DESIGN DATA				
Traffic	Average Daily			
Current 2024	Pass: N/A	Trucks: N/A	Total: <100	
Forecast 2044	Pass: N/A	Trucks: N/A	Total: <100	
Clear Zone Distance: 14'		Design Speed: 45 MPH		
Minimum Sight Dist. for Stopping: 300'		Bridges: N/A		

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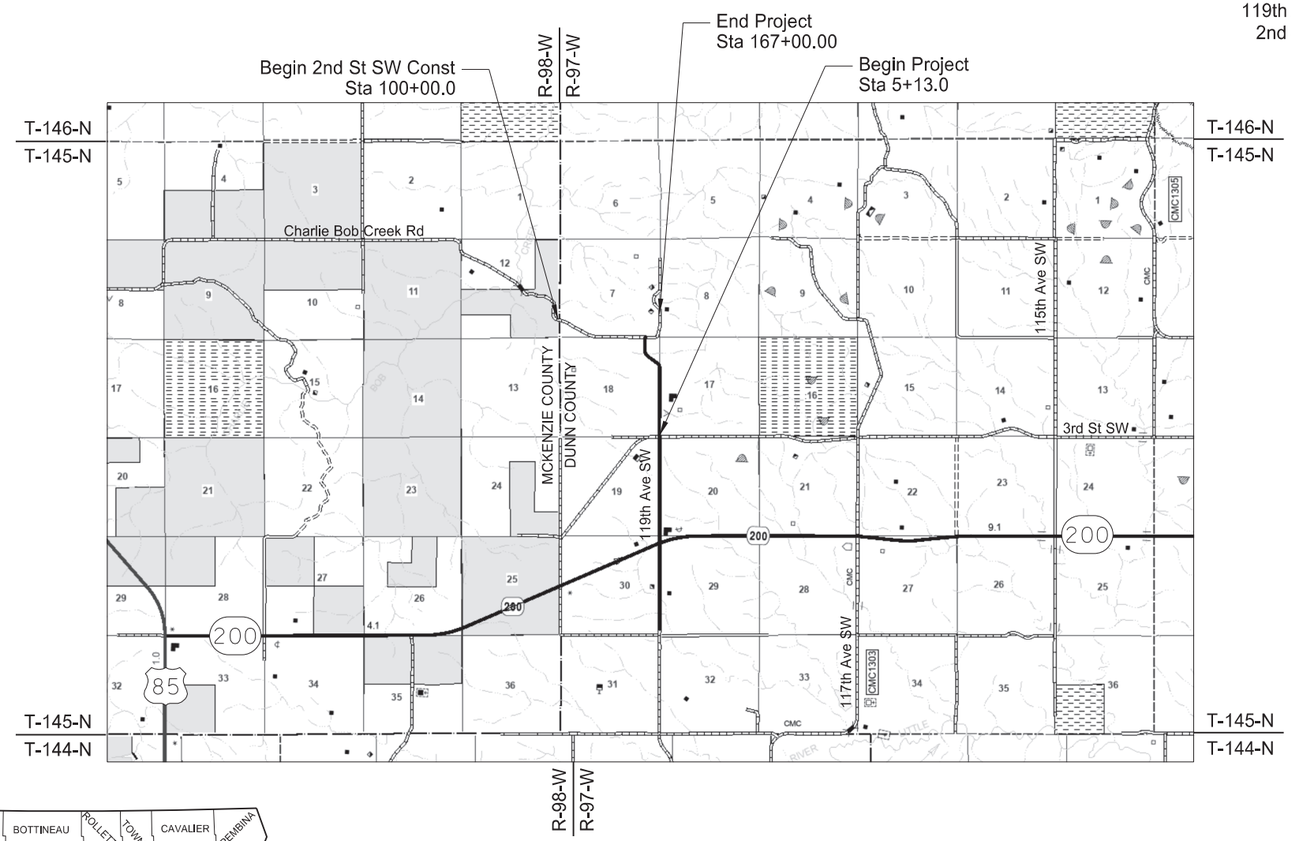
DUNN COUNTY
NORTH DAKOTA

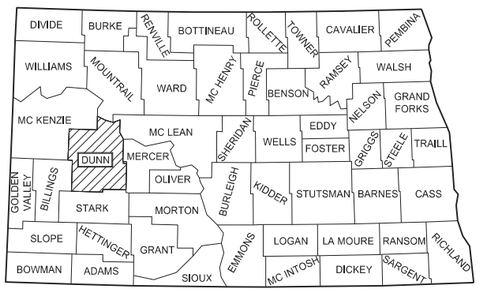
BW-18619.021
119th Ave SW - 2nd St SW to Dunn County Line

Project is located 1 mile North of ND 200 on 119th Ave SW
Grading, Culverts, Aggregate Surfacing & Incidentals

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	7/1/2024
Supplemental Specifications	PROJECT MANUAL

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
119th Ave SW	1.065	1.065
2nd St SW	1.268	2.334





STATE COUNTY MAP

DESIGNER
Dan Green, PE
DESIGNER
Andrew Gottsman, PE
DESIGNER
John Nannenga

BARTLETT & WEST
OFFICE OF PROJECT DEVELOPMENT

Daniel N. Green

BARTLETT & WEST

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

1/6/2025 11:59:13 AM DNG01213 c:\pwdata\bartwest\dng01213\dms20307\001TS.dgn

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PLAN SECTIONS

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10	1	Basis of Estimate
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30	1 - 2	Typical Sections
51	1	Allowable Pipe List
60	1 - 7	Plan & Profile
76	1 - 5	Temporary Erosion Control
81	1 - 1	Survey Coordinate and Curve Data
100	1 - 2	Work Zone Traffic Control
200	1 - 45	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, 30,31,32,33	Symbols
D-101-40	Cross Section Legend
D-203-8	Standard Rural Approaches
D-256-1	Erosion And Siltation Controls
D-260-1	Erosion And Siltation Controls - Silt Fence
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-704-11, 11A	Construction Sign Details - Warning Signs
D-704-13	Barricade And Channelizing Device Details
D-704-14	Construction Sign Punching And Mounting Details
D-704-15	Road Closure Layouts
D-704-22	Construction Truck And Temporary Detour Layouts
D-704-26	Miscellaneous Sign Layouts
D-704-50	Portable Sign Support Assembly
D-708-6	Erosion And Siltation Controls - Median Or Ditch Inlet Protection
D-714-1	Reinforced Concrete Pipe Culverts And End Sections (Round Pipe)
D-714-4	Round Corrugated Steel Pipe Culverts And End Sections
D-714-25	Transverse Mainline Pipe Installation Detail - Pipes More Than 4 Feet Below Top of Subgrade
D-714-26	Transverse Mainline Pipe Installation Detail - Pipes 4 Feet or Less Below Top of Subgrade
D-754-82	Object Markers
D-766-1	Mailbox Location Details

SPECIAL PROVISIONS

Number	Description
SP 1	Temporary Erosion and Sediment Best Management Practices
SP 2	Utility Coordination
SP 6	Soil Stabilization

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Revised 2/7/2025 Revised 2/14/2025	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

100-P01 **COORDINATION OF PROJECTS:** 3rd St SW is being constructed immediately adjacent to this project. Coordinate construction activities with Dunn County, the Engineer in the field, and adjacent contractors.

105-P01 **UTILITIES:** The vertical and horizontal locations shown in the plans are approximate. Plan locations should not be interpreted as exact for bidding or construction purposes.

105-P02 **UTILITIES:** Notify all utility owners of the project schedule as specified in Section 105.03, "Cooperation with Utility Owners".

Coordinate and perform construction activities in a manner that accommodates the utility coordination requirements included in the Special Provision in their existing locations. Utility companies may require a representative be present at the time of construction. It is the contractor's responsibility to facilitate coordination at the time of construction.

It is the contractor's responsibility to protect all utilities within the construction limits.

105-P03 **UTILITIES**: Contractor will coordinate the location of all pipelines that cross the project. Use a hydrovac truck along the length of the entire utility crossing. A qualified representative from each pipeline must be present during the hydrovac excavation. Additional fill material may be required during construction to obtain adequate cover over pipelines or by other means indicated by the pipeline utility to allow construction equipment to pass over these locations. Follow all respective utility standards when working in the vicinity of the utility. Include costs for this work in item bid "Common Excavation – Type C".

108-P01 **WEEKLY PLANNING MEETING:** Hold a weekly on-site meeting to update Dunn County, the Engineer in the field, utility companies, and any other interested parties on upcoming activities & sequencing for the project.

201-P01 **CLEARING AND GRUBBING:** Clearing and grubbing includes the removal and disposal of trees (all sizes), shrubs, stumps, roots, brush, signs and supports, and other surface objects from the excavation and embankment areas along this project. Additional trees may need to be removed adjacent to the construction limits at the Engineer's request.

202-P01 **REMOVAL OF END SECTIONS:** The removal of end sections shall be included in the bid price or "Removal of Culverts – All Types and Sizes"

202-P02 **REMOVAL OF PIPES:** Salvage all pipes removed that are in good condition as determined by the engineer in the field and deliver to Dunn County Highway Department in Killdeer, ND. Include costs for salvaging and transporting removed pipe and end sections in the bid price for "Removal of Culverts – All Types & Sizes".

203-P01 **AVERAGE HAUL:** No average haul has been computed for this project.

203-P02 **SHRINKAGE:** Thirty percent (30%) additional volume is included for shrinkage in earth embankment.

203-P03 **COMMON EXCAVATION – TYPE C:** Backslope rounding is required on the cut sections. Include in the bid price for "Common Excavation – Type C".

Complete the finish grading work around the existing facilities that are in the construction area. Level earth mounds, etc. that remain around the facilities. Install ditch blocks, as needed, per the Engineer's request, if field conditions merit. Include this work in the bid price for "Common Excavation – Type C".

A quantity of water has been included in the project for use during earthwork. Use the water during earthwork operations to ensure a stable, compacted embankment through the project corridor.

203-P04 **COMMON EXCAVATION - SUBCUT:** 500 CY of "Common Excavation – Subcut" is included to be used at the Engineer's discretion. Construction requirements are outlined in Section 203.04 E, with the exception that replacement material may consist of native soil in lieu of subcut aggregate and the material will not be tested, if the Engineer determines aggregate material is required.

203-P05 **COMMON EXCAVATION – WASTE:** Any waste will be placed at the direction of the Engineer along the project. Include all costs for placing waste in the price bid for "Common Excavation Type C."

251-P01 **SEEDING CLASS II:** Use the following seed mix for "Seeding Class II" (amounts are measured in lbs. of pure live seed per acre): Alfalfa – 9, Western Wheatgrass – 4, Intermediate Wheatgrass – 5, Slender Wheatgrass – 2, Oats – 32; Total - 52

302-P01 **AGGREGATE SURFACE COURSE:** Salvage the existing gravel surfacing from the road surface and use as temporary traffic surfacing until Aggregate Surface Course Class 13 can be placed. Include all cost associated with this in the price bid for "Common Excavation – Type C".

302-P02 **AGGREGATE SOURCES:** Section 106.02D of the Standard Specifications will not be enforced.

704-P01 **TRAFFIC CONTROL:** Make the embankment through the project traversable with 4:1 slopes or flatter the same day it is placed/removed, or provide 24 hour flagging at the contractor's expense. Traffic needs to be maintained in large cut and fill areas, the road needs to stay open at all times.

704-P02 **TRAFFIC CONTROL FOR CONSTRUCTION OPERATIONS:** Traffic control for construction operations consists of a temporary road closure. Traffic Control Devices will comply with the following Standard Drawings:

D704-	7, 8, 9, 11, 13, and 14 are applicable
D704-15	Layout Type A: for a one lane closure for culvert work
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The required traffic control signs and devices are included in the "Traffic Control Devices List" and will be measured and paid for at the Contract Unit price for each device. Additional devices are the Contractor's responsibility.

714-P01 **PIPE CONDUIT:** Use Aluminized Type II culverts installed to manufacturer's recommendations for all centerline and section line culverts. Use Galvanized or Aluminized Type II culverts installed to manufacturer's recommendations for all field drive & private drive locations. Include pipe bedding, whether foundation fill or suitable backfill material as determined by the engineer, in the price bid for Pipe Conduit.

720-P01 **MONUMENTS:** Coordinate with the Engineer to ensure all public land corners are properly documented and referenced before disturbing the area immediately around the corners. The Engineer is responsible for resetting all public land corners

752-P01 **FENCE:** Coordinate with Dunn County Highway Department for fencing requirements and details. Allow the fencing contractor 2-3 weeks to remove existing fence and
install temporary fence to allow construction to proceed.

752-P02 **FENCE:** Do not disturb the decorative fence along the project from Sta 148+38 to Sta 167+00.

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REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 2-7-25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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766-P01 **MAILBOXES:** Coordinate any changes to mailboxes with the appropriate land occupant. Replacement of any mailboxes will be in accordance with D-766-1.

980-P01 **CATTLE GUARD RESET:** Where cattle guards are removed and reset, coordinate with the adjacent landowner and Dunn County. Give a minimum 14-day notice to adjacent landowners to allow for necessary preparations. Include all costs associated with resetting cattle guards including excavation, surface preparation, bedding, and incidentals in the price bid for "Cattle Guard Reset."

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

Added 2/7/2025	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

766-P01 **MAILBOXES:** Coordinate any changes to mailboxes with the appropriate land occupant. Replacement of any mailboxes will be in accordance with D-766-1.

900-P01 **APPROACHES:** Proposed approaches for the project are not modeled. Contractors should be aware that field conditions and landowner access may modify the location of an approach installation. Unit prices for applicable bid items will be paid to construct the approach, but no additional compensation will be provided for moving an approach location.

980-P01 **CATTLE GUARD RESET:** Where cattle guards are removed and reset, coordinate with the adjacent landowner and Dunn County. Give a minimum 14-day notice to adjacent landowners to allow for necessary preparations. Include all costs associated with resetting cattle guards including excavation, surface preparation, bedding, and incidentals in the price bid for “Cattle Guard Reset.”

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PE-7616
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DATE: 2-7-25
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Revised 2/7/2025	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
201	0330	CLEARING & GRUBBING	L SUM	1	1
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	301	301
202	0170	REMOVAL OF CULVERTS-ALL TYPES & SIZES	LF	571	571
203	0103	COMMON EXCAVATION-TYPE C	CY	69198	69198
203	0109	TOPSOIL	CY	11442	11442
203	0113	COMMON EXCAVATION-WASTE	CY	4796	4796
203	0138	COMMON EXCAVATION-SUBCUT	CY	500	500
216	0100	WATER	M GAL	965	965
251	0200	SEEDING CLASS II	ACRE	28.64	28.64
251	2000	TEMPORARY COVER CROP	ACRE	28.64	28.64
253	0061	SOIL STABILIZATION	ACRE	52.46	52.46
253	0301	BONDED FIBER MATRIX	ACRE	4.82	4.82
255	0101	ECB TYPE 1	SY	476	476
255	0201	TRM TYPE 1	SY	4220	4220
256	0201	RIPRAP GRADE II	TON	81	81
260	0200	SILT FENCE SUPPORTED	LF	280	280
260	0201	REMOVE SILT FENCE SUPPORTED	LF	280	280
261	0112	FIBER ROLLS 12IN	LF	18020	18020
261	0113	REMOVE FIBER ROLLS 12IN	LF	18020	18020
302	0356	AGGREGATE SURFACE COURSE CL 13	TON	13007	13007
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	240	240
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1187	1187
704	1052	TYPE III BARRICADE	EA	6	6
704	1067	TUBULAR MARKERS	EA	100	100
704	1080	STACKABLE VERTICAL PANELS	EA	100	100
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	77	77
714	4105	PIPE CONDUIT 24IN	LF	320	320
714	4106	PIPE CONDUIT 24IN-APPROACH	LF	1333	1333
714	4115	PIPE CONDUIT 36IN	LF	59	59
754	0803	OBJECT MARKERS - TYPE III	EA	4	4
980	0105	CATTLE GUARD 8FT X 34FT	EA	1	1
980	0170	CATTLE GUARD RESET	EA	1	1
980	0171	REMOVE CATTLE GUARD	EA	1	1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BW-18619.021	8	1

Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
201	0330	CLEARING & GRUBBING	L SUM	1	1
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	301	301
202	0170	REMOVAL OF CULVERTS-ALL TYPES & SIZES	LF	571	571
203	0103	COMMON EXCAVATION-TYPE C	CY	69198	69198
203	0109	TOPSOIL	CY	11442	11442
203	0113	COMMON EXCAVATION-WASTE	CY	4796	4796
203	0138	COMMON EXCAVATION-SUBCUT	CY	500	500
216	0100	WATER	M GAL	965	965
251	0200	SEEDING CLASS II	ACRE	28.64	28.64
251	2000	TEMPORARY COVER CROP	ACRE	28.64	28.64
253	0061	SOIL STABILIZATION	ACRE	52.46	52.46
253	0301	BONDED FIBER MATRIX	ACRE	4.82	4.82
255	0101	ECB TYPE 1	SY	476	476
255	0201	TRM TYPE 1	SY	4220	4220
256	0201	RIPRAP GRADE II	TON	81	81
260	0200	SILT FENCE SUPPORTED	LF	280	280
260	0201	REMOVE SILT FENCE SUPPORTED	LF	280	280
261	0112	FIBER ROLLS 12IN	LF	18020	18020
261	0113	REMOVE FIBER ROLLS 12IN	LF	18020	18020
302	0356	AGGREGATE SURFACE COURSE CL 13	TON	13007	13007
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	240	240
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1187	1187
704	1052	TYPE III BARRICADE	EA	6	6
704	1067	TUBULAR MARKERS	EA	100	100
704	1080	STACKABLE VERTICAL PANELS	EA	100	100
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	199	199
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	77	77
714	4105	PIPE CONDUIT 24IN	LF	320	320
714	4106	PIPE CONDUIT 24IN-APPROACH	LF	1333	1333
714	4115	PIPE CONDUIT 36IN	LF	59	59
754	0803	OBJECT MARKERS - TYPE III	EA	4	4
980	0105	CATTLE GUARD 8FT X 34FT	EA	1	1
980	0170	CATTLE GUARD RESET	EA	1	1
980	0171	REMOVE CATTLE GUARD	EA	1	1

BASIS OF ESTIMATE

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	10	1

CL 13 Aggregate

Mainline 119th Ave SW:
Sta 5+13 to Sta 61+25.37= 5612.37 Ft
(5,612.37 Ft x 14.136 SF) / (27 CF/CY) x (1.875 Ton/CY) = **5,510 TONS**

Mainline 2nd St SW:
Sta 100+00 to Sta 167+00 = 6700 Ft
(6700 Ft x 14.136 SF) / (27 CF/CY) x (1.875 Ton/CY) = **6,577 TONS**

Private Drives:
6 Locations x 40 tons= **240 TONS**

Section Line/Public Roads:
3 Locations x 40 tons= **120 TONS**

Field Approaches:
13 Locations x 20 tons= **260 TONS**

Project ends/Transition material (100 tons each end)= **300 TONS**

TOTAL = 13,007 TONS

Water

20 Gal/Ton for Cl 13 Aggregate
(13,007 Ton x 20 Gal/Ton) x 1 MGal/1,000 Gal) **260 MGal**

10Gal/CY of Embankment:
64,176 CY x 10/1000 = **642 MGal**

Water for Dust Palliative:
25 MGal/Mile for 2.5 miles = **63 MGal**

TOTAL = 965 MGal

Topsoil

Mainline 119th Ave SW:
4-inch depth
(0.333 Ft x 415,267 SF) / (27 CF/CY) = **5,122 CY**

Mainline 2nd St SW:
4-inch depth
(0.333 Ft x 512,424 SF) / (27 CF/CY) = **6,320 CY**

TOTAL = 11,442 CY

Location	Common Excavation - Type C (CY) Pay Item	Embankment (CY)	Embankment Adjusted (CY)*	Common Excavation - Waste (CY)*
	A	B	C = B x 1.30	D = A - C
119th Ave SW (Sta 5+13 to Sta 61+25.37)	30,867	20,285	26,371	4,497
2nd St SW (Sta 100 to Sta 167+00)	38,331	24,855	32,312	6,020
Approaches (Add 200 CY per Approach, 22* Approaches)	0	4,400	5,720	(5,720)
Totals	**69,198**	49,540	64,402	**4,796**

NOTE: This Computation report is not a balance sheet and is for informational purposes only. The Contractor shall calculate their own balance.

* 30% additional Volume is included for shrinkage in earth embankment.

* Any Additional material will be placed at the direction of the engineer along the project.

REGISTERED PROFESSIONAL ENGINEER
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PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	20	1

119th Ave SW

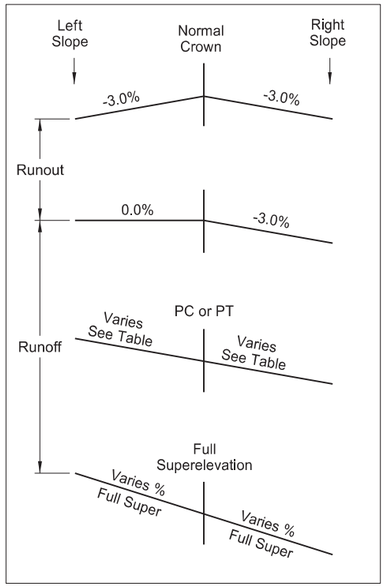
PC 41+28.80
PI 43+34.60
PT 45+08.94
Delta: 54°27'05" LT
Degree: 14°19'26"
Radius: 400.00
Length: 380.14
Tangent: 205.80

Station	Left Slope	Right Slope
39+26.57	-3.0	-3.0
40+13.24	-3.0	0.0
40+99.90	-3.0	3.0
41+86.57	-6.0	6.0
44+51.17	-6.0	6.0
45+37.84	-3.0	3.0
46+24.50	-3.0	0.0
47+11.16	-3.0	-3.0

119th Ave SW

PC 50+55.03
PI 52+61.29
PT 54+35.90
Delta: 54°33'21" RT
Degree: 14°19'26"
Radius: 400.00
Length: 380.87
Tangent: 206.26

Station	Left Slope	Right Slope
48+52.81	-3.0	-3.0
49+39.47	0.0	-3.0
50+26.14	3.0	-3.0
51+12.80	6.0	-6.0
53+78.13	6.0	-6.0
54+64.80	3.0	-3.0
55+51.46	0.0	-3.0
56+38.12	-3.0	-3.0



2nd St SW

PC 101+79.65
PI 102+97.95
PCC 104+15.17
Delta: 13°29'40" RT
Degree: 05°43'46"
Radius: 1000.00
Length: 235.52
Tangent: 118.31

Station	Left Slope	Right Slope
100+00.00	-4.8	4.8
100+99.31	0.0	0.0
102+12.75	4.8	-4.8
103+82.07	4.8	-4.8
104+19.30	3.0	-3.0
104+81.37	0.0	-3.0
105+43.44	-3.0	-3.0

2nd St SW

PC 116+27.41
PI 119+45.27
PCC 122+49.94
Delta: 28°32'06" LT
Degree: 04°35'01"
Radius: 1250.00
Length: 622.53
Tangent: 317.86

Station	Left Slope	Right Slope
114+46.36	-3.0	-3.0
115+33.03	-3.0	0.0
116+19.70	-3.0	3.0
116+74.59	-4.9	4.9
122+02.76	-4.9	4.9
122+57.65	-3.0	3.0
123+44.32	-3.0	0.0
124+30.99	-3.0	-3.0

2nd St SW

PC 150+78.45
PI 153+92.59
PCC 156+11.05
Delta: 76°17'19" LT
Degree: 14°19'26"
Radius: 400.00
Length: 532.60
Tangent: 314.14

Station	Left Slope	Right Slope
149+04.01	-3.0	-3.0
140+79.54	-3.0	0.0
150+54.98	-3.0	3.0
151+27.90	-5.9	5.9
155+61.60	-5.9	5.9
156+34.52	-3.0	3.0
156+99.63	-3.0	2.0

2nd St SW

PC 157+88.21
PI 159+08.98
PCC 160+28.58
Delta: 13°46'20" LT
Degree: 05°43'46"
Radius: 1000.00
Length: 240.37
Tangent: 120.77

Station	Left Slope	Right Slope
156+99.63	-3.0	2.0
157+17.80	-3.0	2.0
157+65.80	-3.0	3.0
158+23.41	-4.2	4.2
159+93.38	-4.2	4.2
160+23.55	-3.0	3.0
160+98.99	-3.0	0.0
161+74.43	-3.0	-3.0

Note: Calculations based on AASHTO method five.
A maximum superelevation of 6% was used.

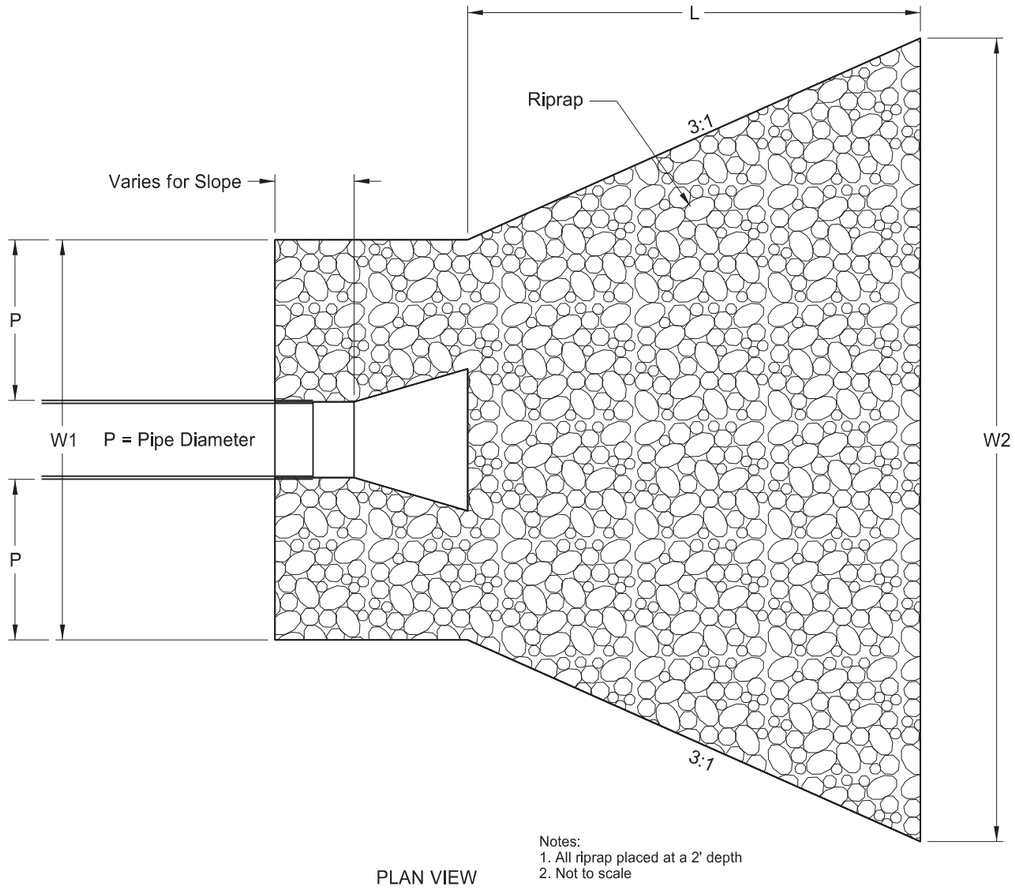
Superelevations

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

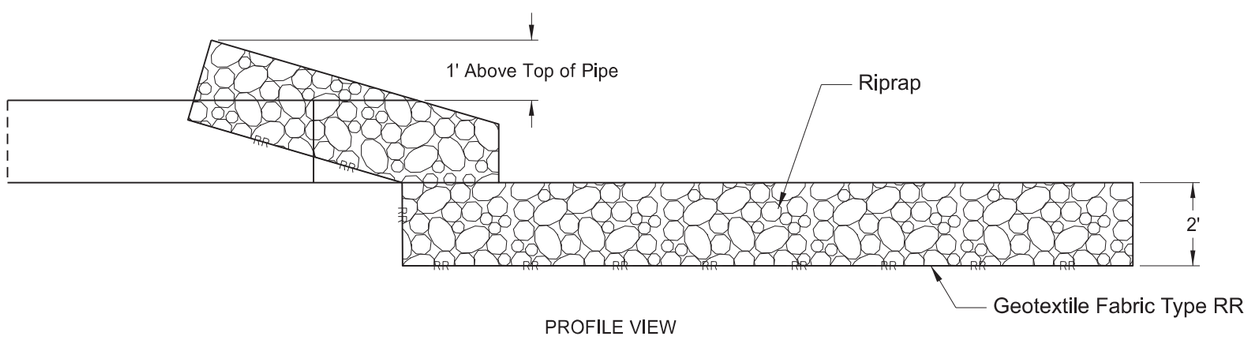
REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	20	2



PLAN VIEW

Notes:
1. All riprap placed at a 2' depth
2. Not to scale



PROFILE VIEW

Riprap Dimensions					
Culvert Diameter (inches)	L (feet)	W1 (feet)	W2 (feet)	Riprap Depth, D (feet)	Riprap Grade II, Tons (CY X 1.7Ton/CY)
24	8	6	11	2	15
36	12	9	17	2	32

NOTE: Riprap Quantity based on a 4:1 Slope

This detail applies to End Sections at:

Station	Pipe Size (IN)	Geotextile Fabric Type RR (SY)	Riprap Grade II (TON)
22+40 Rt	24	14	15
46+00 Rt	24	14	15
54+40 Rt	36	33	32
154+00 Rt	24	14	15
	Total	77	81

Pipe Riprap Detail

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

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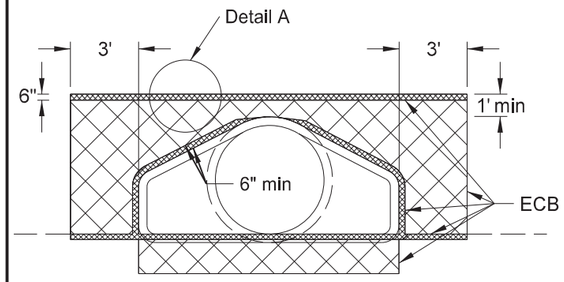
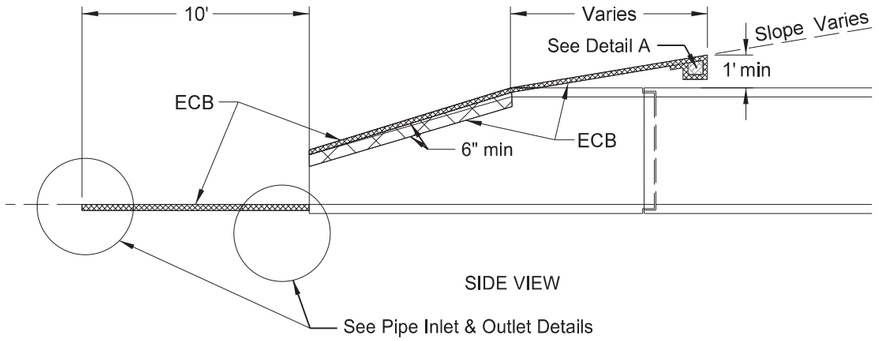
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

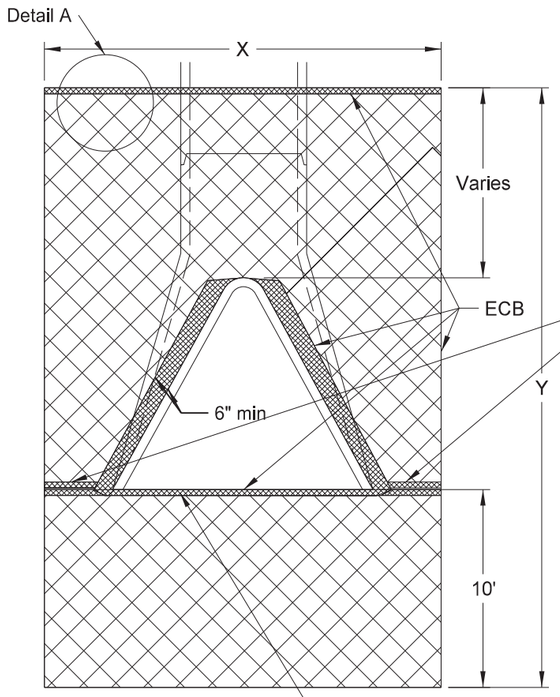
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	20	3



FRONT VIEW



SIDE VIEW

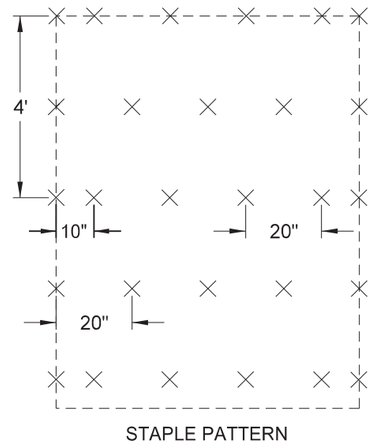


TOP VIEW

Tuck this end a minimum of 6" into the embankment.

Inlet side - see applicable detail for pipe inlet.
Outlet side - see applicable detail for pipe outlet.

NOTE: Tuck the ECB a minimum of 6" into the embankment (against the flared end section) around the opening of the flared end section.

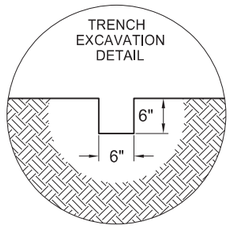


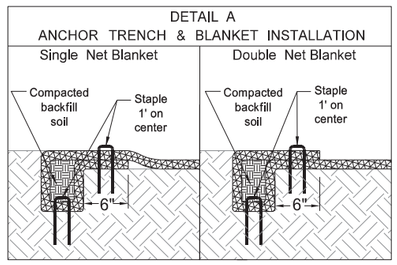
STAPLE PATTERN

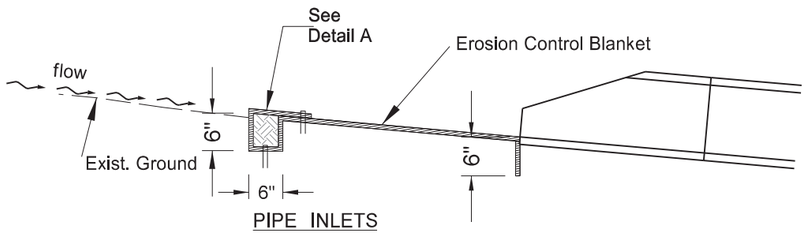
Erosion Control Blanket (ECB)								
Location to be Protected Station	Culvert Type Appr/CL	Pipe Diam (Inch)	No	Unit Quantity (SY)	Total Quantity Type 1 (SY)	Type 2 (SY)	Type 3 (SY)	Type 4 (SY)
19+17 Lt	Appr	24		24	24			
19+17 Rt	Appr	24		24	24			
21+43 Rt	Appr	24		24	24			
31+63 Rt	Appr	24		24	24			
38+40 Rt	CL	24		20	20			
39+69 Lt	Appr	24		24	24			
41+70 Rt	Appr	24		24	24			
49+96 Lt	Appr	24		24	24			
49+96 Rt	Appr	24		24	24			
52+20 Lt	Appr	24		24	24			
59+16 Lt	Appr	24		24	24			
106+60 Lt	Appr	24		24	24			
107+87 Rt	Appr	24		24	24			
128+24 Rt	Appr	24		24	24			
128+98 Lt	Appr	24		24	24			
129+58 Rt	Appr	24		24	24			
137+86 Rt	Appr	24		24	24			
149+43 Lt	Appr	24		24	24			
149+43 Rt	Appr	24		24	24			
160+93.5 Rt	Appr	24		24	24			
Total (SYs)					476			

APPROACH CULVERTS				
DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
15	9.0	20.0	176.0	20
18	9.5	20.7	190.7	22
21	9.5	21.0	190.9	22
24	10.5	21.6	214.1	24
27	11.0	22.0	226.3	25
30	11.6	22.5	241.5	27
36	12.7	23.3	268.8	30
Note: Quantities based on 8:1 slope.				

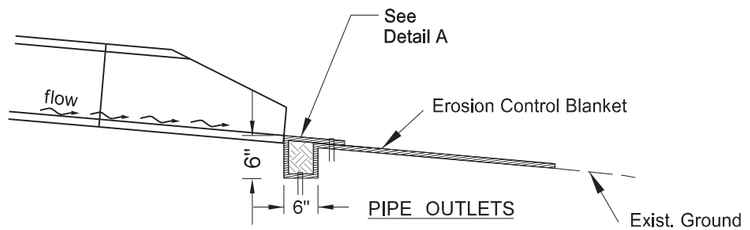
CENTERLINE CULVERTS				
DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
24	10.5	17.6	172.1	20
27	11.0	18.0	182.3	21
30	11.6	18.5	195.1	22
36	12.7	19.2	216.7	24
Note: Quantities based on 4:1 slope.				







PIPE INLETS



PIPE OUTLETS

Erosion Control at Culvert Flared End Sections

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
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Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

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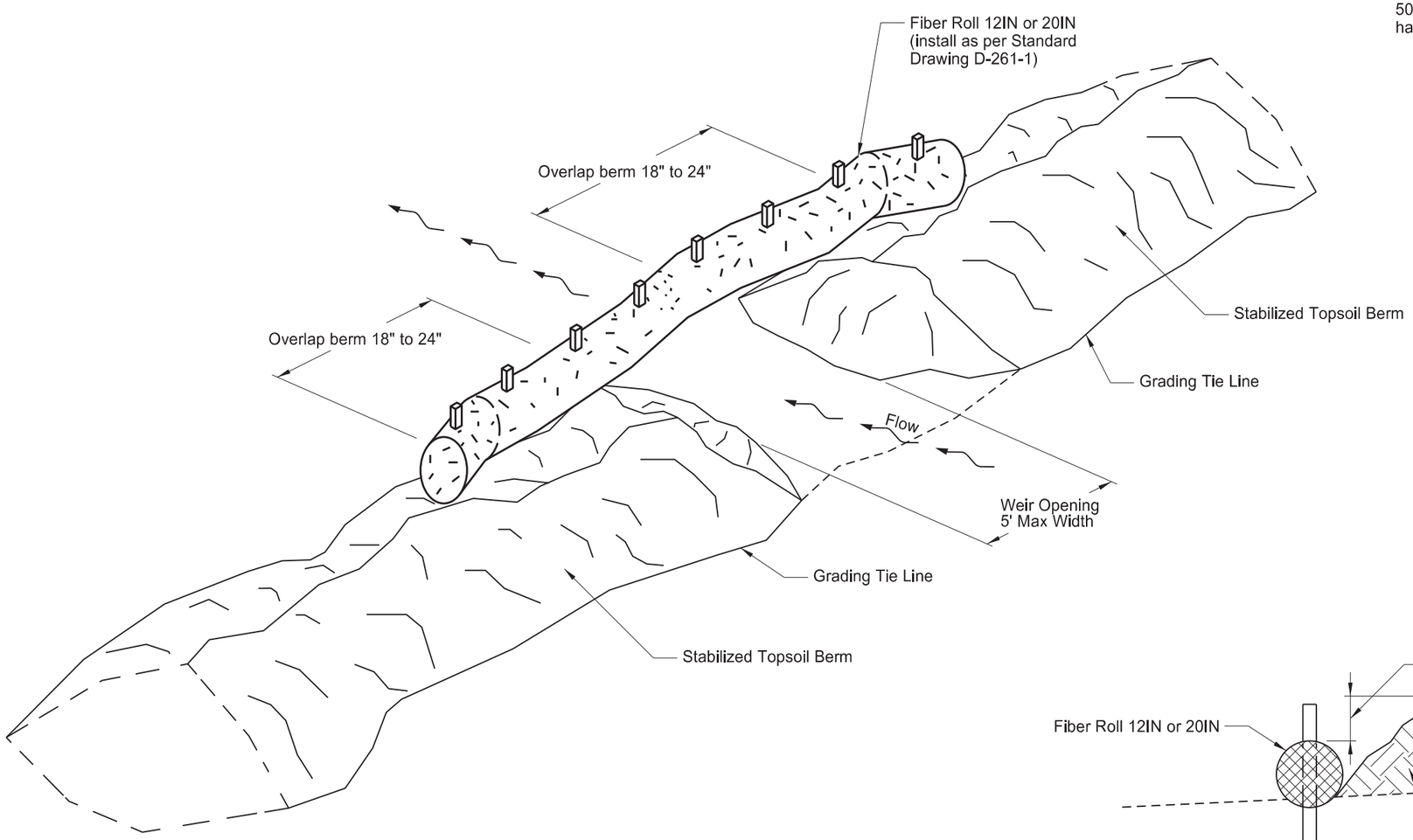
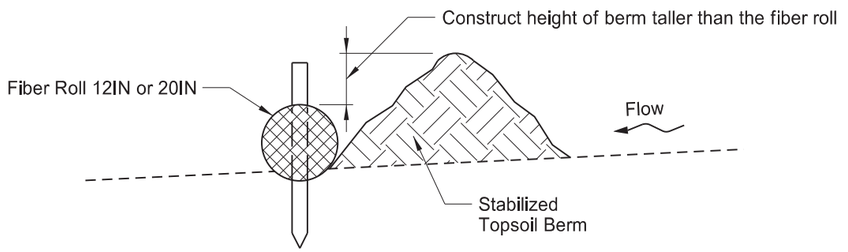
	ND	BW-18619.021	20	4

500 LF of Fiber Roll 12IN and 500 LF of Remove Fiber Roll 12IN have been included in the quantities for use at weirs.





Topsoil Berm Detail

Notes:

1. Windrow the existing topsoil from the foreslope to create a berm at the grading tie line.
2. Stabilize berms in accordance with the Construction General Permit.
3. Place weirs intermittently throughout the length of the berm to allow stormwater to drain through the berm.
4. Avoid placing weirs adjacent to waterbodies.
5. Install fiber rolls as the weirs are created in the topsoil berm.
6. The Engineer will measure and pay for fiber rolls separately.
7. The Engineer will measure and pay for removal of fiber rolls separately when required by the specifications.
8. The Engineer will measure and pay for soil stabilization and temporary cover crop separately.
9. Include the costs to create, maintain, and dismantle the berm in the unit price bid for "Topsoil".

Temporary Topsoil Berm and Weir Detail

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
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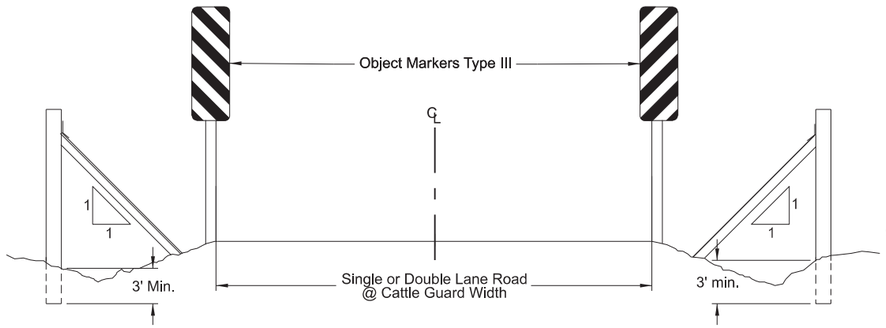
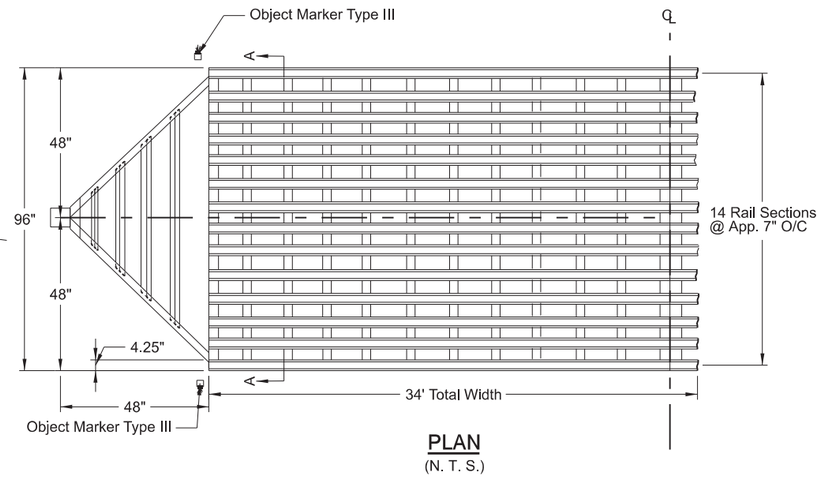
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	20	5



TYPICAL INSTALLATION DETAIL
(N. T. S.)



PLAN
(N. T. S.)

Design Load:
AASHTO HS25-44 loading and U.S.F.S. U80 loading.

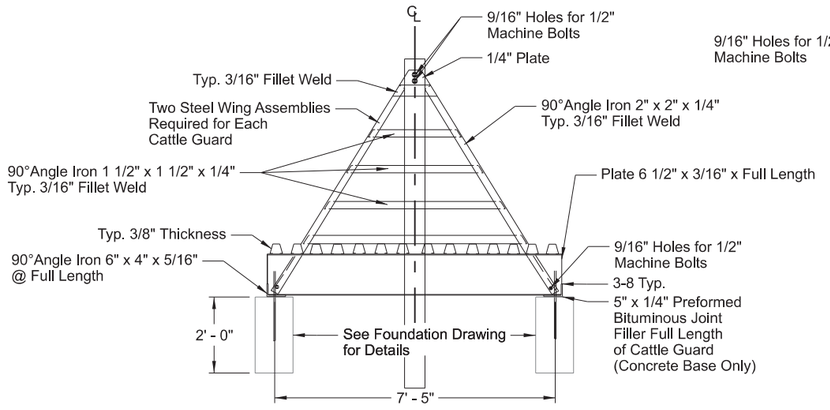
Structural Steel: All Structural Steel except Rail Sections shall conform to AASHTO designation M183-70 (ASTM A36.) Rail Sections shall be either formed sections made from high strength steel conforming to ASTM A500, Grade B. Bolts and Pins shall conform to ASTM designation A307.
Welding and fabrication shall be done in accordance with Section 616 of the Standard Specifications or Special Project Specifications.

Timber: Shall be rough cut No. 1 Douglas Fir, or Western Larch and shall be treated in accordance with AWPA C-2 using one of the following treatments:
(1) Pentachlorophenol Meeting AWPA P-8 using and AWPA P-9 Type A Solvent to a retention of 0.37bl/ft^3;
(2) Creosote meeting AWPA P1/P13 to a retention of 8.11 lb/ft^3.
Penetration shall be as specified in AWPA C-2

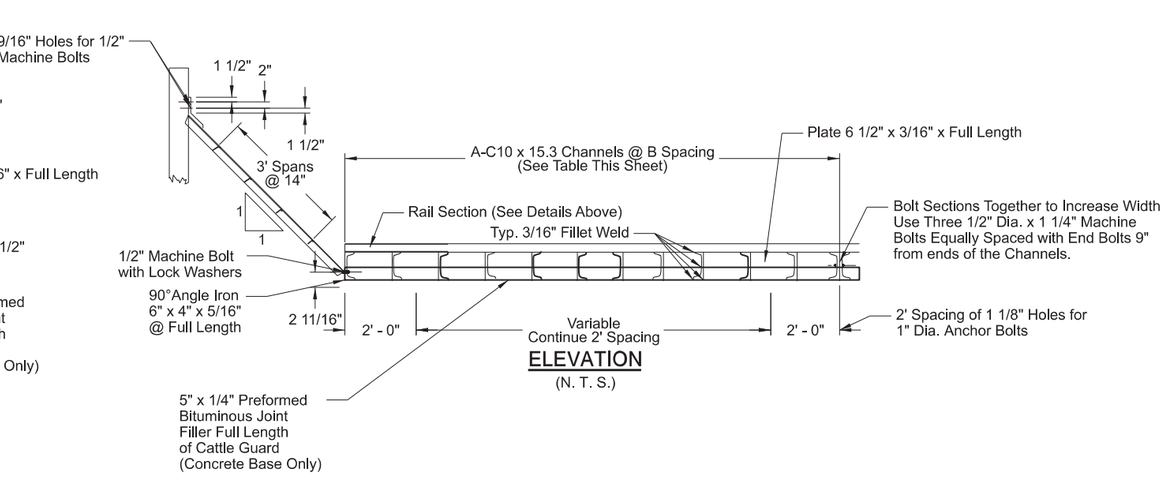
Paint: All metal parts of the cattle guard except the anchor pins shall be painted in accordance with Sections 616 of the Standard Specifications. Paint system 1 or 2 shall be used for coastal environments. Paint system 4 shall be used in milder climates. The color of the final coat shall be determined by the engineer of shall be as indicated in other documents.

Anchor Pins: Shall be galvanized in accordance with AASHTO designation M111 (ASTM A123)

Working Drawing: Shall be stamped and signed by a licensed Professional Engineer.



SECTION A-A
(N. T. S.)



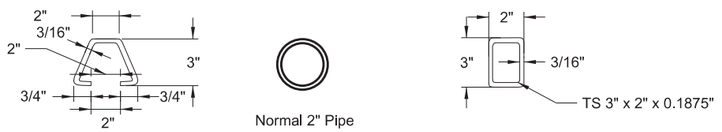
ELEVATION
(N. T. S.)

Note: (N. T. S.) Not To Scale

Channel Spacing (All Dimensions in Inches)						
Cattle Guard Width	96	120	144		168	
Loading	U80	U80	U80	HS25	U80	HS25
A (Number)	7	9	10	9	12	10
B (Spacing)	16	15	16	18	15.4	16.7

NOTE: Single Lane Structures shall be minimum 14' - 0" width. Other widths are to be used only in Combination to construct wider single or double lane Structures

OBJECT MARKER TYPE 3
See Standard Drawing D-754-82 for Details



RAIL SECTIONS
(N. T. S.)

Cattle Guard General Details

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
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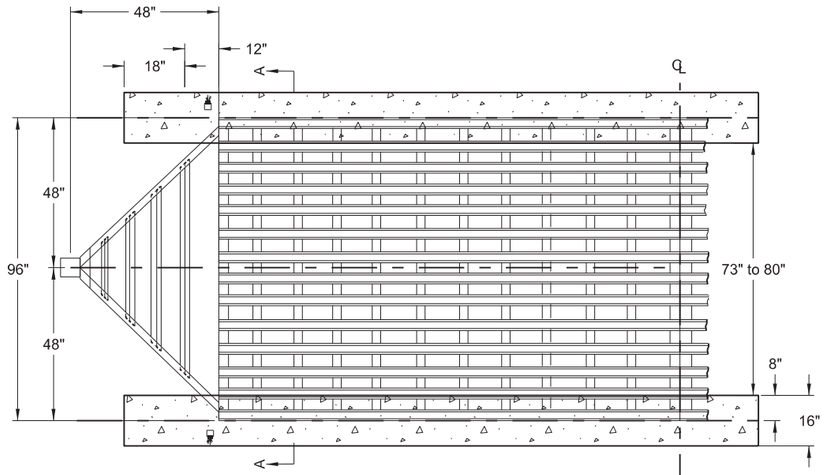
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	20	6



FOUNDATION PLAN
(N. T. S.)

Specifications:
Materials and construction shall be in accordance with USDA-Forest Service General Provisions and Standard Specifications for Construction of Roads and Bridges, current edition.

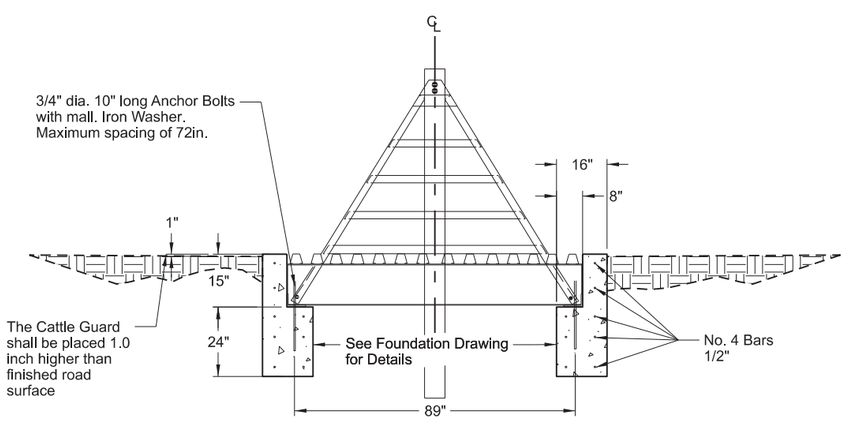
Design:
Cattle Guard is designed for AASHTO HS25-44 loading, other designs are available through the Bridge Section.

Concrete:
The concrete foundation is designed for Cast-In-Place concrete construction using Section 602 - Concrete Structures. If the contractor chooses to use Precast construction, he shall submit drawing and calculations showing the location of the lift points. In adition, the contractor will be required to provide a 3 inches minimum depth leveling course meeting Standard Specification 606.04, upon which the Precast Unit is set.

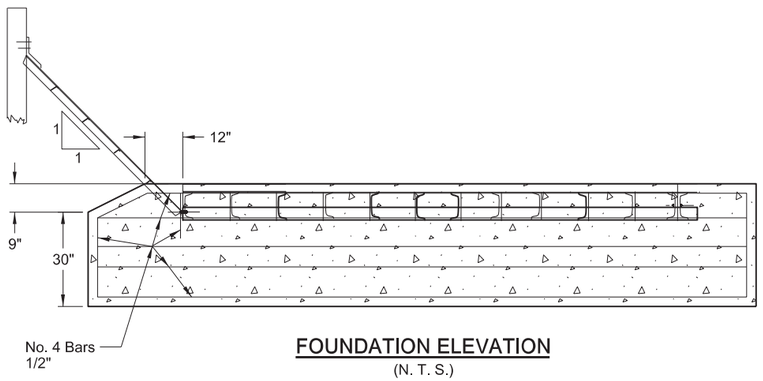
Reinforcing:
Reinforcing Steel shall be AASHTO M31 Grade 40 or 60 and shall have minimum cover not less than 2 inches. Cutting and bending shall conform to ACI 315.

Hardware:
Drift Pins shall be AASHTO M31 Grade 40 or 60 with cutting conforming to ACI 315. Bolts shall be ASTM A307.

1. Rail spacing must not exceed 7.5 inches center to center and the opening between rails must be similar to those shown on the drawing.
2. Roadway width and Cattle Guard width must meet the requested dimensions.
3. Design calculations showing that the Precast meets the applicable AASHTO Specifications must be submitted by a registered Professional Engineer experienced in Cattle Guard Designs.
4. All materials must be new and must have a material certification from a recognized National Organization when completed Cattle Guard is Delivered.
5. Work Drawings must be approved by the Engineer before any fabrication is begun. Shall be stamped and signed by a Licensed Professional Engineer.



SECTION A-A
(N. T. S.)



FOUNDATION ELEVATION
(N. T. S.)

