

DESIGN DATA				
Traffic	Average Daily			Max.Hr.
Current 2023	Pass: <750	Trucks: <750	Total: <750	N/A
Forecast 2043	Pass: <750	Trucks: <750	Total: <750	N/A
Clear Zone Distance: 18'		Design Speed: 65 mph		
Minimum Sight Dist. for Stopping: 645'		Bridges: HL-93		
Minimum Sight Dist. for Safe Passing: 1,100'				
Sight Dist. for No Passing Zone: <1,100'				
Pavement Design Life 20 (years)				

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	23555	1	1

McHENRY COUNTY NORTH DAKOTA

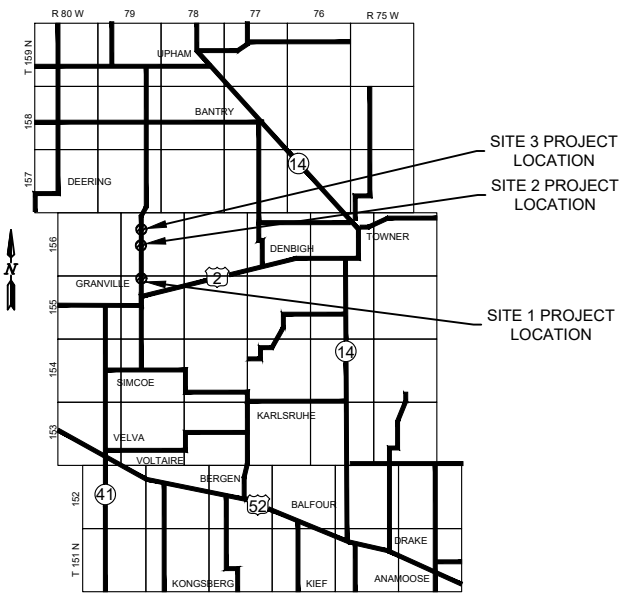
FEDERAL AID PROJECT BRP-BRC-2500(022) STRUCTURE REPLACEMENT

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	4/1/2023
Supplemental Specifications	NONE

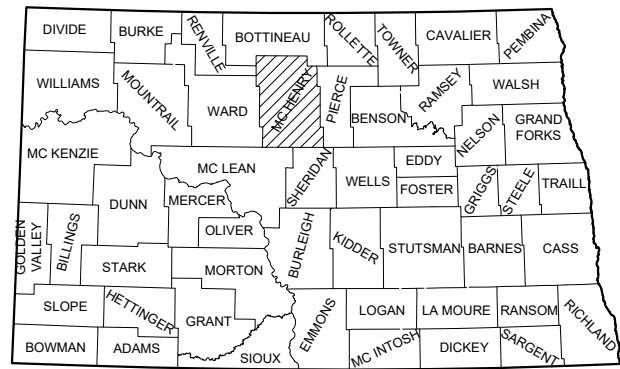
PROJECT CONSISTS OF THREE STRUCTURE REMOVALS, INSTALLATION OF THREE R.C.B.C, BITUMINOUS PAVEMENT, & INCIDENTALS.

SITE #1: OLD STRUCTURE #25-110-25.0 / NEW STRUCTURE #25-110-25.1 IS LOCATED APPROXIMATELY 0.4 MILES NORTH OF GRANVILLE, ND
 SITE #2: OLD STRUCTURE #25-110-21.0 / NEW STRUCTURE #25-110-21.1 IS LOCATED APPROXIMATELY 4 MILES NORTH OF GRANVILLE, ND
 SITE #3: OLD STRUCTURE #25-110-20.1 / NEW STRUCTURE #25-110-20.2 IS LOCATED APPROXIMATELY 5 MILES NORTH OF GRANVILLE, ND

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SITE #1 - BRP-BRC-2500(022) 25-110-25.0	0.121	0.121
SITE #2 - BRP-BRC-2500(022) 25-110-21.0	0.123	0.123
SITE #3 - BRP-BRC-2500(022) 25-110-20.1	0.142	0.142
PROJECT TOTAL	0.386	0.386



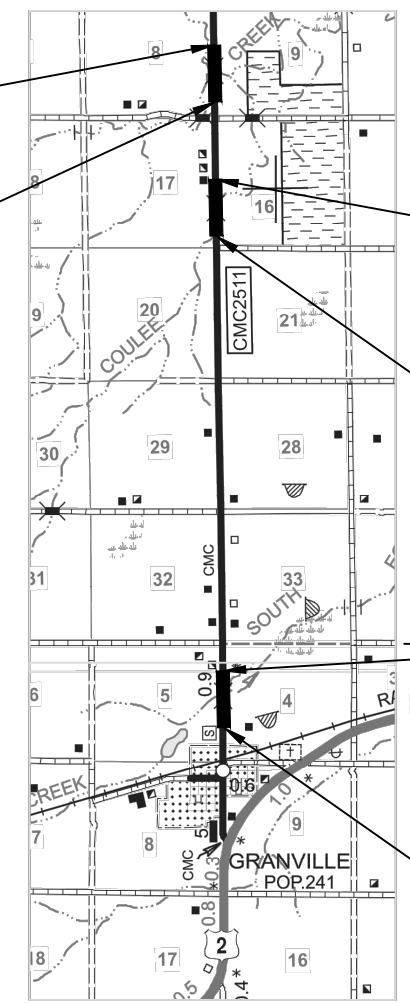
SKETCH MAP OF McHENRY COUNTY



STATE COUNTY MAP

END SITE #3
 STRUCTURE #25-110-20.1
 STA. 317+56 = A POINT 2,133.04 FT NORTH OF THE SW CORNER OF SEC. 9, TWP. 156 N, RGE. 79 W.

BEGIN SITE #3
 STRUCTURE #25-110-20.1
 STA. 310+09 = A POINT 1,386.04 FT NORTH OF THE SW CORNER OF SEC. 9, TWP. 156 N, RGE. 79 W.



END SITE #2
 STRUCTURE #25-110-21.0
 STA. 266+00 = A POINT 2,247.2 FT NORTH OF THE SW CORNER OF SEC. 16, TWP. 156 N, RGE. 79 W.

BEGIN SITE #2
 STRUCTURE #25-110-21.0
 STA. 259+50 = A POINT 1,597.2 FT NORTH OF THE SW CORNER OF SEC. 16, TWP. 156 N, RGE. 79 W.

END SITE #1
 STRUCTURE #25-110-25.0
 STA. 61+50 = A POINT 3,017.66 FT NORTH OF THE SW CORNER OF SEC. 4, TWP. 155 N, RGE. 79 W.

BEGIN SITE #1
 STRUCTURE #25-110-25.0
 STA. 55+10 = A POINT 2,377.66 FT NORTH OF THE SW CORNER OF SEC. 4, TWP. 155 N, RGE. 79 W.

LOCATION MAP



I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.

APPROVED DATE 10/18/2023

Jonathan W. Martin /s/
 WOLD ENGINEERING, P.C.

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	ND	BRP-BRC-2500(022)	2	1

PLAN SECTIONS

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2	1	Table of Contents
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6	2	Environmental Notes
8	1 - 2	Quantities
10	1	Basis of Estimate
20	1 - 2	General Details
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75	1 - 6	Wetland Impacts
76	1 - 3	Temporary Erosion Control
77	1 - 3	Permanent Erosion Control
81	1	Survey Coordinate and Curve Data
100	1 - 4	Work Zone Traffic Control
170	1 - 8	Bridges and Box Culverts
200	1 - 15	Cross Sections

Number	Description
D-101-1, 2, 3, 4	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20, 21	Line Styles
D-101-30, 31, 32, 33	Symbols
D-101-40	Cross Section Legend
D-255-2	Erosion And Siltation Control - Erosion Control Blanket Installation
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	Construction Sign Details - Warning Signs
D-704-13	Barricade And Channelizing Device Details
D-704-14	Construction Sign Punching And Mounting Details
D-704-21	Detour And Roadway Diversion Sign Layouts
D-704-22	Construction Truck And Temporary Detour Layouts
D-714-22	Concrete Pipe, Cattle Pass, or Precast Concrete Box Culvert Ties
D-762-4	Pavement Marking
D-762-11	Short-Term Pavement Marking

SPECIAL PROVISIONS

Number	Description
SP 120(23)	Commercial Grade Hot Mix Asphalt
SP 121(23)	Temporary Water Diversion
SSP 1	Temporary Erosion and Sediment Best Management Practices
SSP 2	Federal Migratory Bird Treaty Act
SSP 3	Local Agency Contracts
PSP 14(23)	Permits and Environmental Considerations

NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	6	1

GENERAL NOTES

- 104-P01 EROSION CONTROL: Bid items Temporary Cover Crop, Fiber Rolls, Silt Fence, and Flotation Silt Curtain are included for use in conjunction with the Contractor's SWPPP. These quantities may be eliminated or increased depending on the Contractor's operation. An estimated quantity has been set up for each item.
- 105-P01 UTILITIES: No utility relocations or adjustments are planned. All utilities on the project need to be protected and remain in existing location.
- 108-P01 CONTRACT TIME FOR COMPLETION: Complete all work and open the roadway to traffic on or before November 8th, 2024. The Contractor will be allowed to close the corridor as shown in Section 100 for a maximum of 90 calendar days. Liquidated damages will be assessed for each day beyond the greater of 90 calendar day closure limit or each day beyond the completion date in accordance with Section 108.07 B.1.
- 202-P01 REMOVAL OF BITUMINOUS SURFACING: Remove the existing pavement, regardless of the depth encountered. Include all costs for pavement removal, as well as disposal of removed pavement, in the contract unit price for "Removal of Bituminous Surfacing".
- 203-010 SHRINKAGE: 40 percent additional volume is included for shrinkage in earth embankment.
- 203-385 AVERAGE HAUL: No average haul has been computed for this project.
- 203-P01 COMPACTION CONTROL: Placement of embankment material shall be in accordance with Section 203.04 G3 of the Standard Specifications (Compaction Control, Type B).
- 203-P02 COMMON EXCAVATION-TYPE B: The suitability of material from on-site excavations for use as ordinary backfill will be determined by the engineer. If the excavated material is deemed not suitable for ordinary backfill or not needed to construct the project, it shall become property of the contractor and disposed of outside of the road right-of-way, not adjacent to the construction site, and at a site approved by the engineer. Depending on site conditions, the Contractor may be required to haul and place waste excavation from one site to another if required embankment is short at one of the sites. All costs associated with excavation, hauling, depositing and leveling the waste material shall be included in the unit price bid for "Common Excavation-Type B".
- 216-P01 WATER: The application of water for compaction of subgrade and aggregates, and for use as a dust palliative, as required, shall be included in the cost for other bid items.
- 430-P01 COMMERCIAL GRADE HOT MIX ASPHALT: The Commercial Grade Hot Mix Asphalt shall meet a minimum of Superpave FAA 42 or greater.

- 430-P02 COMPACTION: Compaction of hot bituminous pavement shall be in accordance with NDDOT Standard Specification Section 430.04 I.3 Ordinary Compaction. The compaction equipment used shall include not less than one vibratory roller.
- 430-P03 PAVEMENT LIFTS: A minimum of 24 hours of cure time is required between lifts.
- 752-P01 TEMPORARY FENCE: Temporary fencing, if needed, will be provided by the Contractor after determining the presence of livestock during construction and in consultation with the landowner. The Contractor shall coordinate with the adjacent landowners to determine if livestock will be present during construction. If a temporary fence is needed, the Contractor shall install and maintain an electric fence to contain the livestock. The temporary electric fence shall remain in place until the permanent fence is installed. If no livestock is present during construction this bid item will be removed. Installation, maintenance and removal of the temporary electric fence shall be included in the price bid for "Temporary Fence".
- 762-P01 PAVEMENT MARKING: If the Engineer and Contractor agree, plan quantity will be used as the measurement for payment for pavement marking items.

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ENVIRONMENTAL NOTES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	6	2

ENVIRONMENTAL NOTES (EN): McHenry County, the North Dakota Department of Transportation and the Federal Highway Administration have made environmental commitments to secure approval of this project. The following environmental notes are requirements to comply with these commitments:

EN-1 SPAWNING RESTRICTION: Do not work within the Egg Creek, Hay Coulee Creek, and South Egg Creek from April 15 to June 1.

EN-2 AQUATIC NUISANCE SPECIES (ANS): Equipment that was last used outside of North Dakota or within a Class I infested waterbody (identified on the North Dakota Game and Fish Department (NDGFD) website) requires an inspection by NDGFD. Notify the NDGFD at least 10 business days prior to pumps, watercraft, or any equipment entering a public water to allow the NDGFD sufficient time to inspect any and all such equipment for ANS. Contact the NDGFD ANS Coordinator, Ben Holen by e-mail - bholen@nd.gov for equipment inspections. Supply one of the following to the engineer as proof of compliance prior to work taking place in the water: (1) the NDGFD inspection report, (2) documented NDGFD correspondence (email or signed letter).

EN-3 TEMPORARY WETLAND IMPACT: Temporary impact areas within wetlands and or other waters are incorporated into the plans for this project. Remove temporary fill placed and sedimentation in wetlands or other waters. Restore these wetlands to preconstruction contours.

EN-4 WETLAND MITIGATION: Prior to beginning work on the project, purchase exactly 0.35 acres of wetland mitigation credits for Site 1, 0.44 acres of wetland mitigation credits for Site 2, and 0.62 acres of wetland mitigation credits for Site 3 from Ducks Unlimited to satisfy the Environmental Commitments shown in Section 75 of the plans. No work shall begin on the project until a Credit Sales Letter from Ducks Unlimited is submitted and accepted by the US Army Corps of Engineers (USACE), North Dakota Regulatory Office. The wetland mitigation credits shall be purchased from the Souris River Basin service area. The details are:

Souris River Basin 1.41 credits @ \$90,000/credit = \$126,900

The contact information to purchase the wetland mitigation credits from Ducks Unlimited is provided below (refer to project number NWO-2009-00990-BIS):

Trenton Hieb
Biologist in Ecosystem Services – Mitigation
Ducks Unlimited (Great Plains Region)
2525 River Road
Bismarck, ND 58503
Phone: 701-355-3573
Email: thieb@ducks.org

Permits Required

US Army Corps of Engineers – Section 404 Permit
Status: To be obtained.

ND Department of Health – NDPDES Permit
Status: To be obtained by contractor prior to construction. Owner to be listed as McHenry County on the permit.

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Estimated Quantities

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	Site 1	Site 2	Site 3	TOTAL
103	0100	CONTRACT BOND	L SUM	0.33	0.33	0.34	1
202	0108	REMOVAL OF STRUCTURE-SITE 1	L SUM	1			1
202	0109	REMOVAL OF STRUCTURE-SITE 2	L SUM		1		1
202	0110	REMOVAL OF STRUCTURE-SITE 3	L SUM			1	1
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	641	647	734	2022
202	0312	REMOVE EXISTING FENCE	LF	250	330	538	1118
203	0102	COMMON EXCAVATION-TYPE B	CY	1404	1866	1995	5265
203	0109	TOPSOIL	CY	431	575	504	1510
210	0051	BOX CULVERT EXCAVATION - SITE 1	EA	1			1
210	0052	BOX CULVERT EXCAVATION - SITE 2	EA		1		1
210	0053	BOX CULVERT EXCAVATION - SITE 3	EA			1	1
210	0210	FOUNDATION FILL	CY	904	914	1152	2970
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1	1	1	3
251	0200	SEEDING CLASS II	ACRE	0.8	0.8	0.8	2.4
251	2000	TEMPORARY COVER CROP	ACRE	0.8	0.8	0.8	2.4
253	0101	STRAW MULCH	ACRE	1.6	1.6	1.6	4.8
255	0103	ECB TYPE 3	SY			352	352
256	0200	RIPRAP GRADE II	CY	160	162	304	626
260	0200	SILT FENCE SUPPORTED	LF	160	200	130	490
260	0201	REMOVE SILT FENCE SUPPORTED	LF	160	200	130	490
261	0112	FIBER ROLLS 12IN	LF	440	440	660	1540
261	0113	REMOVE FIBER ROLLS 12IN	LF	160	120	280	560
262	0100	FLOTATION SILT CURTAIN	LF	80		110	190
262	0101	REMOVE FLOTATION SILT CURTAIN	LF	80		110	190
302	0120	AGGREGATE BASE COURSE CL 5	TON	515	515	594	1624
411	0105	MILLING PAVEMENT SURFACE	SY	76	76	76	228
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	203	203	232	638
606	0905	9FT X 5FT PRECAST RCB CULVERT	LF	240			240
606	0906	9FT X 6FT PRECAST RCB CULVERT	LF		228		228
606	1209	12FT X 9FT PRECAST RCB CULVERT	LF			288	288
606	4905	9FT X 5FT PRECAST RCB END SECTION	EA	2			2
606	4906	9FT X 6FT PRECAST RCB END SECTION	EA		2		2
606	5209	12FT X 9FT PRECAST RCB END SECTION	EA			2	2
702	0100	MOBILIZATION	L SUM	0.33	0.33	0.34	1
704	1000	TRAFFIC CONTROL SIGNS	UNIT			2018	2018
704	1052	TYPE III BARRICADE	EA			33	33
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	338	321	491	1150
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	238	242	454	934
752	0320	FENCE BARBED WIRE 4 STRAND-STEEL POST	LF	250	330	435	1015
752	0905	TEMPORARY FENCE	LF	315	388	400	1103
752	2100	VEHICLE GATE	EA			1	1
752	3150	CORNER ASSEMBLY BARBED WIRE-WOOD POST	EA			2	2
762	0430	SHORT TERM 4IN LINE-TYPE NR	LF	160	163	187	510
762	1104	PVMT MK PAINTED 4IN LINE	LF	1440	1463	1681	4584
900	1001	TEMPORARY STREAM DIVERSION - SITE 1	EA	1			1
900	1002	TEMPORARY STREAM DIVERSION - SITE 2	EA		1		1
900	1003	TEMPORARY STREAM DIVERSION - SITE 3	EA			1	1

Estimated Quantities

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	BRP-BRC-2500(022)	8	2

SPEC	CODE	ITEM DESCRIPTION	UNIT	Site 1	Site 2	Site 3	TOTAL
900	2001	WETLAND MITIGATION SITE 1	ACRE	0.35			0.35
900	2002	WETLAND MITIGATION SITE 2	ACRE		0.44		0.44
900	2003	WETLAND MITIGATION SITE 3	ACRE			0.62	0.62

BASIS OF ESTIMATE							
Site 1 ~ Typical Section ~ Sta. 57+29 to 59+35 (0.039 Miles) Site 2 ~ Typical Section ~ Sta. 261+66 to 263+74 (0.039 Miles) Site 3 ~ Typical Section ~ Sta. 312+70 to 315+06 (0.045 Miles)							
Description	Unit	Width	Unit/Mile	Site 1	Site 2	Site 3	Total
Aggregate Base Course CL. 5 @ 1.875 Ton/CY	TON	32'	13,200	515	515	594	1,624
Tack Coat @ 0.05 Gal/SY (2 nd Lift) (Not a pay item)	GAL	32'	939	37	37	42	116
Commercial Grade Hot Mix Asphalt	TON	28'	4,889	191	191	220	602
PG 58S-28 Asphalt Cement @ 6.5% (Not a pay item)	TON	28'	318	12.4	12.4	14.3	39.1
Site 1 ~ Typical Section ~ Sta. 57+17 to 57+29 & 59+35 to 59+47 (0.005 Miles) Site 2 ~ Typical Section ~ Sta. 261+54 to 261+66 & 263+74 to 263+86 (0.005 Miles) Site 3 ~ Typical Section ~ Sta. 312+58 to 312+70 & 315+06 to 315+18 (0.005 Miles)							
Description	Unit	Width	Unit/Mile	Site 1	Site 2	Site 3	Total
Tack Coat @ 0.05 Gal/SY (2 nd Lift) (Not a pay item)	GAL	32'	939	5	5	5	15
Commercial Grade Hot Mix Asphalt	TON	28'	2,363	12	12	12	36
PG 58S-28 Asphalt Cement @ 6.5% (Not a pay item)	TON	28'	154	0.8	0.8	0.8	2.4

Topsoil
Payment shall be plan quantity

Common Excavation – Type B
Payment shall be plan quantity

Short Term 4IN Line-Type NR
 Site 1 - Sta. 55+10 to 61+50 (Yellow CL Skips after Top Lift of Asphalt) – 160 LF
 Site 2 - Sta. 259+50 to 266+00 (Yellow CL Skips after Top Lift of Asphalt) – 163 LF
 Site 3 - Sta. 310+09 to 317+56 (Yellow CL Skips after Top Lift of Asphalt) – 187 LF

