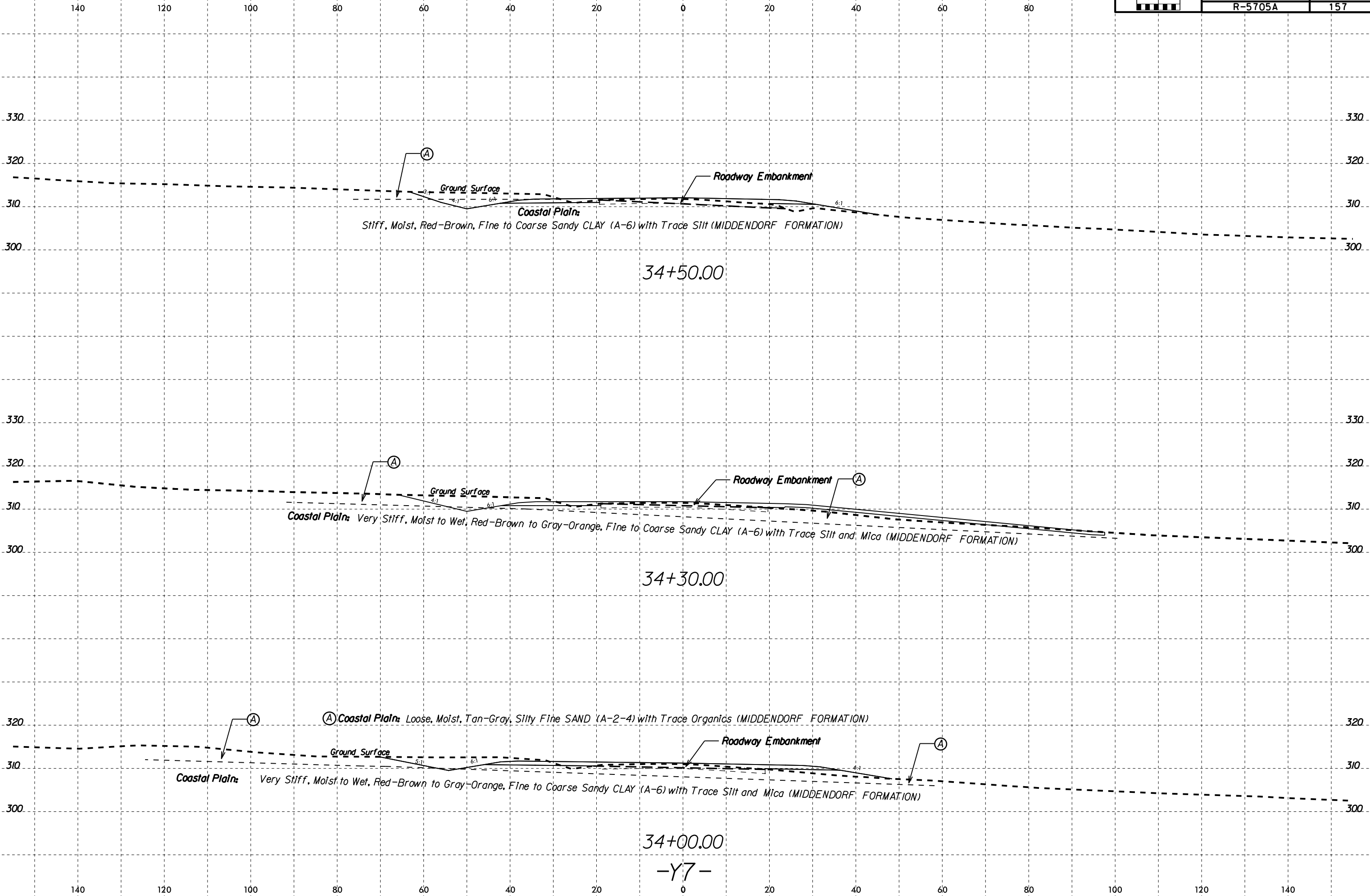
60

80

100

120

140



Coastal Plain: Stiff, Moist, Red-Brown, Fine to Coarse Sandy CLAY (A-6) with Trace Silt (MIDDENDORF FORMATION)

34+50.00

Coastal Plain: Very Stiff, Moist to Wet, Red-Brown to Gray-Orange, Fine to Coarse Sandy CLAY (A-6) with Trace Silt and Mica (MIDDENDORF FORMATION)

34+30.00

Coastal Plain: Loose, Moist, Tan-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

Coastal Plain: Very Stiff, Moist to Wet, Red-Brown to Gray-Orange, Fine to Coarse Sandy CLAY (A-6) with Trace Silt and Mica (MIDDENDORF FORMATION)

