DESIGN DATA				
Traffic	Average Daily			
Current 2020	Pass: 1,305	Trucks: 90	Total: 1,395	
Forecast 2040	Pass: 1,765	Trucks: 125	Total: 1,890	
Clear Zone Distance: Existing		Design Speed: 55 mph		
Minimum Sight Dist. for Stopping: NA		Bridges: NA		
Sight Dist. for No Passing Zone: NA				
Pavement Design Life 20 (years)				
Design Accumulated One-way Flexible ESALs: 189,903				

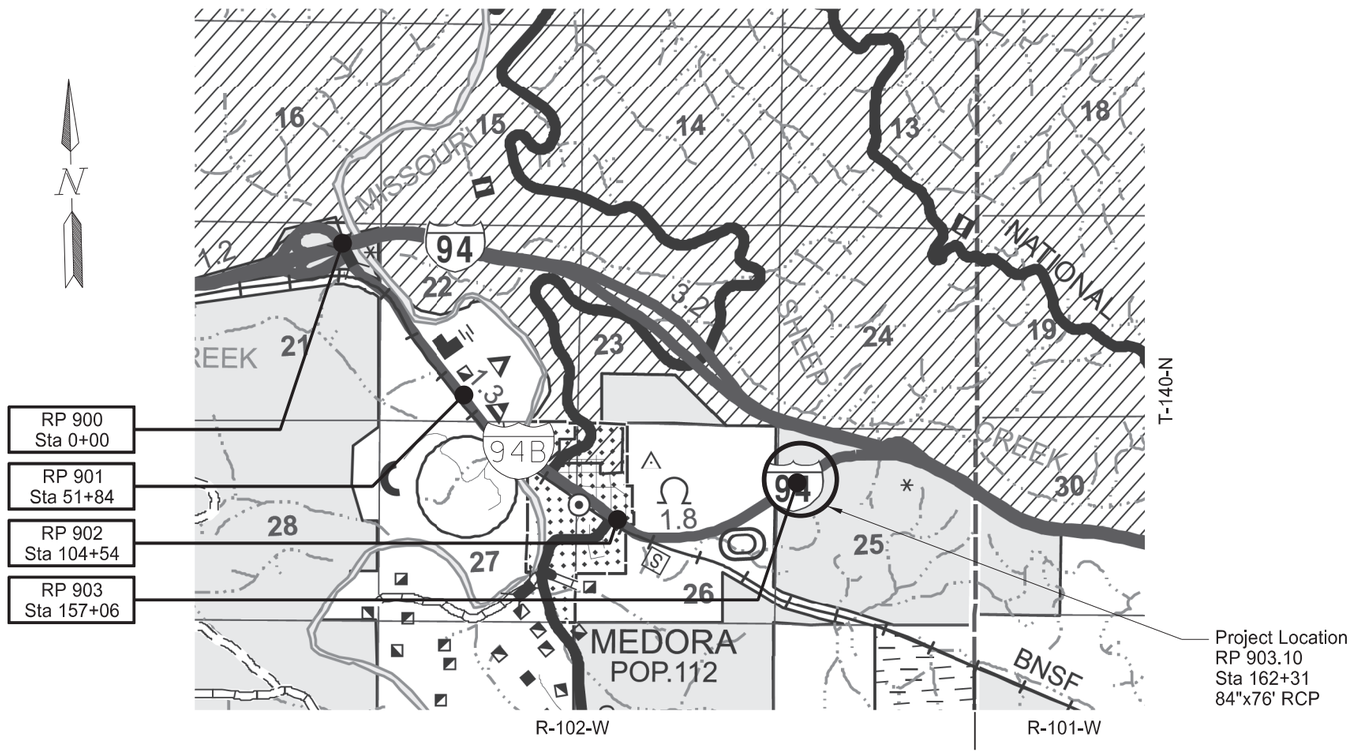
STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	23139	1	1

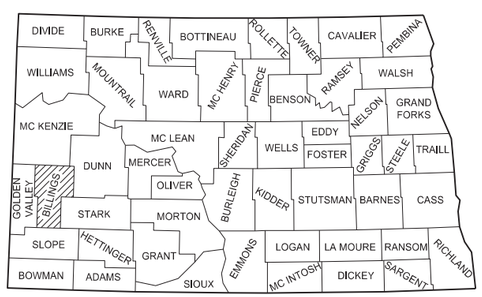
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

SS-5-094(153)903
Billings County
I-94 Business Loop East of Medora
Culvert Removal, Aggregate Base, and HMA Paving

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	01/01/2022
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SS-5-094(153)903	0.06	0.06





STATE COUNTY MAP

DESIGNER	Jeffrey R. Rensch
DESIGNER	
DESIGNER	

ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT
Kirk J Hoff
Hoff, Kirk J.
02/24/22

NDDOT DESIGN DIVISION
JAMES DOUGLAS SMITH
REGISTERED
PROFESSIONAL
PE-4288
ENGINEER
NORTH DAKOTA
02 24 2022
DocuSign

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	2	1

TABLE OF CONTENTS

PLAN SECTIONS

Section	Page(s)	Description
1	1	Title Sheet
2	1	Table of Contents
4	1	Scope of Work
6	1	Notes
8	1	Quantities
10	1	Basis of Estimate
20	1	General Details
30	1	Typical Sections
40	1	Removals
60	1	Plan & Profile
77	1	Permanent Erosion Control
80	1	Layouts
81	1	Survey Coordinate and Curve Data
90	1	Paving Layouts
100	1 - 6	Work Zone Traffic Control
110	1 - 3	Signing
200	1 - 5	Cross Sections

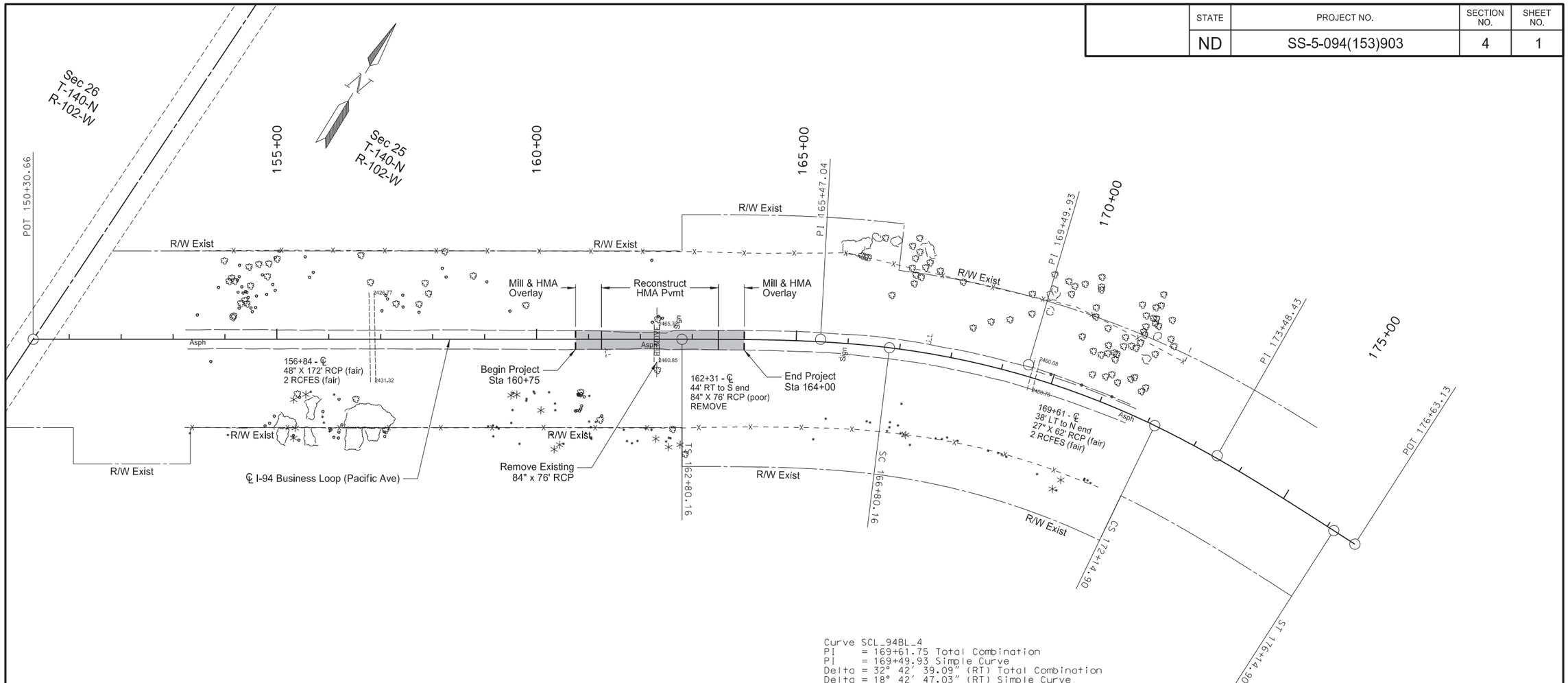
LIST OF STANDARD DRAWINGS

Number	Description
D-101-1, 2,3,4	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20, 21	Line Styles
D-101-30, 31,32,33	Symbols
D-101-40	Cross Section Legend
D-261-1	Erosion Control - Fiber Roll Placement Details
D-704-7	Breakaway Systems For Construction Zone Signs - Perforated Tube
D-704-8	Breakaway Systems For Construction Zone Signs - U-Channel Post
D-704-9	Construction Sign Details - Terminal And Guide Signs
D-704-10	Construction Sign Details - Regulatory Signs
D-704-11, 11A	Construction Sign Details - Warning Signs
D-704-13	Barricade And Channelizing Device Details
D-704-14	Construction Sign Punching And Mounting Details
D-704-22	Construction Truck And Temporary Detour Layouts
D-704-50	Portable Sign Support Assembly
D-714-1	Reinforced Concrete Pipe Culverts And End Sections (Round Pipe)
D-754-12	Breakaway Coupler System - Structural Details For W-Shape Supports
D-754-13	Breakaway System Structural Details For W-Shape Supports
D-754-14	Wind Beams And Anchor Plates For W-Shape Supports
D-754-23	Perforated Tube Assembly Details
D-754-24, 25	Mounting Details Perforated Tube
D-754-24A	Breakaway Coupler System For Perforated Tubes
D-762-4	Pavement Marking

SPECIAL PROVISIONS

Number	Description
PSP 1	Permits and Environmental Considerations
SSP 10	E-Ticketing
SSP 2	Federal Migratory Bird Treaty Act

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	4	1




```
Curve SCL_94BL_4
PI    = 169+61.75 Total Combination
PI    = 169+49.93 Simple Curve
Delta = 32° 42′ 39.09″ (RT) Total Combination
Delta = 18° 42′ 47.03″ (RT) Simple Curve
Da    = 3° 29′ 58.02″
R     = 1,637.28
L     = 534.74 Simple Curve
Ls    = 400.00
Sc    = 6° 59′ 56.03″
Yc    = 16.27
Xc    = 399.40
Ts    = 681.59
```

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Scope of Work

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	6	1

NOTES

100-P01 TIED PROJECT: This project is tied to project IM-5-094(156)023. Portable traffic control devices for D-704-22 K/L used on these tied projects will be paid for once, on this project, even though they are used on both projects.

Contract bond, Mobilization, Contractor lab and Bituminous lab bid items will be split and paid for on each project.

107-P01 SCHOOL DISTRICT NOTIFICATION: Notify the Billings County School District, via email, with a copy to the Engineer, a minimum of 14 days in advance of the road closure of the I-94 Business Loop (Pacific Ave.). Provide the anticipated dates for the road closure in the notification. Contact information for the school district is provided below.

Mrs. Shae Peplinski
District Superintendent
Email: shae.peplinski@k12.nd.us
Telephone: 701-623-4363

Mrs. Tammy Simnioniw
Business Manager
Email: tammy.simnioniw@k12.nd.us
Telephone: 701-623-4363

108-P01 PROSECUTION OF WORK: The I-94 Business Loop (Pacific Ave.) must remain fully open for public travel until September 12th, 2022. The road closure shown in Section 100 of the Plans may be installed starting September 12th, 2022.

201-P01 CLEARING & GRUBBING: Remove existing trees and brush as shown in Section 40. Unless noted otherwise in the Plans, all tree removals will be paid for under the “Clearing and Grubbing” bid item regardless of size.

202-P01 REMOVAL OF BITUMINOUS SURFACING: Removal of Bituminous Surfacing includes the removal of bituminous pavement and aggregate base. Pavement and base thicknesses shown in the existing typical section are based on previous construction plans. Actual thicknesses may vary, with approximately 24” of existing bituminous pavement possible above the existing pipe. Payment is based on the top width of pavement plus the pavement slough.