PVMT MK Painted 4IN Line
 Site 1 - Sta. 55+10 to 61+50 (Yellow CL Skips) – 160 LF
 Sta. 55+10 to 61+50 (White Edge Line) – 1,280 LF
 Site 2 - Sta. 259+50 to 266+00 (Yellow CL Skips) – 163 LF
 Sta. 259+50 to 266+00 (White Edge Line) – 1,300 LF
 Site 3 - Sta. 310+09 to 317+56 (Yellow CL Skips) – 187 LF
 Sta. 310+09 to 317+56 (White Edge Line) – 1,494 LF

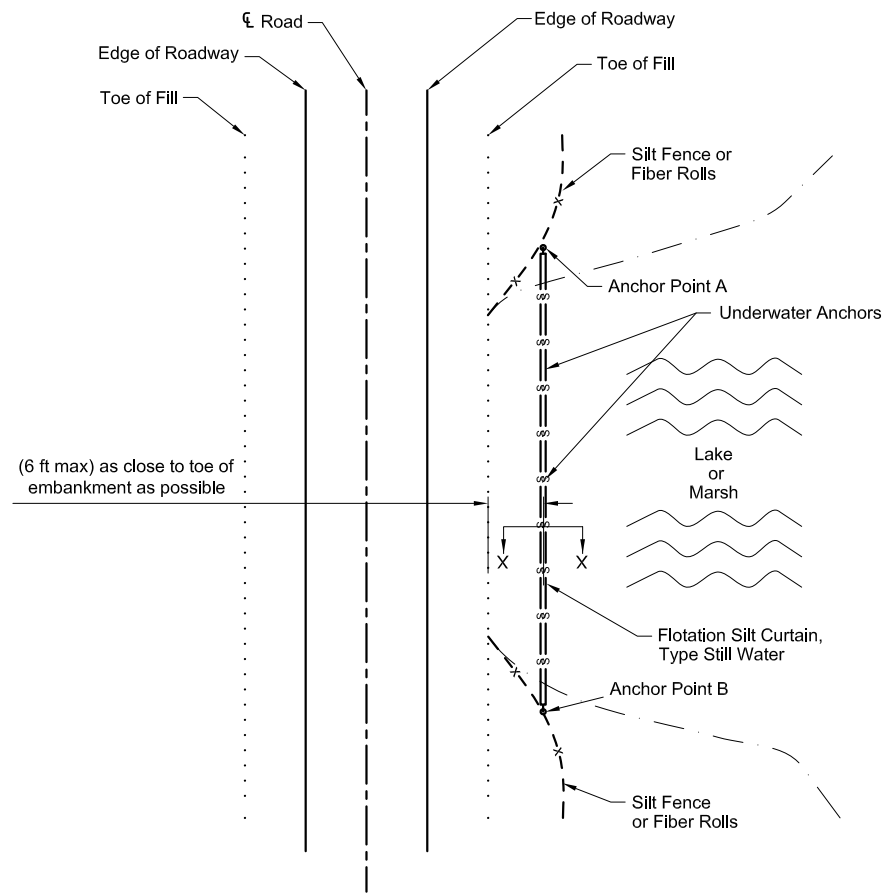
Earthwork Table				
LOCATION	Common Excavation – Type B	Embankment	Waste	Topsoil ¹
	(CY)	(CY)	(CY)	(CY)
	A	B	C = A – B	D
Site 1 Sta. 55+10 to 61+50	1,404	1,207	197	431
Site 2 Sta. 259+50 to 266+00	1,866	1,640	226	575
Site 3 Sta. 310+09 to 317+56	1,995	1,067	928	504
Project Totals	5,265	3,914	1,351	1,510

¹Topsoil quantities based on 6" stripping and 6" respreading within the grading limits.

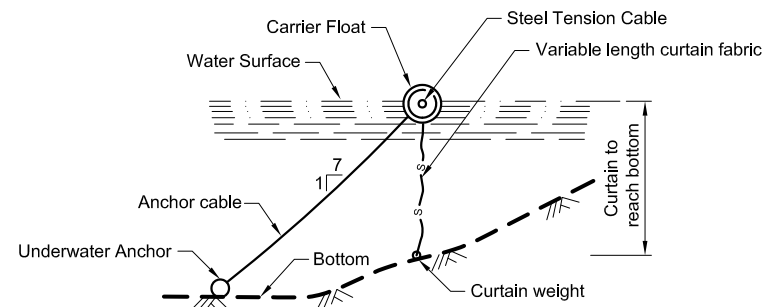
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Basis of Estimate

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	20	1



PLAN VIEW
FLOTATION SILT CURTAIN - TYPE STILL WATER
 The silt curtain shall extend onto shore and shall also be anchored there.



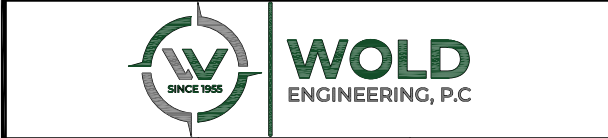
SECTION X-X
FLOTATION SILT CURTAINS

Note:
 Maximum water velocity for moving water = 5 ft/sec

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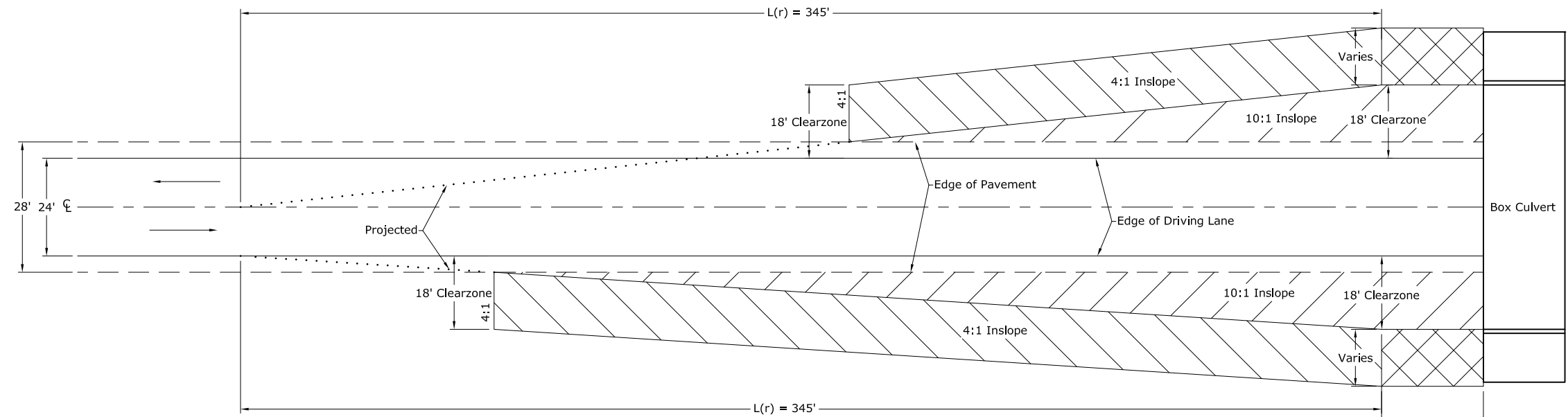
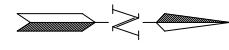
**Temporary Erosion Control
 Flotation Silt Curtain**

REVISED: 00/00/0000

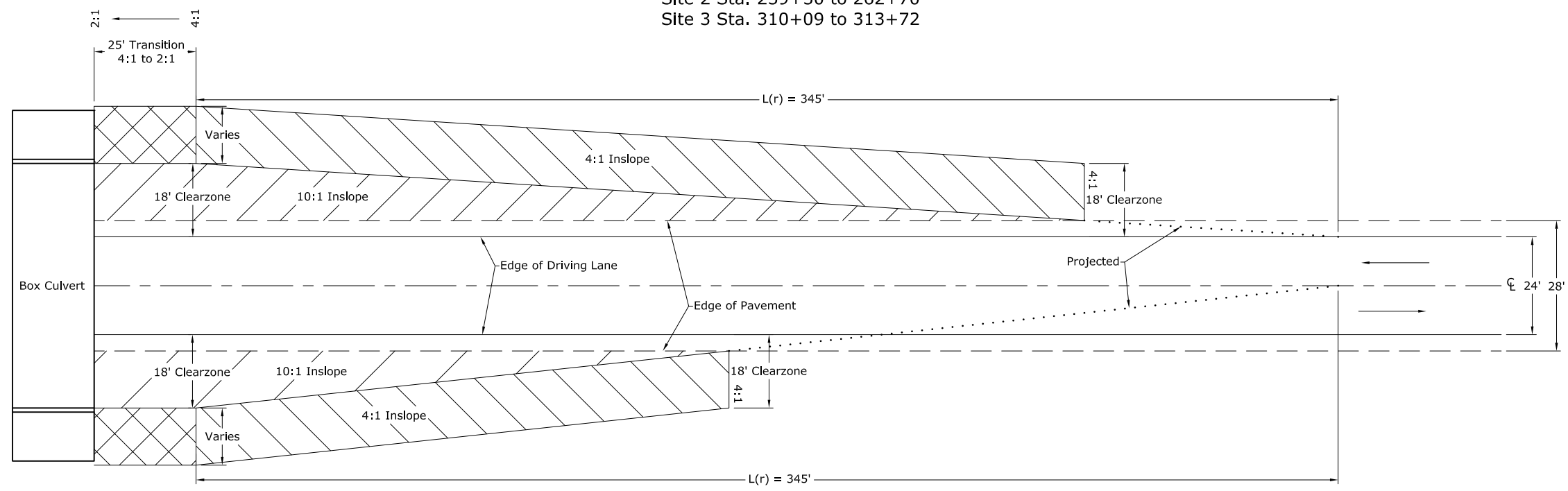
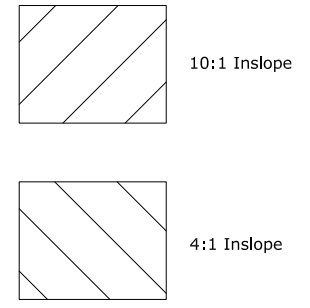


DRAWN BY: JWM CHECKED BY: MRR DATE: 10/18/2023

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	20	2



Slope Transition
 Site 1 Sta. 55+10 to 58+36
 Site 2 Sta. 259+50 to 262+70
 Site 3 Sta. 310+09 to 313+72



Slope Transition
 Site 1 Sta. 58+28 to 61+50
 Site 2 Sta. 262+70 to 266+00
 Site 3 Sta. 314+04 to 317+56

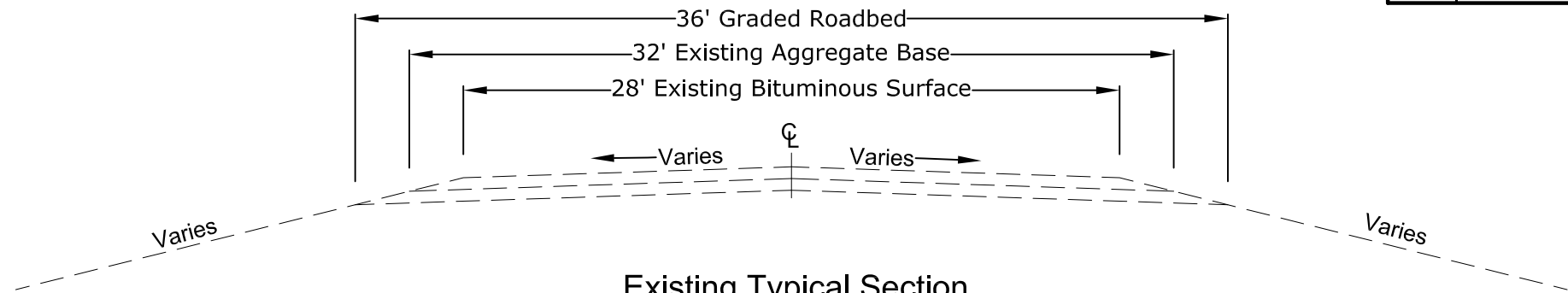


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Slope Transition Details
 Site 1, 2 & 3

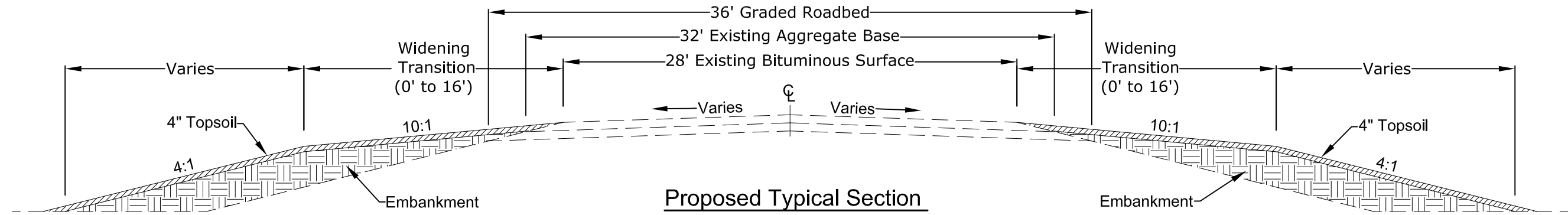
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	30	1



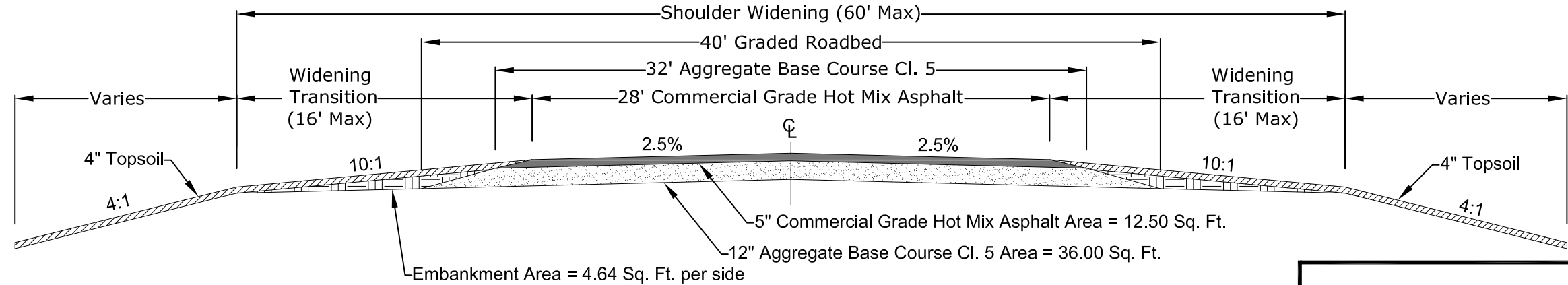
Existing Typical Section

Site 1 Sta. 55+10 To 61+50 (0.121 Miles)
 Site 2 Sta. 259+50 To 266+00 (0.123 Miles)
 Site 3 Sta. 310+09 To 317+56 (0.142 Miles)



Proposed Typical Section



Site 1 Sta. 55+10 To 57+29 & 59+35 TO 61+50 (0.082 Miles)
 Site 2 Sta. 259+50 To 261+66 & 263+74 TO 266+00 (0.084 Miles)
 Site 3 Sta. 310+09 To 312+70 & 315+06 TO 317+56 (0.097 Miles)



Proposed Typical Section

Site 1 Sta. 57+29 To 59+35 (0.039 Miles)
 Site 2 Sta. 261+66 To 263+74 (0.039 Miles)
 Site 3 Sta. 312+70 To 315+06 (0.045 Miles)



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Typical Section		
REVISED: 00/00/0000		
		
DRAWN BY: JWM	CHECKED BY: MRR	DATE: 10/18/2023
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	40	1

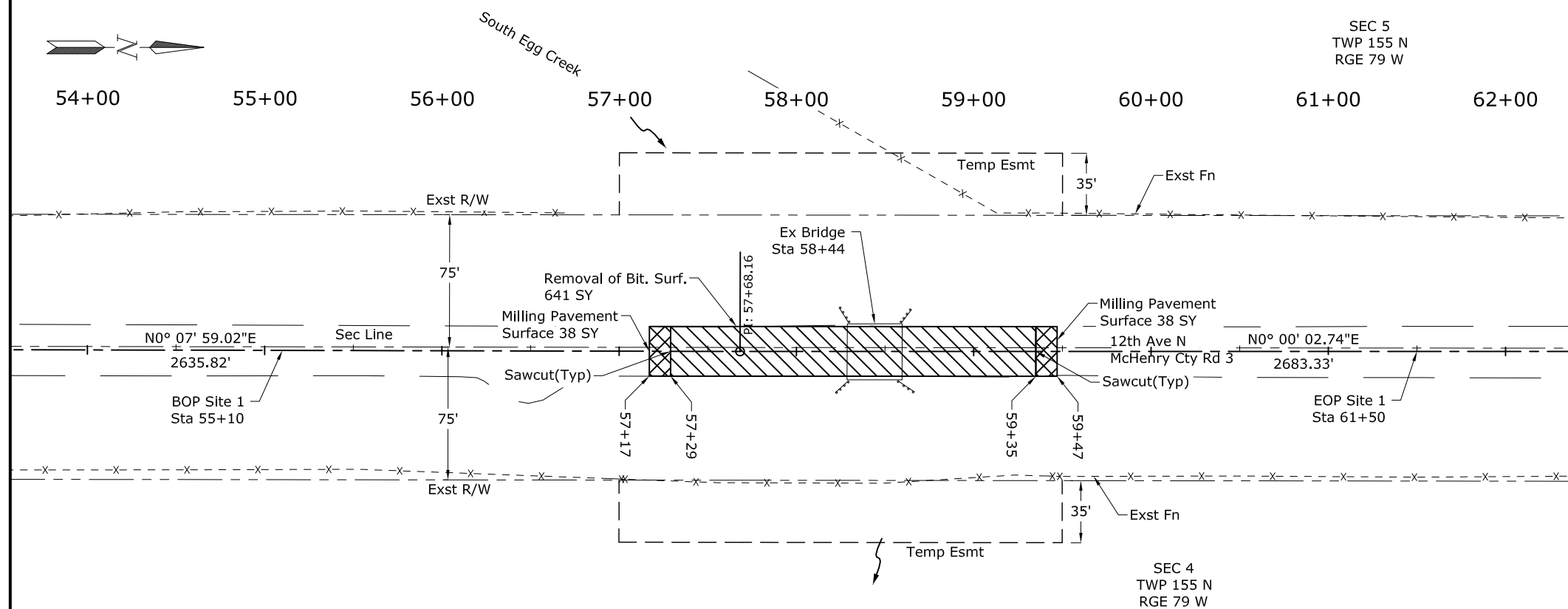
SPEC CODE	BID ITEM	QTY	UNIT
<u>202-0132</u>	<u>REMOVAL OF BITUMINOUS SURFACING</u>		
	STA. 57+29 TO 59+35	641	SY
<u>202-0312</u>	<u>REMOVE EXISTING FENCE</u>		
	STA. 57+00 TO 59+50 RT	250	LF
<u>411-0105</u>	<u>MILLING PAVEMENT SURFACE</u>		
	STA. 57+17 TO 57+29	38	SY
	STA. 59+35 TO 59+47	38	SY

LEGEND

-  - Removal of Bituminous Surfacing
-  - Milling Pavement Surfacing

NOTES

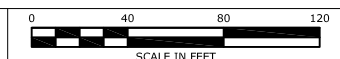
1. All bituminous sawcut costs shall be incidental to the removal of the bituminous surfacing.
2. The milling pavement surface depth shall be 2.5" thick.