34+00.00

-Y7-

140

120

100

80

60

40

20

0

20

40

60

80

330

320

310

300

290

330

320

310

300

290

Ⓐ Coastal Plain: Loose, Moist, Brown, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

Ground Surface

Roadway Embankment

Coastal Plain: Stiff to Very Stiff, Moist, Gray-Red-Brown to Gray-Orange, Fine to Coarse Sandy CLAY (A-6) with Trace Mica and Silt (MIDDENDORF FORMATION)

36+00.00

Ⓐ Coastal Plain: Very Loose, Moist, Tan-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

Ⓑ Coastal Plain: Stiff, Moist, Red-Brown, Fine to Coarse Sandy CLAY (A-6) with Trace Silt

Ground Surface

Roadway Embankment

35+50.00

-Y7-

140

120

100

80

60

40

20

0

20

40

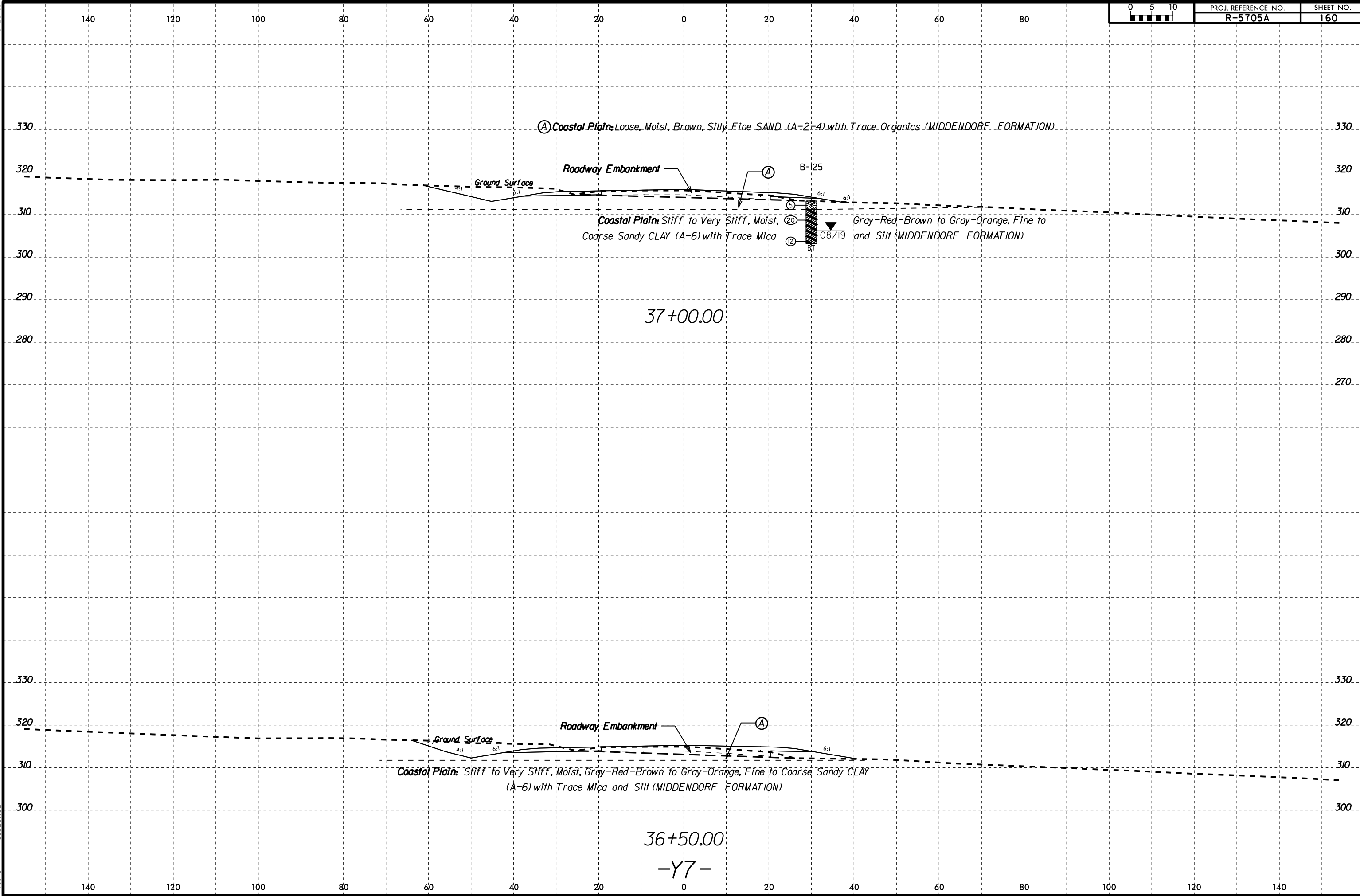
60

80