203-010 SHRINKAGE: 25 percent additional volume is included for shrinkage in earth embankment.

203-385 AVERAGE HAUL: No average haul has been computed for this project.

203-P01 COMMON EXCAVATION: Common Excavation is required for removal of the existing 84” RCP and reconstruction of the roadway. Common Excavation will not be measured on the project and will be paid for as plan quantity.

261-P01 PERMANENT FIBER ROLLS: For fiber rolls remaining on the project, use fiber rolls that are composed of netting that meets either of the following:

- Bio- or photo-degradable plastic netting that has a life expectancy between 6 and 24 months.
- 100 percent biodegradable natural netting that has a life expectancy between 6 and 24 months.

704-P01 TRAFFIC CONTROL DEVICES: The traffic control devices list has been developed using the layout shown Section 100 of the Plans and the standard layouts listed below:

D-704-22, Layouts K & L for Construction Trucks Hauling Materials

704-P02 PORTABLE CHANGEABLE MESSAGE SIGN: Install Portable Changeable Message Signs (PCMS) 2 weeks prior to the road closure for the project. The Engineer will determine the locations for PCMS installation. Relocate the PCMS as directed by the Engineer.

Provide an operator trained in the use of the PCMS.

Example language for the messages to be displayed is shown in Section 100. The Engineer will determine the messages to be displayed. The operator shall program the message within one hour of the Engineer's request to change the message.

762-050 PAVEMENT MARKING: If the Engineer and Contractor agree, plan quantity will be used as the measurement for payment for pavement marking items

REGISTERED PROFESSIONAL ENGINEER
JEFFREY RENSCH
PE-8211
DATE 04/04/22
NORTH DAKOTA

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
103	0100	CONTRACT BOND	L SUM	0.3	0.3
201	0330	CLEARING & GRUBBING	L SUM	1	1
201	0390	REMOVAL OF TREES 30IN	EA	1	1
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	853	853
202	0174	REMOVAL OF PIPE ALL TYPES AND SIZES	LF	76	76
203	0101	COMMON EXCAVATION-TYPE A	CY	913	913
203	0109	TOPSOIL	CY	636	636
203	0140	BORROW-EXCAVATION	CY	702	702
216	0100	WATER	M GAL	42	42
251	0200	SEEDING CLASS II	ACRE	0.8	0.8
253	0301	BONDED FIBER MATRIX	ACRE	0.8	0.8
261	0112	FIBER ROLLS 12IN	LF	900	900
302	0120	AGGREGATE BASE COURSE CL 5	TON	792	792
401	0050	TACK COAT	GAL	43	43
401	0060	PRIME COAT	GAL	307	307
411	0105	MILLING PAVEMENT SURFACE	SY	409	409
430	0045	SUPERPAVE FAA 45	TON	250	250
430	1000	CORED SAMPLE	EA	6	6
430	5818	PG 58H-34 ASPHALT CEMENT	TON	15	15
702	0100	MOBILIZATION	L SUM	0.3	0.3
704	1000	TRAFFIC CONTROL SIGNS	UNIT	642	642
704	1052	TYPE III BARRICADE	EA	15	15
704	1060	DELINEATOR DRUMS	EA	50	50
704	4011	PORTABLE CHANGEABLE MESSAGE SIGN	EA	1	1
706	0550	BITUMINOUS LABORATORY	EA	0.3	0.3
706	0600	CONTRACTOR'S LABORATORY	EA	0.3	0.3
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	16	16
754	0214	GALV STEEL POSTS-W-SHAPE POSTS(TWO OR MORE)	LF	28	28
754	0592	RESET SIGN PANEL	EA	2	2
754	0593	RESET SIGN SUPPORT	EA	2	2
754	1104	REMOVE SIGN FOUNDATION	EA	2	2
762	1104	PVMT MK PAINTED 4IN LINE	LF	1,125	1,125

ESTIMATE NUMBER: 22254 ESTIMATE TYPE: FINAL FINALIZED: Y RUN DATE: 02/28/2022 TIME: 13:00:16

Water
20 MGal for Dust Palliative
20 Gal/Ton for Aggregates
10 Gal/CY for Embankments

Materials

Aggregate Base Course CL 5	1.5 Ton/CY + 25%
Superpave FAA 45	2.0 Ton/CY
PG 58H-34 Asphalt Cement	6.0% of Superpave FAA 45
Tack Coat	0.05 Gal/SY
Prime Coat	0.35 Gal/SY

Permanent Pavement Marking Quantities

Final Striping: Sta 160+00 to Sta 165+00						
Spec	Code	Description	Start Sta	End Sta	Qty	Unit
762	1104	PVMT MK PAINTED 4IN LINE			1125	LF
		Yellow Centerline Skips @ 1,320 LF/mile	160+00	165+00	125	LF
		Solid White Edge Lines - 2 lines @ 5,280 LF/mile each	160+00	165+00	1000	LF

Earthwork Summary

Location	EXCAVATION	EMBANKMENT	203-0101 COMMON EXCAVATION - TYPE A	203-0140 BORROW EXCAVATION
			Pay Item	Pay Item
	(CY)	(CY)	(CY)	(CY)
Roadway Reconstruction	120	431	120	311
Trench Excavation (See Section 20 Detail)	793	992	793	199
Volume Req'd for Pipe Void	0	192	0	192
TOTALS	913	1,615	913	702

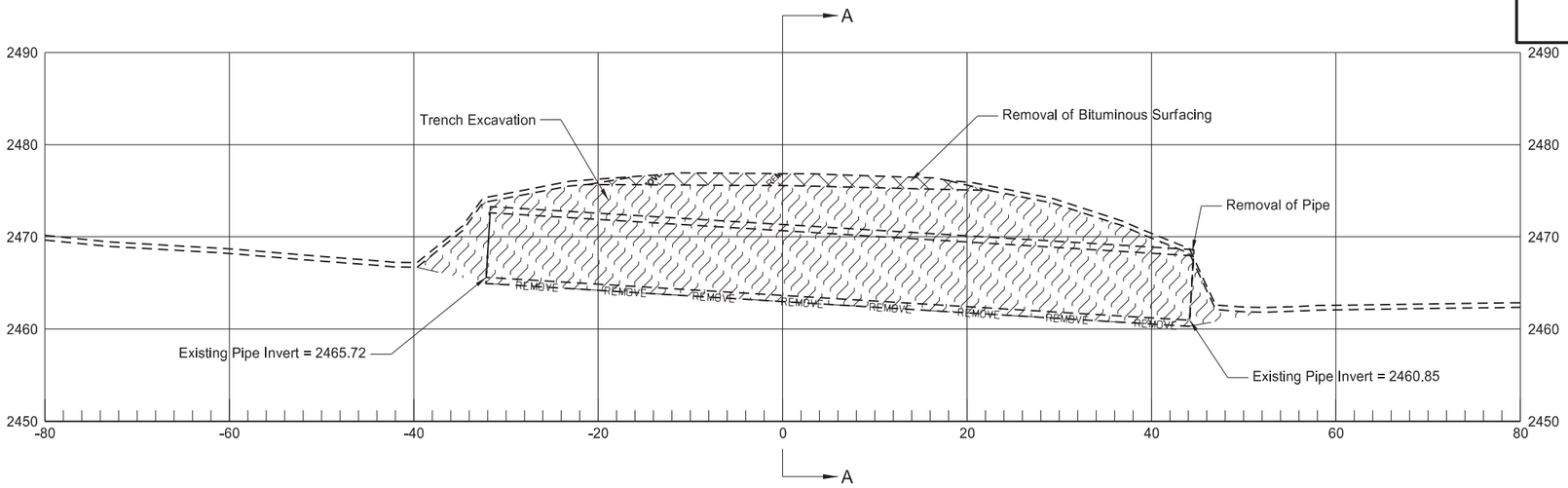
Note: An additional volume of 25% has been included in all embankment volumes to account for shrinkage.

Specification Section	Location	Distance (Ft)/2000	Lanes	Joints	Lifts	Quantity (A x B x C)	Quantity (1 per mile)	Unit
430.04 I.2.b(1), "General"	I-94 Business Loop	1	2	N/A	2	4	N/A	EA
SSP 4 Longitudinal Joint Density in HMA Pavements (Centerline)	I-94 Business Loop	1	N/A	1	2	2	N/A	EA
430.04 I.2.b(2), "Pavement Thickness Determination Cores"	430.04 I.2.b(2), "Pavement Thickness Determination Cores"	Not Required: Not on NHS System						EA
					Total	6	0	EA

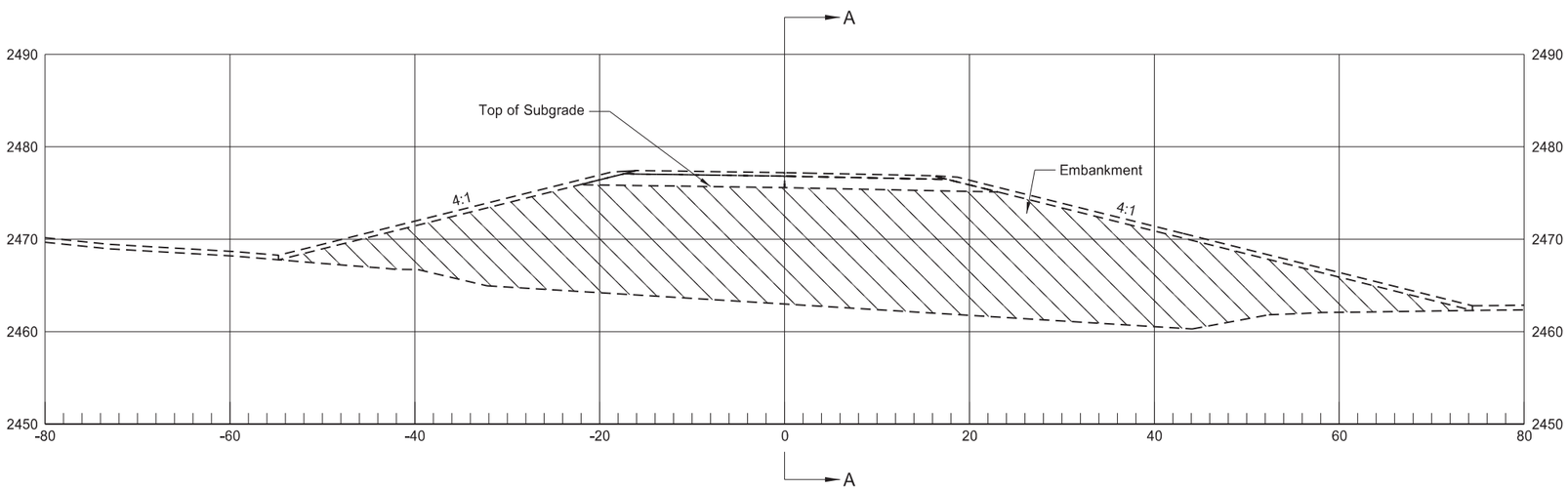
REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/28/2022
NORTH DAKOTA

Basis of Estimate

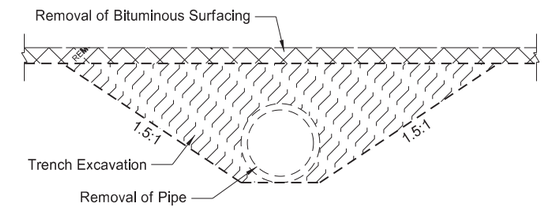
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	20	1



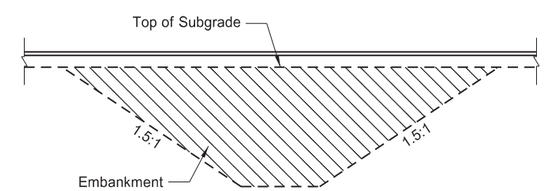
REMOVAL SECTION @ 84" RCP



BACKFILL SECTION @ 84" RCP



EXCAVATION DETAIL
(Section A-A)



BACKFILL DETAIL
(Section A-A)

Pay Items
1) Removal of Pipe All Types and Sizes*
2) Removal of Bituminous Surfacing
3) Embankment
4) Trench Excavation (Paid for as Common Excavation - Type A)

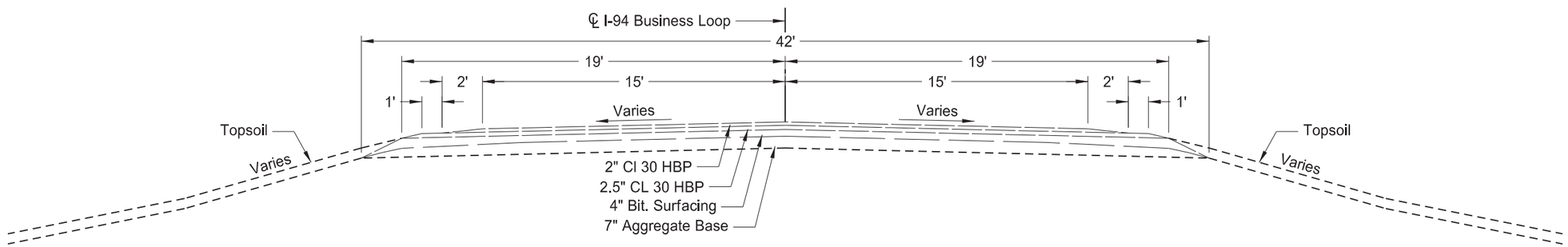
*Included in Removal of Pipe All Types and Sizes
1) Removal of Pipe
2) Removal of Headwalls

NOTES:
Embankment may be either Borrow Excavation or Common Excavation - Type A.