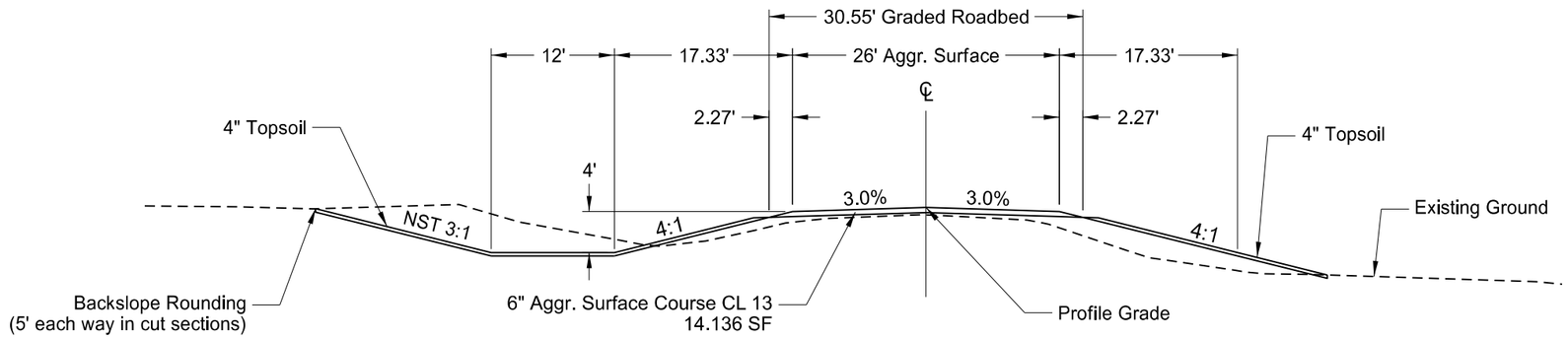
Cattle Guard Foundation Details

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

Revised 2/7/2025	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	30	1



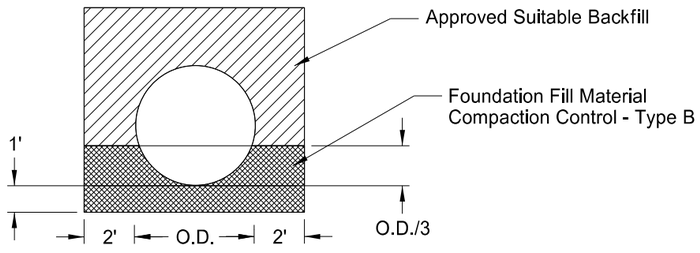
IN CUT

Typical Section

119th Ave SW Sta 5+13.0 to Sta 61+20
2nd St SW Sta 100+00 to Sta 167+52.25

IN FILL

Centerline Pipe Bedding Detail



NST = Not Steeper Than

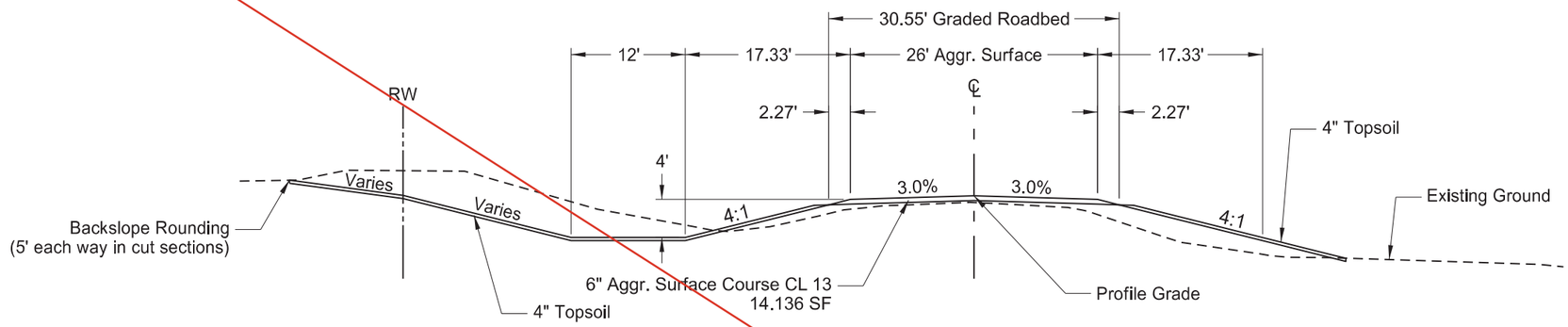
REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 2-7-25
NORTH DAKOTA

Typical Sections

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND Highway 200 to the County Line

Dunn County, ND

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	30	1



IN CUT

Typical Section

119th Ave SW Sta 5+13.0 to Sta 61+25.37
2nd St SW Sta 100+00 to Sta 167+00

IN FILL

Typical Sections

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

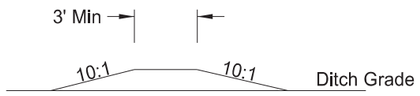
Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

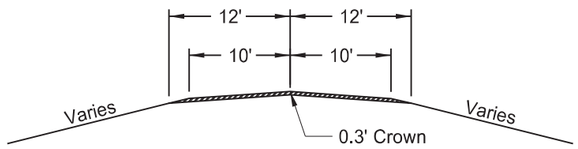
1/6/2025 1:25:00 PM DNG01213 c:\pwdata\bartwest\dng01213\dms20307\030TP_001_Dunn County.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	30	2

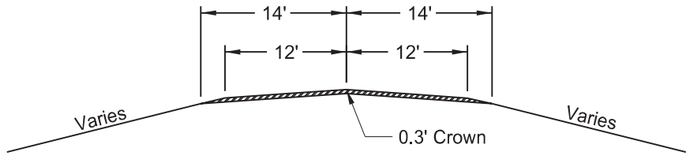
DITCH BLOCK



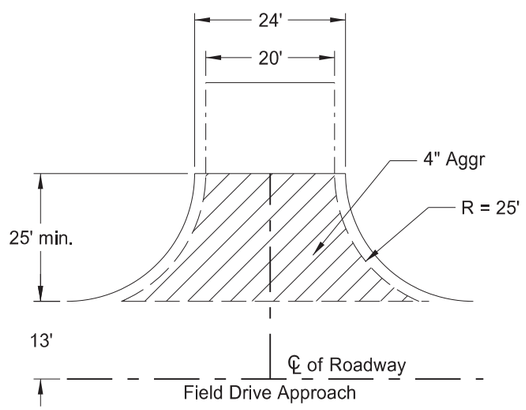
FIELD DRIVE APPROACH

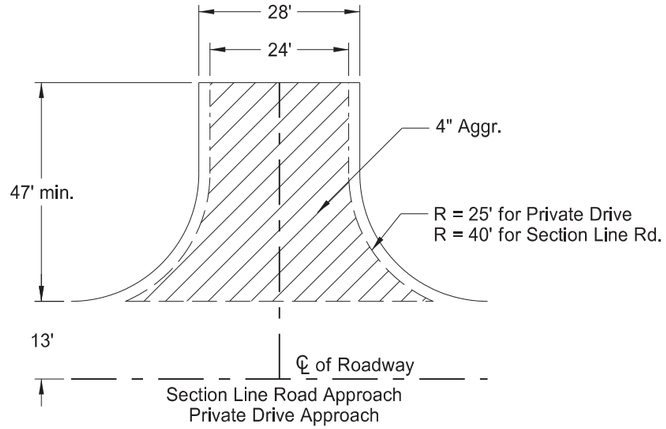


SECTION LINE & PRIVATE DRIVE APPROACH



NOTE:
This detail sheet is to be used with Standard Drawing D-203-8





BASIS OF ESTIMATE (Aggregate Surface Course CL13)
Section Line Rd. Approach = 40 Ton
Private Drive Approach = 40 Ton
Field Drive Approach = 20 Ton

Typical Section Details

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

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Revised	2/7/2025	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
Revised	2/14/2025	ND	BW-18619.021	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	(*) End Sections		Applicable Backfill
				In	Bid Item	LF		In	Type		In	Begin EA	End EA	
13+00	40' Lt	13+00	51' Rt	24	Pipe Conduit	91	Corrugated Steel Pipe	24	A	2	0.064	FES	FES	Standard D-714-28[1]
18+56	36'.3 Lt	19+17	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
18+56	36.3' Rt	19+17	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
20+71	36.3 Rt	21+43	36.3' Rt	24	Pipe Conduit - Approach	73	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
22+40	23" Lt	22+40	24' Rt	24	Pipe Conduit	47	Corrugated Steel Pipe	24	A	2	0.064	FES	FES	Standard D-714-28[1]
31+02	36.3' Rt	31+63	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
38+40	23' Lt	38+20	23' Rt	24	Pipe Conduit	46	Corrugated Steel Pipe	24	A	2	0.064	FES	FES	Standard D-714-28[1]
39+08	36.3' Lt	39+69	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
40+99	39.5 Rt	41+70	40.7' Rt	24	Pipe Conduit - Approach	75	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
46+00	25' Lt	46+00	50' Rt	24	Pipe Conduit	75	Corrugated Steel Pipe	24	A	2	0.064	FES	FES	Standard D-714-28[1]
49+35	36.3' Lt	49+96	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
49+35	36.3' Rt	49+96	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
51+51	36.3' Lt	52+20	36.3' Lt	24	Pipe Conduit - Approach	75	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
54+40	28' Lt	54+40	31' Rt	36	Pipe Conduit	59	Corrugated Steel Pipe	36	A	2	0.064	FES	FES	Standard D-714-28[1]
59+16	36.3' Lt	59+96	36.3' Lt	24	Pipe Conduit - Approach	80	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
106+11	34.3' Lt	106+31	34.3' Lt	24	Pipe Conduit - Approach	20	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
106+60	36.3' Lt	107+21	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
107+87	36.3' Rt	108+62	36.3' Rt	24	Pipe Conduit - Approach	76	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
127+63	36.3' Rt	128+24	33' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
128+18	36.3' Lt	128+98	36.3' Lt	24	Pipe Conduit - Approach	80	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
128+97	36.3' Rt	129+58	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
137+25	36.3' Lt	137+86	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
137+25	36.3' Rt	137+86	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
148+82	36.3' Lt	149+43	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
148+82	36.3 Rt	149+43	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A
154+00	24' Lt	154+00	37' Rt	24	Pipe Conduit	61	Corrugated Steel Pipe	24	A	2	0.064	FES	FES	Standard D-714-28[1]
160+46.5	32.3' Rt	160+93.5	32.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A	2	0.064	FES	FES	Specification 714.04 A

Corrugations: **2** = 2-2/3"x1/2"
3 = 3"x1"
5 = 5"x1"

Coatings: **Z** = Zinc
A = Aluminum

Spiral Ribs: **3/4** = 3/4"x3/4"@7-1/2"
1 = 3/4"x1"@11-1/2"

[1] Replace bedding detail with detail on Sec 30 Sht 1
(*) End sections are measured and paid for separately for pipe extensions.
FES = Flared End Section
TES = Traversable End Section

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 2-14-25
NORTH DAKOTA

Pipe List

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND Highway 200 to the County Line

Dunn County, ND

Revised 2/7/2025	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	(*) End Sections		Applicable Backfill
				In	Bid Item	LF		In	Type		In	Begin EA	End EA	
13+00	40' Lt	13+00	51' Rt	24	Pipe Conduit	91	Corrugated Steel Pipe	24	A	2	0.064	FES	FES	Standard D-714-28[1]
18+56	36'.3 Lt	19+17	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
18+56	36.3' Rt	19+17	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
20+71	36.3 Rt	21+43	36.3' Rt	24	Pipe Conduit - Approach	73	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
22+40	23" Lt	22+40	24' Rt	24	Pipe Conduit	47	Corrugated Steel Pipe	24	A	2	0.064	FES	FES	Standard D-714-28[1]
31+02	36.3' Rt	31+63	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
38+40	23' Lt	38+20	23' Rt	24	Pipe Conduit	46	Corrugated Steel Pipe	24	A	2	0.064	FES	FES	Standard D-714-28[1]
39+08	36.3' Lt	39+69	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
40+99	39.5 Rt	41+70	40.7' Rt	24	Pipe Conduit - Approach	75	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
46+00	25' Lt	46+00	50' Rt	24	Pipe Conduit	75	Corrugated Steel Pipe	24	A	2	0.064	FES	FES	Standard D-714-28[1]
49+35	36.3' Lt	49+96	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
49+35	36.3' Rt	49+96	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
51+51	36.3' Lt	52+20	36.3' Lt	24	Pipe Conduit - Approach	75	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
54+40	28' Lt	54+40	31' Rt	36	Pipe Conduit	59	Corrugated Steel Pipe	36	A	2	0.064	FES	FES	Standard D-714-28[1]
59+16	36.3' Lt	59+96	36.3' Lt	24	Pipe Conduit - Approach	80	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
106+11	34.3' Lt	106+31	34.3' Lt	24	Pipe Conduit - Approach	20	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
106+60	36.3' Lt	107+21	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
107+87	36.3' Rt	108+62	36.3' Rt	24	Pipe Conduit - Approach	76	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
127+63	36.3' Rt	128+24	33' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
128+18	36.3' Lt	128+98	36.3' Lt	24	Pipe Conduit - Approach	80	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
128+97	36.3' Rt	129+58	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
137+25	36.3' Lt	137+86	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
137+25	36.3' Rt	137+86	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
148+82	36.3' Lt	149+43	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
148+82	36.3 Rt	149+43	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A
154+00	24' Lt	154+00	37' Rt	24	Pipe Conduit	61	Corrugated Steel Pipe	24	A	2	0.064	FES	FES	Standard D-714-28[1]
160+46.5	32.3' Rt	160+93.5	32.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z	2	0.064	FES	FES	Specification 714.04 A

Corrugations: **2** = 2-2/3"x1/2"
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5 = 5"x1"

Coatings: **Z** = Zinc
A = Aluminum

Spiral Ribs: **3/4** = 3/4"x3/4"@7-1/2"
1 = 3/4"x1"@11-1/2"

[1] Replace bedding detail with detail on Sec 30 Sht 1
(*) End sections are measured and paid for separately for pipe extensions.
FES = Flared End Section
TES = Traversable End Section

REGISTERED PROFESSIONAL ENGINEER
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Daniel N. Green
DATE: 2-7-25
NORTH DAKOTA

Pipe List

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND Highway 200 to the County Line

Dunn County, ND

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	Geosythetic Material - Type G (Pay Item)	(*) End Sections		Applicable Backfill
													Begin	End	
				In	Bid Item	LF		In	Type		In	SY	EA	EA	
13+00	40' Lt	13+00	51' Rt	24	Pipe Conduit	91	Corrugated Steel Pipe	24	Z, A, P	2	0.064	61	FES	FES	Standard D-714-28
18+56	36'.3 Lt	19+17	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
18+56	36.3' Rt	19+17	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
20+71	36.3 Rt	21+43	36.3' Rt	24	Pipe Conduit - Approach	73	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
22+40	23" Lt	22+40	24' Rt	24	Pipe Conduit	47	Corrugated Steel Pipe	24	Z, A, P	2	0.064	31	FES	FES	Standard D-714-28
31+02	36.3' Rt	31+63	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
38+40	23' Lt	38+20	23' Rt	24	Pipe Conduit	46	Corrugated Steel Pipe	24	Z, A, P	2	0.064	31	FES	FES	Standard D-714-28
39+08	36.3' Lt	39+69	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
40+99	39.5 Rt	41+70	40.7' Rt	24	Pipe Conduit - Approach	75	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
46+00	25' Lt	46+00	50' Rt	24	Pipe Conduit	75	Corrugated Steel Pipe	24	Z, A, P	2	0.064	50	FES	FES	Standard D-714-28
49+35	36.3' Lt	49+96	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
49+35	36.3' Rt	49+96	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
51+51	36.3' Lt	52+20	36.3' Lt	24	Pipe Conduit - Approach	75	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
54+40	28' Lt	54+40	31' Rt	36	Pipe Conduit	59	Corrugated Steel Pipe	24	Z, A, P	2	0.064	46	FES	FES	Standard D-714-28
59+16	36.3' Lt	59+96	36.3' Lt	24	Pipe Conduit - Approach	80	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
106+11	34.3' Lt	106+31	34.3' Lt	24	Pipe Conduit - Approach	20	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
106+60	36.3' Lt	107+21	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
107+87	36.3' Rt	108+62	36.3' Rt	24	Pipe Conduit - Approach	76	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
127+63	36.3' Rt	128+24	33' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
128+18	36.3' Lt	128+98	36.3' Lt	24	Pipe Conduit - Approach	80	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
128+97	36.3' Rt	129+58	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
137+25	36.3' Lt	137+86	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
137+25	36.3' Rt	137+86	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
148+82	36.3' Lt	149+43	36.3' Lt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
148+82	36.3 Rt	149+43	36.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A
154+00	24' Lt	154+00	37' Rt	24	Pipe Conduit	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064	41	FES	FES	Standard D-714-28
160+46.5	32.3' Rt	160+93.5	32.3' Rt	24	Pipe Conduit - Approach	61	Corrugated Steel Pipe	24	Z, A, P	2	0.064		FES	FES	Specification 714.04 A

Corrugations: **2** = 2-2/3"x1/2"
3 = 3"x1"
5 = 5"x1"

Coatings: **Z** = Zinc
A = Aluminum
P = Polymeric (over Zinc or Aluminum)

Spiral Ribs: **3/4** = 3/4"x3/4"@7-1/2"
1 = 3/4"x1"@11-1/2"

(*) End sections are measured and paid for separately for pipe extensions.
FES = Flared End Section
TES = Traversable End Section

Pipe List

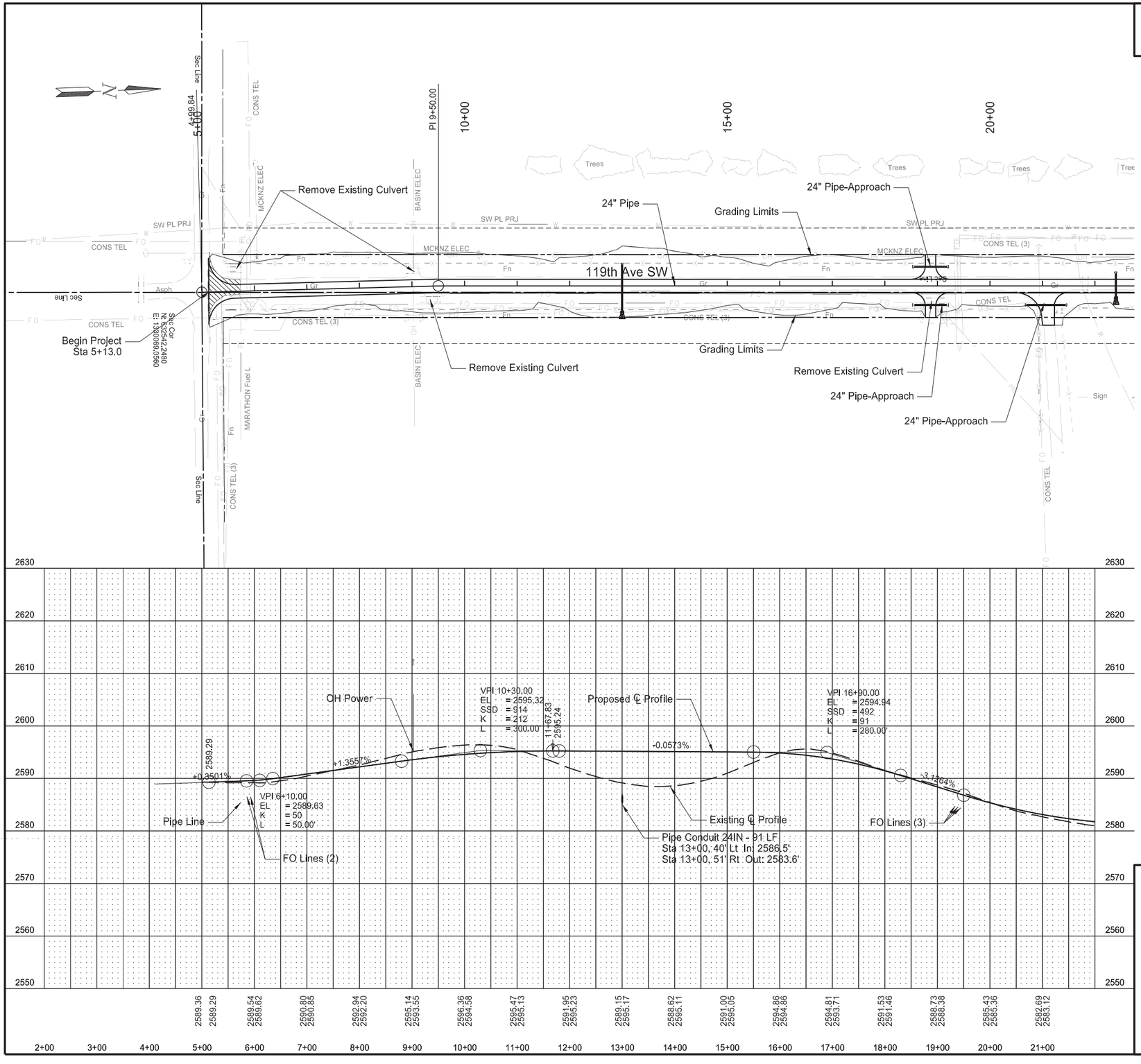
119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BW-18619.021	60	1

SPEC	CODE	BID ITEM	QTY	UNIT
202	0132	REMOVAL OF BITUMINOUS SURFACING		
		Sta 5+13 to Sta 5+73	301	SY
202	0170	REMOVAL OF CULVERTS - ALL TYPES & SIZES		
		Sta 5+63, 41.5 Lt	29	LF
		Sta 9+03, 30.3 Lt	30	LF
		Sta 9+34, 24.9 Rt	40	LF
		Sta 18+91, 28.6 Rt	46	LF
714	4105	PIPE CONDUIT 24IN		
		Sta 13+00 ℄	91	LF
714	4106	PIPE CONDUIT 24IN-APPROACH		
		Sta 18+56 Lt to Sta 19+17 Lt	61	LF
		Sta 18+56 Rt to Sta 19+17 Rt	61	LF
		Sta 20+71 Rt to Sta 21+43 Rt	73	LF



Removal of Bituminous Surfacing

Plan & Profile
119th Ave SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

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PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

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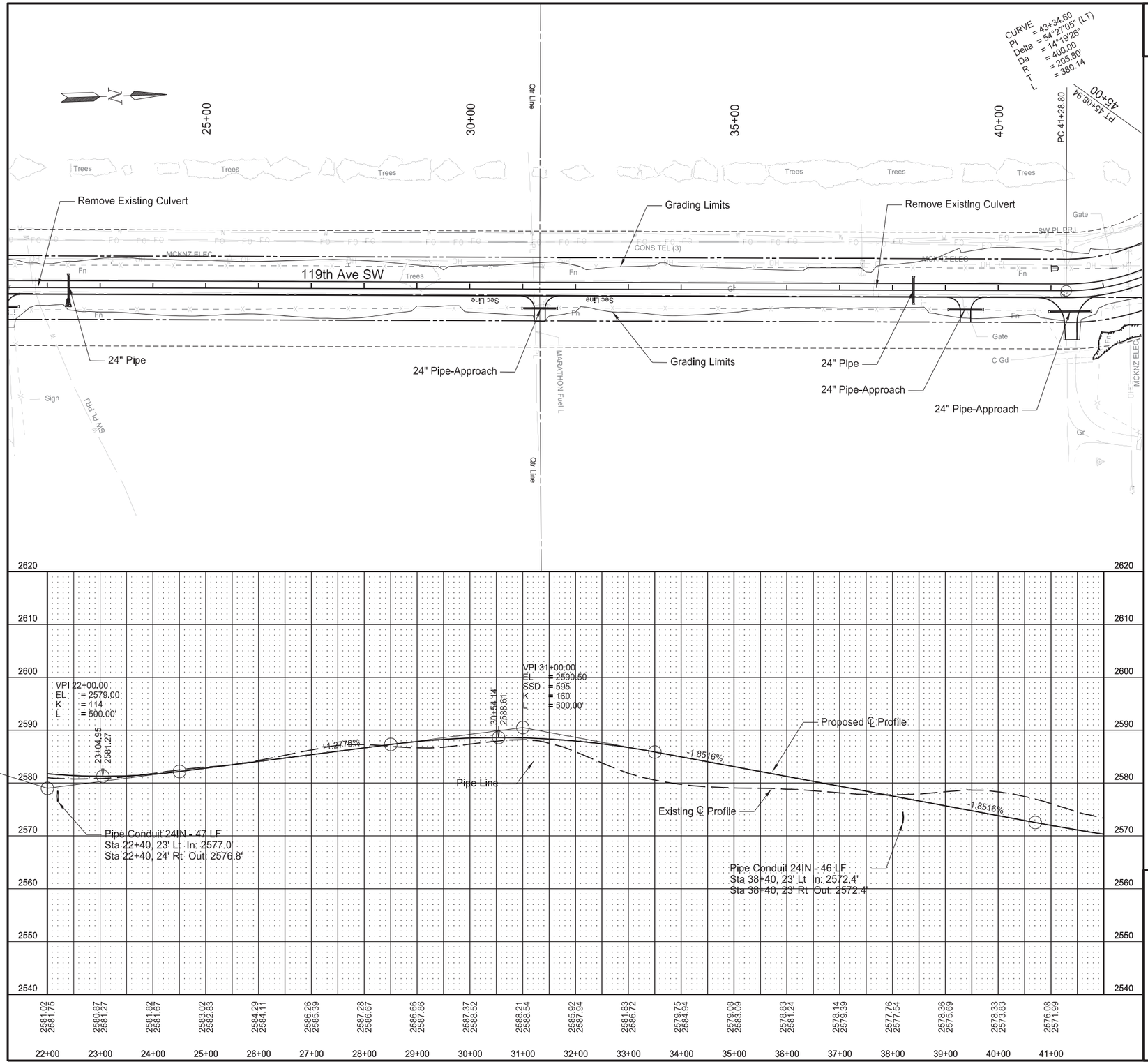
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	60	2

SPEC	CODE	BID ITEM	QTY	UNIT
202	0170	REMOVAL OF CULVERTS - ALL TYPES & SIZES		
		Sta 21+82, ℄	30	LF
		Sta 37+69, ℄	30	LF
714	4105	PIPE CONDUIT 24IN		
		Sta 22+40 ℄	47	LF
		Sta 38+20 ℄	46	LF
714	4106	PIPE CONDUIT 24IN-APPROACH		
		Sta 31+02 Rt to Sta 31+63 Rt	61	LF
		Sta 39+08 Rt to Sta 39+69 Rt	61	LF
		Sta 40+99 Rt to Sta 41+70 Rt	75	LF



Plan & Profile
119th Ave SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
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PE-7616
Daniel N. Green
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NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BW-18619.021	60	3

SPEC	CODE	BID ITEM	QTY	UNIT
202	0170	REMOVAL OF CULVERTS - ALL TYPES & SIZES		
		Sta 45+94, ℄	29	LF
		Sta 51+90, 44.4' Lt	60	LF
		Sta 54+26, ℄	40	LF
		Sta 59+58, 34.5' Lt	60	LF
714	4105	PIPE CONDUIT 24IN		
		Sta 46+00 ℄	75	LF
714	4106	PIPE CONDUIT 24IN-APPROACH		
		Sta 49+35 Lt to Sta 49+96 Lt	61	LF
		Sta 49+35 Rt to Sta 49+96 Rt	61	LF
		Sta 51+51 Lt to Sta 52+20 Lt	75	LF
		Sta 59+16 Lt to Sta 59+96 Lt	80	LF
714	4115	PIPE CONDUIT 36IN		
		Sta 54+40 ℄	59	LF
980	0170	CATTLE GUARD RESET		
		Sta 59+56 65.5' Lt	1	EA

Plan & Profile
119th Ave SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

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Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	60	4

SPEC	CODE	BID ITEM	QTY	UNIT
202	0170	REMOVAL OF CULVERTS - ALL TYPES & SIZES		
		Sta 108+24, 57.4 Rt	40	LF
714	4106	PIPE CONDUIT 24IN-APPROACH		
		Sta 106+11 Rt to Sta 106+31 Rt	20	LF
		Sta 106+60 Lt to Sta 107+21 Lt	61	LF
		Sta 107+87 Rt to Sta 108+62 Rt	76	LF
980	0100	CATTLE GUARD 8' x 34'		
		Sta 101+10 ℄	1	EA
980	0171	REMOVE CATTLE GUARD		
		Sta 105+95 ℄	1	EA

Plan & Profile
2nd St SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

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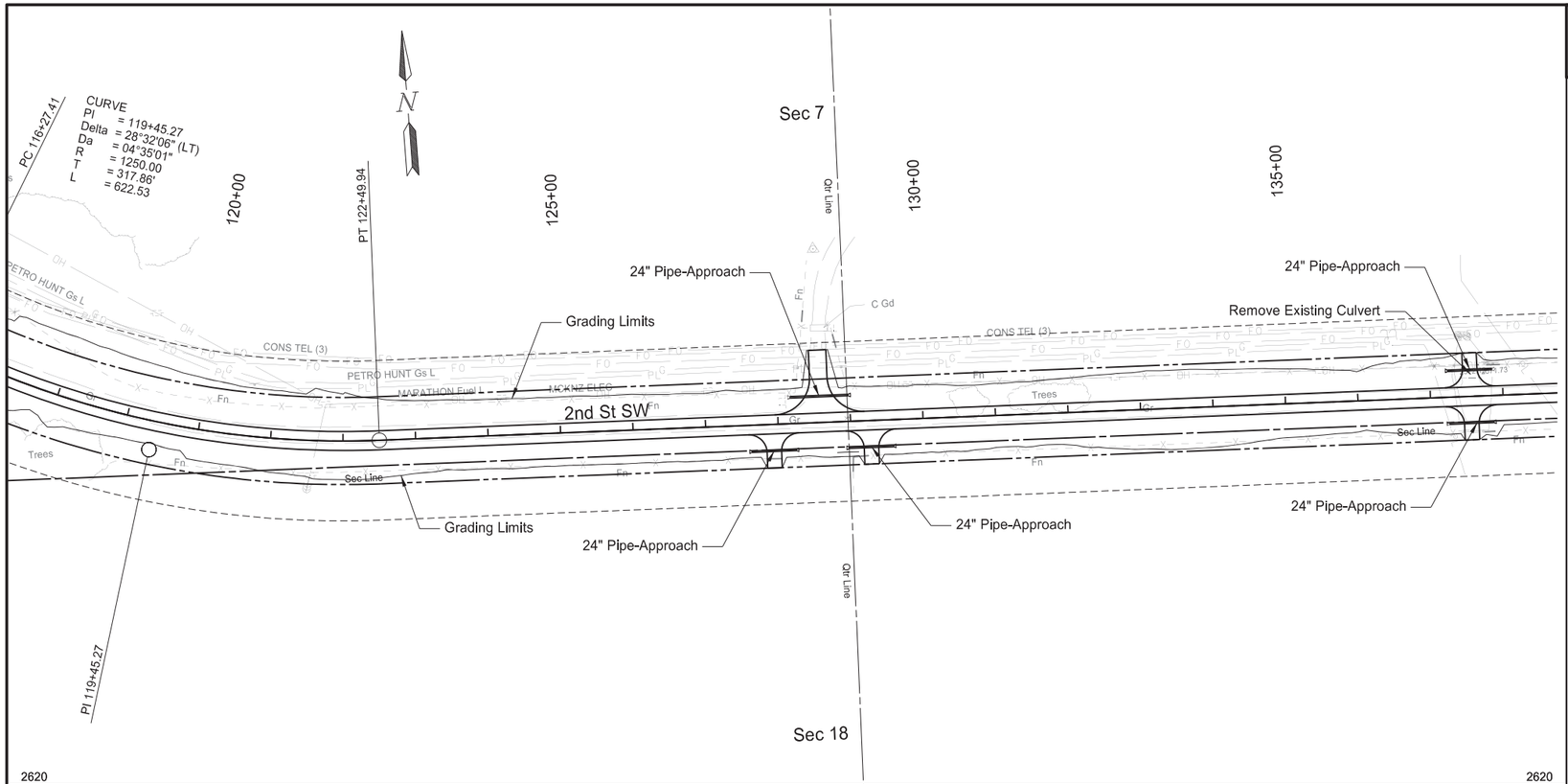

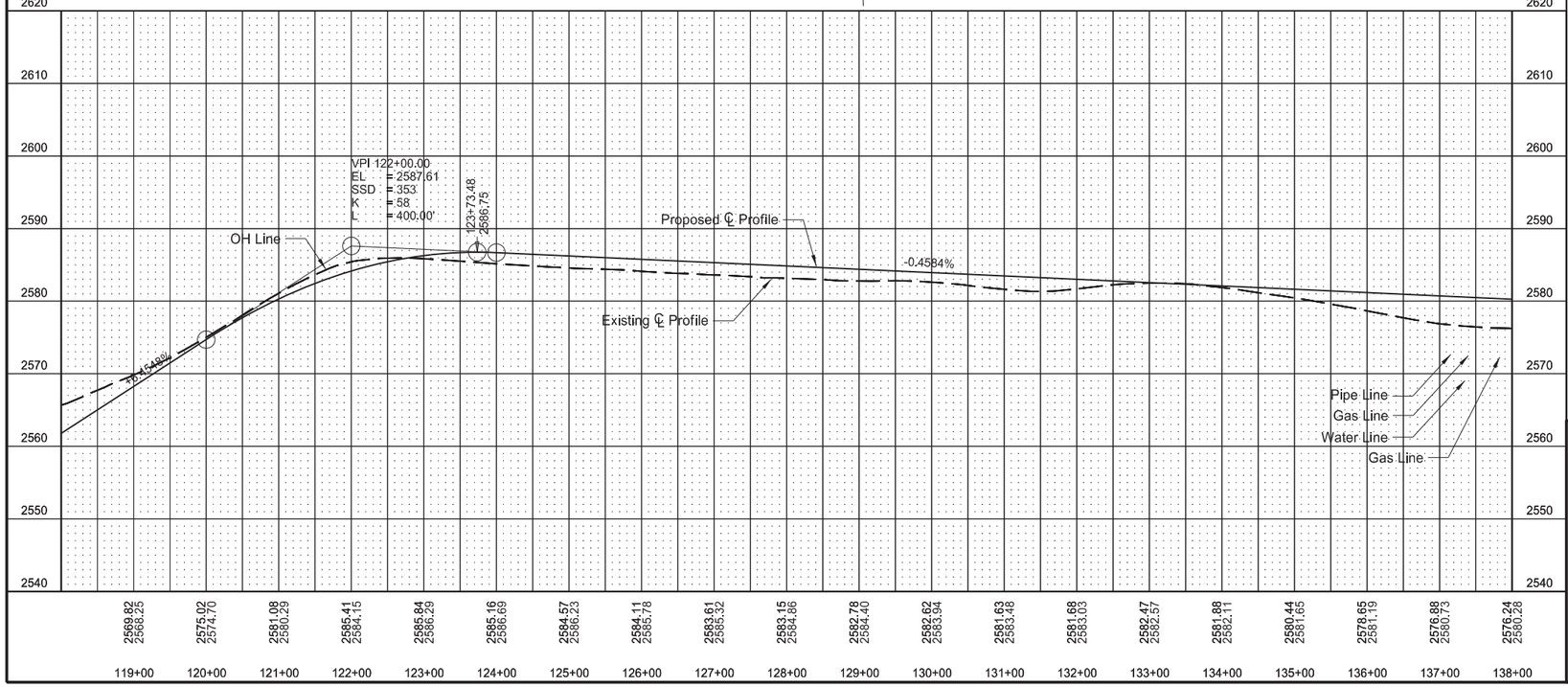

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	60	5

SPEC	CODE	BID ITEM	QTY	UNIT
202	0170	REMOVAL OF CULVERTS - ALL TYPES & SIZES		
		Sta 137+57, 30.2'	30	LF
714	4106	PIPE CONDUIT 24IN-APPROACH		
		Sta 127+63 Rt to Sta 128+24 Rt	61	LF
		Sta 128+18 Lt to Sta 128+98 Lt	80	LF
		Sta 128+97 Rt to Sta 129+58 Rt	61	LF
		Sta 137+25 Lt to Sta 137+86 Lt	61	LF
		Sta 137+25 Rt to Sta 137+86 Rt	61	LF

Plan & Profile
2nd St SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
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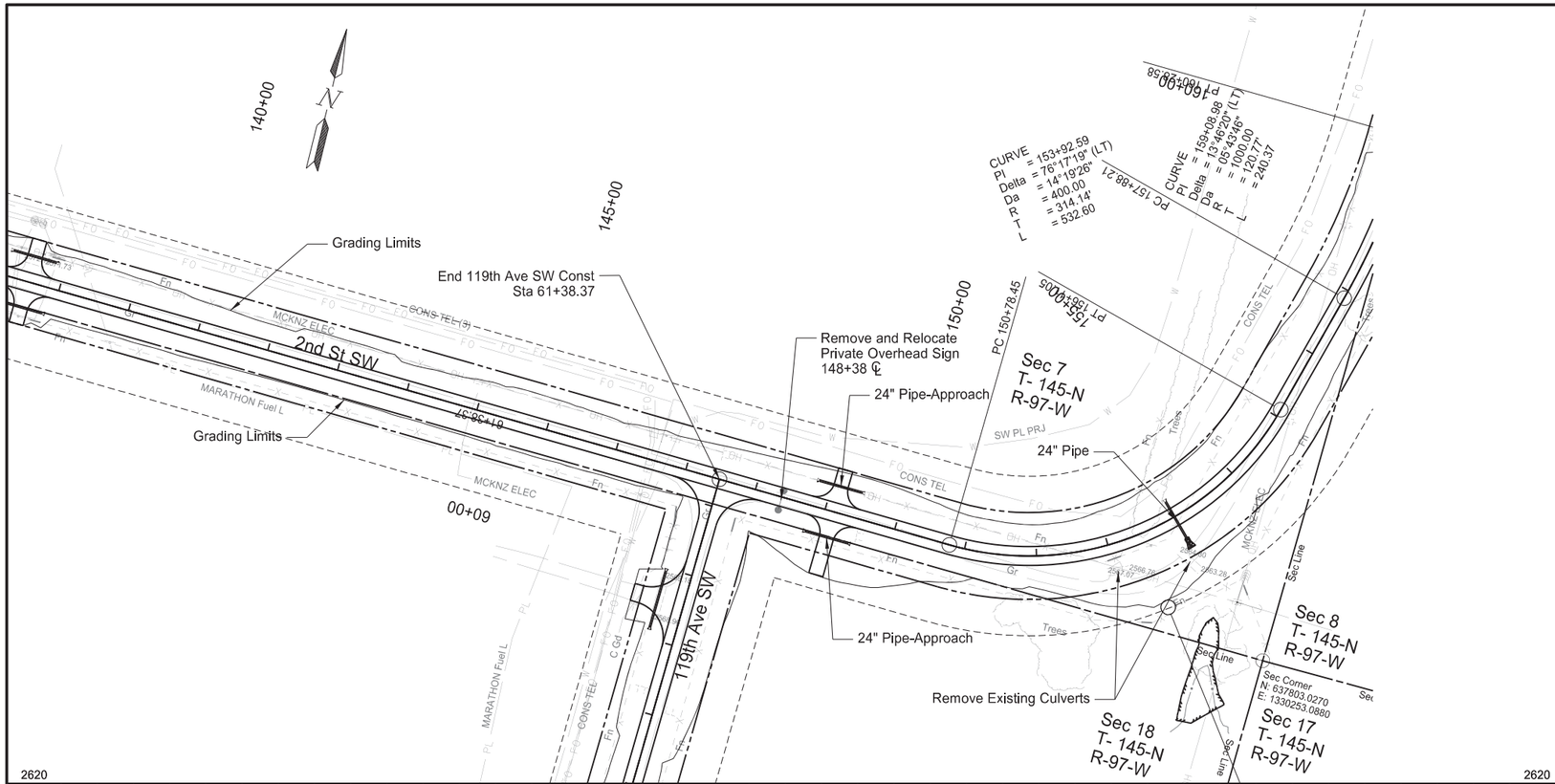
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	60	6

SPEC	CODE	BID ITEM	QTY	UNIT
202	0170	REMOVAL OF CULVERTS - ALL TYPES & SIZES		
		Sta 153+04, 30.2' Rt	30	LF
		Sta 153+90, 64.2' Rt	39	LF
714	4105	PIPE CONDUIT 24IN		
		Sta 154+00 ℄	61	LF
714	4106	PIPE CONDUIT 24IN-APPROACH		
		Sta 148+82 Lt to Sta 149+43 Lt	61	LF
		Sta 148+82 Rt to Sta 149+43 Rt	61	LF



Plan & Profile
2nd St SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

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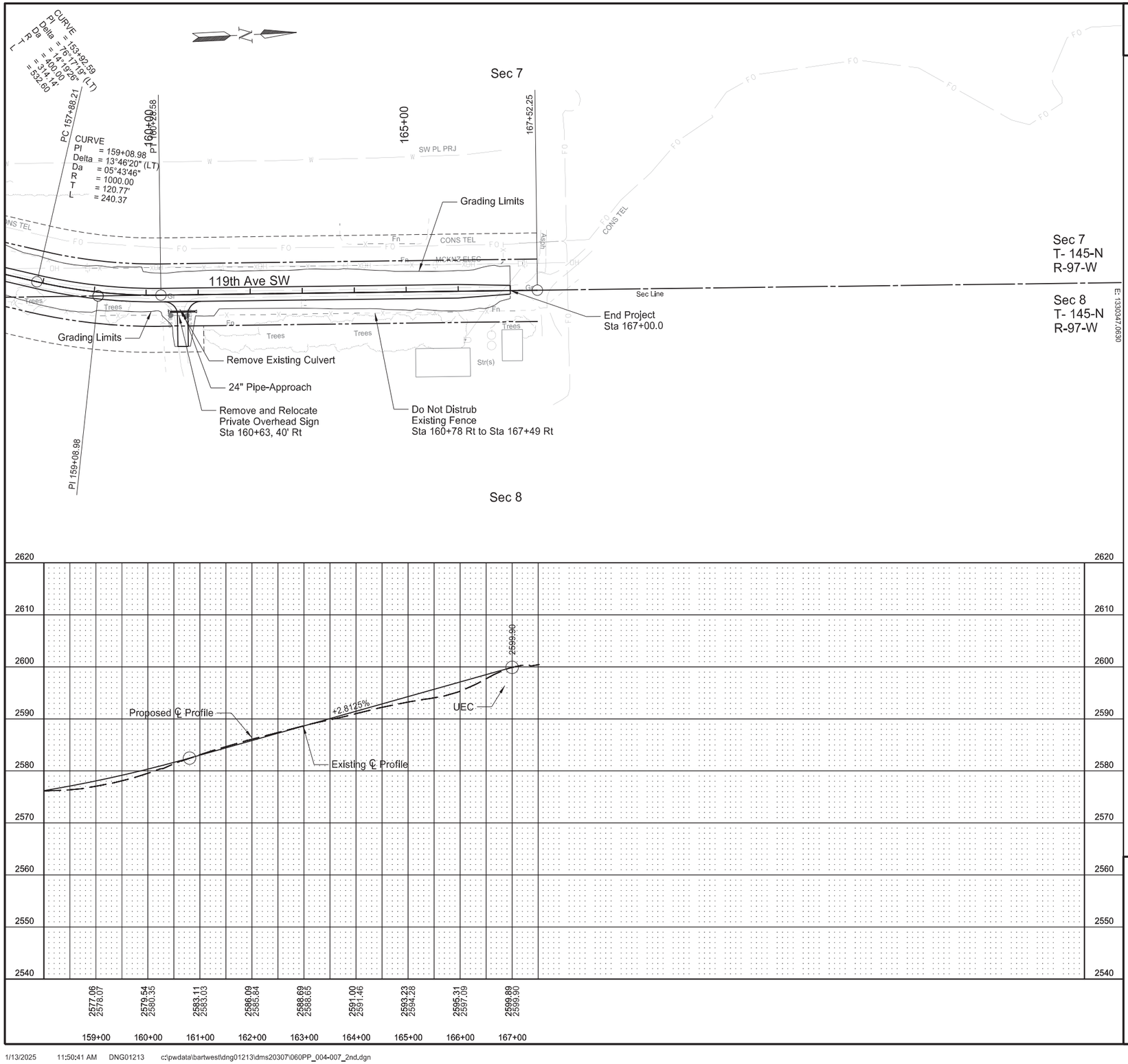

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	60	7

SPEC	CODE	BID ITEM	QTY	UNIT
202	0170	REMOVAL OF CULVERTS - ALL TYPES & SIZES Sta 160+60, 27.1' Rt	38	LF
714	4106	PIPE CONDUIT 24IN-APPROACH Sta 160+46.5 Rt to Sta 160+93.5 Rt	61	LF

Plan & Profile
2nd St SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

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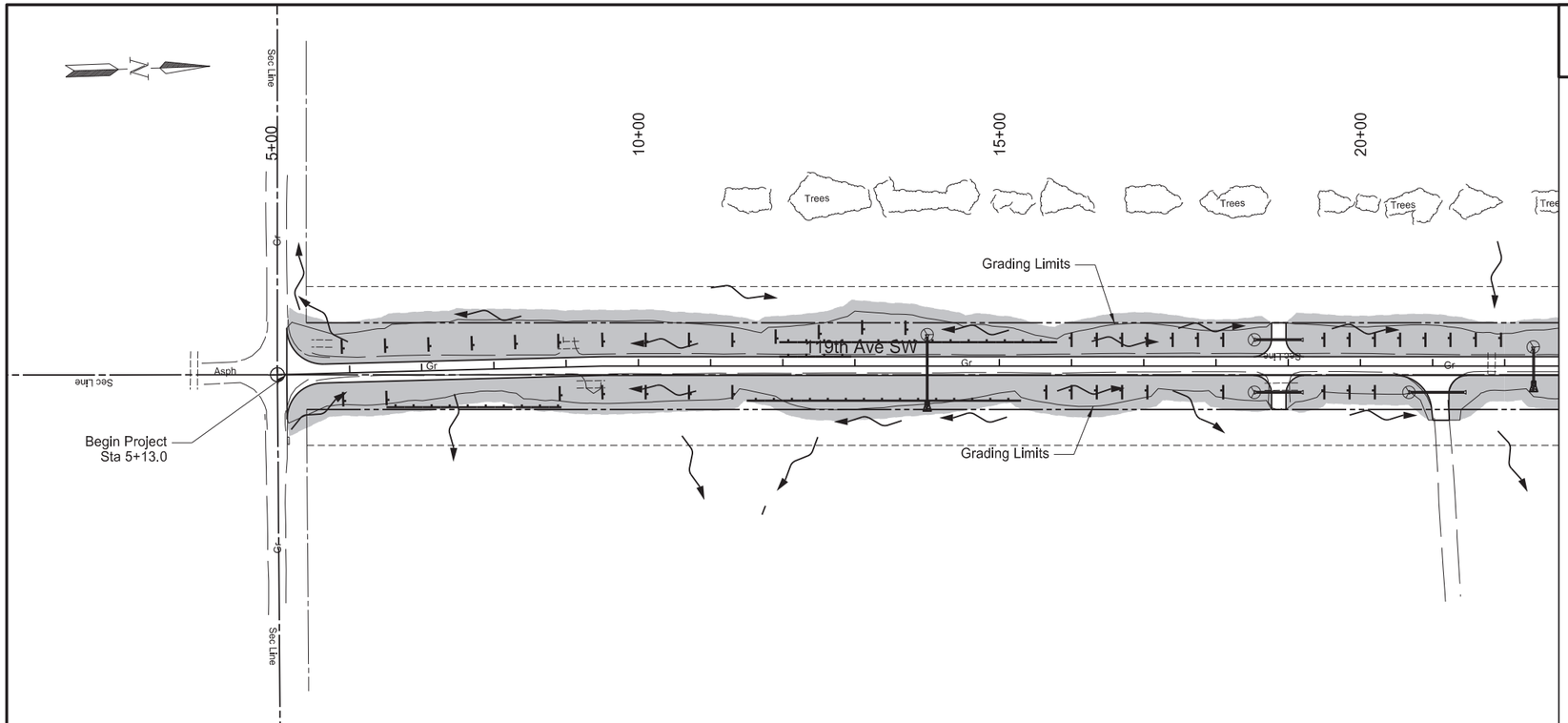
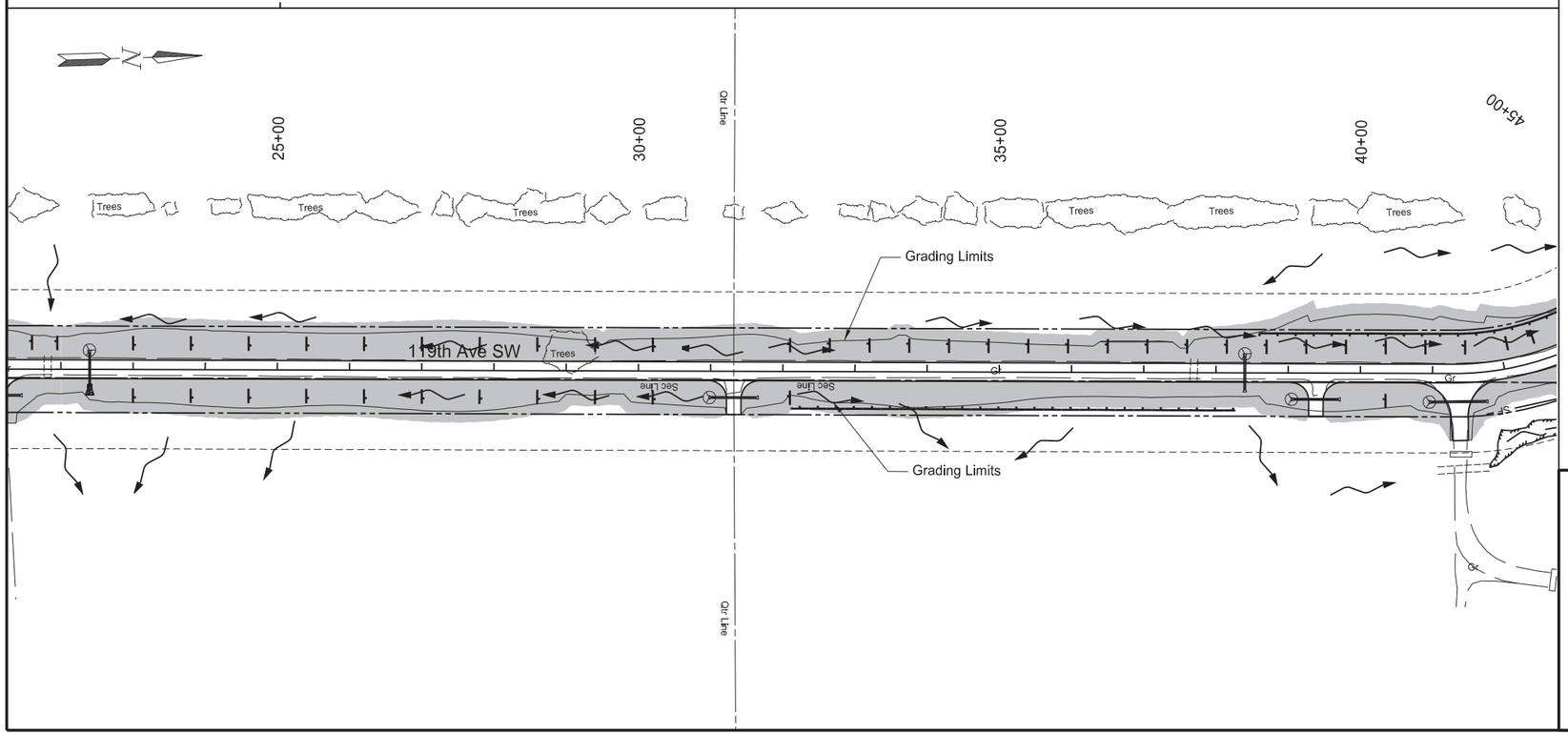
DATE: 1-13-25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	76	1





SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 5+13 Lt to Sta 22+00 Lt	2.30	ACRE
		Sta 5+13 Rt to Sta 22+00 Rt	1.78	ACRE
		Sta 22+00 Lt to Sta 42+00 Lt	2.48	ACRE
		Sta 22+00 Rt to Sta 42+00 Rt	2.07	ACRE
251	2000	TEMPORARY COVER CROP		
		Sta 5+13 Lt to Sta 22+00 Lt	2.30	ACRE
		Sta 5+13 Rt to Sta 22+00 Rt	1.78	ACRE
		Sta 22+00 Lt to Sta 42+00 Lt	2.48	ACRE
		Sta 22+00 Rt to Sta 42+00 Rt	2.07	ACRE
253	0061	SOIL STABILIZATION		
		Sta 5+13 Lt to Sta 22+00 Lt	4.60	ACRE
		Sta 5+13 Rt to Sta 22+00 Rt	3.56	ACRE
		Sta 22+00 Lt to Sta 42+00 Lt	4.96	ACRE
		Sta 22+00 Rt to Sta 42+00 Rt	4.14	ACRE
260	0200	SILT FENCE SUPPORTED		
		Sta 41+69 Rt to Sta 42+00 Rt	50	LF
260	0201	REMOVE SILT FENCE SUPPORTED		
		Sta 41+69 Rt to Sta 42+00 Rt	50	LF

Fiber Rolls 12IN (Temporary use Only)

Seeding Class II, Temporary Cover Crop, Soil Stabilization

Riprap Grade II

Stationing of erosion control measures are estimated.
Placement of fiber rolls must meet field conditions.

Erosion Control
119th Ave SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
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DATE: 1-13-25
NORTH DAKOTA

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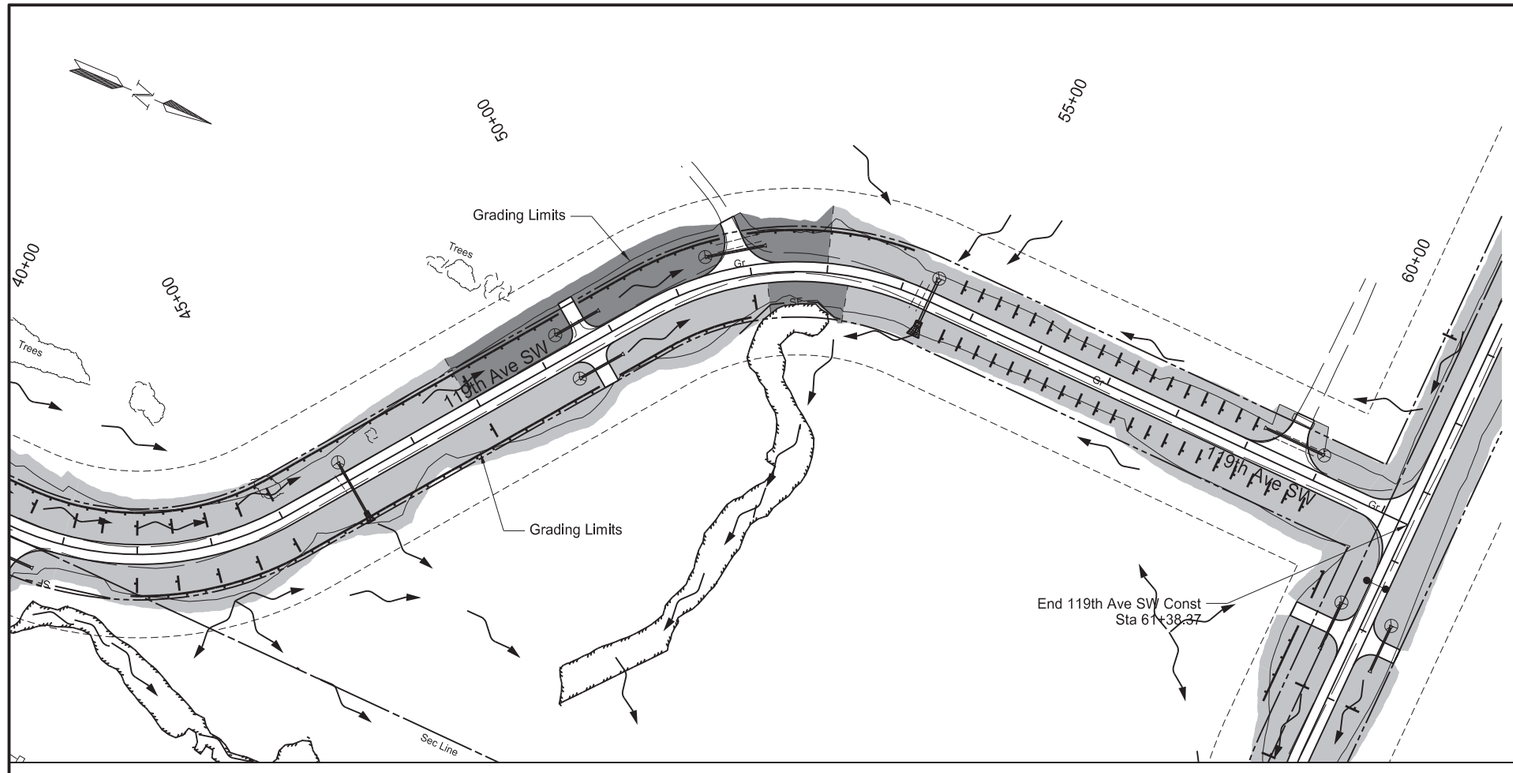

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	76	2

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 42+00 Lt to Sta 61+25.37 Lt	1.52	ACRE
		Sta 42+00 Rt to Sta 61+25.37 Rt	2.06	ACRE
251	2000	TEMPORARY COVER CROP		
		Sta 42+00 Lt to Sta 61+25.37 Lt	1.52	ACRE
		Sta 42+00 Rt to Sta 61+25.37 Rt	2.06	ACRE
253	0061	SOIL STABILIZATION		
		Sta 42+00 Lt to Sta 61+25.37 Lt	2.30	ACRE
		Sta 42+00 Rt to Sta 61+25.37 Rt	4.04	ACRE
253	0301	BONDED FIBER MATRIX		
		Sta 47+90 Lt to Sta 53+00 Lt	0.74	ACRE
		Sta 52+20 Rt to Sta 53+30 Rt	0.08	ACRE
260	0200	SILT FENCE SUPPORTED		
		Sta 42+00 Rt to Sta 42+70 Rt	70	LF
		Sta 51+65 Rt to Sta 53+30 Rt	160	LF
260	0201	REMOVE SILT FENCE SUPPORTED		
		Sta 42+00 Rt to Sta 42+70 Rt	70	LF
		Sta 51+65 Rt to Sta 53+30 Rt	160	LF

Fiber Rolls 12IN (Temporary use Only)

Seeding Class II, Temporary Cover Crop, Soil Stabilization

Seeding Class II, Temporary Cover Crop, Bonded Fiber Matrix

Riprap Grade II

Stationing of erosion control measures are estimated.
Placement of fiber rolls must meet field conditions.

Erosion Control
119th Ave SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

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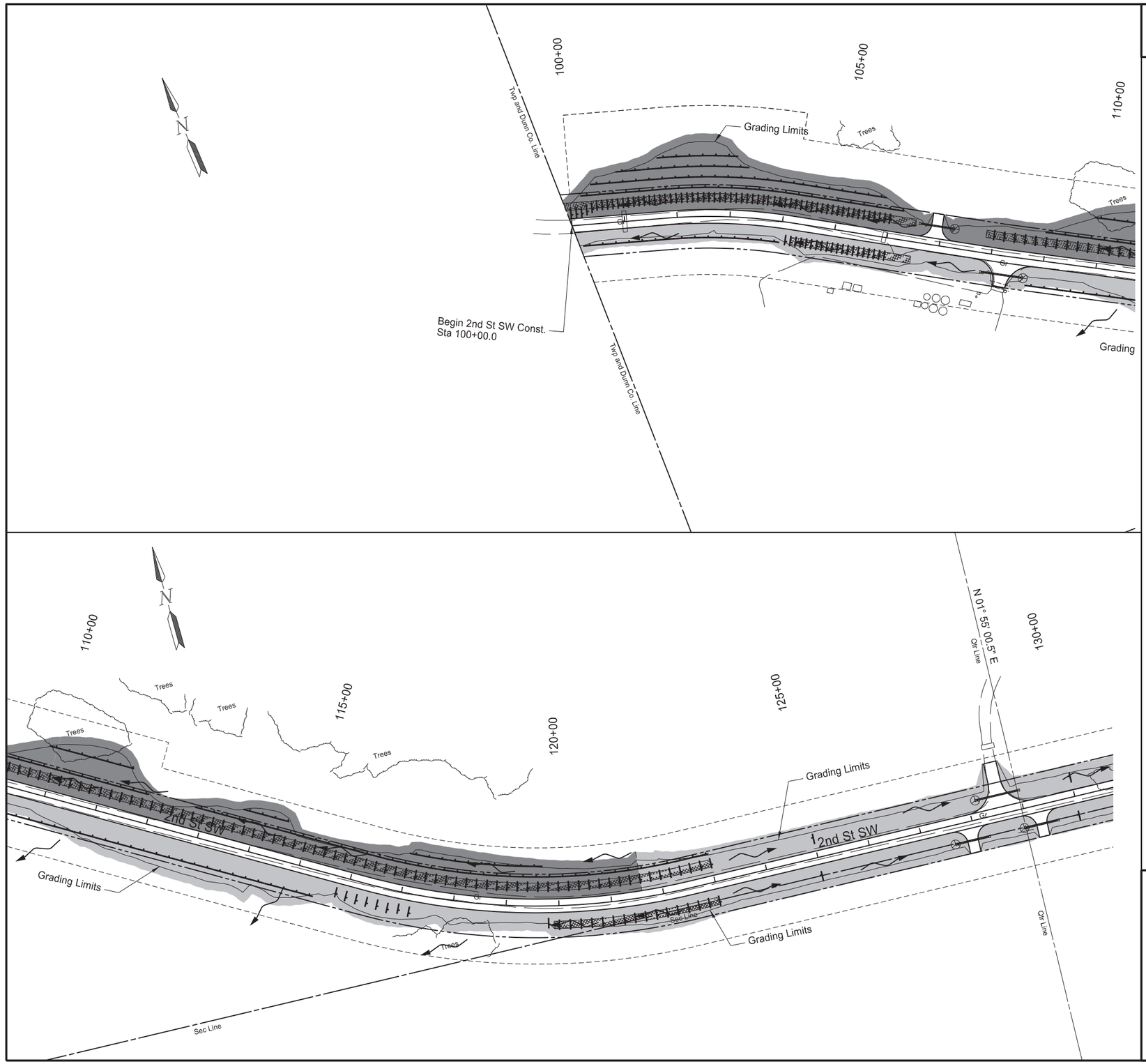
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	76	3



SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 100+00 Lt to Sta 110+00 Lt	1.97	ACRE
		Sta 100+00 Rt to Sta 110+00 Rt	0.88	ACRE
		Sta 110+00 Lt to Sta 130+00 Lt	3.01	ACRE
		Sta 110+00 Rt to Sta 130+00 Rt	2.37	ACRE
251	2000	TEMPORARY COVER CROP		
		Sta 100+00 Lt to Sta 106+50 Lt	1.97	ACRE
		Sta 100+00 Rt to Sta 110+00 Rt	0.88	ACRE
		Sta 110+00 Lt to Sta 130+00 Lt	3.01	ACRE
		Sta 110+00 Rt to Sta 130+00 Rt	2.37	ACRE
253	0061	SOIL STABILIZATION		
		Sta 100+00 Lt to Sta 110+00 Lt	1.97	ACRE
		Sta 100+00 Rt to Sta 110+00 Rt	1.76	ACRE
		Sta 110+00 Lt to Sta 130+00 Lt	3.99	ACRE
		Sta 110+00 Rt to Sta 130+00 Rt	4.74	ACRE
253	0301	BONDED FIBER MATRIX		
		Sta 100+00 Lt to Sta 110+00 Lt	1.97	ACRE
		Sta 110+00 Lt to Sta 130+00 Lt	2.03	ACRE
255	0201	TRM TYPE 1		
		Sta 100+00 Lt to Sta 106+50 Lt	1,041	SY
		Sta 104+20 Rt to Sta 106+50 Rt	358	SY
		Sta 107+86 Lt to Sta 110+00 Lt	333	SY
		Sta 110+00 Lt to Sta 123+00 Lt	1,994	SY
		Sta 119+90 Lt to Sta 123+00 Lt	494	SY

Fiber Rolls 12IN (Temporary use Only)

Seeding Class II, Temporary Cover Crop, Soil Stabilization

Seeding Class II, Temporary Cover Crop, Bonded Fiber Matrix

TRM Type 1

Stationing of erosion control measures are estimated.
Placement of fiber rolls must meet field conditions.

Erosion Control
2nd St SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

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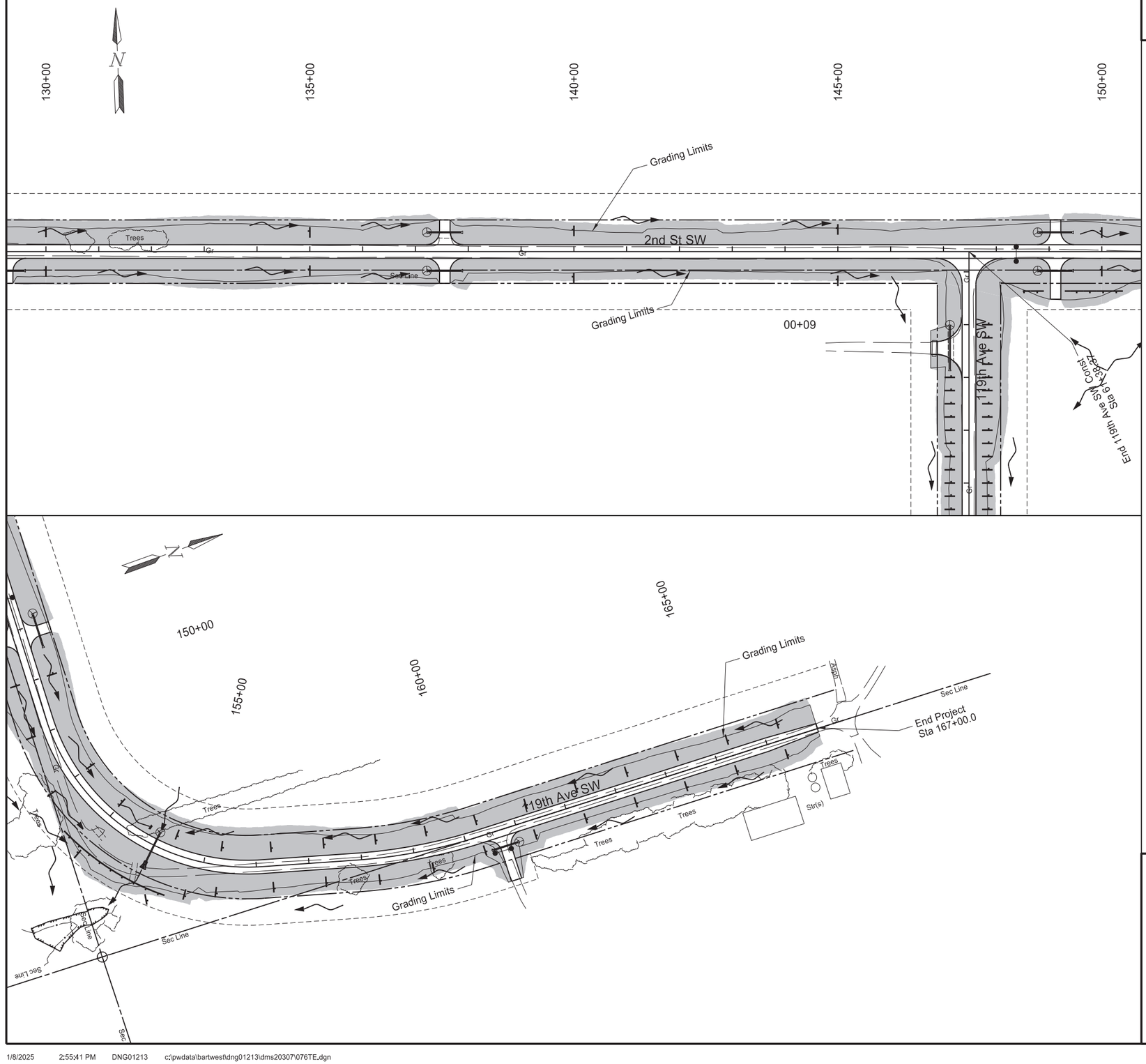
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BW-18619.021	76	4

SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 130+00 Lt to Sta 150+00 Lt	2.14	ACRE
		Sta 130+00 Rt to Sta 150+00 Rt	2.17	ACRE
		Sta 150+00 Lt to Sta 167+00 Lt	1.89	ACRE
		Sta 150+00 Rt to Sta 167+00 Rt	2.00	ACRE
251	2000	TEMPORARY COVER CROP		
		Sta 130+00 Lt to Sta 150+00 Lt	2.14	ACRE
		Sta 130+00 Rt to Sta 150+00 Rt	2.17	ACRE
		Sta 150+00 Lt to Sta 167+00 Lt	1.89	ACRE
		Sta 150+00 Rt to Sta 167+00 Rt	2.00	ACRE
253	0061	SOIL STABILIZATION		
		Sta 130+00 Lt to Sta 150+00 Lt	4.28	ACRE
		Sta 130+00 Rt to Sta 150+00 Rt	4.34	ACRE
		Sta 150+00 Lt to Sta 167+00 Lt	3.78	ACRE
		Sta 150+00 Rt to Sta 167+00 Rt	4.00	ACRE



Fiber Rolls 12IN (Temporary use Only)

Seeding Class II, Temporary Cover Crop, Soil Stabilization

Riprap Grade II

Stationing of erosion control measures are estimated.
Placement of fiber rolls must meet field conditions.