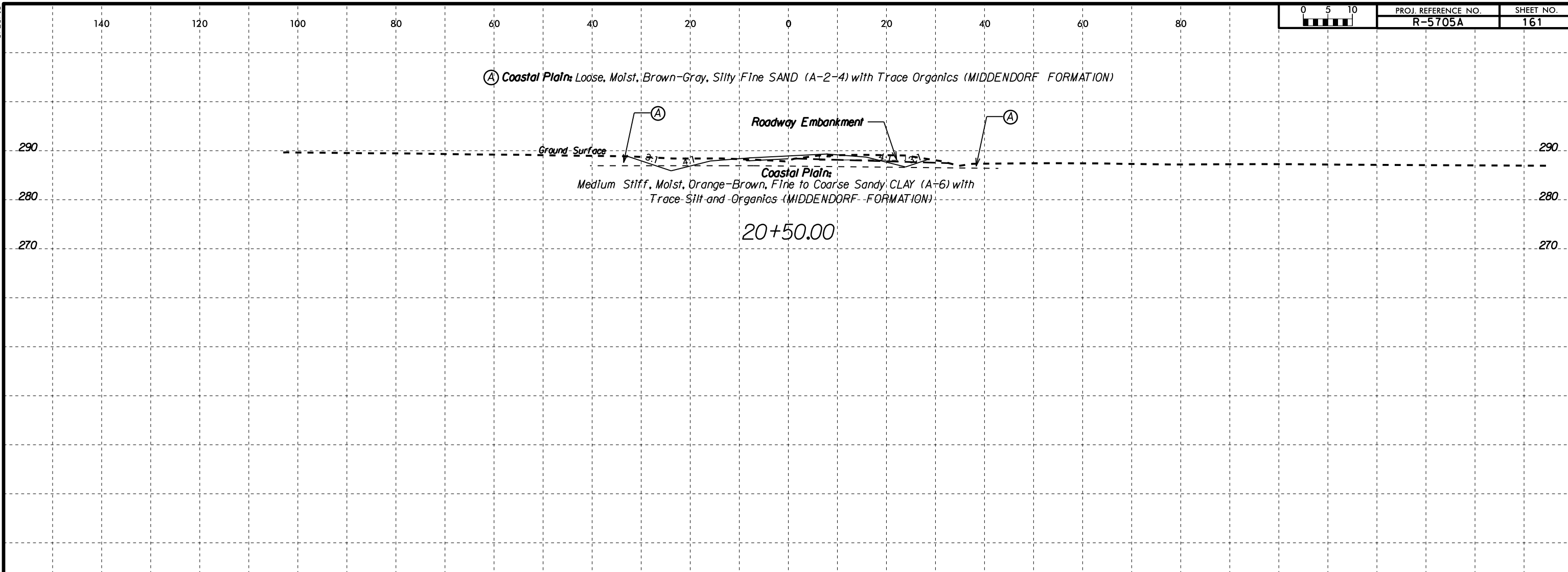
100

120

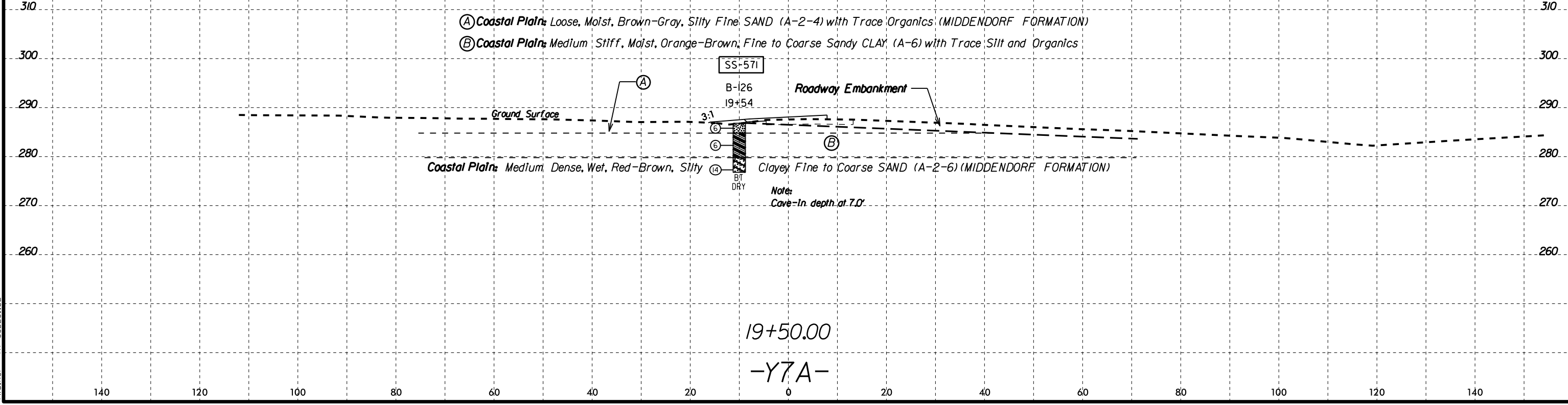
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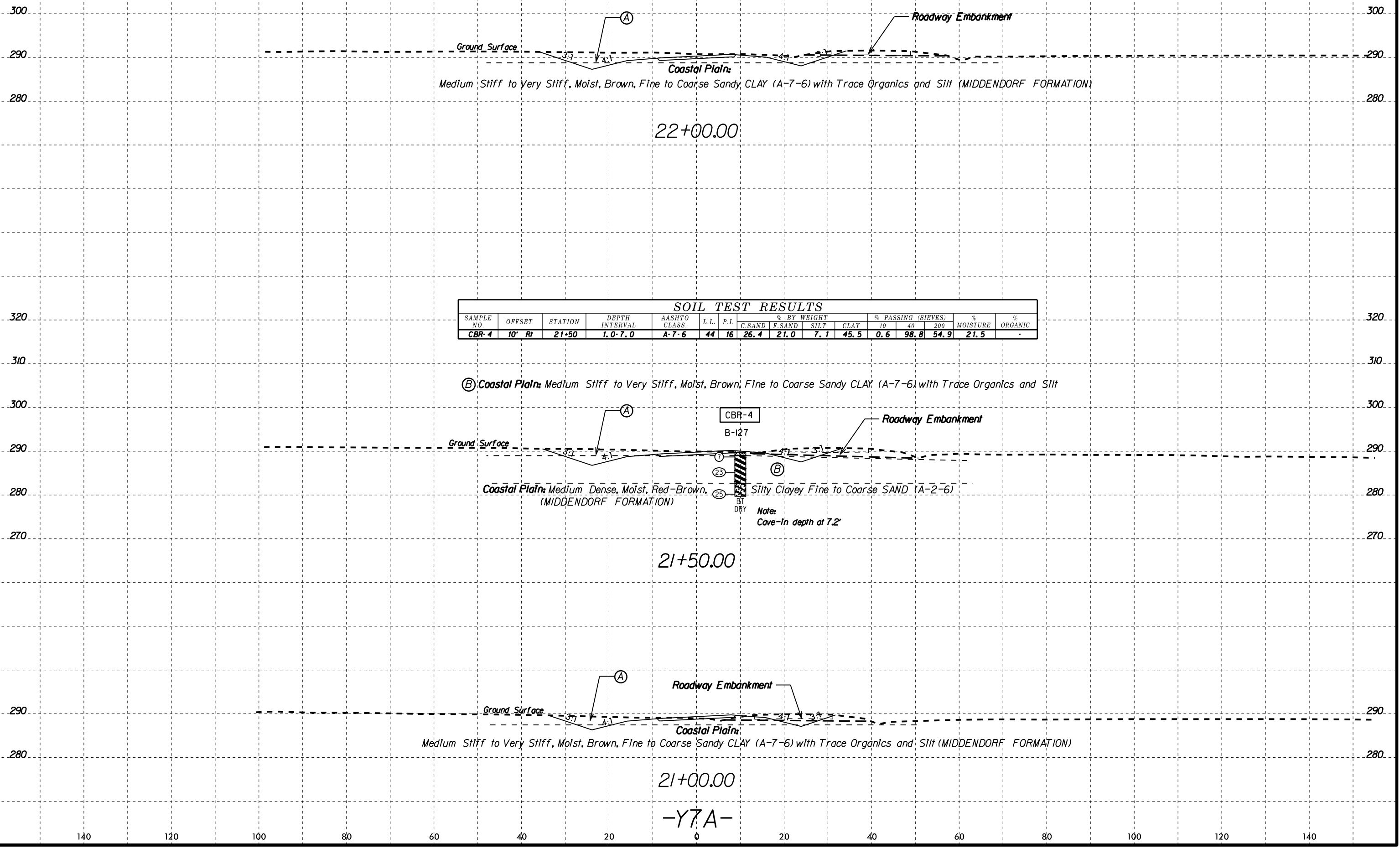
6/23/16
 I:\JUN-2020\157\66X\66X-0138 NCDOT - R-5705A Harnett County\Projects\66X\66X-0138 NCDOT - R-5705A Harnett County\GEO\RDWY\CADD\GEO\TECH\SS-R5705A-geo-ssl-Y7A.dgn
 T.Walker-A 66026102