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Removals
Site 1
STA. 54+00 TO 62+00



FILE:
BRP-BRC-2500(022).dwg



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	40	2

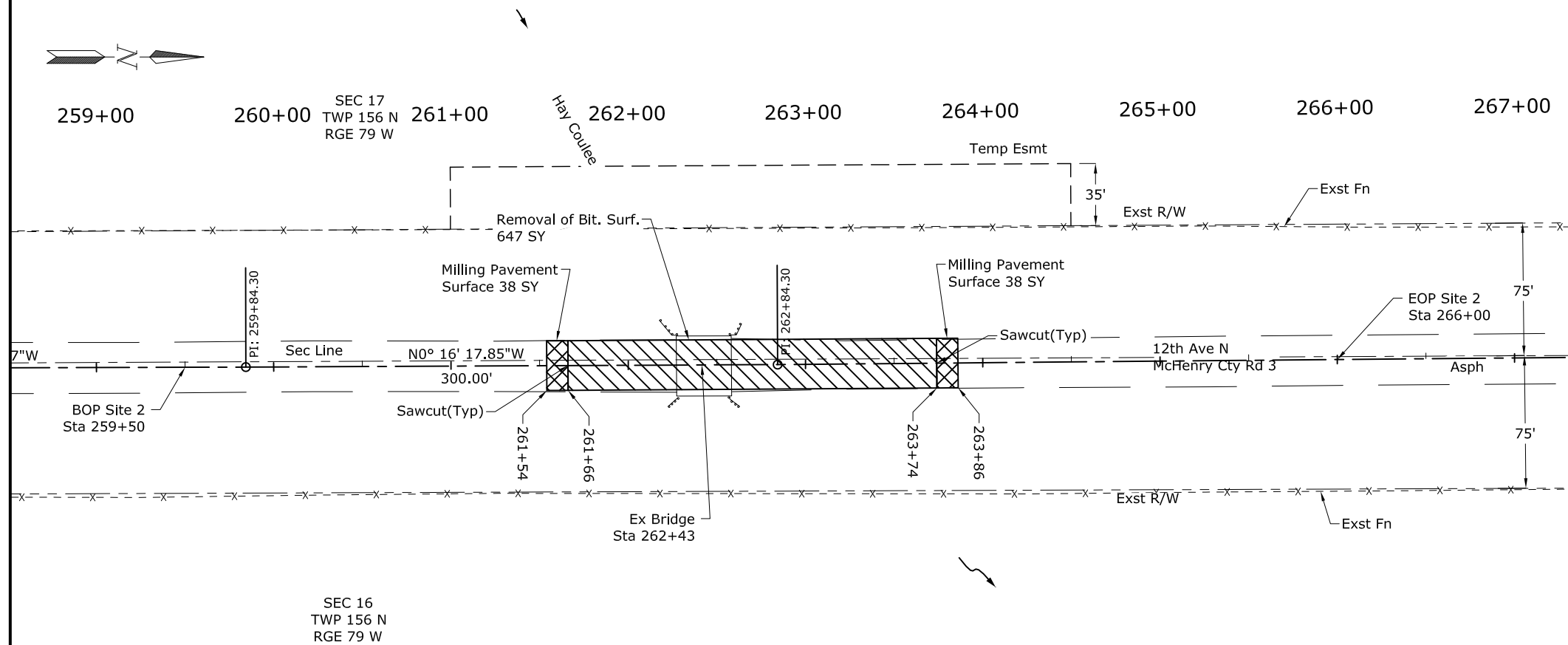
SPEC CODE	BID ITEM	QTY	UNIT
<u>202-0132</u>	<u>REMOVAL OF BITUMINOUS SURFACING</u>		
	STA. 261+66 TO 263+74	647	SY
<u>202-0312</u>	<u>REMOVE EXISTING FENCE</u>		
	STA. 261+20 TO 264+50 LT	330	LF
<u>411-0105</u>	<u>MILLING PAVEMENT SURFACE</u>		
	STA. 261+58 TO 261+66	38	SY
	STA. 263+74 TO 263+86	38	SY

LEGEND

-  - Removal of Bituminous Surfacing
-  - Milling Pavement Surfacing

NOTES

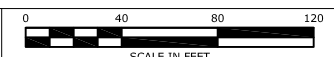
1. All bituminous sawcut costs shall be incidental to the removal of the bituminous surfacing.
2. The milling pavement surface depth shall be 2.5" thick.



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Removals
Site 2
STA. 259+00 TO 267+00



FILE:
BRP-BRC-2500(022).dwg



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	40	3

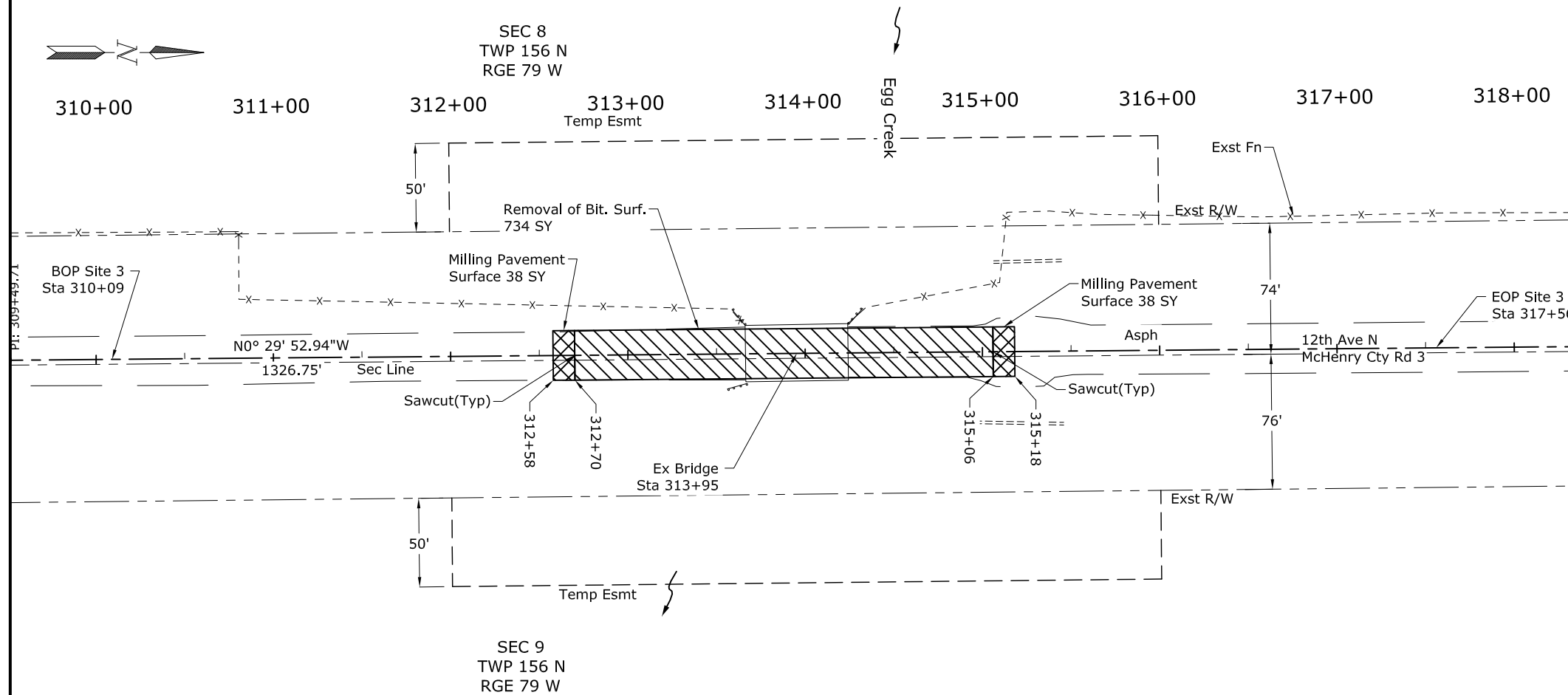
SPEC CODE	BID ITEM	QTY	UNIT
<u>202-0132</u>	<u>REMOVAL OF BITUMINOUS SURFACING</u>		
	STA. 312+70 TO 315+06	734	SY
<u>202-0312</u>	<u>REMOVE EXISTING FENCE</u>		
	STA. 310+80 TO 316+00 LT	538	LF
<u>411-0105</u>	<u>MILLING PAVEMENT SURFACE</u>		
	STA. 312+58 TO 312+70	38	SY
	STA. 315+06 TO 315+18	38	SY

LEGEND

-  - Removal of Bituminous Surfacing
-  - Milling Pavement Surfacing

NOTES

1. All bituminous sawcut costs shall be incidental to the removal of the bituminous surfacing.
2. The milling pavement surface depth shall be 2.5" thick.

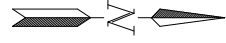


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Removals
Site 3
STA. 310+00 TO 318+00

FILE:
BRP-BRC-2500(022).dwg

0 40 80 120
SCALE IN FEET

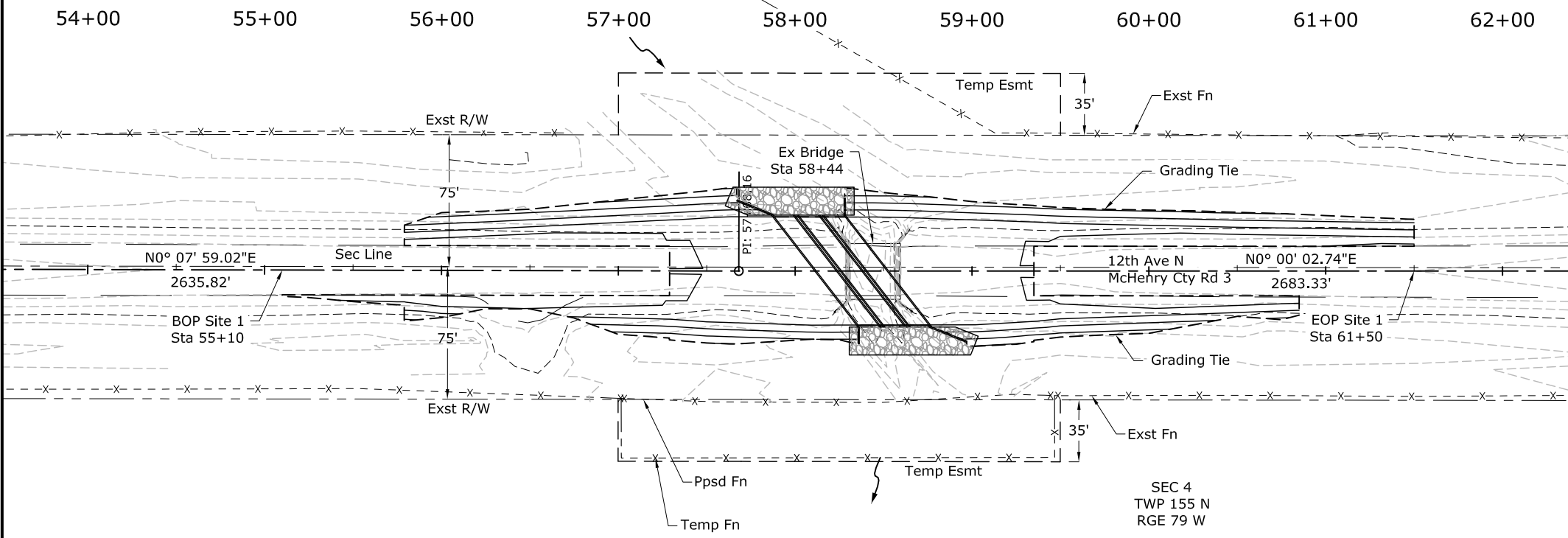


South Egg Creek

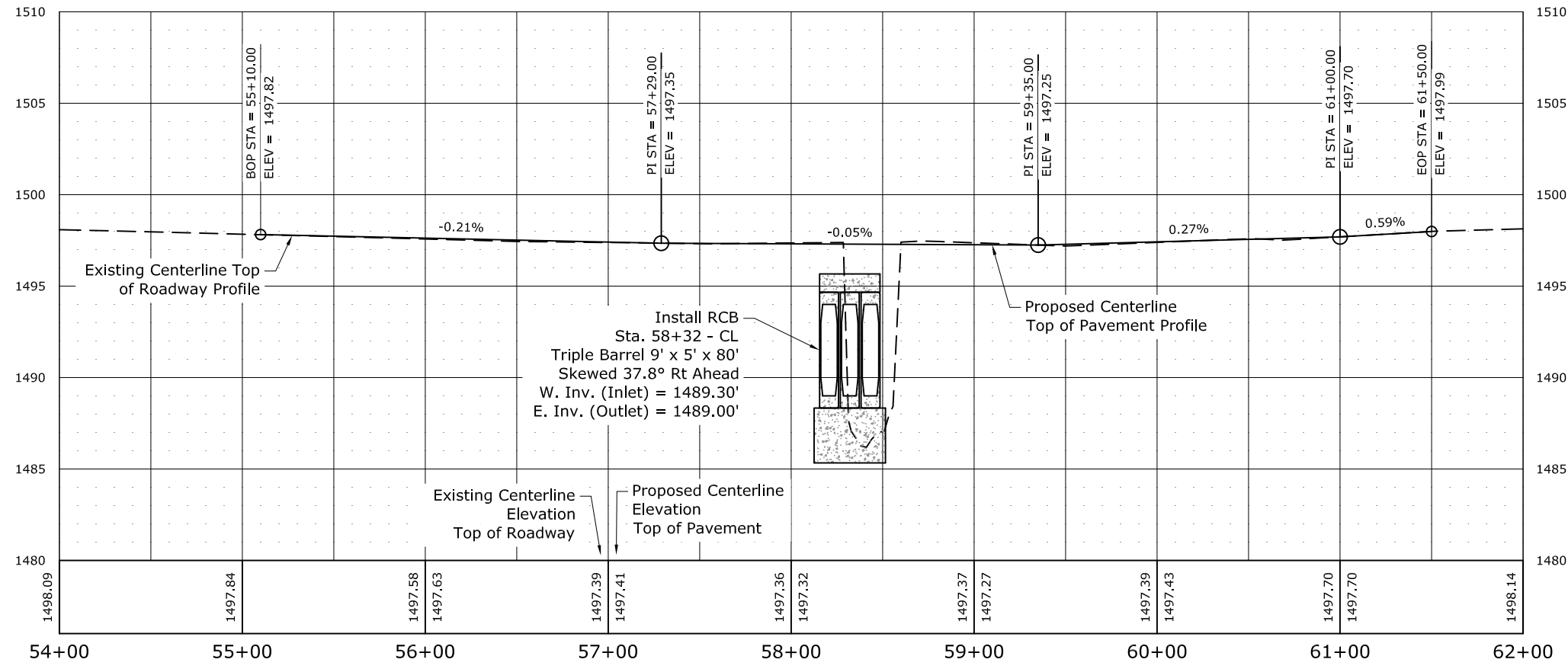
SEC 5
TWP 155 N
RGE 79 W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	60	1

SPEC CODE	BID ITEM	QTY	UNIT
752-0320	FENCE BARBED WIRE 4 STRAND-STEEL POST	250	LF
STA. 57+00 TO 59+50 RT			
752-0905	TEMPORARY FENCE	315	LF
STA. 57+00 TO 59+50 RT			



SEC 4
TWP 155 N
RGE 79 W

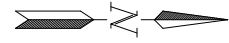


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Plan & Profile
Site 1
STA. 54+00 TO 62+00

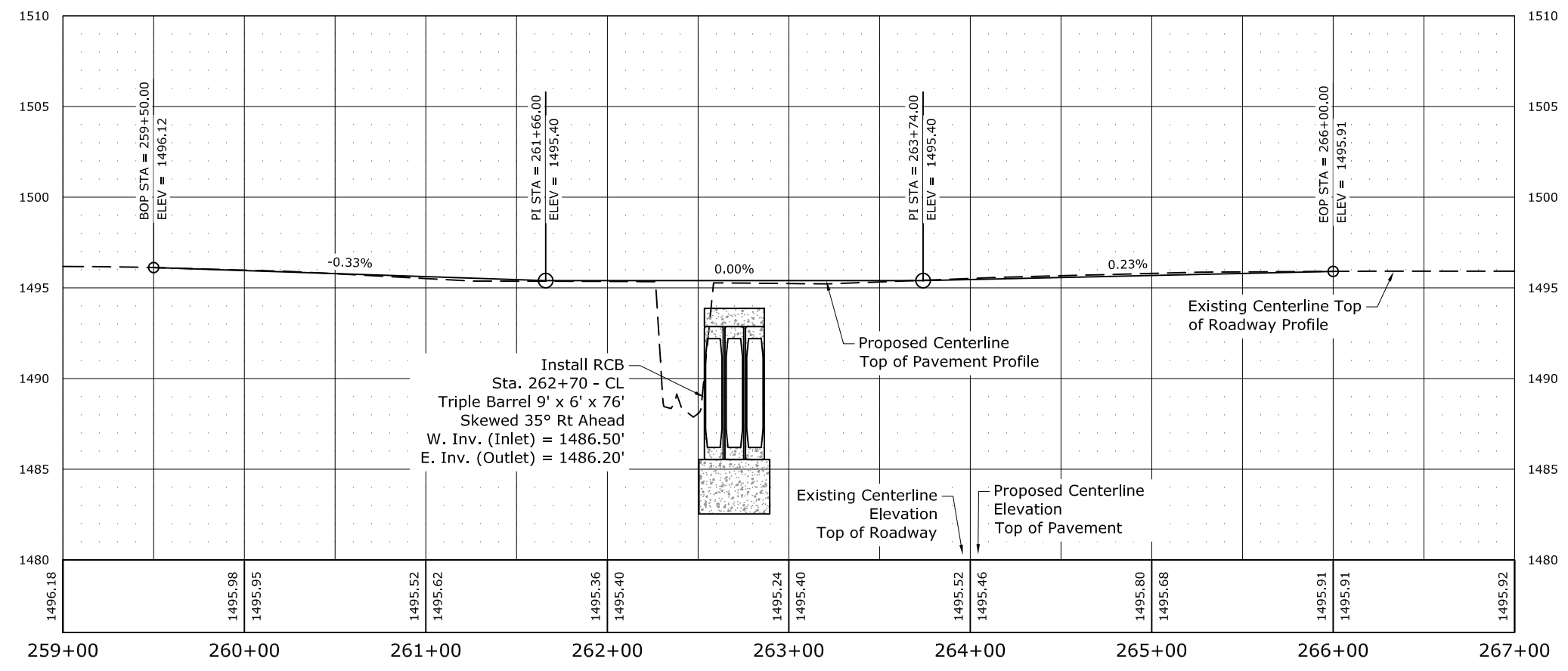
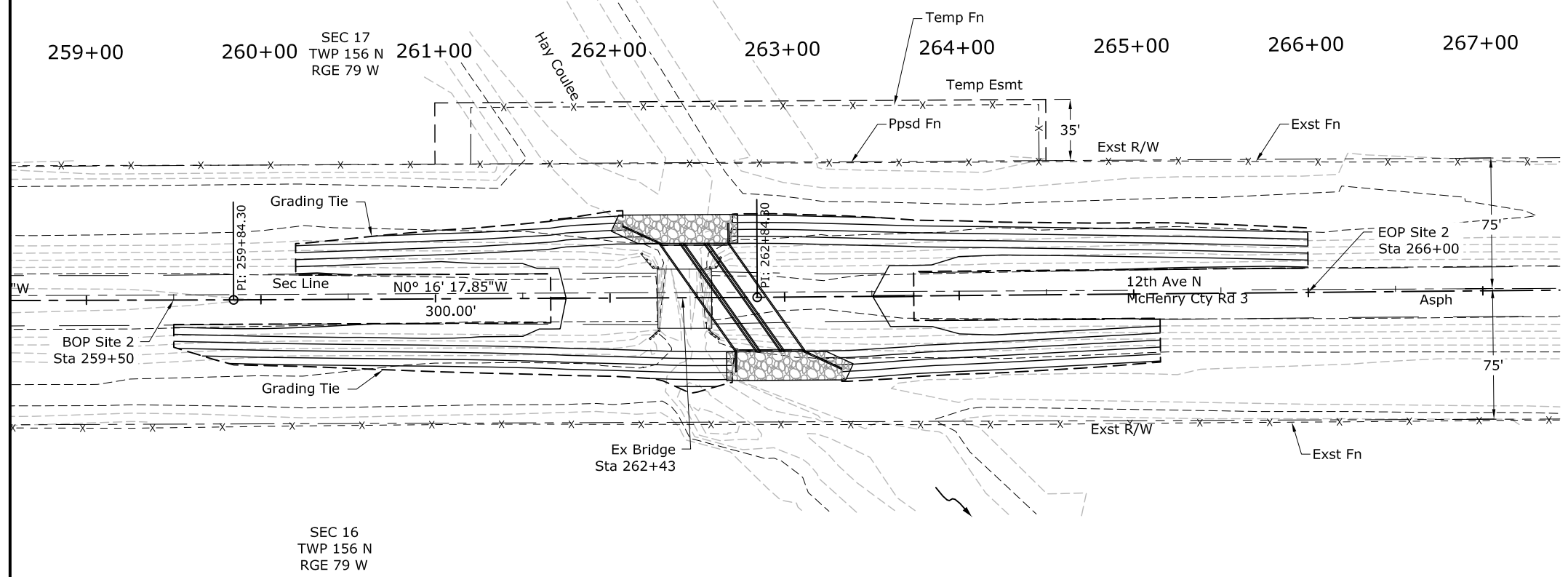
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0 40 80 120
SCALE IN FEET



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	60	2

SPEC CODE	BID ITEM	QTY	UNIT
752-0320	FENCE BARBED WIRE 4 STRAND-STEEL POST	330	LF
STA. 261+20 TO 264+50 LT			
752-0905	TEMPORARY FENCE	388	LF
STA. 261+20 TO 264+50 LT			

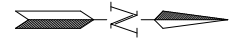


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Plan & Profile
Site 2
STA. 259+00 TO 267+00