Erosion Control
2nd St SW

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

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PE-7616
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DATE: 1-13-25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	76	5

Ditch Checks - FIBER ROLLS 12IN (LF)					
Begin	End	Offset	Spacing (ft)	Length	Total LF
5+90	13+70	LT	60	20	280
5+90	6+50	RT	60	20	40
8+90	11+30	RT	60	20	100
15+65	17+05	RT	35	20	100
16+00	18+10	LT	35	20	140
18+18	18+10	RT	N/A	20	20
19+50.0	21+95	LT	35	20	160
19+50.0	20+20.0	RT	35	20	60
23+00	30+20	LT, RT	80	20	400
32+10	32+10	RT	N/A	20	20
32+10	45+00	LT	55	20	500
40+35	40+35	RT	N/A	20	20
43+00	45+00	RT	55	20	100
48+00	48+00	LT, RT	N/A	20	40
52+00	52+00	RT	N/A	20	20
54+75	59+00	LT	25	20	360
54+75	60+00	RT	25	20	440
100+00	106+00	LT	10	20	1220
104+10	106+00	RT	10	20	400
108+00	123+00	LT	20	20	1520
115+80	117+20	RT	20	20	160
119+80	123+00	RT	20	20	340
125+00	150+00	LT, RT	500	20	240
150+00	167+00	LT,RT	100	20	720
				Total	**7400**

Runoff Protection - FIBER ROLLS 12IN (LF)			
Begin	End	Offset	LF
6+50	8+90	55' RT	240
11+50	15+30	48' RT	380
11+95	15+80	33' LT	385
32+10	38+25	52' RT	615
38+60	49+50	55' LT	1040
42+90	49+50	55 'RT	690
52+00	54+00	55' LT	455
53+05	54+30	45' RT	115
100+20	106+25	55' LT	620
100+15	104+00	40' LT	245
100+40	105+90	75' LT	570
100+90	103+30	95' LT	255
101+70	103+10	105' LT	155
108+70	115+40	50' RT	670
108+95	111+90	55' LT	295
109+85	111+50	95' LT	165
112+80	123+00	55' LT	1000
113+70	114+60	75' LT	90
117+00	119+70	75' LT	255
148+50	148+90	75' RT	40
149+30	150+40	75' RT	110
152+60	154+50	80' RT	230
		Engineer's Discretion	**1000**
		Total	**9620**

Inlet Protection - FIBER ROLLS 12IN (LF)					
Station	Offset	LF	Station	Offset	LF
14+00	LT	20	107+24	LT	20
18+53	LT	20	108+65	RT	20
18+53	RT	20	127+59	RT	20
22+40	LT	20	128+14	LT	20
31+00	RT	20	128+94	RT	20
38+40	LT	20	137+22	LT	20
39+05	RT	20	137+22	RT	20
40+96	RT	20	148+79	LT	20
46+00	LT	20	148+79	RT	20
49+32	LT	20	154+00	LT	20
49+32	RT	20	160+97	RT	20
51+48	LT	20			
54+40	LT	20			
59+99	LT	20			
				Total	**500**

Erosion Control

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

SURVEY COORDINATE AND CURVE DATA - 119th Ave SW / 2nd St SW, 1 Mile North of ND 200 to the County Line

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BW-18619.021	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
119TH AVE SW (Chain: CL119TH)			
Begin POB (Sec Cor)	4+99.84	632,542.30	1,330,069.14
PI	9+50.00	632,992.44	1,330,072.87
PC	41+28.80	636,169.30	1,330,183.96
PI	43+34.60	636,374.97	1,330,191.15
PT	45+08.94	636,500.40	1,330,027.99
PC	50+55.03	636,833.23	1,329,595.05
PI	52+61.29	636,958.94	1,329,431.52
PT	54+35.90	637,165.06	1,329,439.10
End POE	61+38.37	637,867.05	1,329,464.93
2nd ST SW (Chain: CL2ND)			
Begin POT	100+00.00	639,914.78	1,324,955.63
PC	101+79.65	638,858.02	1,325,129.07
PI	102+97.95	638,820.63	1,325,238.31
PT	104+15.17	638,758.09	1,325,338.74
PI	108+17.96	638,545.15	1,325,680.64
PC	116+27.41	638,132.60	1,326,377.07
PI	119+45.27	637,970.59	1,326,650.55
PT	122+49.97	637,958.91	1,326,968.20
PC	150+78.45	637,854.91	1,329,794.80
PI	153+92.59	637,843.36	1,330,108.72
PT	156+11.05	638,145.61	1,330,194.35
PC	157+88.21	6638,316.06	1,330,242.65
PI	159+08.98	638,432.25	1,330,275.57
PT	160+28.58	638,552.94	1,330,279.88
End POT	167+52.25	639,276.15	1,330,305.72
W ¼ COR SEC 8	179+10.36	640,433.52	1,330,347.06

CURVE DATA

ARC DEFINITION

PRC01 (Chain: CL119TH)		PRC02 (Chain: CL119TH)	
PI Sta =	43+34.60 (SIMPLE CURVE)	PI Sta =	52+61.29 (SIMPLE CURVE)
Delta =	54° 27' 05" LT	Delta =	54° 33' 21" (RT)
Da =	14°19' 26"	Da =	14°19' 26"
R =	400.00	R =	400.00
T =	205.80'	T =	206.26'
L =	380.14	L =	380.87
PRC03 (Chain: CL2ND)		PRC04 (Chain: CL2ND)	
PI Sta =	102+97.95 (SIMPLE CURVE)	PI Sta =	119+45.27 (SIMPLE CURVE)
Delta =	13° 29' 40" (RT)	Delta =	28° 32' 06" (LT)
Da =	05° 43' 46"	Da =	04° 35' 01"
R =	1000.00	R =	1250.00
T =	118.31'	T =	317.86'
L =	235.52	L =	622.53
PRC05 (Chain: CL2ND)		PRC06 (Chain: CL2ND)	
PI Sta =	153+92.59 (SIMPLE CURVE)	PI Sta =	159+08.98 (SIMPLE CURVE)
Delta =	76°17' 19" (LT)	Delta =	13° 46' 20" (LT)
Da =	14° 19' 26"	Da =	05° 43' 46"
R =	400.00	R =	1000.00
T =	314.14'	T =	120.77'
L =	532.60	L =	240.37

US PUBLIC LAND SURVEY DATA

T-145-N R-97-W

CORNER	IRN	NORTHING	EASTING
NW Cor Sec 7	1-C	643,249.86	1,325,090.95
W ¼ Cor Sec 7	1-D	640,624.42	1,325,008.99
NW Cor Sec 18	1-E	637,998.98	1,324,927.04
W ¼ Cor Sec 18	1-F	635,362.07	1,324,843.61
SW Cor Sec 18	1-G	632,725.16	1,324,760.18
N ¼ Cor Sec 7	2-C	643,149.61	1,327,788.85
Center Sec 7	2-D	640,528.15	1,327,701.12
N ¼ Cor Sec 18	2-E	637,906.15	1,327,613.36
Center Sec 18	2-F	635,266.64	1,327,522.74
S ¼ Cor Sec 18	2-G	632,633.24	1,327,432.33
W ¼ Cor Sec 8	3-D	640,433.52	1,330,347.06
NW Cor Sec 17	3-E	637,803.03	1,330,253.09
W ¼ Cor Sec 17	3-F	635,172.66	1,330,161.12
NW Cor Sec 20	3-G	632,542.30	1,330,069.14
SW Cor Sec 20	3-J	627,272.54	1,329,890.10
N ¼ Cor Sec 17	4-E	637,738.62	1,332,890.72
Center Sec 17	4-F	637,738.62	1,332,890.72
S ¼ Cor Sec 17	4-G	632,470.33	1,221,707.50
NW Cor Sec 17	5-E	637,674.21	1,335,528.36
E ¼ Cor Sec 17	5-F	637,674.21	1,335,528.36

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	MONUMENT DESCRIPTION
PRIMARY CONTROL (PRP 119TH and 2ND)						
CP 1	632,473.61	1,330,900.82	2582.02'	4+60	845' Rt	#4 Rebar / Pink Plastic B&W Cap
CP 2	636,222.21	1,330,509.23	2574.22'	41+64	326' Rt	#4 Rebar / Pink Plastic B&W Cap
CP 3	638,175.81	1,327,584.42	2584.12'	128+58	85' Lt	#4 Rebar / Pink Plastic B&W Cap
CP 4	635,183.44	1,330,180.76	2586.30'	31+43	31' Rt	#4 Rebar / Pink Plastic B&W Cap

REFERENCE MARKERS

R Mkr #	NORTHING	EASTING	STATION	OFFSET	ALIGNMENT

NOTES: Sheet 1 of 1

Date Survey Completed 8/9/22

☐ Assumed Coordinates

☒ All coordinates on this sheet are Dunn County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota South Zone Combination Factor (cf) = 0.9998690

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

INITIALIZING BENCH MARK

☒ NAVD-88

☐ _____

☐ GEOID12B ☐ _____

☒ GEOID18

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

1/6/2025 2:49:39 PM DNG01213 c:\pwdata\bartwest\dng01213\dms20307\081CD.dgn

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	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**	**3**	**28**	**84**
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)		18	
G20-2-48	**48"x24"**	**END ROAD WORK**	**3**	**26**	**78**
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**	**1**	**43**	**43**
G20-52a-72	**72"x24"**	**ROAD WORK NEXT __ MILES RT or LT ARROW**	**2**	**36**	**72**
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		32	
R1-2-60	60"x60"	YIELD		29	
R2-1-36	**36"x48"**	**SPEED LIMIT __ (Portable only)**	**4**	**30**	**120**
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)		12	
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)		15	
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**	**4**	**35**	**140**
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**4**	**35**	**140**
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**	**4**	**35**	**140**
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**	**2**	**35**	**70**
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT or _ MILE		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT or _ MILE		35	
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**	**4**	**35**	**140**
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		35	
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**	**4**	**35**	**140**
W20-8-18	**18"x18"**	**STOP - SLOW PADDLE Back to Back**	**4**	**5**	**20**
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

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**1187**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	**FLAGGING**	**MHR**	**240**
704-1048	PORTABLE RUMBLE STRIPS	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1052	**TYPE III BARRICADES**	**EACH**	**6**
704-1060	DELINEATOR DRUMS	EACH	
704-1065	TRAFFIC CONES	EACH	
704-1067	**TUBULAR MARKERS**	**EACH**	**100**
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1080	**STACKABLE VERTICAL PANELS**	**EACH**	**100**
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	
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/

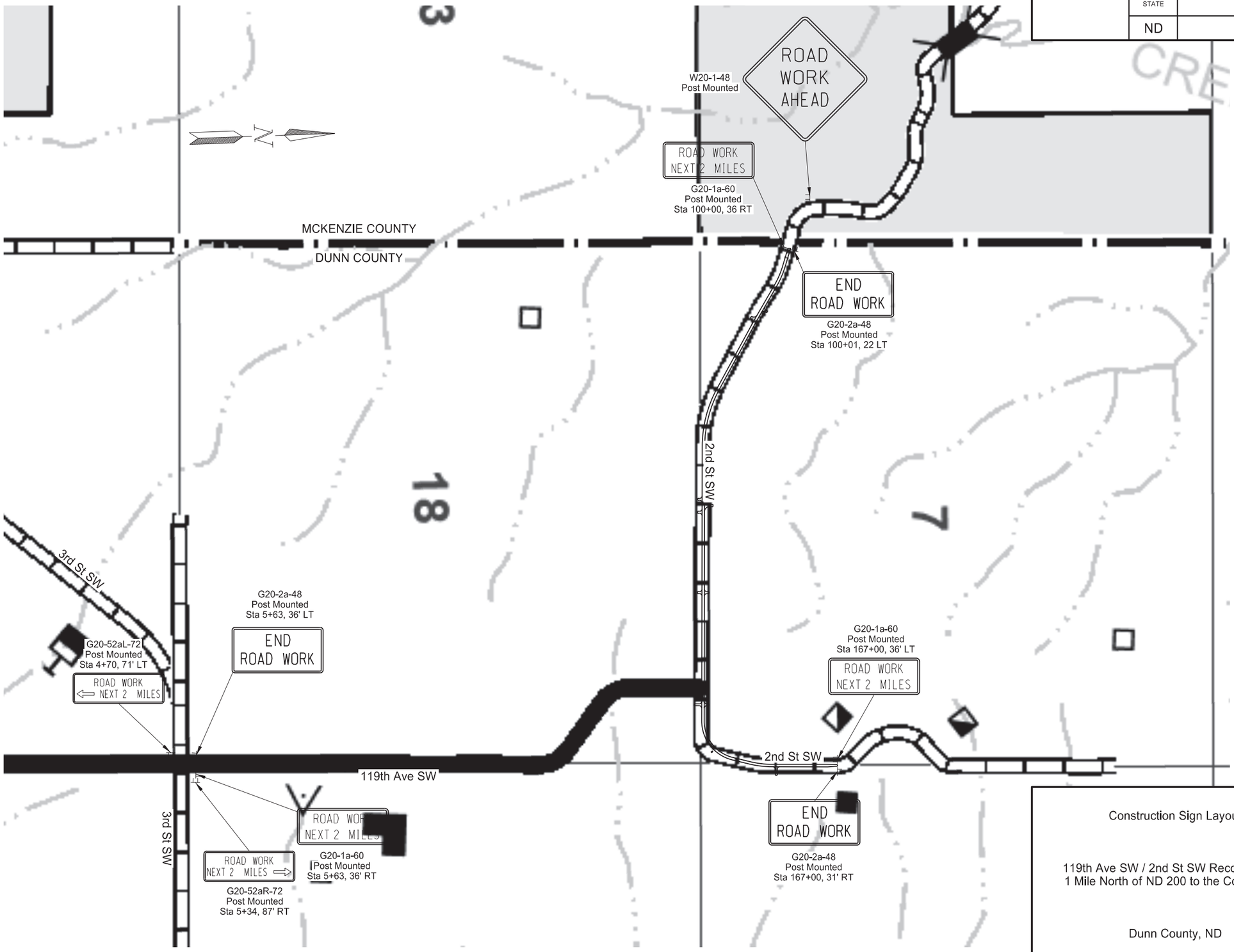
REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

Traffic Control Devices List

119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	100	2



Construction Sign Layout

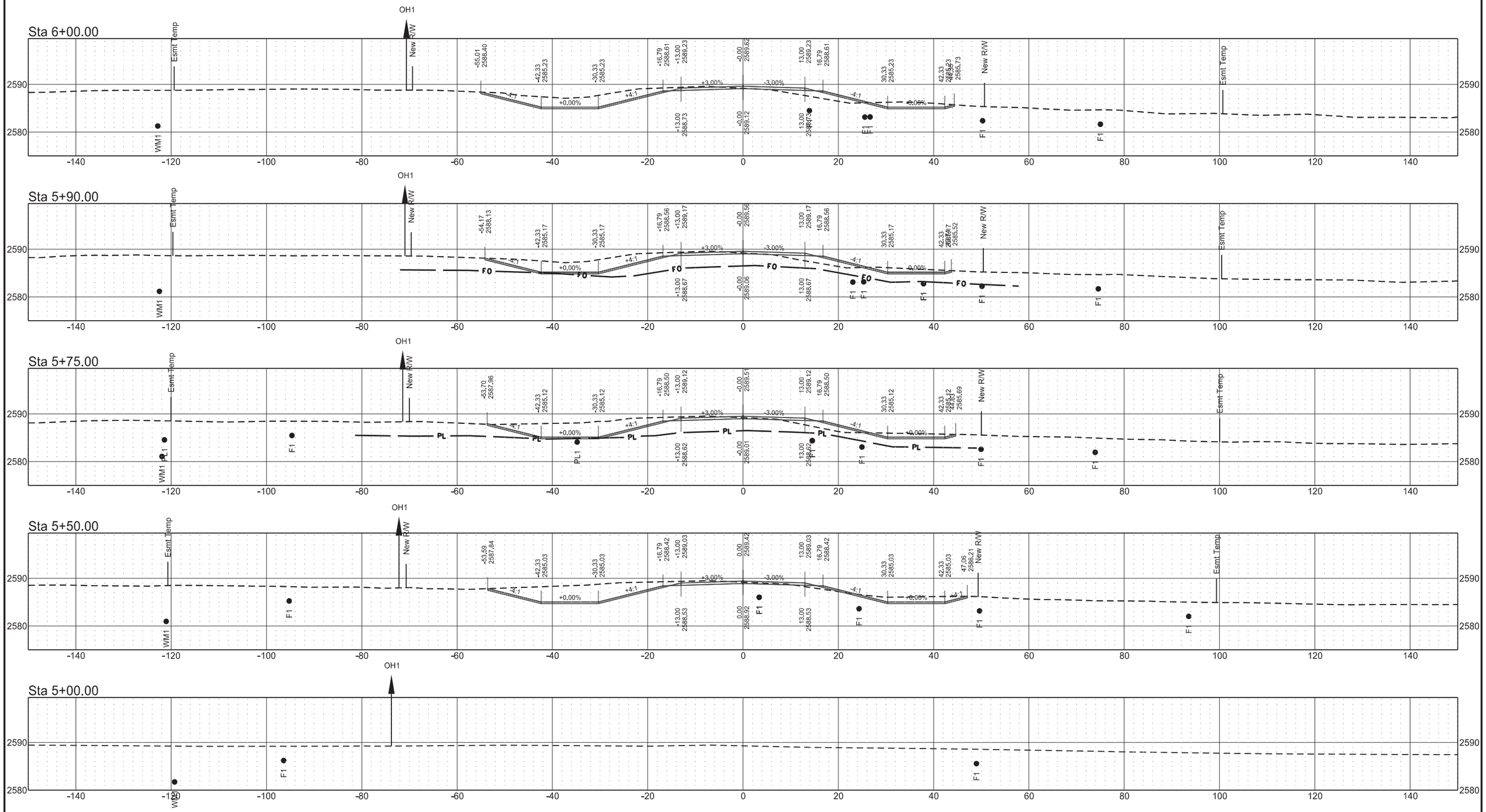
119th Ave SW / 2nd St SW Reconstruction
1 Mile North of ND 200 to the County Line

Dunn County, ND

REGISTERED PROFESSIONAL ENGINEER
DANIEL N. GREEN
PE-7616
Daniel N. Green
DATE: 1-13-25
NORTH DAKOTA

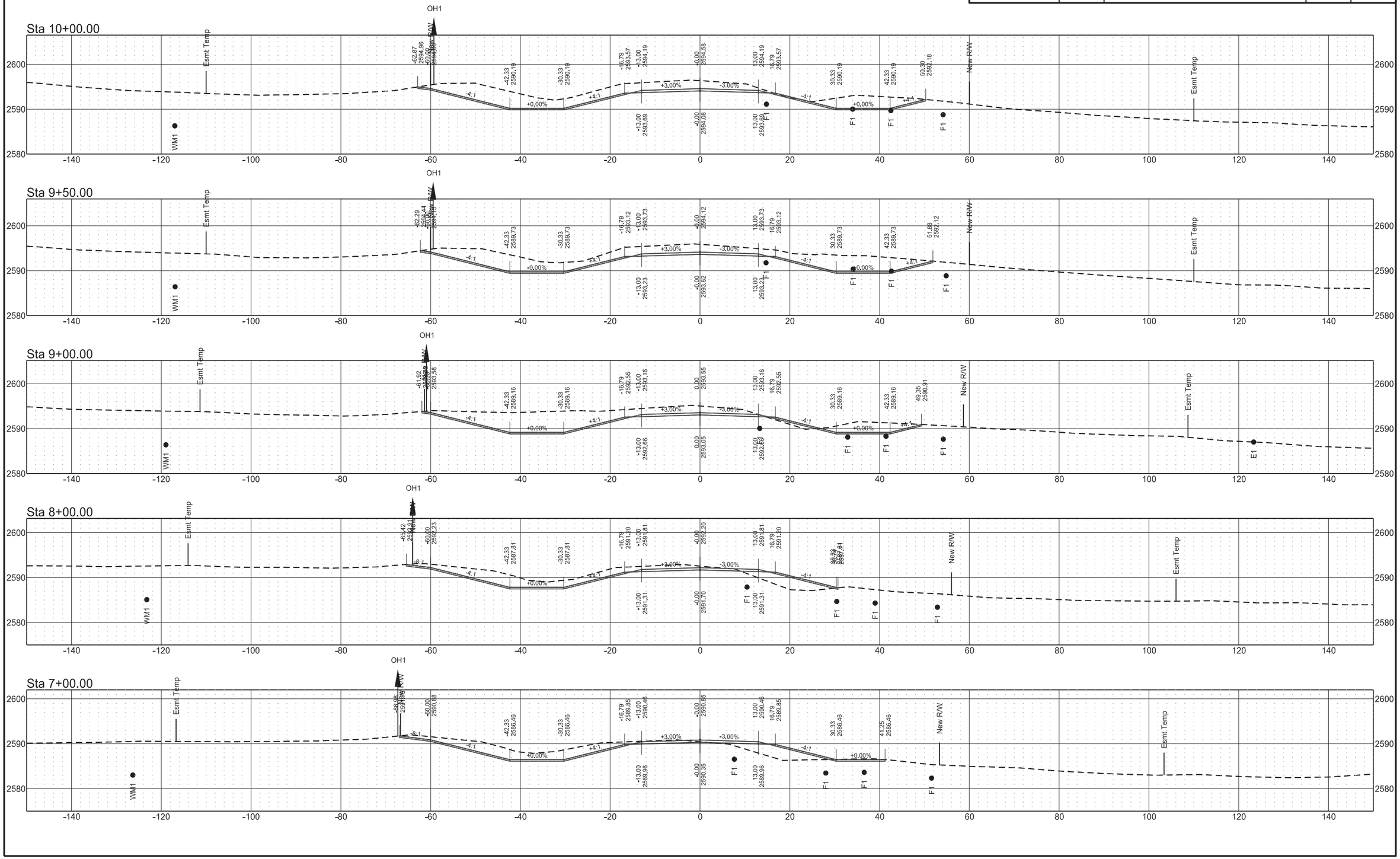
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	1

119th Ave SW
5+00 to 6+00



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	2

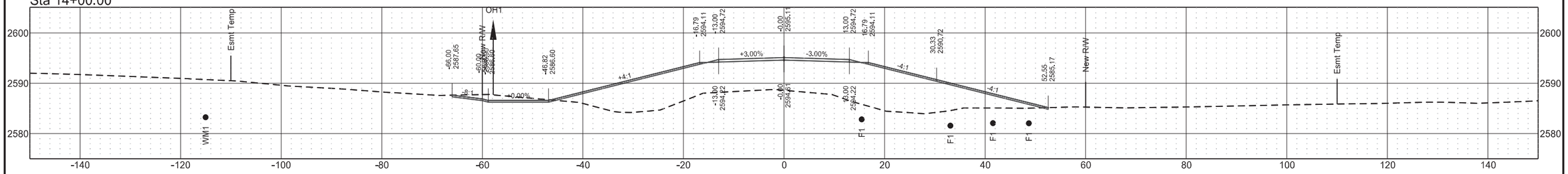
119th Ave SW
7+00 to 10+00



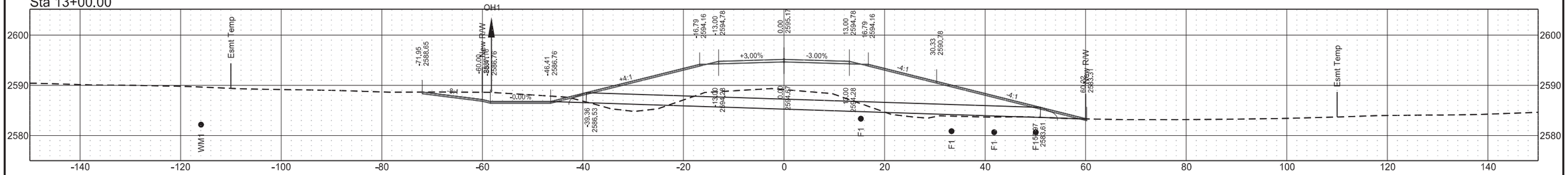
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	3

119th Ave SW
11+00 to 14+00

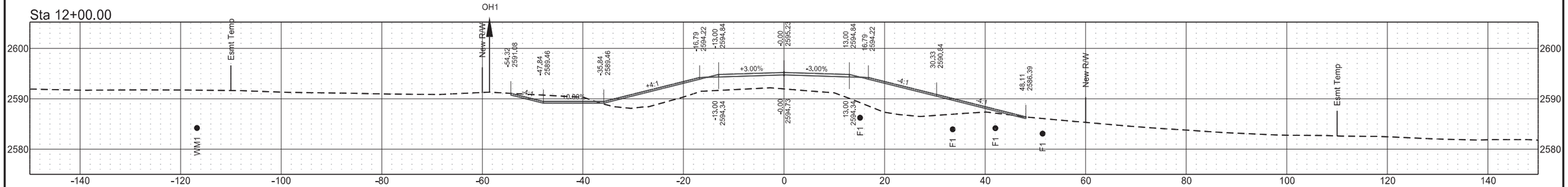
Sta 14+00.00



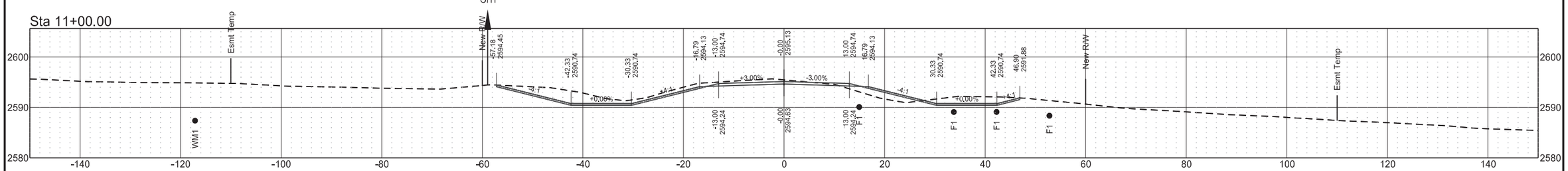
Sta 13+00.00



Sta 12+00.00

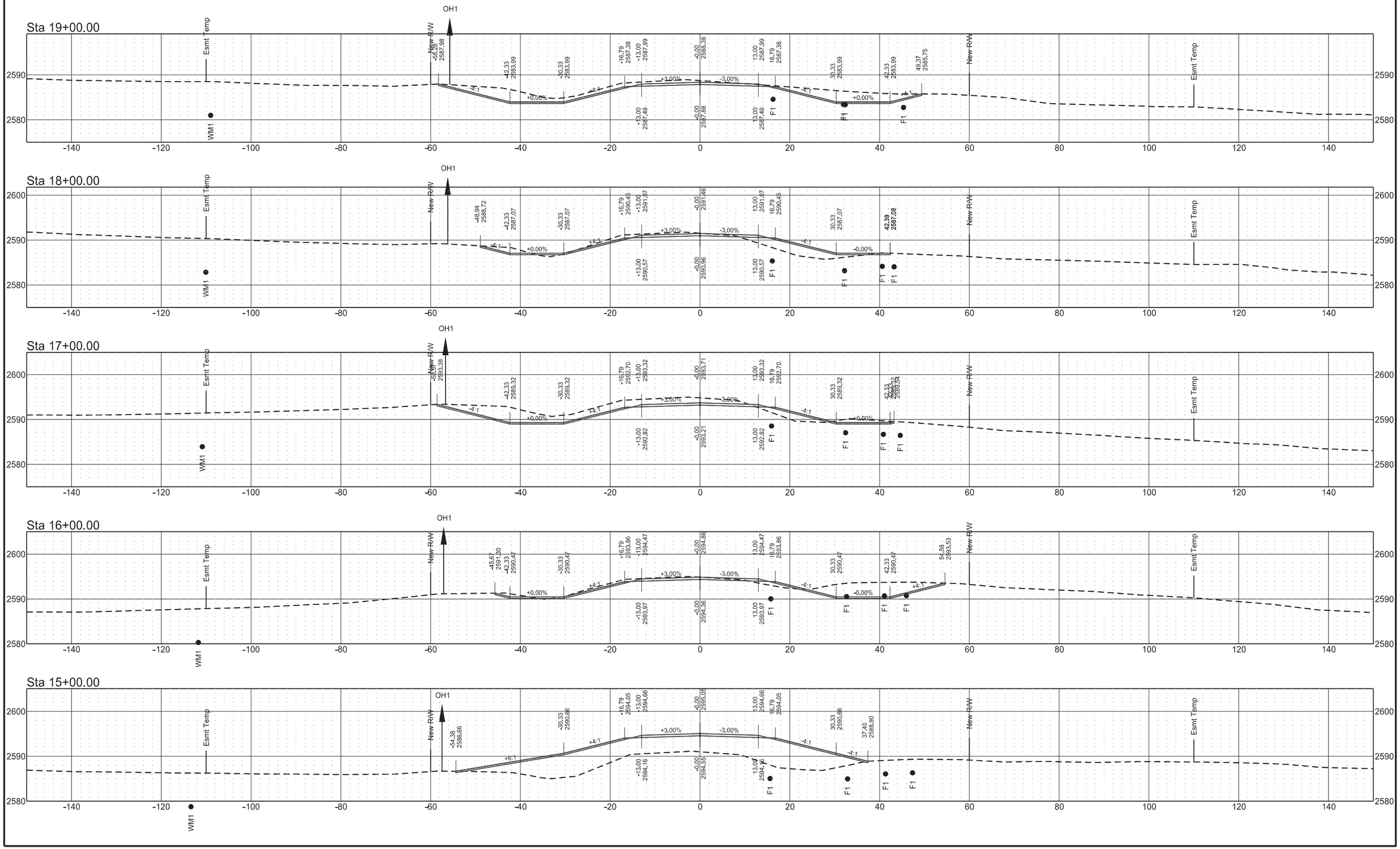


Sta 11+00.00



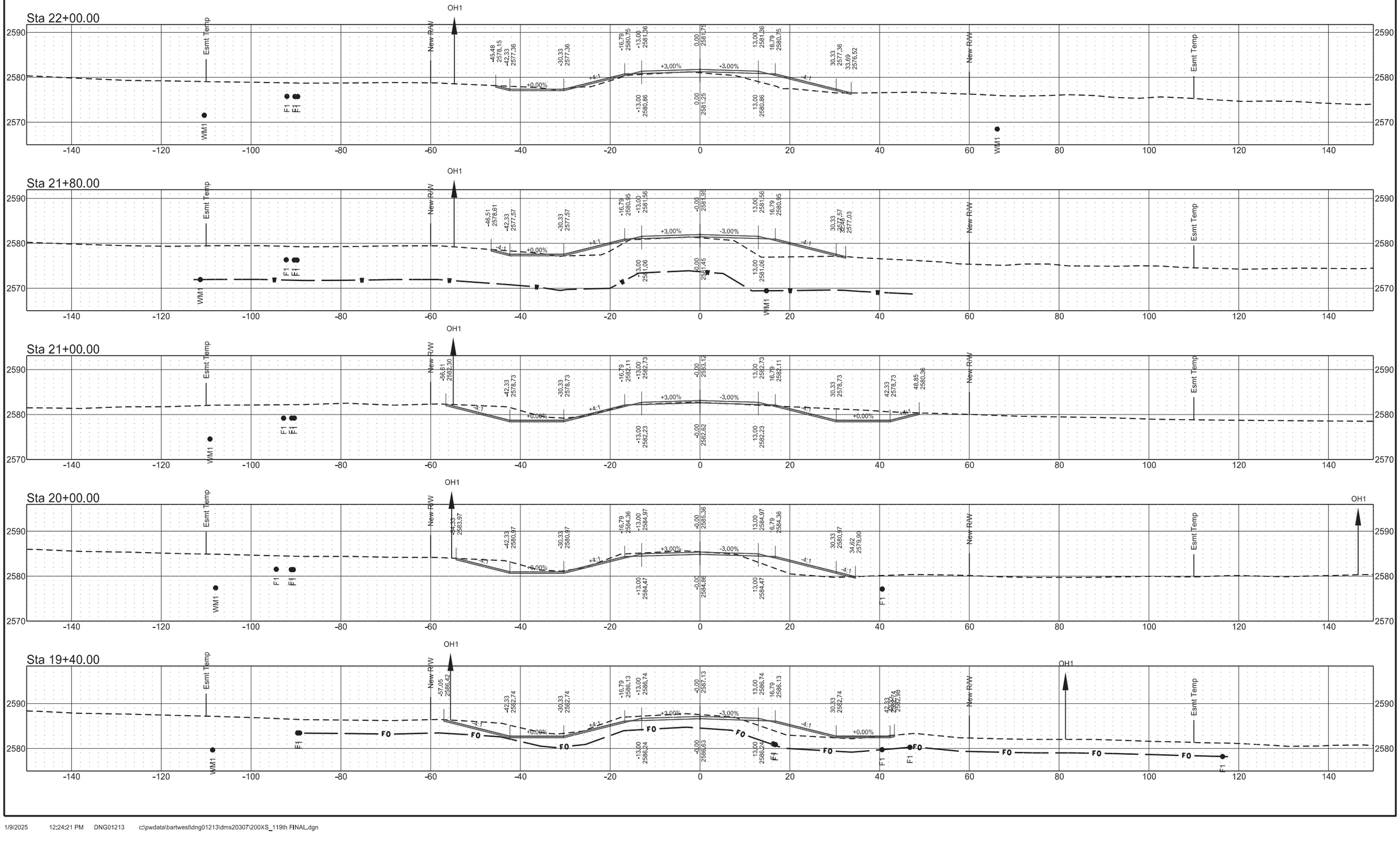
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	4

119th Ave SW
14+00 to 19+00



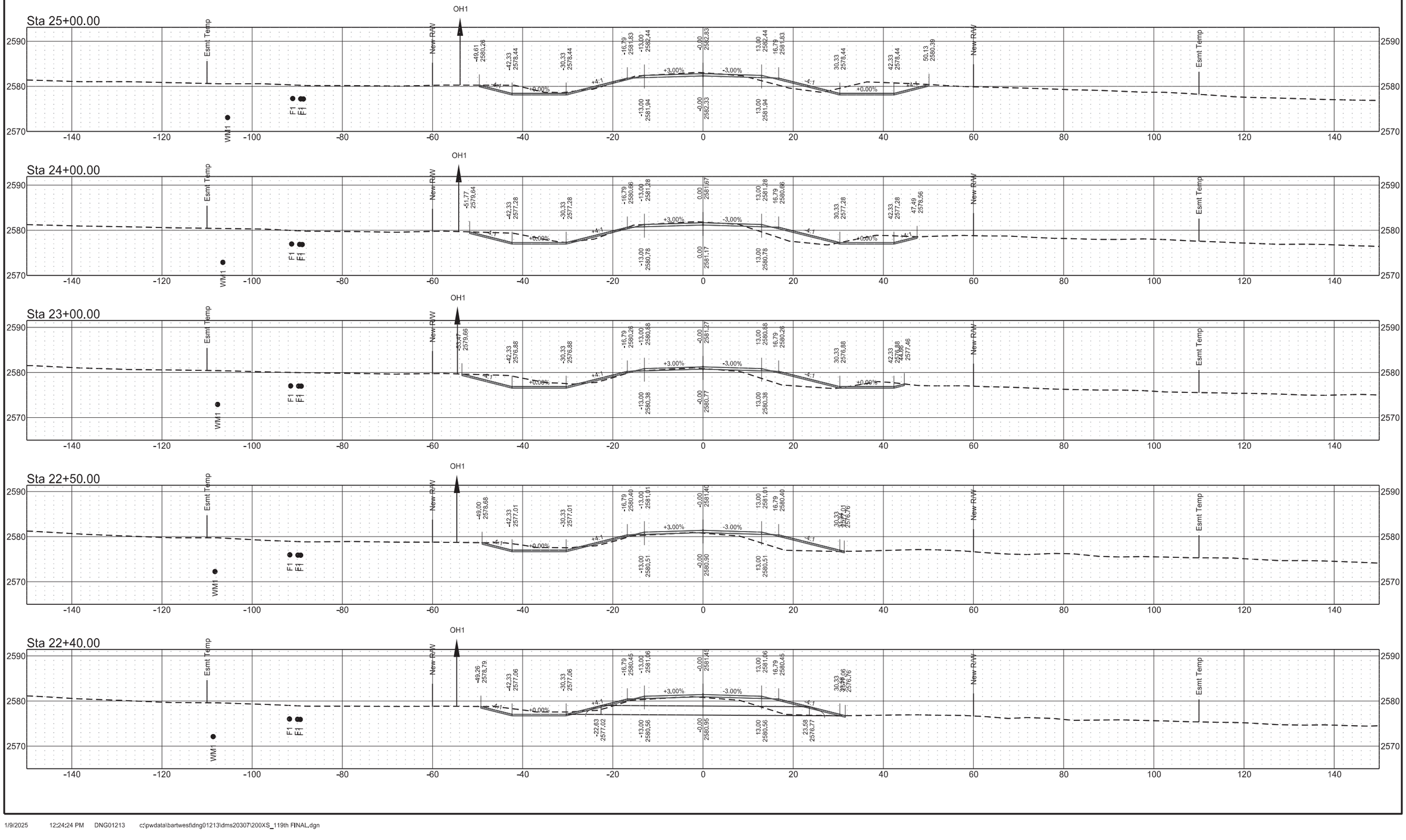
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	5

119th Ave SW
19+40 to 22+00



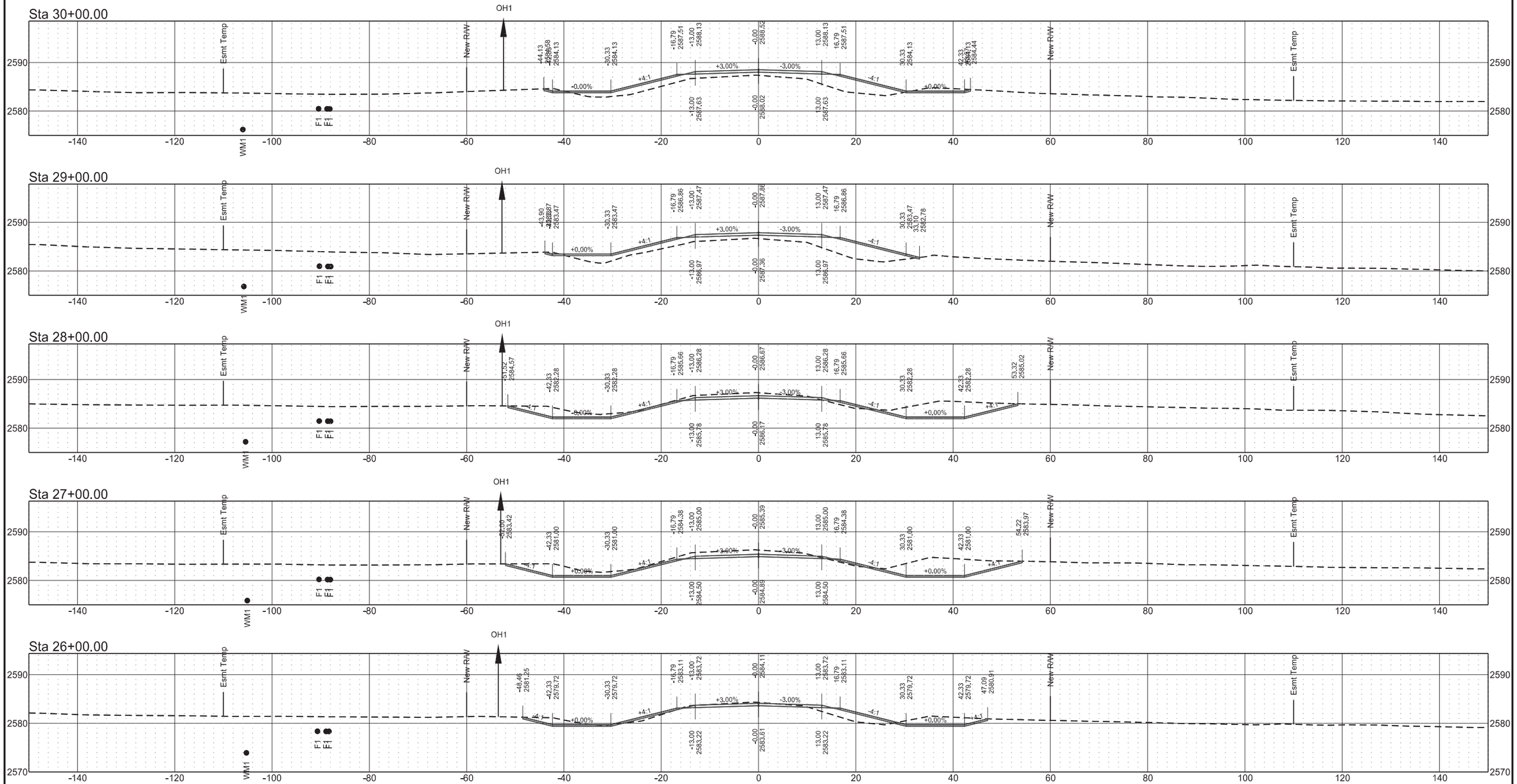
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	6

119th Ave SW
22+40 to 25+00



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	7

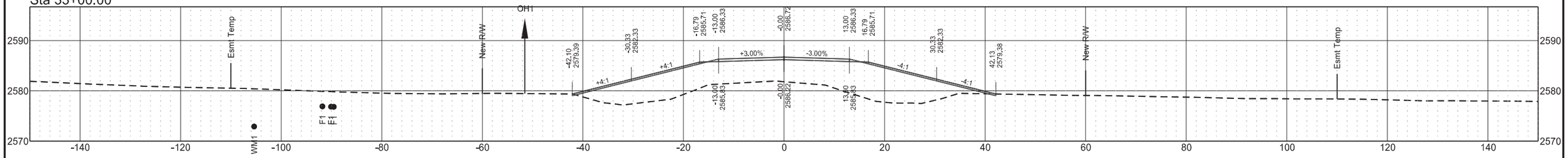
119th Ave SW
26+00 to 30+00



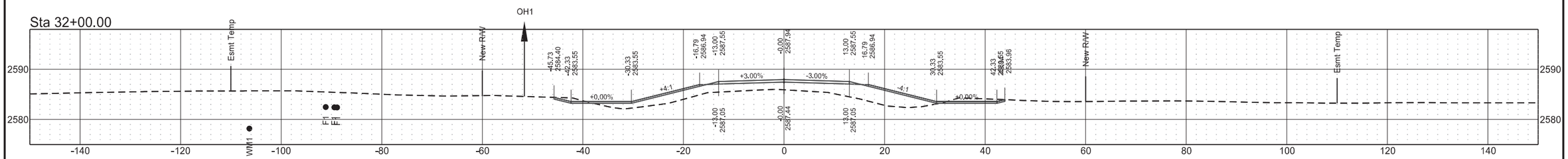
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	8

119th Ave SW
31+00 to 33+00

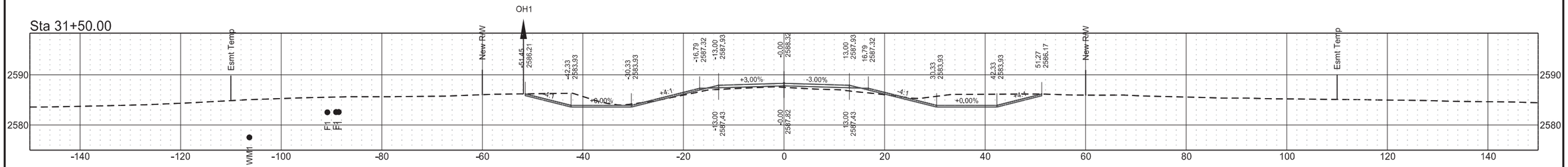
Sta 33+00.00



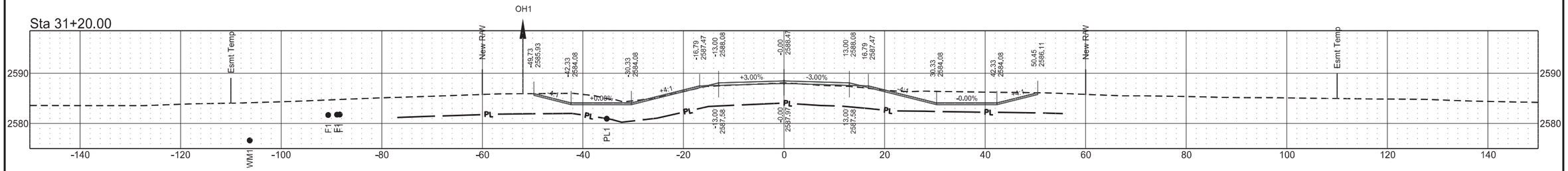
Sta 32+00.00



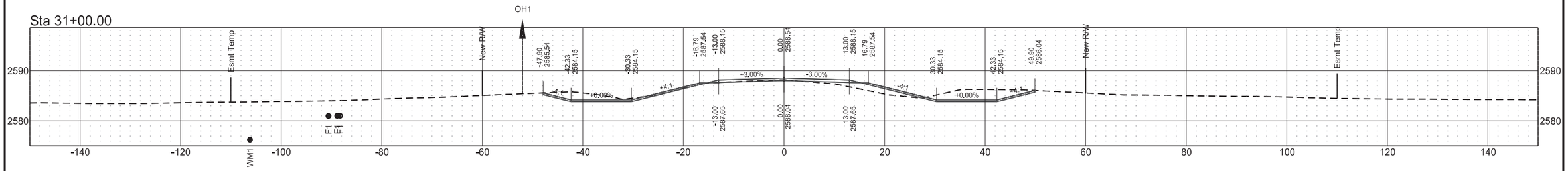
Sta 31+50.00



Sta 31+20.00

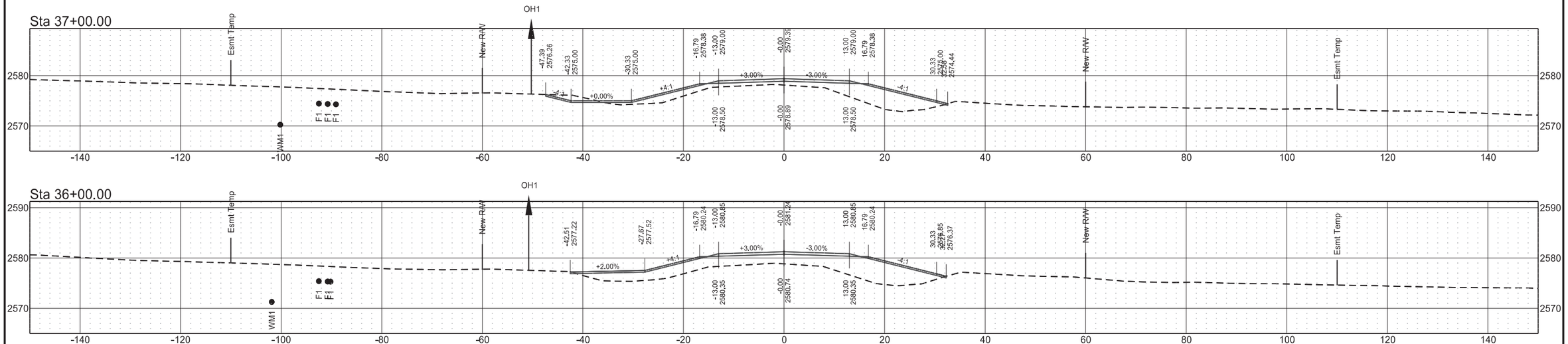


Sta 31+00.00



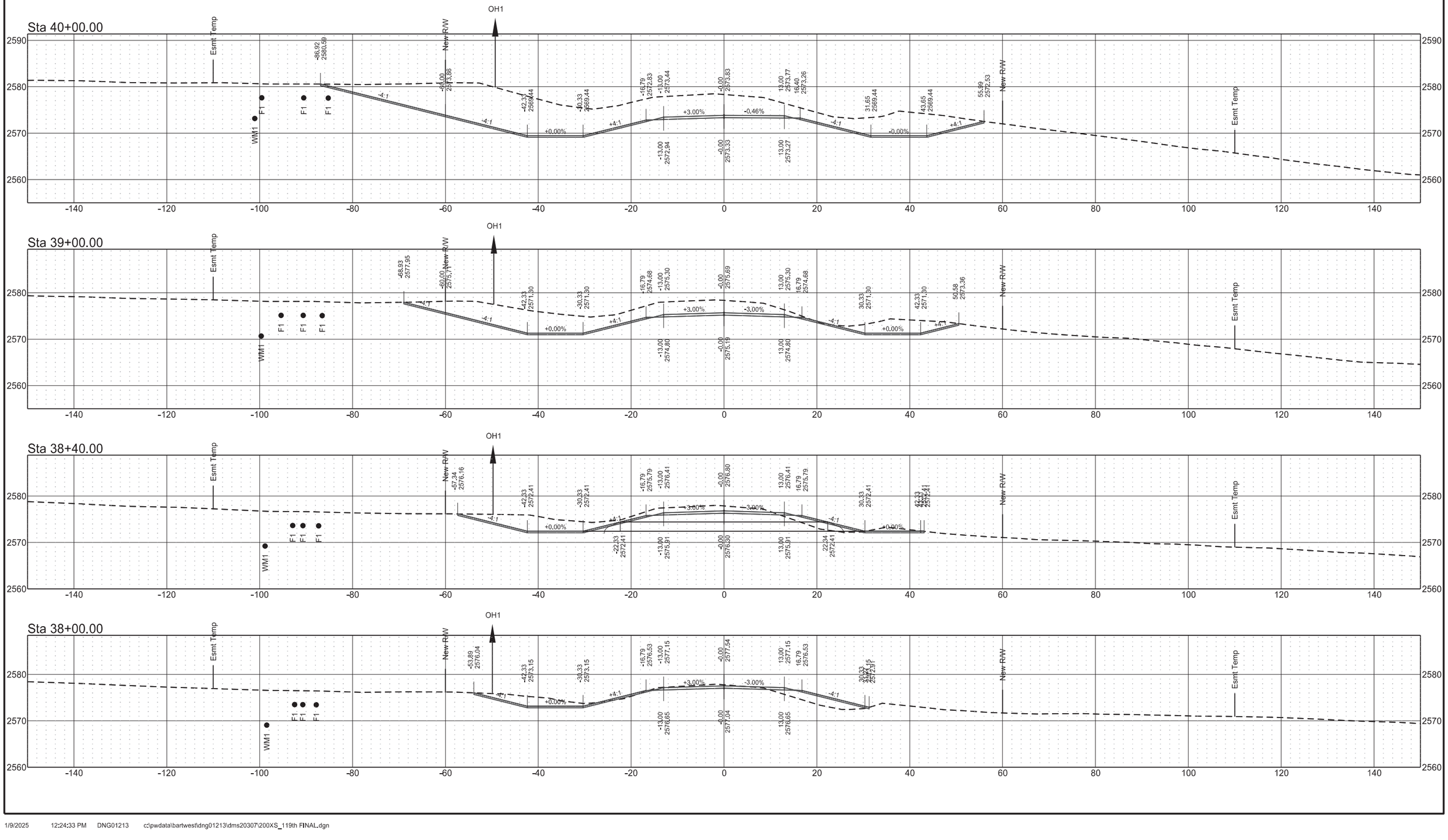
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	9

119th Ave SW
34+00 to 37+00



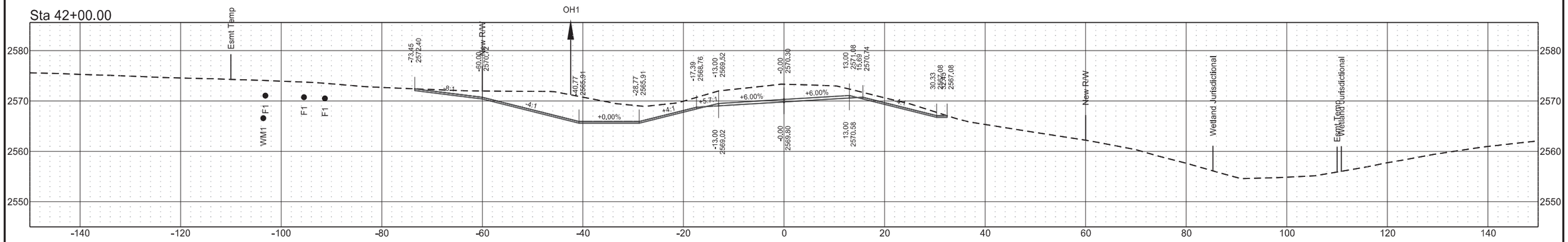
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	10

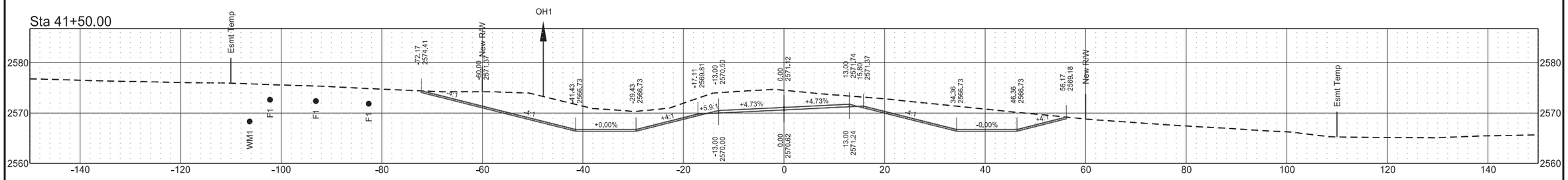
119th Ave SW
38+00 to 40+00

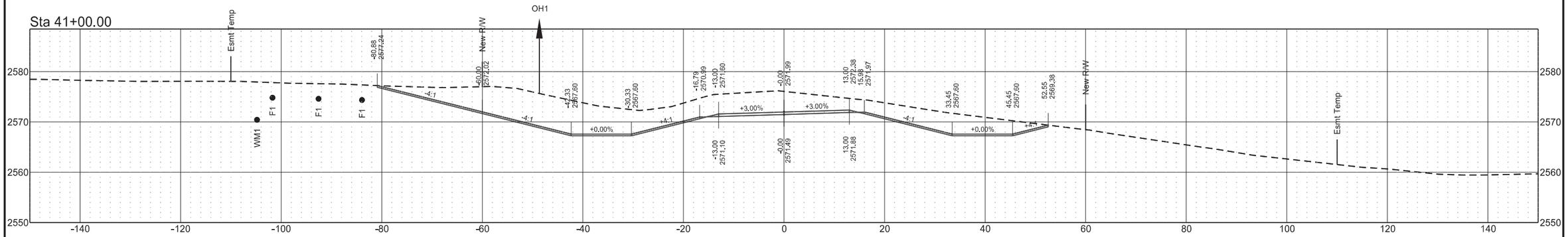


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	11

119th Ave SW
41+00 to 42+00

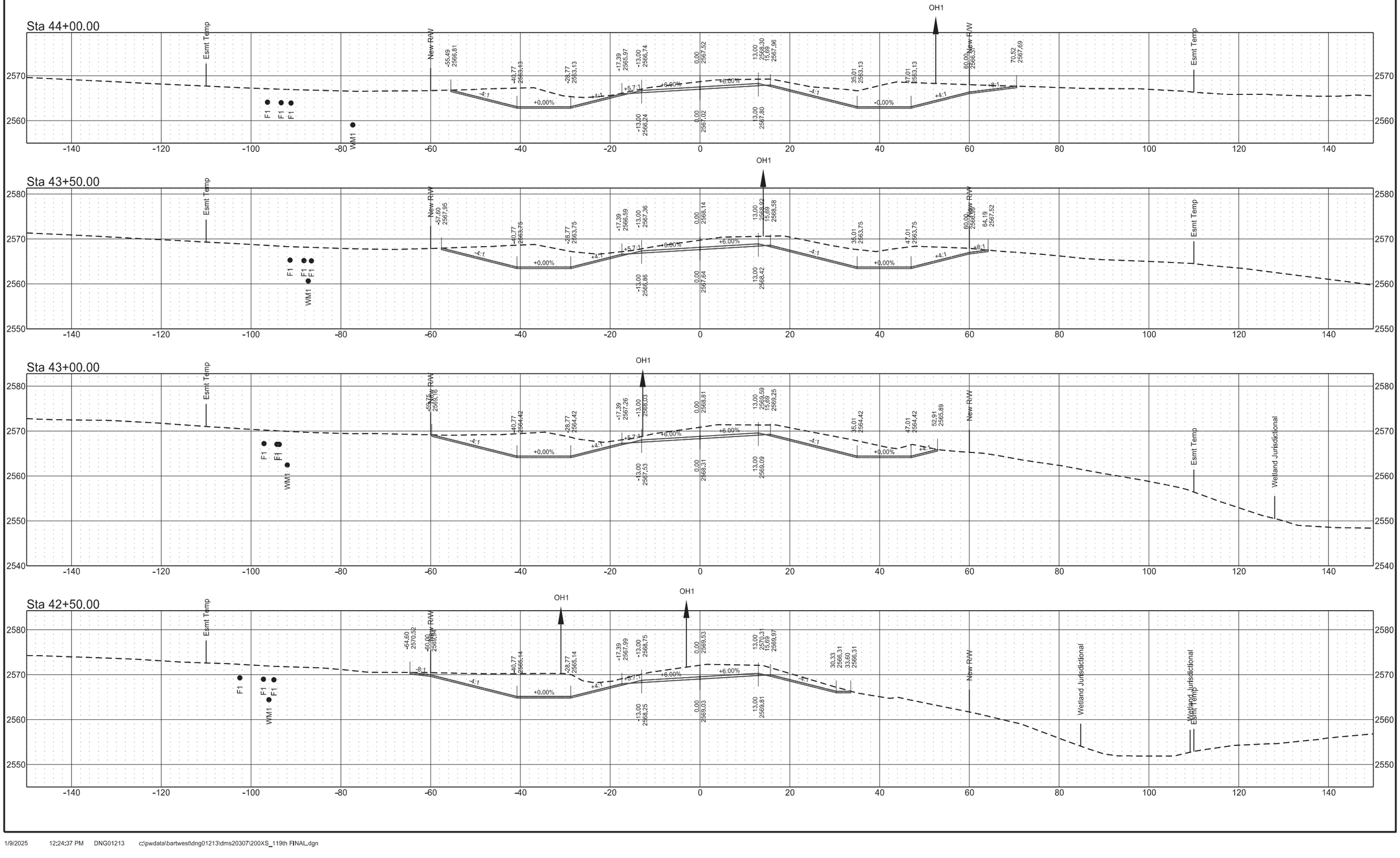






	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	12

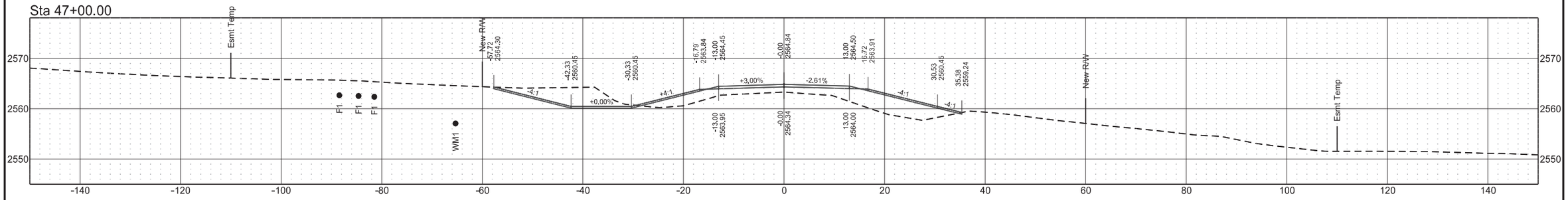
119th Ave SW
42+50 to 44+00



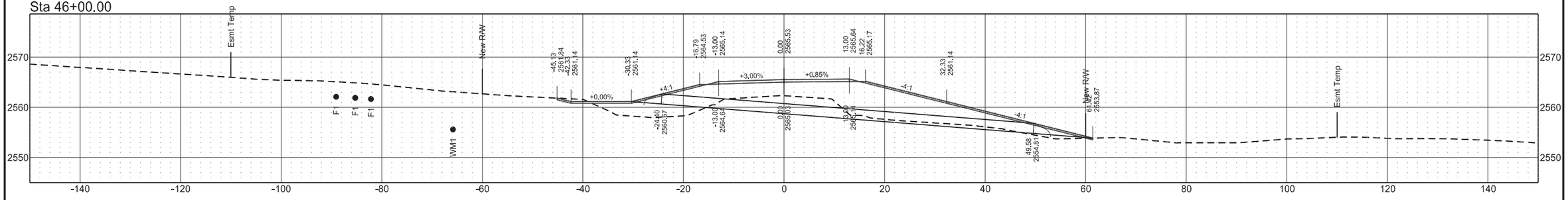
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	13

119th Ave SW
44+50 to 47+00

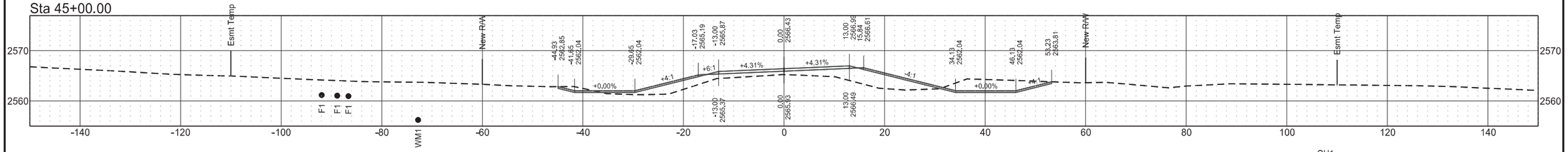
Sta 47+00.00



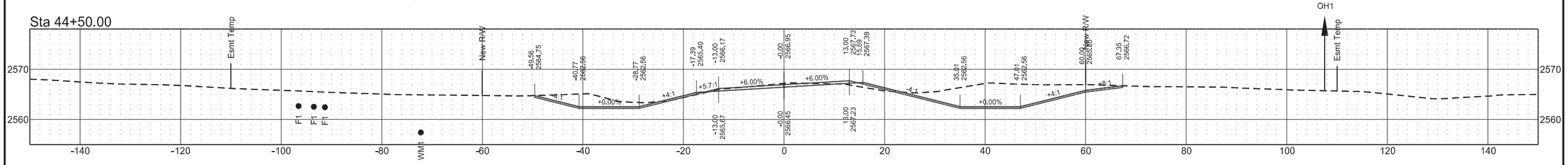
Sta 46+00.00



Sta 45+00.00



Sta 44+50.00

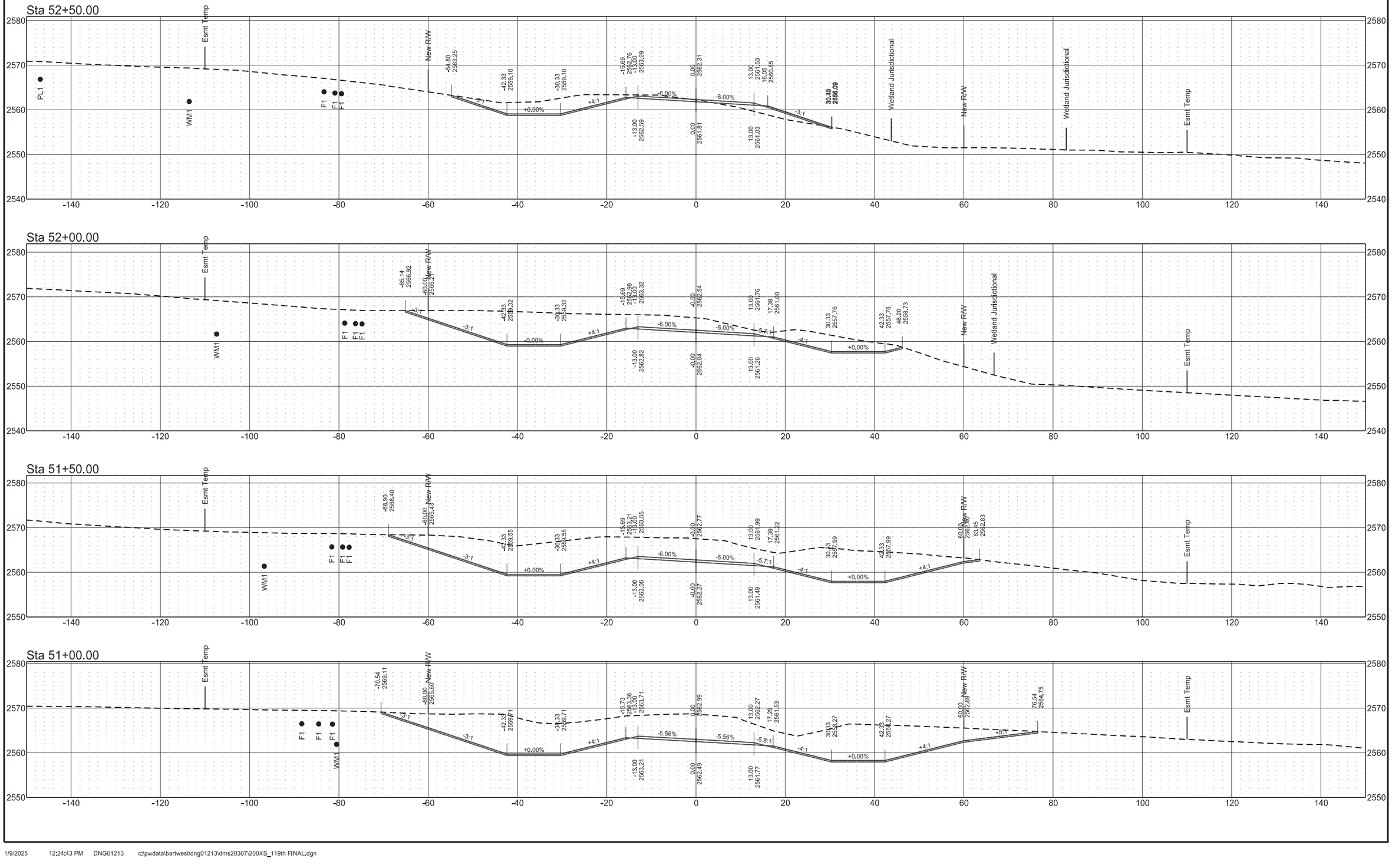


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	14

119th Ave SW
48+00 to 50+50

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	15

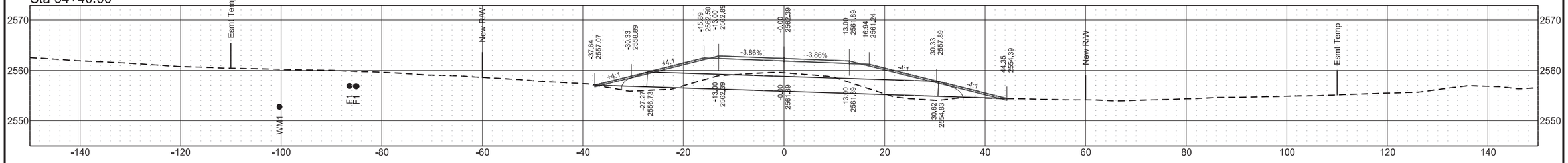
119th Ave SW
51+00 to 52+50



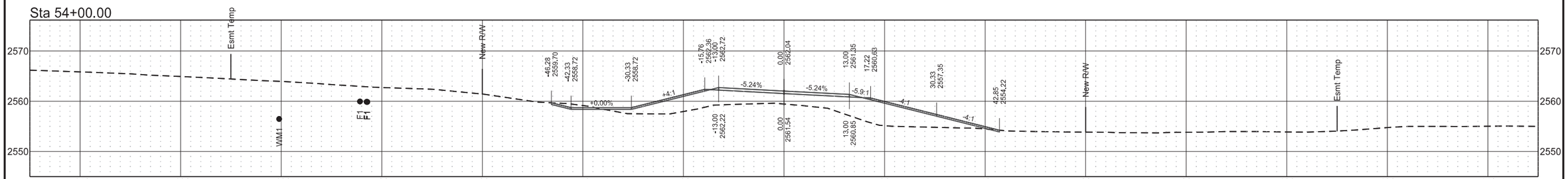
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	16