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-571	10' Lt	19+54	3.5-5.0	A-6	36	13	34.9	27.7	7.5	29.9	0.0	99.6	40.9	16.2	-



6/23/16
 I:\JUN-2020\157\657\66X\0138\NCDDOT - R-5705A\Harnett County\CAADD\GEO\RDWY\CADD\GEO\TECH\XSC\R5705A_geo_xst.Y7A.dgn
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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		
CBR-4	10' Rt	21+50	1.0-7.0	A-7-6	44	16	26.4	21.0	7.1	45.5	0.6	98.8	54.9	21.5	-

ⓑ Coastal Plains Medium Stiff to Very Stiff, Moist, Brown, Fine to Coarse Sandy CLAY (A-7-6) with Trace Organics and Silt

CBR-4
B-127

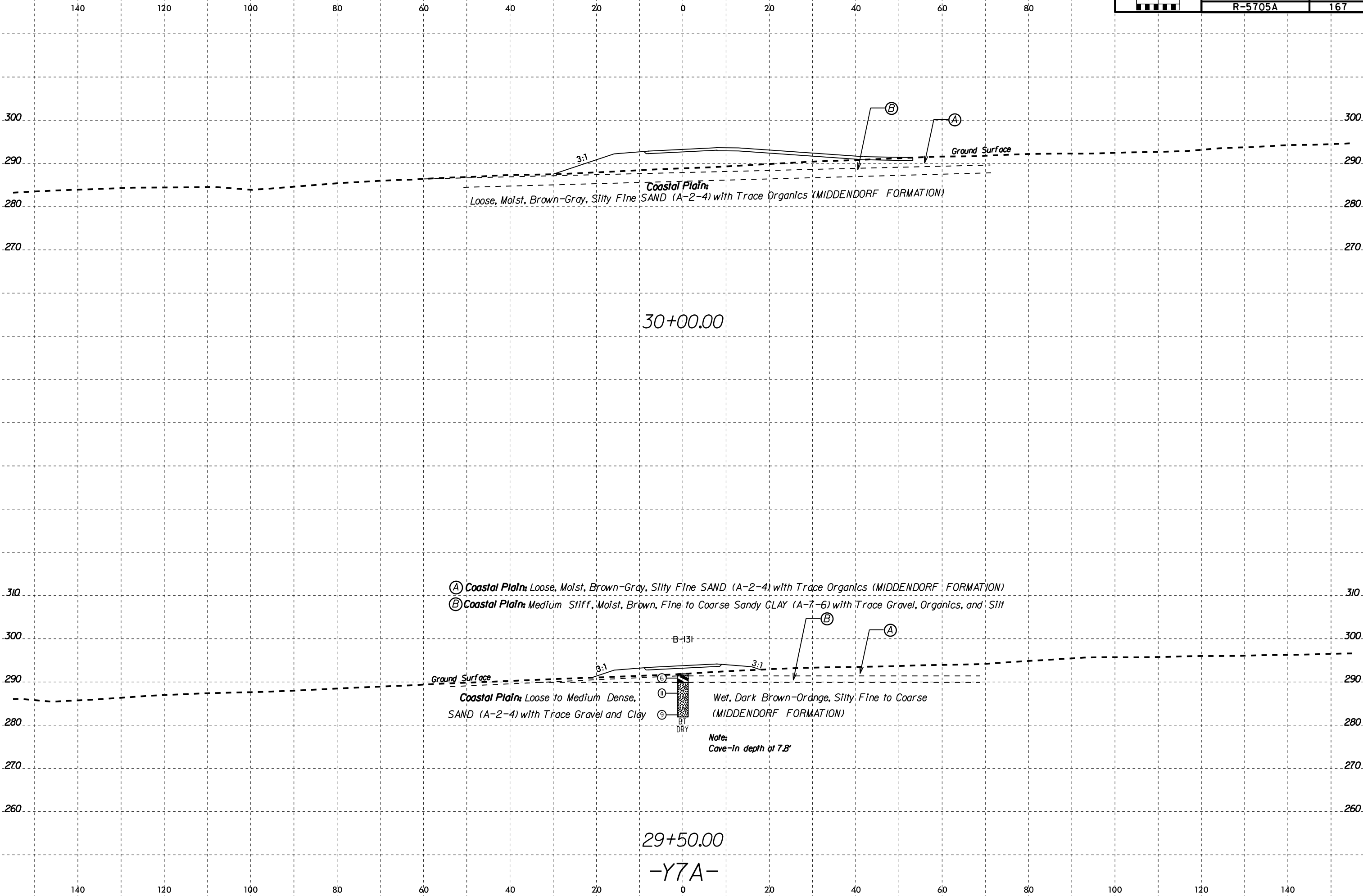
7
23
25
BT
DRY

Note:
Cave-in depth at 7.2'