REGISTERED PROFESSIONAL ENGINEER
JEFFREY RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

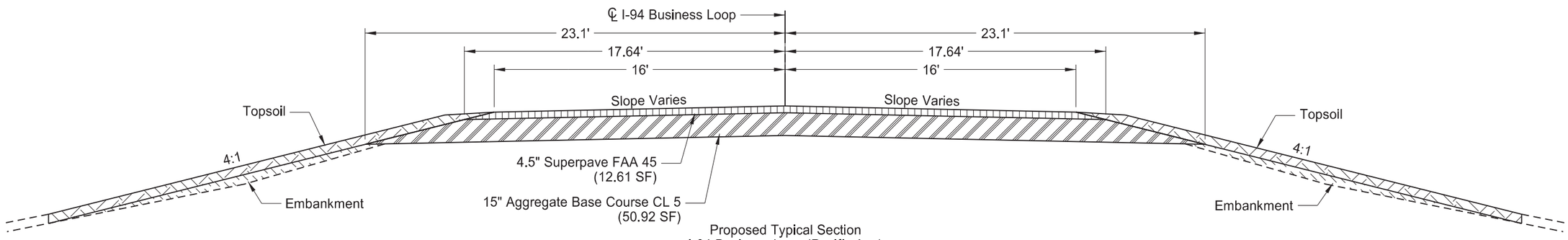
Pipe Removal
Excavation and Backfill Detail

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	30	1



Existing Typical Section
I-94 Business Loop (Pacific Ave)

Note: Pavement and base thickness based on previous construction plans.
Actual thickness may vary. Approximately 24" of HBP is possible over existing pipe.

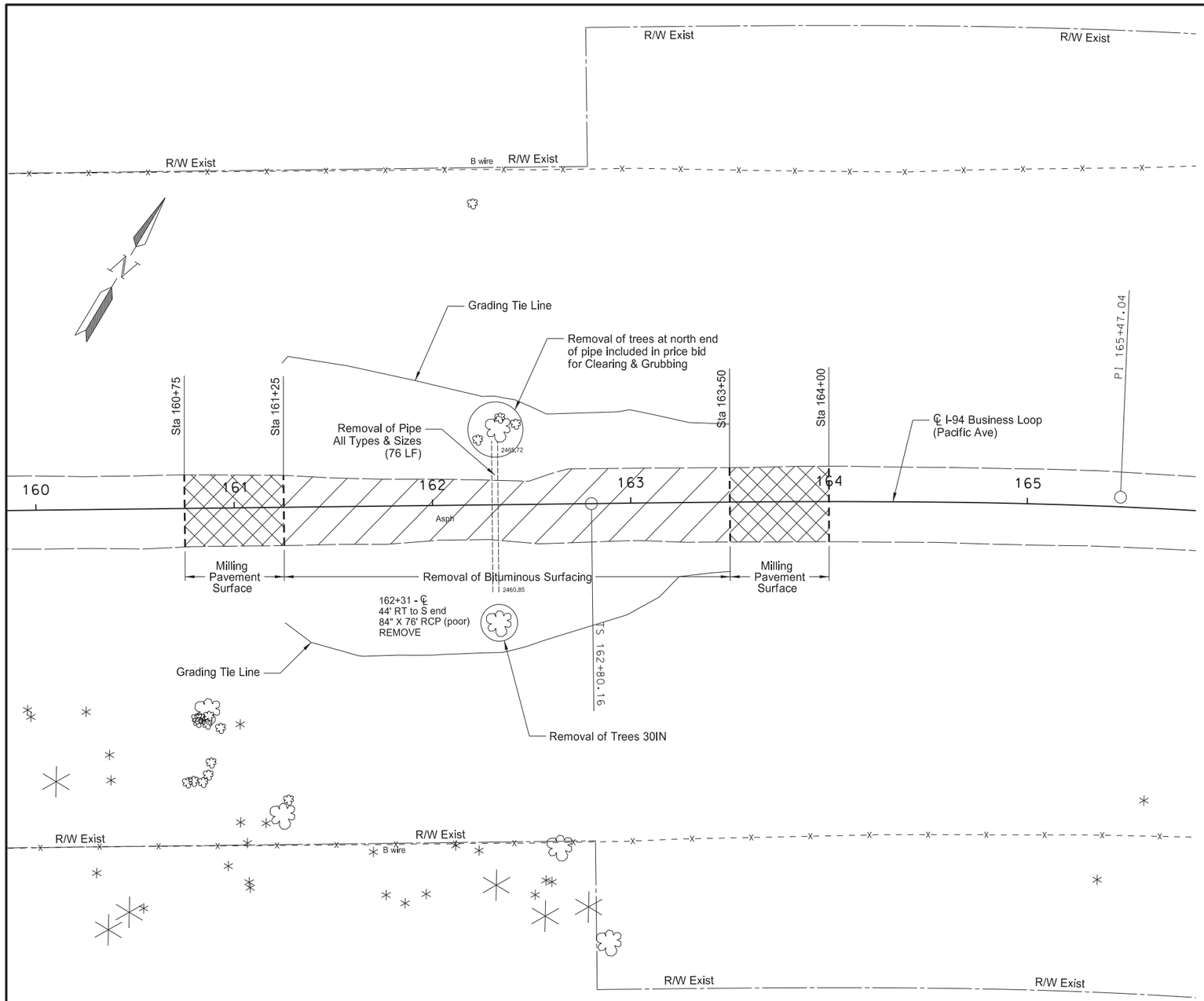


Proposed Typical Section
I-94 Business Loop (Pacific Ave)

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/28/2022
NORTH DAKOTA

Typical Sections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	40	1



SPEC	CODE	BID ITEM	QTY	UNIT
201	0330	CLEARING AND GRUBBING		
		Sta 160+75 to 164+00	1	LSUM
201	0390	REMOVAL OF TREES 30IN		
		Sta 162+31 Rt (End of Existing RCB)	1	EA
202	0132	REMOVAL OF BITUMINOUS SURFACING		
		Sta 161+25 to 163+50	853	SY
202	0174	REMOVAL OF PIPE ALL TYPES & SIZES		
		84" RCP - Sta 162+31	76	LF
411	0105	MILLING PAVEMENT SURFACE		
		Sta 160+75 to 161+25	199	SY
		Sta 163+50 to 164+00	210	SY

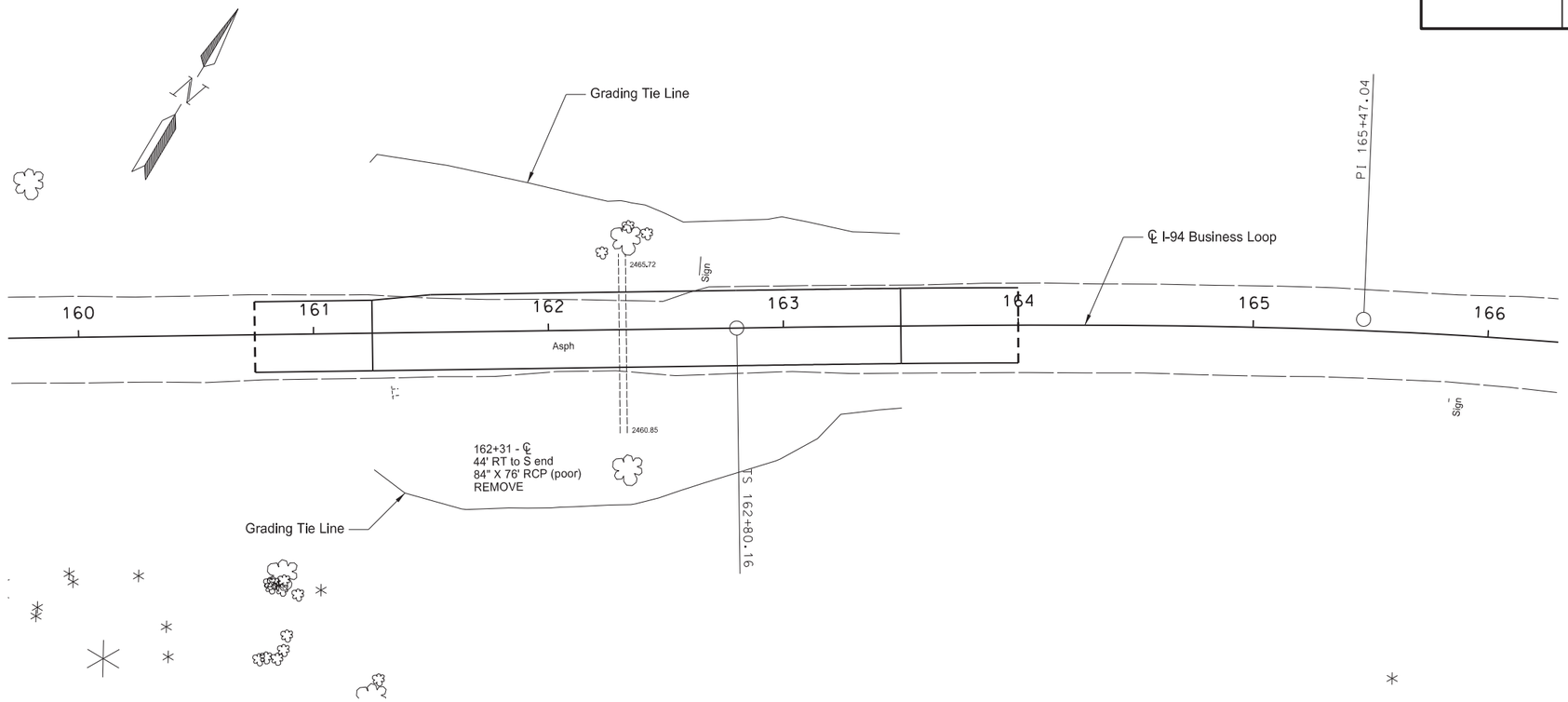
Milling Pavement Surface (2" Mill Depth)