119th Ave SW
53+00 to 54+40

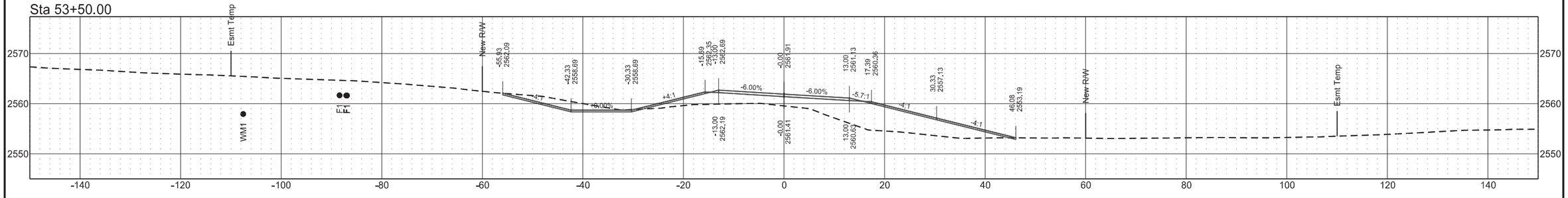
Sta 54+40.00



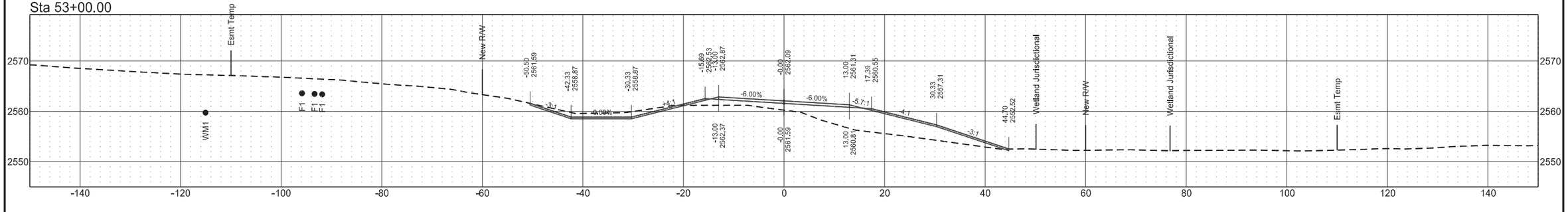
Sta 54+00.00



Sta 53+50.00



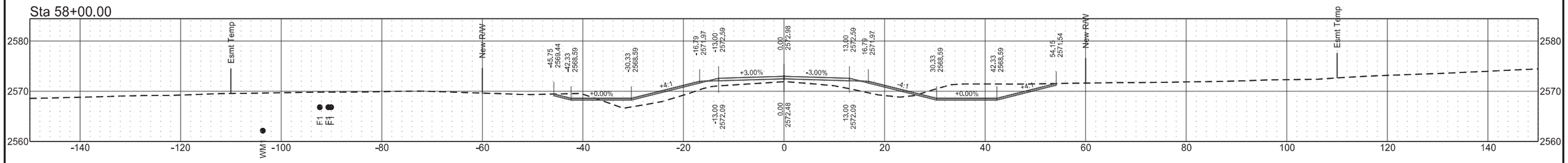
Sta 53+00.00



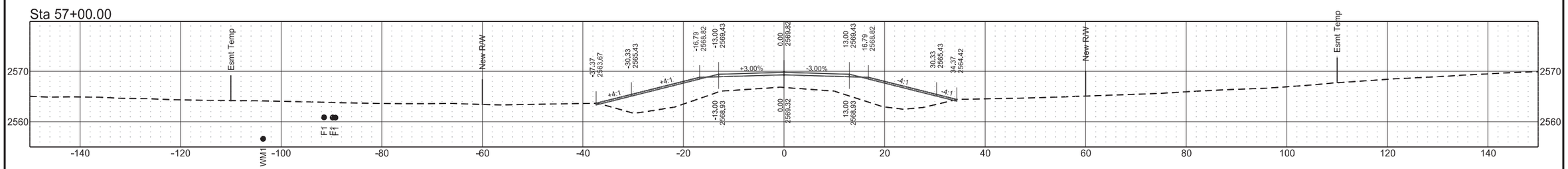
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	17

119th Ave SW
54+50 to 58+00

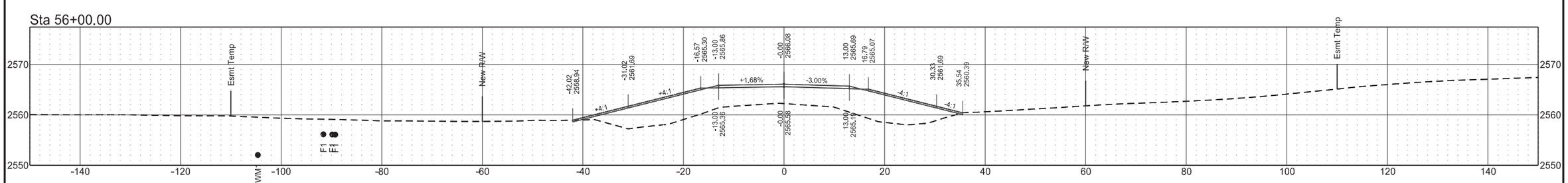
Sta 58+00.00



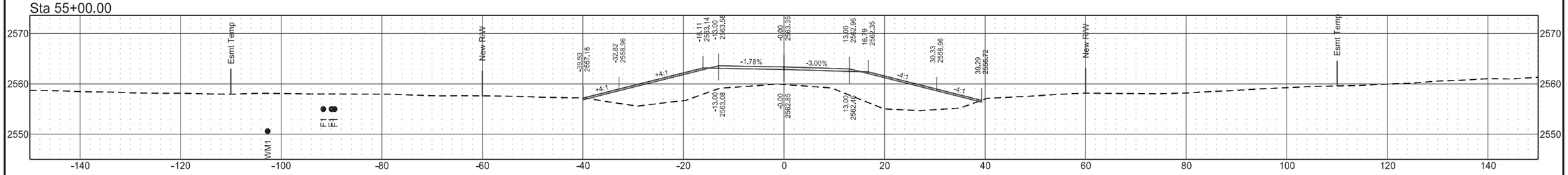
Sta 57+00.00



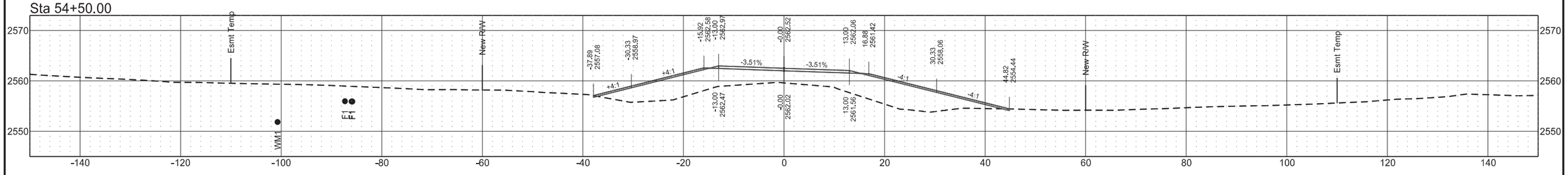
Sta 56+00.00



Sta 55+00.00



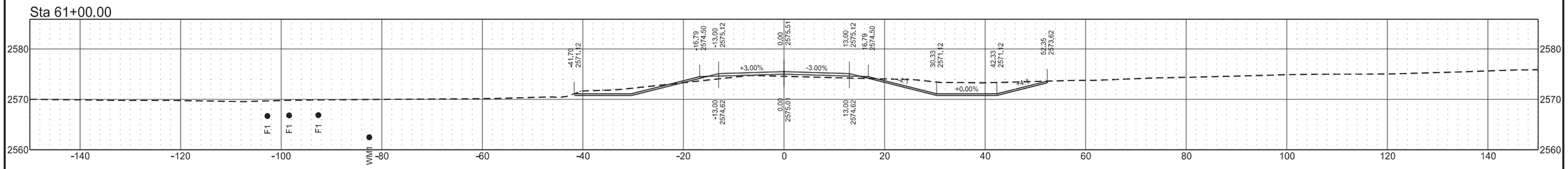
Sta 54+50.00



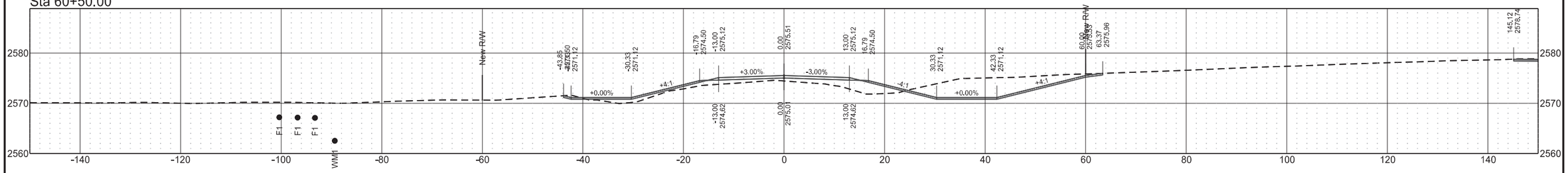
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	18

119th Ave SW
59+00 to 61+00

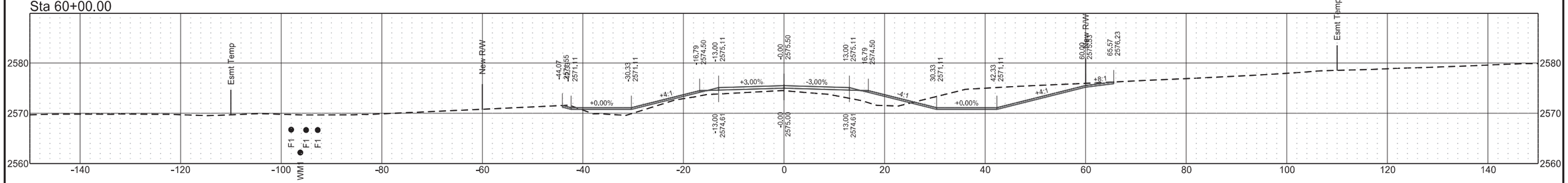
Sta 61+00.00



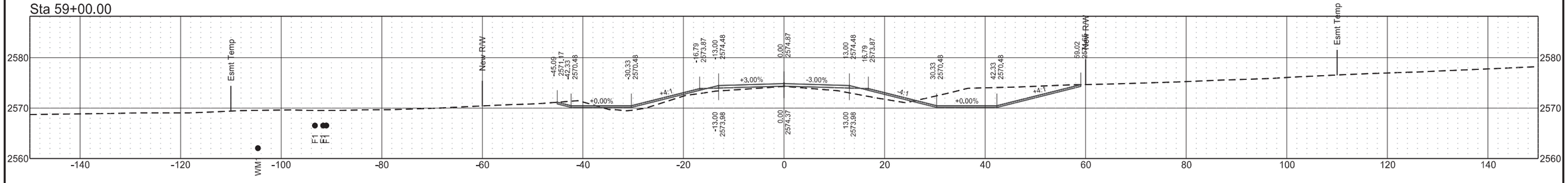
Sta 60+50.00



Sta 60+00.00



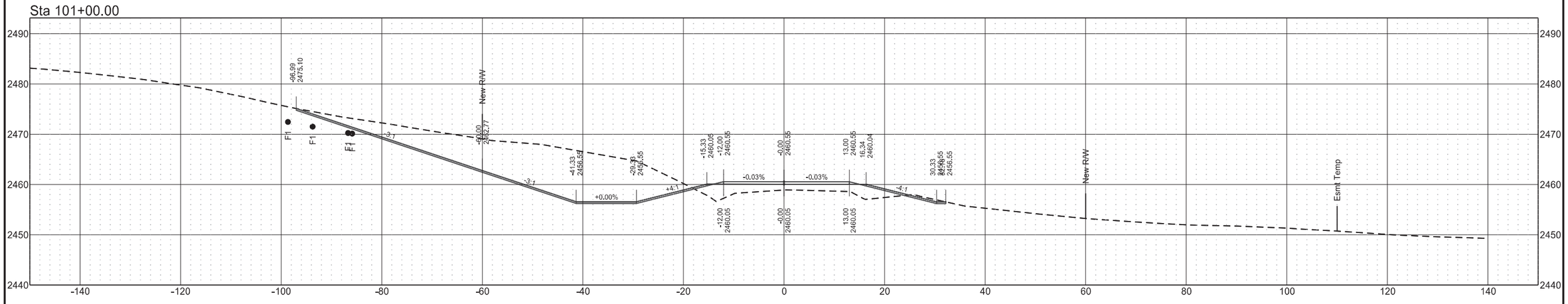
Sta 59+00.00



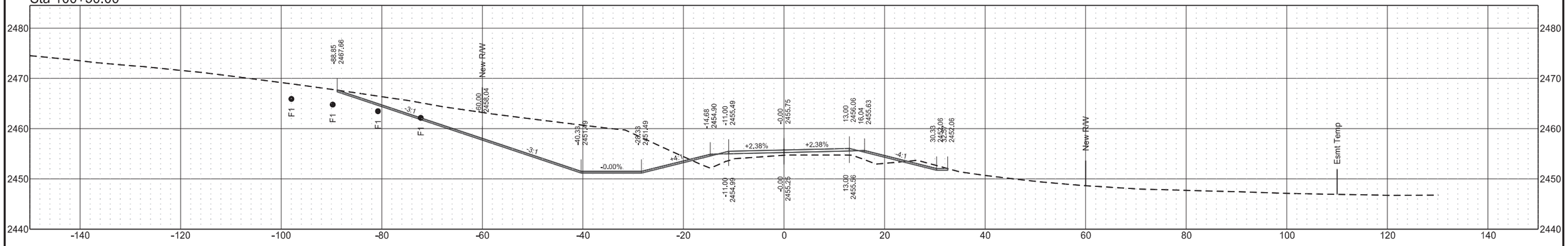
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	19

2nd St SW
100+00 to 101+00

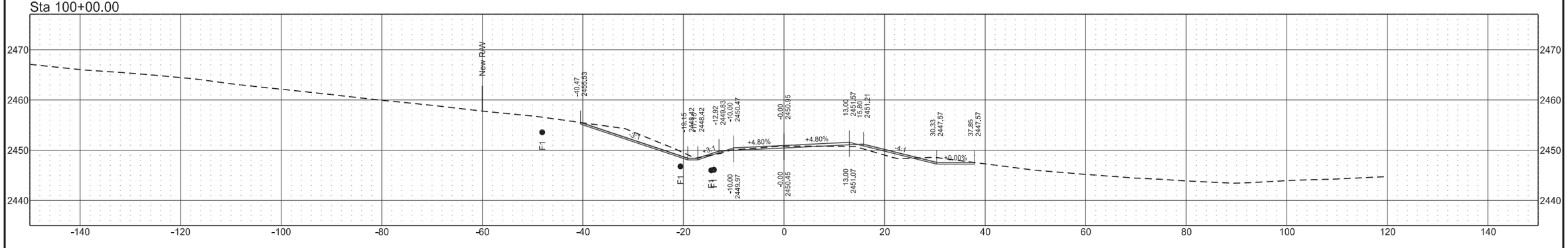
Sta 101+00.00



Sta 100+50.00



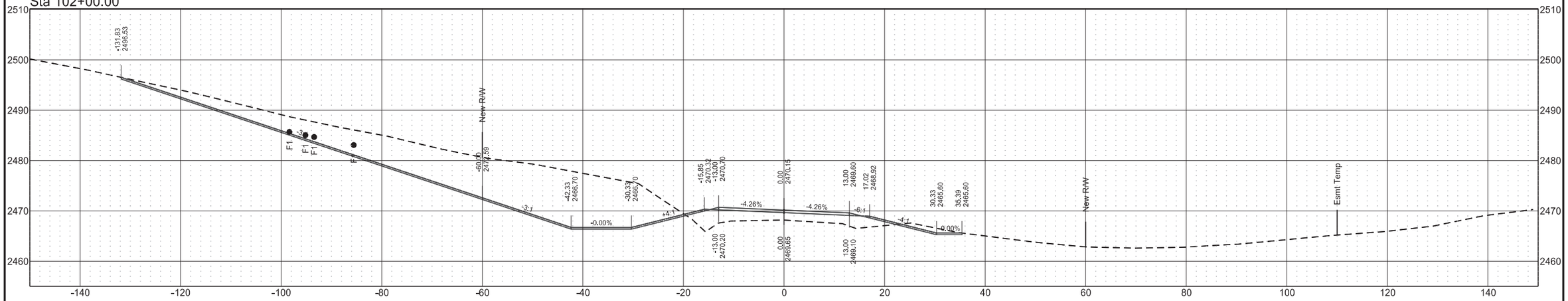
Sta 100+00.00



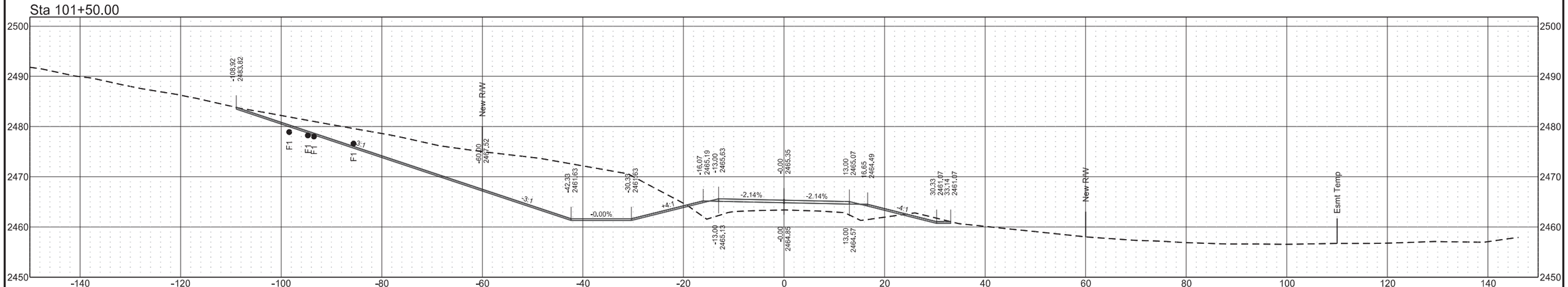
2nd St SW
101+50 to 102+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	20

Sta 102+00.00



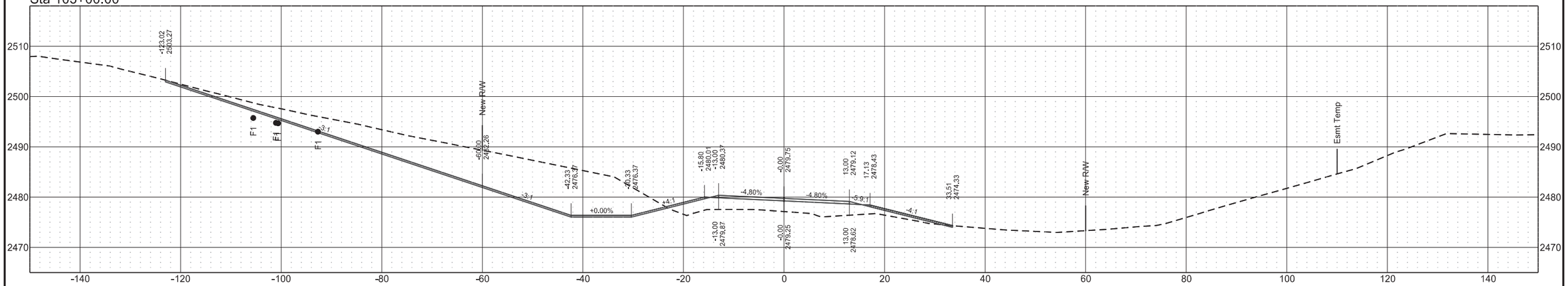
Sta 101+50.00



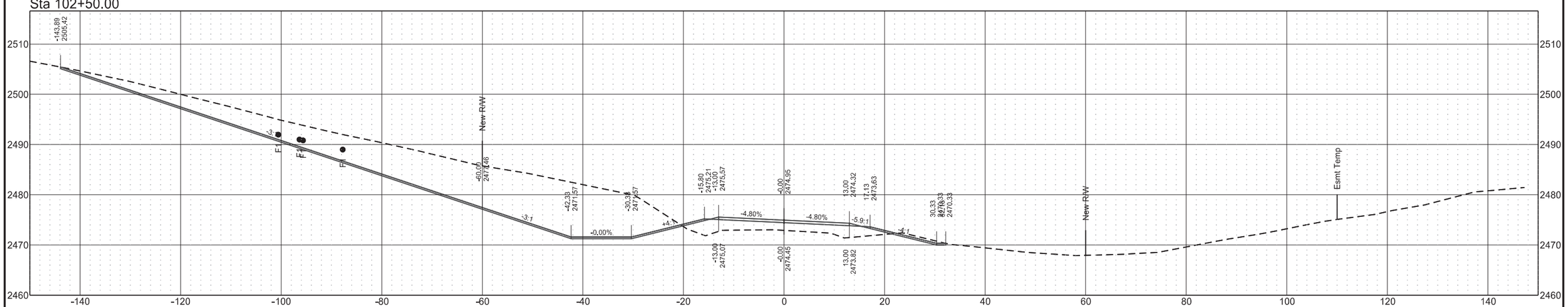
2nd St SW
102+50 to 103+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	21

Sta 103+00.00



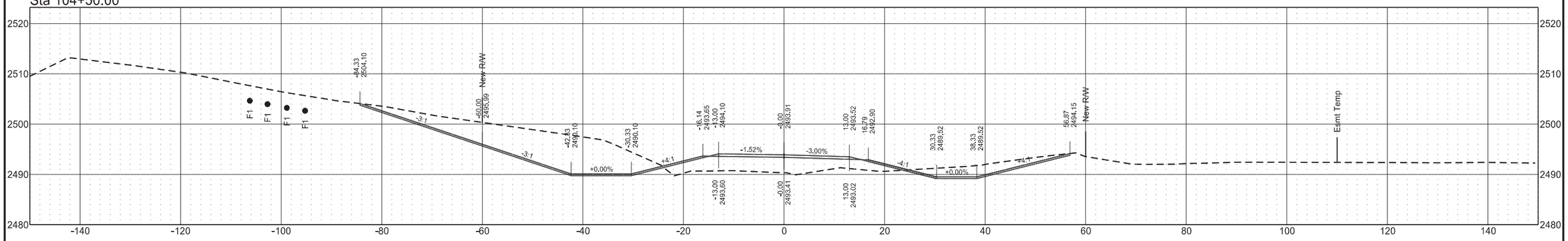
Sta 102+50.00



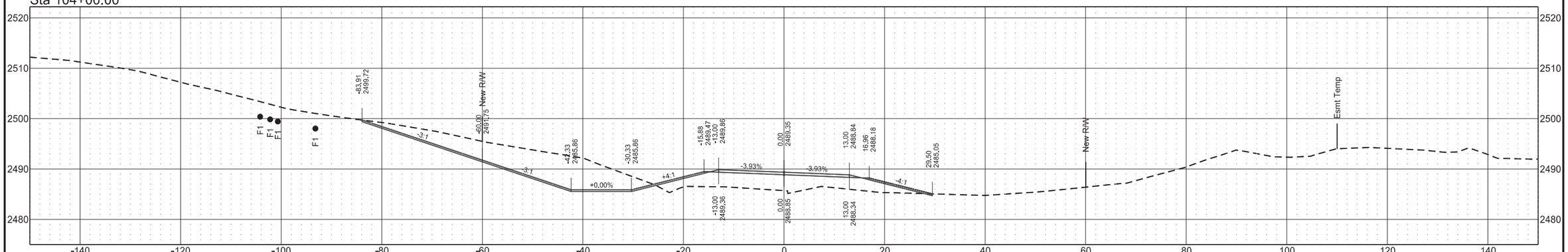
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	22

2nd St SW
103+50 to 104+50

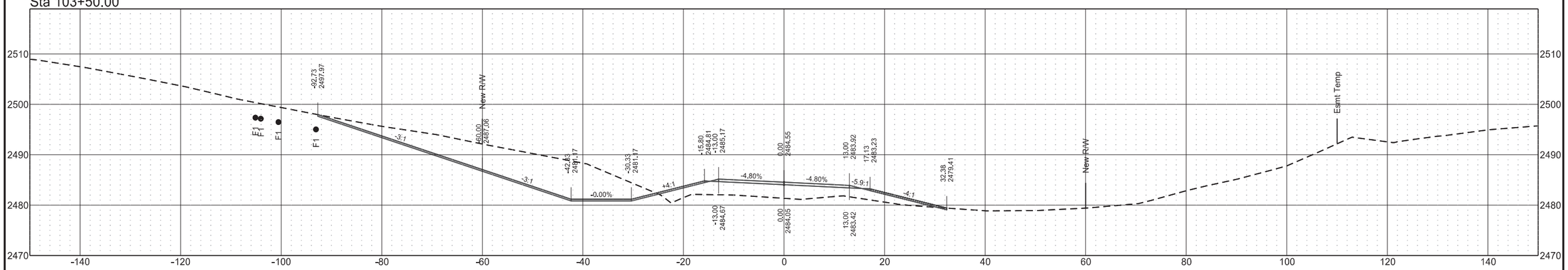
Sta 104+50.00



Sta 104+00.00



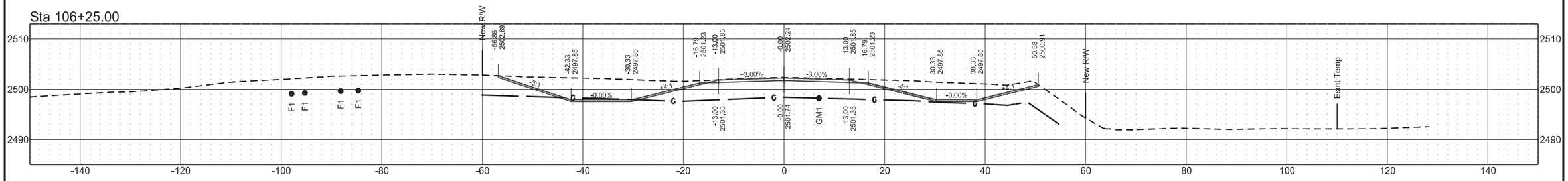
Sta 103+50.00



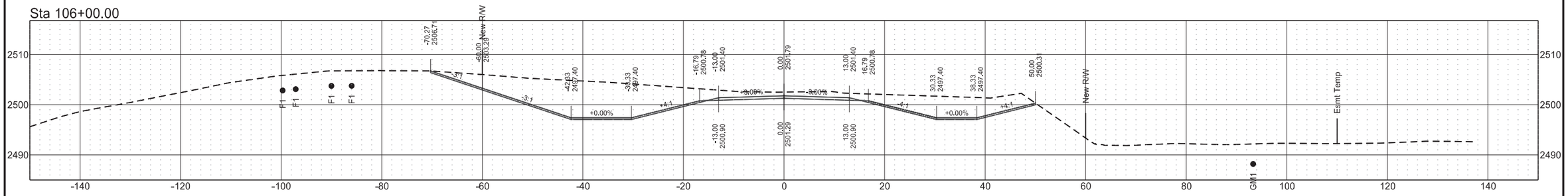
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	23

2nd St SW
105+00 to 106+25

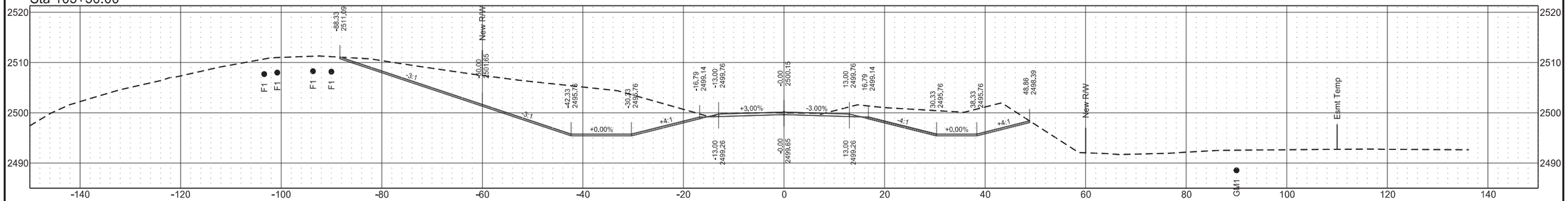
Sta 106+25.00



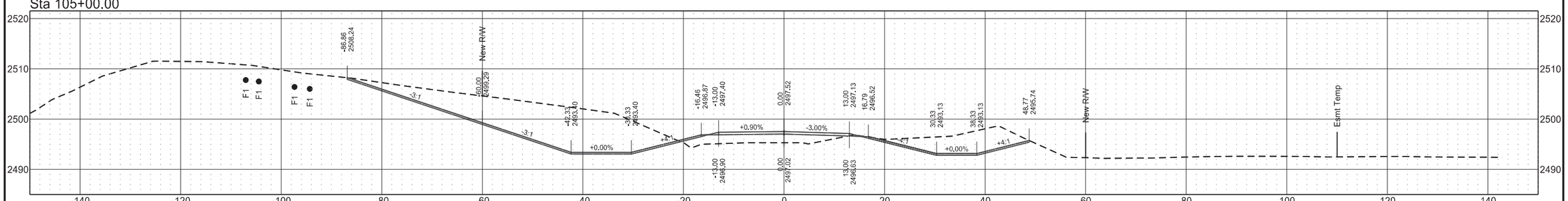
Sta 106+00.00



Sta 105+50.00



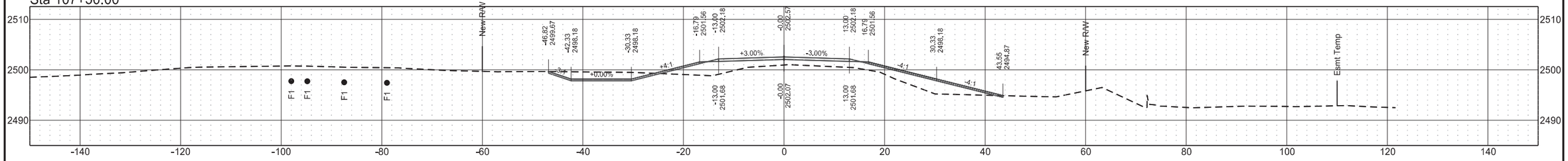
Sta 105+00.00



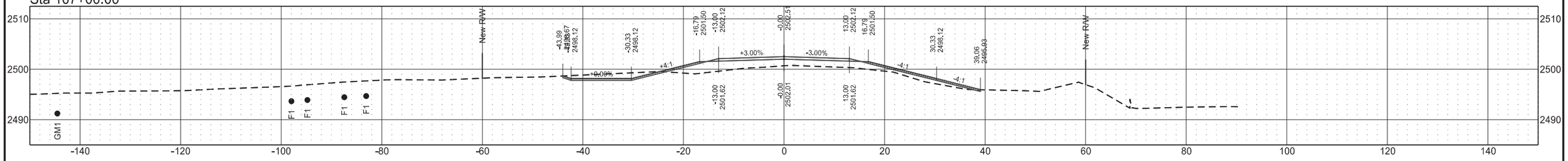
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	24

2nd St SW
106+50 to 107+50

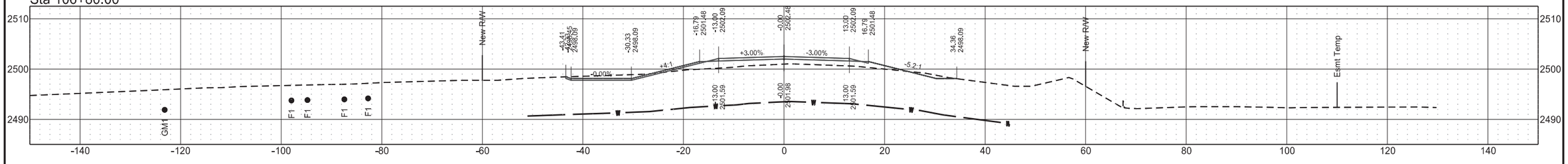
Sta 107+50.00



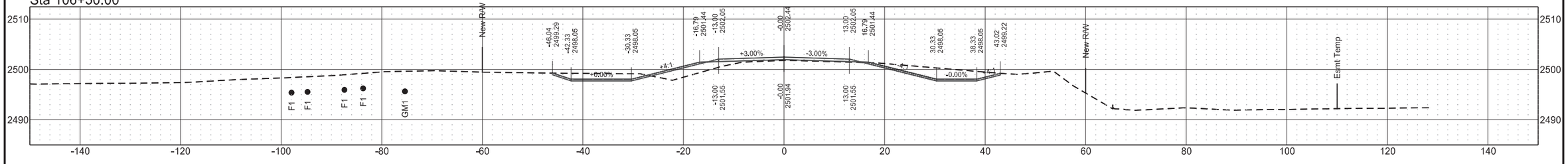
Sta 107+00.00



Sta 106+80.00



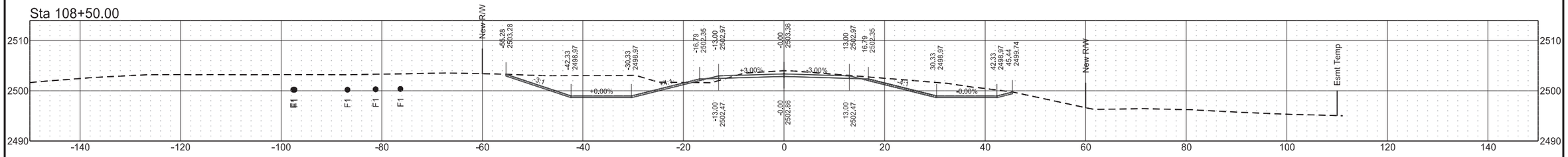
Sta 106+50.00



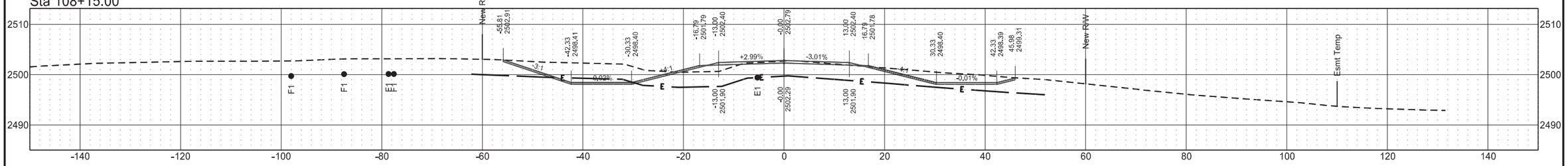
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	25

2nd St SW
107+90 to 108+50

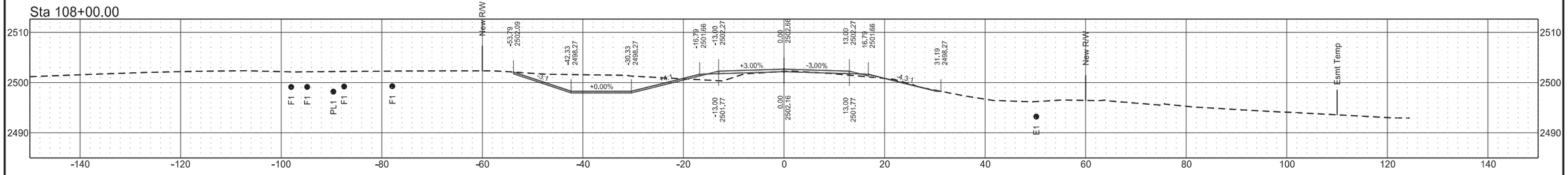
Sta 108+50.00



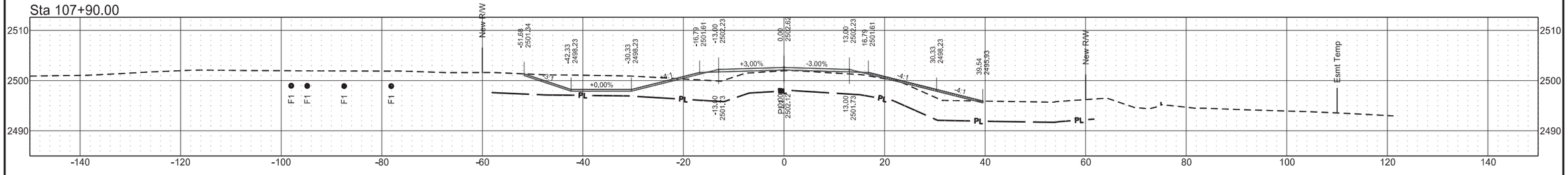
Sta 108+15.00



Sta 108+00.00



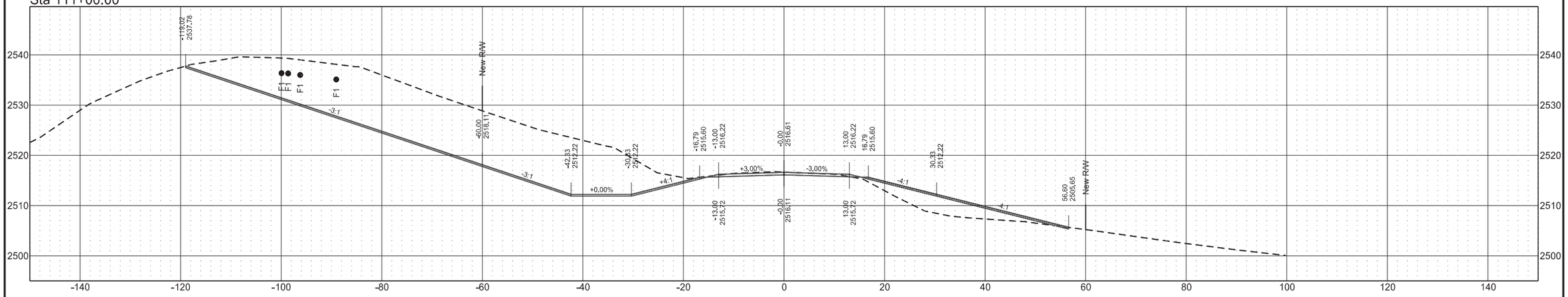
Sta 107+90.00



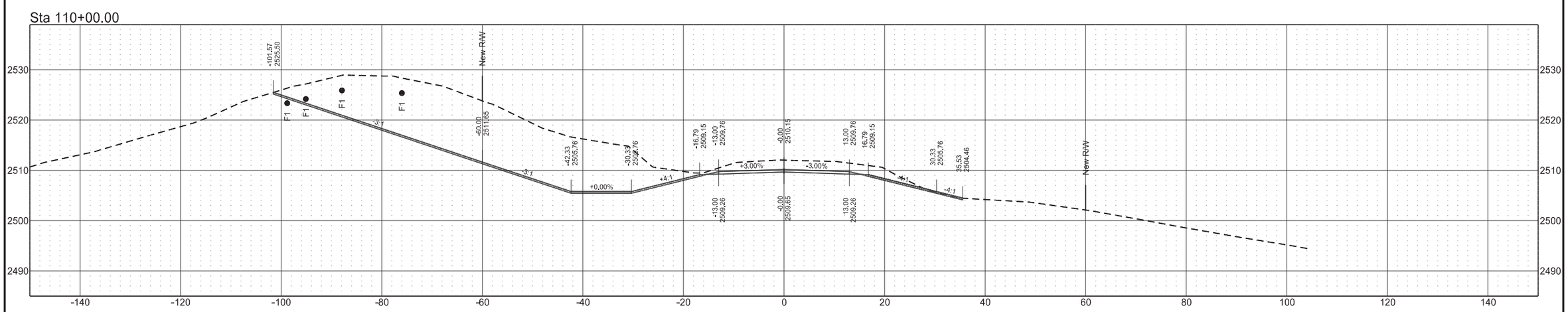
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	26

2nd St SW
109+00 to 111+00

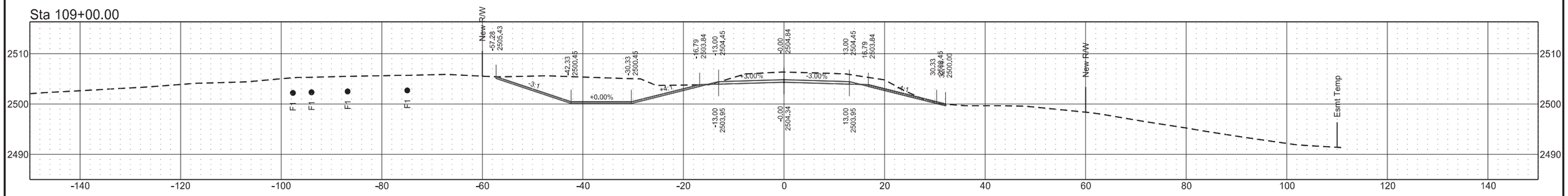
Sta 111+00.00



Sta 110+00.00



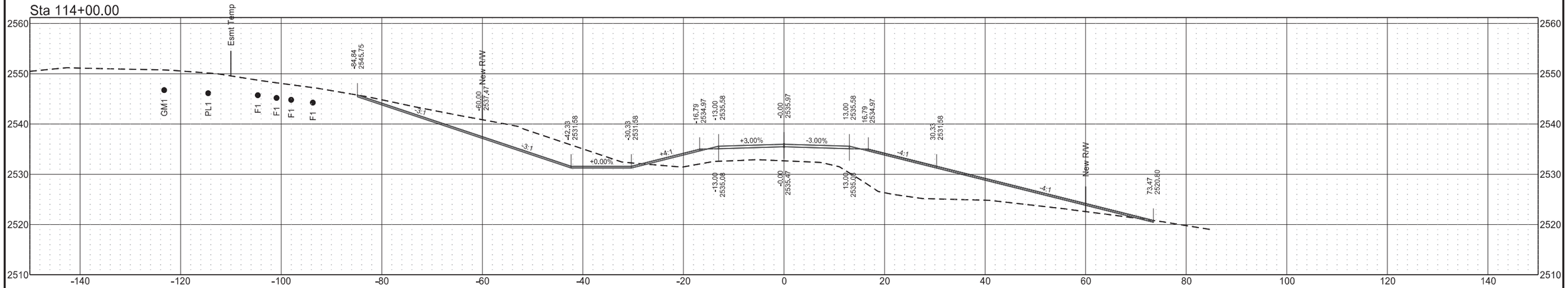
Sta 109+00.00



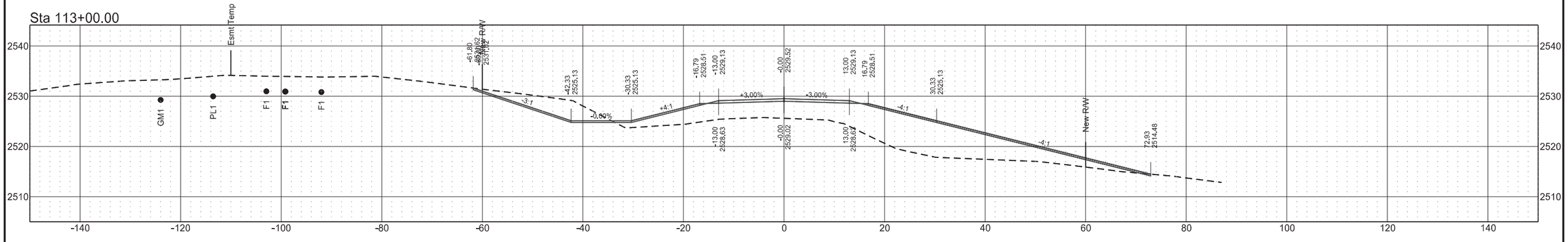
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	27

2nd St SW
112+00 to 114+00

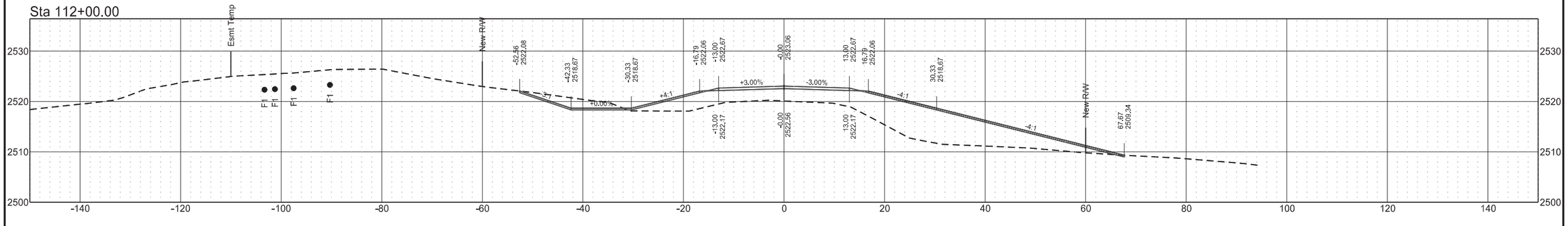
Sta 114+00.00



Sta 113+00.00



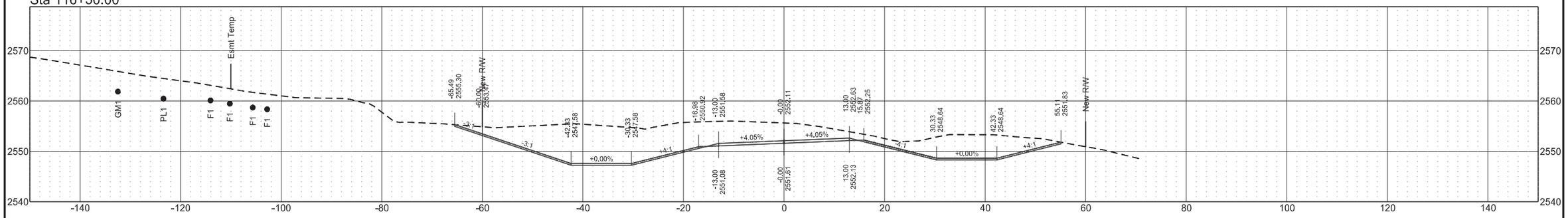
Sta 112+00.00



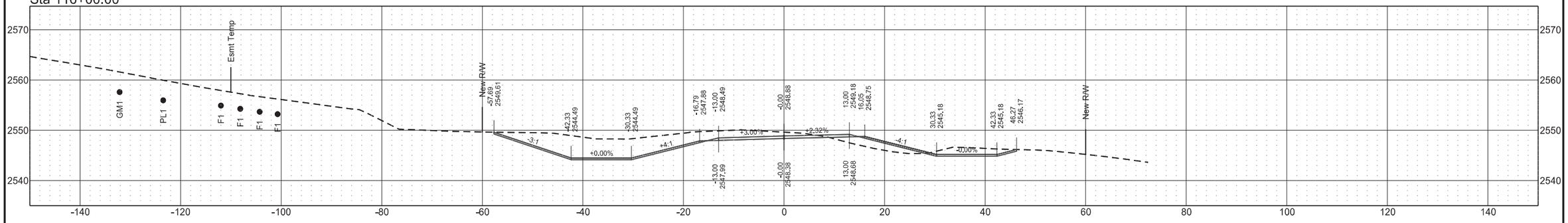
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	28

2nd St SW
115+00 to 116+00

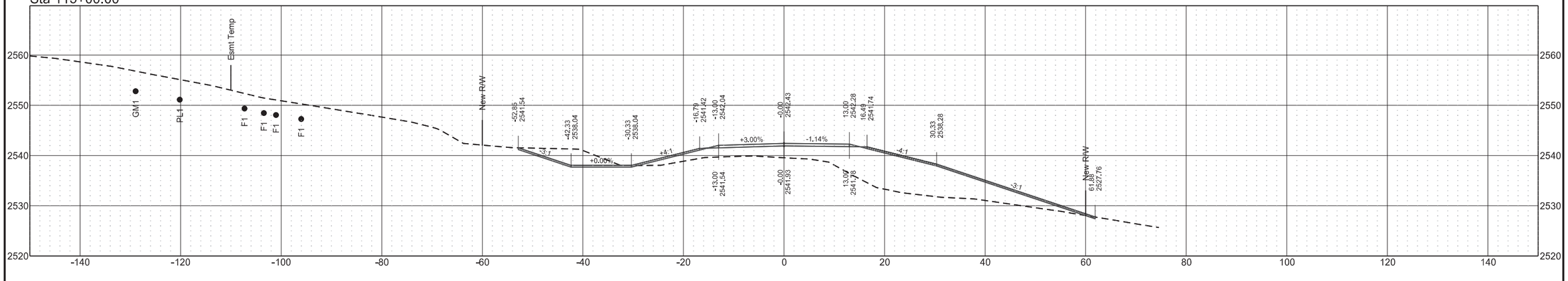
Sta 116+50.00



Sta 116+00.00



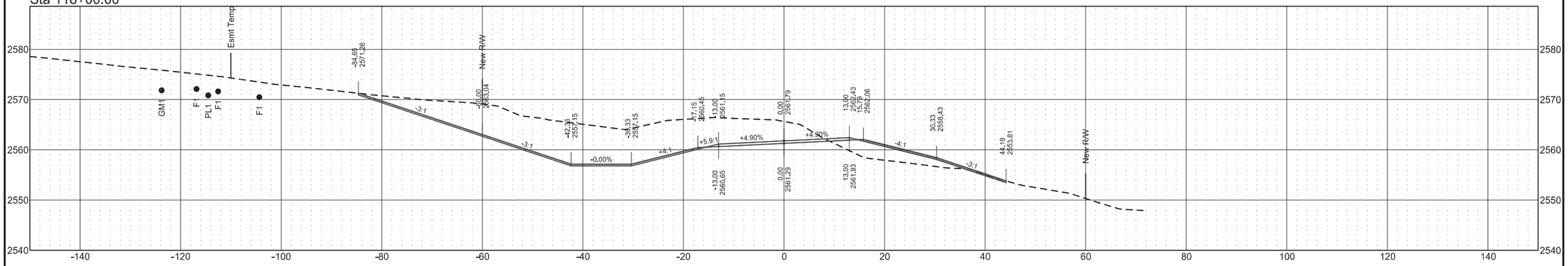
Sta 115+00.00



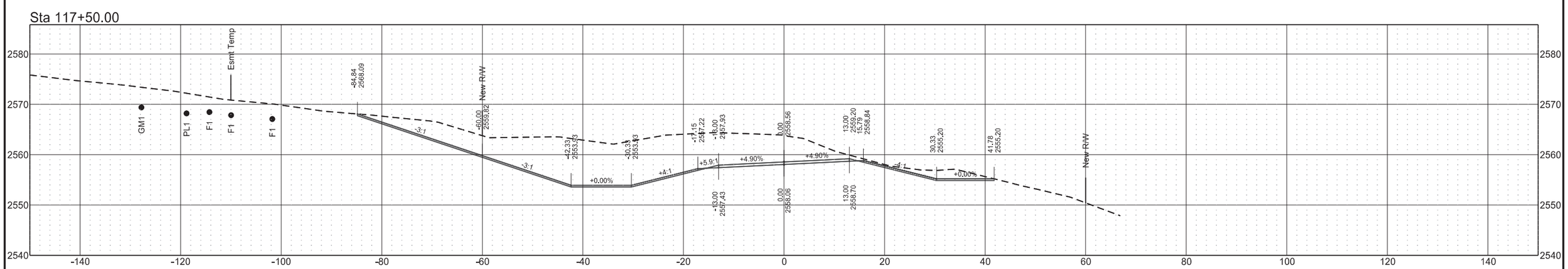
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	29

2nd St SW
117+00 to 118+00

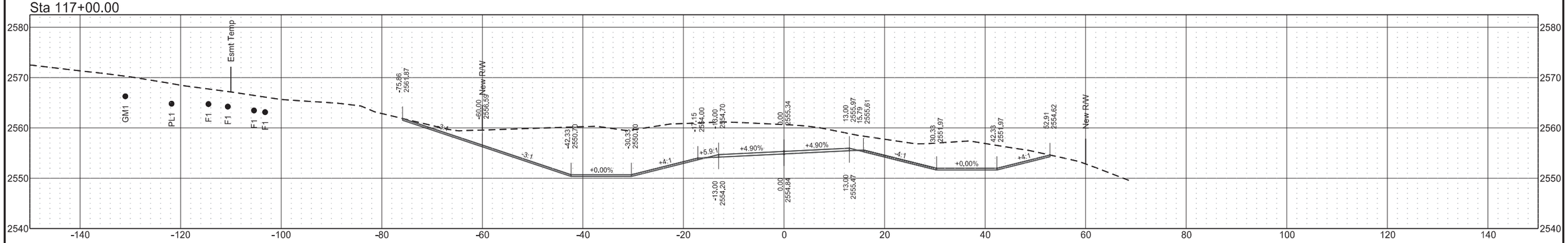
Sta 118+00.00



Sta 117+50.00



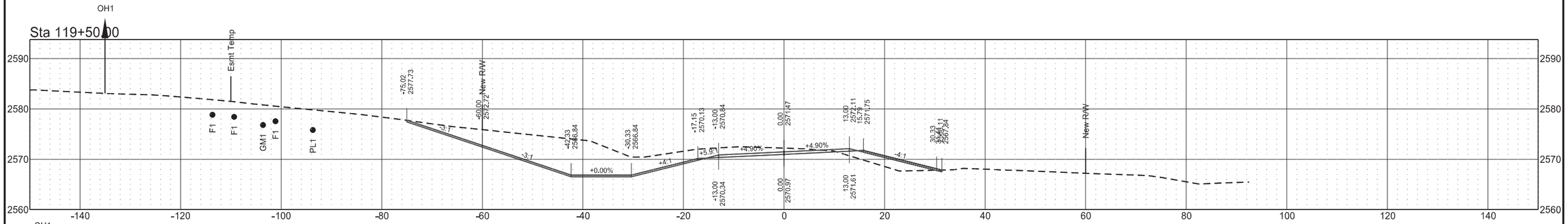
Sta 117+00.00



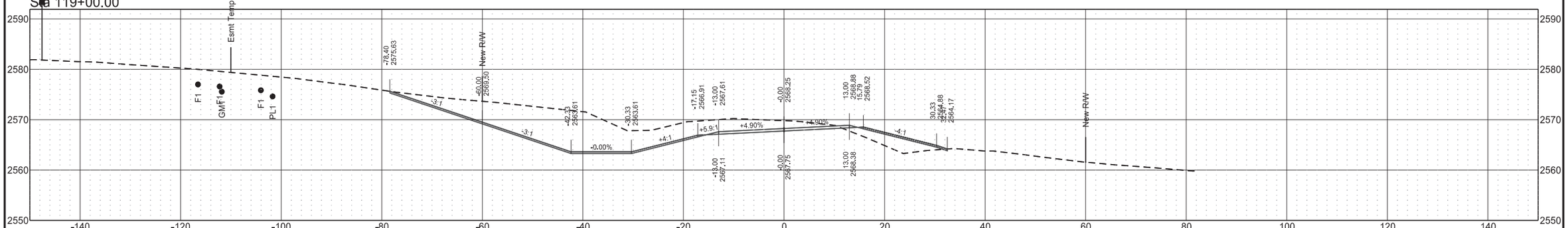
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	30

2nd St SW
118+50 to 119+50

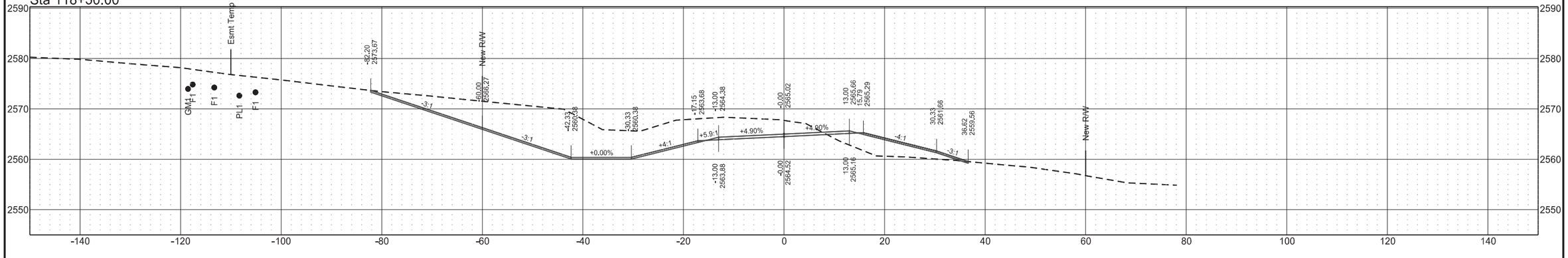
Sta 119+50.00



Sta 119+00.00

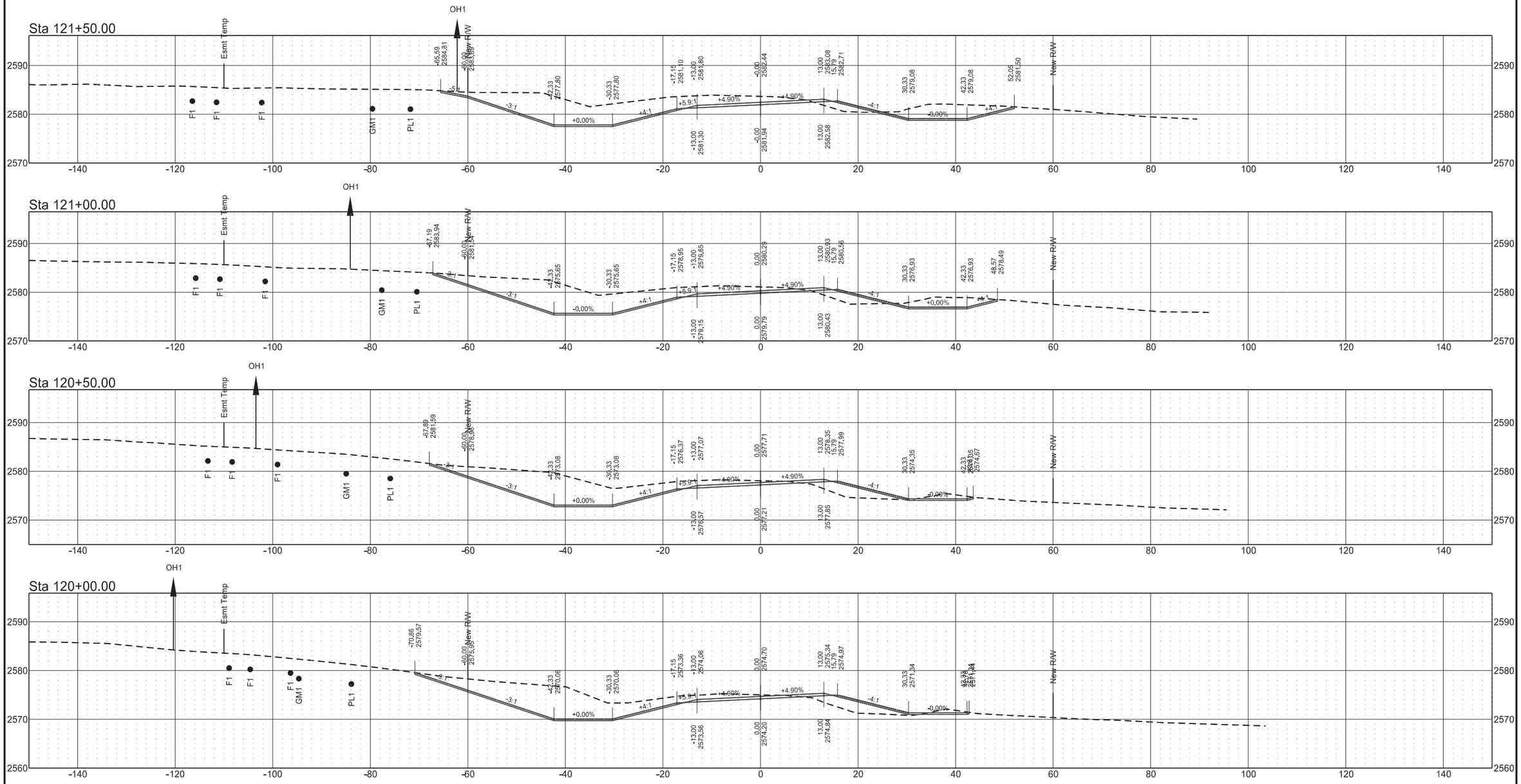


Sta 118+50.00



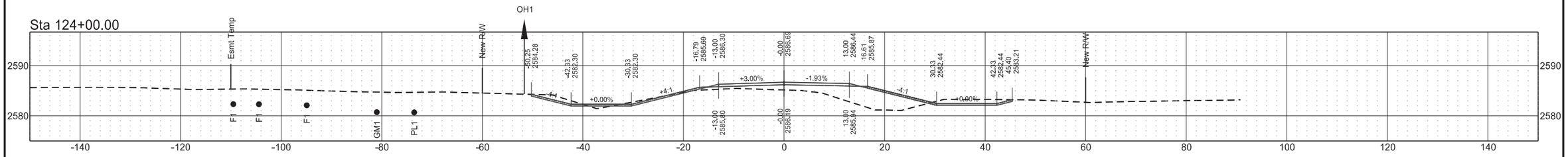
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	31

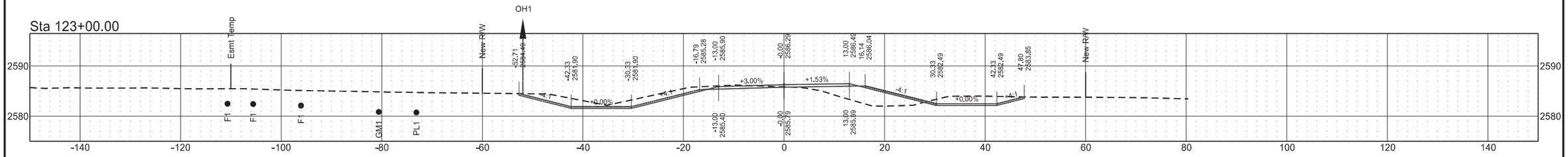
2nd St SW
120+00 to 121+50

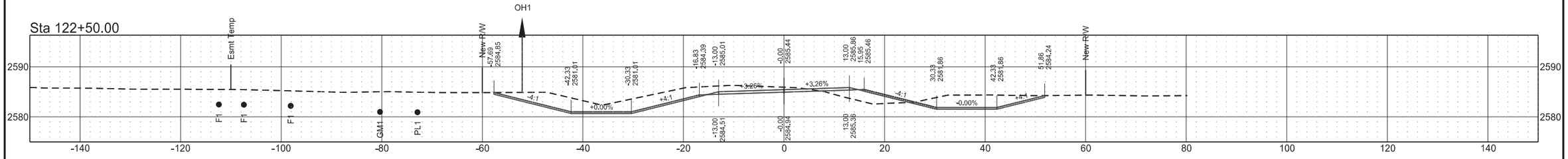


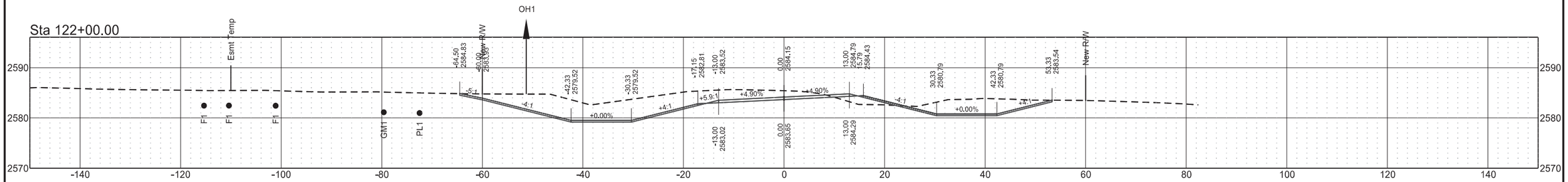
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	32