21+50.00

21+00.00

-Y7A-



30+00.00

29+50.00

-Y7A-

Coastal Plain: Loose, Moist, Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

(A) Coastal Plain: Loose, Moist, Brown-Gray, Silty Fine SAND (A-2-4) with Trace Organics (MIDDENDORF FORMATION)

(B) Coastal Plain: Medium Stiff, Moist, Brown, Fine to Coarse Sandy CLAY (A-7-6) with Trace Gravel, Organics, and Silt

Coastal Plain: Loose to Medium Dense, SAND (A-2-4) with Trace Gravel and Clay

Wet, Dark Brown-Orange, Silty Fine to Coarse (MIDDENDORF FORMATION)

Note: Cave-in depth of 7.8'



140

120

100

80

60

40

20

0

20

40

60

80

310

300

290

280

270

260

310

300

290

280

270

260

Ⓐ Alluvial: Soft, Wet, Dark Brown, Fine to Coarse Sandy CLAY (A-6) with Trace Organics and Silt

3:1

B-17

3:1

Ⓐ

Ground Surface

Coastal Plain: Loose, Saturated, Tan-Brown, Silty Fine (MIDDENDORF FORMATION)

HABT08/19
FIAD

Note:
Cave-In depth at 2.3'

to Coarse Sand (A-2-4) with Trace Gravel

31+00.00

-Y7A-

140

120

100

80

60

40

20

0

20

40

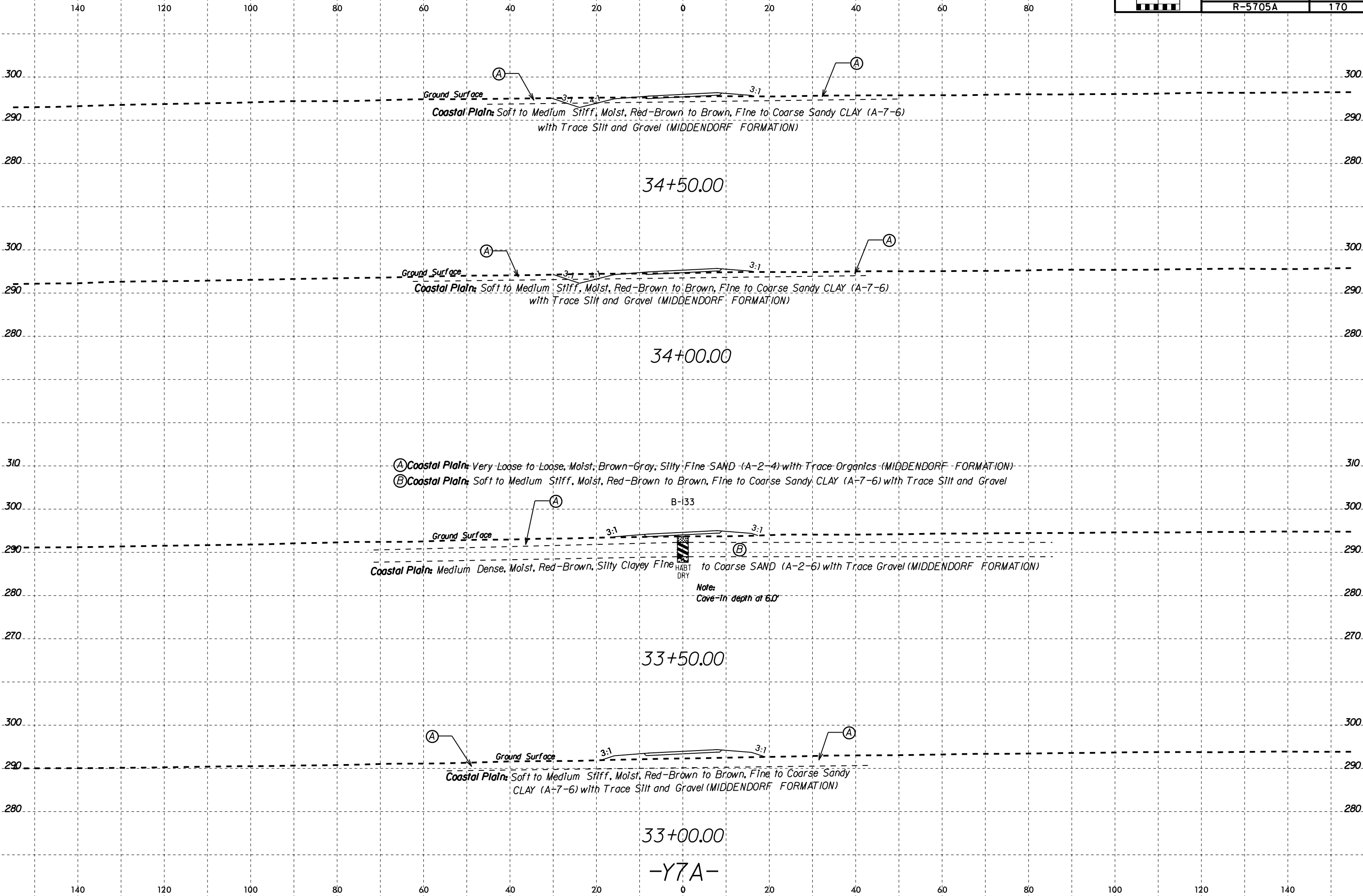
60

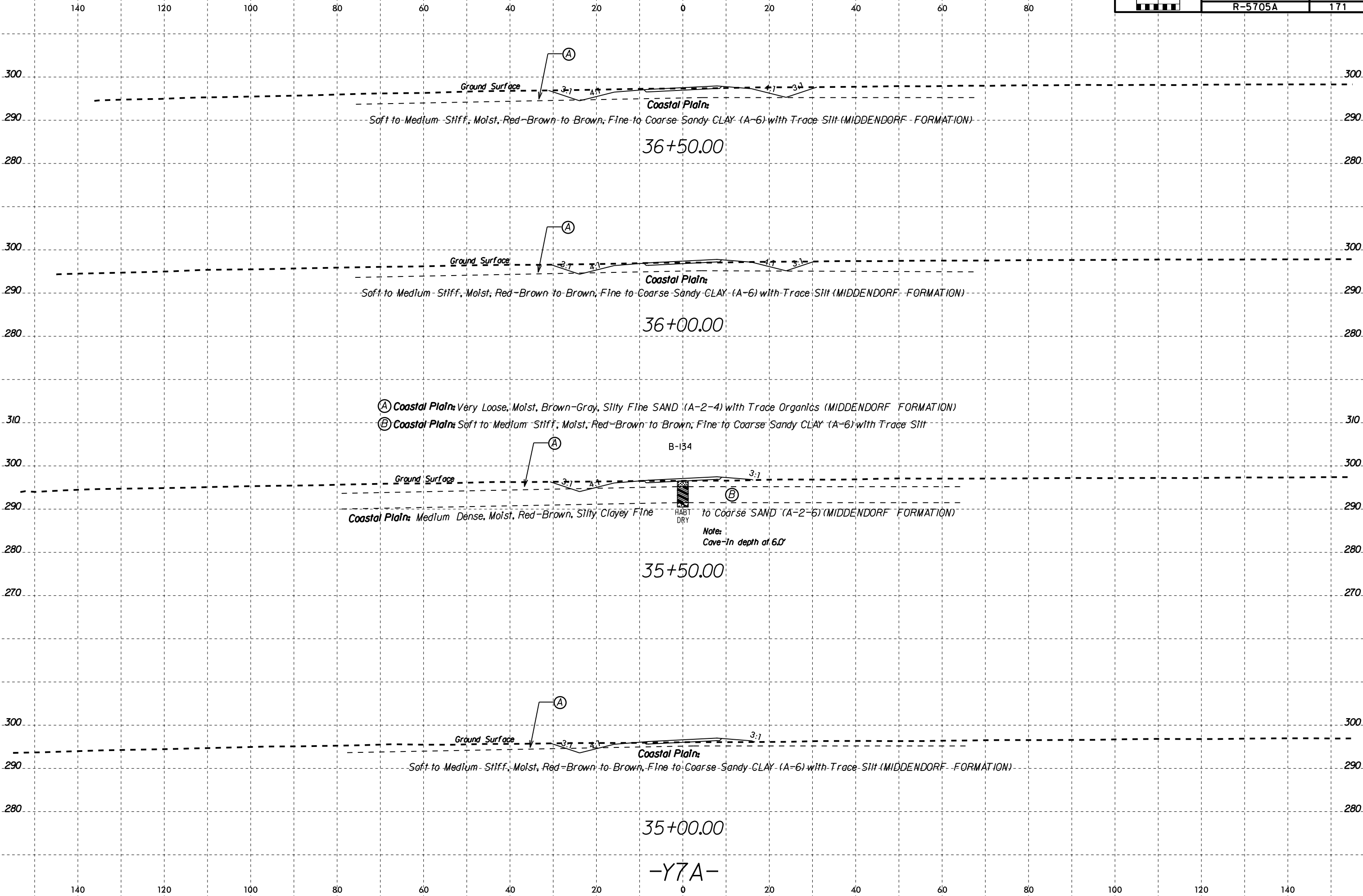
80

100

120

140





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		
ST-7	CL	41+60	3.0-5.0	A-2-4	21	8	43.9	24.3	7.3	24.5	0.1	97.7	33.2	14.8	-
SS-127	CL	41+60	13.5-15.0	A-7-6	45	23	1.7	14.2	23.7	60.4	0.0	100.0	88.9	19.7	-