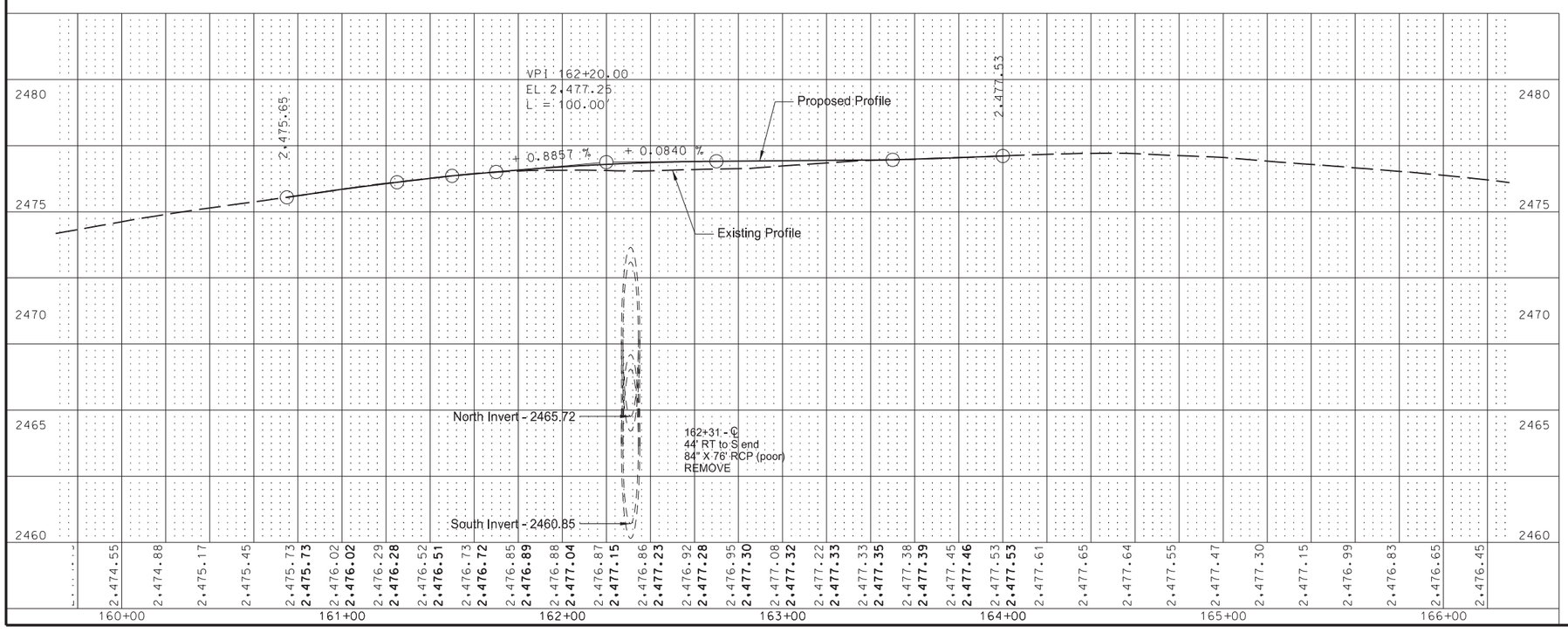
Removal of Bituminous Surfacing

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Removals

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	60	1





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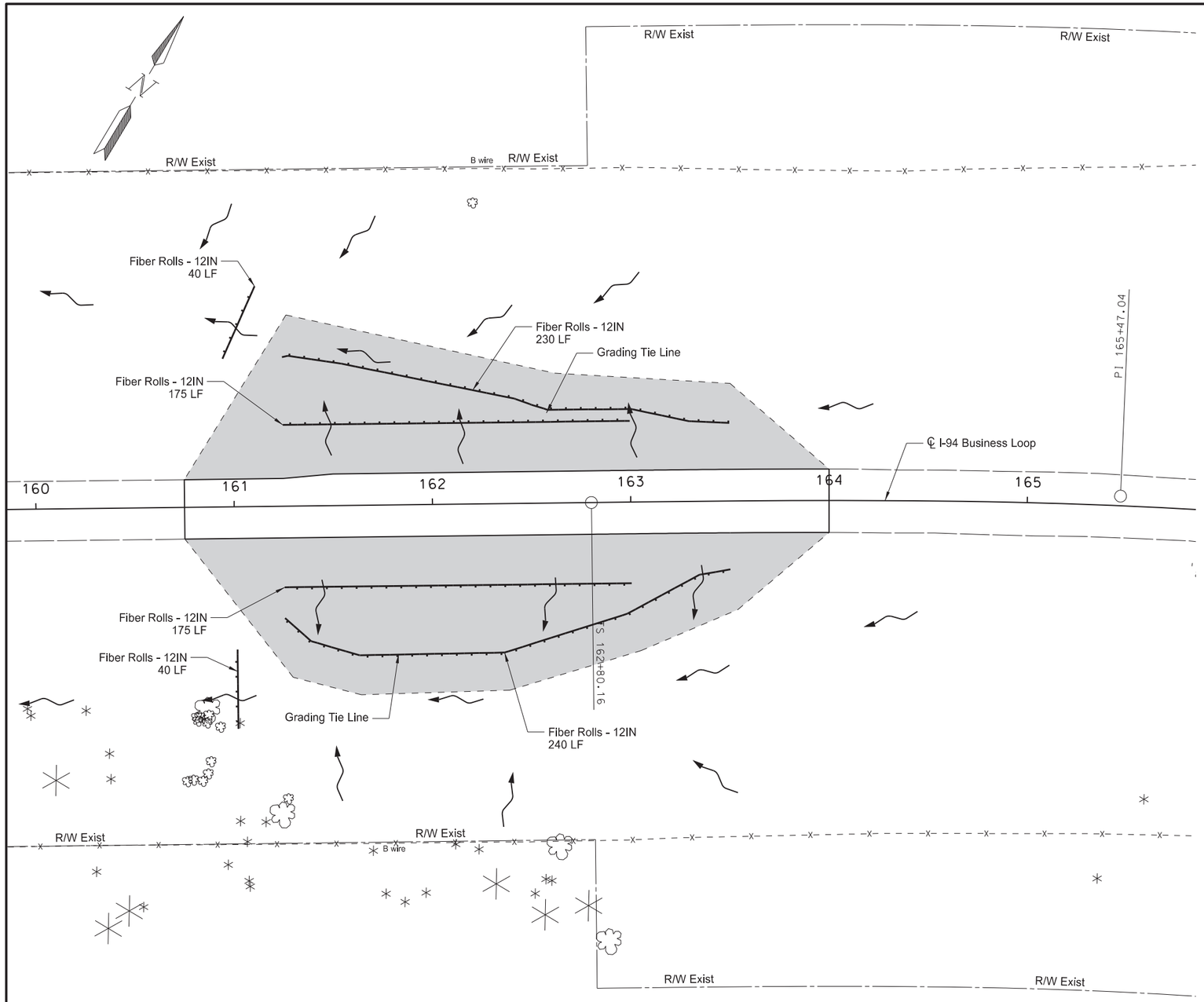
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Plan & Profile

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	77	1



SPEC	CODE	BID ITEM	QTY	UNIT
203	0109	TOPSOIL		
		Sta 160+75 Lt to 164+00 Lt	299	CY
		Sta 160+75 Rt to 164+00 Rt	337	CY
251	0200	SEEDING CLASS II		
		Sta 160+75 Lt to 164+00 Lt	0.37	ACRE
		Sta 160+75 Rt to 164+00 Rt	0.42	ACRE
253	0301	BONDED FIBER MATRIX		
		Sta 160+75 Lt to 164+00 Lt	0.37	ACRE
		Sta 160+75 Rt to 164+00 Rt	0.42	ACRE
261	0112	FIBER ROLLS 12IN		
		Sta 161+00 - Lt	40	LF
		Sta 161+25 to 163+00 - Lt	175	LF
		Sta 161+25 to 163+50 - Lt	230	LF
		Sta 161+00 - Rt	40	LF
		Sta 161+25 to 163+00 - Rt	175	LF
		Sta 161+25 to 163+50 - Rt	240	LF

LEGEND

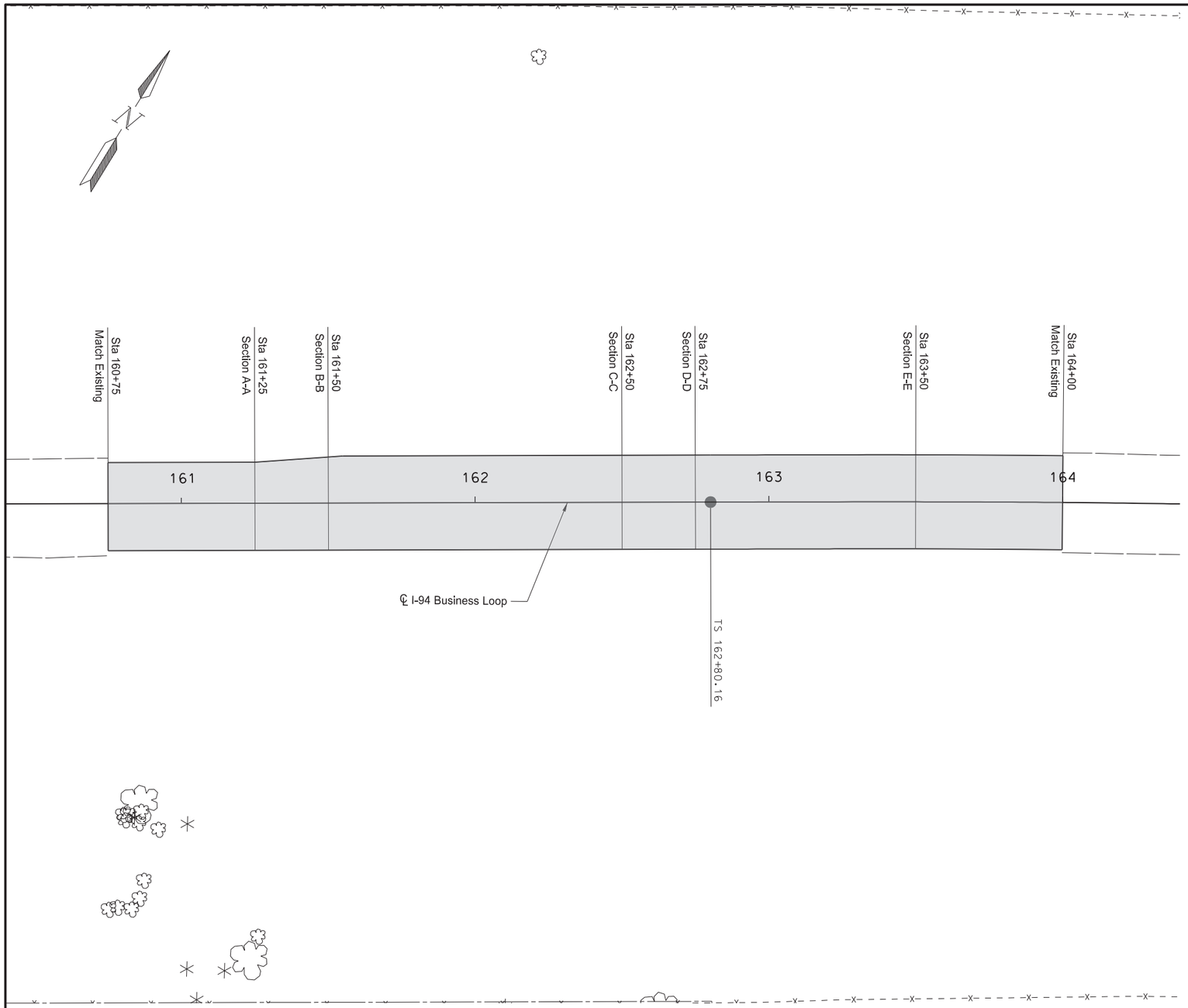
Topsoil, Seeding Class II, & Bonded Fiber Matrix

Fiber Rolls - 12IN

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Permanent Erosion Control

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	80	1



Superelevation Table (Looking Downstation)

Shldr Slope	Lane Slope	Lane Slope	Shldr Slope
1.00%	1.00%	-1.30%	-1.30%
Section A-A Sta 161+25			
1.00%	1.00%	-2.00%	-2.00%
Section B-B Sta 161+50			
-2.00%	-2.00%	-2.00%	-2.00%
Section C-C Sta 162+50			
-0.50%	-2.50%	-4.00%	-4.00%
Section D-D Sta 162+75			
4.00%	-2.50%	-4.00%	-4.00%
Section E-E Sta 163+50			

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Superelevation Layout

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - East of Medora

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
I-94 Business loop (SCL_94BL)			
Begin	150+30.66	469,009.98	1,218,132.60
TS	162+80.16	469,664.77	1,219,196.79
SC	166+80.16	469,860.21	1,219,545.48
PI	169+61.75	470,021.95	1,219,777.29
CS	172+14.90	470,000.23	1,220,059.11
ST	176+14.90	470,008.78	1,220,458.76
End	176+63.13	470,007.85	1,220,506.97

CURVE DATA

ARC DEFINITION	
SCS521	
PI STA	= 169+61.75
Delta	= 32° 42' 39" RT
D_a	= 3° 29' 58"
R	= 1,637.28'
L	= 534.74'
L_s	= 400.00'
S_c	= 6° 59' 56"
T_s	= 681.59'

US PUBLIC LAND SURVEY DATA

CORNER	IRN	NORTHING	EASTING
T-140-N R-102-W			
SE Cor Sec 23	11-J	470,871.10	1,218,199.66
W Qtr Cor Sec 25	11-K	468,247.92	1,218,105.14
SE Qtr Sec 26	11-L	465,620.81	1,217,998.61

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
MONUMENT DESCRIPTION					
PRIMARY CONTROL					
GPS1	470,045.54	1,212,168.66	2,264.05	N/A	N/A
2.5" Al Cap FHA 2001					
GPS2	468,886.24	1,217,763.79	2,408.27	N/A	N/A
#5 Rebar					
GPS3	470,035.30	1,219,765.58	2,460.99	169+40	89' Lt
#5 Rebar					
SECONDARY CONTROL					
RTK 42303	469,169.99	1,213,046.01	2,267.14	N/A	N/A
RTK 42304	469,422.29	1,212,687.18	2,267.14	N/A	N/A
RTK 50001	470,023.03	1,220,563.80	2,427.83	N/A	N/A
RTK 51222	468,441.22	1,214,080.01	2,279.40	N/A	N/A

REFERENCE MARKERS

R Mkr #	NORTHING	EASTING	STATION	OFFSET	ALIGNMENT
903	469,340.54	1,218,722.02	157+06	27' Rt	(SCL_94BL)

NOTES: Alignment based on NDOT Proj # SNFAP 283C(3) 1942

Date Survey Completed 03/16/21

☐ Assumed Coordinates

☒ All coordinates on this sheet are Billings County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota South Zone Combination Factor (cf) = 0.9998085

All coordinates and measurements on this document derived from the International Foot definition.