FILE: BRP-BRC-2500(022).dwg

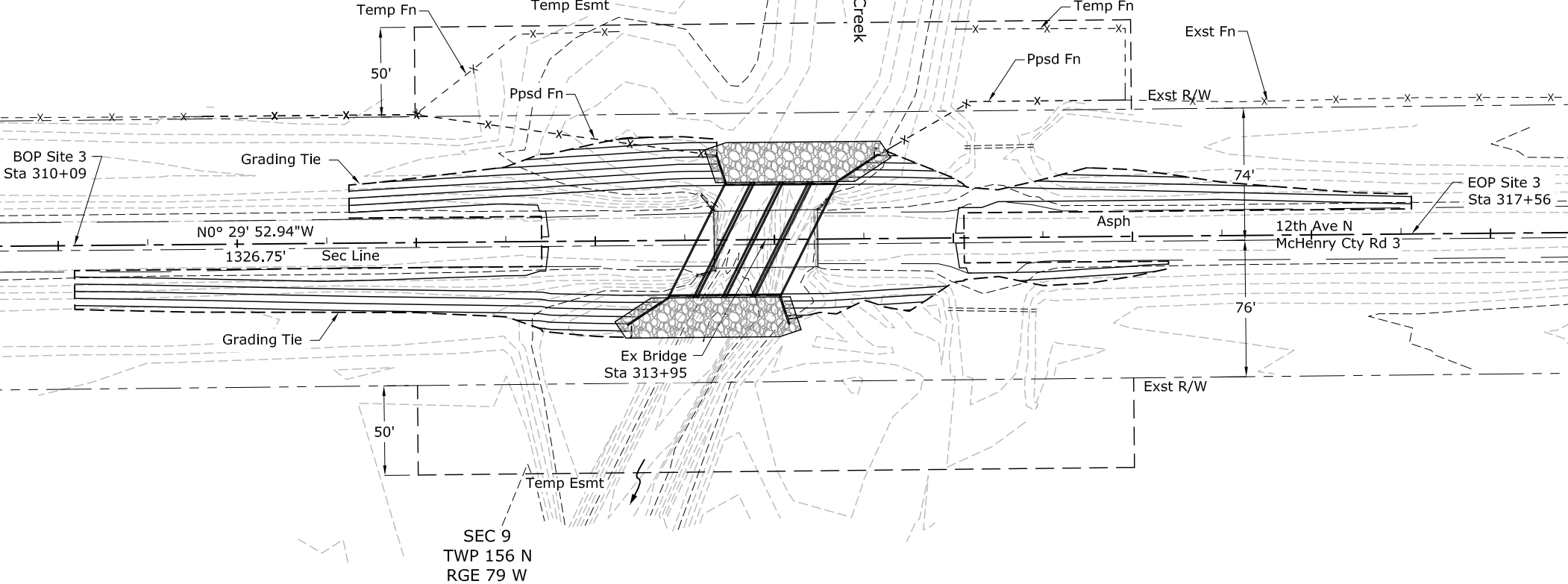
0 40 80 120
SCALE IN FEET



SEC 8
TWP 156 N
RGE 79 W

Egg Creek

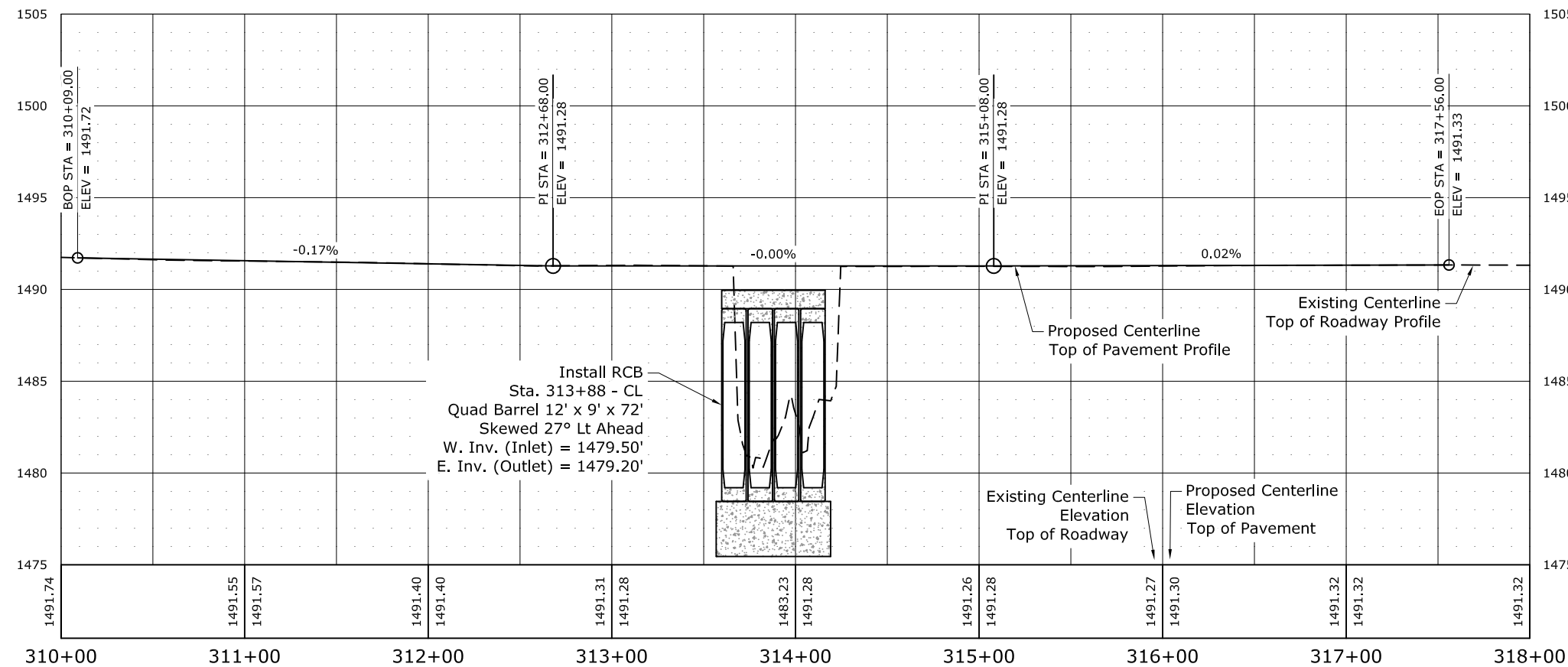
310+00 311+00 312+00 313+00 314+00 315+00 316+00 317+00 318+00



SEC 9
TWP 156 N
RGE 79 W

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	60	3

SPEC CODE	BID ITEM	QTY	UNIT
752-0320	FENCE BARBED WIRE 4 STRAND-STEEL POST		
	STA. 310+80 TO 313+70 LT	290	LF
	STA. 314+55 TO 316+00 LT	145	LF
752-0905	TEMPORARY FENCE		
	STA. 310+80 TO 313+30 LT	250	LF
	STA. 314+50 TO 316+00 LT	150	LF
752-2100	VEHICLE GATE		
	STA. 315+26 LT	1	EA
752-3150	CORNER ASSEMBLY BARBED WIRE-WOOD POST		
	STA. 312+00 LT	1	EA
	STA. 315+10 LT	1	EA



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Plan & Profile
Site 3
STA. 310+00 TO 318+00

FILE: BRP-BRC-2500(022).dwg

0 40 80 120
SCALE IN FEET

Wetland Impact Table																	
Wetland Number	Location	Wetland Feature	Wetland Feature	USACE Jurisdictional Wetlands ¹	Wetland Impacts Acre(s)		USFWS Easement Impacts Acre(s)		Wetland Mitigation								
					Temp.	Perm.	Temp.	Perm.	Mitigation Required			USACE/11990 Bank		11990 Bank		USFWS Bank	
									EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)
1c	Sec.5, T155N, R79W	Fringe Wetland	Natural	Yes	0.10	0.03	0	0	Y	Y	N	DU	0.03				
1d	Sec.5, T155N, R79W	Fringe Wetland	Natural	Yes	0.03	0.06	0	0	Y	Y	N	DU	0.06				
1e	Sec.4, T155N, R79W	Fringe Wetland	Natural	Yes	0	0	0	0	N	N	N						
1f	Sec.4, T155N, R79W	Fringe Wetland	Natural	Yes	0.12	0.04	0	0	Y	Y	N	DU	0.04				
1g	Sec.4, T155N, R79W	Fringe Wetland	Natural	Yes	0.07	0.02	0	0	Y	Y	N	DU	0.02				
1h	Sec.4, T155N, R79W	Fringe Wetland	Natural	Yes	0	0	0	0	N	N	N						
					0.32	0.15	0	0				0.15	0		0		

Other Waters Impact Table																
Number	Location	Type	Other Waters				USACE Jurisdictional ¹	Impacts to Other Waters				Mitigation Required			Mitigation Location; ratio	Method
			Size		Feature	Acre(s)		Linear Feet		EO 11990	USACE	USFWS				
			Acre(s)	Linear Feet		Temp		Perm	Temp				Perm			
1a	Sec.5, T155N, R79W	South Egg Creek	0.52	320	Natural	Yes	0.18	0.05	100	61	N	Y	N	DU @ 2:1		
1b	Sec.4, T155N, R79W	South Egg Creek	0.57	210	Natural	Yes	0.18	0.05	100	61	N	Y	N	DU @ 2:1		
Totals			1.09	530			0.36	0.10	200	122						

¹ A wetland Jurisdictional Determination was issued by the USACE on 3/07/2023; NWO-2009-00990-BIS.

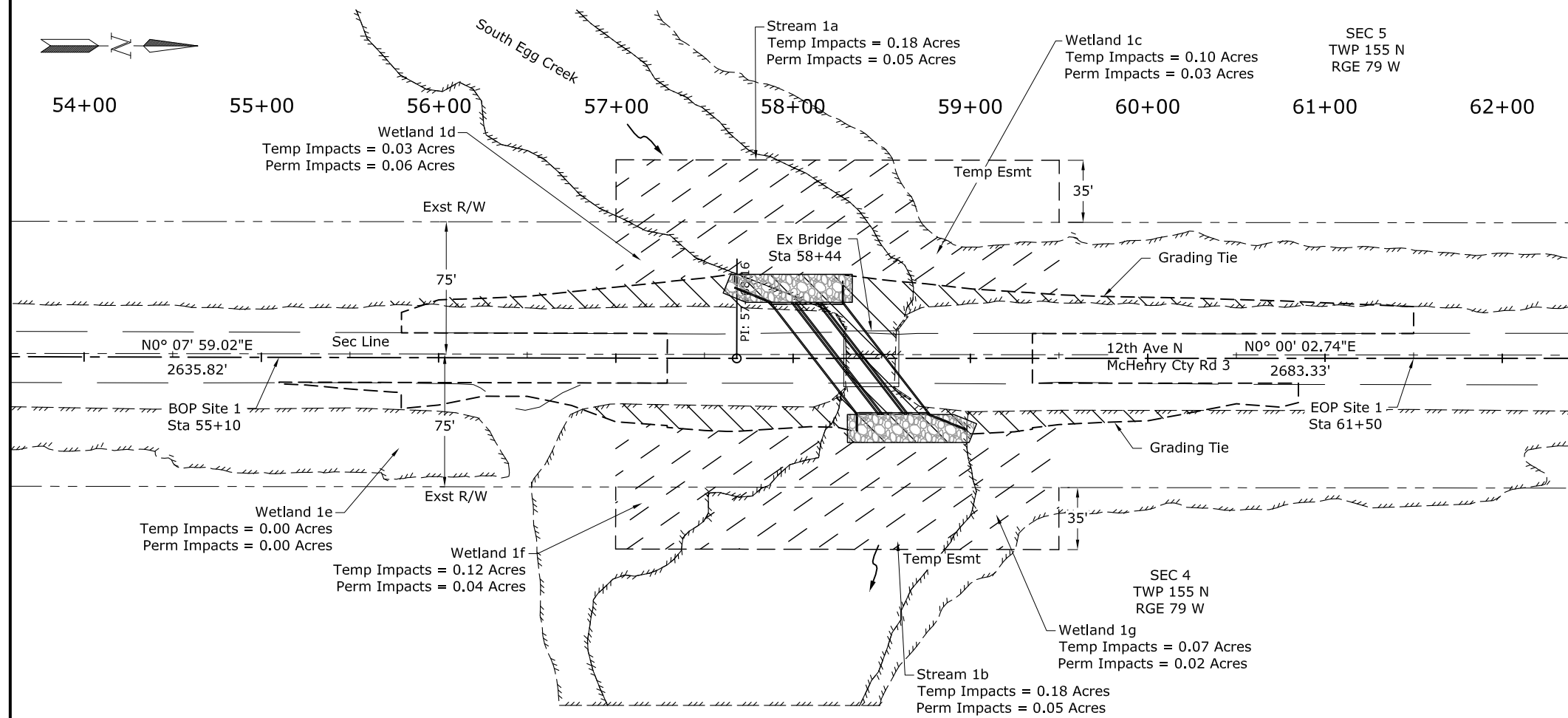
Impact Summary Table			
Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	Total (Acres)	Wetland Type	Total (Acres/Lf)
Natural/JD	0.15	Temporary JD	0.32
Natural/Non-JD	0	Non-JD Temporary	0
Artificial/JD	0	Permanent JD > 0.10	0.15
Artificial /Non-JD	0	Permanent OW	0.10 ac/122 ft.
Total	0.15	Temporary OW	0.36 ac/200 ft.

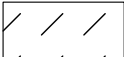
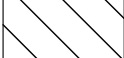
Mitigation Summary Table					
	Location	Onsite Acre(s)	11990 Bank Acre(s)	USACE/11990 Bank Acre(s)	USFWS Bank Acre(s)
USACE Only					
EO 11990 Only					
USACE/11990	DU	0		0.35	
USFWS					
Total		0	0	0.35	0

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Wetlands Mitigation and Environmental Site 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	75	2



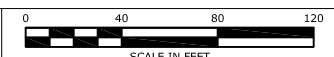
-  - Temporary Impacts
-  - Permanent Impacts



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Wetland Impacts
 Site 1
 STA. 54+00 TO 62+00

FILE:
BRP-BRC-2500(022).dwg



Wetland Impact Table																	
Wetland Number	Location	Wetland Feature	Wetland Feature	USACE Jurisdictional Wetlands ¹	Wetland Impacts Acre(s)		USFWS Easement Impacts Acre(s)		Wetland Mitigation								
					Temp.	Perm.	Temp.	Perm.	Mitigation Required			USACE/11990 Bank		11990 Bank		USFWS Bank	
									EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)
2a	Sec.17, T156N, R79W	Fringe Wetland	Natural	Yes	0.12	0.05	0	0	Y	Y	N	DU	0.05				
2b	Sec.17, T156N, R79W	Fringe Wetland	Natural	Yes	0.05	0	0	0	N	N	N						
2c	Sec.16, T156N, R79W	Fringe Wetland	Natural	Yes	0	0.05	0	0	Y	Y	N	DU	0.05				
2d	Sec.16, T156N, R79W	Fringe Wetland	Natural	Yes	0.03	0.04	0	0	Y	Y	N	DU	0.04				
					0.20	0.14	0	0				0.14		0		0	

Other Waters Impact Table																			
Other Waters														Other Water Mitigation					
Number	Location	Type	Size		Feature	USACE Jurisdictional ¹	Impacts to Other Waters (USACE)				Impacts to Other Waters (USFWS)				Mitigation Required			Mitigation Location; ratio	Method
			Acre(s)	Linear Feet			Acre(s)		Linear Feet		Acre(s)		Linear Feet		EO 11990	USACE	USFWS		
			Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	Temp	Perm	EO 11990	USACE	USFWS		
2	Sec.16&17, T156N, R79W	Hay Coulee	1.06	558	Natural	Yes	0.26	0.15	150	126	0	0	0	0	N	Y	N	DU @ 2:1	
Totals			1.06	558			0.26	0.15	150	126	0	0	0	0					

¹ A wetland Jurisdictional Determination was issued by the USACE on 3/07/2023; NWO-2009-00990-BIS.

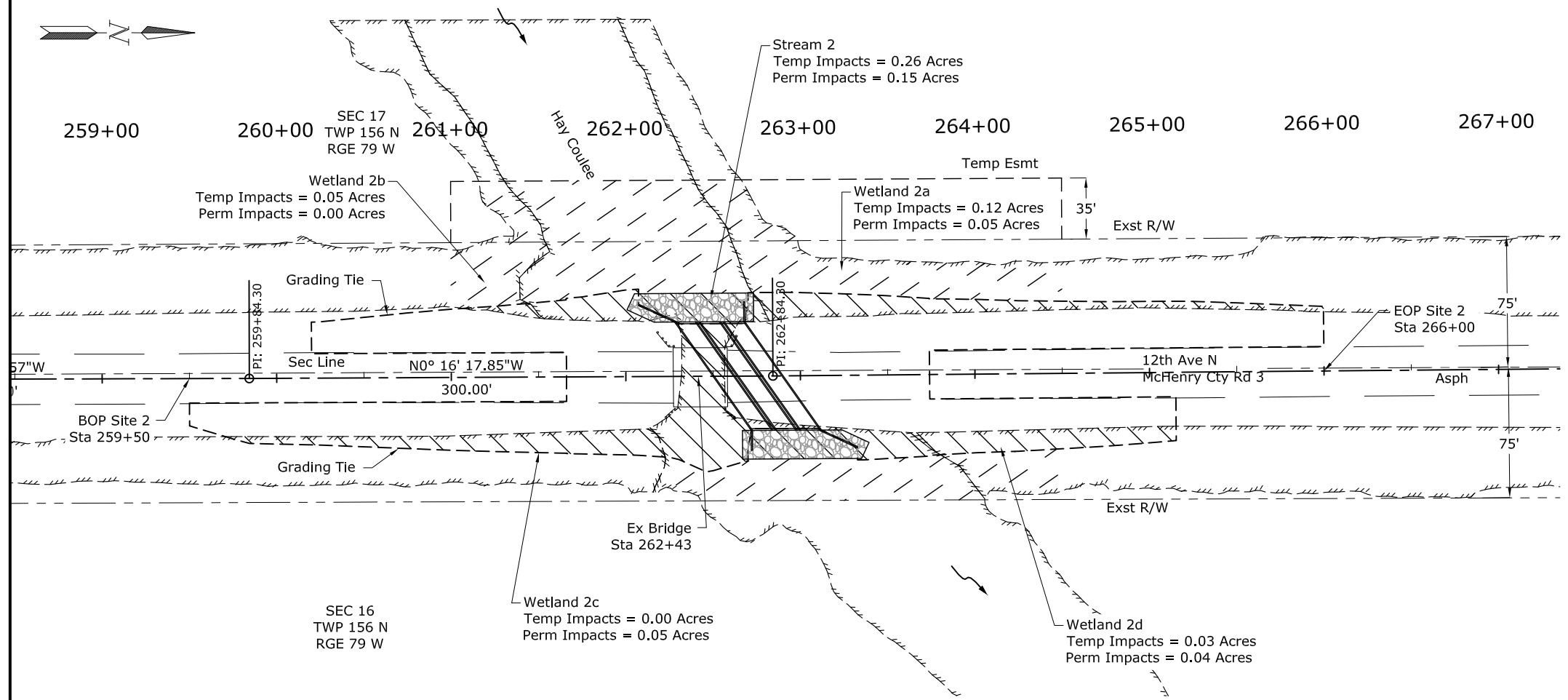
Impact Summary Table			
Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	Total (Acres)	Wetland Type	Total (Acres/Lf)
Natural/JD	0.14	Temporary JD	0.20
Natural/Non-JD	0	Non-JD Temporary	0
Artificial/JD	0	Permanent JD > 0.10	0.14
Artificial/Non-JD	0	Permanent OW	0.15 ac/126 ft.
Total	0.14	Temporary OW	0.26 ac/150 ft.

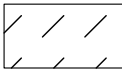
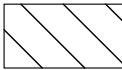
Mitigation Summary Table					
	Location	Onsite Acre(s)	11990 Bank Acre(s)	USACE/11990 Bank Acre(s)	USFWS Bank Acre(s)
USACE Only					
EO 11990 Only					
USACE/11990	DU	0		0.44	
USFWS					
Total		0	0	0.44	0

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Wetlands Mitigation and Environmental Site 2

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	75	4



-  - Temporary Impacts
-  - Permanent Impacts



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Wetland Impacts
Site 2
STA. 259+00 TO 267+00

FILE:
BRP-BRC-2500(022).dwg

0 40 80 120
SCALE IN FEET

Wetland Impact Table																	
Wetland Number	Location	Wetland Feature	Wetland Feature	USACE Jurisdictional Wetlands ¹	Wetland Impacts Acre(s)		USFWS Easement Impacts Acre(s)		Wetland Mitigation								
					Temp.	Perm.	Temp.	Perm.	Mitigation Required			USACE/11990 Bank		11990 Bank		USFWS Bank	
									EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)
1a	Sec.8, T156N, R79W	Fringe Wetland	Natural	Yes	0	0	0	0	N	N	N						
1b	Sec.8, T156N, R79W	Fringe Wetland	Natural	Yes	0.04	0.01	0	0	Y	Y	N	DU	0.01				
1c	Sec.8, T156N, R79W	Fringe Wetland	Natural	Yes	0.12	0.03	0	0	Y	Y	N	DU	0.03				
1d	Sec.9, T156N, R79W	Fringe Wetland	Natural	Yes	0.06	0.06	0	0	Y	Y	N	DU	0.06				
1e	Sec.9, T156N, R79W	Fringe Wetland	Natural	Yes	0.26	0.02	0	0	Y	Y	N	DU	0.02				
					0.48	0.12	0	0					0.12	0		0	

Other Waters Impact Table																
Other Waters										Other Water Mitigation						
Number	Location	Type	Size		Feature	USACE Jurisdictional ¹	Impacts to Other Waters				Mitigation Required			Mitigation Location; ratio	Method	
			Acre(s)	Linear Feet			Acre(s)		Linear Feet		EO 11990	USACE	USFWS			
							Temp	Perm	Temp	Perm						
1	Sec.8&9, T156N, R79W	Egg Creek	0.91	552	Natural	Yes	0.41	0.25	150	122	N	Y	N	DU @ 2:1		
Totals			0.91	552			0.41	0.25	150	122						

¹ A wetland Jurisdictional Determination was issued by the USACE on 12/22/2022; NWO-2009-02389-BIS.