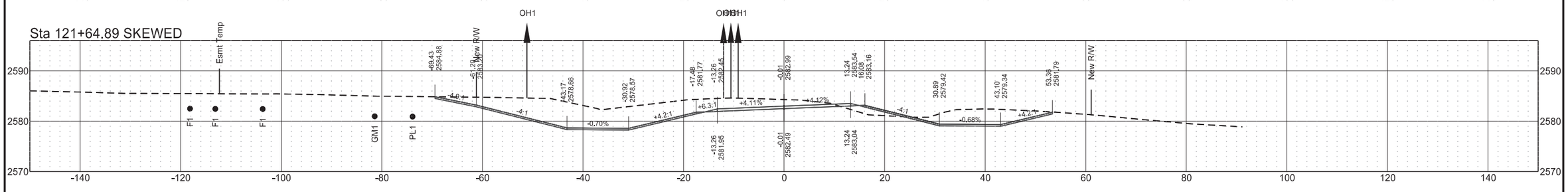
2nd St SW
121+64.89 to 124+00





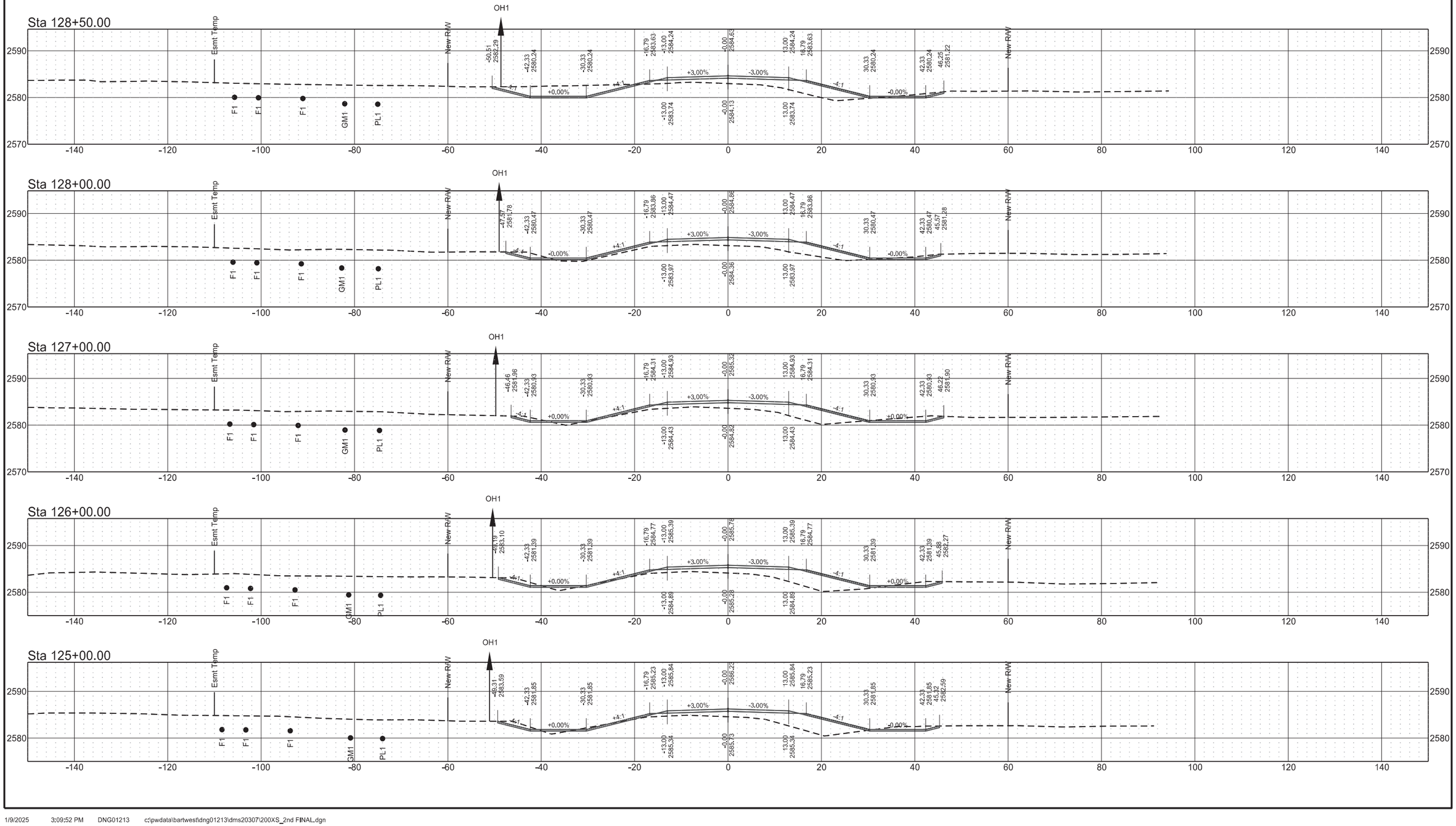






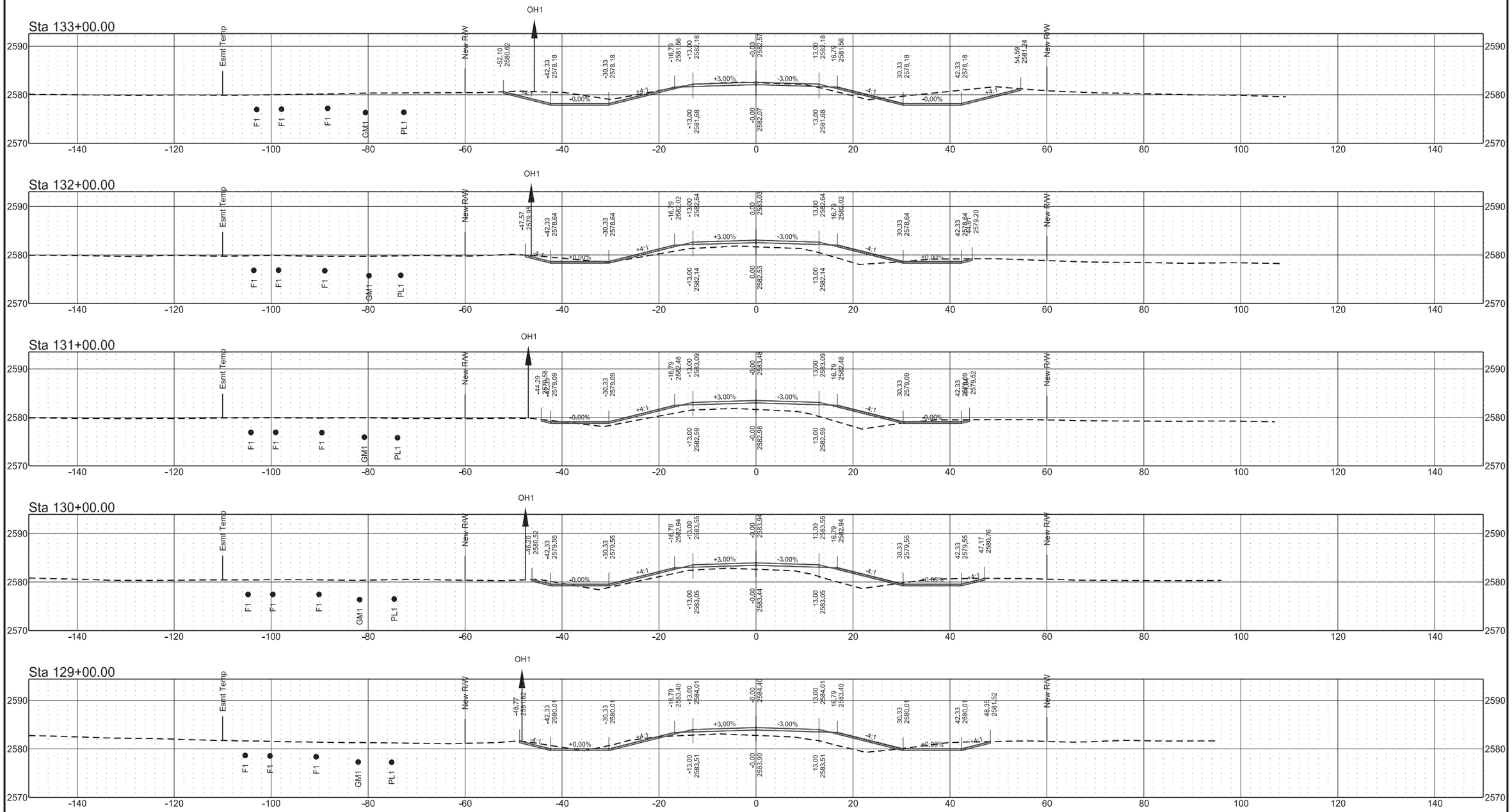
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	33

2nd St SW
125+00 to 128+50



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	34

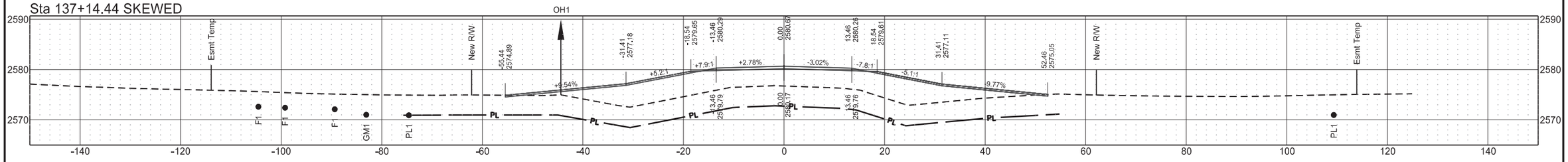
2nd St SW
129+00 to 133+00



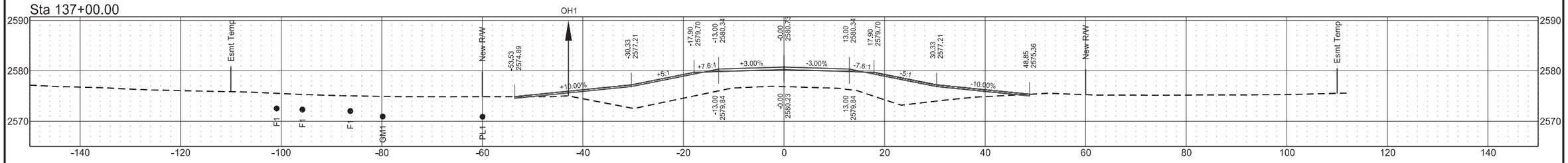
2nd St SW
134+00 to 137+14.44

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	35

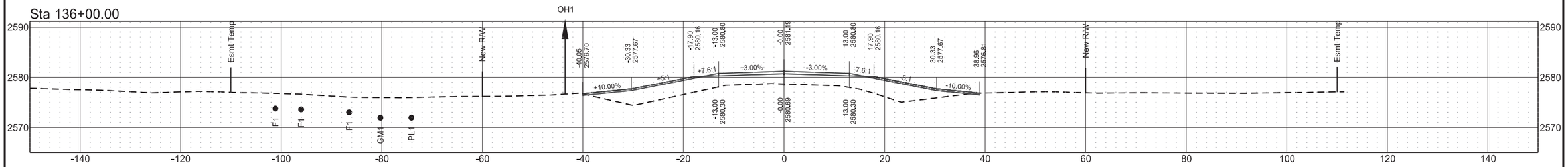
Sta 137+14.44 SKEWED



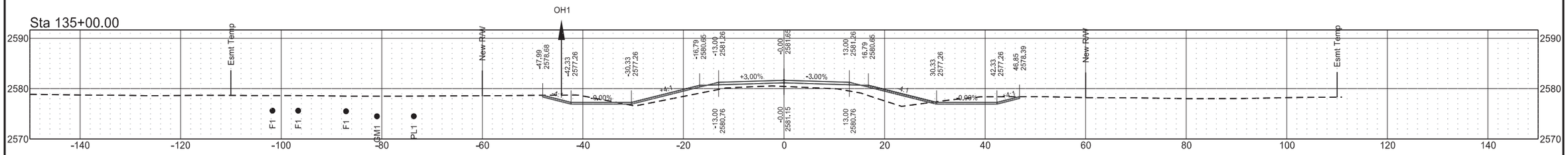
Sta 137+00.00



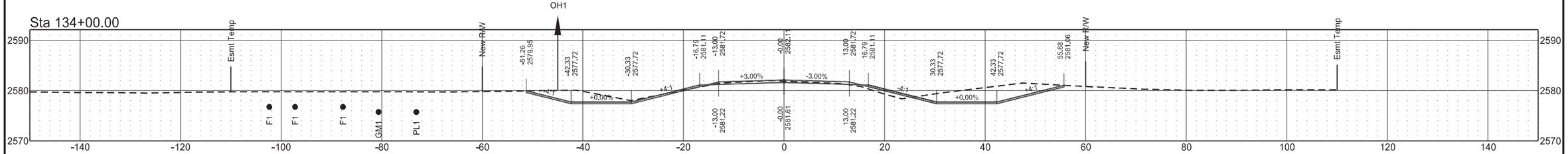
Sta 136+00.00



Sta 135+00.00

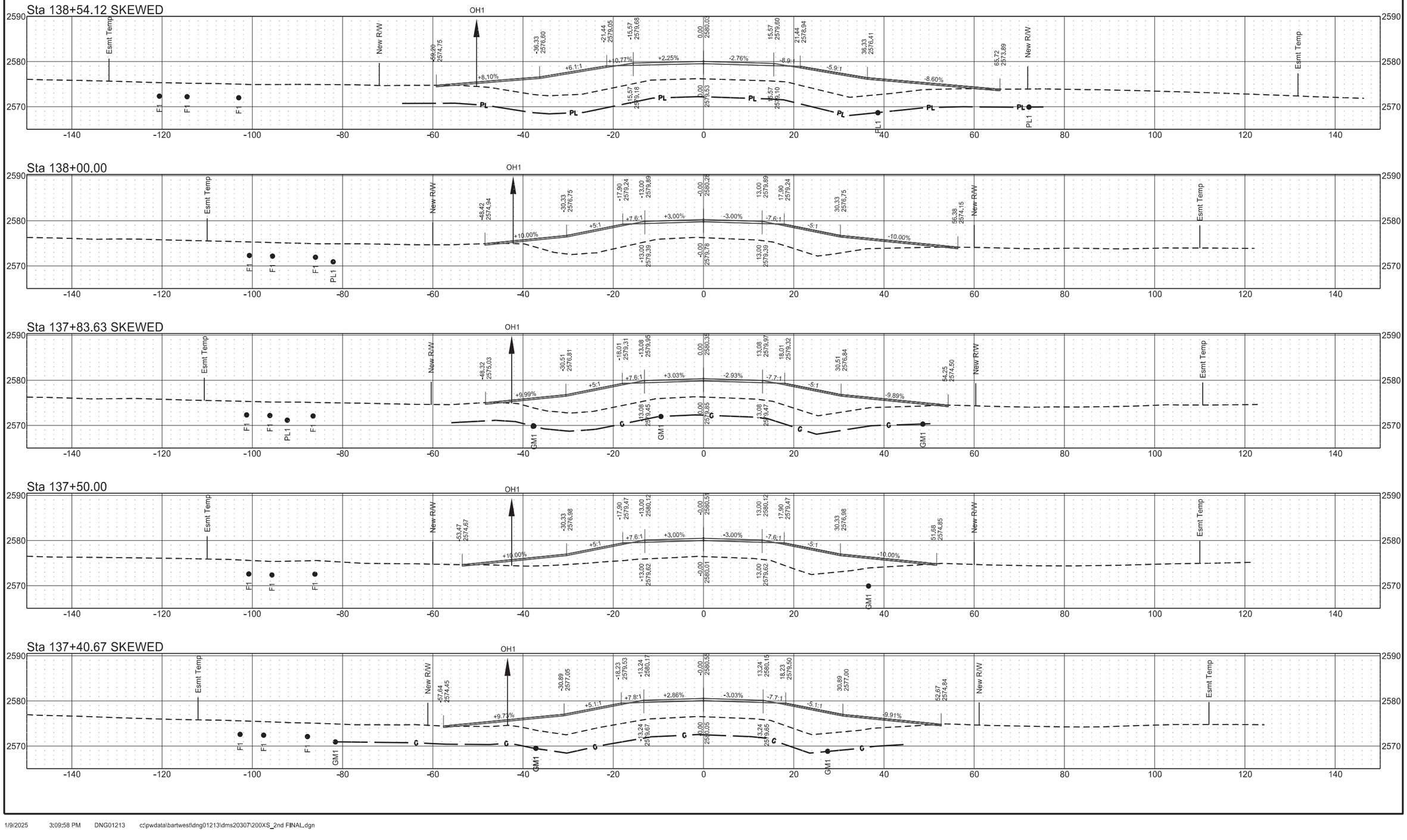


Sta 134+00.00



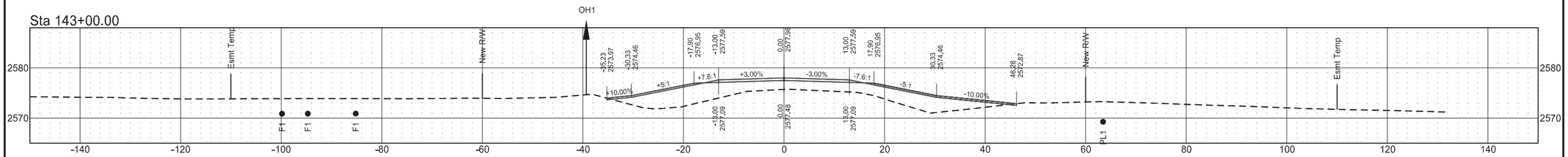
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	36

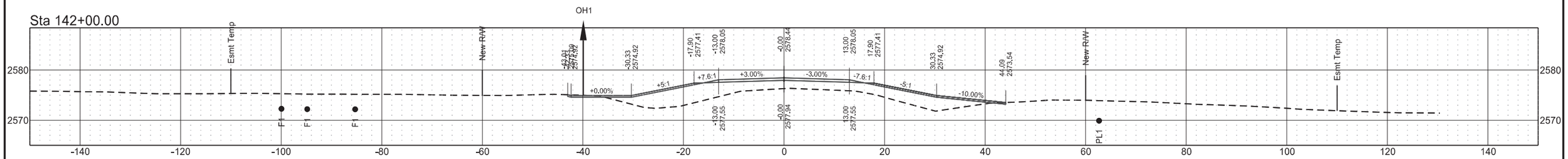
2nd St SW
137+40.67 to 138+54.12

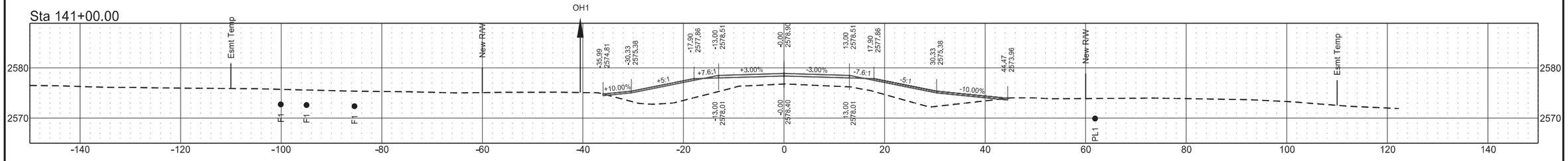


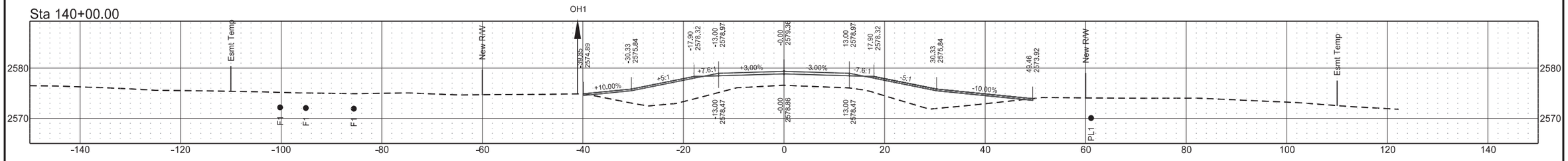
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	37

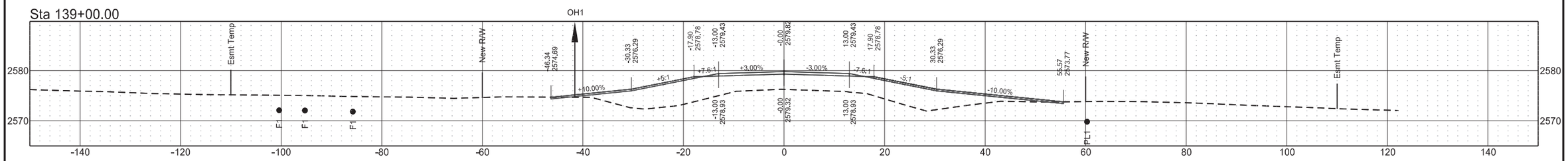
2nd St SW
139+00 to 140+00







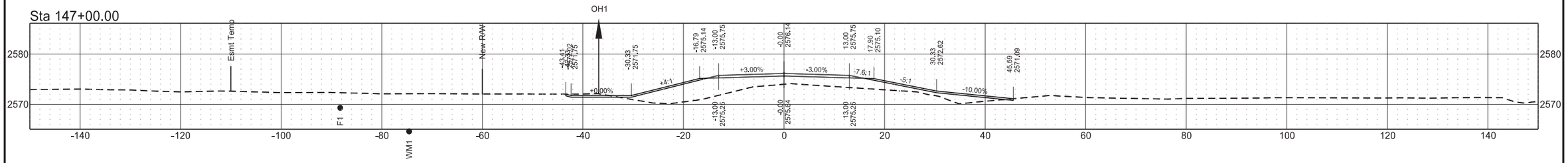




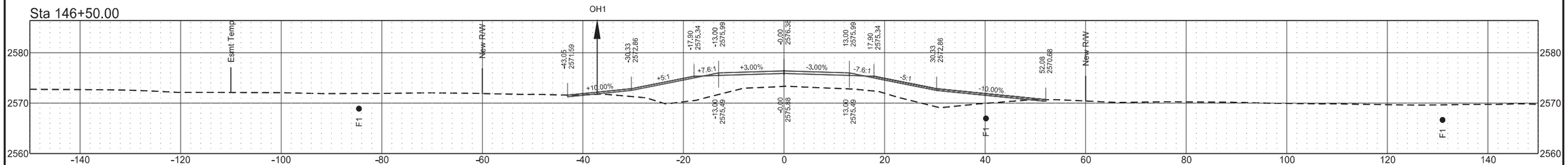
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	38

2nd St SW
144+00 to 147+00

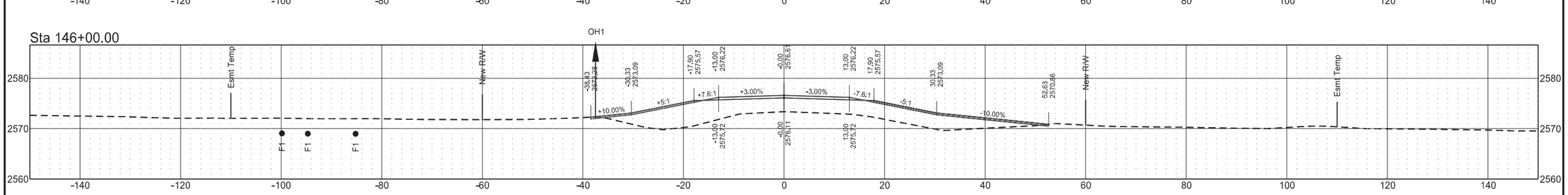
Sta 147+00.00



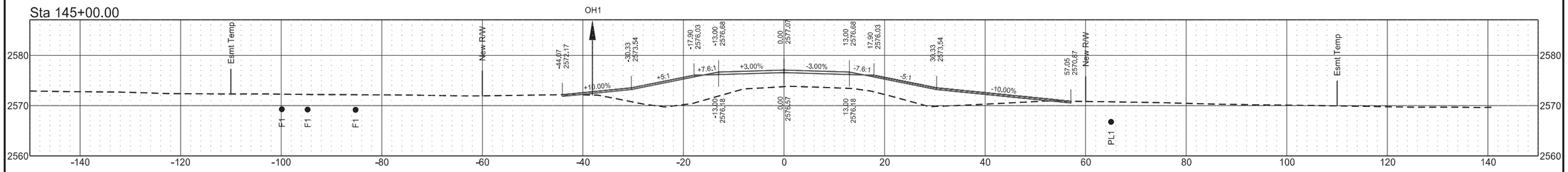
Sta 146+50.00



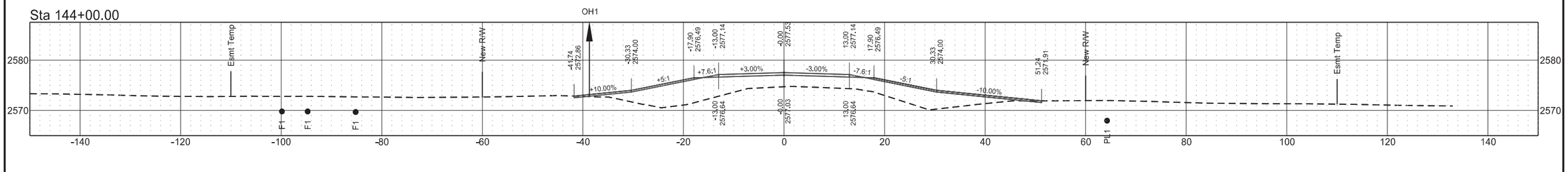
Sta 146+00.00



Sta 145+00.00

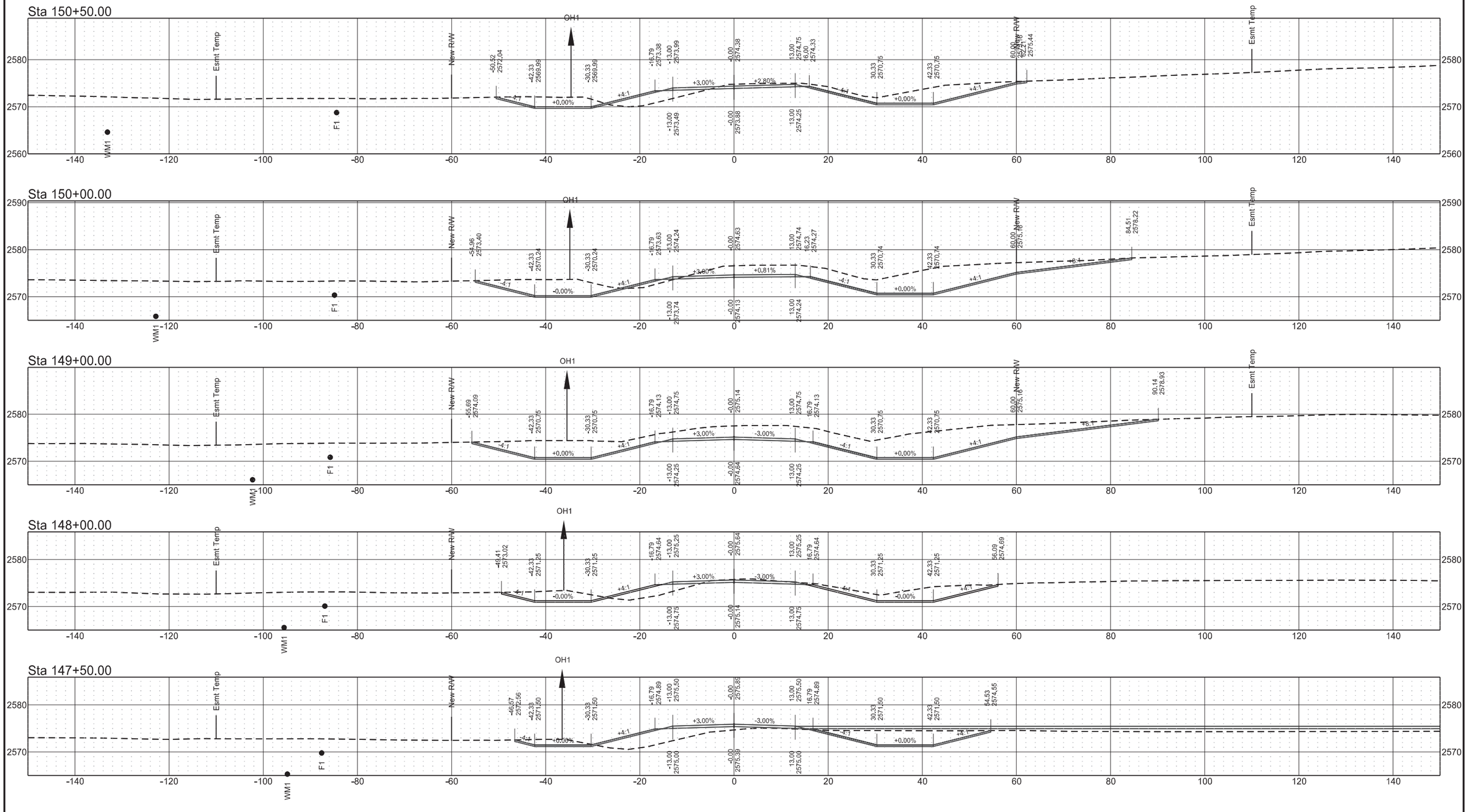


Sta 144+00.00



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	39

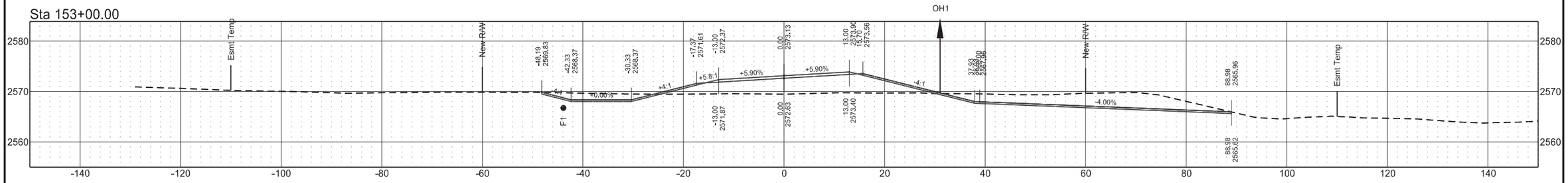
2nd St SW
147+50 to 150+50



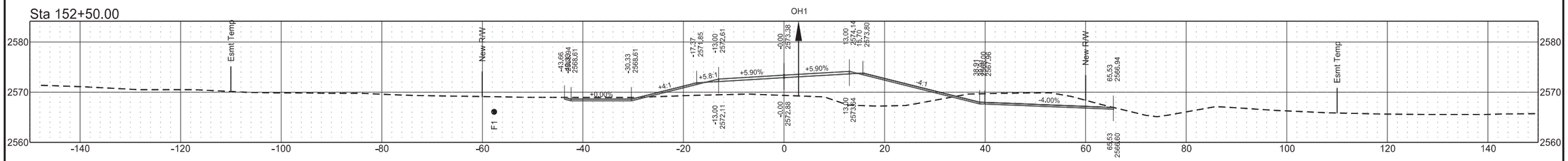
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	40

2nd St SW
151+00 to 153+00

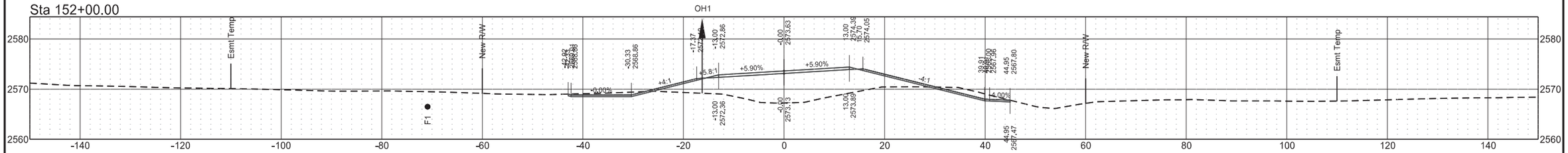
Sta 153+00.00



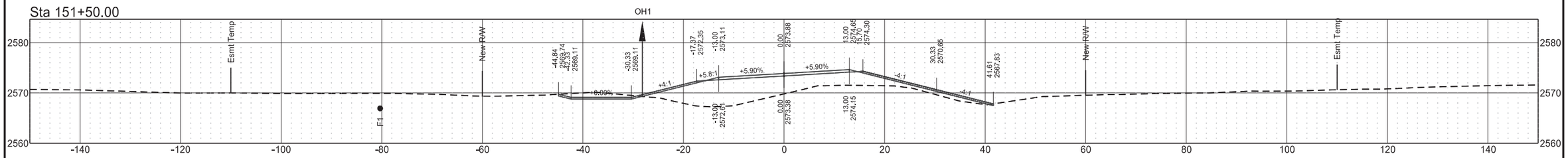
Sta 152+50.00



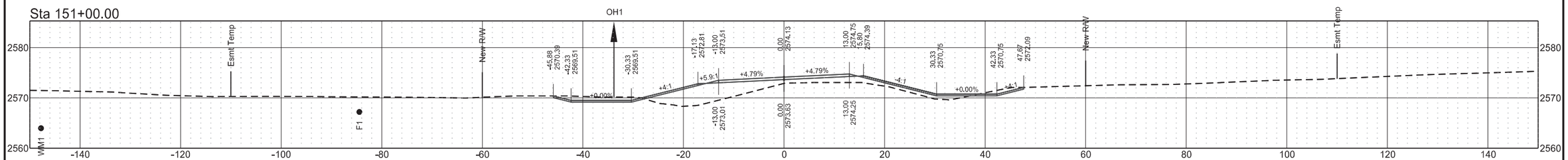
Sta 152+00.00



Sta 151+50.00

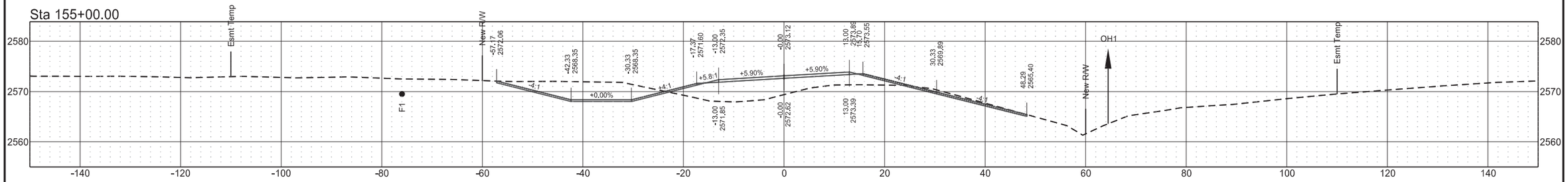


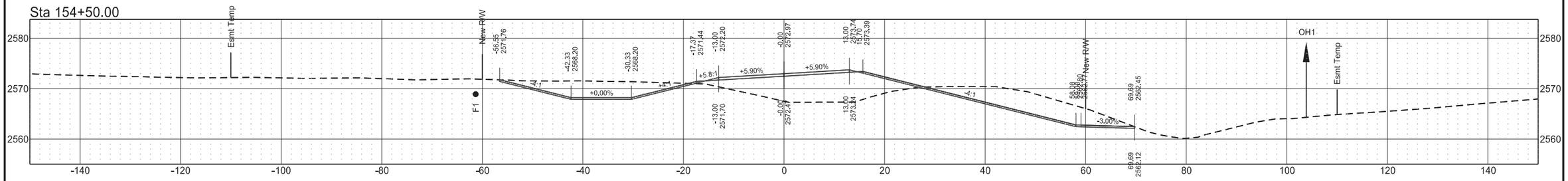
Sta 151+00.00

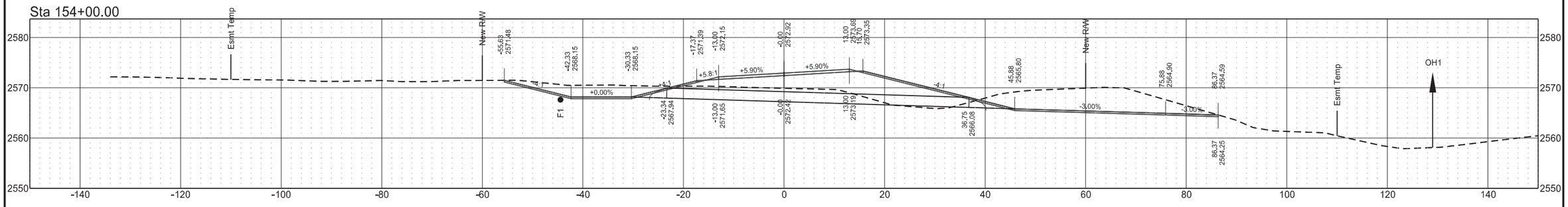


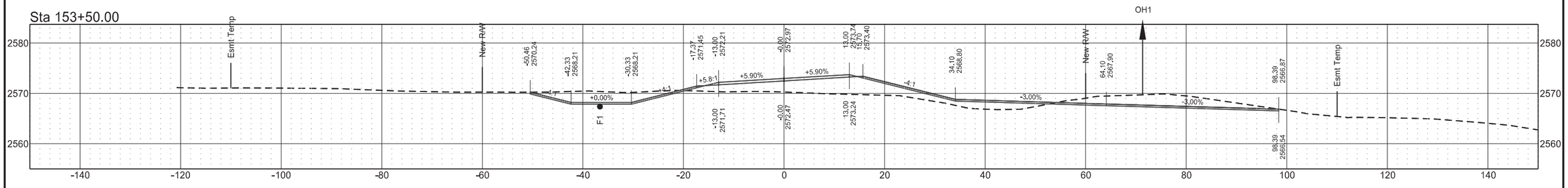
2nd St SW
153+50 to 155+00

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	41



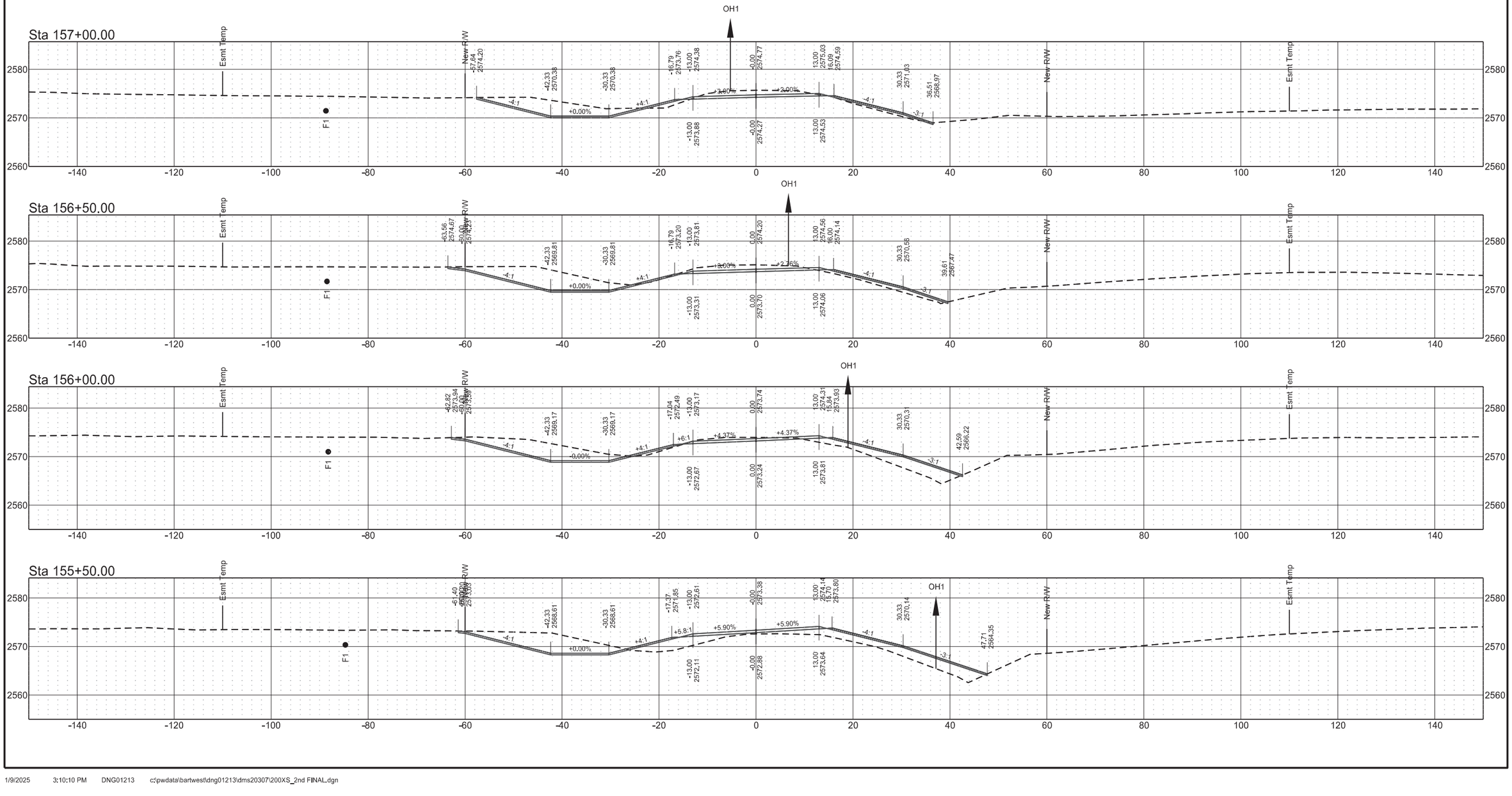






	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	42

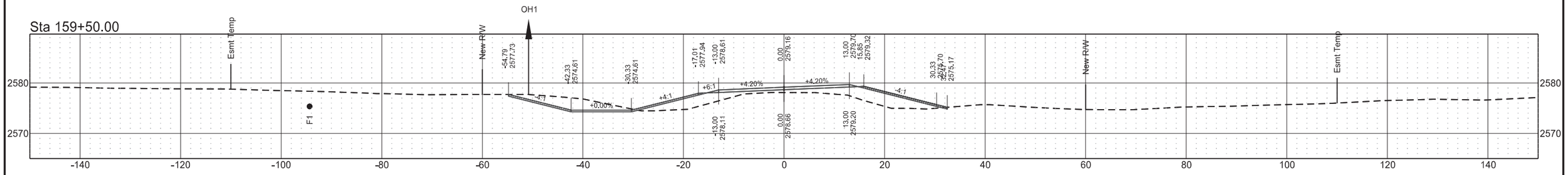
2nd St SW
155+50 to 157+00



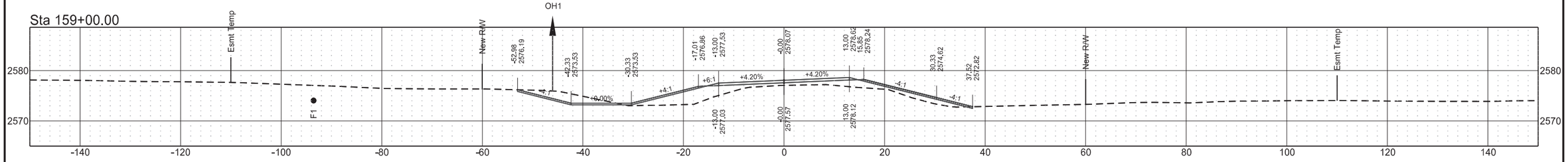
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	43

2nd St SW
157+50 to 158+50

Sta 159+50.00

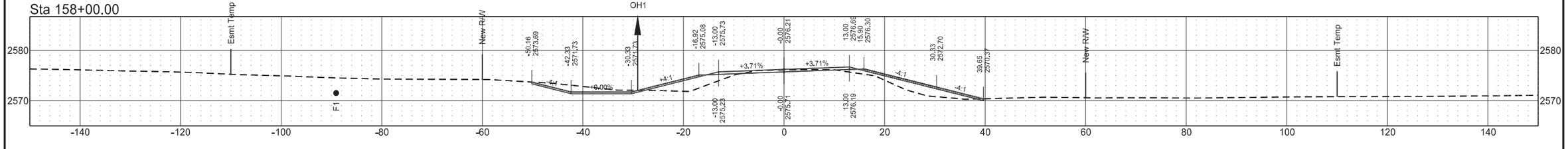


Sta 159+00.00

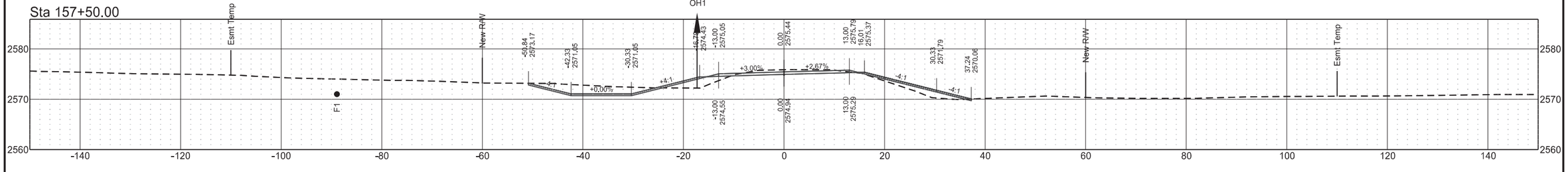


Sta 158+50.00

Sta 158+00.00

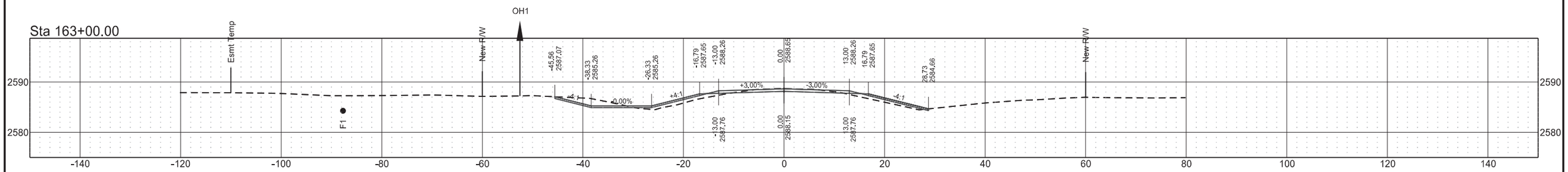


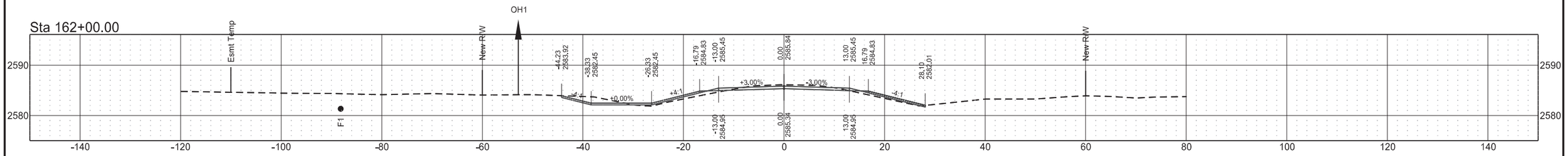
Sta 157+50.00

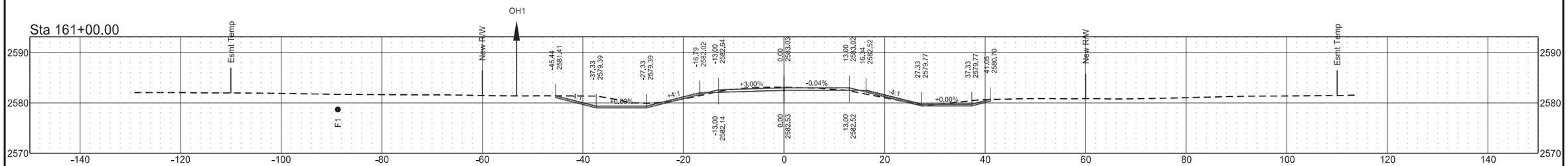


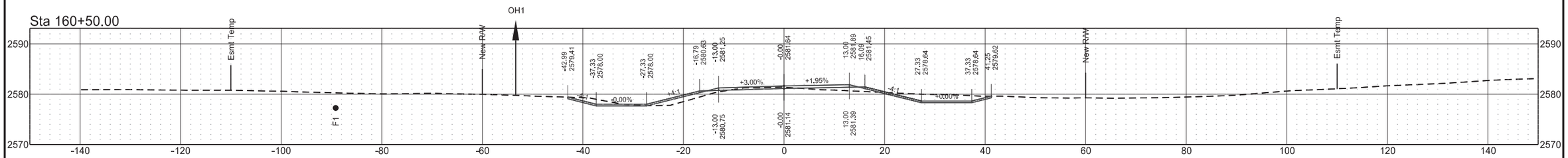
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	44

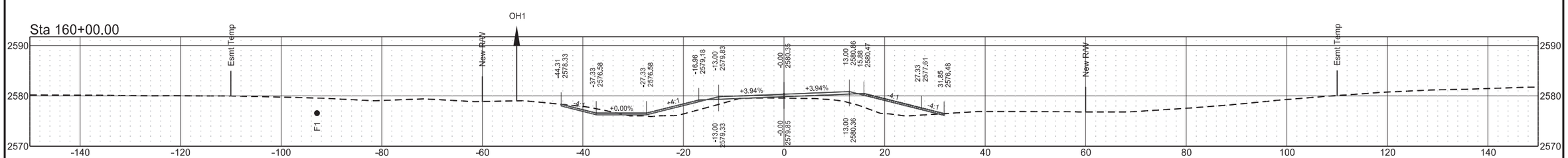
2nd St SW
160+00 to 163+00





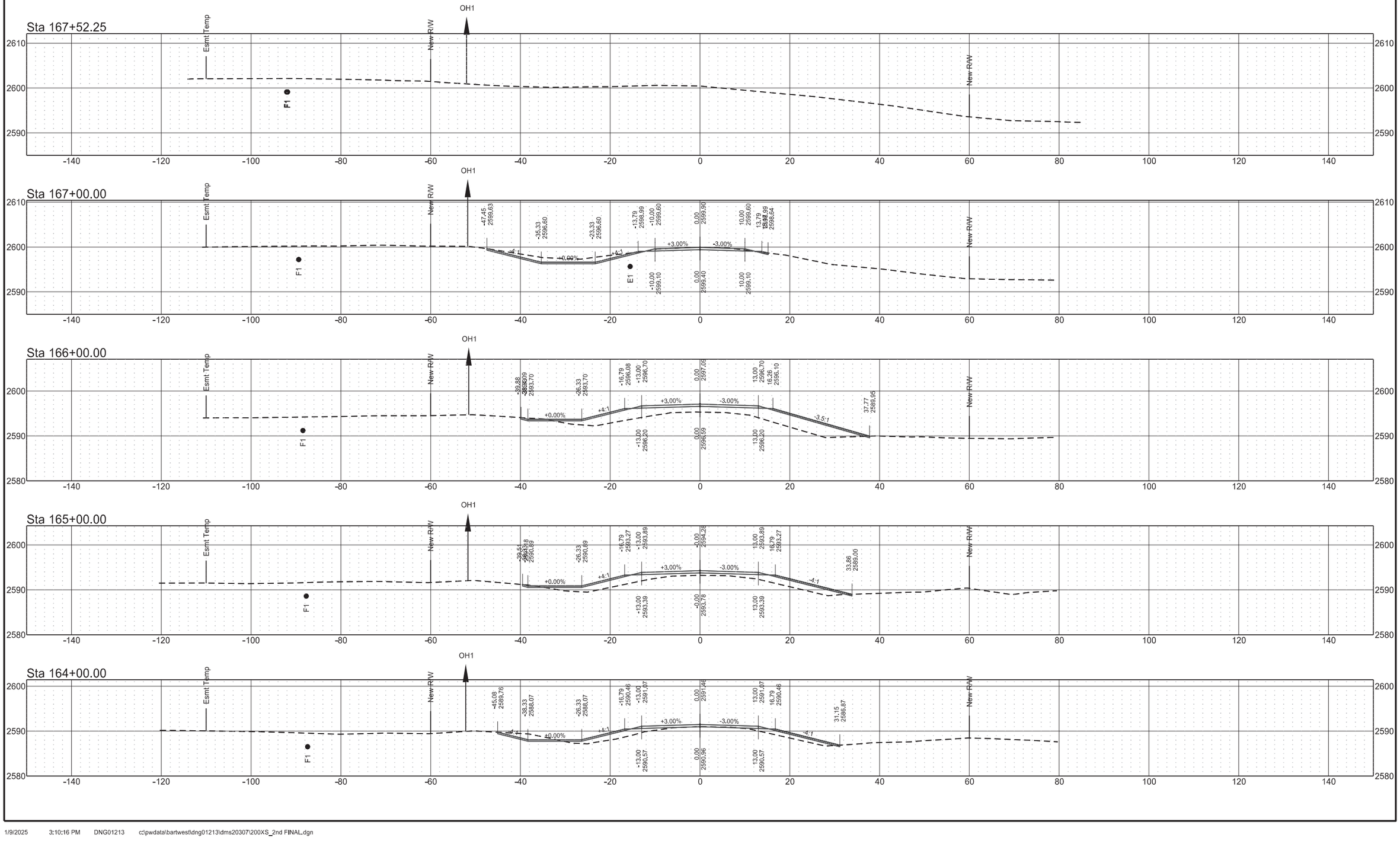






	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BW-18619.021	200	45

2nd St SW
164+00 to 167+52.25



NDDOT ABBREVIATIONS

D-101-1

?	This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.
Abn	abandoned
Abut	abutment
Adj	adjusted
Aggr	aggregate
Ahd	ahead
ARV	air release valve
Align	alignment
Al	alley
Alt	alternate
Alum	aluminum
ADA	Americans with Disabilities Act
&	and
Appr	approach
Approx	approximate
ACP	asbestos cement pipe
Asph	asphalt
AC	asphalt cement
Assmd	assumed
@	at
Atten	attenuation
ATR	automatic traffic recorder
Ave	Avenue
Avg	average
ADT	average daily traffic
Bk	back
BF	back face
Balc	balcony
B Wire	barbed wire
Barr	barricade
Btry	battery
BI	beehive inlet
Beg	begin
BG	below grade
BM	bench mark
Bkwy	bikeway
Bit	bituminous
Blk	block
BH	bore hole
Bot	bottom
Blvd	Boulevard
Bndry	boundary
Brkwy	breakaway
Br	bridge
Bldg	building
Bus.	business
BV	butterfly valve
Byp	bypass
C Gdrl	cable guardrail
Calc	calculate
CIP	cast iron pipe
CB	catch basin
CRS	cationic rapid setting
C Gd	cattle guard
C To C	center to center
CL or ℄	centerline
Ch	chain
Chnlk	chain-link
Ch Blk	channel block
Ch Ch	channel change
Chk	check
Chsld	chiseled
Cir	circle
Cl	class
Clnt	clean-out
Clr	clear
Cl&gr	clearing & grubbing
Comb.	combination
Coml	commercial
Compr	compression
CADD	computer aided drafting & design
Conc	concrete
CECB	concrete erosion control blanket
Cond	conductor
Const	construction
Cont	continuous
CSB	continuous split barrel sample
Contr	contraction
Contr	contractor
CP	control point
Coord	coordinate
Cor	corner
Corr	corrected
CAES	corrugated aluminum end section
CAP	corrugated aluminum pipe
CMES	corrugated metal end section
CMP	corrugated metal pipe
CPVCP	corrugated poly-vinyl chloride pipe
CSES	corrugated steel end section
CSFES	corrugated steel flared end section
CSP	corrugated steel pipe
CSTES	corrugated steel traversable end section
Co	County
Crse	course
Ct	Court
Xarm	cross arm
Xbuck	cross buck
Xsec	cross sections
Xing	crossing
Xrd	crossroad
Crn	crown
Culv	culvert
C&G	curb & gutter
CI	curb inlet
CR	curb ramp
C	cut
Dd Ld	dead load
Defl	deflection
Defm	deformed
Dlnt	delineate
Dlntr	delineator
Depr	depression
Desc	description
Det	detail
DWP	detectable warning panel
Dtr	detour
Dia or ø	diameter
Dir	direction
Dist	distance
DM	disturbed material
DB	ditch block
DG	ditch grade
Dbl	double
Dn	down
Dwg	drawing
Dr	drive
Drwy	driveway
DI	drop inlet
D	dry density
Ea	each
Esmt	easement
E	East
EB	Eastbound
Elast	elastomeric
EL	electric locker
E Mtr	electric meter
Elec	electric/al
EDM	electronic distance meter
Elev or El	elevation
Ellipt	elliptical
Emb	embankment
Emuls	emulsion/emulsified
ES	end section
Engr	engineer
ESS	environmental sensor station
Eq	equal
Evgr	evergreen
Exc	excavation
Exst	existing
Exp	expansion
Expy	Expressway
E	external of curve
Extru	extruded
FOS	factor of safety
Fed	Federal
FP	feed point
Fn	fence
Fn P	fence post
FO	fiber optic
FD	field drive
F	fill
FAA	fine aggregate angularity
FH	fire hydrant
Fl	flange
Flrd	flared
FES	flared end section
F Bcn	flashing beacon
FA	flight auger sample
FL	flow line
Ftg	footing
FM	force main
Fnd	found
Fdn	foundation
Frac	fractional
Frwy	freeway
Frt	front
FF	front face
F Disp	fuel dispenser
FFP	fuel filler pipes
FLS	fuel leak sensor
Furn	furnish/ed

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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REVISIONS	
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12-18-20	General Revisions
08-16-22	General Revisions

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NDDOT ABBREVIATIONS

D-101-2

Galv	galvanized
Gar	garage
Gs L	gas line
G Reg	gas line regulator
GMV	gas main valve
G Mtr	gas meter
GSV	gas service valve
GVP	gas vent pipe
GV	gate valve
Ga	gauge
Gov	government
Grd	graded/grade
Grnd	ground
GWM	ground water monitor
Gdrl	guardrail
Gtr	gutter
H Plg	H piling
Hdwl	headwall
Ht	height
Hel	helical
HDPE	high density polyethylene
HM	high mast
HP	high pressure
HPS	high pressure sodium
HTCG	high tension cable guardrail
Hwy	highway
Hor	horizontal
HBP	hot bituminous pavement
HMA	hot mix asphalt
Hyd	hydrant
Ph	hydrogen ion content
Id	identification
Incl	inclinometer tube
IMH	inlet manhole
ID	inside diameter
Inst	instrument
Intchg	interchange
Intmdt	intermediate
Intscn	intersection
Inv	invert
IP	iron pipe
Jt	joint
Jct	junction
Ln	lane
Lg	large
Lat	latitude
Lt	left
Lens	lenses
Lvl	level
Lvlng	leveling
Lht	light
LP	light pole
Ltg	lighting
Liq	liquid
LL	liquid limit
Loc	location
Long.	longitude
Lp	loop
LD	loop detector
Lum	luminaire
Mb	mailbox
ML	main line
MH	manhole
Mkd	marked
Mkr	marker
Mkg	marking
MA	mast arm
Matl	material
Max	maximum
MC	meander corner
Meas	measure
Mdn	median
MD	median drain
MC	medium curing
MGS	Midwest Guardrail System
MM	mile marker
MP	mile post
Min	minimum
Misc	miscellaneous
Mon	monument
Mnd	mound
Mtbl	mountable
Mtd	mounted
Mtg	mounting
Mk	muck
Neop	neoprene
Ntwk	network
N	North
NE	North East
NW	North West
NB	Northbound
No. or #	number
Obsc	obscure(d)
Ocpd	occupied
Ocpy	occupy
O/s	offset
OC	on center
C	one dimensional consolidation
OC	organic content
Orig	original
O To O	out to out
OD	outside diameter
OH	overhead
PMT	pad mounted transformer
Pg	pages
Pntd	painted
Pr	pair
Pnl	panel
Pk	park
PSD	passing sight distance
Pvmt	pavement
Ped	pedestal
Ped	pedestrian
PPP	pedestrian pushbutton post
Pen.	penetration
Perf	perforated
Per.	perimeter
Perm	permanent
PL	pipeline
Pl	place
P&P	plan & profile
PL	plastic limit
Pl or ℄	plate
Pt	point
PE	polyethylene
PVC	polyvinyl chloride
PCC	Portland Cement concrete
PP	power pole
Preempt	preemption
Prefab	prefabricated
Prfmd or Pref	preformed
Prep	preperation
Press.	pressure
PRV	pressure relief valve
Prestr	prestressed
Pvt	private
PD	private drive
Prod.	production/produce
Prog	programmed
Prop.	property
Prop Ln	property line
Ppsd	proposed
PB	pull box
Qty	quantity
Qtr	quarter
Rad or R	radius
RR	railroad
Rlwy	railway
Rsd	raised
RC	rapid curing
Rec	record
Rcy	recycle
RAP	recycled asphalt pavement
RPCC	recycled portland cement concrete
Ref	reference
R Mkr	reference marker
RM	reference monument
RP	reference point
Refl	reflectorized
RCB	reinforced concrete box
RCES	reinforced concrete end section
RCFES	reinforced concrete flared end section
RCP	reinforced concrete pipe
RCPS	reinforced concrete pipe sewer
RCTES	reinforced concrete traversable end section
Reinf	reinforcement
Res	reservation
Res	residence
Ret	retaining
Rev	reverse
Rt	right
R/W	right of way
Riv	river
Rd	road
Rdbd	road bed
Rdwy	roadway
RWIS	roadway weather information system
Rk	rock
Rt	route

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Salv	salvage(d)
San	sanitary sewer line
Sec	section
SL	section line
Sep	separation
Seq	sequence
Serv	service
Sht	sheet
Shtng	sheeting
Shldr	shoulder
Sw or Sdwk	sidewalk
SD	sight distance
SN	sign number
Sig	signal
Sgl	single
SRCP	slotted reinforced concrete pipe
SC	slow curing
SS	slow setting
Sm	small
S	South
SE	South East
SW	South West
SB	Southbound
Sp	spaces
Spcl	special
SA	special assembly
SP	special provisions
G	specific gravity
Spk	spike
SB	split barrel sample
SH	sprinkler head
SV	sprinkler valve
Sq	square
Stk	stake
Std	standard
N	standard penetration test
Std Specs	standard specifications
Stm L	steam line
SEC	steel encased concrete
SMA	stone matrix asphalt
SSD	stopping sight distance
SD	storm drain
St	street
SPP	structural plate pipe
SPPA	structural plate pipe arch
Str	structure
Subd	subdivision
Sub	subgrade
Sub Prep	subgrade preperation
Ss	subsoil
SS	supplement specification
Supp	supplemental
Surf	surfacing
Surv	survey
Sym	symmetrical

Tel	telephone
Tel B	Telephone Booth
Tel P	telephone pole
Tv	television
Temp	temperature
Temp	temporary
TBM	temporary bench mark
T	thinwall tube sample
Ts	topsoil
Traf	traffic
TSCB	traffic signal control box
Tr	trail
Transf	transformer
Trans	transition
TT	transmission tower
TES	traversable end section
Trans	transverse
Trtd	treated
Trmt	treatment
Qc	triaxial compression
TERO	tribal employment rights ordinance
Tpl	triple
Typ	typical
Qu	unconfined compressive strength
Ugrnd	underground
Util	utility
VG	valley gutter
Vap	vapor
Vert	vertical
VCP	vitrified clay pipe
Vol	volume
VSFS	vehicle speed feedback sign
Wkwy	walkway
W	water content
WGV	water gate valve
WL	water line
WM	water main
WMV	water main valve
W Mtr	water meter
WSV	water service valve
WW	water well
Wrng	wearing
WIM	weigh in motion
W	west
WB	westbound
Wrng	wiring
W/	with
W/o	without
WC	witness corner

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NDDOT ABBREVIATIONS

MEASUREMENTS

ac	acres
A	ampere
Bd Ft	board feet
Cd	candela
cm	centimeter
C	coulomb
CF	cubic feet
m3	cubic meter
m3/s	cubic meters per second
CY	cubic yard
CY/mi	cubic yards per mile
D or Deg	degree
F	Fahrenheit
F	farad
ft	feet/foot
Gal	gallon
G	giga
Ha	hectare
H	henry
Hz	hertz
hr	hour(s)
in	inch
J	joule
K	kelvin
kN	kilo newton
kPa	kilo pascal
kg	kilogram
kg/m3	kilogram per cubic meter
km	kilometer
K	Kip(s)
LF	linear foot
L	litre
Lm	lumen
L sum	lump sum
Lx	lux
M Hr	man hour
M	mega
m	meter
m/s	meters per second
mi	mile
mL	milliliter
mm	millimeter
mm/hr	millimeters per hour
n	nano
N	newton
Pa	pascal
lb	pounds
sec	seconds
S	siemens
SF	square feet
km2	square kilometer
m2	square meter
SY	square yard
Sta Yd	station yards
SI	Systems International
T	tesla
T/mi	tons per mile
V	volt
W	watt
Wb	weber

SURVEY DESCRIPTIONS

Az	azimuth
Bs	backsight
Brg	bearing
BP Cap	blue plastic cap
BS	both sides
BC	brass cap
CS	curve to spiral
Eq	equation
E	external of curve
FS	far side
FB	field book
Fs	foresight
Geod	geodetic
GIS	Geographical Information System
GPS	Global Positioning System
HI	height of instrument
IM	iron monument
I Pn	iron pin
LS	Land Surveyor (licensed)
LSIT	Land Surveyor In Training
L	length of curve
LC	long chord
LB	level book
Mer	meridian
M	mid ordinate of curve
NGS	National Geodetic Survey
NS	near side
Obsn	observation
Off Loc	office location
OP Cap	orange plastic cap
PK	Parker-Kalon nail
P Cap	plastic cap
PP Cap	pink plastic cap
PCC	point of compound curve
PC	point of curve
PI	point of intersection
PRC	point of reverse curvature
PT	point of tangent
POC	point on curve
POT	point on tangent
RTP	random traverse point
Rge	range
RP Cap	red plastic cap
SC	spiral to curve
ST	spiral to tangent
Sta	station
SE	superelevation
Tan	tangent
T	tangent (semi)
TS	tangent to spiral
Twp	township
TB	transit book
TP	traverse point
TP	turning point
USC&G	US Coast & Geodetic Survey
USGS	US Geologic Survey
VC	vertical curve
WGS	World Geodetic System
YP Cap	yellow plastic cap
Z	zenith