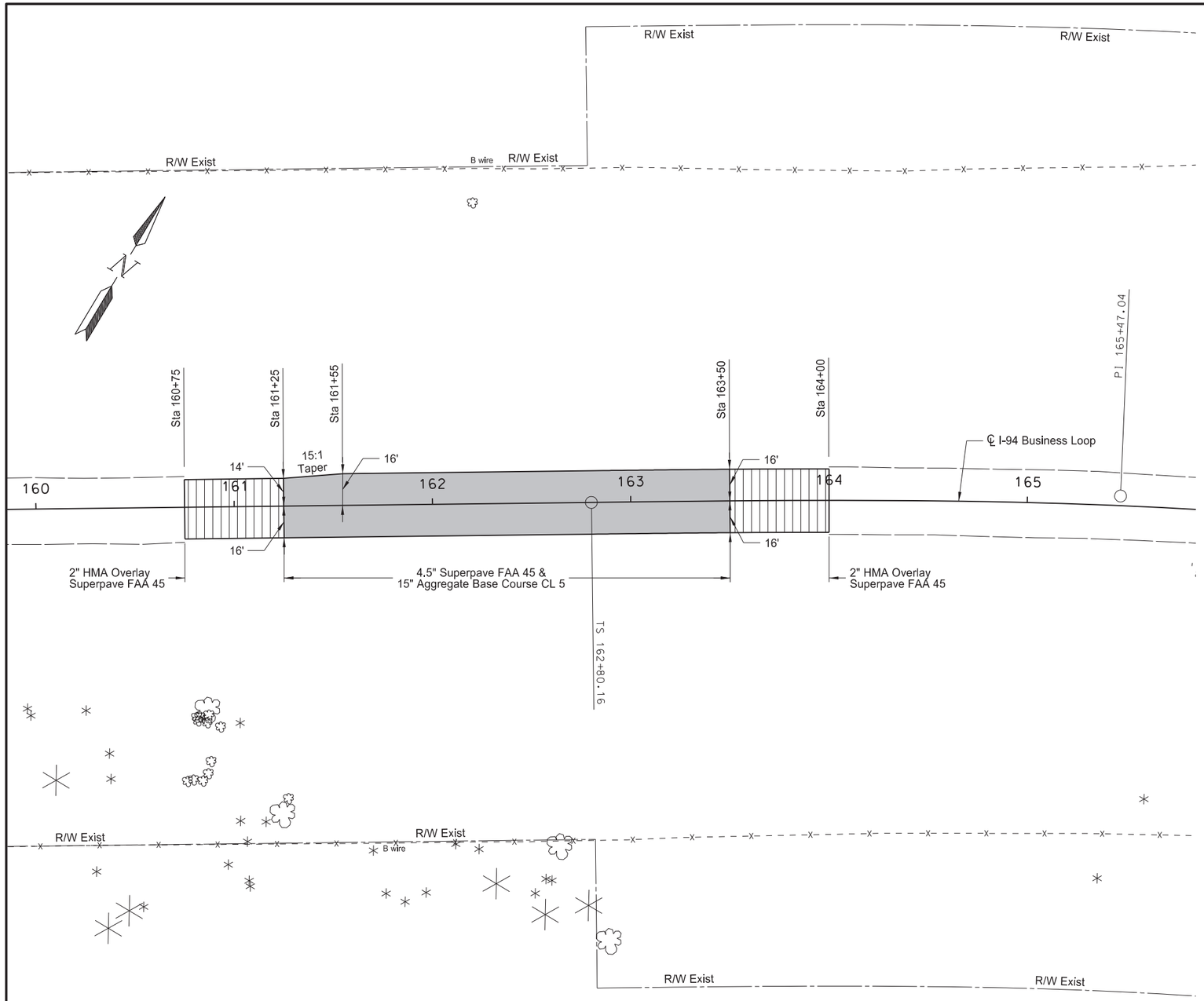
INITIALIZING BENCH MARK
NDGPS Stations (OPUS)

☒ NAVD-88
☐ _____

☐ GEOID12B ☐ _____
☒ GEOID18

REGISTERED PROFESSIONAL LAND SURVEYOR
STEVEN JOHNSON
LS-10169
DATE
NORTH DAKOTA
02/23/22

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	90	1



SPEC	CODE	BID ITEM	QTY	UNIT
302	0120	AGGREGATE BASE COURSE CL 5		
		Sta 161+25 to 163+50	792	TON
401	0050	TACK COAT		
		Sta 160+75 to 164+00	43	GAL
401	0060	PRIME COAT		
		Sta 161+25 to 163+50	307	GAL
430	0045	SUPERPAVE FAA 45		
		Sta 160+75 to 164+00	250	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
		Sta 160+75 to 164+00	15	TON

LEGEND

4.5" Superpave FAA 45 &
15" Aggregate Base Course CL 5

2" HMA Overlay
Superpave FAA 45

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Paving Layout

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE		35	
G20-1-60	60"x24"	ROAD WORK NEXT __ MILES		28	
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)		18	
G20-2-48	48"x24"	END ROAD WORK		26	
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)		18	
G20-10-108	108"x48"	CONTRACTOR SIGN		70	
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS		43	
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW		36	
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT		59	
I2-5-96	96"x48"	YOUR HIGHWAY DOLLARS AT WORK		59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)		7	
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)		7	
R1-1-48	**48"x48"**	**STOP**	**4**	**32**	**128**
R1-2-60	60"x60"	YIELD		29	
R2-1-36	36"x48"	SPEED LIMIT __ (Portable only)		30	
R2-1-48	48"x60"	SPEED LIMIT __		39	
R2-1aP-24	24"x18"	MINIMUM FEE $80 (Mounted on Speed Limit post)		10	
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)		14	
R7-1-12	12"x18"	NO PARKING ANY TIME		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	**48"x30"**	**ROAD CLOSED (Mounted on barricade)**	**4**	**12**	**48**
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)		12	
R11-3a-60	**60"x30"**	**ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)**	**2**	**15**	**30**
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)		15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT		35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT		35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT		35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD		35	
W3-3-48	48"x48"	SIGNAL AHEAD		35	
W3-4-48	48"x48"	BE PREPARED TO STOP		35	
W3-5-48	48"x48"	SPEED REDUCTION AHEAD		35	
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC		35	
W8-1-48	48"x48"	BUMP		35	
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
W8-12-48	48"x48"	NO CENTER LINE		35	
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	**48"x48"**	**TRUCKS ENTERING AHEAD or __ FT or _ MILE**	**2**	**35**	**70**
W8-55-48	**48"x48"**	**TRUCKS CROSSING AHEAD or __ FT or _ MILE**	**2**	**35**	**70**
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)		14	
W14-3-64	64"x48"	NO PASSING ZONE		28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)		10	
W20-1-48	48"x48"	ROAD WORK AHEAD or _FT or _ MILE		35	
W20-2-48	48"x48"	DETOUR AHEAD or __ FT or _ MILE		35	
W20-3-48	**48"x48"**	**ROAD or STREET CLOSED AHEAD or __ FT or _ MILE**	**4**	**35**	**140**
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or _ MILE		35	
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE		35	
W20-7-48	48"x48"	FLAGGER		35	
W20-8-18	18"x18"	STOP - SLOW PADDLE Back to Back		5	
W20-52P-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)		12	
W21-1-48	48"x48"	WORKERS		35	
W21-2-48	48"x48"	FRESH OIL		35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or _ MILE		35	
W21-5-48	48"x48"	SHOULDER WORK		35	
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED		35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT or _ MILE		35	
W21-6-48	48"x48"	SURVEY CREW		35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT		35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY		35	
W21-52-48	48"x48"	PAVEMENT BREAKS		35	
W21-53-48	48"x48"	RUMBLE STRIPS AHEAD		35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK		35	

SPECIAL SIGNS

Consign 1	**102"x60"**	**EXIT 27 CLOSED USE EXIT 24**	**2**	**78**	**156**

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**642**

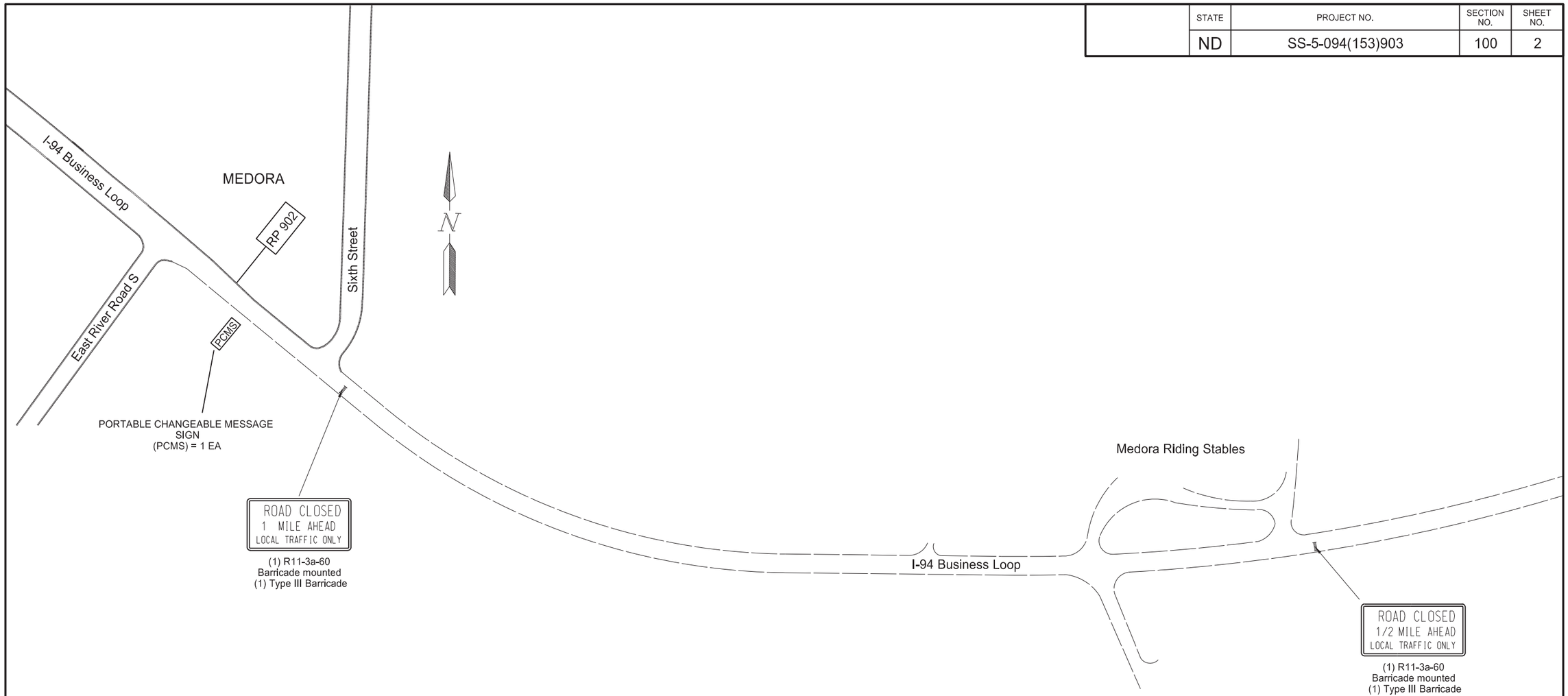
SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	FLAGGING	MHR	
704-1048	PORTABLE RUMBLE STRIPS	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1052	**TYPE III BARRICADES**	**EACH**	**15**
704-1060	**DELINEATOR DRUMS**	**EACH**	**50**
704-1065	TRAFFIC CONES	EACH	
704-1067	TUBULAR MARKERS	EACH	
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1080	STACKABLE VERTICAL PANELS	EACH	
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH	
704-1500	OBLITERATION OF PVMT MK	SF	
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
704-4011	**PORTABLE CHANGEABLE MESSAGE SIGN**	**EACH**	**1**
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	