Impact Summary Table			
Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	Total (Acres)	Wetland Type	Total (Acres/Lf)
Natural/JD	0.12	Temporary JD	0.48
Natural/Non-JD	0	Non-JD Temporary	0
Artificial/JD	0	Permanent JD > 0.10	0.12
Artificial /Non-JD	0	Permanent OW	0.25 ac/122 ft.
Total	0.12	Temporary OW	0.41 ac/150 ft.

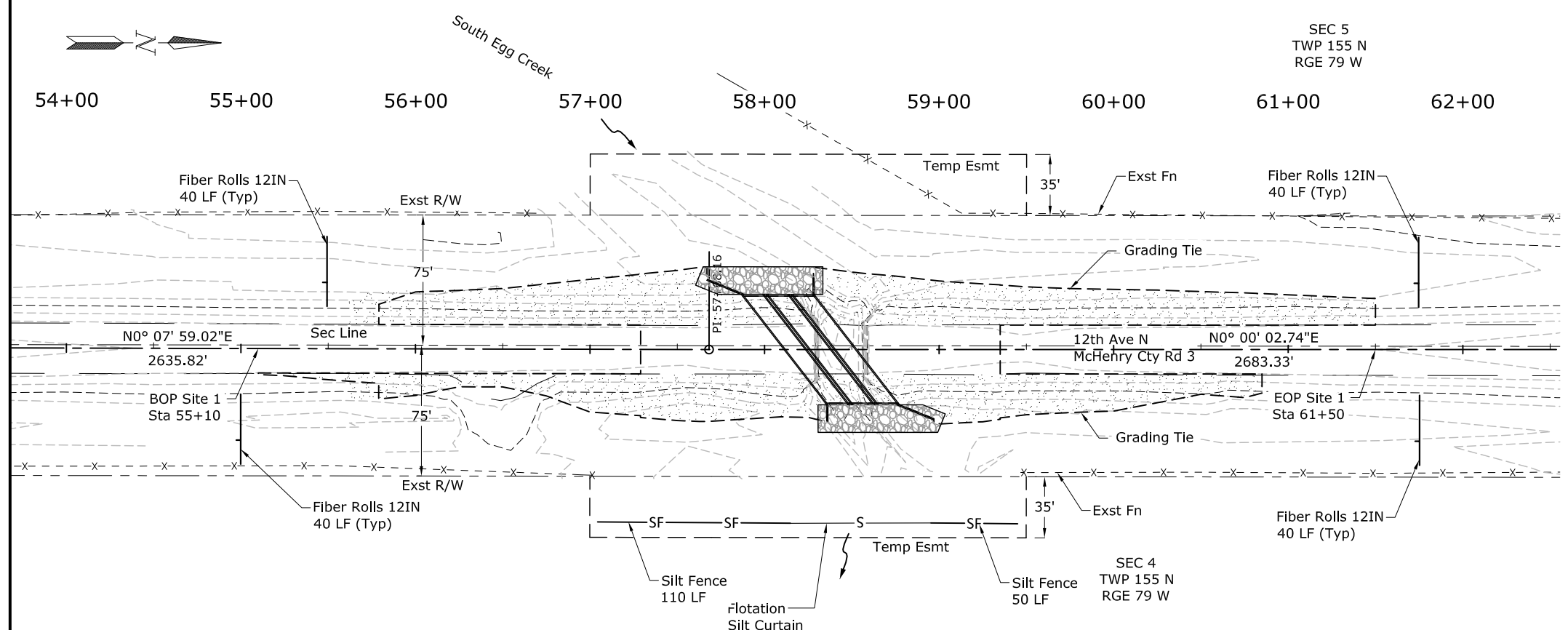
Mitigation Summary Table					
	Location	Onsite Acre(s)	11990 Bank Acre(s)	USACE/11990 Bank Acre(s)	USFWS Bank Acre(s)
USACE Only					
EO 11990 Only					
USACE/11990	DU	0		0.62	
USFWS					
Total		0	0	0.62	0

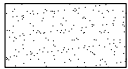


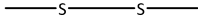
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Wetlands Mitigation and Environmental Site 3

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	76	1

SPEC CODE	BID ITEM	QTY	UNIT
<u>251-2000</u>	<u>TEMPORARY COVER CROP</u>		
	STA. 55+10 TO 61+50	0.8	ACRE
<u>253-0101</u>	<u>STRAW MULCH</u>		
	STA. 55+10 TO 61+50	0.8	ACRE
<u>260-0200</u>	<u>SILT FENCE SUPPORTED</u>		
	STA. 57+00 TO 59+50 RT	160	LF
<u>260-0201</u>	<u>REMOVE SILT FENCE SUPPORTED</u>		
	STA. 57+00 TO 59+50 RT	160	LF
<u>261-0112</u>	<u>FIBER ROLLS 12IN</u>		
	STA. 55+00 RT DITCH BOTTOM	40	LF
	STA. 55+50 LT DITCH BOTTOM	40	LF
	STA. 61+70 LT & RT DITCH BOTTOM	80	LF
<u>261-0113</u>	<u>REMOVE FIBER ROLLS 12IN</u>		
	STA. 55+00 RT DITCH BOTTOM	40	LF
	STA. 55+50 LT DITCH BOTTOM	40	LF
	STA. 61+70 LT & RT DITCH BOTTOM	80	LF
<u>262-0100</u>	<u>FLOTATION SILT CURTAIN</u>		
	STA. 58+00 TO 58+80 RT	80	LF
<u>262-0101</u>	<u>REMOVE FLOTATION SILT CURTAIN</u>		
	STA. 58+00 TO 58+80 RT	80	LF



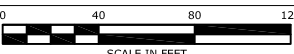
-  - Temporary Cover Crop and Straw Mulching
-  - Fiber Rolls 12IN
-  - Silt Fence Supported
-  - Flotation Silt Curtain



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Temporary Erosion Control
Site 1
STA. 54+00 TO 62+00

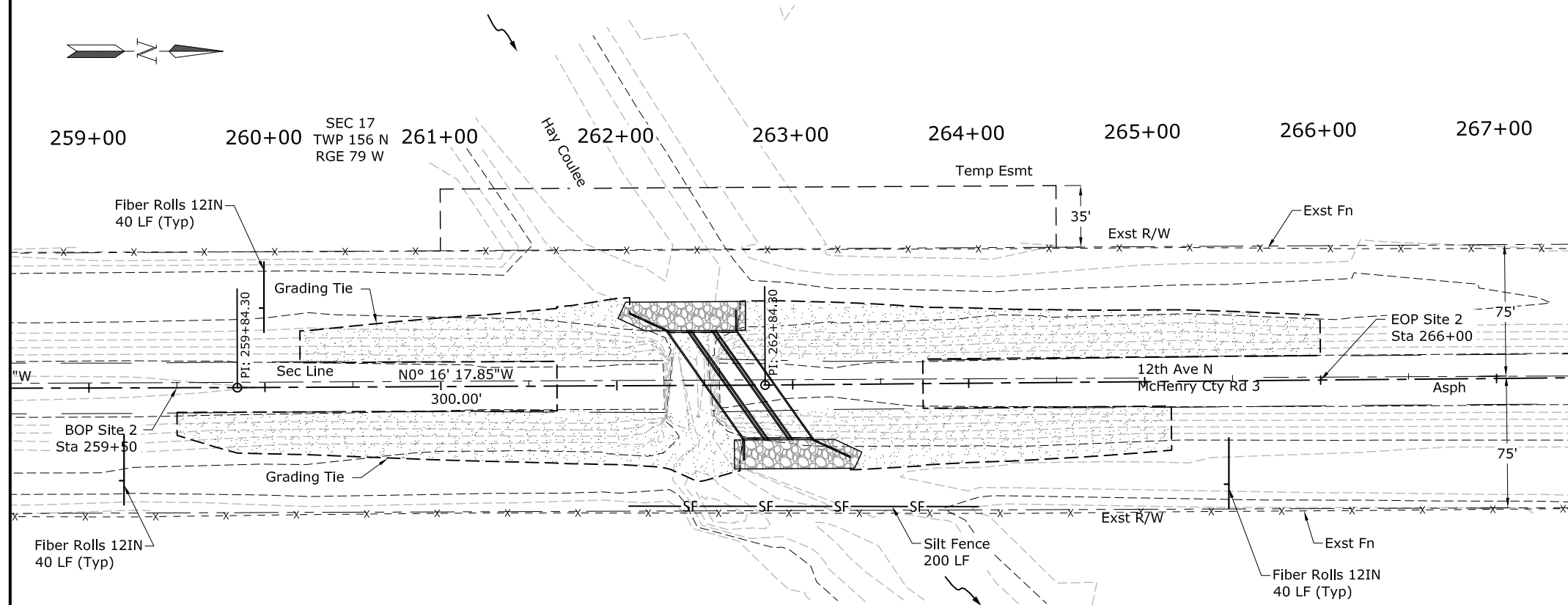
FILE: BRP-BRC-2500(022).dwg

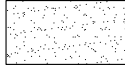





SCALE IN FEET

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	76	2

SPEC CODE	BID ITEM	QTY	UNIT
<u>251-2000</u>	<u>TEMPORARY COVER CROP</u>		
	STA. 259+50 TO 266+00	0.8	ACRE
<u>253-0101</u>	<u>STRAW MULCH</u>		
	STA. 259+50 TO 266+00	0.8	ACRE
<u>260-0200</u>	<u>SILT FENCE SUPPORTED</u>		
	STA. 262+00 TO 264+00 RT	200	LF
<u>260-0201</u>	<u>REMOVE SILT FENCE SUPPORTED</u>		
	STA. 262+00 TO 264+00 RT	200	LF
<u>261-0112</u>	<u>FIBER ROLLS 12IN</u>		
	STA. 259+20 RT DITCH BOTTOM	40	LF
	STA. 260+00 LT DITCH BOTTOM	40	LF
	STA. 265+50 RT DITCH BOTTOM	40	LF
<u>261-0113</u>	<u>REMOVE FIBER ROLLS 12IN</u>		
	STA. 259+20 RT DITCH BOTTOM	40	LF
	STA. 260+00 LT DITCH BOTTOM	40	LF
	STA. 265+50 RT DITCH BOTTOM	40	LF



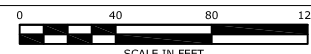
-  - Temporary Cover Crop and Straw Mulching
-  - Fiber Rolls 12IN
-  - Silt Fence Supported
-  - Flotation Silt Curtain



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Temporary Erosion Control
Site 2
STA. 259+00 TO 267+00

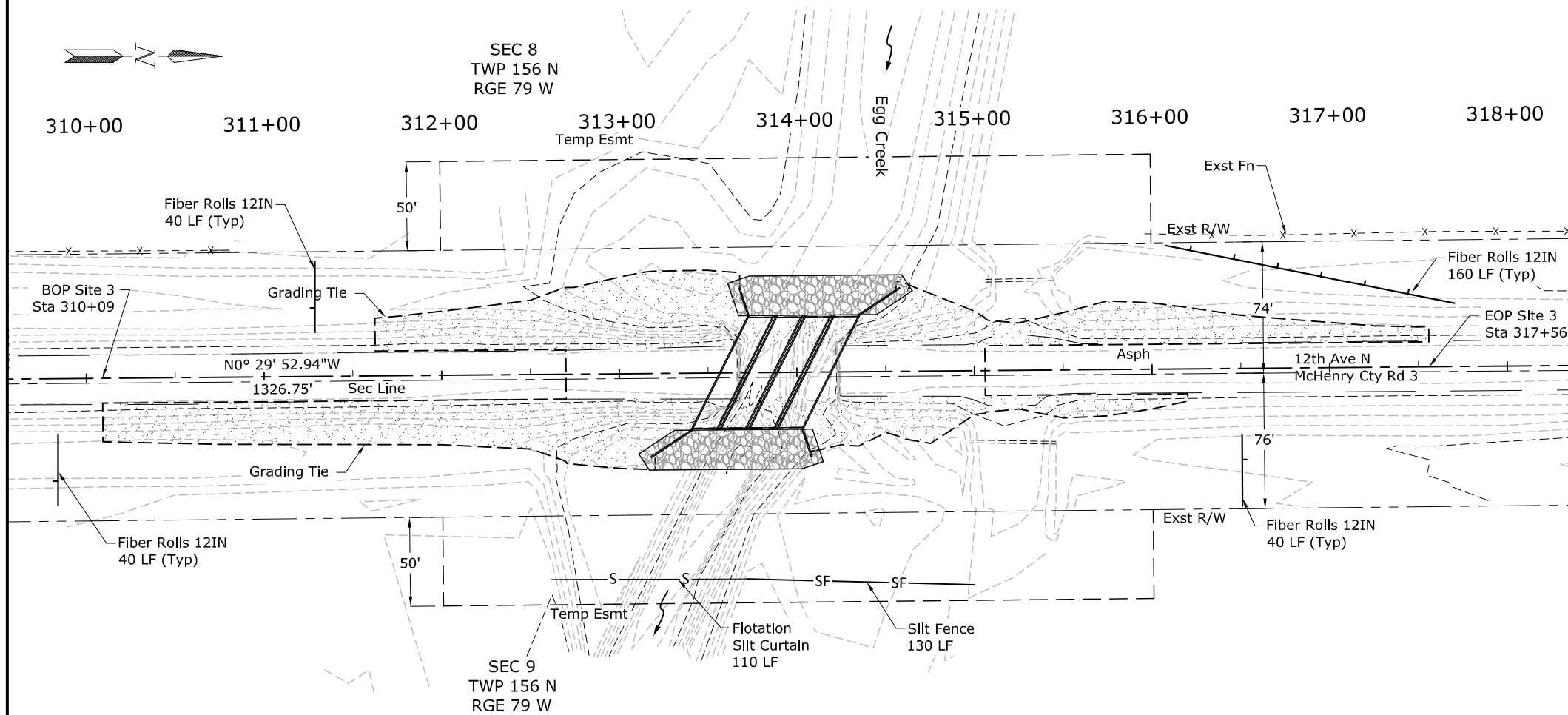
FILE: BRP-BRC-2500(022).dwg




SCALE IN FEET

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	76	3

SPEC CODE	BID ITEM	QTY	UNIT
<u>251-2000</u>	<u>TEMPORARY COVER CROP</u>		
	STA. 310+09 TO 317+56	0.8	ACRE
<u>253-0101</u>	<u>STRAW MULCH</u>		
	STA. 310+09 TO 317+56	0.8	ACRE
<u>260-0200</u>	<u>SILT FENCE SUPPORTED</u>		
	STA. 313+70 TO 315+00	130	LF
<u>260-0201</u>	<u>REMOVE SILT FENCE SUPPORTED</u>		
	STA. 313+70 TO 315+00	130	LF
<u>261-0112</u>	<u>FIBER ROLLS 12IN</u>		
	STA. 309+80 RT DITCH BOTTOM	40	LF
	STA. 311+30 LT DITCH BOTTOM	40	LF
	STA. 316+00 TO 317+60 LT DITCH BOTTOM	160	LF
	STA. 316+50 RT DITCH BOTTOM	40	LF
<u>261-0113</u>	<u>REMOVE FIBER ROLLS 12IN</u>		
	STA. 309+80 RT DITCH BOTTOM	40	LF
	STA. 311+30 LT DITCH BOTTOM	40	LF
	STA. 316+00 TO 317+60 LT DITCH BOTTOM	160	LF
	STA. 316+50 RT DITCH BOTTOM	40	LF
<u>262-0100</u>	<u>FLOTATION SILT CURTAIN</u>		
	STA. 312+60 TO 313+70 RT	110	LF
<u>262-0101</u>	<u>REMOVE FLOTATION SILT CURTAIN</u>		
	STA. 312+60 TO 313+70 RT	110	LF



 - Temporary Cover Crop and Straw Mulching

 - Fiber Rolls 12IN

 - Silt Fence Supported

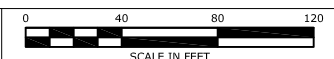
 - Flotation Silt Curtain



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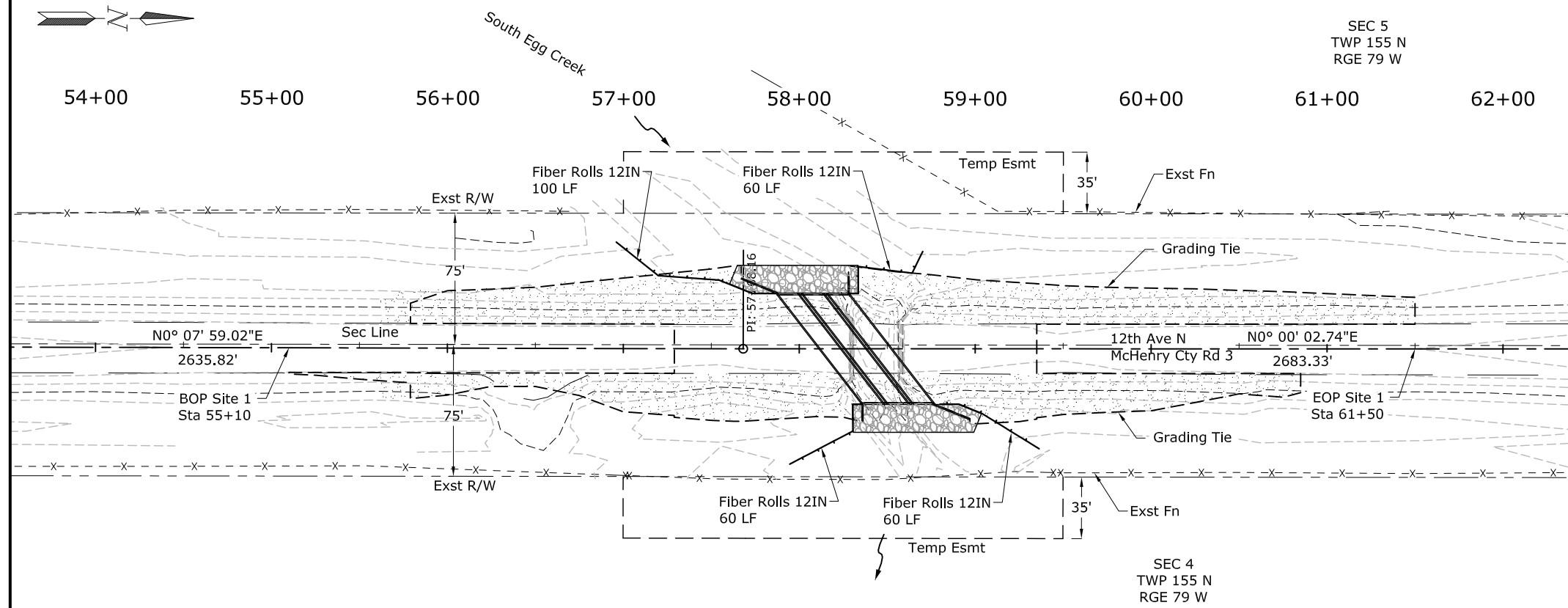
Temporary Erosion Control
Site 3
STA. 310+00 TO 318+00

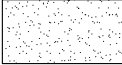
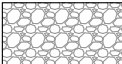


FILE:
BRP-BRC-2500(022).dwg



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	77	1

SPEC CODE BID ITEM	QTY UNIT
<u>251-0200 SEEDING CLASS II</u>	
STA. 55+10 TO 61+50	0.8 ACRE
<u>253-0101 STRAW MULCH</u>	
STA. 55+10 TO 61+50	0.8 ACRE
<u>256-0200 RIPRAP GRADE II</u>	
STA. 57+59 TO 58+34 LT	80 CY
STA. 58+30 TO 59+05 RT	80 CY
<u>261-0112 FIBER ROLLS 12IN</u>	
STA. 55+10 TO 61+50	280 LF
<u>709-0151 GEOSYNTHETIC MATERIAL TYPE RR</u>	
STA. 57+59 TO 58+34 LT	119 SY
STA. 58+30 TO 59+05 RT	119 SY