SOIL TYPES

Cl	clay
Cl F	clay fill
Cl Hvy	clay heavy
Cl Lm	clay loam
Co S	coal slack
C Gr	coarse gravel
CS	coarse sand
FS	fine sand
Gr	gravel
Lig Co	lignite coal
Lig Sl	lignite slack
Lm	loam
Rk	rock
Sd	sand
Sdy Cl	sandy clay
Sdy Cl Lm	sandy clay loam
Sdy Fl	sandy fill
Sdy Lm	sandy loam
Sc	scoria
Sh	shale
Si Cl	silt clay
Si Cl Lm	silty clay loam
Si Lm	silty loam

NORTH DAKOTA
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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM	702 Communications
ACCENT	Accent Communications
AGASSIZ WU	Agassiz Water Users Incorporated
AGC	Assiociated General Contractors of America
ALL PL	Alliance Pipeline
ALL SEAS WU	All Seasons Water Users Association
AMOCO PI	Amoco Pipeline Company
AMRDA HESS	Amerada Hess Corporation
AT&T	AT&T Corporation
B PAW	Bear Paw Energy Incorporated
BAKER ELEC	Baker Electric
BASIN ELEC	Basin Electric Cooperative Incorporated
BEK TEL	Bek Communications Cooperative
BELLE PL	Belle Fourche Pipeline Company
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe Railway
BOEING	Boeing
BRNS RWD	Barnes Rural Water District
BURK-DIV ELEC	Burke-Divide Electric Cooperative
BURL WU	Burleigh Water Users
CABLE ONE	Cable One
CABLE SERV	Cable Services
CAP ELEC	Capital Electric Cooperative Incorporat
CASS CO ELEC	Cass County Electric Cooperative
CASS RWU	Cass Rural Water Users Incorporated
CAV ELEC	Cavalier Rural Electric Cooperative
CBLCOM	Cablecom Of Fargo
CENEX PL	Cenex Pipeline
CENT PL WATER DIST	Central Pipe Line Water District
CENT PWR ELEC	Central Power Electric Cooperative
CENTURYLINK	CenturyLink
COE	Corps of Engineers
CONS TEL	Consolidated Telephone
CONT RES	Continental Resource Inc
CPR	Canadian Pacific Railway
D O E	Department Of Energy
DAK CARR	Dakota Carrier Network
DAK CENT TEL	Dakota Central Telephone
DAK RWD	Dakota Rural Water District
DGC	Dakota Gasification Company
DICKEY R NET	Dickey Rural Networks
DICKEY RWU	Dickey Rural Water Users Association
DICKEY TEL	Dickey Telephone
DNRR	Dakota Northern Railroad
DOME PL	Dome Pipeline Company
DVELEC	Dakota Valley Electric Cooperative
DVMW	Dakota, Missouri Valley & Western
ENBRDG	Enbridge Pipelines Incorporated
ENVENTIS	Enventis Telephone
EQUINOR	Equinor Pipeline
FALK MNG	Falkirk Mining Company
FHWA	Federal Highway Administration
G FKS-TRL WD	Grand Forks-traill Water District
GETTY TRD & TRAN	Getty Trading & Transportation
GLDN W ELEC	Golden West Electric Cooperative
GRGS CO TEL	Griggs County Telephone
GTR RAMSEY WD	Greater Ramsey Water District
GT PLNS NAT GAS	Great Plains Natural Gas Company
HALS TEL	Halstad Telephone Company
IDEA1	Idea1
INT-COMM TEL	Inter-Community Telephone Company
KANEB PL	Kaneb Pipeline Company
KEM ELEC	Kem Electric Cooperative Incorporated
KOCH GATH SYS	Koch Gathering Systems Incorporated
LKHD PL	Lakehead Pipeline Company
LNGDN RWU	Langdon Rural Water Users Incorporated
LWR YELL R ELEC	Lower Yellowstone Rural Electric
MCKNZ CON	McKenzie Consolidated Telcom
MCKNZ ELEC	McKenzie Electric Cooperative
MCKNZ WRD	McKenzie County Water Resource District
MCLEOD	McLeod USA
MCLN ELEC	McLean Electric Cooperative
MCLN-SHRDN R WAT	McLean-Sheridan Rural Water
MDU	Montana-dakota Utilities
MIDCO	MidContinent Communications
MIDSTATE TEL	Midstate Telephone Company
MINOT CABLE	Minot Cable Television
MINOT TEL	Minot Telephone Company
MISS VALL COMM	Missouri Valley Communications
MISS W W S	Missouri West Water System
MNKOTA PWR	Minnkota Power
MOR-GRAN-SOU ELEC	Mor-gran-sou Electric Cooperative
MOUNT-WILLI ELEC	Mountrail-williams Electric Cooperative
MRE LBTY TEL	Moore & Liberty Telephone
MUNICIPAL	City Water And Sewer
MUNICIPAL	City Of '.....'
N CENT ELEC	North Central Electric Cooperative
N VALL W DIST	North Valley Water District
ND PKS & REC	North Dakota Parks And Recreation
ND TEL	North Dakota Telephone Company
NDDOT	North Dakota Department of Transportation
NDSU SOIL SCI DEPT	NDSU Soil Science Department
NEMONT TEL	Nemont Telephone
NODAK R ELEC	Nodak Rural Electric Cooperative
NOON FRMS TEL	Noonan Farmers Telephone Company
NPR	Northern Plains Railroad
NSP	Northern States Power
NTH PRAIR RW	Northern Prairie Rural Water Association
NTHN BRDR PL	Northern Border Pipeline
NTHN PLNS ELEC	Northern Plains Electric Cooperative Incorporated
NTHWSTRN REF	Northwestern Refinery Company
NW COMM	Northwest Communication Cooperation
NWRWD	Northwest Rural Water District
ONEOK	Oneok gas
OSHA	Occupational Safety and Health Administration
OTTR TL PWR	Otter Tail Power Company
PAAP	Plains All American Pipeline
P L E M	Prairielands Energy Marketing
POLAR COM	Polar Communications
PVT ELEC	Private Electric
QWEST	Qwest Communications
R&T W SUPPLY	R & T Water Supply Association
RED RIV COMM	Red River Rural Communications
RESVTN TEL	Reservation Telephone
ROBRTS TEL	Roberts Company Telephone
R-RIDER ELEC	Roughrider Electric Cooperative
RRVW	Red River Valley & Western Railroad
S CENT REG WD	South Central Regional Water District
S E W U	South East Water Users Incorporated
SCOTT CABLE	Scott Cable Television Dickinson
SHERDN ELEC	Sheridan Electric Cooperative
SHEYN VLY ELEC	Sheyenne Valley Electric Cooperative
SKYTECH	Skyland Technologies Incorporated
SLOPE ELEC	Slope Electric Cooperative Incorporated
SOURIS RIV TELCOM	Souris River Telecommunications
ST WAT COMM	State Water Commission
STATE LN WATER	State Line Water Cooperative
STER ENG	Sterling Energy
STUT RWU	Stutsman Rural Water Users
SW PL PRJ	Southwest Pipeline Project
T M C	Turtle Mountain Communications
TCI	TCI of North Dakota
TESORO HGH PLNS PL	Tesoro High Plains Pipeline
TRI-CNTY WU	Tri-County Water Users Incorporated
TRL CO RWU	Traill County Rural Water Users
UNTD TEL	United Telephone
UPPR SOUR WUA	Upper Souris Water Users Association
US SPRINT	U.S. Sprint
USAF MSL CABLE	U.S.A.F. Missile Cable
USFWS	US Fish and Wildlife Service
USW COMM	U.S. West Communications
VRNDRY ELEC	Verendrye Electric Cooperative
W RIV TEL	West River Telephone Incorporated
WAPA	Western Area Power Administration
WAWSA	Western Area Water Supply Authority
WEB	W. E. B. Water Development Association
WILLI RWA	Williams Rural Water Association
WILSTN BAS PL	Williston Basin Interstate Pipeline Company
WLSH RWD	Walsh Water Rural Water District
WOLVRTN TEL	Wolverton Telephone
XLENER	Xcel Energy
YSVR	Yellowstone Valley Railroad

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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12-18-20	General Revisions
08-16-22	General Revisions

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08/16/22

LINE STYLES

D-101-20

Existing Topography

- Existing Ground Void
- Existing Cemetary Boundary
- Existing Box Culvert Bridge
- Existing Concrete Surface
- Existing Drainage Structure
- Existing Gravel Surface
- Existing Riprap
- Existing Dirt Surface
- Existing Asphalt Surface
- Existing Tie Point Line
- Existing Railroad Centerline
- Existing Guardrail Cable
- Existing Guardrail Metal
- Existing Edge of Water
- Existing Fence
- Existing Railroad
- Existing Field Line
- Exst Flow
- Existing Curb
- Existing Valley Gutter
- Existing Driveway Gutter
- Existing Curb and Gutter
- Existing Mountable Curb and Gutter

- Existing 3-Cable w Posts
- Site Boundary
- Existing Berm, Dike, Pit, or Earth Dam
- Existing Ditch Block
- Existing Tree Boundary
- Existing Brush or Shrub Boundary
- Existing Retaining Wall
- Existing Planter or Wall
- Existing W-Beam Guardrail with Posts
- Existing Railroad Switch
- Gravel Pit - Borrow Area
- Existing Wet Area-Vegetation Break
- Existing High Tension Cable Guardrail
- Existing High Tension Cable Guardrail with Posts

Proposed Topography

- 3-Cable w Posts
- Flow
- Fence
- Remove Line
- Wall
- Retaining Wall (Plan View)
- W-Beam w Posts
- High Tension Cable Guardrail with Posts

Existing Utilities

- Existing Electrical
- Existing Fiber Optic Line
- Existing TV Fiber Optic
- Existing Gas Pipe
- Existing Overhead Utility Line
- Existing Power
- Existing Fuel Pipeline
- Existing Undefined Above Ground Pipe Line
- Existing Sanitary Sewer
- Existing Sanitary Force Main
- Existing Storm Drain
- Existing Storm Drain Force Main
- Existing Culvert
- Existing Telephone Line
- Existing TV Line
- Existing Water or Steam Line
- Existing Under Drain
- Existing Slotted Drain
- Existing Conduit
- Existing Conductor
- Existing Down Guy Wire Down Guy
- Existing Underground Vault or Lift Station

Proposed Utilities

- 24 Inch Pipe
- Reinforced Concrete Pipe
- Under Drain
- Edge Drain

Traffic Utilities

- Conductor
- Fiber Optic
- Existing Loop Detector
- Existing Double Micro Loop Detector
- Micro Loop Detector Double
- Existing Micro Loop Detector
- Micro Loop Detector
- Signal Head with Mast Arm
- Existing Signal Head with Mast Arm

Sign Structures

- Existing Overhead Sign Structure
- Existing Overhead Sign Structure Cantilever
- Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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12 18 2020

LINE STYLES

D-101-21

Right Of Way

- Easement
- Existing Easement
- Right of Way
- Existing Right of Way
- Existing Right of Way Railroad
- Existing Right of Way Not State Owned
- Existing Government Lot Line
- Existing Adjacent Block Lines
- Existing Adjacent Lot Lines
- Existing Adjacent Property Line
- Existing Adjacent Subdivision Lines
- Sight Distance Triangle Line
- Dimension Leader

Boundary Control

- Existing City Corporate Limits or Reservation Boundary
- Existing State or International Line
- Existing Township
- Existing County
- Existing Section Line
- Existing Quarter Section Line
- Existing Sixteenth Section Line
- Existing Centerline
- Tangent Line

Cross Sections and Typicals

- Existing Ground
- Existing Topsoil (Cross Section View)
- Existing Ground Void (Not Surveyed) (void — void — void — v)
- Existing Concrete
- Existing Aggregate (Cross Section View)
- Existing Curb and Gutter (Cross Section View)
- Existing Asphalt (Cross Section View)
- Existing Reinforcement Rebar

Geotechnical

- Geotextile Fabric Type D (D — D)
- Geogrid (Geo — Geo)
- Geotextile Fabric Type R (R — R)
- Geotextile Fabric Type R1 (R — R)
- Geotextile Fabric Type RR (RR — RR)
- Geotextile Fabric Type S (S — S)
- Subgrade Reinforcement

Countours

- Failure Line
- Depression Contours
- Supplemental Contour

Profile

- Subgrade, Subcut or Ditch Grade
- Topsoil Profile

Striping

- Centerline Pavement Marking
- Barrier with Centerline Pavement Marking
- Barrier Pavement Marking
- Stripe 4 IN Dotted Extension White
- Stripe 8 IN Dotted Extension White
- Stripe 8 IN Lane Drop

Pavement Joints

- Doweled Joint
- Tie Bar 30 Inch 4 Foot Center to Center
- Tie Bar 18 Inch 3 Foot Center to Center
- Tie Bar at Random Spacing

Bridge Details

- Small Hidden Object
- Large Hidden Object
- Phantom Object
- Existing Conditions Object
- Centerline Main
- Centerline Secondary
- Excavation Limits
- Proposed Ground
- Sheet Piling

Erosion Control

- Limits of Const Transition Line
- Bale Check
- Rock Check
- Floating Silt Curtain (S — S)
- Silt Fence (SF — SF)
- Excavation Limits
- Fiber Rolls

Environmental

- Wetland Mitigation
- Existing Wetland Easement USFWS
- Existing Wetland Jurisdictional
- Existing Wetland
- Tree Row

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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12 18 2020

SYMBOLS

D-101-30

North Arrow (Half Scale)

Alignment Data Point

Alignment Monument

Spot Elevation

Existing Miscellaneous Spot

Existing Access Control Arrow

Existing Benchmark

Reset USGS Marker

Iron Monument Found

Iron Pin R/W Monument

Property Corner

Iron Pin Reference Monument

Right of Way Marker (Exst, Ppsd, Reset)

Existing Federal Reference Corner

Existing Section Corner (Full, Quarter, Sixteenth, Meander)

Existing Witness Corner

Existing Control Point (CP, GPS-RTK, TRI)

Existing Traverse PI Aerial Panel

Existing Reference Marker Point NGS

Existing EFB Misc

Existing Bush or Shrub

Existing Large Evergreen Tree

Existing Small Evergreen Tree

Existing Large Tree

Existing Small Tree

Existing Tree Trunk

Cairn or Stone Circle

Existing Artifact

Existing Satellite Dish

Existing Weather Station

Existing Windmill or Tower

Reinforced Pavement

CSB Continuous Split Barrel Sample

FA Flight Auger Sample

SB Split Barrel Sample

T Thinwall Tube Sample

N Standard Penetration Test

Incl Inclinometer Tube

Excavation Unit

Existing Ground Water Well Bore Hole

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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12 18 2020

SYMBOLS

D-101-31

- Flexible Delineator
- Flexible Delineator Type A (Exst, Ppsd)
- Flexible Delineator Type B (Exst, Ppsd)
- Flexible Delineator Type C (Exst, Ppsd)
- Flexible Delineator Type D (Exst, Ppsd)
- Flexible Delineator Type E (Exst, Ppsd)
- Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)
- Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)
- Delineator Type C (Exst, Ppsd, Diamond Grade)
- Delineator Type D (Exst, Ppsd, Diamond Grade)
- Delineator Type E (Exst, Ppsd, Diamond Grade)
- Barricade (Type I, Type II, Type III}
- Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)
- Attenuation Device
- Truck Mounted Attenuator
- Delineator Drums
- Flagger
- Tubular Marker
- Traffic Cone
- Back to Back Vertical Panel Sign

- Highway Sign (Exst, Ppsd)
- Mile Post Type A (Exst-Ppsd-Reset)
- Mile Post Type B (Exst, Ppsd)
- Mile Post Type C (Exst, Ppsd)
- Object Marker Type I (Exst, Ppsd)
- Object Marker Type II (Exst, Ppsd)
- Object Marker Type III (Exst, Ppsd)
- Existing Reference Marker
- Road Closure Gate 18 Ft (Exst, Ppsd)
- Road Closure Gate 28 Ft (Exst, Ppsd)
- Road Closure Gate 40 Ft (Exst, Ppsd)
- Existing Railroad Battery Box
- Existing RR Profile Spot
- Existing Railroad Crossbuck
- Existing Railroad Frog
- Existing Mailbox (Private, Federal)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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12 18 2020

SYMBOLS

D-101-32

- Existing Luminaire
- Luminaire LED
- Existing Light Standard Luminaire
- Relocate Light Standard
- Light Standard Light LED Luminaire
- Light Standard 35 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 50 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 70 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 100 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 150 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 200 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 250 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 310 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 400 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 700 Watt High Pressure Sodium Vapor Luminaire
- Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire
- Emergency Vehicle Detector
- Video Detection Camera

- High Mast Light Standard 3 Luminaire (Exst, Ppsd)
- High Mast Light Standard 4 Luminaire (Exst, Ppsd)
- High Mast Light Standard 5 Luminaire (Exst, Ppsd)
- High Mast Light Standard 6 Luminaire (Exst, Ppsd)
- High Mast Light Standard 7 Luminaire (Exst, Ppsd)
- High Mast Light Standard 8 Luminaire (Exst, Ppsd)
- High Mast Light Standard 9 Luminaire (Exst, Ppsd)
- High Mast Light Standard 10 Luminaire (Exst, Ppsd)
- Overhead Sign Structure Load Center (Exst, Ppsd)
- Traffic Signal Controller (Exst, Ppsd)
- Pad Mounted Traffic Signal Controller (Exst, Ppsd)
- Flashing Beacon (Exst, Ppsd)
- Concrete Foundation (Exst, Ppsd)
- Pipe Mounted Flasher (Exst, Ppsd)
- Pad Mounted Feed Point (Exst, Ppsd)
- Pipe Mounted Feed Point with Pad (Exst, Ppsd)
- Pole Mounted Feed Point (Exst, Ppsd)
- Junction Box (Exst, Ppsd)
- Existing Pedestrian Head with Number
- Existing Signal Head
- Pole Mounted Head
- Existing Lighting Standard Pole

- Existing Traffic Signal Standard
- Pull Box (Exst-Ppsd-Undefined)
- Intelligent Transportation Pull Box (Exst, Ppsd)
- Transformer (Exst, Ppsd)
- Power Pole (Exst-Ppsd-with Transformer)
- Wood Pole (Exst, Ppsd)
- Pedestrian Push Button Post (Exst, Ppsd)
- Existing Pole
- Existing Telephone Pole
- Existing Post
- Connection Conductor (Ground, Neutral, Phase 1, Phase 2)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions

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SYMBOLS

D-101-33

Existing Manhole (Electrical, Gas, Telephone)

Water Manhole (Exst, Exst with Valve)

Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)

Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)

Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)

Force Main Storm Drain Manhole (Exst, Exst with Valve)

Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)

Existing Water Appurtenance

Sprinkler Head (Exst, Ppsd)

Fire Hydrant (Exst, Ppsd)

Cleanout (Exst Sanitary, Underdrain)

Existing Catch Basin Inlet (Round, Square)

Existing Curb Inlet (Round, Square)

Existing Slotted Reinforced Concrete Pipe

Catch Basin (Riser 30 Inch, Beehive, Type A)

Inlet Mountable Curb (Type A, Type B)

Inlet Saddle Base (Type 1, Type 2)

Inlet Special (Catch Basin, Type 1, Type A)

Inlet (Tee, Type 1, Type 2, Type 2 Double)

Median Drain

Headwall (Exst, Ppsd, Ppsd Single with Vegitation Barrier,
Ppsd Double with Vegitation Barrier)

Cap or Stub
Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water

Existing Pedestal
Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined

Existing Pipe Vent
Gas, Fuel, Sanitary, Storm Drain, Water, Undefined

Valve
Exst Gas, Exst Water, Ppsd Water, Exst Undefined

Pump
Sanitary, Storm Drain, Exst Water

Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)

Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)

Existing Utility Marker

Existing Meter

Existing Fuel Dispensers

Existing Fuel Filler Pipes

Existing Fuel Leak Sensors

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	General Revisions Sheet added - Continued from D-101-32

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12 18 2020

Cross Section Legend

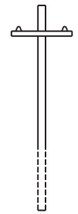
D-101-40

Description	Longitudinal Parallel to Roadway	Transverse Perpendicular to Roadway*
Cable Line	CBL1	CBL2
Conduit Line	CDU1	CDU2
Electric Line	E1	E2
Fiber Optic Line	F1	F2
Gas Main Line	GM1	GM2
Gas Service Line	GS1	GS2
Gas Transmission Line	GT1	GT2
Fuel Pipeline	PL1	PL2
Sanitary Sewer Force Main	SSF1	SSF2
Sanitary Sewer	SS1	SS2
Steam Line	STE1	STE2
Storm Drain (Assumed Depth)	SD1	SD2
Telephone Line	T1	T2
TV Line	TV1	TV2
Water Main Line	WM1	WM2
Water Service Line	WS1	WS2

Description	Longitudinal Parallel to Roadway	Transverse Perpendicular to Roadway*
Overhead Power Transmission Line	OHT1	OHT2
Overhead Line	OH1	OH2

Light Standard - Multiple Variations
- Concrete
- Steel
- Wood
- with Traffic Signal

Pole - Multiple Variations
- Utility
- Brace
- Feed Point
- Guy
- Power
- Power Structure
- Power with Light
- Power with Transformer



Manhole - Multiple Variations
- Electric
- Fiber Optic
- Gas
- Inlet
- Sanitary Force Main
- Sanitary
- Sanitary with Valve
- Steam
- Storm
- Storm Force Main
- Storm with Valve
- Telephone
- Water
- Water with Meter
- Water with Valve
- Water with Air Release Valve

Anchor

High Tension Cable Guardrail

* Usually the transverse utilities are shown on a cross section with 2 or more symbols. The utility runs from one symbol to the other, but the connection may not be shown.

Connection to infer that probably will not be displayed

When storm drain invert elevations are NOT used to draw pipe, they will appear as shown to the left. When invert elevations are used to draw pipe, they will be a cross section similar to the graphics shown below.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-20-18	
REVISIONS	
DATE	CHANGE
6/14/2023	CADD Standards Update

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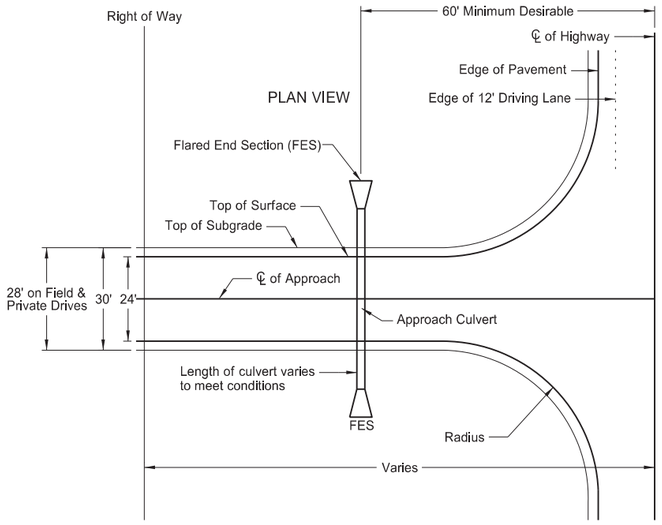
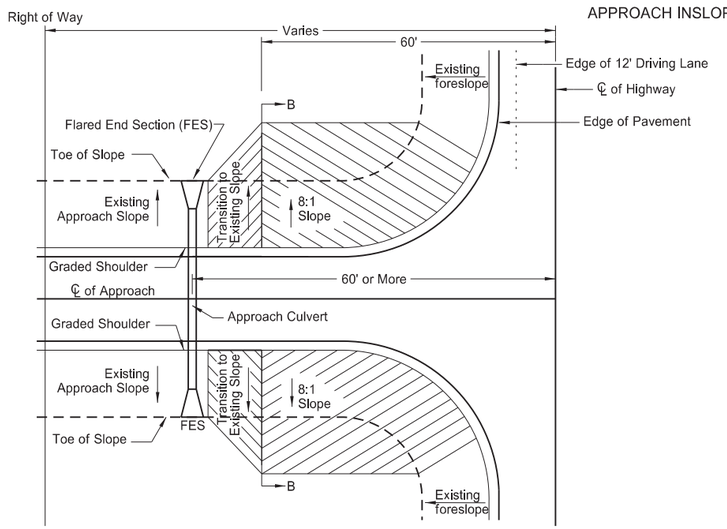
06/14/23

STANDARD RURAL APPROACHES

D-203-8

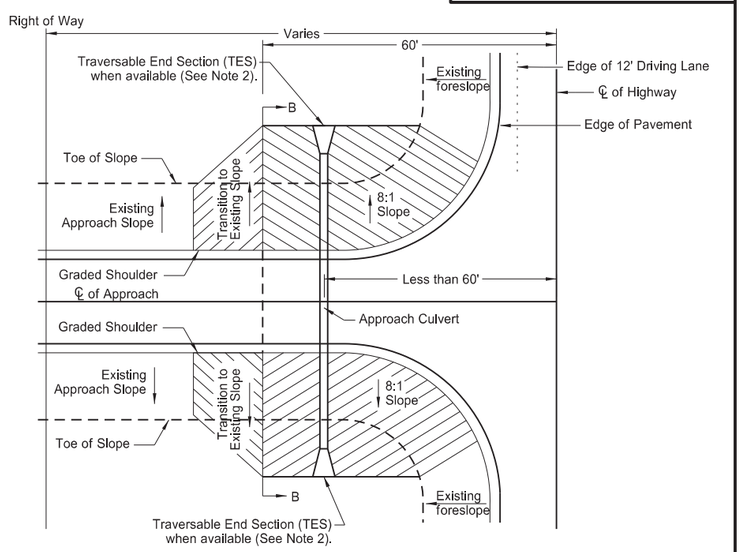


APPROACH INSLOPES



CASE 1

APPROACH PIPE LOCATED
60' OR MORE FROM ℄



CASE 2

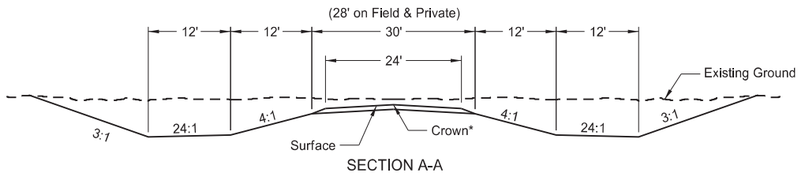
APPROACH PIPE LOCATED
LESS THAN 60' FROM ℄

Approach Pipe Traversable End Sections (TES)

RCP	CSP	CSP Arch
15"	15"	
18"	18"	21"x15"
		24"x18"
24"	24"	28"x20"

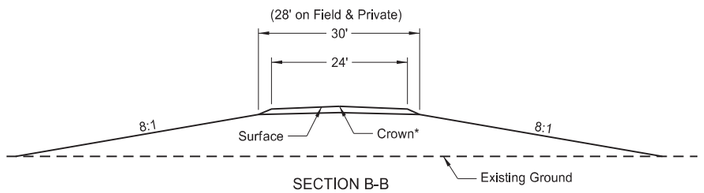
CRITERIA FOR RURAL APPROACH TYPES

	Field Drives	Private Drives	Low Volume Public Roads
Radius	R=40 ft	R=40 ft	R=50 ft
Maximum Grade	10%	7%	7%
Storage Platform	24 ft	24 ft	50 ft
Vertical Curve Length	10 ft	10 ft	Varies (Min. 20 mph)

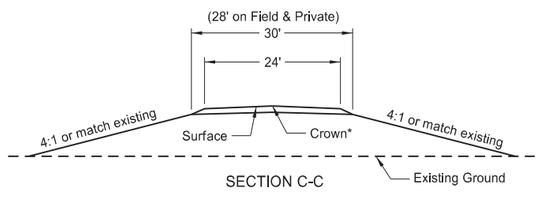


SECTION A-A

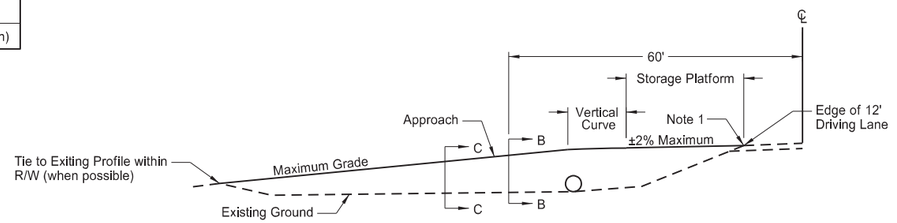
*2.1% crown for paved surface
*3.0% crown for gravel surface



SECTION B-B



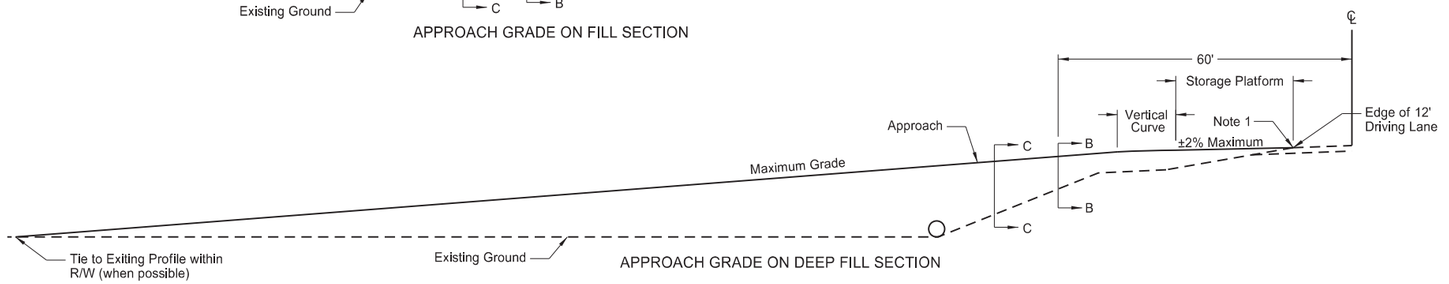
SECTION C-C



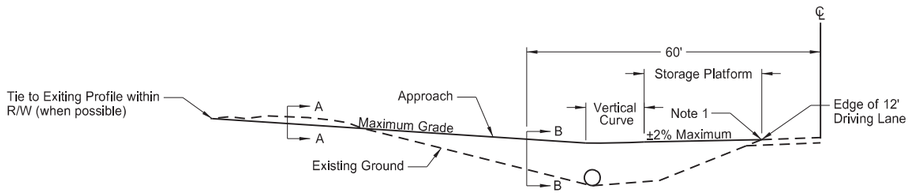
APPROACH GRADE ON FILL SECTION

NOTES:

1. 5% Max Rollover between approach storage platform and highway.
2. Approach pipes up to 24" diameter are acceptable (with traversable end sections) for Case 2. Install approach pipes larger than 24" diameter in accordance with Case 1.



APPROACH GRADE ON DEEP FILL SECTION



APPROACH GRADE ON CUT SECTION

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-25-14	
REVISIONS	
DATE	CHANGE
06-30-17	Revised Radius, Storage Platform, Inslope dimensions, and Note 1
10-25-19 06-29-22	Changed "Inslope" to "Foreslope" Added "TES", Table, and Note 2

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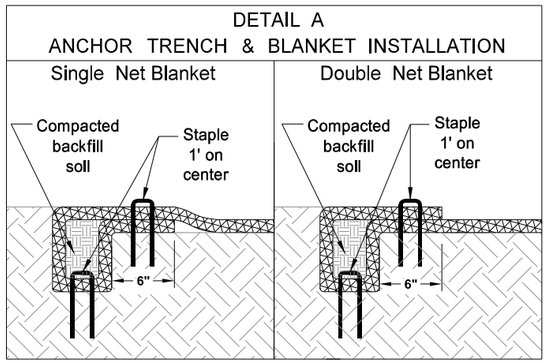
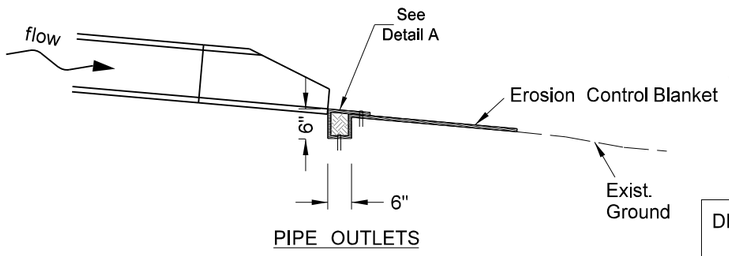
06/29/22

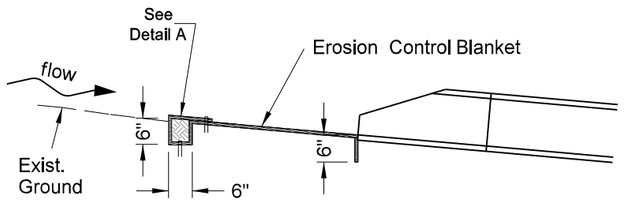
EROSION AND SILTATION CONTROL
EROSION CONTROL BLANKET INSTALLATION



NOTE:
If a Single Net Blanket is used the side with the netting should be on the top once the blanket is installed.

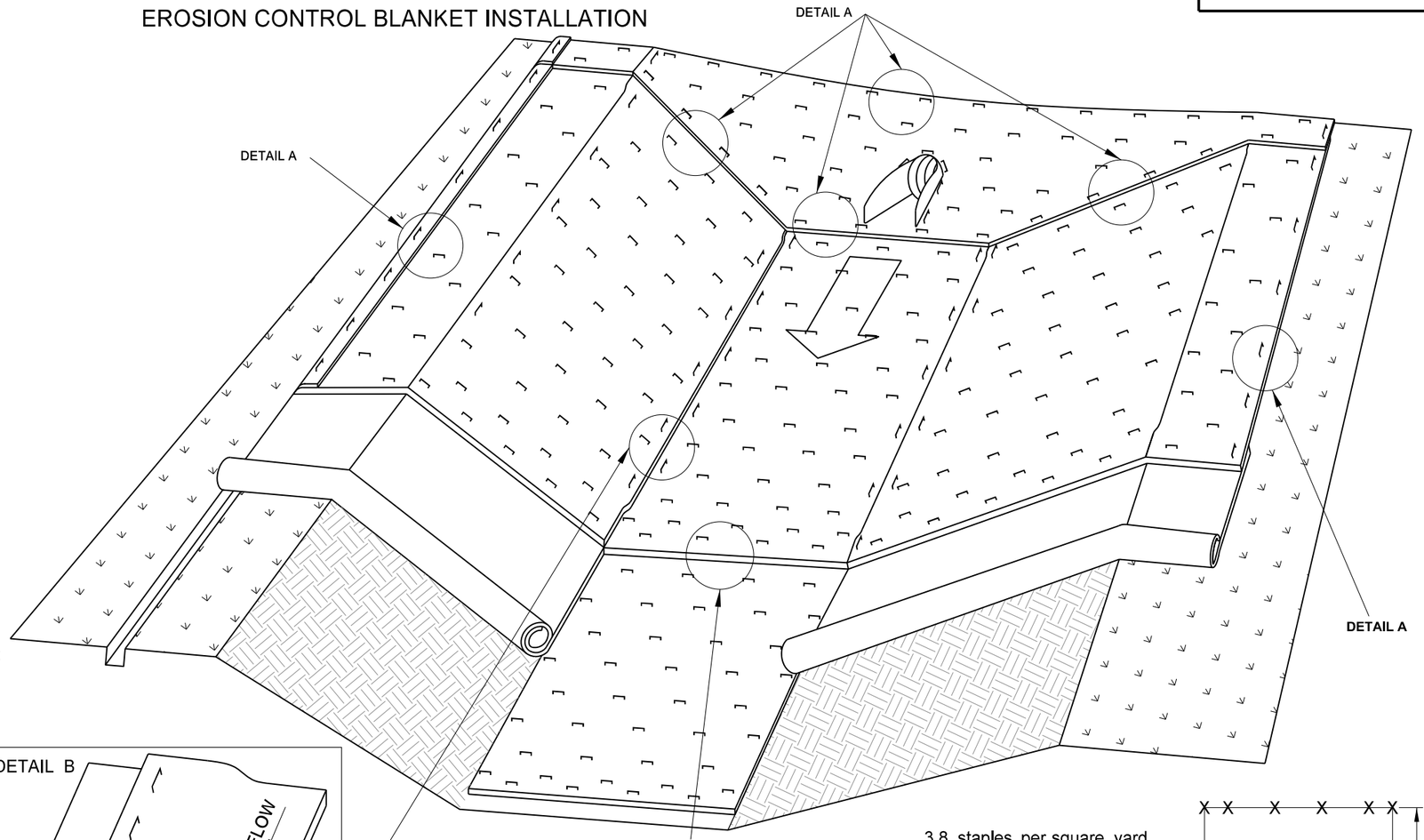


PIPE OUTLETS

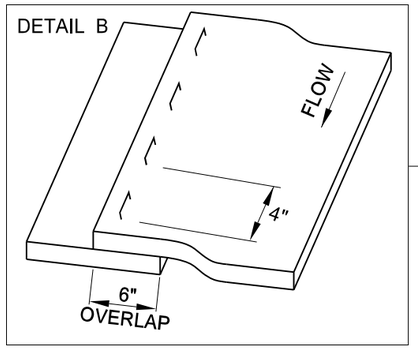


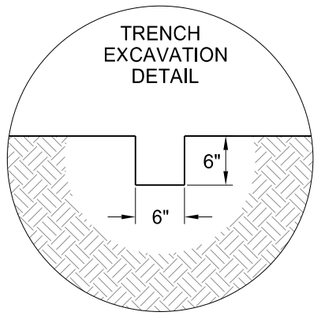
PIPE INLETS

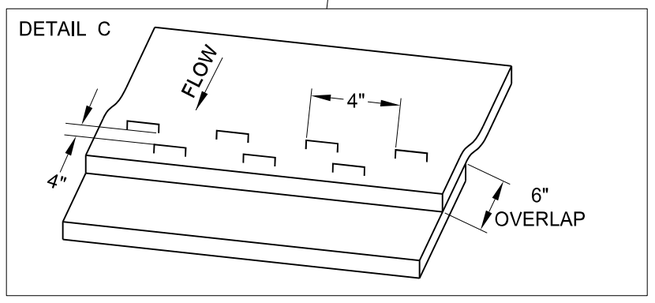
INSTALLATION AT PIPE ENDS



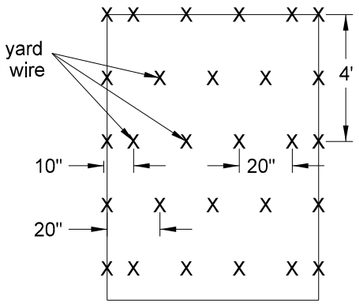
BLANKET LAYOUT
CHANNEL OR SLOPE INSTALLATION







3.8 staples per square yard using 8-inch 11 gauge wire "u" staples.



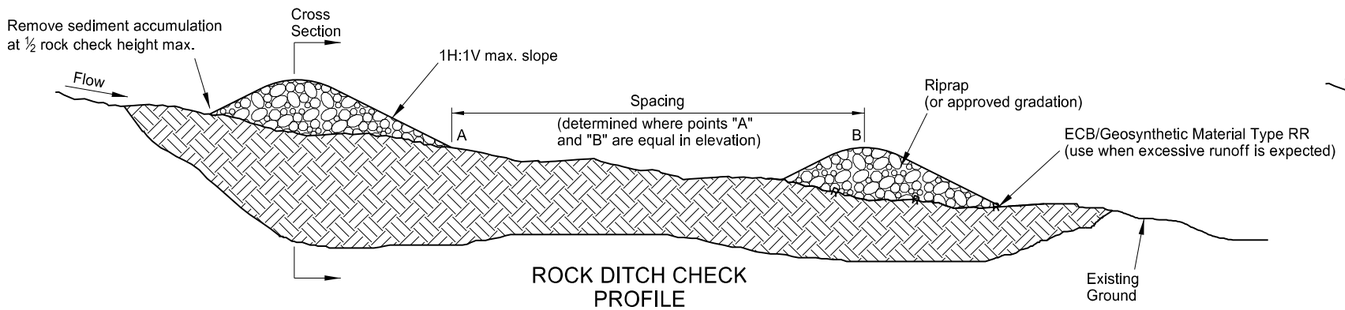
STAPLE PATTERN

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Changed standard drawing number from D-708-5 to D-255-2.
07-27-15	Changed Installation details such as trench depth and overlap dimensions.
08-27-19	New Design Engineer PE Stamp.

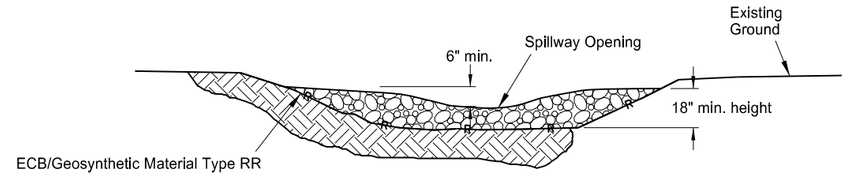
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 08/27/19 and the original document is stored at the North Dakota Department of Transportation

EROSION AND SILTATION CONTROLS

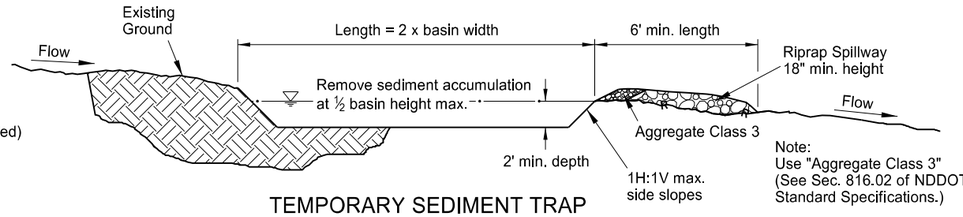
D-256-1



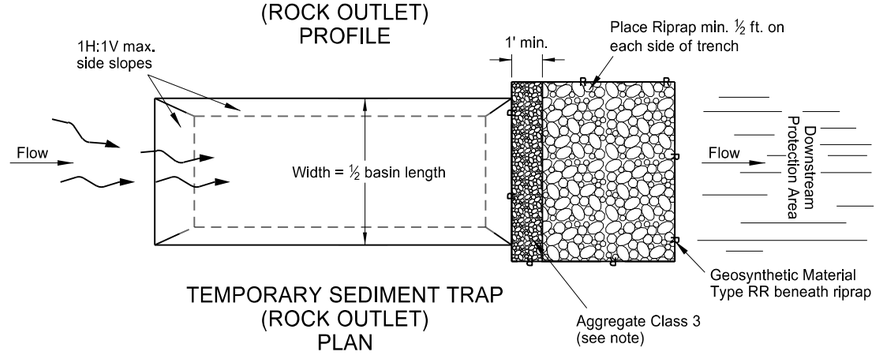
ROCK DITCH CHECK
PROFILE



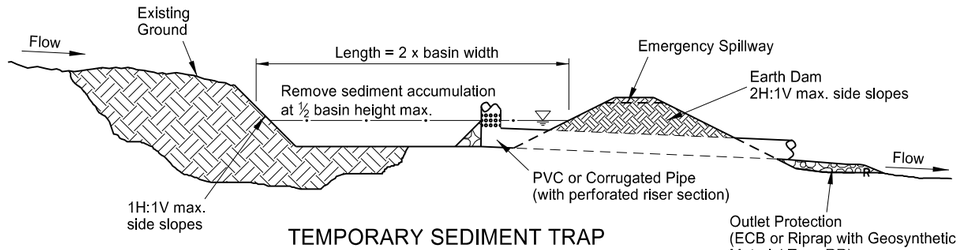
ROCK DITCH CHECK
CROSS SECTION



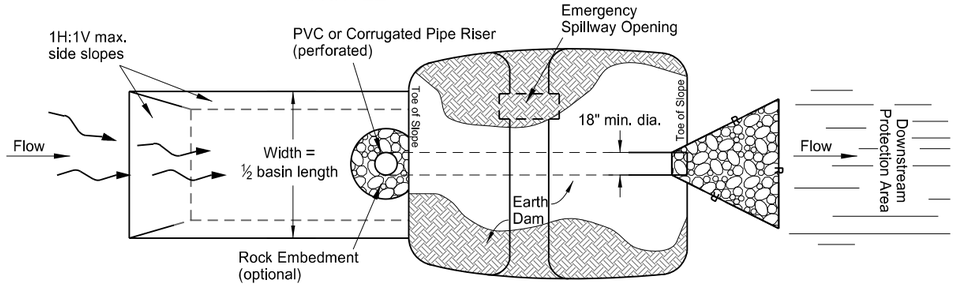
TEMPORARY SEDIMENT TRAP
(ROCK OUTLET)
PROFILE



TEMPORARY SEDIMENT TRAP
(ROCK OUTLET)
PLAN



TEMPORARY SEDIMENT TRAP
(RISER PIPE OUTLET)
PROFILE



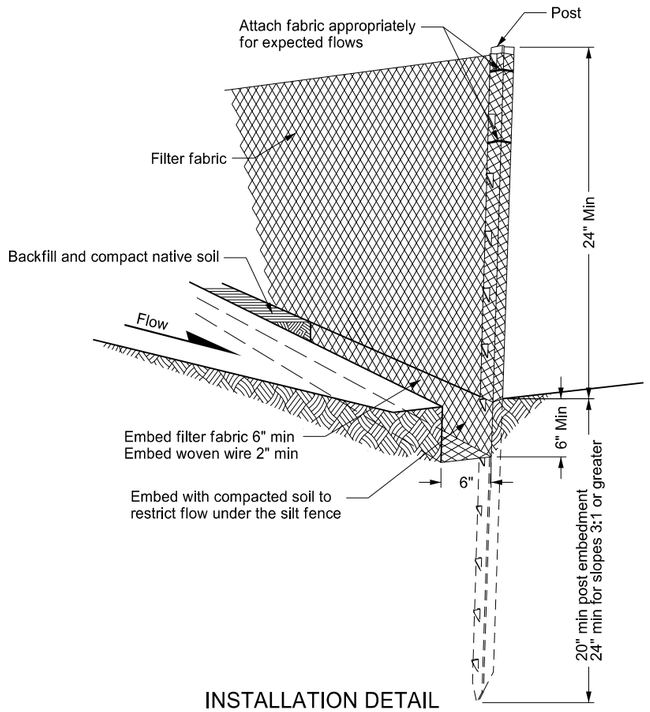
TEMPORARY SEDIMENT TRAP
(RISER PIPE OUTLET)
PLAN

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Changed standard drawing number from D-708-2 to D-256-1. Deleted silt fence details.
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8-27-2019 and the original document is stored at the North Dakota Department of Transportation

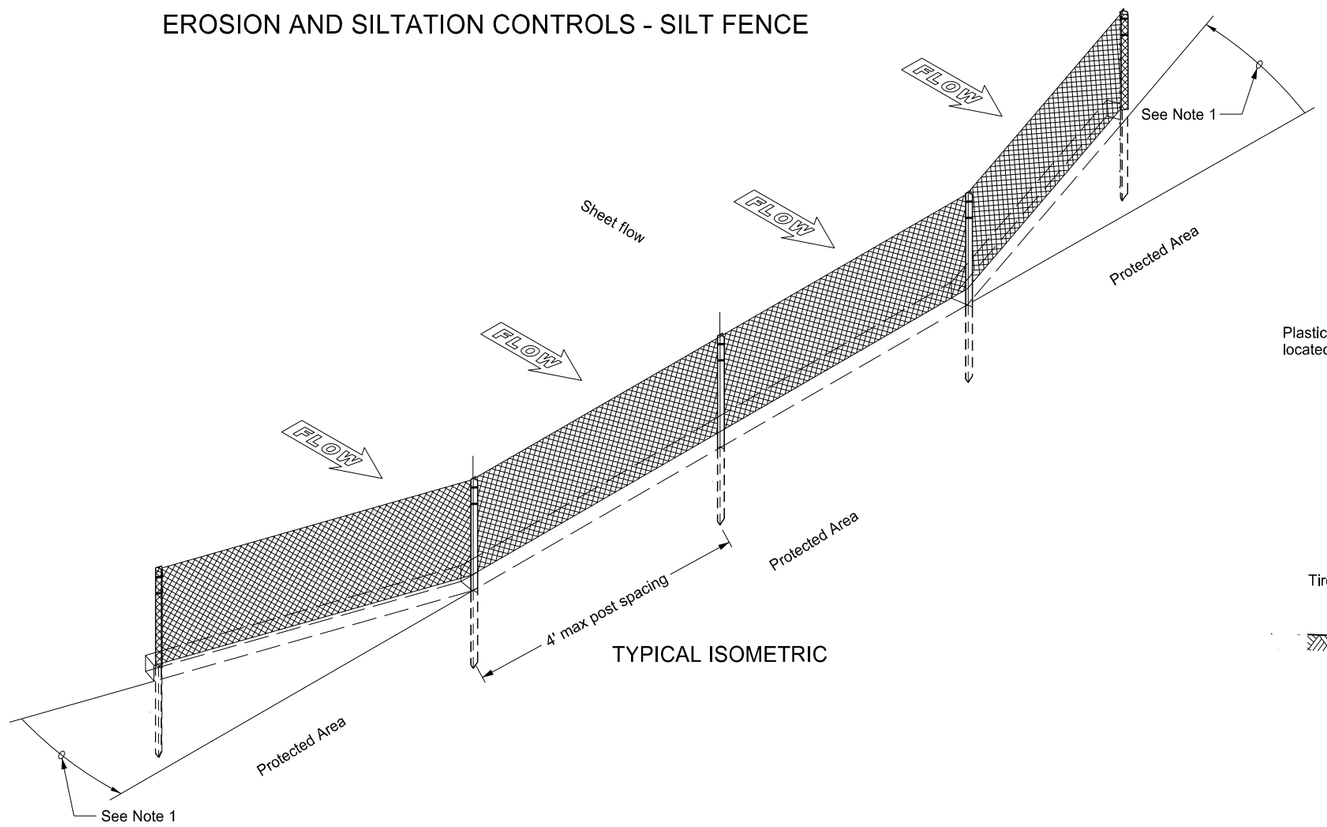
EROSION AND SILTATION CONTROLS - SILT FENCE

D-260-1

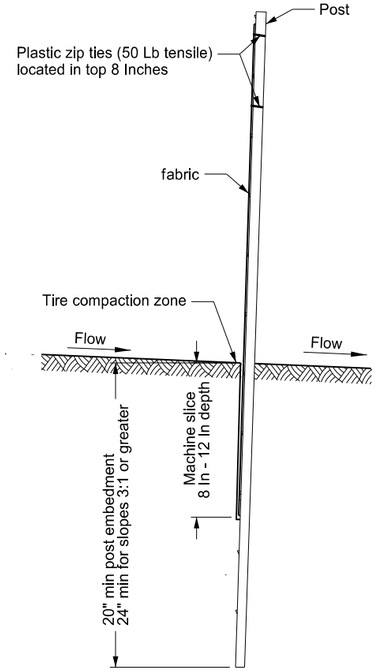


INSTALLATION DETAIL

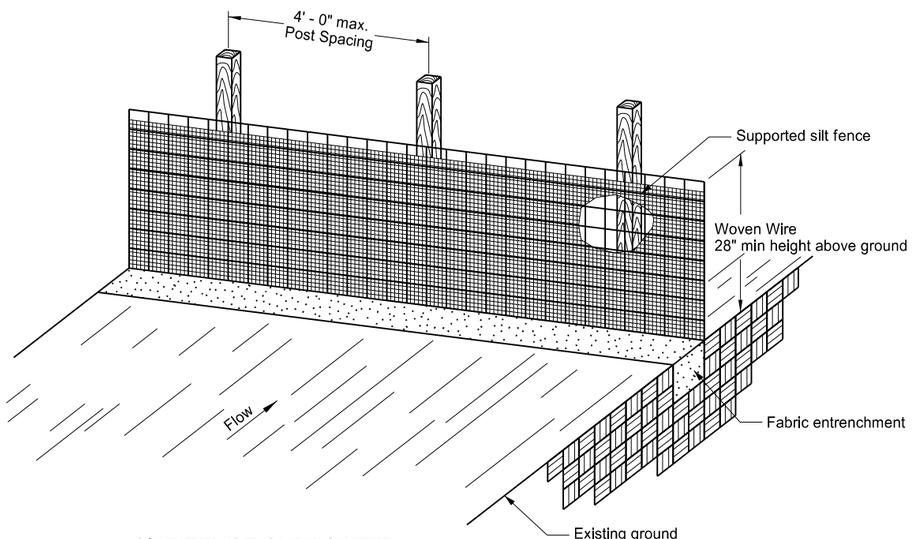
Minimize disturbance of ground around trench and smooth surface after excavation to avoid concentrating flows. Compact to prevent undercutting flows.



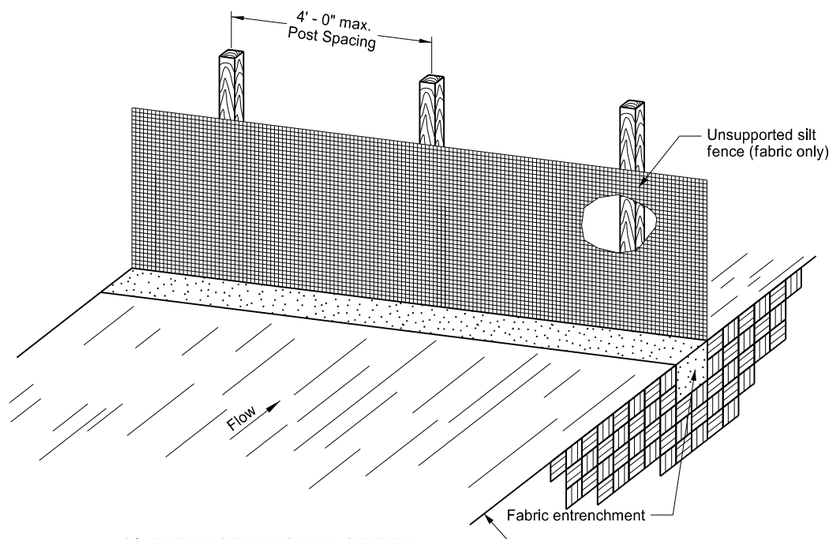
TYPICAL ISOMETRIC



MACHINE SLICED SILT FENCE



SILT FENCE SUPPORTED



SILT FENCE UNSUPPORTED

NOTES:
1. Install the ends of the silt fence to point slightly upslope to prevent sediment from flowing around the ends of the fence.
2. Place splices outside low spots.
3. Install silt fencing parallel to contour lines.
4. Do not embed silt fence when placed in standing water.
5. Silt fence material does not need to reach the top of woven wire support.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Standard drawing resulted from splitting standard D-708-2.
06-27-16 08-27-19	Revised details & added new ones. New Design Engineer PE Stamp.

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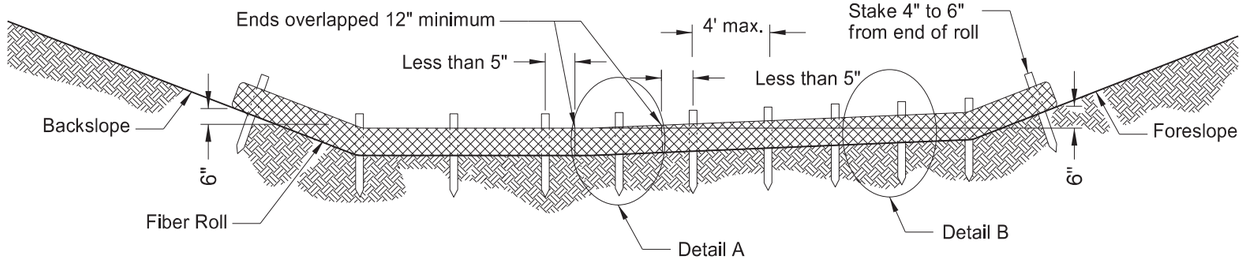
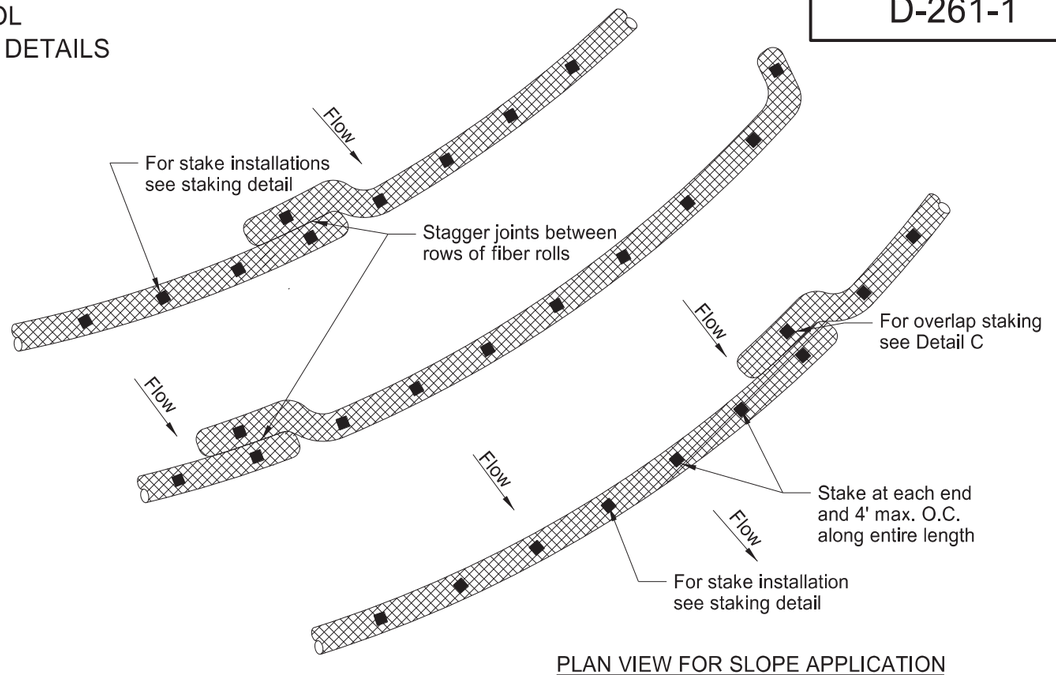
D-261-1

EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS

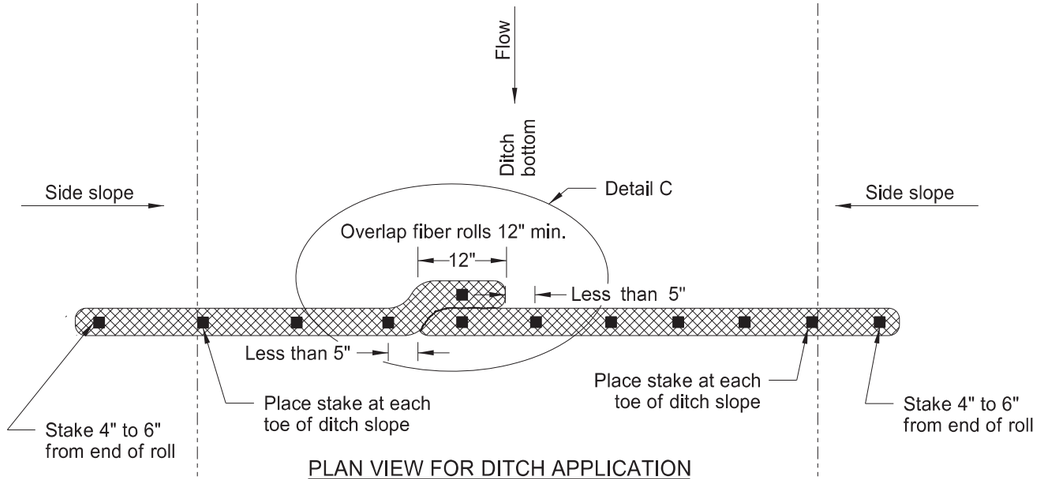


12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



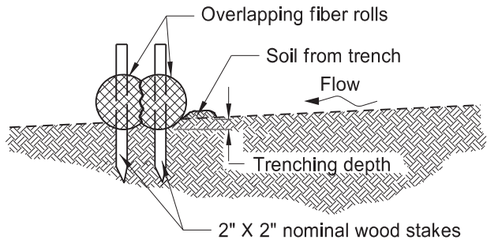
PLAN VIEW FOR SLOPE APPLICATION

Ensure fiber rolls are placed along the contours of the slope.



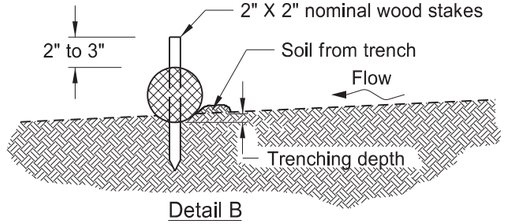
PLAN VIEW FOR DITCH APPLICATION

FIBER ROLL DIAMETER	NOMINAL STAKE SIZE	MINIMUM STAKE LENGTH	MINIMUM TRENCH DEPTH	MAXIMUM TRENCH DEPTH
6"	2" x 2"	18"	2"	2"
12"	2" x 2"	24"	2"	3"
20"	2" x 2"	36"	3"	5"



Detail A

Fiber Roll Overlapping Staking Detail



Detail B

Fiber Roll Staking Detail

NOTE: Runoff must not be allowed to run under or around roll.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-18-10	
REVISIONS	
DATE	CHANGE
06-10-13	Added plan view for ditch and slope application. Added table with values for stake and trench dimensions.
10-04-13	Revised fiber roll overlap detail.
06-26-14	Changed standard drawing number from D-708-7 to D-261-1.
08-27-19	New Design Engineer PE Stamp
04-22-24	Slope Plan View-Overlap Change.

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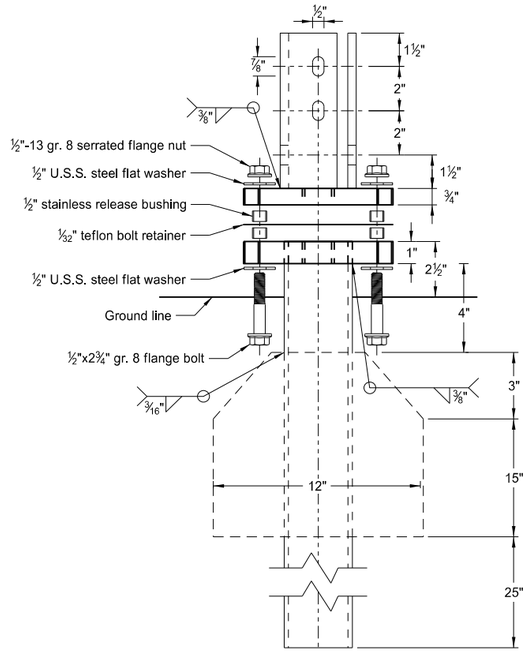
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

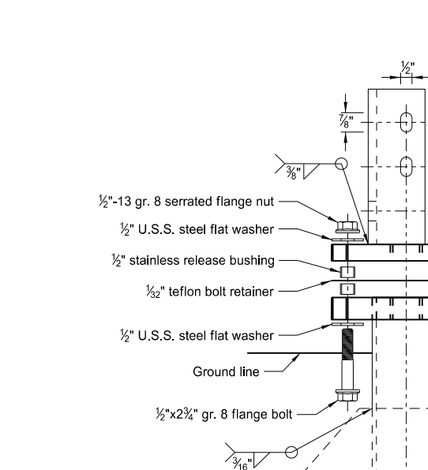
04/22/24

BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

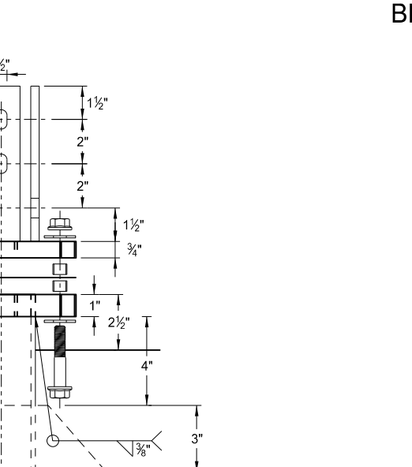
D-704-7



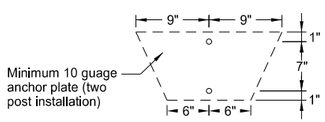
Multi-Directional
Slip Base Assembly



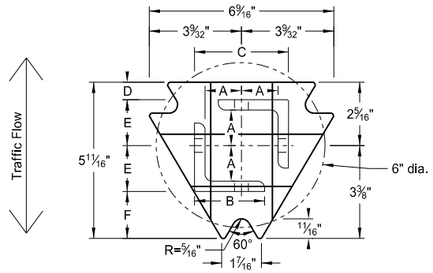
Anchor Unit and Post Assembly



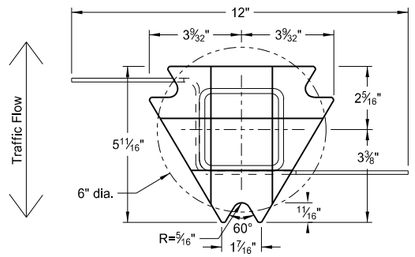
Multi-Directional
Slip Base Anchor Unit
and Post Sleeve Assembly



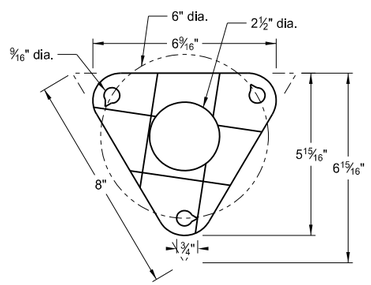
Perforated Tube



Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2½"x2½"x⅜" ASTM A36 structural angle



Bottom Soil Stub
Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50



Bolt Retainer for Base Connection
Bolt Retainer- 1/32" Reprocessed Teflon

Notes:

1. Torque slip base bolts as specified by manufacturer.
2. Use anchor with 43.9 KSI yield strength and 59.3 KSI tensile strength.
3. Provide 4" vertical clearance for anchor or breakaway base. Measure the 4"x60" measurement above and below post location and back and ahead of post.
4. In concrete sidewalk, use same anchor without wings.
5. Provide more than 7' between the first and fourth posts of a four post sign.