NOTE:
If additional signs are required, units will be calculated using the formula from Section III-18.06 of the Design Manual.
http://www.dot.nd.gov/

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Traffic Control Devices List

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	100	2



EXAMPLE LANGUAGE FOR PCMS

MESSAGE 1:

ROAD CLOSED
BEGINNING SEPTEMBER XX

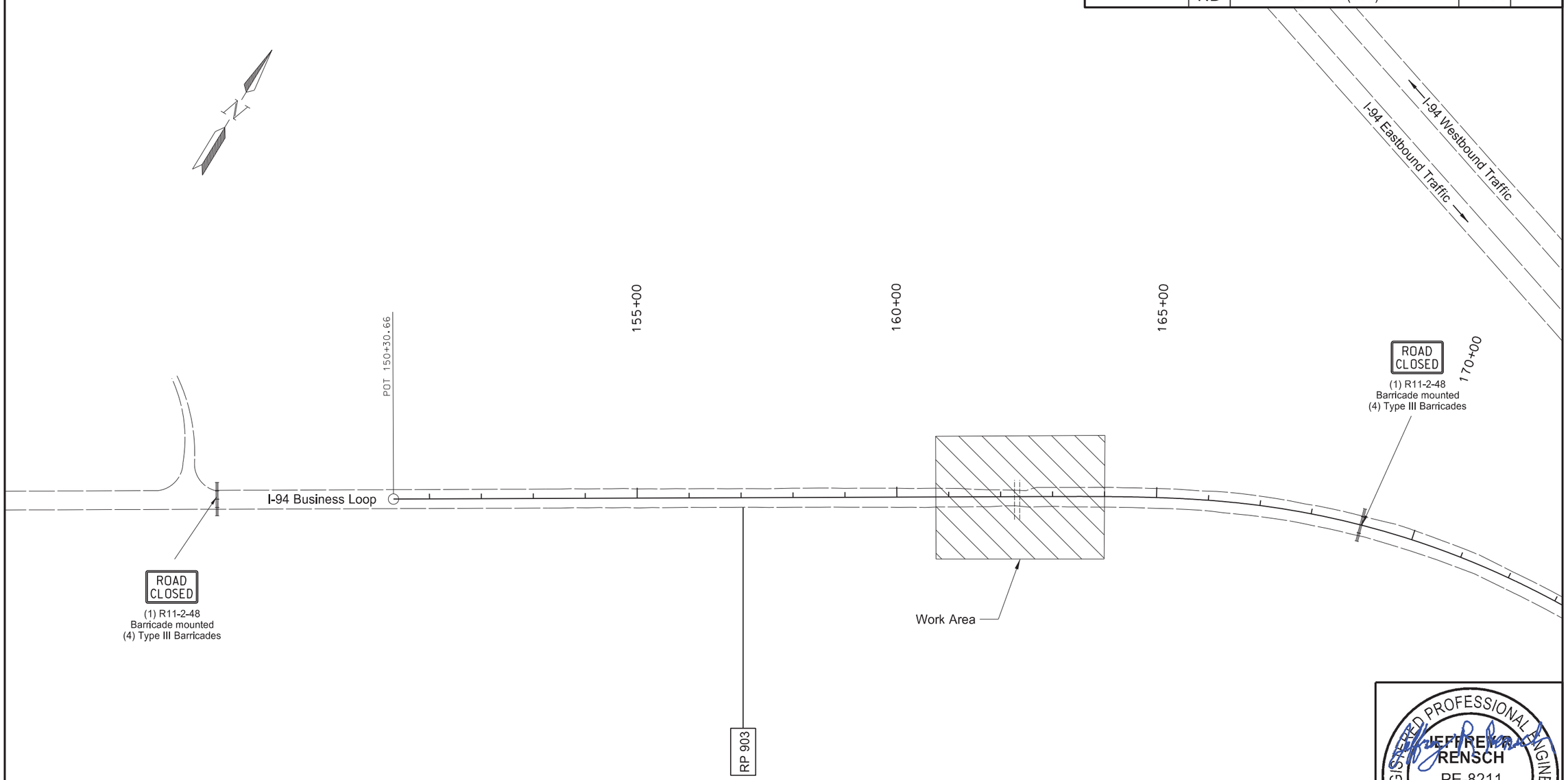
MESSAGE 2:

ROAD CLOSED AHEAD
USE EXIT 24

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Work Zone Traffic Control

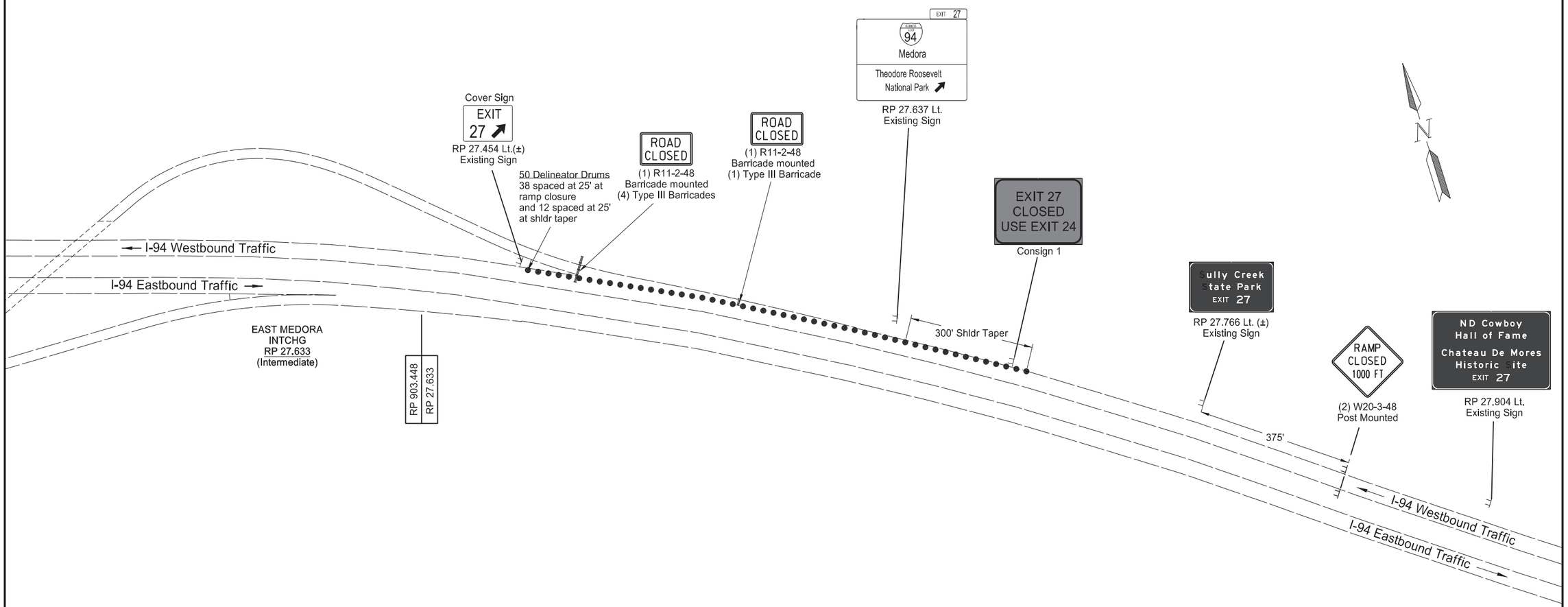
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	100	3



REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Work Zone Traffic Control

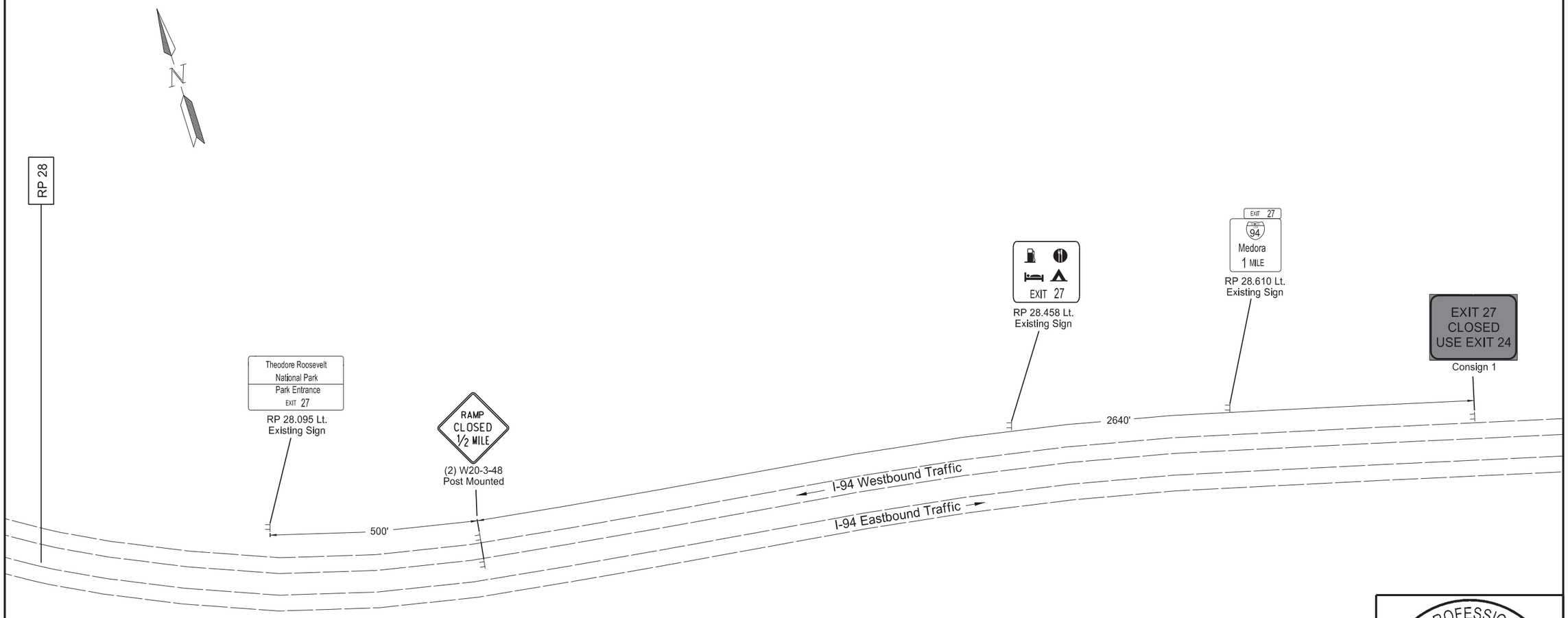
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	100	4



REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Work Zone Traffic Control

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	100	5



REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Work Zone Traffic Control

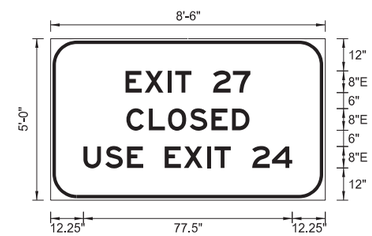
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	100	6

SIGN NUMBER	Consign 1
WIDTH X HEIGHT	8'-6" x 5'-0"
BORDER WIDTH	1.25" (inset 0.75")
CORNER RADIUS	9"
MOUNTING	Ground
BACKGROUND	TYPE: XI Reflective
	COLOR: Fluorescent Orange
LEGEND/BORDER	TYPE: Non-reflective
	COLOR: Black

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):

AREA: 42.5 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_Const_Detour.ssl

LETTER POSITION (X)																		LENGTH	SIZE	SERIES
E	X	I	T		2	7												46.3	8	E 2000
27.8	35	43.5	46.3	52.3	60.3	67.7														
C	L	O	S	E	D													45.7	8	E 2000
28.2	36.5	43.6	51.7	59.8	67.4															
U	S	E		E	X	I	T		2	4								77.5	8	E 2000
12.2	20.3	28.4	34.4	42.4	49.5	58.1	60.9	66.9	74.9	82.2										