-  - Seeding Class 2 and Mulching
-  - Riprap
-  - Erosion Control Blanket Type 3
-  - Fiber Rolls 12IN

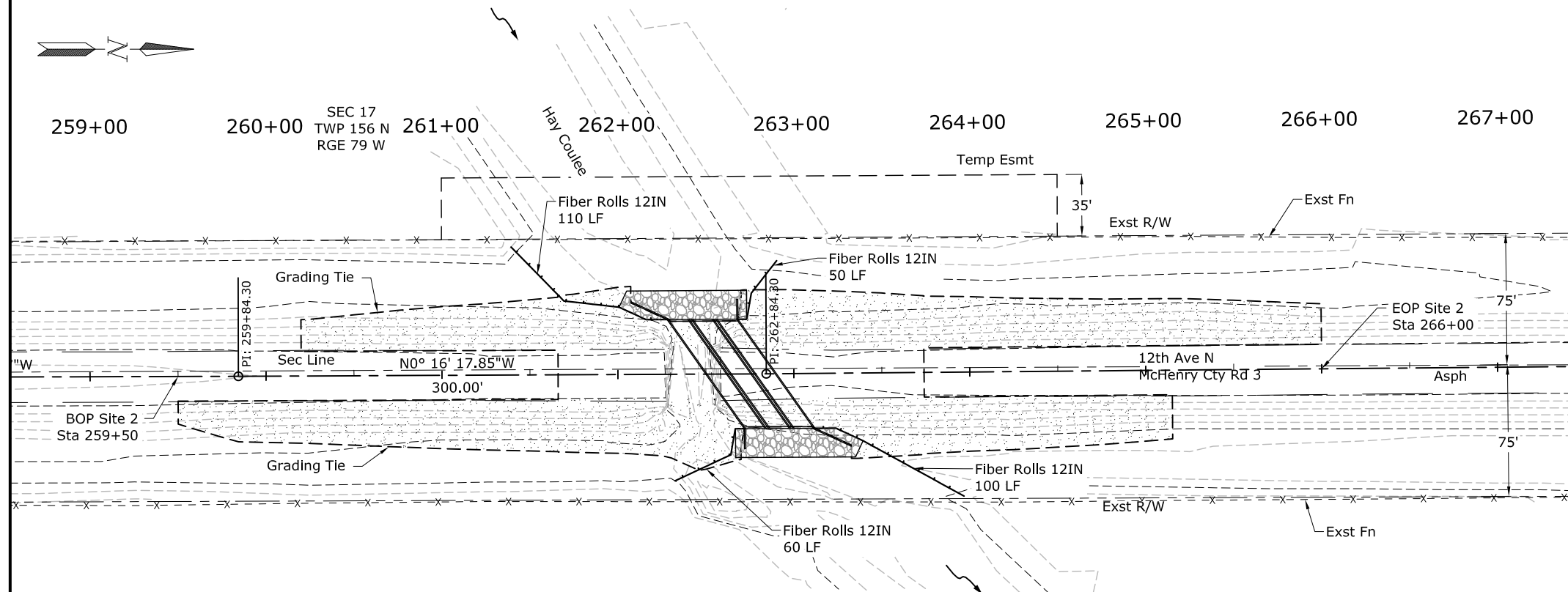


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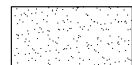
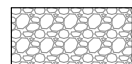

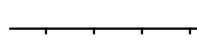
Permanent Erosion Control
 Site 1
 STA. 54+00 TO 62+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	77	2

SPEC CODE	BID ITEM	QTY	UNIT
<u>251-0200 SEEDING CLASS II</u>			
	STA. 259+50 TO 266+00	0.8	ACRE
<u>253-0101 STRAW MULCH</u>			
	STA. 259+50 TO 266+00	0.8	ACRE
<u>256-0200 RIPRAP GRADE II</u>			
	STA. 262+00 TO 262+76 LT	81	CY
	STA. 262+64 TO 263+39 RT	81	CY
<u>261-0112 FIBER ROLLS 12IN</u>			
	STA. 259+50 TO 266+00	320	LF
<u>709-0151 GEOSYNTHETIC MATERIAL TYPE RR</u>			
	STA. 262+00 TO 262+76 LT	121	SY
	STA. 262+64 TO 263+39 RT	121	SY



SEC 16
TWP 156 N
RGE 79 W

-  - Seeding Class 2 and Mulching
-  - Riprap
-  - Erosion Control Blanket Type 3
-  - Fiber Rolls 12IN



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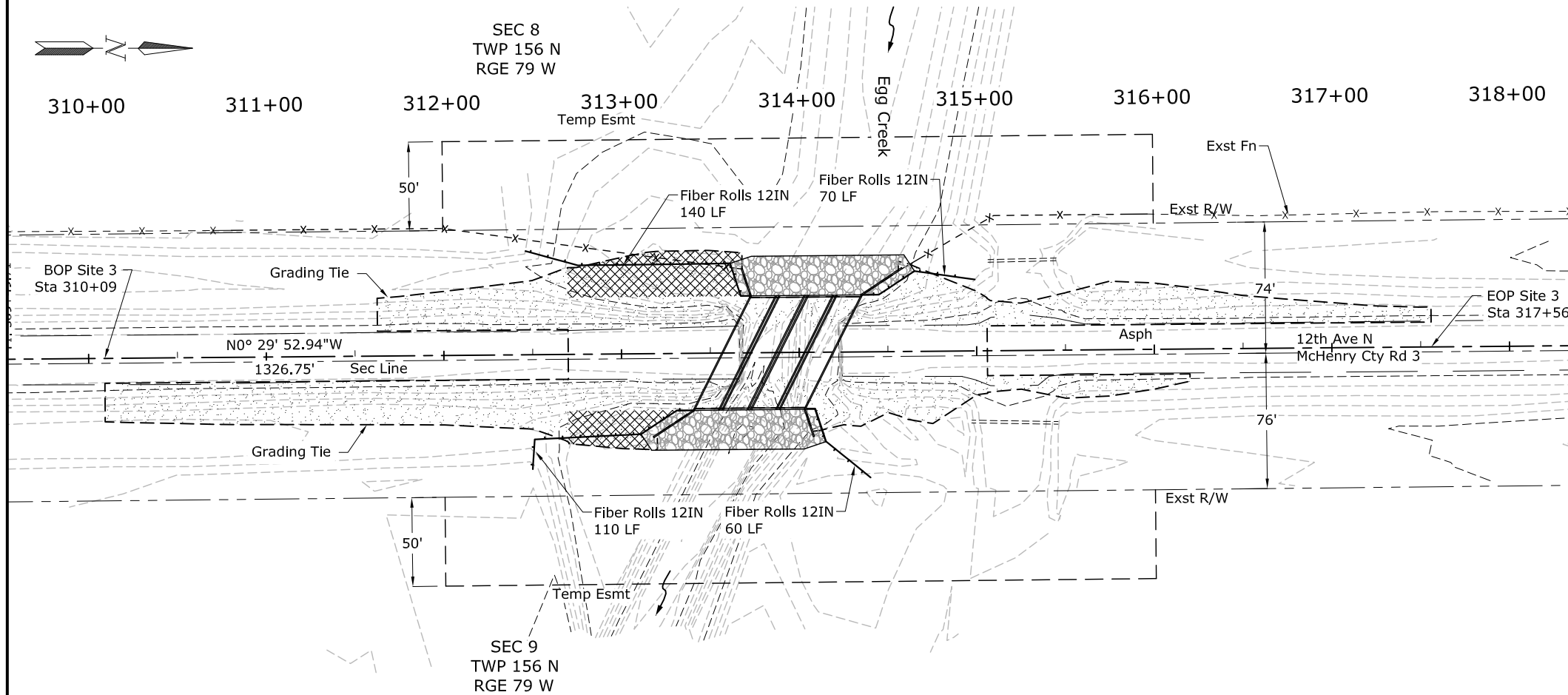
Permanent Erosion Control
Site 2
STA. 259+00 TO 267+00


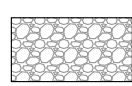
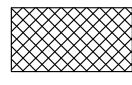
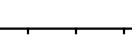
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0 40 80 120
SCALE IN FEET

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	77	3

SPEC CODE	BID ITEM	QTY	UNIT
251-0200	SEEDING CLASS II		
	STA. 310+09 TO 317+56	0.8	ACRE
253-0101	STRAW MULCH		
	STA. 310+09 TO 317+56	0.8	ACRE
255-0103	ECB TYPE 3		
	STA. 312+70 TO 313+68 LT	243	CY
	STA. 312+70 TO 313+31 RT	109	CY
256-0200	RIPRAP GRADE II		
	STA. 313+10 TO 314+14 RT	152	CY
	STA. 313+61 TO 314+65 LT	152	CY
261-0112	FIBER ROLLS 12IN		
	STA. 310+09 TO 317+56	380	LF
709-0151	GEOSYNTHETIC MATERIAL TYPE RR		
	STA. 313+10 TO 314+14 RT	227	SY
	STA. 313+61 TO 314+65 LT	227	SY



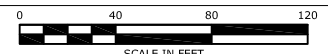
-  - Seeding Class 2 and Mulching
-  - Riprap
-  - Erosion Control Blanket Type 3
-  - Fiber Rolls 12IN



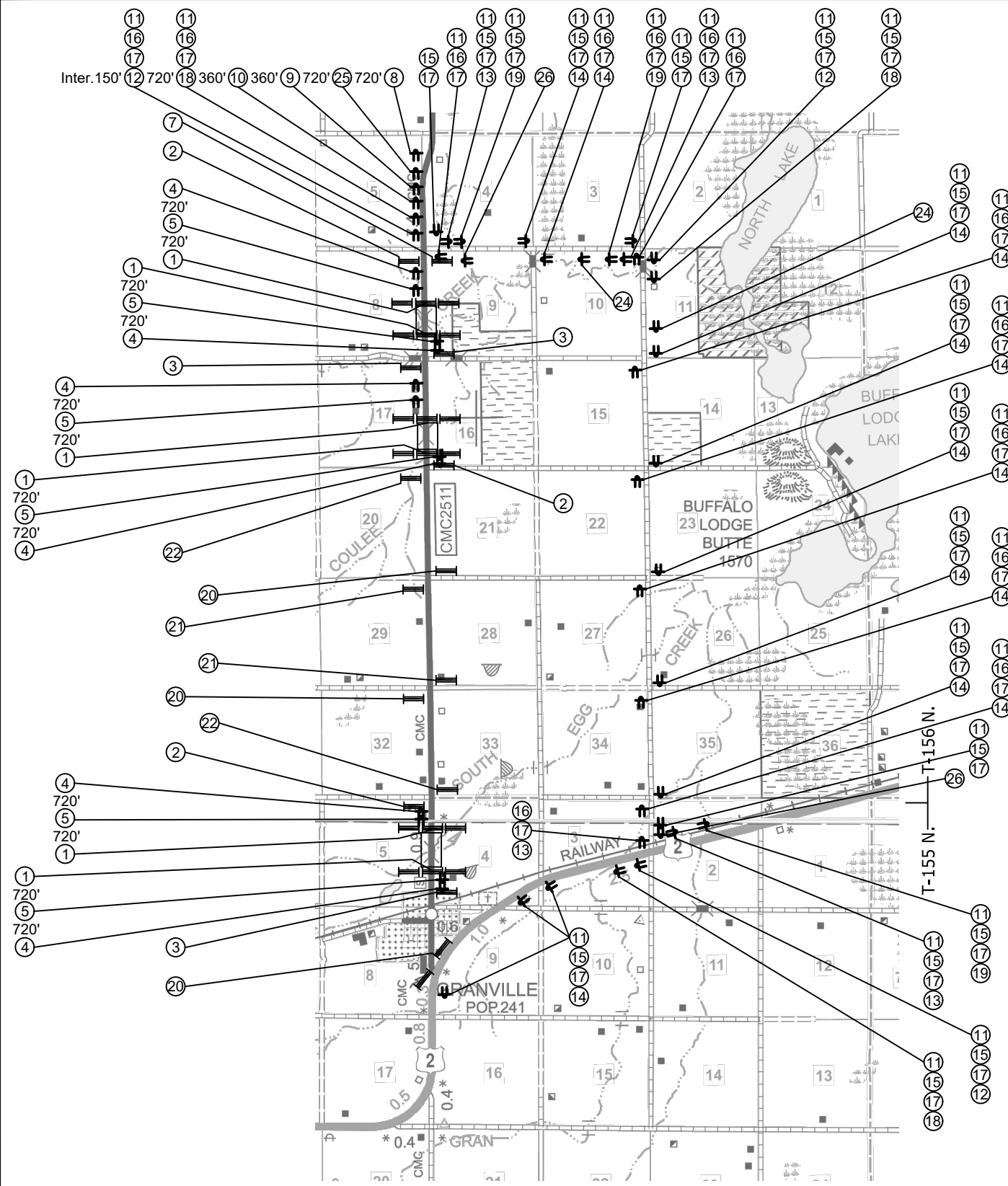
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Permanent Erosion Control
 Site 3
 STA. 310+00 TO 318+00

FILE: BRP-BRC-2500(022).dwg



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	BRP-BRC-2500(022)	100	2



Traffic Control Layout

LEGEND

- ① - R11-2-48 Road Closed (Barricade Mounted)
- ② - R11-3a-60 Road Closed 0.3 Miles Ahead Local Traffic Only (Barricade Mounted)
- ③ - R11-3a-60 Road Closed 0.6 Miles Ahead Local Traffic Only (Barricade Mounted)
- ④ - W20-3-48 Road Closed 1,440 FT (Post Mounted)
- ⑤ - W20-3-48 Road Closed 720 FT (Post Mounted)
- ⑥ - M4-10R-48 Detour Arrow (Barricade Mounted)
- ⑦ - M4-10L-48 Detour Arrow (Barricade Mounted)
- ⑧ - W20-3-48 Road Closed Ahead (Post Mounted)
- ⑨ - W20-2-48 Detour 1,590 FT (Post Mounted)
- ⑩ - W20-2-48 Detour 1,230 FT (Post Mounted)
- ⑪ - M4-8-24 Detour (Post Mounted)
- ⑫ - M6-1-21 Arrow Left (Post Mounted)
- ⑬ - M6-1-21 Arrow Right (Post Mounted)
- ⑭ - M6-3-21 Arrow Up (Post Mounted)
- ⑮ - M3-1-24 North (Post Mounted)
- ⑯ - M3-3-24 South (Post Mounted)
- ⑰ - M1-6-24 County Road 3 Route Marker (Post Mounted)
- ⑱ - M5-1-21 Advance Arrow Left (Post Mounted)
- ⑲ - M5-1-21 Advance Arrow Right (Post Mounted)
- ⑳ - R11-3a-60 Road Closed 1.3 Miles Ahead Local Traffic Only (Barricade Mounted)
- ㉑ - R11-3a-60 Road Closed 2.3 Miles Ahead Local Traffic Only (Barricade Mounted)
- ㉒ - R11-3a-60 Road Closed 3.3 Miles Ahead Local Traffic Only (Barricade Mounted)
- ㉓ - R11-3a-60 Road Closed 15 Miles Ahead Local Traffic Only (Barricade Mounted)
- ㉔ - W38-1-48 5 TON Restricted Bridge Ahead (Post Mounted)
- ㉕ - W20-2-48 Detour Ahead 5 TON Limit (Post Mounted)
- ㉖ - W20-2-48 Detour 5 TON Limit (Post Mounted)

Notes:

1. The Contractor shall maintain the signed detour route roadways during the project. Maintenance shall include grading the gravel to maintain a smooth and bound surface for the public. Water for compaction and as a dust palliative may be required. The costs required to complete this work shall be included into the bid price for other bid items.

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Work Zone Traffic Control

REVISED: 00/00/0000

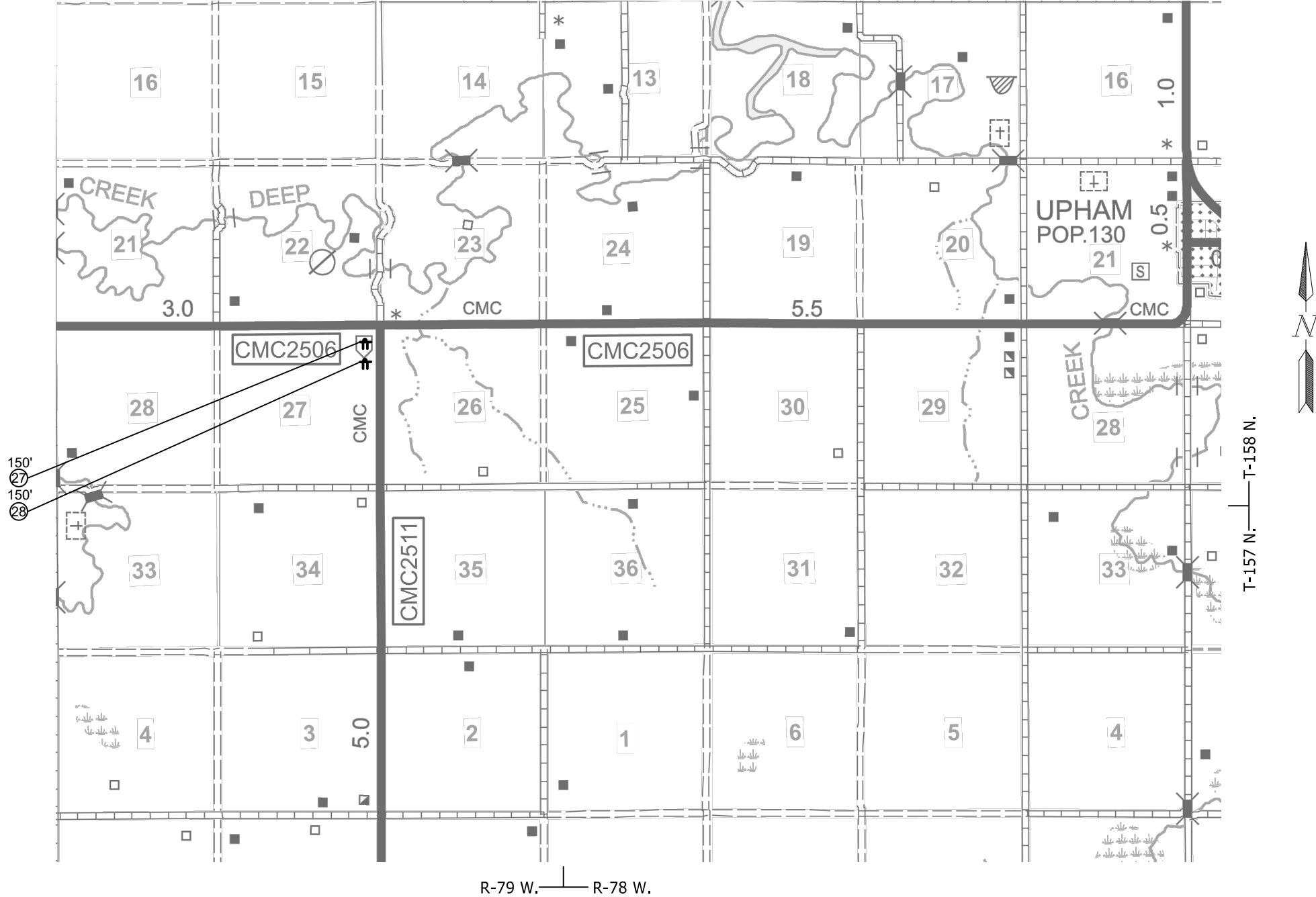


DRAWN BY: JRB CHECKED BY: JWM DATE: 10/18/2023

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
N.D.	BRP-BRC-2500(022)	100	3

LEGEND

- ②7 - W20-3-48 Road Closed 15 Miles (Post Mounted)
- ②8 - W20-2-48 Detour 15 Miles 5 Ton Limit (Post Mounted)



Traffic Control Layout

Notes:
 1. The Contractor shall maintain the signed detour route roadways during the project. Maintenance shall include grading the gravel to maintain a smooth and bound surface for the public. Water for compaction and as a dust palliative may be required. The costs required to complete this work shall be included into the bid price for other bid items.