Telescoping Perforated Tube						
Number of Posts	Post Size in.	Wall Thick-ness Gauge	Sleeve Size in.	Wall Thick-ness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2¼
1	2¼	12			No	2½
1	2½	12			(A)	3
1	2½	10			Yes	
1	2¼	12	2	12	Yes	
1	2½	12	2¼	12	Yes	
2	2	12			No	2¼
2	2¼	12			No	2½
2	2½	12			Yes	
2	2½	12			Yes	
2	2¼	10	2	12	Yes	
2	2½	12	2¼	12	Yes	
3 & 4	2½	12			Yes	
3 & 4	2½	10			Yes	
3 & 4	2½	12	2¼	12	Yes	
3 & 4	2¼	12	2	12	Yes	
3 & 4	2½	10	2³/16	10	Yes	

Properties of Telescoping Perforated Tube						
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in.⁴	Cross Sec. Area in.²	Section Modulus in.³
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2³/16 x 2³/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.785

Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2³/16"x10 ga.	1⁹/64"	2½"	3¹/32"	2⁵/32"	1³³/64"	1⅞"
2½"x10 ga.	1⁹/32"	2½"	3⁵/16"	⅝"	1²¹/32"	1¾"

(A) Use breakaway base when support is placed in weak soils. Engineer determines if soils are weak.

(B) For additional wind load, insert the 2³/16"x10 ga. into 2½"x10 ga.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp

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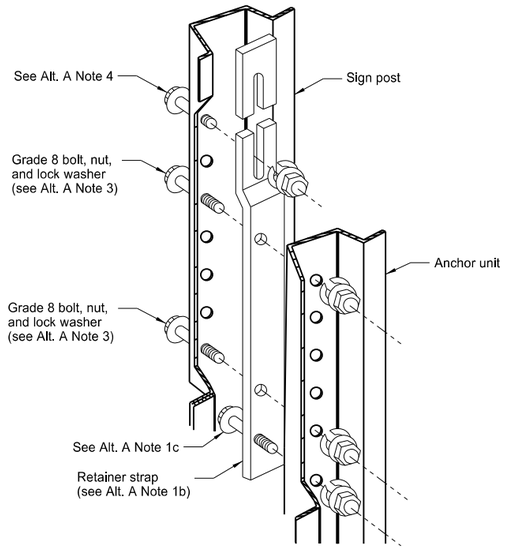
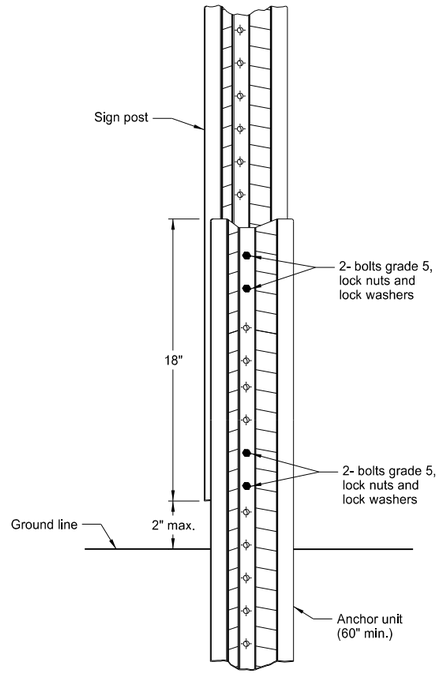
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post

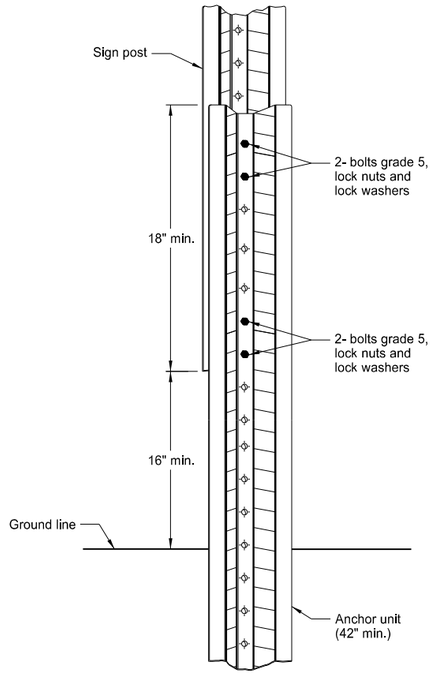


Detail A



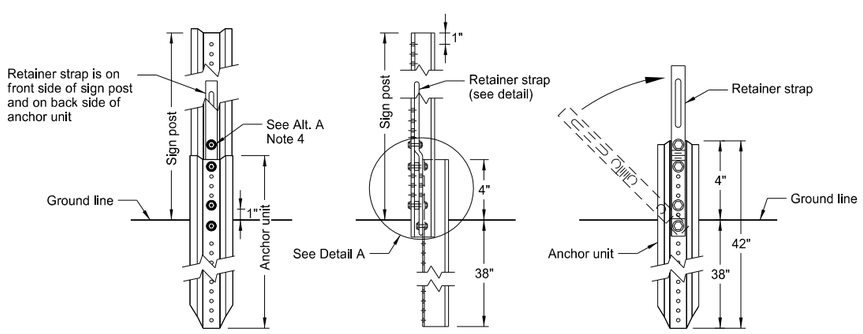
Breakaway U-Channel Splice Detail
Alternate B
(2.5 and 3 lb/ft)

Install a maximum of 3 posts within 7'.



Breakaway U-Channel Splice Detail
Alternate C
(2.5 and 3 lb/ft)

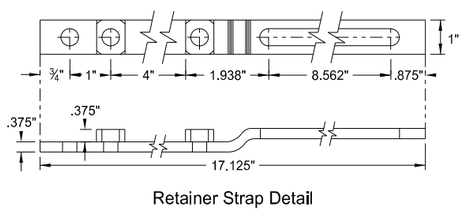
Install a maximum of 3 posts within 7'.



Front View Side View Back View

Breakaway U-Channel Detail
Alternate A

Install a maximum of 2 posts within 7'.



Retainer Strap Detail

Alternate A Steps of Installation:

1. a) Drive anchor unit to within 12" of ground level.
   b) Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
   c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
   d) Rotate strap 90° to left.
2. a) Drive anchor unit to 4" above ground.
   b) Rotate strap to vertical position.
3. a) Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.
   b) Alternately tighten two connector bolts.
4. Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
5. Properly nest base post, strap, and sign post. Proper nesting occurs when all flat surfaces of the base post, strap, and sign post at the bolts have full contact across the entire width.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp

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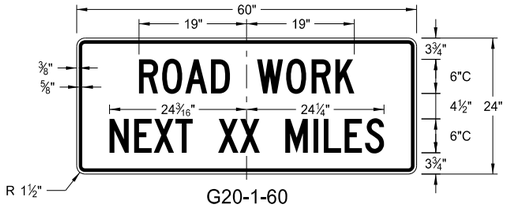
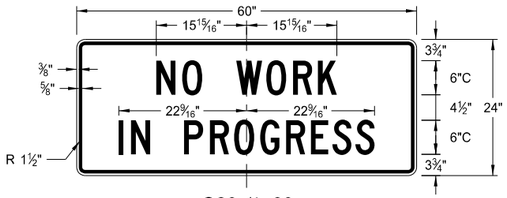
CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS



G20-1-60
Legend: black (non-refl)
Background: orange



G20-1b-60
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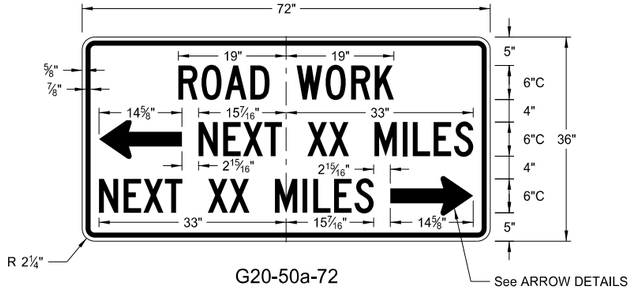
Background: orange



G20-50a-72
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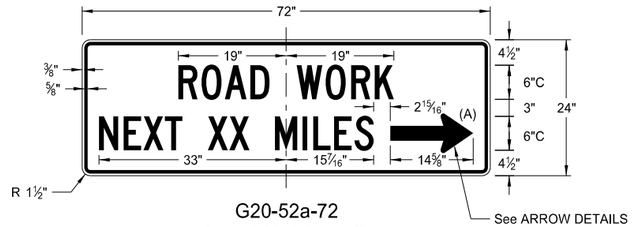
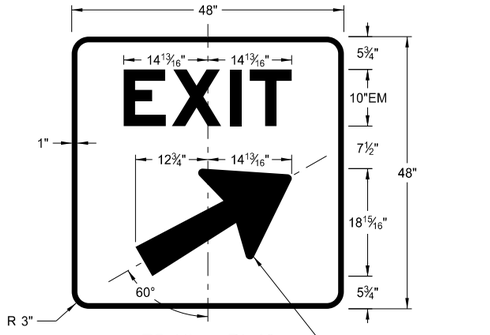
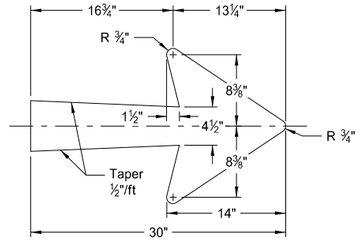
Background: orange



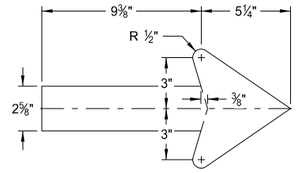
G20-52a-72
Legend: black (non-refl)
Background: orange



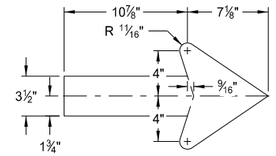
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



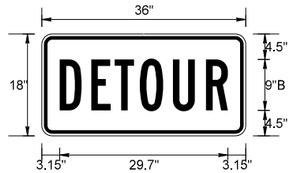
E5-1-48



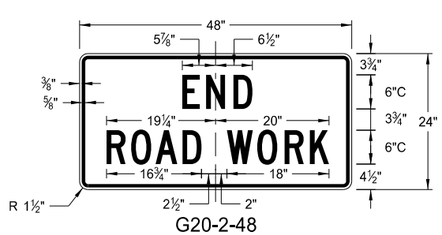
G20-50a-72
G20-52a-72



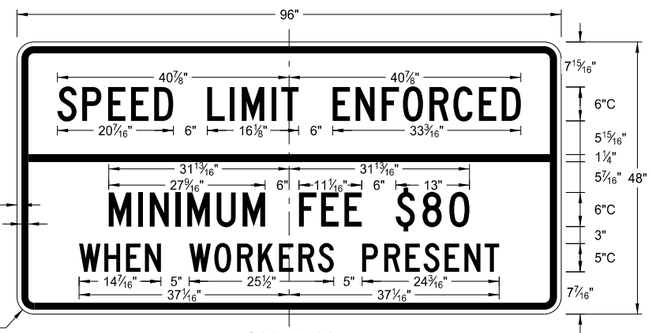
M4-9(L or R)-30
Right or Left



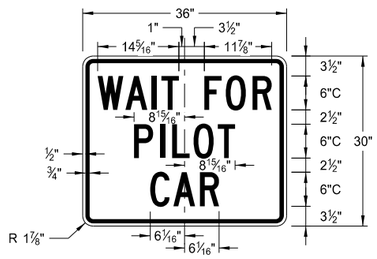
M4-8-36
Legend: black (non-refl)
Background: orange



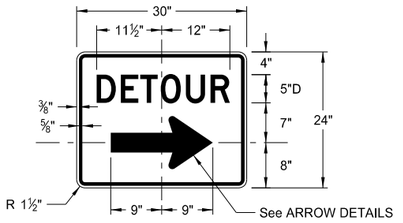
G20-2-48
Legend: black (non-refl)
Background: orange



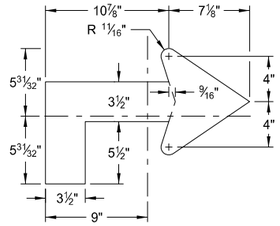
G20-55-96
Legend: black (non-refl)
Background: orange



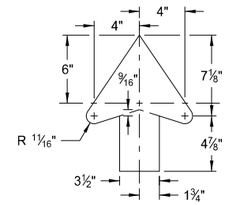
G20-4b-36
Legend: black (non-refl)
Background: orange



M4-9(L or R)-30 &
M4-9-30
Legend: black (non-refl)
Background: orange



M4-9(L or R)-30
Advanced Right or Left



M4-9-30
Straight

ARROW DETAILS

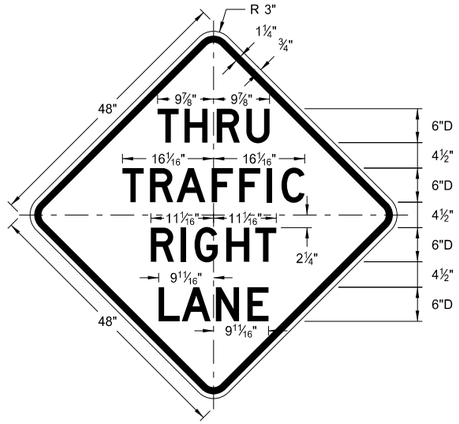
NOTES:

(A) Arrow may be right or left of the legend to indicate construction to the right or left.

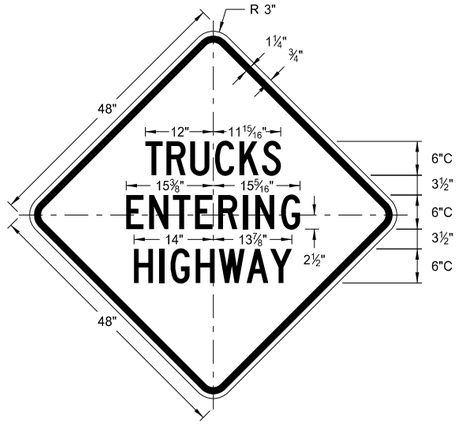
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17 10-03-19	Added sign & background color New Design Engineer PE Stamp

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 10/03/19 and the original document is stored at the North Dakota Department of Transportation

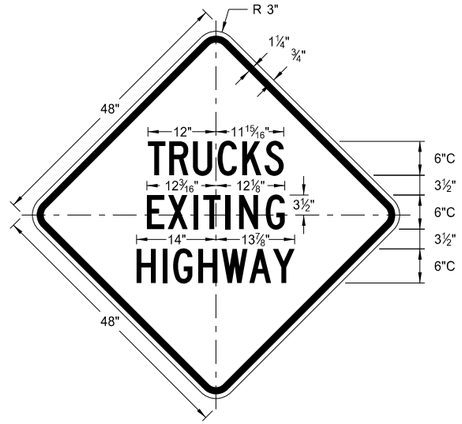
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



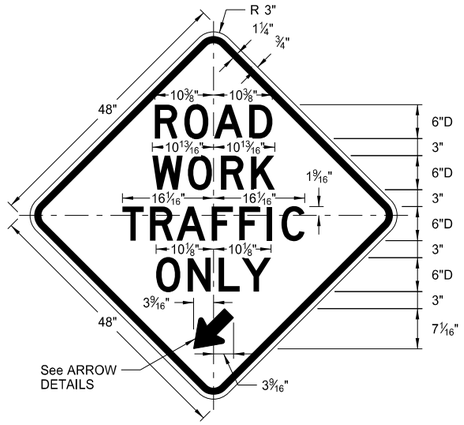
W5-8-48
Legend: black (non-refl)
Background: orange



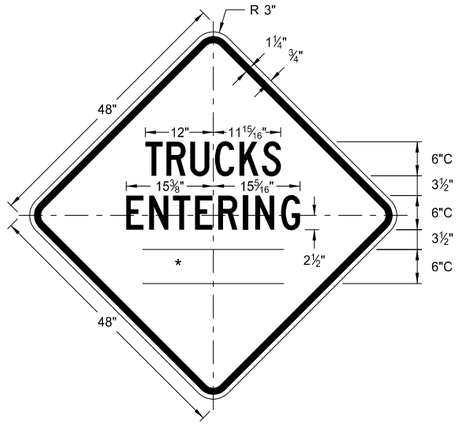
W8-53-48
Legend: black (non-refl)
Background: orange



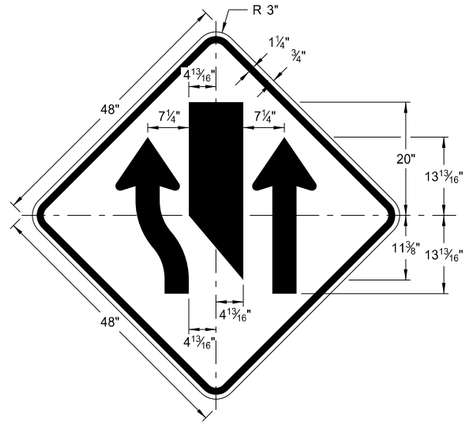
W8-56-48
Legend: black (non-refl)
Background: orange



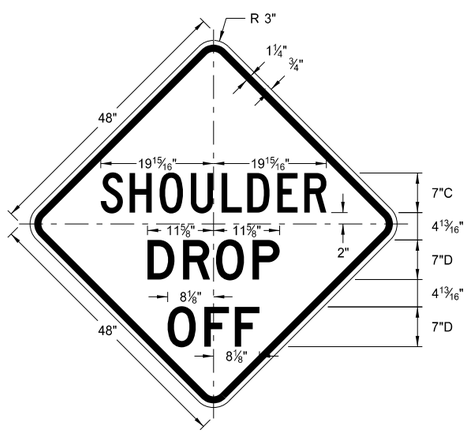
W5-9-48
Legend: black (non-refl)
Background: orange



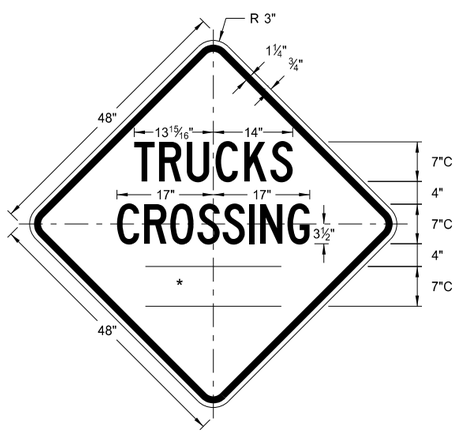
W8-54-48
Legend: black (non-refl)
Background: orange



W9-3a-48
Legend: black (non-refl)
Background: orange



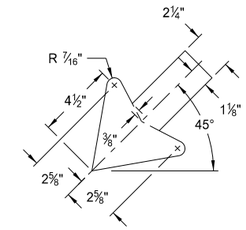
W8-9a-48
Legend: black (non-refl)
Background: orange



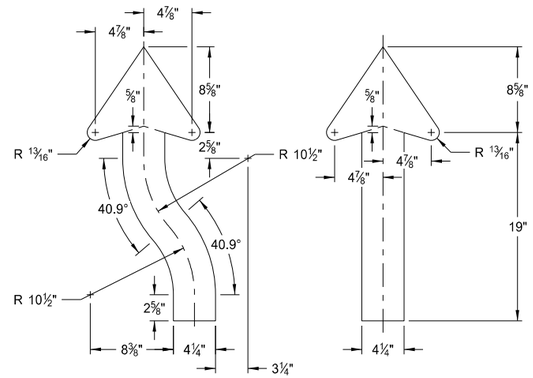
W8-55-48
Legend: black (non-refl)
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

* DISTANCE MESSAGES



W5-9-48



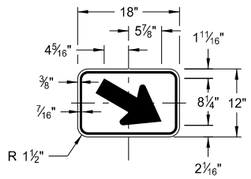
W9-3a-48

ARROW DETAILS

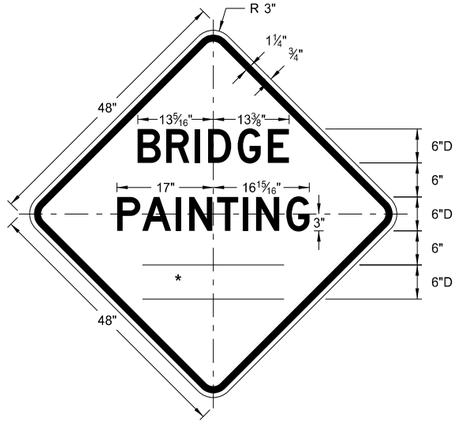
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 10/03/19 and the original document is stored at the North Dakota Department of Transportation

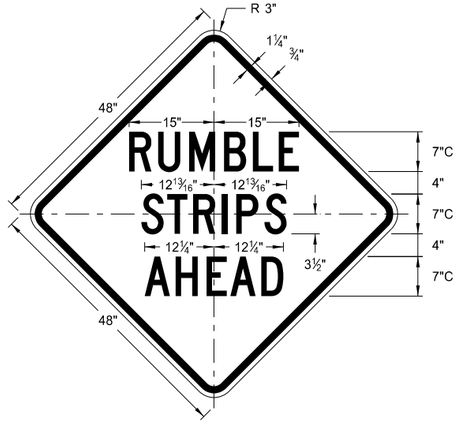
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



W16-7aP-18
Legend: black (non-refl)
Background: orange



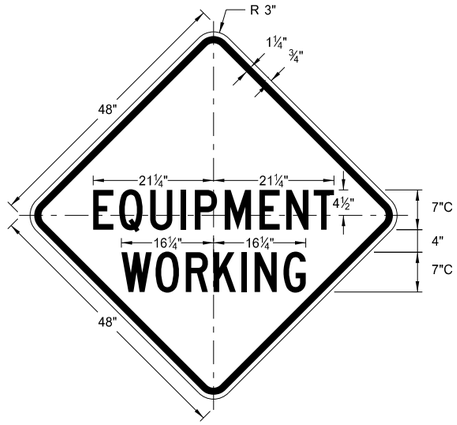
W21-50-48
Legend: black (non-refl)
Background: orange



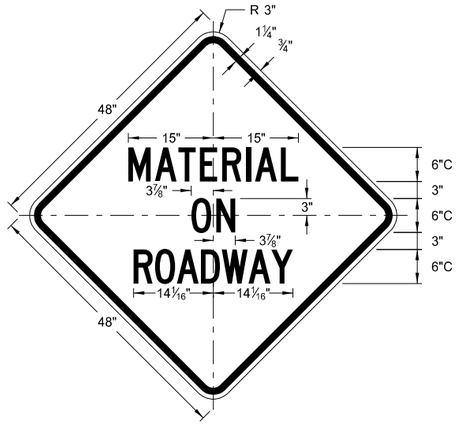
W21-53-48
Legend: black (non-refl)
Background: orange

WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

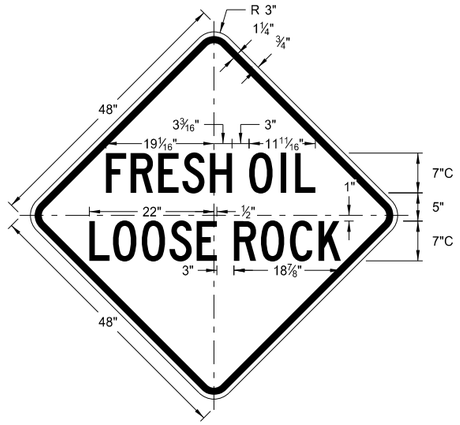
* DISTANCE MESSAGES



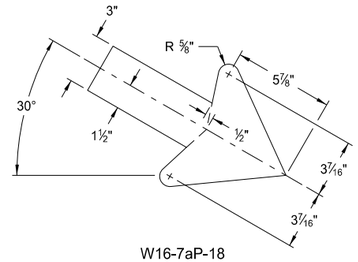
W20-51-48
Legend: black (non-refl)
Background: orange



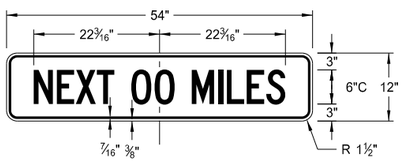
W21-51-48
Legend: black (non-refl)
Background: orange



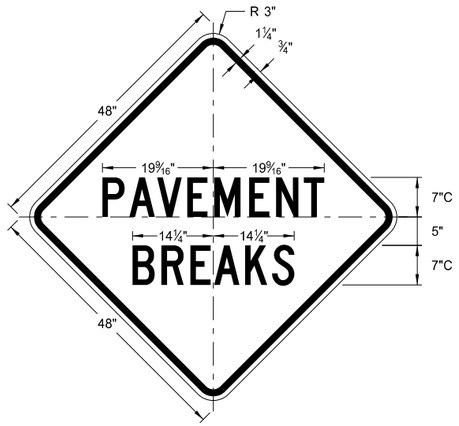
W22-8-48
Legend: black (non-refl)
Background: orange



W16-7aP-18



W20-52P-54
Legend: black (non-refl)
Background: orange



W21-52-48
Legend: black (non-refl)
Background: orange

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.

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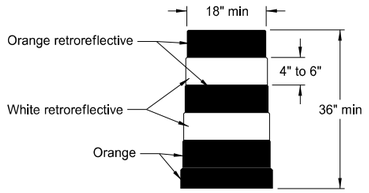
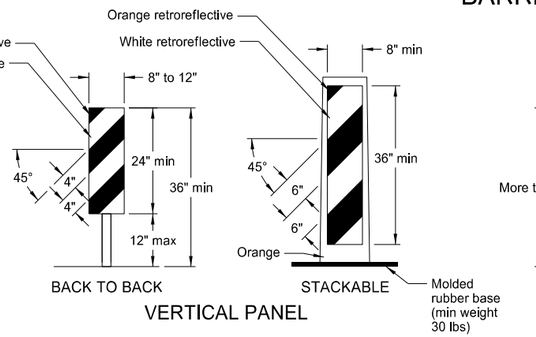
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



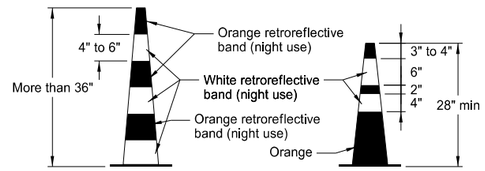
DELINEATOR DRUM

Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflectorized spaces between the horizontal orange and white stripes. Avoid placement of stripes on drum ribs or indentations. Use closed top drums that will not allow collection of debris. Do not place ballast on the top of drum.



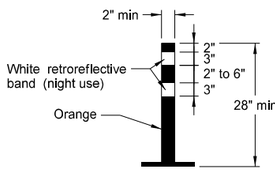
VERTICAL PANEL

Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective material on the vertical panel is 36 inches or more, use a stripe width of 6 inches.



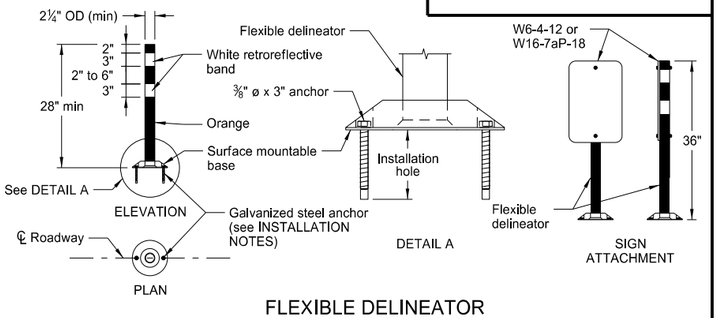
TRAFFIC CONE

Provide retroreflectorization of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflectorized space between the orange and white stripes.



TUBULAR MARKER

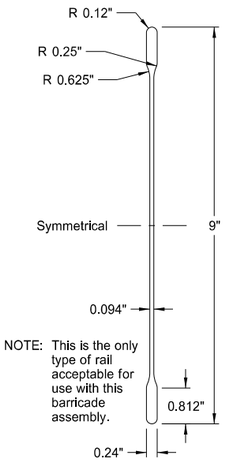
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



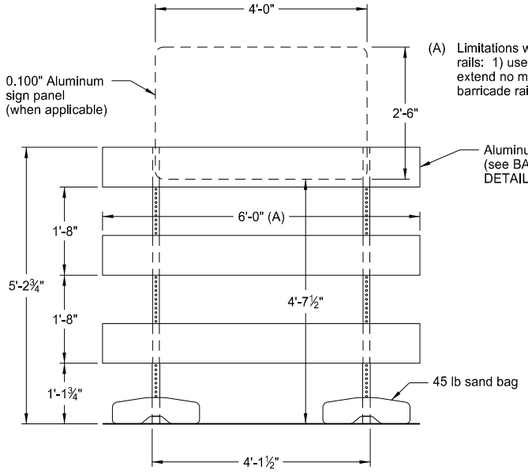
FLEXIBLE DELINEATOR

INSTALLATION NOTES:

1. Drill installation holes to diameter and depth required by manufacturer's specifications.
2. For removal, remove anchors and fill installation hole with an epoxy designed to bond to pavement surface.
3. In lieu of bolted down base, use an 8" x 8" butyl pad or hot melt butyl. Remove butyl as close as possible to pavement surface.

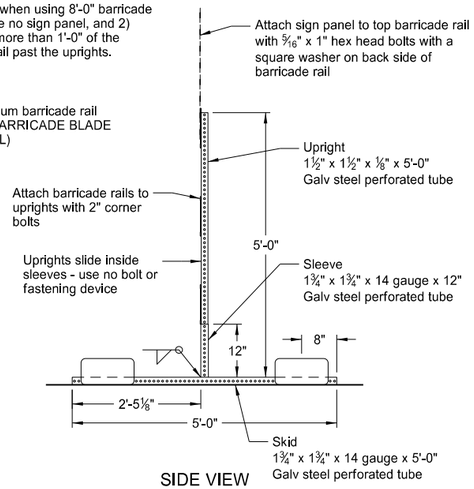


BARRICADE BLADE DETAIL



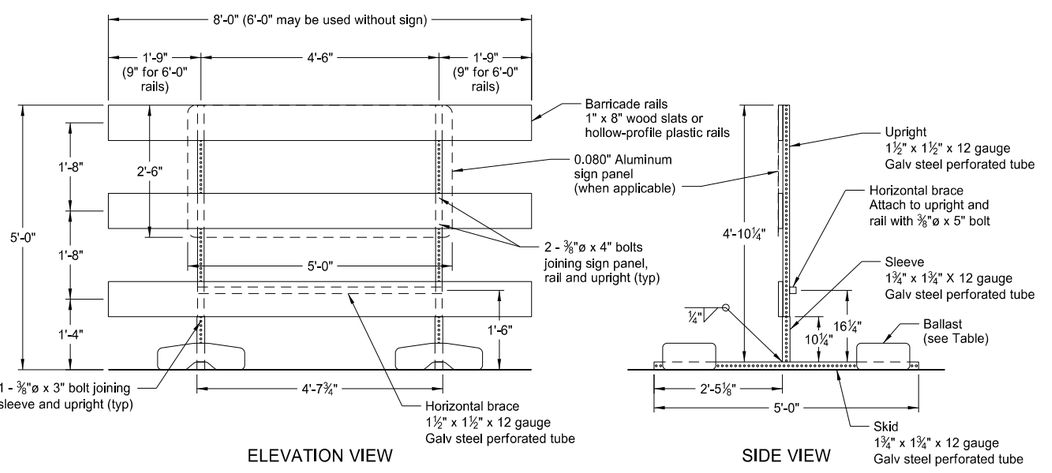
ELEVATION VIEW

(A) Limitations when using 8'-0" barricade rails: 1) use no sign panel, and 2) extend no more than 1'-0" of the barricade rail past the uprights.



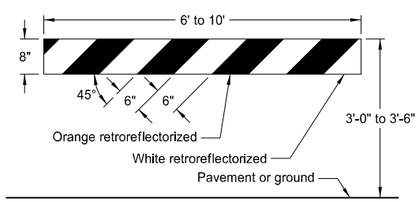
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

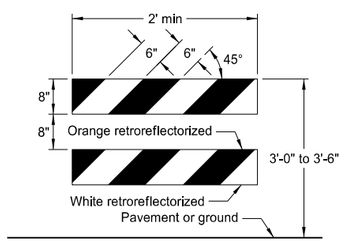


BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

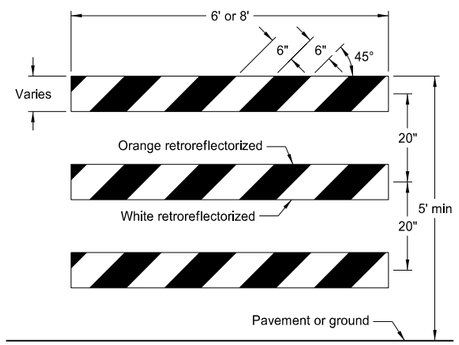
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the barricade length is less than 36", use a rail stripe width of 4".



TYPE I BARRICADE

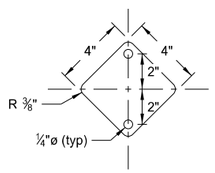


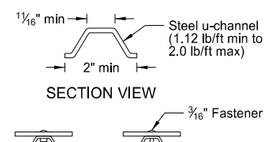
TYPE II BARRICADE

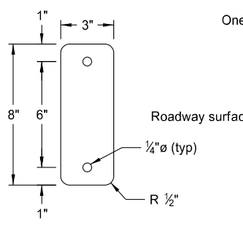


TYPE III BARRICADE

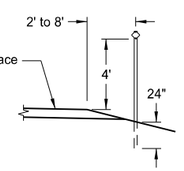
BARRICADE RAIL DETAILS







REFLECTOR DETAIL



ELEVATION

DELINEATORS

MINIMUM BALLAST
(For each side of barricade support)

Without Sign	4 - 25 lb sandbags
With Sign	6 - 25 lb sandbags

Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17 11-01-19	Updated to active voice Revised details for Flexible Delineator

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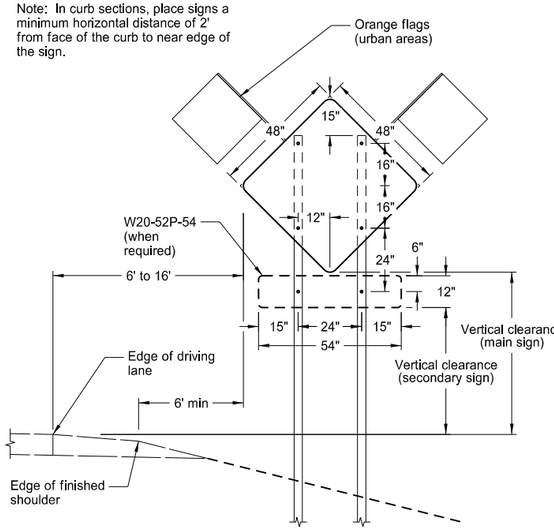
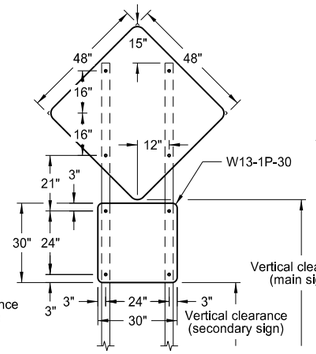
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

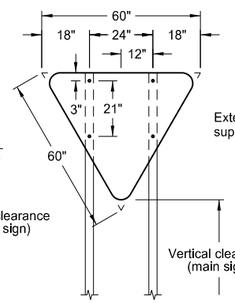
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



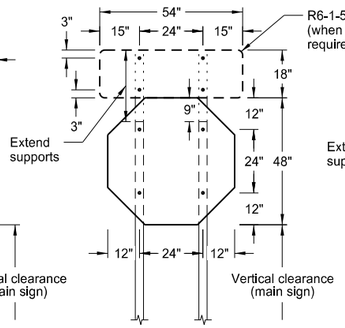
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



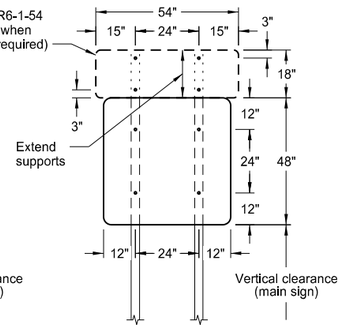
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



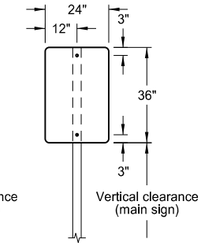
R1-2-60 - YIELD SIGN



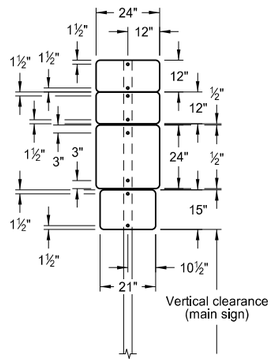
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



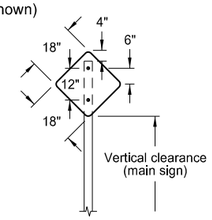
48" x 48" SIGN
(with R6-1-54 sign as required)



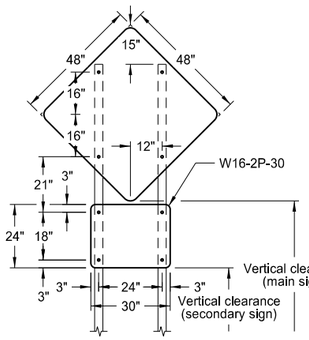
24" x 36" SIGN



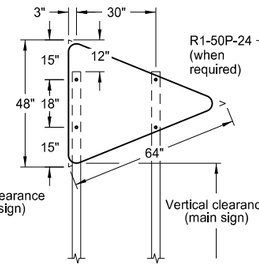
24" x 24"
ROUTE MARKER
ASSEMBLY



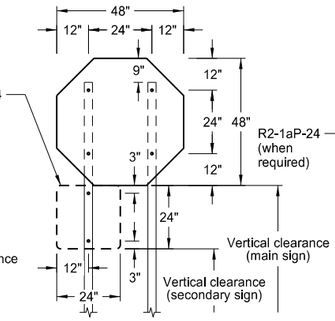
18" x 18"
DIAMOND SIGN



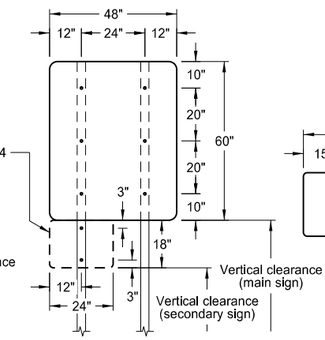
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



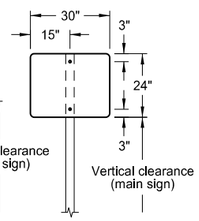
W14-3-64 - PENNANT SIGN



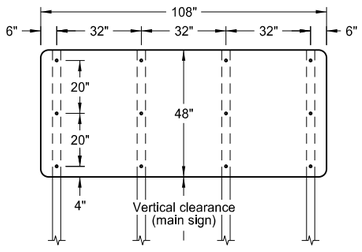
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



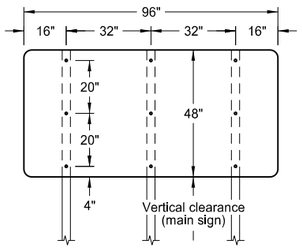
48" x 48" SIGN
(with R2-1aP-24 sign as required)



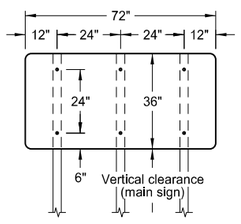
30" x 24" SIGN



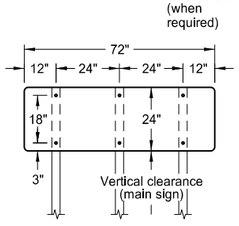
108" x 48" SIGN



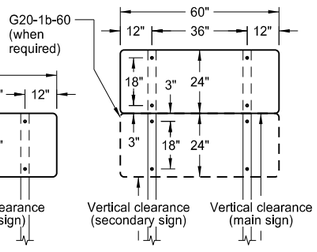
96" x 48" SIGN



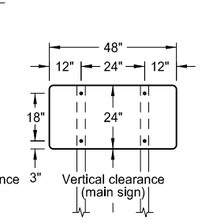
72" x 36" SIGN



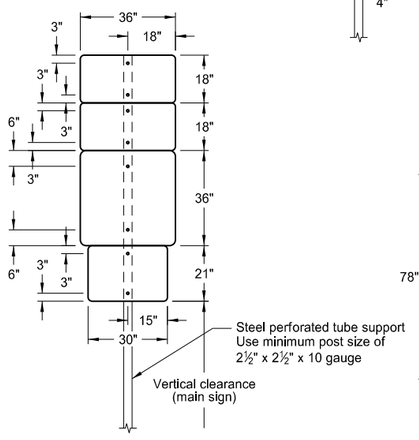
72" x 24" SIGN



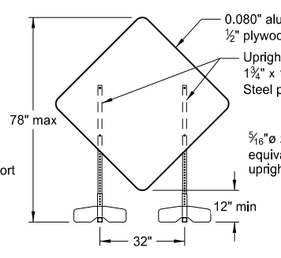
60" x 24" SIGN



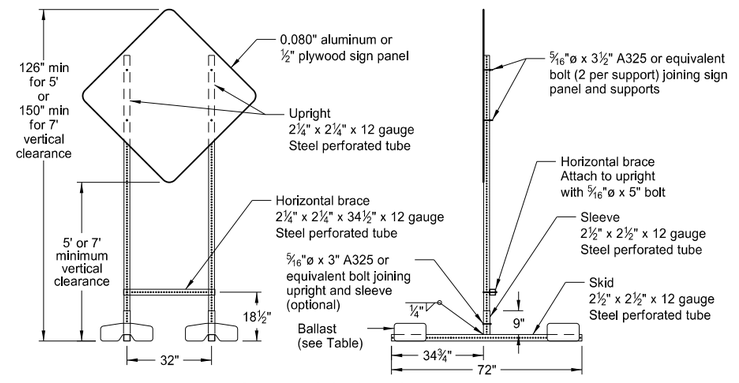
48" x 24" SIGN



36" x 36"
ROUTE MARKER
ASSEMBLY



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

1. Sign Supports: Galvanize or paint supports. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH.

   Place signs over 50 square feet on 2½" x 2½" perforated tube supports as a minimum.

   Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.

2. Sign Panels: Provide sign panels made of 0.100" aluminum, ½" plywood, or other approved material, except where noted. Punch all holes round for ⅜" bolts.

3. Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on lane closure sign)

4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

   Interstate - white legend on blue background
   Interstate Business Loop - white legend on green background
   US and State - black legend on white background
   County - yellow legend on blue background

5. Vertical Clearance: Install signs with a vertical clearance of 5'-0" (see TYPICAL SECTION.) In areas where parking or pedestrian movements are likely or the view of the sign may be obstructed, install signs with a vertical clearance of 7'-0" from the top of the curb or from the near edge of the driving lane in absence of a curb.

   The vertical clearance to secondary signs is 1'-0" less than the vertical clearance stated above.

   Provide a minimum clearance of 7'-0" from the ground at the post for signs with an area exceeding 50 square feet.

6. Portable Signs: Provide portable signs that meet the vertical clearance stated above when it is necessary to place signs within the pavement surface.

   Use of low-mounting height (minimum 12" vertical clearance) portable signs for 5 days or less, is allowed as long as the view of the sign is not obstructed. Time delays caused by unforseen circumstances, such as equipment breakdown, rain, subgrade failures, etc., will not accrue towards the 5 day period. Use of R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 is allowed for longer than 5 days.

   Restrict signs mounted on portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT details to a maximum surface area of 16 square feet.

MINIMUM BALLAST
(For each side of sign support base)

Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

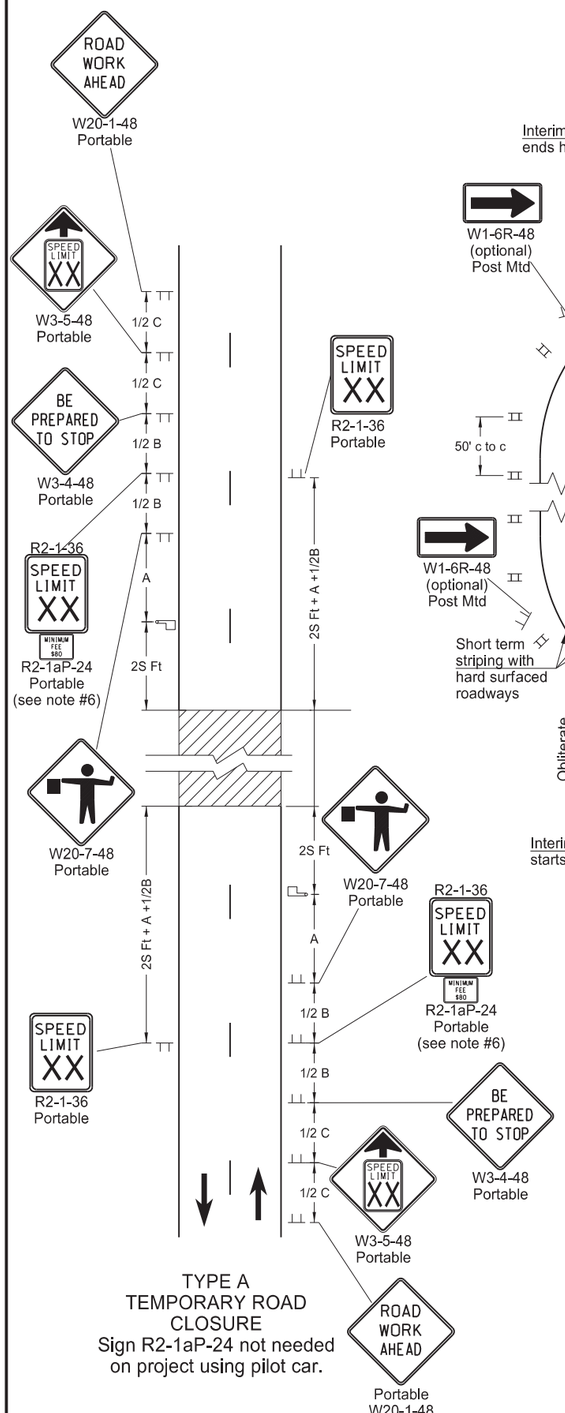
Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of skids.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
REVISIONS	
DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail

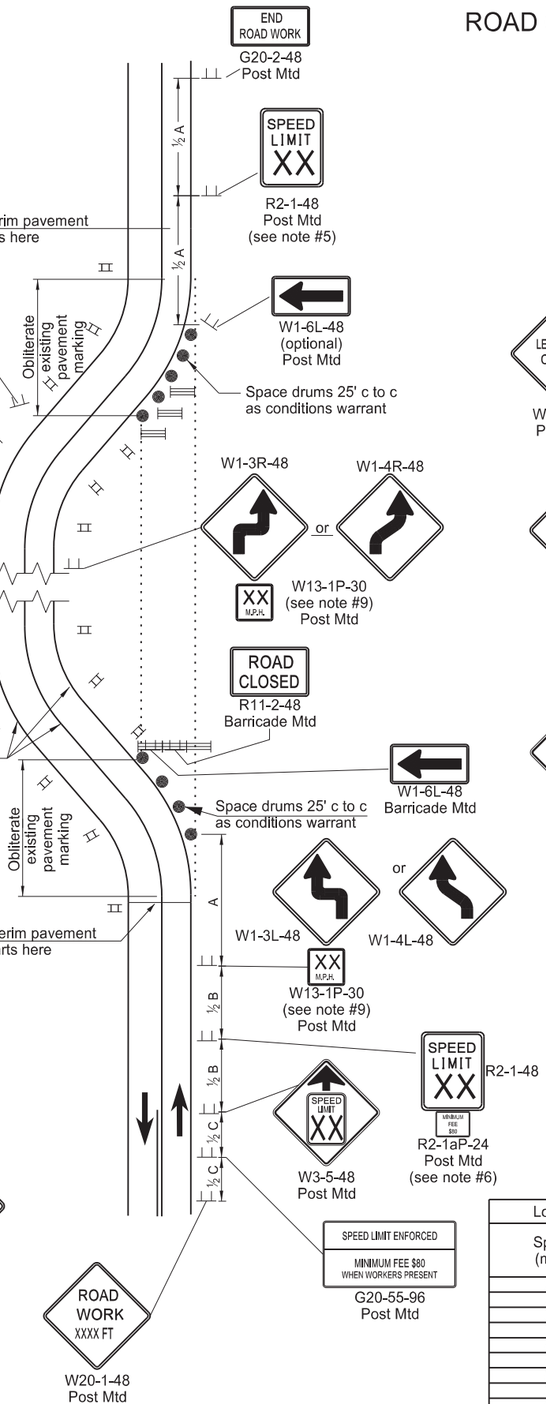
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

ROAD CLOSURE LAYOUTS

D-704-15



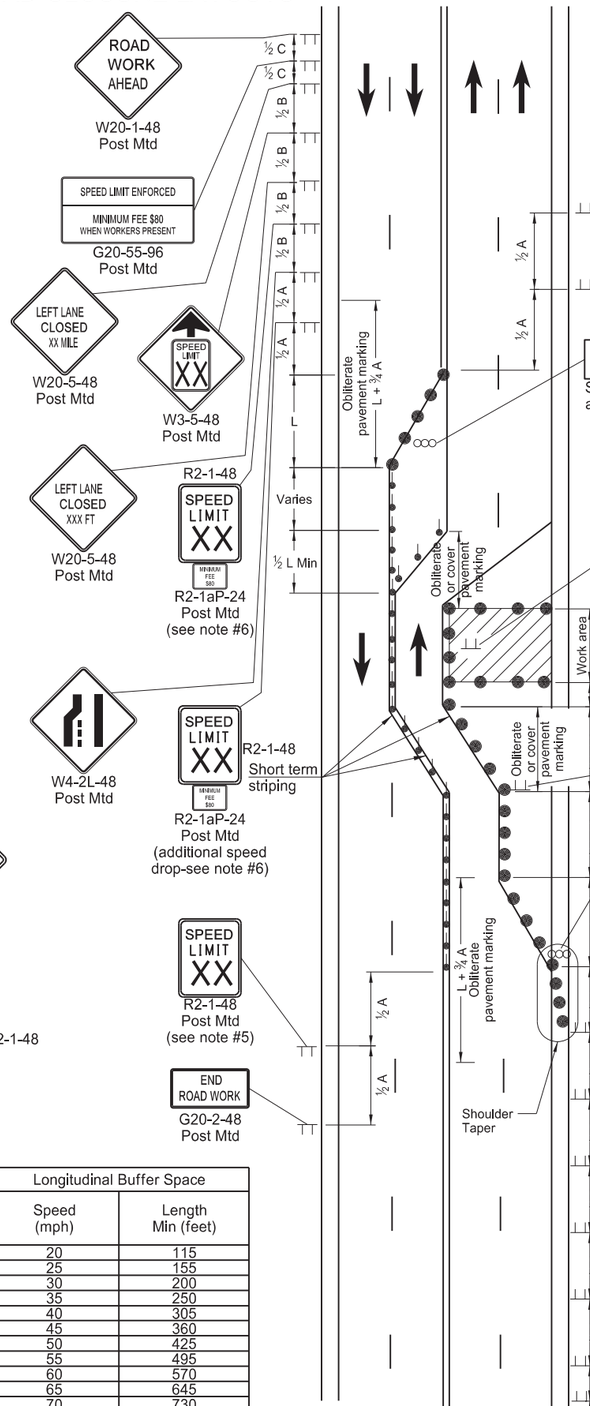
TYPE A
TEMPORARY ROAD CLOSURE
Sign R2-1aP-24 not needed on project using pilot car.

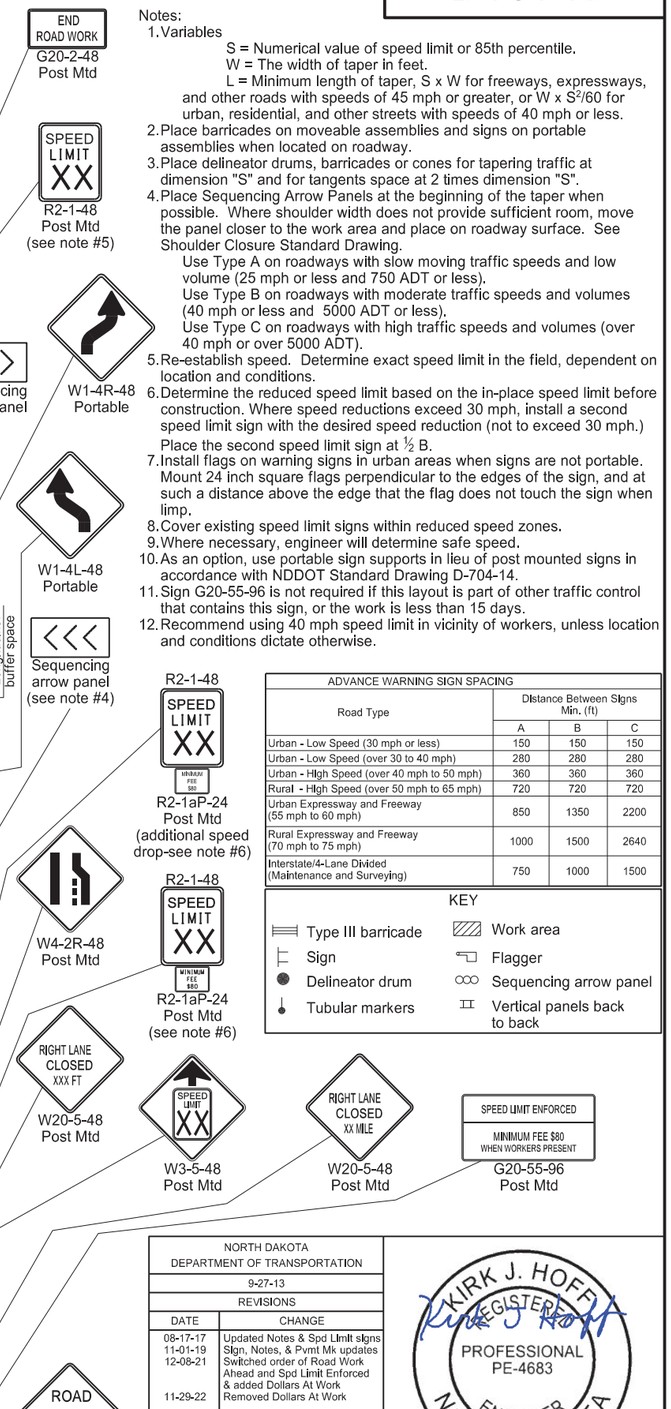


TYPE B
ROAD CLOSURE WITH A DIVERSION

Two lane highway where roadway is closed and detour provided (signing shown for one direction only). Use on bridge and culvert installation with ½ mile or less closure.

Longitudinal Buffer Space	
Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820





TYPE C
HALF ROAD CLOSURE ON A MULTI-LANE, HIGH SPEED HIGHWAY

4 lane undivided highway with half the roadway closed.

Notes:

1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper in feet.
   L = Minimum length of taper, S x W for freeways, expressways, and other roads with speeds of 45 mph or greater, or W x $S^2/60$ for urban, residential, and other streets with speeds of 40 mph or less.
2. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
3. Place delineator drums, barricades or cones for tapering traffic at dimension "S" and for tangents space at 2 times dimension "S".
4. Place Sequencing Arrow Panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on roadway surface. See Shoulder Closure Standard Drawing.
   Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
   Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
5. Re-establish speed. Determine exact speed limit in the field, dependent on location and conditions.
6. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B.
7. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
8. Cover existing speed limit signs within reduced speed zones.
9. Where necessary, engineer will determine safe speed.
10. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
11. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

- Type III barricade
- Sign
- Delineator drum
- Tubular markers
- Work area
- Flagger
- Sequencing arrow panel
- Vertical panels back to back

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pvmt Mk updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work

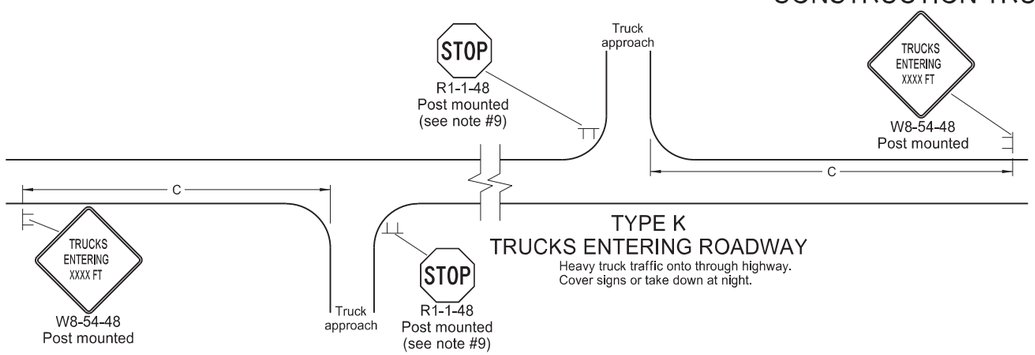
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

11/29/22

CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

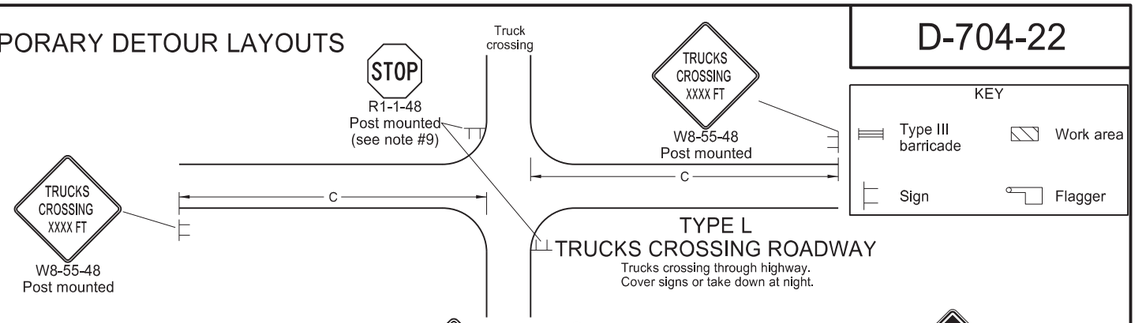
D-704-22

KEY
- Type III barricade
- Work area
- Sign
- Flagger



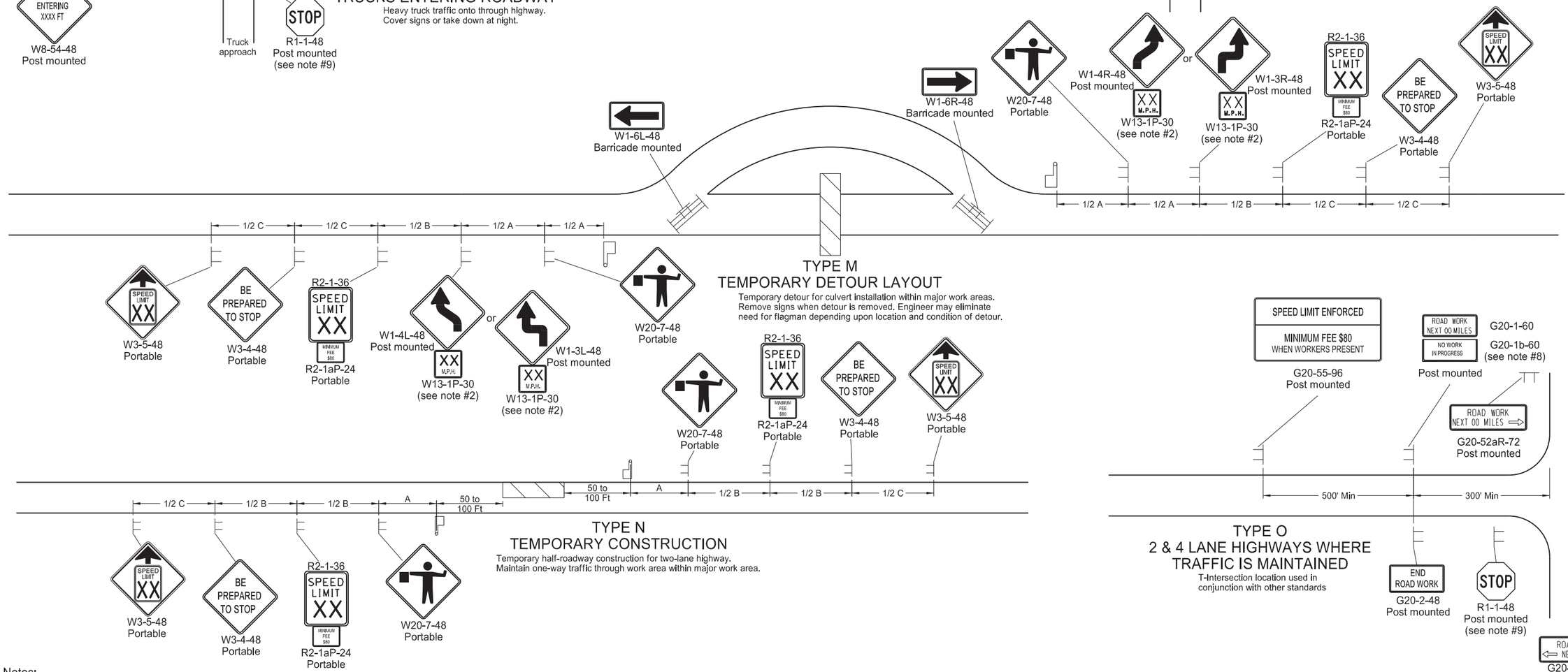
TYPE K
TRUCKS ENTERING ROADWAY

Heavy truck traffic onto through highway.
Cover signs or take down at night.



TYPE L
TRUCKS CROSSING ROADWAY

Trucks crossing through highway.
Cover signs or take down at night.



TYPE M
TEMPORARY DETOUR LAYOUT

Temporary detour for culvert installation within major work areas.
Remove signs when detour is removed. Engineer may eliminate need for flagman depending upon location and condition of detour.

TYPE N
TEMPORARY CONSTRUCTION

Temporary half-roadway construction for two-lane highway.
Maintain one-way traffic through work area within major work areas.