REGISTERED PROFESSIONAL ENGINEER
JEFFREY R. RENSCH
PE-8211
DATE
02/23/2022
NORTH DAKOTA

Construction Sign Details

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SS-5-094(153)903	110	1

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	Sign Support Length 2nd LF	Sign Support Length 3rd LF	Sign Support Length 4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	Sleeve Length 2nd LF	Sleeve Length 3rd LF	Sleeve Length 4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
161+31 Rt					12.4				5.0	2 x 2 12 ga	13.4						1	4	2.25 x 2.25 12 ga	1			
Sub Total			0.0	0.0		**Total**	12.4										**Total**	4.0		1	0	0	
Grand Total			**0.0**	**0.0**		**Total**	**12.4**										**Total**	**4**	**0**	**1**	**0**	**0**	

DOUGLAS A SCHUMACHER
REGISTERED
PROFESSIONAL
PE-5047
ENGINEER
NORTH DAKOTA

02/23/22

Sign Summary
Perforated Tube

East of Medora

I-94

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	SS-5-094(153)903	110	2

Station / RP	Sign / Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Panel For Signs IV SF	Panel For Signs XI SF	Overlay Panel IV SF	Overlay Panel XI SF	Vert Clear-ance FT	Galv Steel Sheet Standard Pipe 1st LF	Galv Steel Sheet Standard Pipe 2nd LF	Size	Galv Steel Post W-Shape Posts 1st LF	Galv Steel Post W-Shape Posts 2nd LF	Galv Steel Post W-Shape Posts 3rd LF	Max Post Len LF	Post Space FT	Revise Fuse Joint EA	Std Pipe Fdn Dia FT	Std Pipe Fdn Dep FT	Std Pipe Fdn Vol CY	W-Shape Pile LF	Remove Sign Fdns Conc Fdn EA	Remove Sign Fdns W-Shape Pile EA	Reset Sign Panel EA	Reset Sign Support EA	Stub Post EA	Multi Dir Base EA	Comments
162+65 Lt								5.0			W4x13					4.5					28		2	1	2			
Sub Total								**Total**	0.0			**Total**	0.0							0.0	28	0	2	1	2	0	0	
Grand Total								**Total**	**0.0**			**Total**		**0.0**						**0.0**	**28**	**0**	**2**	**1**	**2**	**0**	**0**	

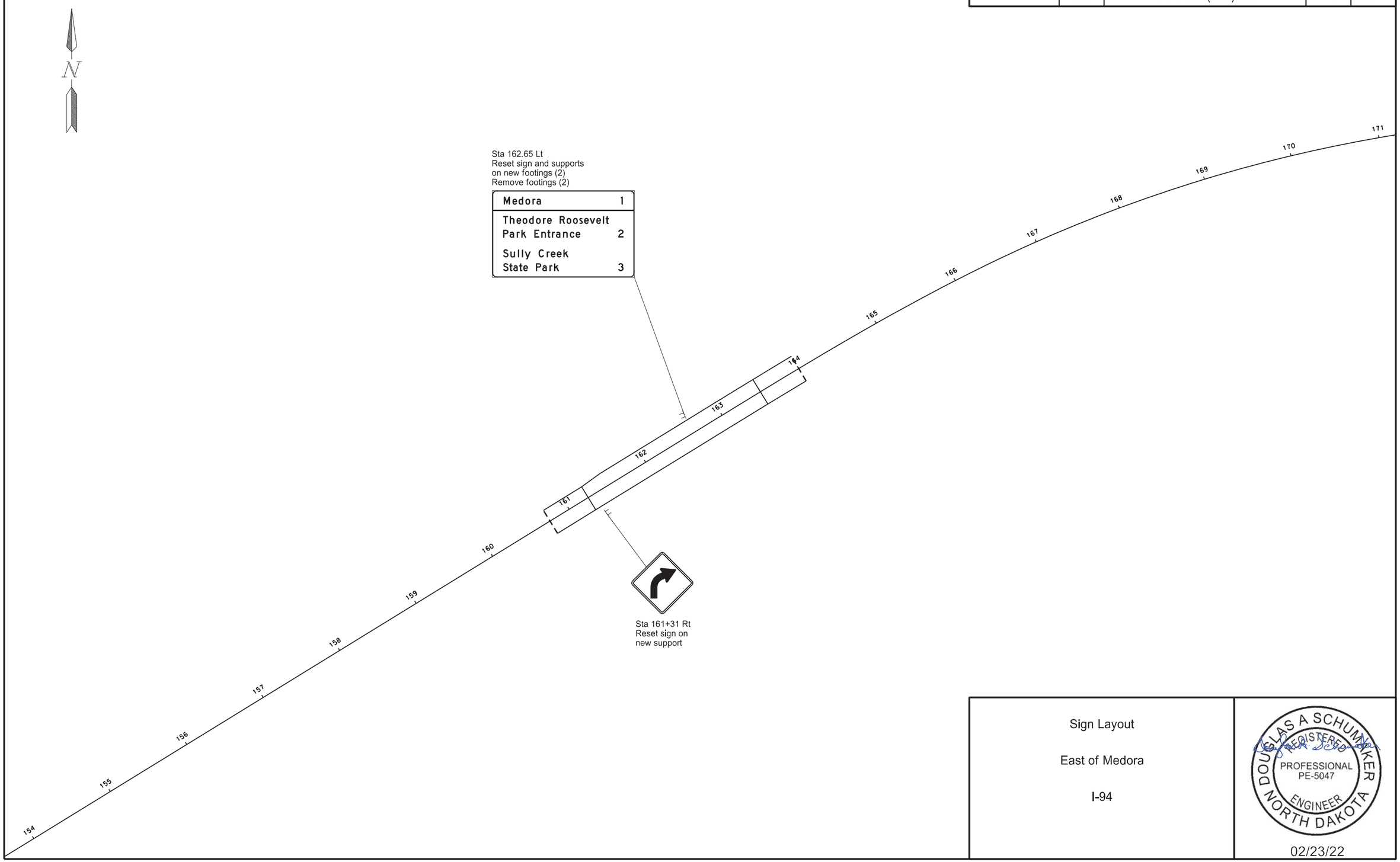
02/23/22

Sign Summary
Round Steel Pipe & W-Shape

East of Medora

I-94

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	110	3



Sign Layout

East of Medora

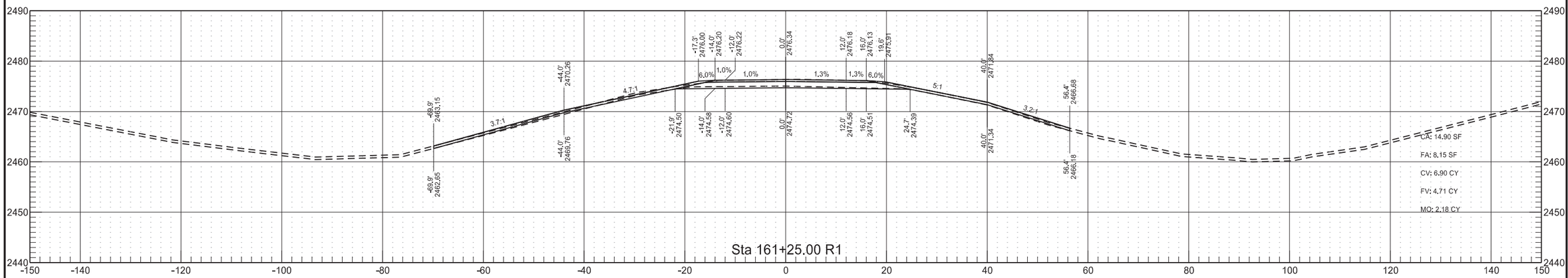
I-94

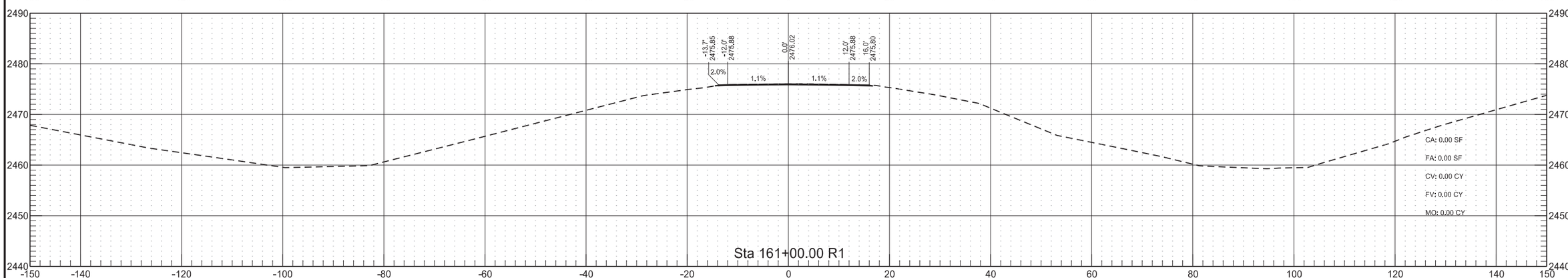
DOUGLAS A SCHUMACHER
REGISTERED
PROFESSIONAL
PE-5047
ENGINEER
NORTH DAKOTA

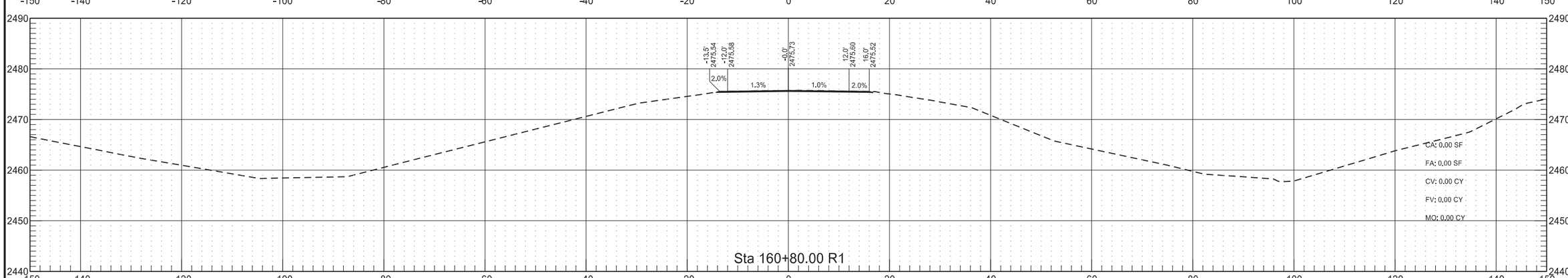
02/23/22

2/23/2022 1:56:52 PM jallery R:\project\50094903.153\traffic\110SN_003_LSign_SignLayout.dgn

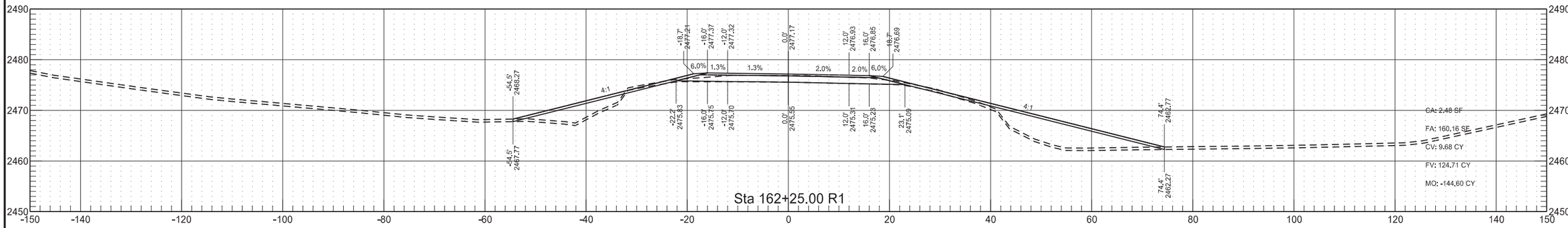
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	200	1