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Work Zone Traffic Control		
REVISED: 00/00/0000		
		WOLD ENGINEERING, P.C.
DRAWN BY: JRB	CHECKED BY: JWM	DATE: 10/18/2023
© Wold Engineering, P.C. 2023		

1
R11-2-48
Barricade Mounted

Type III Barricade Post Mounted

2
R11-3a-60
Barricade Mounted

Type III Barricade Post Mounted

3
R11-3a-60
Barricade Mounted

Type III Barricade Post Mounted

4
ROAD CLOSED
1440 FT

W20-3-48 Post Mounted

5
ROAD CLOSED
720 FT

W20-3-48 Post Mounted

6
M4-10R-48
Barricade Mounted

Type III Barricade Post Mounted

7
M4-10R-48
Barricade Mounted

Type III Barricade Post Mounted

8
ROAD CLOSED
AHEAD

W20-3-48 Post Mounted

9
DETOUR
1590 FT

W20-2-48 Post Mounted

10
DETOUR
1230 FT

W20-2-48 Post Mounted

11
15
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20
R11-3a-60
Barricade Mounted

Type III Barricade Post Mounted

21
R11-3a-60
Barricade Mounted

Type III Barricade Post Mounted

22
R11-3a-60
Barricade Mounted

Type III Barricade Post Mounted

23
R11-3a-60
Barricade Mounted

Type III Barricade Post Mounted

24
5 TON
RESTRICTED
BRIDGE
AHEAD

W38-1-48 Post Mounted

25
DETOUR
AHEAD
5 TON
LIMIT

W20-2-48 Post Mounted

26
DETOUR
5 TON
LIMIT

W20-2-48 Post Mounted

27
ROAD
CLOSED
15 MILES

W20-3-48 Post Mounted

28
DETOUR
15 MILES
5 TON
LIMIT

W20-2-48 Post Mounted

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Traffic Control Sign Assembly

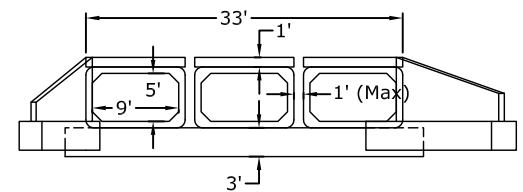
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WOLD ENGINEERING, P.C.

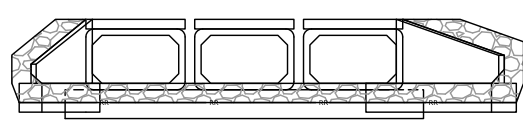
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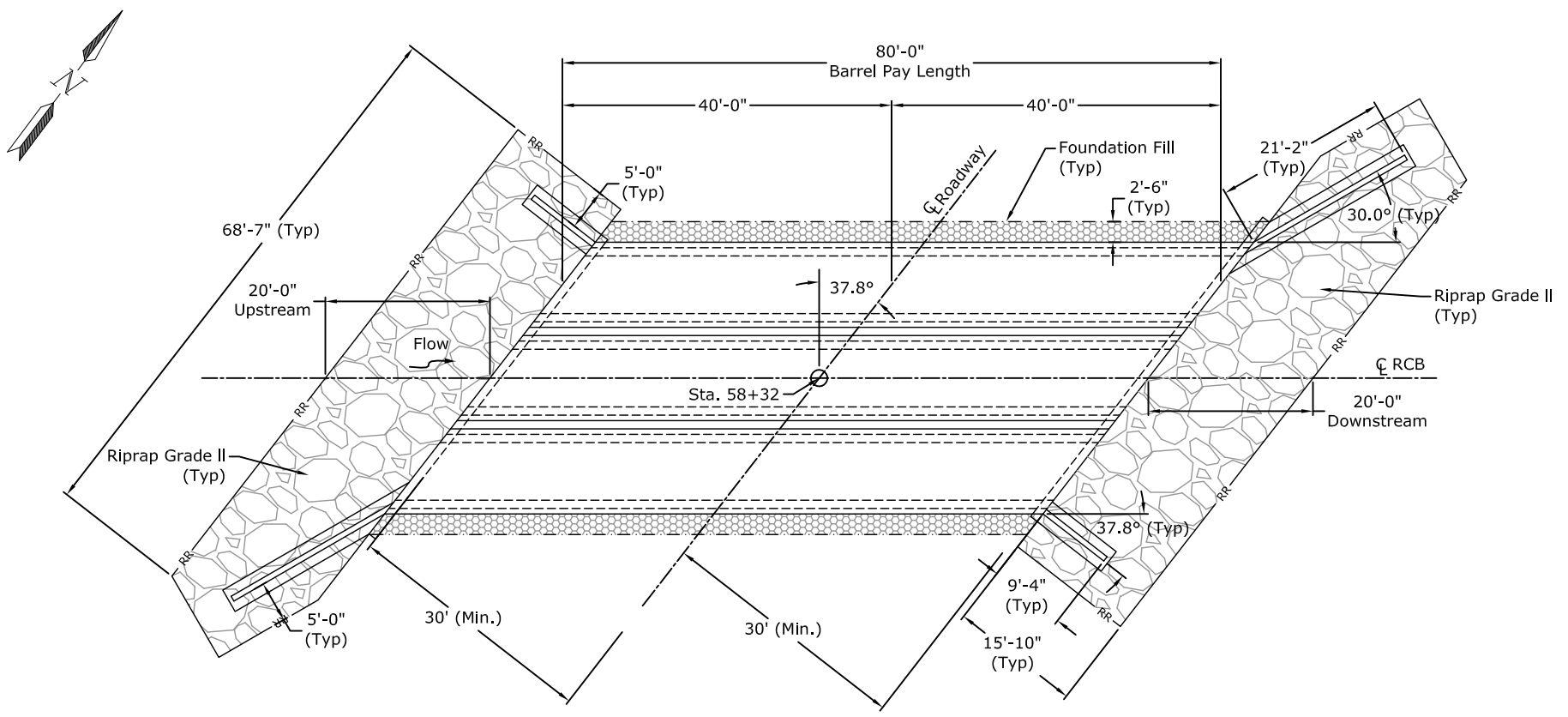
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	170	1



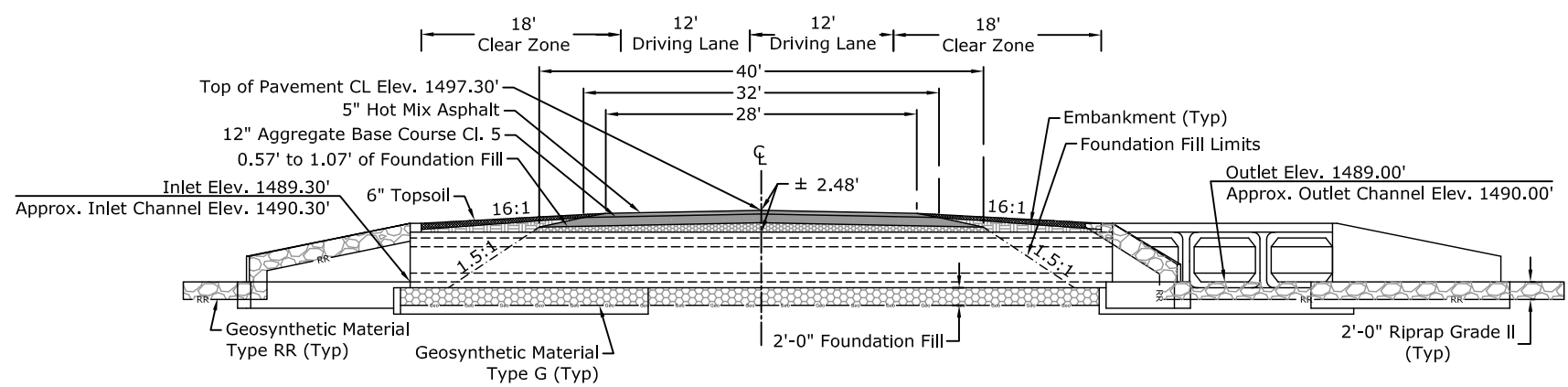
END VIEW
(Showing Dimensions)



END VIEW
(Showing Finished Section)



PLAN



ELEVATION



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HYDRAULIC DATA	
DRAINAGE AREA	33.9 sq. miles
STREAM SLOPE	0.00108 ft/ft
DESIGN FREQUENCY	25 year
DESIGN DISCHARGE	589 cfs
DESIGN HEADWATER STAGE	1,495.31'
DESIGN TAILWATER STAGE	1,494.06'
DESIGN VELOCITY	5.45 fps
100-YEAR FREQUENCY DISCHARGE	1,000 cfs
100-YEAR FREQUENCY HEADWATER	1,497.41'
OVERTOPPING STAGE	1,497.30'
OVERTOPPING DISCHARGE	980 cfs

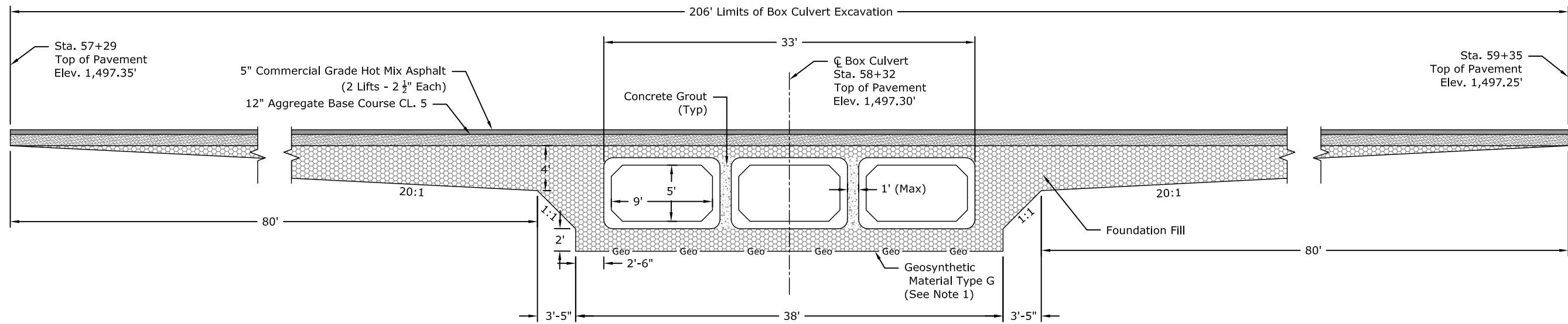
Reinforced Concrete Box Culvert Quantities				
SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0108	REMOVAL OF STRUCTURE-SITE 1	L SUM	1
210	0051	BOX CULVERT EXCAVATION - SITE 1	EA	1
210	0210	FOUNDATION FILL	CY	904
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
606	0905	9FT X 5FT PRECAST RCB CULVERT	LF	240
606	4905	9FT X 5FT PRECAST RCB END SECTION	EA	2
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	338

Precast Box Culvert Layout
Site 1

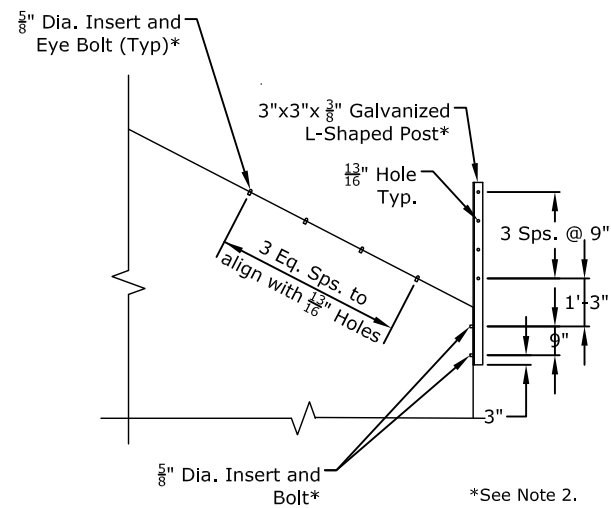
FILE: BRP-BRC-2500(022).dwg

SCALE IN FEET

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	170	2



Box Culvert Excavation
& Backfill Detail
(Showing Section along ϵ of Road)



End Section Insert and
L-Shape Post Detail

NOTES:

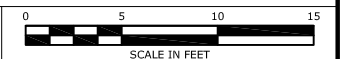
1. Geo fabric will extend to the cutoff wall.
2. Provide and install inserts, eye bolts, L-shaped post and bolts in the walls of the end sections corresponding to the locations of the proposed fence.



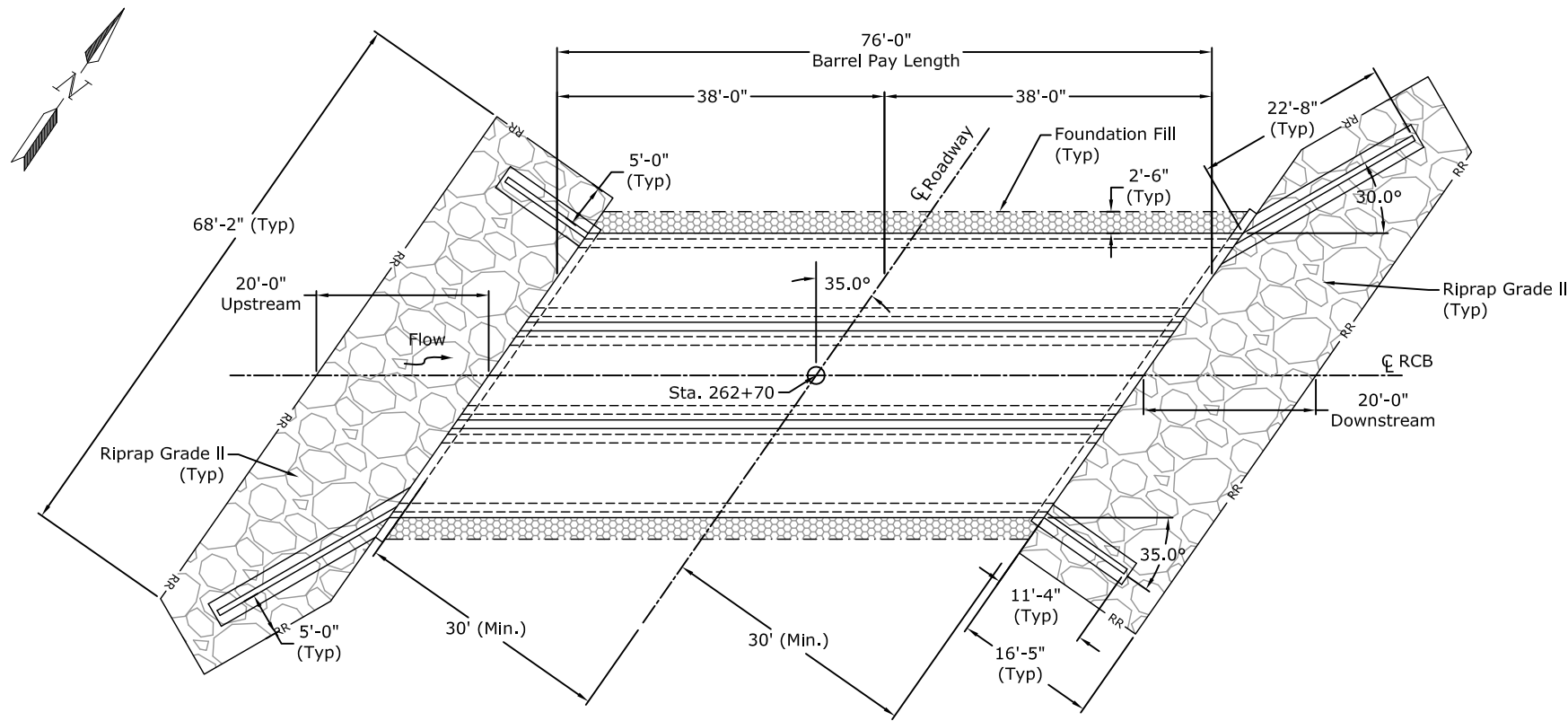
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Excavation & Backfill Details
Site 1

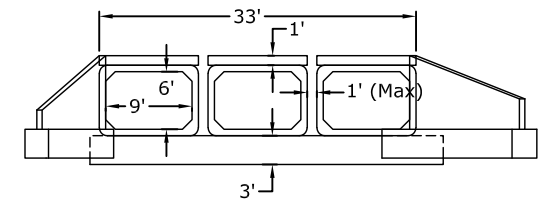
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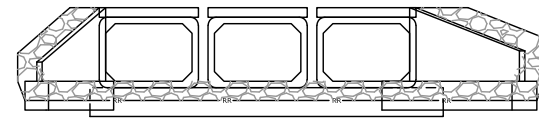
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	170	3



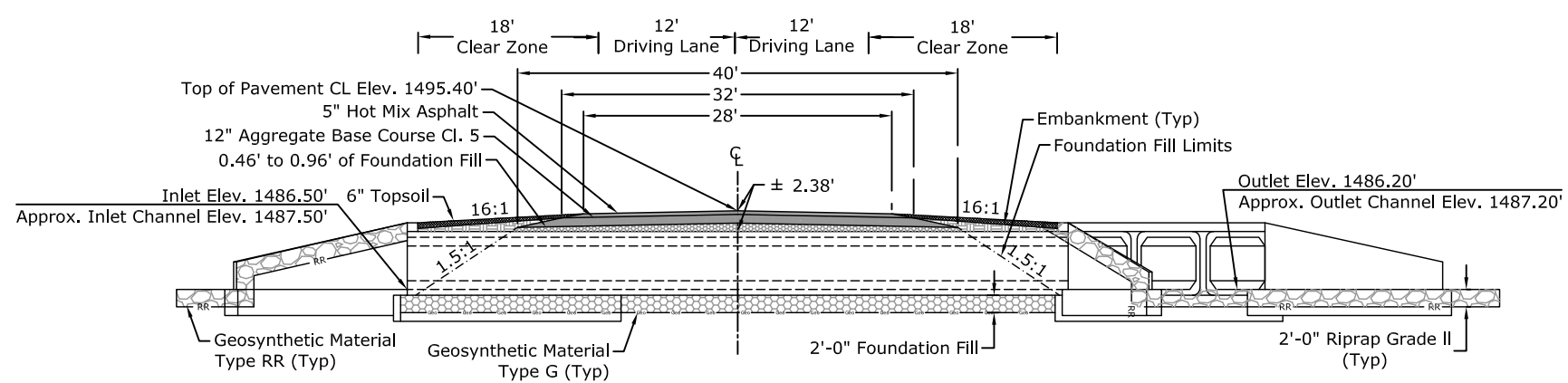
PLAN



END VIEW
(Showing Dimensions)



END VIEW
(Showing Finished Section)



ELEVATION



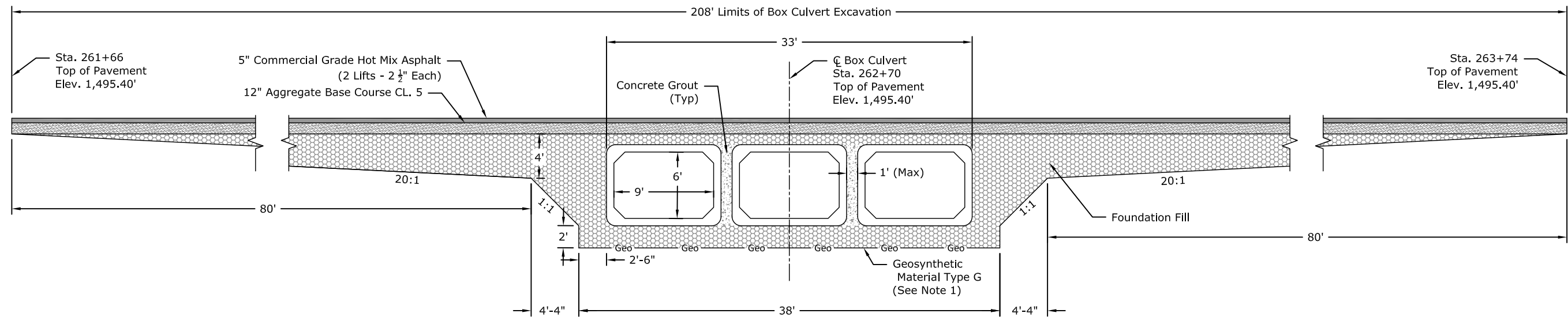
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HYDRAULIC DATA	
DRAINAGE AREA	81.8 sq. miles
STREAM SLOPE	0.000867 ft/ft
DESIGN FREQUENCY	25 year
DESIGN DISCHARGE	799 cfs
DESIGN HEADWATER STAGE	1,493.38'
DESIGN TAILWATER STAGE	1,492.33'
DESIGN VELOCITY	6.10 fps
100-YEAR FREQUENCY DISCHARGE	1,059 cfs
100-YEAR FREQUENCY HEADWATER	1,494.38'
OVERTOPPING STAGE	1,492.54'
OVERTOPPING DISCHARGE	N/A cfs

Reinforced Concrete Box Culvert Quantities				
SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0109	REMOVAL OF STRUCTURE-SITE 2	L SUM	1
210	0052	BOX CULVERT EXCAVATION - SITE 2	EA	1
210	0210	FOUNDATION FILL	CY	914
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
606	0906	9FT X 6FT PRECAST RCB CULVERT	LF	228
606	4906	9FT X 6FT PRECAST RCB END SECTION	EA	2
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	321

Precast Box Culvert Layout
Site 2

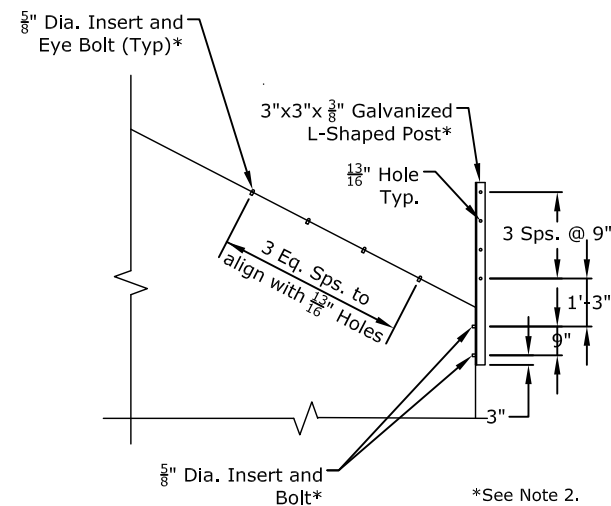
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRP-BRC-2500(022)	170	4



Box Culvert Excavation
& Backfill Detail
(Showing Section along ϵ of Road)

NOTES:

1. Geo fabric will extend to the cutoff wall.
2. Provide and install inserts, eye bolts, L-shaped post and bolts in the walls of the end sections corresponding to the locations of the proposed fence.