TYPE O
2 & 4 LANE HIGHWAYS WHERE TRAFFIC IS MAINTAINED

T-Intersection location used in conjunction with other standards

Notes:

1. Place barricades on a moveable assemblies and signs on portable assemblies when located on roadway.
2. Where necessary, safe speed to be determined by the Engineer.
3. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½ B.
4. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
5. Cover existing speed limit signs within a reduced speed zone.
6. Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
7. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
8. Install sign G20-1b-60 when work is suspended for winter.
9. If existing stop sign is in place, a 48" stop sign is not required.
10. Sign G20-55-96 is not required if layout is part of other traffic control that contains this sign, or if work is less than 15 days.
11. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

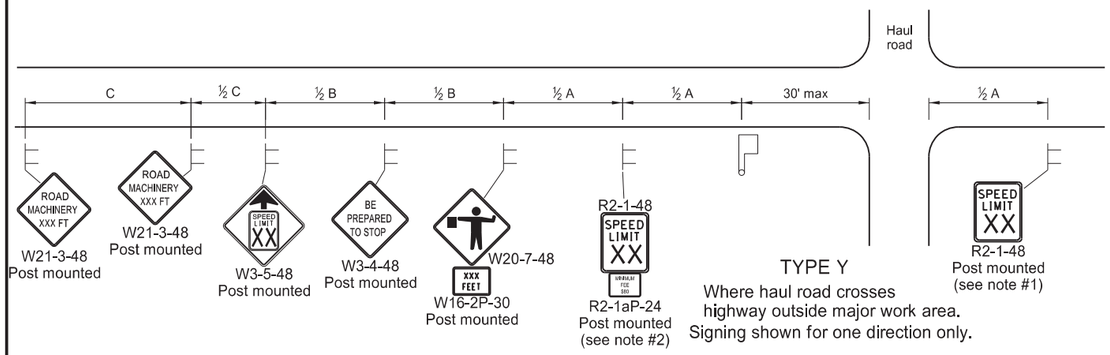
DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

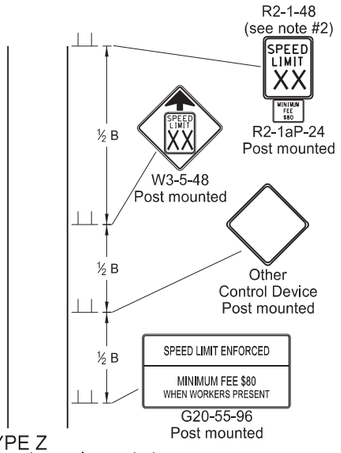
11/29/22

MISCELLANEOUS SIGN LAYOUTS

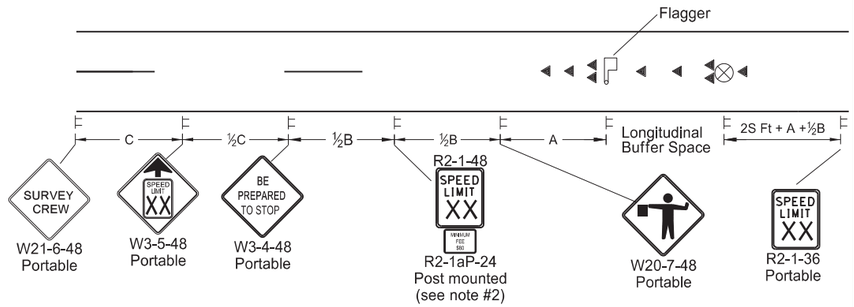
D-704-26



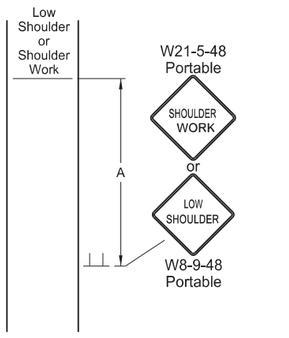
TYPE Y
Where haul road crosses highway outside major work area.
Signing shown for one direction only.



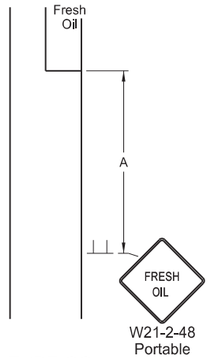
TYPE Z
Where speed zone is needed
Signing shown for one direction only.



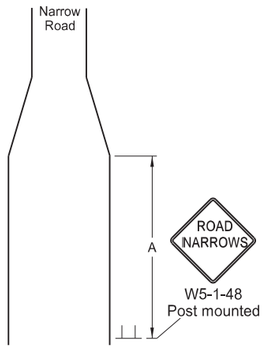
TYPE AA
Where survey crew is used
Signing shown for one direction only.



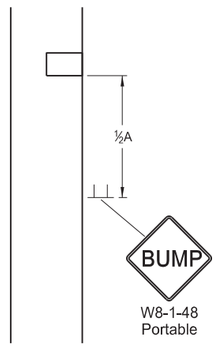
TYPE BB
Within major work area where sign conditions exist



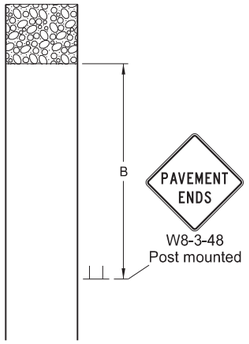
TYPE CC
Where sign conditions exist



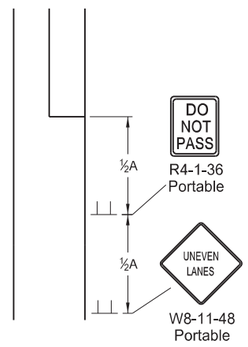
TYPE DD
Where sign conditions exist



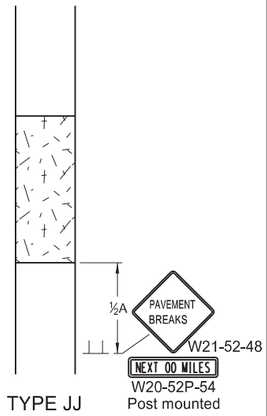
TYPE EE
Where sign conditions exist



TYPE FF
Where sign conditions exist
Signing shown for one direction only.



TYPE GG
Where elevation difference exists between lanes

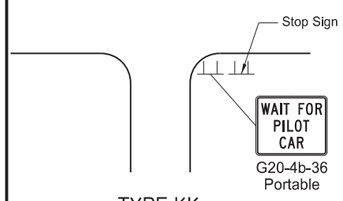


TYPE JJ
For break in pavement.
Install signs when conditions exist and remove when not applicable.
Signing shown for one direction only.

KEY

Flagger	Sign
Cones	Survey Equipment

S = Numerical value of speed limit or 85th percentile.



TYPE KK
At major intersections within pilot car control area

Notes
1. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
2. Determine reduced speed limit based on in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½B.
3. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
4. Cover existing speed limit signs within reduced speed zones.
5. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
6. Sign G20-55-96 is not required if this standard is part of other traffic control layouts, or work is less than 15 days.
7. When pilot car operation is used, place sign G20-4b-36 "Wait For Pilot Car" at major intersections within pilot car control area.
8. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
9. Layouts shown for one direction only.

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft) A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

Longitudinal Buffer Space

*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

* Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

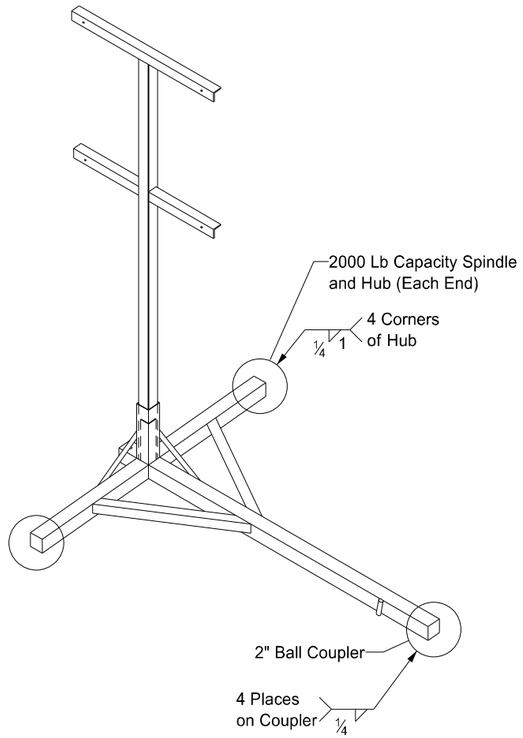
DATE	CHANGE
8-17-17	Added speed limit signs. Updated notes & sign numbers.
11-01-19	Revised note 5 & sign numbers.
2-23-23	Revised distance & removed signs.

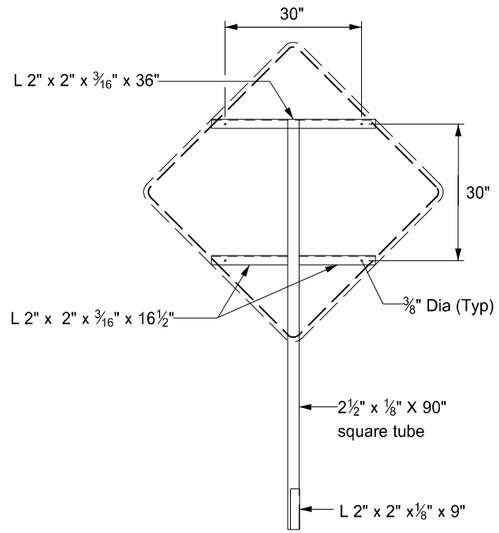
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

02/23/23

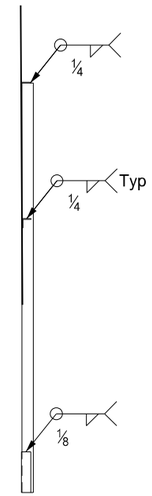
PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50





FRONT

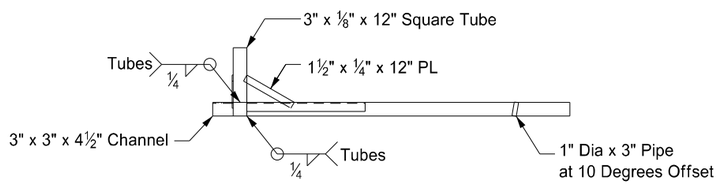


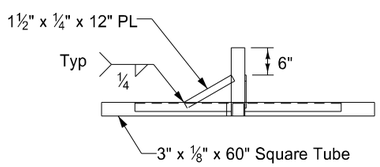
RIGHT

SIGN SUPPORT

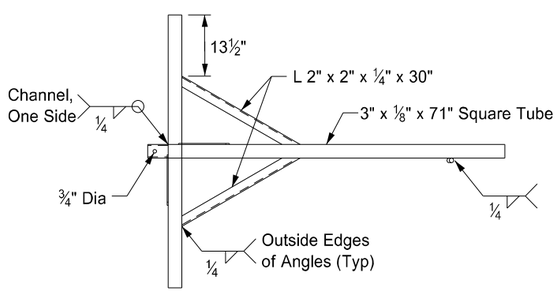
Notes:

1. Maximum 250 pound weight of assembly.
2. Use a 14" wheel and tire.
3. Use no automotive and equipment axle assemblies for trailer-mounted sign supports.
4. Other NCHRP 350 or MASH crash tested assemblies are acceptable.





RIGHT



TOP

TRAILER

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE
12/02/2020	Updated Note to active voice.

KIRK J. HOFF
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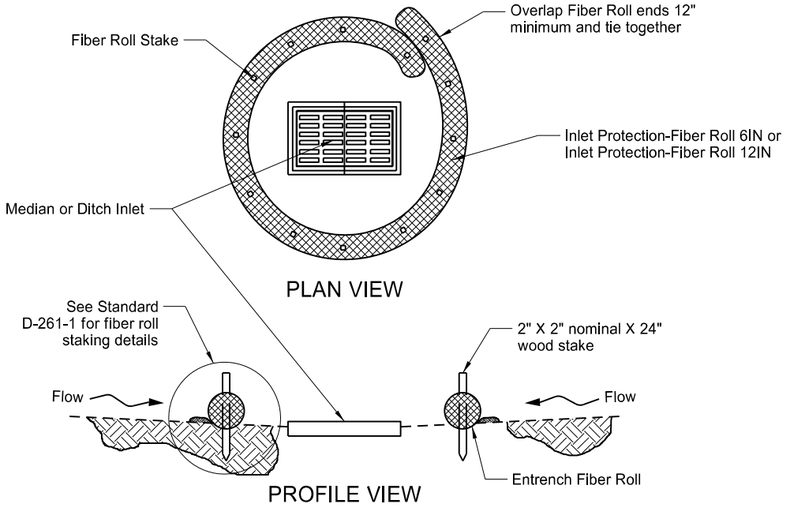
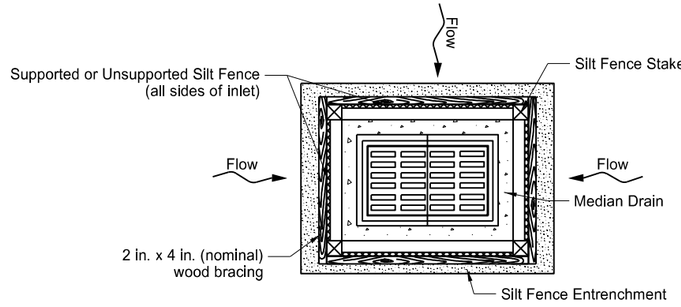
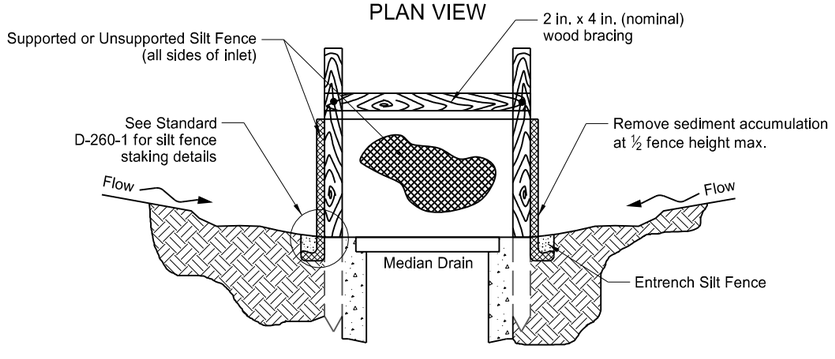
NORTH DAKOTA
Kirk J Hoff
12 02 2020

EROSION AND SILTATION CONTROLS
MEDIAN OR DITCH INLET PROTECTION

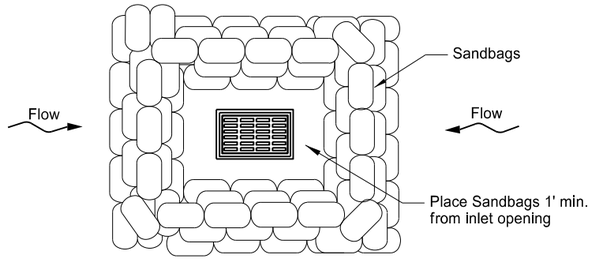


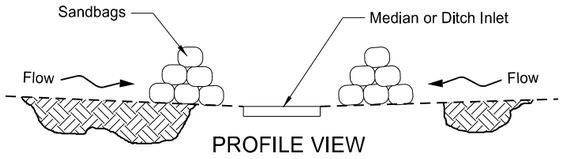
FIBER ROLL PROTECTION (MEDIAN OR DITCH INLET)



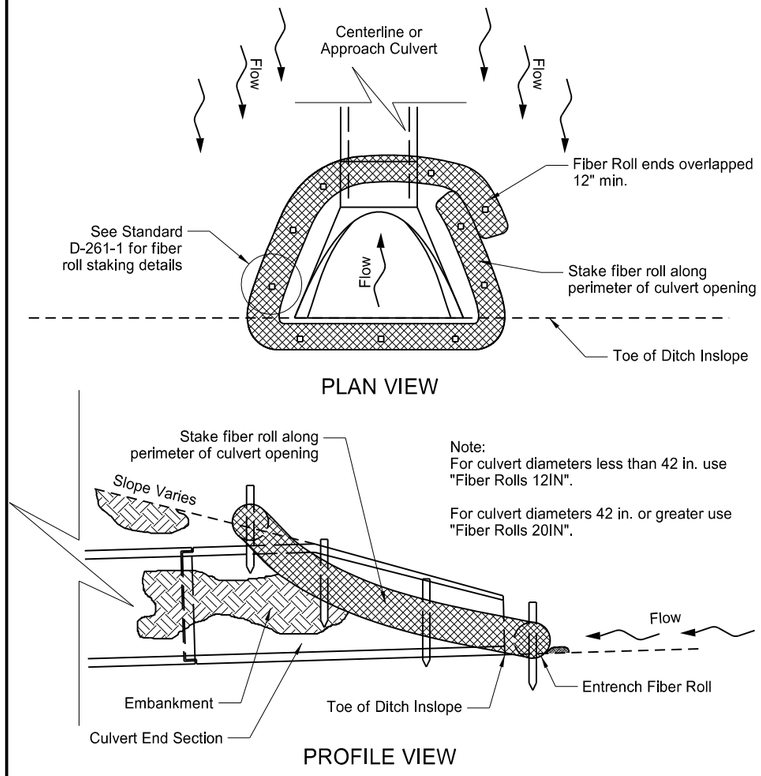


SILT FENCE PROTECTION (MEDIAN OR DITCH INLET)

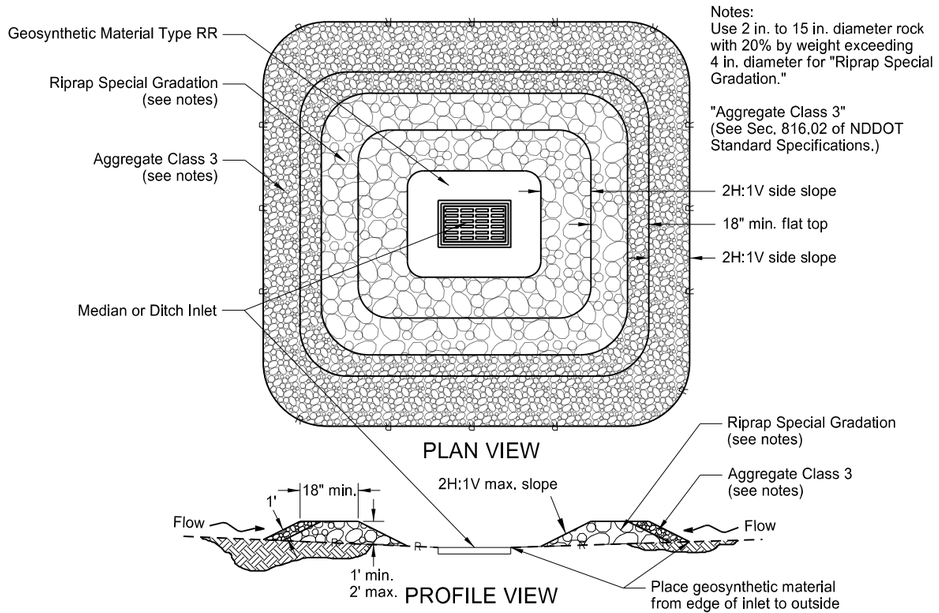




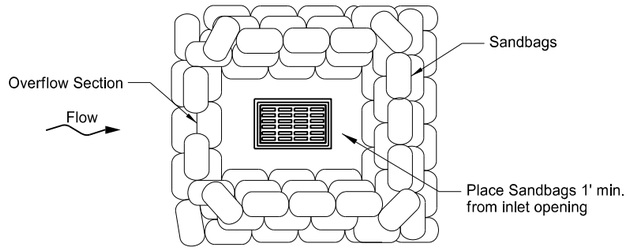
SANDBAG PROTECTION (LOW POINT)

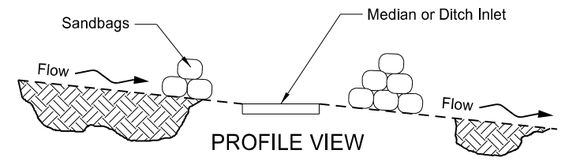


FIBER ROLL PROTECTION (INLET OF CULVERT)



GRAVEL INLET PROTECTION (MEDIAN OR DITCH INLET)





SANDBAG PROTECTION (ON SLOPE)

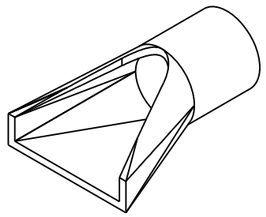
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Updated reference to standard drawing number for fiber roll staking details.
10-01-14	Updated reference to standard drawing number for silt fence.
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8-27-19 and the original document is stored at the North Dakota Department of Transportation

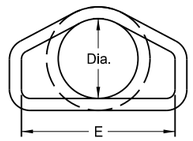
REINFORCED CONCRETE PIPE CULVERTS AND END SECTIONS
(Round Pipe)

D-714-1

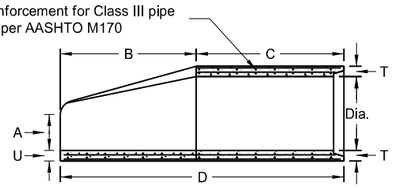
FLARED END SECTION						
TERMINAL DIMENSIONS						
DIA	A	B	C	D	E	U
12	0'-4"	2'-0"	4'-0⅞"	6'-0⅞"	2'-0"	2"
15	0'-6"	2'-3"	3'-10"	6'-1"	2'-6"	2¼"
18	0'-9"	2'-3"	3'-10"	6'-1"	3'-0"	2½"
21	0'-9"	3'-0"	3'-1"	6'-1"	3'-6"	2¾"
24	0'-9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3"
27	0'-10½"	4'-0"	2'-1½"	6'-1½"	4'-6"	3¼"
30	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3½"
36	1'-3"	5'-3"	2'-9"	8'-0"	6'-0"	4"
42	1'-9"	5'-3"	2'-9"	8'-0"	6'-6"	4½"
48	2'-0"	6'-0"	2'-0"	8'-0"	7'-0"	5"
54	2'-3"	5'-5"	2'-9¼"	8'-2¼"	7'-6"	5½"
60	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"
66	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5½"
72	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"
78	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6½"
84	3'-0"	7'-6½"	1'-9"	9'-3½"	10'-0"	6½"
90	3'-5"	7'-3½"	2'-0"	9'-3½"	11'-0"	6½"



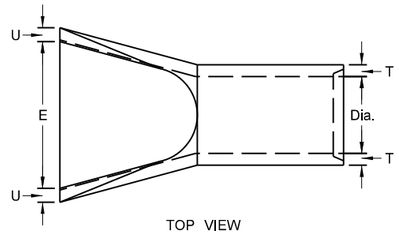
PERSPECTIVE



END VIEW



SIDE VIEW



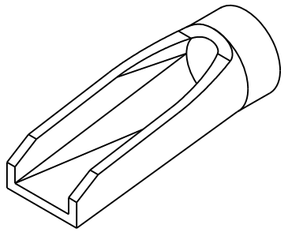
TOP VIEW

REINFORCED CONCRETE PIPE - FLARED END SECTION
Reinforcement to be equivalent to Class III RCP

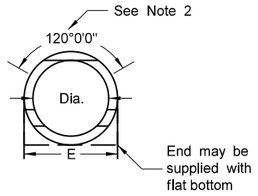
NOTES:

1. All reinforcing steel shall meet AASHTO M170 requirements.
2. All circular, longitudinal, and elliptical reinforcement shall be assembled and securely fastened in cage fashion so as to maintain reinforcement in exact shape and correct positions within the forms.
3. Laying length of pipe: 12" to 66" (incl.) = not less than 4 feet
   66" to 108" (incl.) = not less than 6 feet
4. Joints shall be sealed with rubber gaskets or with sealer approved by the engineer whenever pipe are specified for storm drain or sanitary sewers.
5. For Class IV and Class V reinforced concrete pipe and end section sizes which do not have reinforcement specified by AASHTO M170, shop drawings and design calculations shall be prepared and sealed by a Professional Engineer and submitted for the Engineer's review.

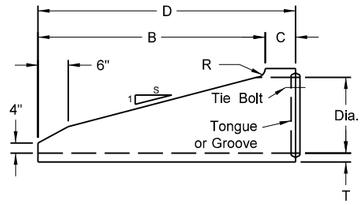
TRAVERSABLE END SECTION						
DIA	B	C	D	E	R	S
15"	4'	9"	4'-9"	1'-7½"	3"	6
18"	5'-9"	9"	6'-6"	1'-11"	3"	6
24"	6'	1'	7'	2'-6"	3"	4
30"	7'-6"	1'	8'-6"	3'-1"	3½"	4
36"	7'-3"	15"	8'-6"	3'-8"	3"	4



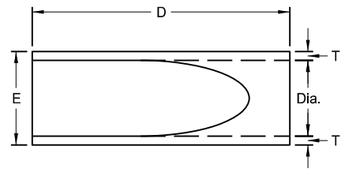
PERSPECTIVE



END VIEW



SIDE VIEW



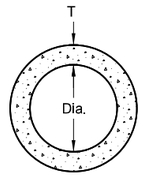
TOP VIEW

REINFORCED CONCRETE PIPE - TRAVERSABLE END SECTION
Reinforcement to be equivalent to Class III RCP

NOTES (Traversable End Section):

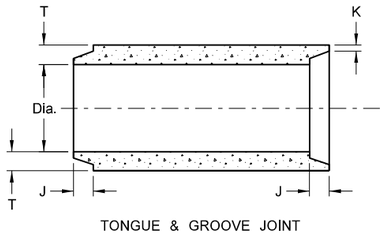
1. Manufactured in accordance with applicable portions of ASTM C76/AASHTO M170.
2. Reinforcement per Class III RCP with double reinforcement in the upper 120° of the full barrel portion.

All Classifications of Round Concrete Pipe					
Internal Dia. of pipe in inches	Cross-Sectional Water Area	Weight per lin. foot of Pipe Std. Wall	Joint J Groove End Min./Max.	Joint K Tongue End Min.	Minimum Wall Thickness (T)
Dia	Sq. ft.	Lbs.	In.	In.	In.
12	0.79	92	1⅛-2⅛	¾	2
15	1.23	127	1⅛-2¼	⅞	2¼
18	1.77	168	1⅛-2⅛	1	2½
21	2.40	214	1⅛-3⅛	1⅛	2¾
24	3.14	265	2¼-3¼	1⅛	3
27	3.98	322	2¼-4	1¼	3¼
30	4.91	384	3¼-4¼	1¼	3½
33	5.94	452	3¼-4¼	1½	3¾
36	7.07	524	3¼-4¼	1½	4
42	9.62	685	3¾-4¾	1¾	4½
48	12.57	685	3⅞-4¾	1⅞	5
54	15.90	1070	4⅛-5¼	2	5½
60	19.63	1296	4½-5½	2¼	6
66	23.76	1542	5-6	2⅝	6½
72	28.27	1810	5⅛-6¾	2⅞	7
78	33.18	2098	6¼-7¼	2⅞	7½
84	38.48	2410	5⅛-7¾	3⅜	8
90	44.18	2793	6¾-8½	3⅛	8½
96	50.27	3092	7-8¼	3½	9
102	56.75	3466	7-8¼	3½	9½
108	63.62	3864	7¼-8½	3¾	10

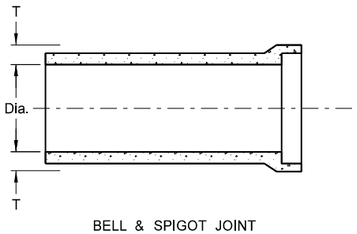


END VIEW

CIRCULAR PIPE

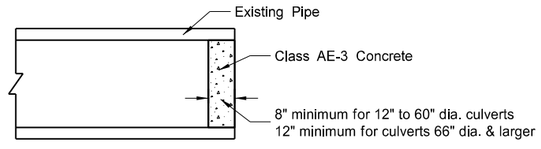


TONGUE & GROOVE JOINT



BELL & SPIGOT JOINT

JOINTS FOR REINFORCED CONCRETE PIPE



CONCRETE PIPE PLUG

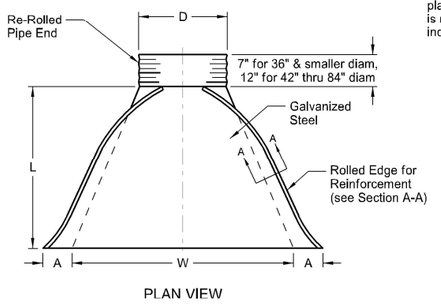
SEE STANDARD DRAWING D-714-22 FOR DETAILS OF CONCRETE PIPE TIES (TIE BOLTS).

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-12-14	
REVISIONS	
DATE	CHANGE
01-21-15	Revised Note 5
11-21-16	Revised End Section Dimensions
09-18-19	Updated Perspective View Details

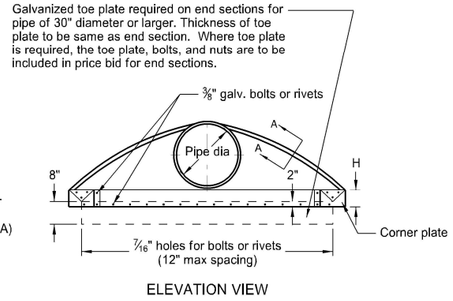
This document was originally issued and sealed by Jon Ketterling Registration Number PE-4684, on 9/18/19 and the original document is stored at the North Dakota Department of Transportation

ROUND CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS

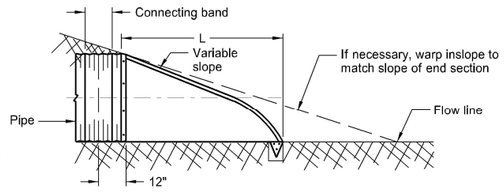
D-714-4



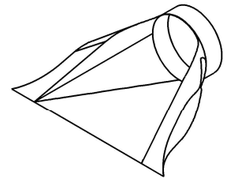
PLAN VIEW



ELEVATION VIEW



TYPICAL CROSS SECTION
(showing connector section)



PERSPECTIVE VIEW

** PIPE DIA.	GALVANIZED THICKNESS	END SECTION DIMENSIONS					APPROX. SLOPE	BODY
		A	B	H	L	W		
IN	IN	IN	IN	IN	IN	IN	RATE	PIECE
15	0.064 - 0.079	7	8	6	26	30	2½:1	1
18	0.064 - 0.109	8	10	6	31	36	2½:1	1
24	0.064 - 0.109	10	13	6	41	48	2½:1	1
30	0.064 - 0.109	12	16	8	51	60	2½:1	1 or 2
36	0.064 - 0.109	14	19	9	60	72	2½:1	2
42	0.064 - 0.138	16	22	11	69	84	2½:1	2
48	0.064 - 0.168	18	27	12	78	90	2¼:1	2
54	0.064 - 0.168	18	30	12	84	102	2:1	2
*60	0.064 - 0.168	18	33	12	87	114	1¾:1	3
*66	0.064 - 0.168	18	36	12	87	120	1½:1	3
*72	0.064 - 0.168	18	39	12	87	126	1½:1	3
*78	0.064 - 0.168	18	42	12	87	132	1¼:1	3
*84	0.064 - 0.168	18	45	12	87	138	1⅛:1	3

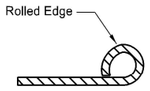
* These sizes have 0.109" sides and 0.138" center panels.

** Pipe diameter is equal to dimension "D" of end section.

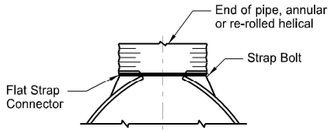
Manufacturers tolerances of above dimensions will be allowed.

Splices to be the lap riveted type.

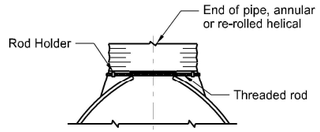
Multiple panel bodies shall have lap seams which are to be tightly joined with ⅜" dia. galv. bolts or rivets. Nuts to be torqued to 25 foot-lbs ±.



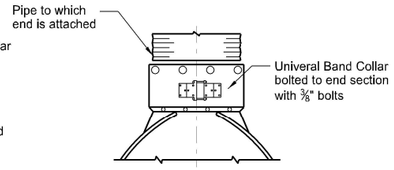
SECTION A-A



TYPE #1
For circular pipes with diameter 24" & smaller



TYPE #2
For circular pipes with diameter 30" through 36"

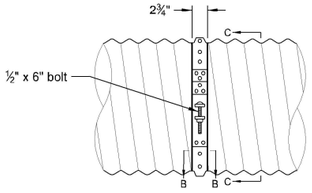


TYPE #3
For all pipe sizes

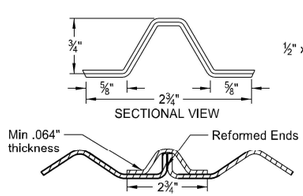
COUPLING BAND DIMENSIONS				
COUPLING TYPE	CORRUGATION PITCH x DEPTH	PIPE SIZE	COUPLING BAND LENGTH	MIN. BAND THICKNESS
Hat Band	2⅔" x ½"	12" - 48"	2¾"	.064"
Annular Band	2⅔" x ½"	12" - 72"	12"	.052"
		78" - 84"	12"	.079"
	3" x 1"	48" - 120"	14"	.052"
Hugger Band	2⅔" x ½" Rerolled End	12" - 72"	10½"	.052"
		78" - 84"	10½"	.079"
	3" x 1" Rerolled End	48" - 120"	10½"	.052"
	5" x 1" Rerolled End	48" - 120"	12"	.064"

NOTES:

1. Pipes and connecting bands shall conform to applicable sections of NDDOT Standard Specifications and to AASHTO M-36.
2. Top edge of all end sections to have rolled edges for reinforcement (see Section A-A). The reinforced edges are to be supplemented with 2" x 2" x ¼" galv. angle for 60" through 72" dia. and 2½" x 2½" x ¼" galv. angle for 78" and 84" dia.. Angles to be attached by galv. ⅜" dia. bolts and nuts. Angles are to extend from pipe to the corner wing bend.
3. Elongated pipes shall be factory preformed so that the vertical diameter shall be 5% greater and the horizontal diameter 5% less than a circular pipe.
4. Coupling bands shall be two-piece for pipes larger than 36" as shown in Section C-C & D-D details. For pipes 36" and smaller, a one-piece band is acceptable.
5. ½" x 8" bolts may be used as a substitute for the ½" x 6" bolts shown in the details.
6. Coupling bands wider than 14" may be used if a minimum of four ½" bolts with maximum spacing of 5½" are used for the connection.
7. Length of spot welds shall be minimum ½".

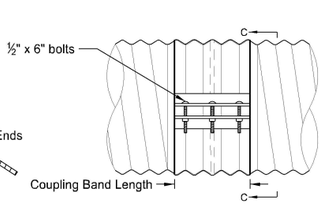


SIDE VIEW

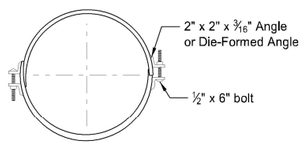


SECTION B-B

HAT BAND FOR FLANGED END PIPE

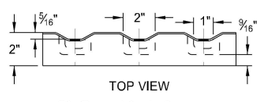


SIDE VIEW

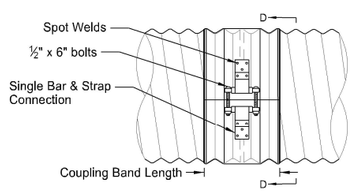


SECTION C-C
Angle Connection

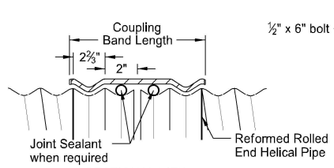
ANNULAR BAND



TOP VIEW
Die-Formed Angle Connector

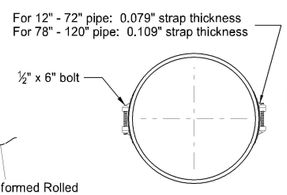


SIDE VIEW

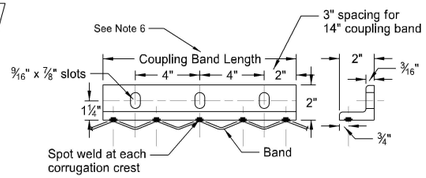


SECTIONAL VIEW

HUGGER COUPLING BAND

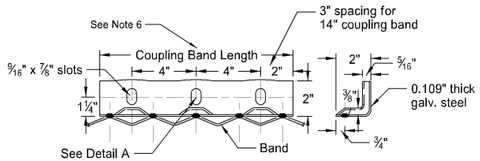


SECTION D-D
Bar & Strap Connection



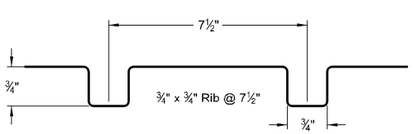
SIDE VIEW END VIEW

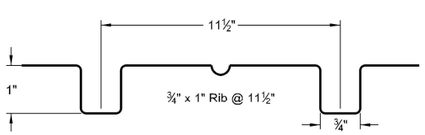
2" x 2" x 3/16" Angle Connector



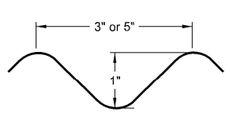
SIDE VIEW END VIEW

Die-Formed Angle Connector

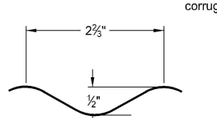




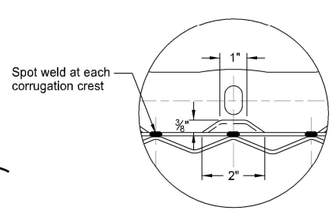
SPIRAL RIB CORRUGATIONS



3" x 1" CORRUGATIONS or
5" x 1" CORRUGATIONS



2⅔" x ½" CORRUGATIONS



Detail A

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
08-16-13	
REVISIONS	
DATE	CHANGE
01-07-14	End Section Plan View
02-27-14	3" x 1" Corrugation Detail
09-18-19	Added Perspective View Detail
09-23-22	Galvanized Thickness Table

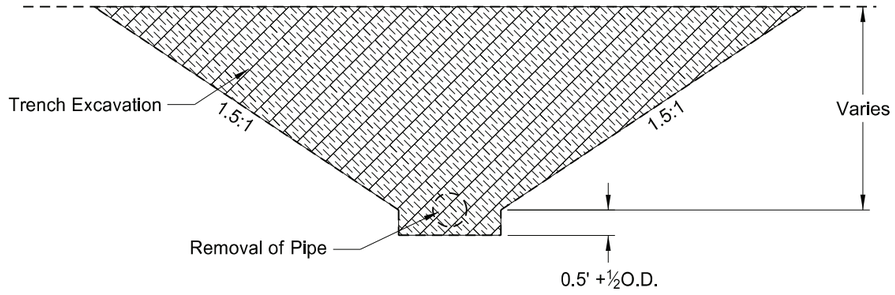
JONATHAN D KETTERLING
REGISTERED
PROFESSIONAL
PE-4684
ENGINEER
NORTH DAKOTA

09/23/22

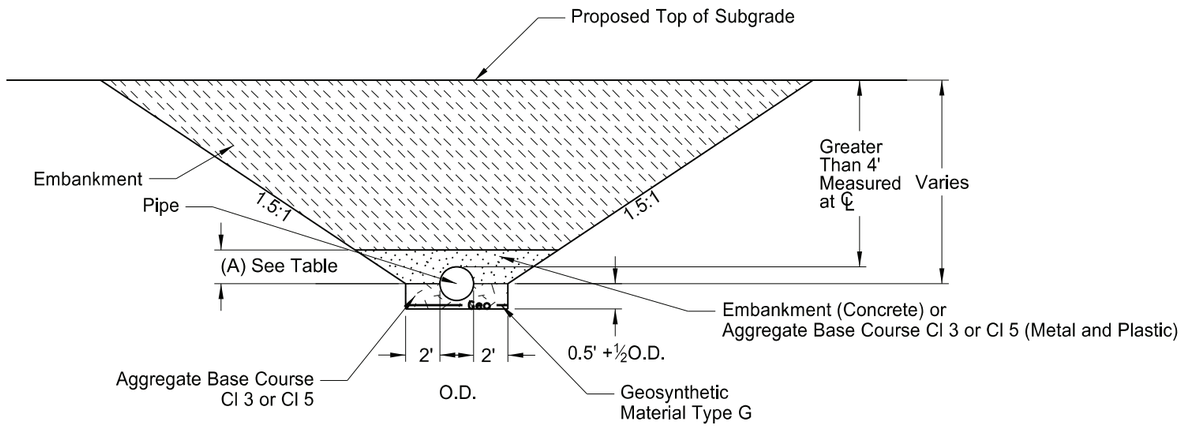
DocuSign

TRANSVERSE MAINLINE PIPE INSTALLATION DETAIL
PIPES MORE THAN 4 FEET BELOW TOP OF SUBGRADE

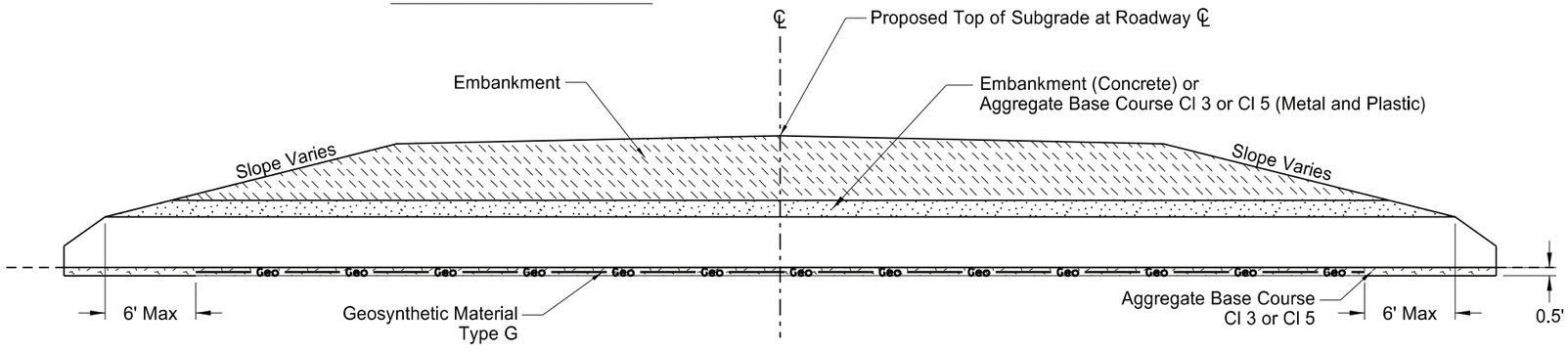
D-714-25



EXCAVATION DETAIL



INSTALLATION DETAIL



CROSS SECTION

Pay Items
1) Pipe*
2) Geosynthetic Material Type G
3) Removal of Pipe (if required)

*Included in Pipe Pay Item
1) Pipe
2) Trench excavation
3) Aggregate Base Course Cl 3 or Cl 5
4) Embankment

NOTES:

1) This drawing applies to new/replaced mainline and paved intersection roadways (including ramps). It does not include pipes in approaches.

2) Embankment may be either Borrow Excavation or Common Excavation - Type A.

Backfill Dimensions	
Pipe Materials	Dimension (A)
Concrete	0.5 O.D.
Metal and Plastic	0.5 O.D. + 1 Foot

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

7-26-13

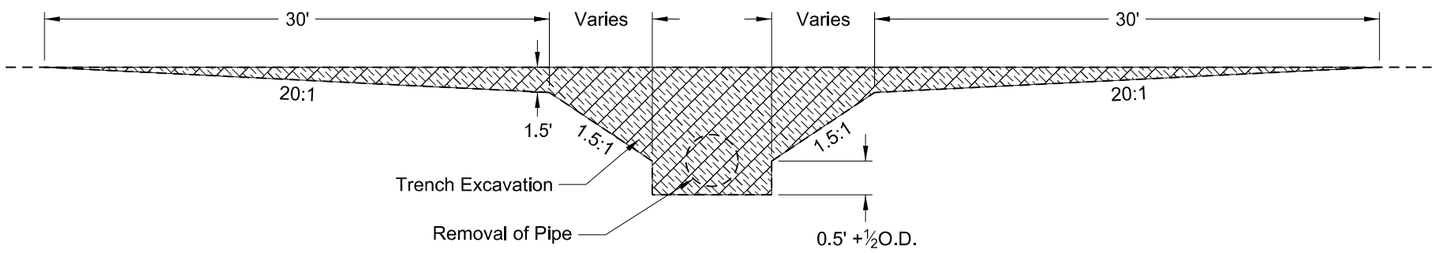
REVISIONS

DATE	CHANGE
10-15-13	Label Formatting
1-21-14	Nomenclature
9-18-15	Title Rewording
12-10-15	Added Plastic Pipe
5-27-20	Replaced R1 Fabric with Geogrid Changed bedding depth

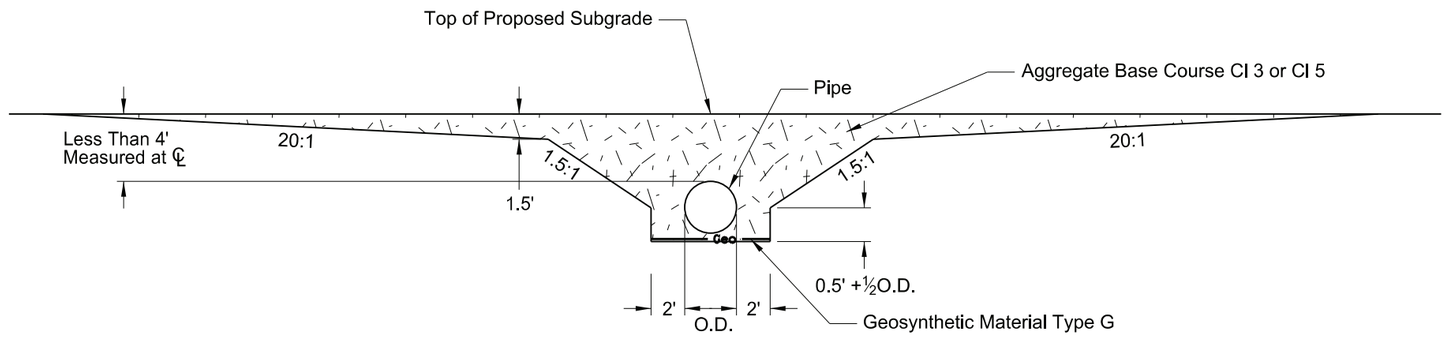
REGISTERED PROFESSIONAL ENGINEER
MATTHEW C KURLE
PE-8777
DATE
05/27/20
NORTH DAKOTA
DocuSign

TRANSVERSE MAINLINE PIPE INSTALLATION DETAIL
PIPES 4 FEET OR LESS BELOW TOP OF SUBGRADE

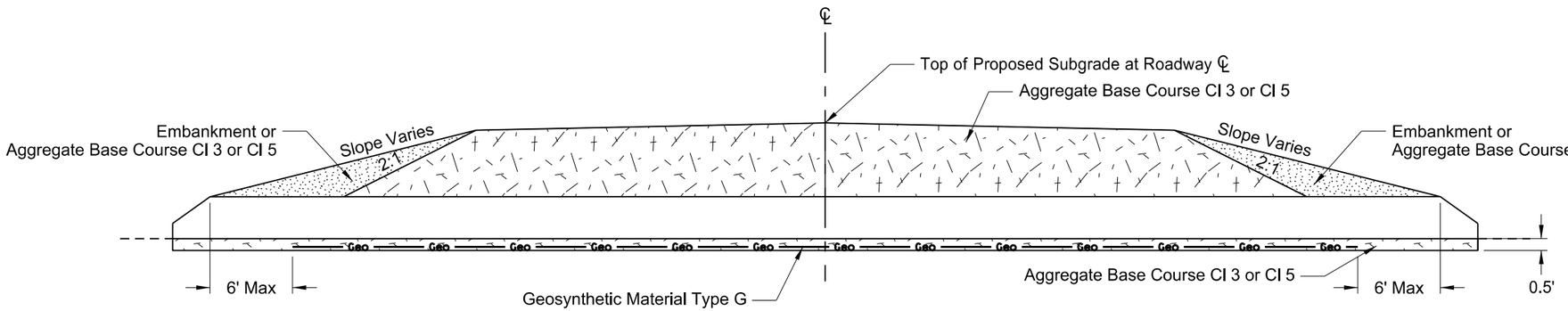
D-714-26



EXCAVATION DETAIL



INSTALLATION DETAIL



CROSS SECTION

Pay Items
1) Pipe*
2) Geosynthetic Material Type G
3) Removal of Pipe (if required)

*Included in Pipe Pay Item
1) Pipe
2) Trench Excavation
3) Aggregate Base Course Cl 3 or Cl 5
4) Embankment

NOTES:

1) This drawing applies to new/replaced mainline and paved intersection roadway pipes only (including ramps). It does not include pipes in approaches.

2) Embankment may be either borrow Excavation or Common Excavation - Type A

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

7-26-13

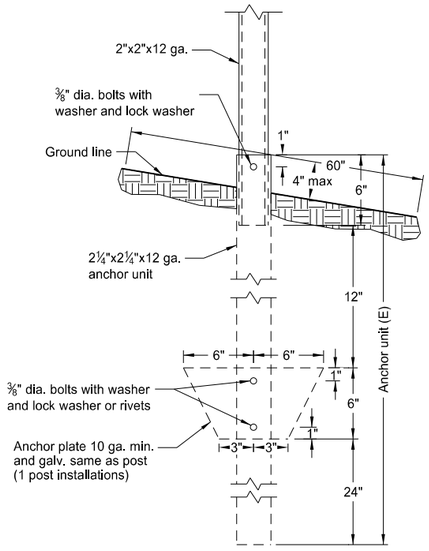
REVISIONS

DATE	CHANGE
10-15-13	Label Formatting
1-21-15	Nomenclature
9-18-15	Title Rewording
5-27-20	Replaced R1 Fabric with Geogrid Changed bedding depth

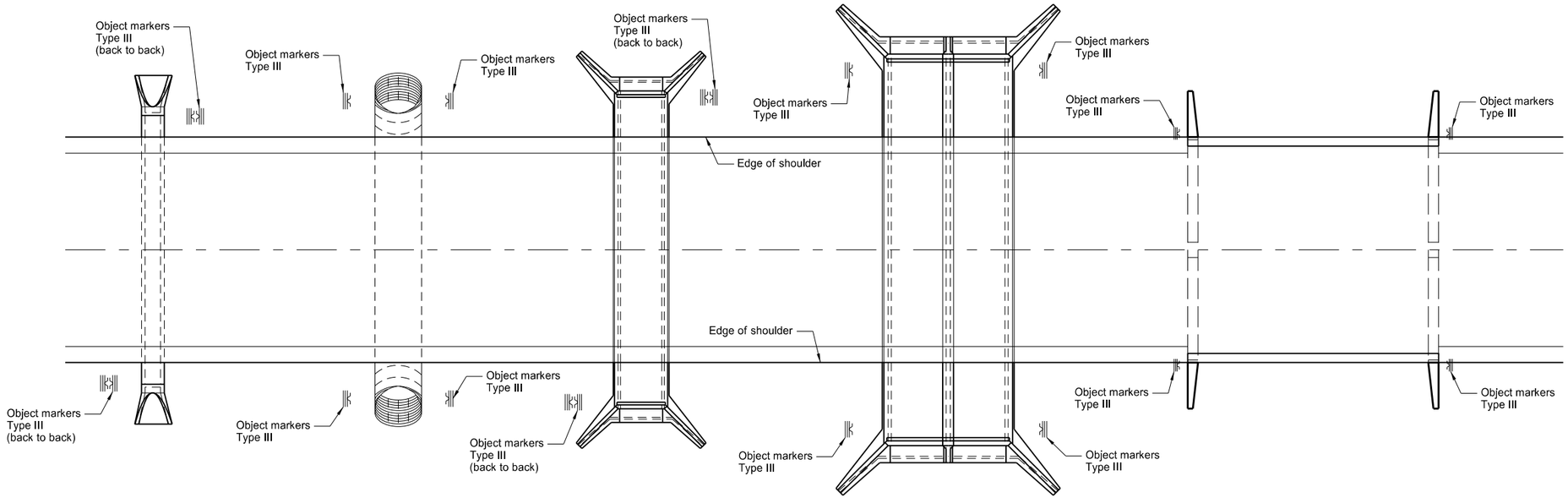
REGISTERED PROFESSIONAL ENGINEER
MATTHEW C KURLE
PE-8777
DATE
05/27/20
NORTH DAKOTA
DocuSign

OBJECT MARKERS

D-754-82



Perforated Tube Anchor Unit Assembly



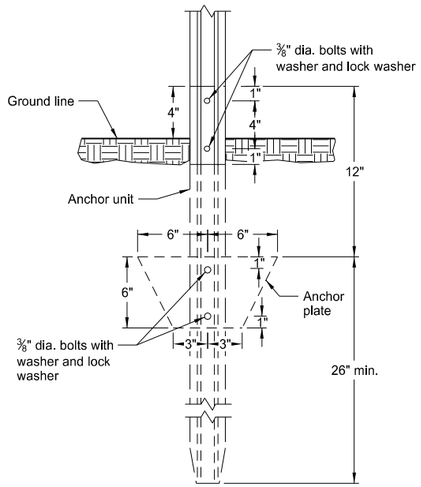
Pipe Culverts
10' max

Pipe Culverts
greater than 10'

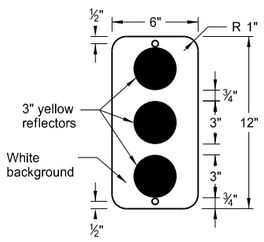
Box Culverts
10' max

Box Culverts
greater than 10'

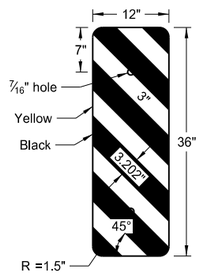
Bridges (B)



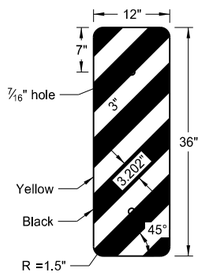
U-Channel Anchor Unit Assembly



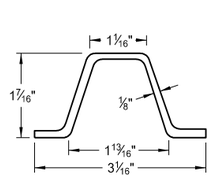
Object Marker
OM2-1V (C)
Type II



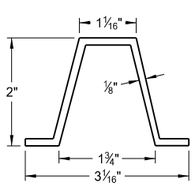
Object Marker Left
OM-3L (C)
Type III



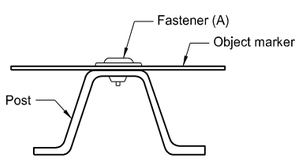
Object Marker Right
OM-3R (C)
Type III



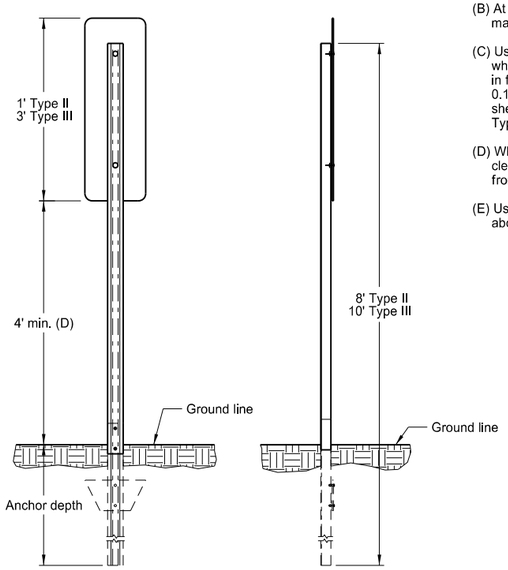
Steel Post Detail
Approx. 2 lb/ft



Aluminum Post Detail
Approx. 0.88 lb/ft



Fastener Detail



Object Marker
Installation Detail

Notes:

(A) Use ⅜" dia. tension pin type or other non-rust vandal resistant fastener with min. outside dia. 13/16" flat washer.

(B) At locations of approach guardrail with reflectors and end terminal with impact head object markers, do not install object markers.

(C) Use two object markers for back to back mountings. On bridges where the distance between wheel guards is less than the approach width, mount object markers vertically on steel posts in front of the bridge railing on each side of highway to mark the horizontal clearance. Use 0.100" minimum thickness sheet aluminum for sign backing material. Use ASTM Type XI sheeting for Type III object markers and ASTM Type IV background sheeting with ASTM Type XI reflectors for Type II object markers.

(D) When object marker is located 8' or less from shoulder or curb, provide 4' minimum vertical clearance from near edge of traveled way to bottom of sign. When located more than 8' from shoulder or curb provide 4' minimum vertical clearance from ground to bottom of sign.

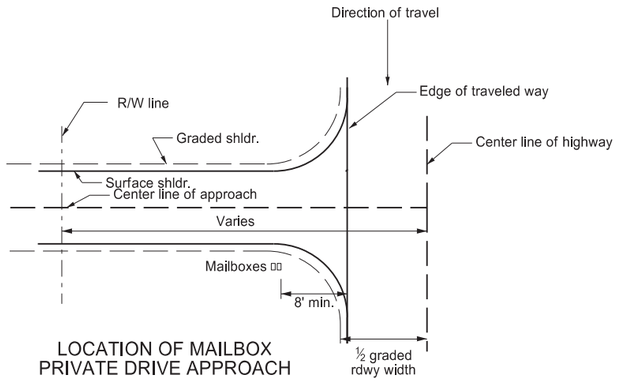
(E) Use 4" vertical clearance for anchor or breakaway base. Provide 4"x60" measurement above and below post location and back and ahead of post.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
7-18-14	Revised Note C
8-30-18	Updated notes to active voice and removed note.
9-05-19	New Design Engineer PE Stamp.

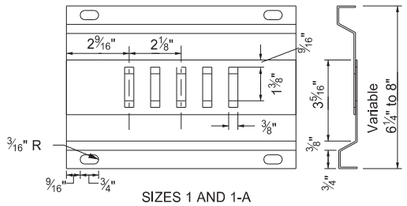
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 9/05/19 and the original document is stored at the North Dakota Department of Transportation

MAILBOX LOCATION DETAILS

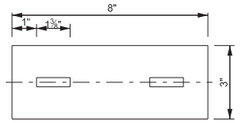
D-766-1



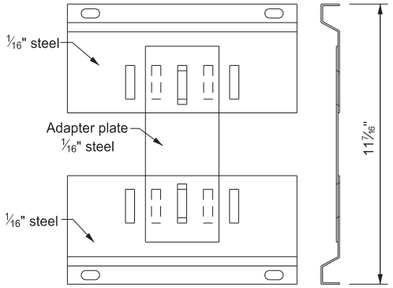
LOCATION OF MAILBOX
PRIVATE DRIVE APPROACH
ALTERNATE "A" LOCATION



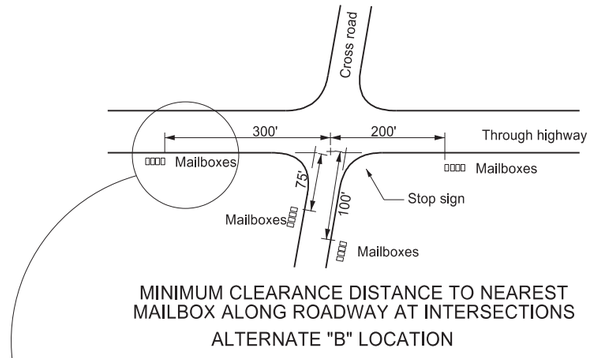
SIZES 1 AND 1-A
MOUNTING BRACKET



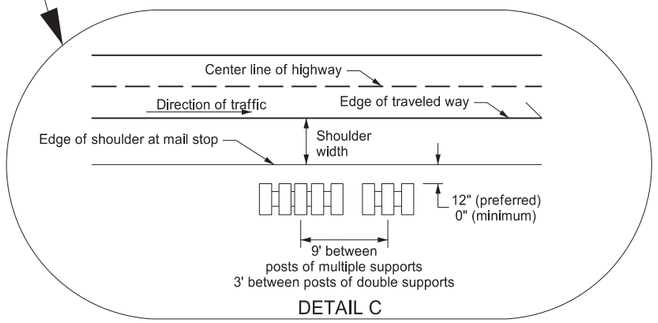
ADAPTOR PLATE



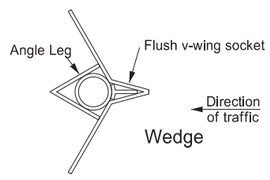
SIZE 2 WITH ADAPTOR PLATE
MOUNTING BRACKET



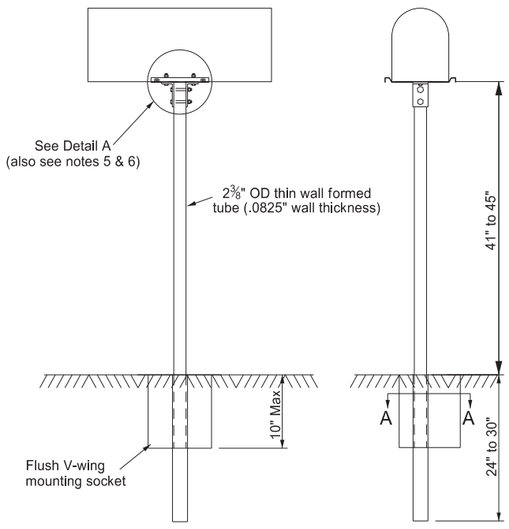
MINIMUM CLEARANCE DISTANCE TO NEAREST
MAILBOX ALONG ROADWAY AT INTERSECTIONS
ALTERNATE "B" LOCATION



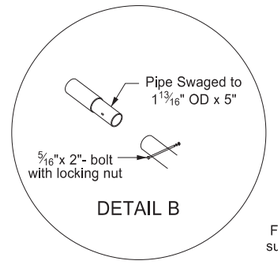
DETAIL C



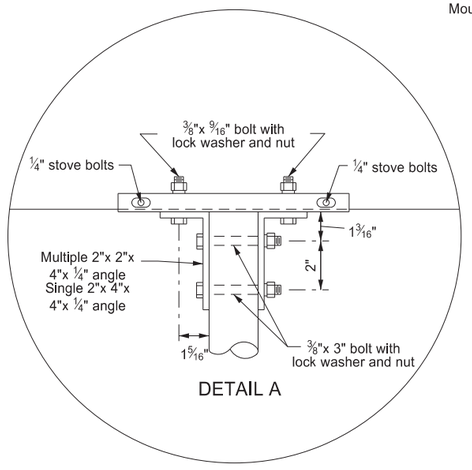
FLUSH V-WING
POST MOUNTING SOCKET
SECTION A-A



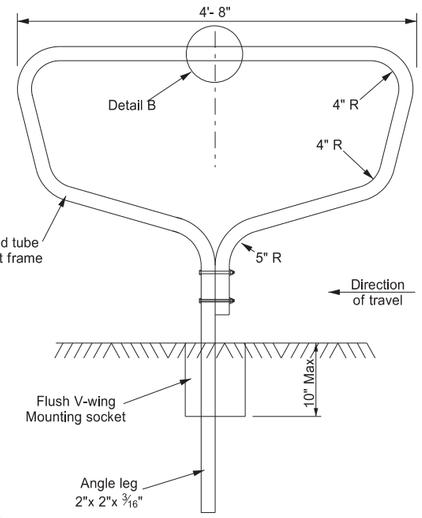
SIDE FRONT
SINGLE SUPPORT



DETAIL B



DETAIL A



FRONT

Notes:

1. The mailbox support and hardware details consist of the "V-Loc Mailbox Support System" manufactured by:

   Tapco Traffic & Parking Control Co. Inc.

   Use any equal crash tested and Federal Highway Administration approved support system meeting the requirements of NCHRP Report 350 or MASH. Install approved alternate mailbox assemblies in the manner and arrangement crash tested.

2. Install mailboxes in Alternate "A" locations when possible. Install mailboxes in Alternate "B" locations when warranted by existing field conditions.

3. Locate mailboxes on the right-hand side of the road in the direction traveled by the carrier. The Engineer will verify the correct direction with the postmaster before installion.

4. Install mailboxes on private drive approaches on the downstream side of the approach.

5. Install angle connection parallel to traffic flow for size 2 mailbox mounted on single posts.

6. For Size 2 mailbox mounted on multiple supports, attach the adapter plate to mounting bracket with 2 each, 3/8" by 9/16" bolts with lock washers and nuts. Then attach the unit to the formed tube support frame using 4 angle connections as shown in Detail A.

7. Space multiple support frames a minimum of 4 feet apart. Space single support frames a minimum of 3 ft apart. Do not place more than five No. 1 mailboxes, three No. 2 mailboxes, or any combination of four No. 1-A and No. 2 mailboxes on multiple support frames.

TABLE A

TYPICAL MAILBOX DIMENSIONS			
Size	Width	Height	Length
1	6½"	8½"	19"
1-A	8"	10½"	21"
2	11½"	13½"	23½"

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-15-2010	
REVISIONS	
DATE	CHANGE
08-25-2023	Dsn Engr stamp/signature update

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08/25/23