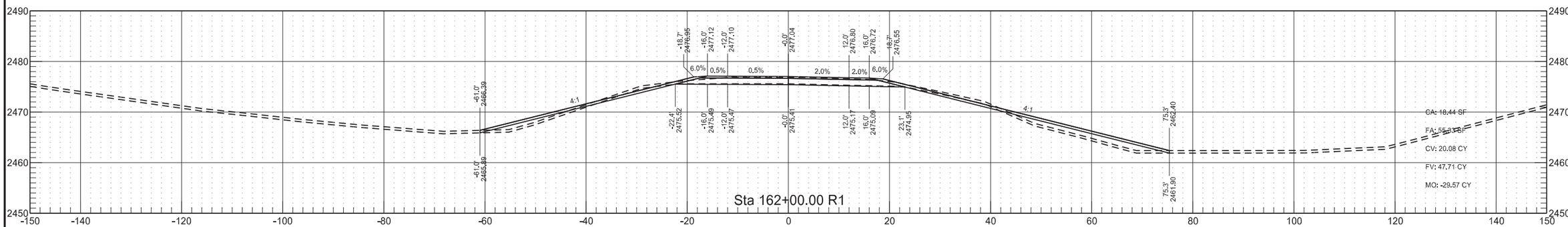


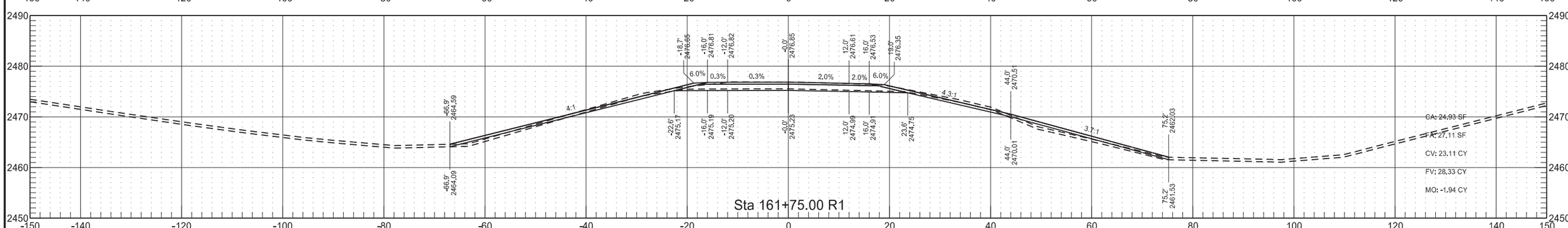


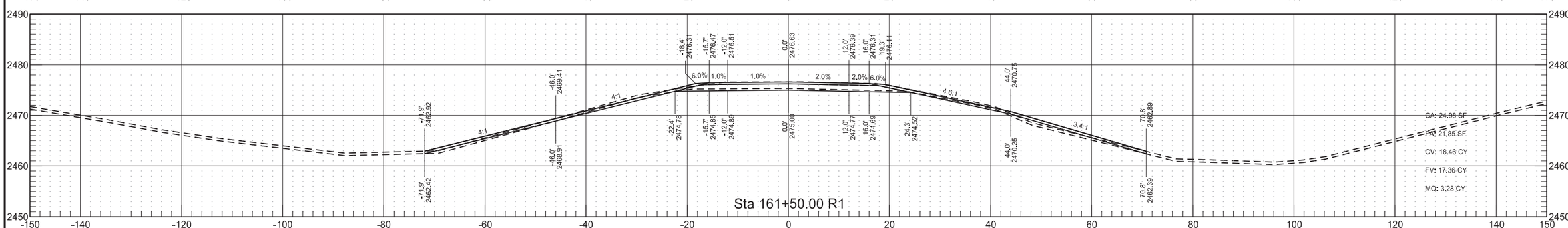


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	200	2

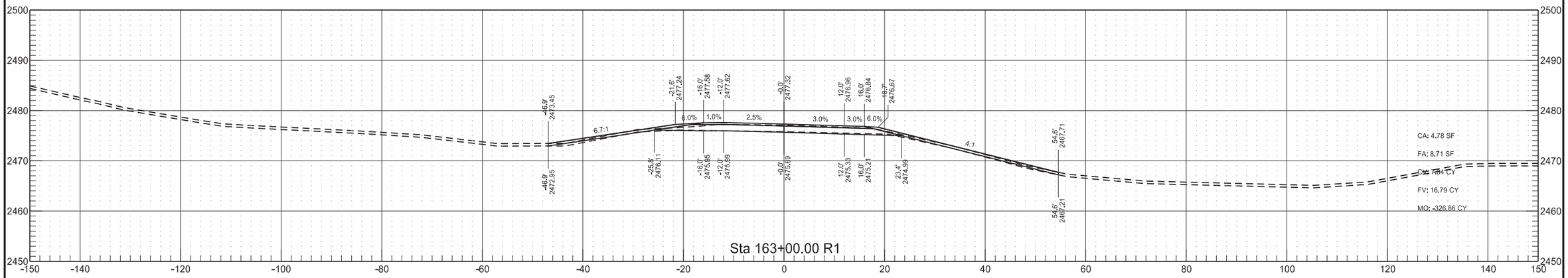


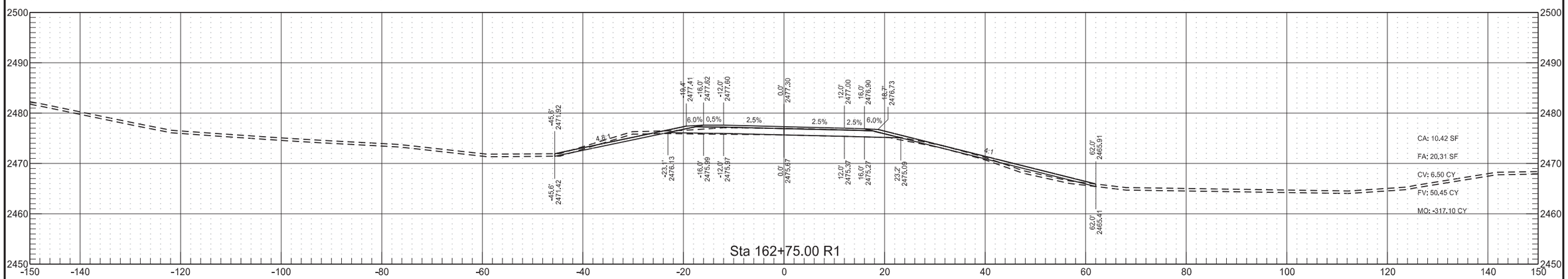


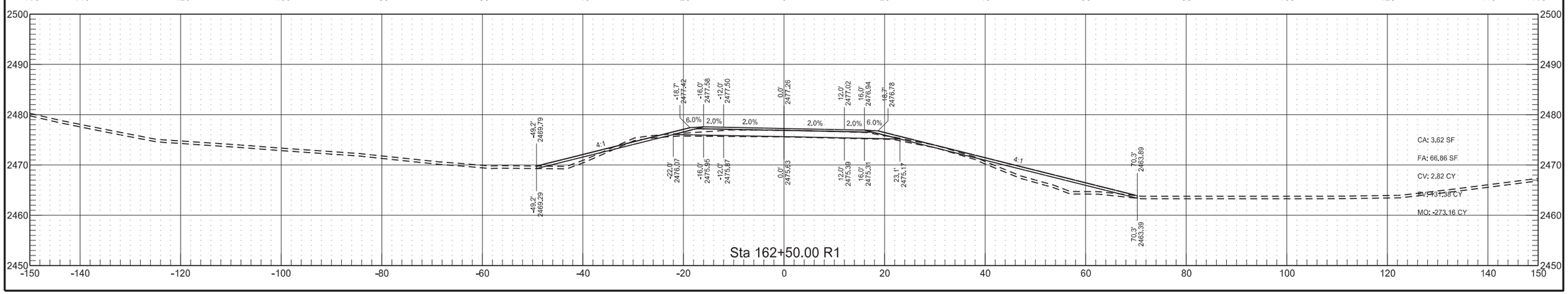




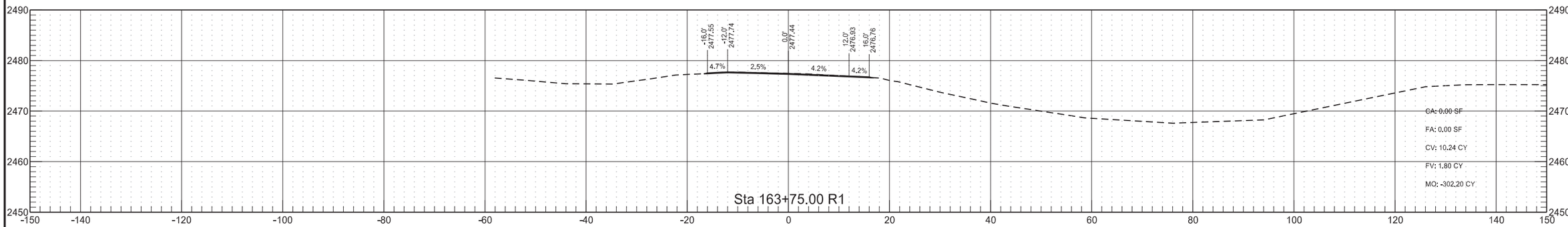
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	200	3

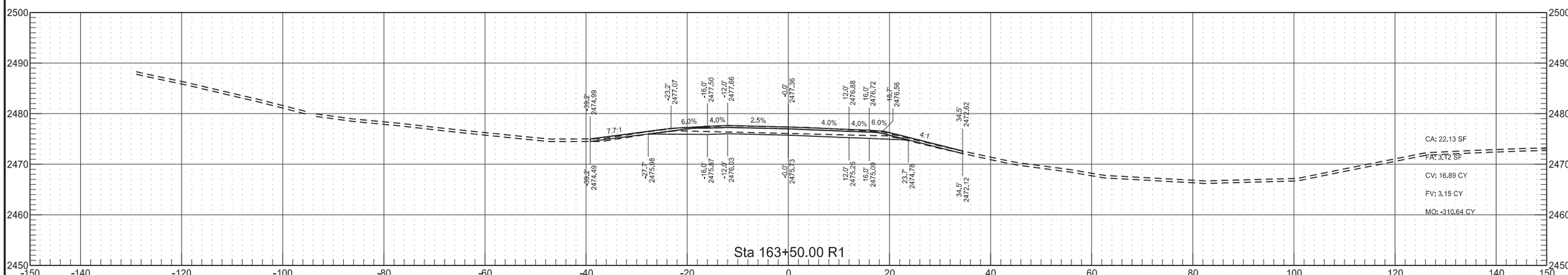


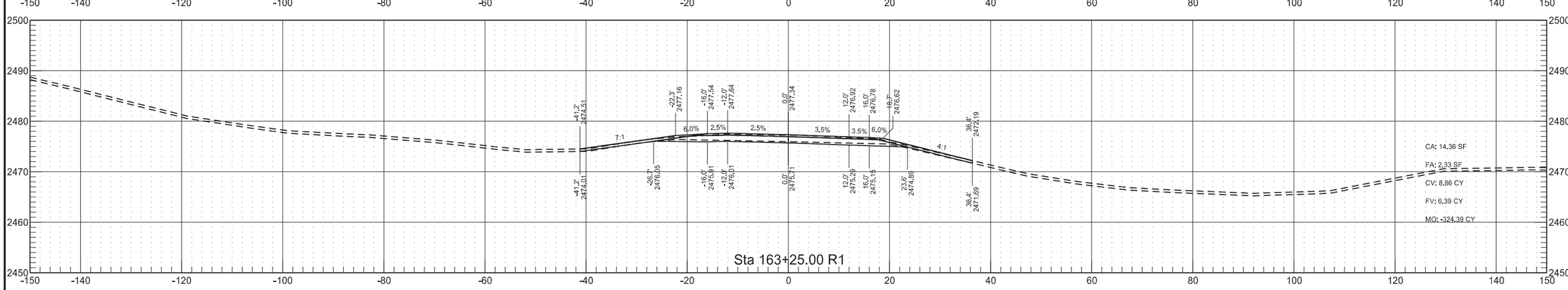




STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-5-094(153)903	200	4







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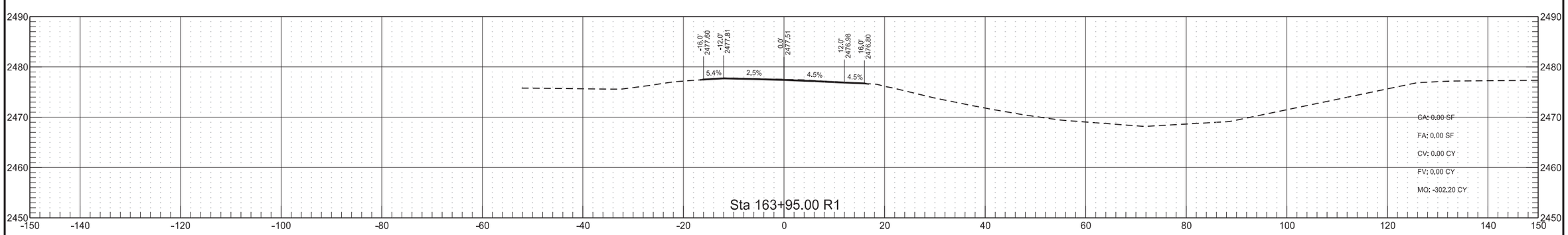
ND	SS-5-094(153)903	200	5



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