Ⓐ Artificial Fill: Very Loose to Loose, Moist to Wet, Dark Brown-Orange, Silty Fine SAND (A-2-4) with Trace Organics

ST-7
SS-127
B-137

3:1 41+60 3:1

Ground Surface

④

Ⓐ

②

0.7/19

Alluvial: Very Loose, Saturated, Orange-Brown, Clayey

Fine to Coarse SAND (A-2-6) with Little Organics

③

Coastal Plain: Medium Stiff, Moist, Orange-Brown, (MIDDENDORF FORMATION)

Fine Silty CLAY (A-7-6) with Trace Coarse Sand

41+50.00

Ground Surface

3:1

Alluvial:

Very Loose, Saturated, Orange-Brown, Clayey Fine to Coarse SAND (A-2-6) with Little Organics

40+50.00

-Y7A-

140

120

100

80

60

40

20

0

20

40

60

80

300

290

280

270

260

250

300

290

280

270

260

250

B-166

41+92

HABT

HR DRY

FIAD

Alluvial; Loose, Wet, Black, Silty Fine

Ground Surface

SAND (A-2-4) with Trace Organics

*Note:
Cave-in depth at 2.0'*

3:1

3:1

42+00.00

-Y7A-

140

120

100

80

60

40

20

0

20

40

60

80

100

120

140

GEOTECHNICAL BORING REPORT BORE LOG

WBS 46377.1.2	TIP R-5705A	COUNTY HARNETT	GEOLOGIST M. Durway
SITE DESCRIPTION NC 55 from south of SR 1532 (Oak Grove Church Road) to north of NC 210			GROUND WTR (ft)
BORING NO. B-83	STATION 182+00	OFFSET 40 ft LT	ALIGNMENT -L-
COLLAR ELEV. 249.0 ft	TOTAL DEPTH 5.0 ft	NORTHING 631,365	EASTING 2,075,313
DRILL RIG/HAMMER EFF./DATE F&R5785 CME-55 73% 03/01/2019		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER M. Renza	START DATE 07/30/19	COMP. DATE 07/30/19	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					ELEV. (ft)
250															
	249.0	0.0												249.0	0.0
			3	4	3	7	SS-130	18%		247.0	2.0
245	245.5	3.5												244.0	5.0
			4	4	3	7									

Boring Terminated at Elevation 244.0 ft in TREE STUMP

Notes:

1. Surficial Organic Soil: 0.0-0.2'
2. Terminated at 5.0' due to skewed auger from tree roots; offset 5.0' backstation to B-83 (1)
3. FIAD=Filled Immediately After Drilling due to skewed auger

NCDOT BORE DOUBLE R5705A_GEO_BH.GPJ NC_DOT.GDT 6/16/20

**North Carolina Department of Transportation
Division of Highways
Materials and Test Unit
Soils Laboratory**

T.I.P. ID NO.: R-5705A
DESCRIPTION: NC 55 from south of SR 1532 (Oak Grove Church Road) to north of NC 210

REPORT ON SAMPLES OF: SOIL FOR QUALITY

WBS No.: 46377.1.2
DATE SAMPLED: 7/19-8/19
SAMPLED FROM: -L-
SUBMITTED BY: M. Arnold

COUNTY: Harnett
RECEIVED: 7/19-8/19
REPORTED: 8/19-9/19
BY: D. Council
Certification No.: 101-02-0603

PROJ. SAMPLE NO.	SS-130											
BORING NO.	B-83											
Retained #4 Sieve %	0.0											
Passing #10 Sieve %	98.5											
Passing #40 Sieve %	91.3											
Passing #200 Sieve %	50.9											

SOIL MORTAR - 100%												
Coarse Sand Ret - #60 %	16.5											
Fine Sand Ret - #270 %	36.9											
Silt 0.053 - 0.010 mm %	19.1											
Clay < 0.010 mm %	27.5											
L.L.	29											
P.L.	19											
P.I.	10											
AASHTO Classification	A-4 (2)											
Station	182+00											
Offset	40' LT											
Depth (ft)	0.2											
to	1.5											
Alignment	-L-											
Moisture Content (%)	18.3											
Organic Content (%)	4.8											

NP = Not plastic
NT = Not tested
ND = Not Determined
CL = Centerline

W.P. Alton, P.E.
Soils Engineer