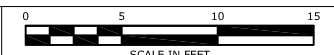
End Section Insert and
L-Shape Post Detail



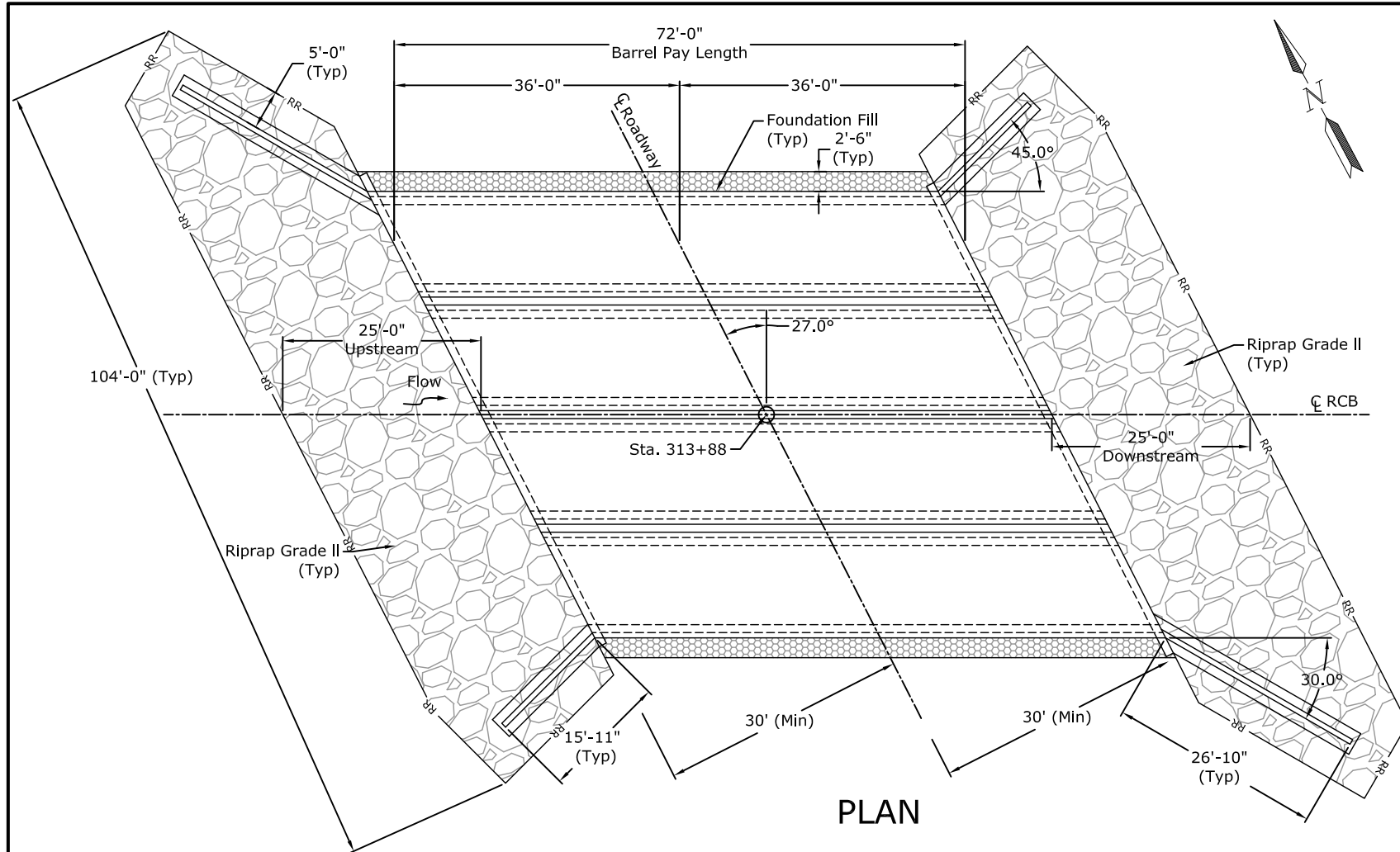
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Excavation & Backfill Details
Site 2

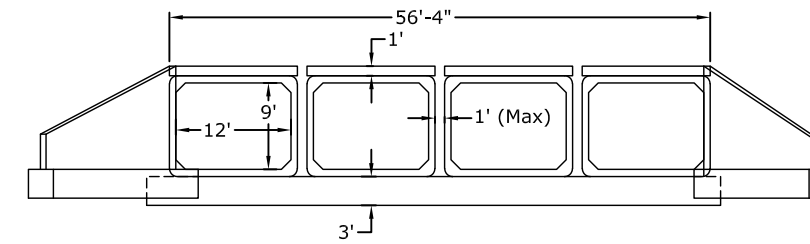
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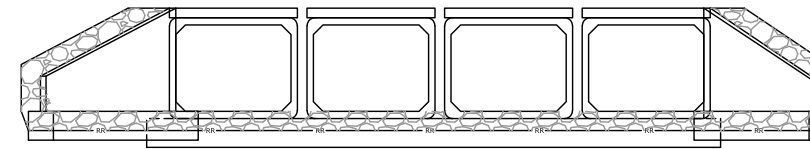
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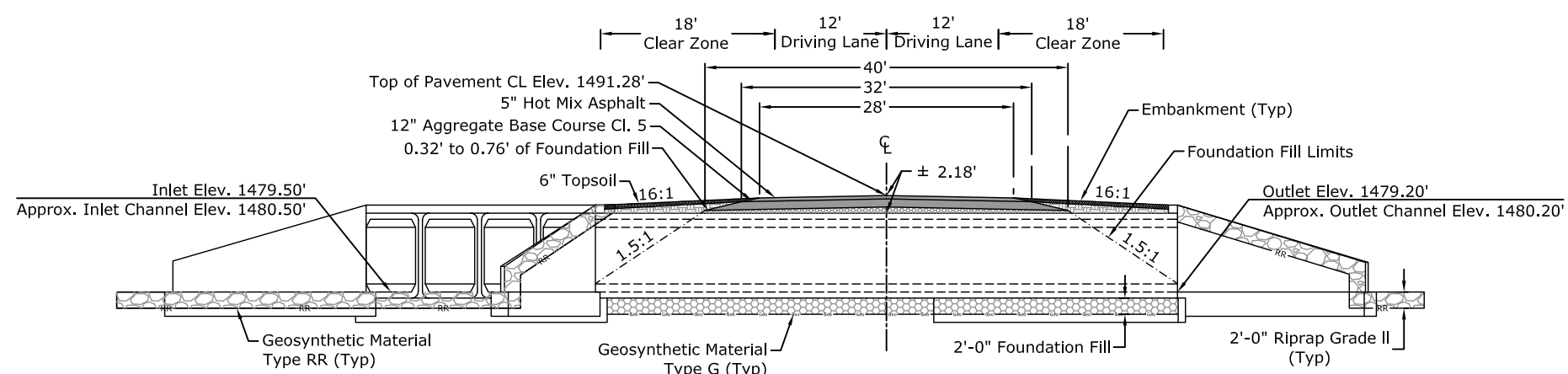
PLAN



END VIEW
(Showing Dimensions)



END VIEW
(Showing Finished Section)



ELEVATION



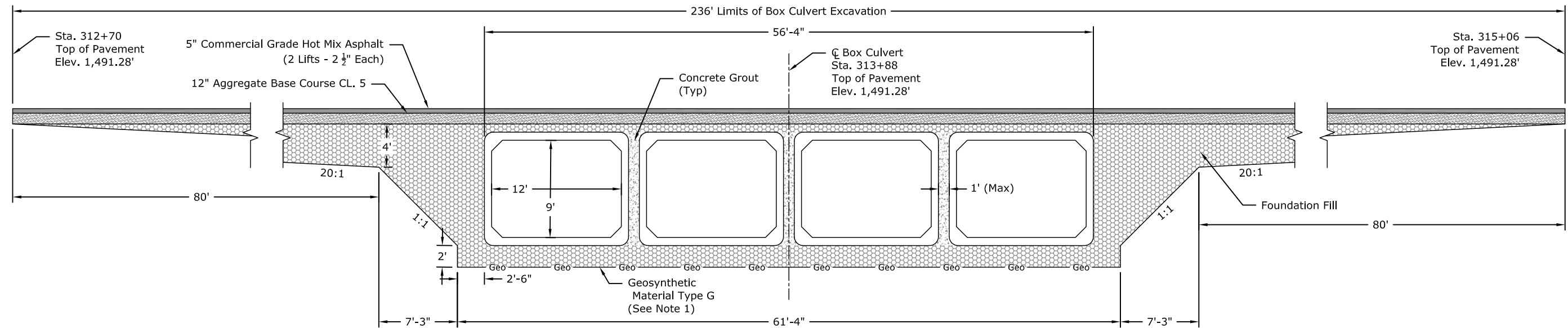
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HYDRAULIC DATA	
DRAINAGE AREA	147 sq. miles
STREAM SLOPE	0.000686 ft/ft
DESIGN FREQUENCY	25 year
DESIGN DISCHARGE	1,538 cfs
DESIGN HEADWATER STAGE	1,490.04'
DESIGN TAILWATER STAGE	1,489.61'
DESIGN VELOCITY	4.01 fps
100-YEAR FREQUENCY DISCHARGE	2,921 cfs
100-YEAR FREQUENCY HEADWATER	1,491.36'
OVERTOPPING STAGE	1,491.27'
OVERTOPPING DISCHARGE	2,800 cfs

Reinforced Concrete Box Culvert Quantities				
SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0110	REMOVAL OF STRUCTURE-SITE 3	L SUM	1
210	0053	BOX CULVERT EXCAVATION - SITE 3	EA	1
210	0210	FOUNDATION FILL	CY	1,152
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
606	1209	12FT X 9FT PRECAST RCB CULVERT	LF	288
606	5209	12FT X 9FT PRECAST RCB END SECTION	EA	2
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	491

Precast Box Culvert Layout
Site 3

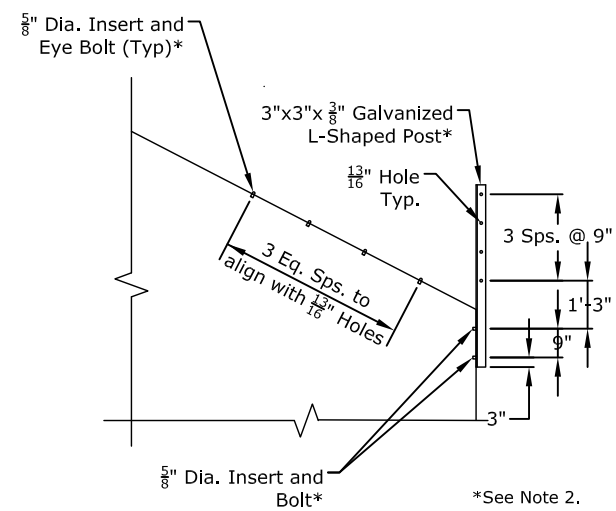
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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**Box Culvert Excavation
& Backfill Detail**
(Showing Section along ϵ of Road)

NOTES:

1. Geo fabric will extend to the cutoff wall.
2. Provide and install inserts, eye bolts, L-shaped post and bolts in the walls of the end sections corresponding to the locations of the proposed fence.



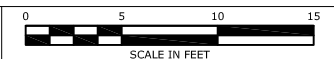
**End Section Insert and
L-Shape Post Detail**



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Excavation & Backfill Details
Site 3

FILE:
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NOTES

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100-P01 SCOPE OF WORK: Site 1 consists of removing the existing bridge and installing a triple 9 feet span by 5 feet high precast concrete box culvert. Site 2 consists of removing the existing bridge and installing a triple 9 feet span by 6 feet high precast concrete box culvert. Site 3 consists of removing the existing bridge and installing a quad 12 feet span by 9 feet high precast concrete box culvert.

202-P01 REMOVAL OF STRUCTURE: The existing structure at Site 1 from station 58+29 to 58+59 shall be removed. The existing structure is a 30.8-foot single span concrete channel beam bridge with timber abutments. The structure has a clear roadway width of 30.8 feet. The existing structure at Site 2 from station 262+27 to 262+59 shall be removed. The existing structure is a 32.2-foot single span concrete channel beam bridge with timber abutments. The structure has a clear roadway width of 32.8 feet. The existing structure at Site 3 from station 313+66 to 314+24 shall be removed. The existing structure is a 58.1-foot two span concrete channel beam bridge with timber abutments. The structure has a clear roadway width of 30.5 feet. The Contractor shall notify McHenry County two (2) weeks prior to removal. The Contractor shall remove and deliver the existing concrete channel beams, and related hardware to the McHenry County Stockyard (2nd St SW, West side of Granville). The Contractor will coordinate this work with Darlene Carpenter (1-701-537-5724).

The bid item "REMOVAL OF STRUCTURE" shall include:

1. The concrete channel beams, and related hardware shall remain the property of the County.
2. All other materials removed shall become property of the contractor and shall be disposed of properly off the right-of-way.
3. The removal and delivery of the existing concrete channel beams, and related hardware to the McHenry County Stockyard.
4. Existing piling shall be cut-off a minimum of one foot below the proposed foundation fill limits and backfilled with foundation fill.

210-P01 FOUNDATION FILL: The quantity for foundation fill was computed to a depth of 2.0' below the box culvert; however, this may vary depending on the soil conditions. If, in the opinion of the engineer, a suitable foundation exists under the culvert site, the foundation fill may be eliminated. Place foundation fill in layers of not more than 12", moisten or dry as required, and compact according to Section 203.04 G.3 of the Standard Specifications. Material will be accepted by Engineers Statement. No aggregate testing shall be required unless deemed necessary by the Engineer.

Foundation fill required for wing wall installation or required by the manufacturer shall be included in the bid price for the "9FT X 5FT PRECAST RCB END SECTION", "9FT X 6FT PRECAST RCB END SECTION", and "12FT X 9FT PRECAST RCB END SECTION".

256-P01 RIPRAP-GRADE II: Final pay quantity for "Riprap Grade II" shall be determined by field measurements in accordance with plan length, width, and depth, or by measured load count.

606-P01 PRECAST RCB CULVERT:
Dimensions: Site 1 Triple 9ft. span x 5ft. rise sections
Site 2 Triple 9ft. span x 6ft. rise sections
Site 3 Quad 12ft. span x 9ft. rise sections

Fill: 0ft. to 5ft.

Design Load: HL-93

Tie Bolts: All sections shall be tied together with a minimum of 2 tie bolts per outside wall. The tie bolts shall be placed at third points of the outside walls. Cost of ties shall be included in price bid for "9FT X 5FT PRECAST RCB CULVERT", "9FT X 6FT PRECAST RCB CULVERT" and "12FT X 9FT PRECAST RCB CULVERT". An alternate tie system using pre-cast tubes and an internal cable tie will be allowed but subject to review of work drawings.

End Sections: Holes shall be cast at 3' centers through the floor of the last barrel section and into the cutoff wall to receive 3/4" diameter reinforcing bars. Cast holes in the roof of the last barrel section at 1' centers for 1/2" diameter reinforcing bars to attach the parapet. Cast the parapet against the section. Install the bars according to the manufacturer's recommendation, with a high strength adhesive specifically intended for concrete anchorage, in accordance with Section 806.06 of the NDDOT Standard Specifications. The wings shall be connected to the last barrel section by the use of galvanized U-bolts, steel-bolted plates, or another approved method so the inside corner surface is smooth.

The "9FT X 5FT PRECAST RCB END SECTION", "9FT X 6FT PRECAST RCB END SECTION" and "12FT X 9FT PRECAST RCB END SECTION" shall consist of the threaded inserts, eye bolts, galvanized L3x3x3/8" angle, cutoff wall, parapet and two wing walls.

Threaded Inserts for Eye Bolts: Four (4) 5/8" Dia. galvanized threaded inserts and 5/8" Dia. threaded eyebolts shall be provided per wall on each end section to provide anchor points for fencing. The concrete inserts shall be of such design that when installed in concrete, will be capable of developing the full strength of the 5/8" Dia. threaded eye bolt. The insets shall start at 15" intervals up the end section outer wall and be spaced at 15" intervals up the wall to match hole spacing in galvanized L3x3x3/8" angle.

Bolts, Plates, Angles and Studs: All bolts, plates, angles, and studs shall meet ASTM A 36. Nuts shall be ASTM A 563 and washers shall be ASTM F 436, Type 1. Welded pipe sleeves shall conform to ASTM A 53, Grade B. All hardware shall be galvanized according to AASHTO M 232. Structural steel shall be galvanized after fabrication according to AASHTO M 111. Welders shall be properly certified for all shop and field welds. Field welds shall be coated with galvanizing paint.

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NOTES

Joints: Provide watertight joints on the floor, on the exterior walls, and roof using a preformed mastic meeting ASTM C 990. All joints shall be covered with a minimum of 12 inches wide waterproof membrane on the exterior walls and roof. Prepare the walls and roof exterior surface of the joints according to the waterproof membrane manufacturer's recommendation. Roll the membrane to the surface keeping it free of wrinkles and bubbles. Lap waterproof membrane joints a minimum of 2.5 inches. Seal the joints and exposed edges with a joint sealing mastic recommended by the manufacturer of the membrane.

Lifting Holes: All lifting holes on the roof and walls shall be plugged with popits and covered with a minimum of 9 inch by 9 inch waterproof membrane squares. Prepare the walls and roof exterior surface of the lifting holes according to the waterproof membrane manufacturer's recommendation. Roll the membrane to the surface keeping it free of wrinkles and bubbles. All lifting holes on the floor and in the end section walls shall be grouted with an approved non-shrink grout.

Single to Single RCB Spacing: The Contractor shall install each single span precast box culvert with a space between barrel lines of 1'-0" maximum. This space shall be filled with grout with the following mix design:

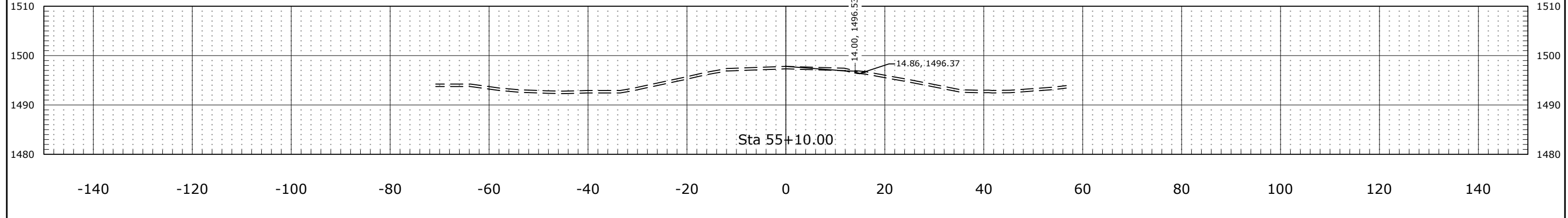
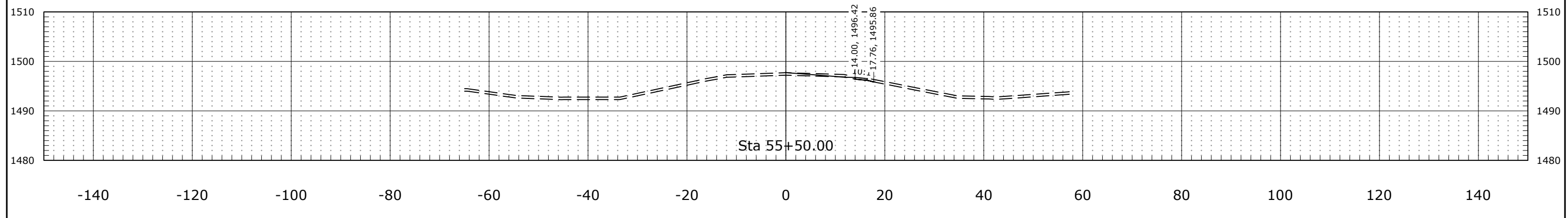
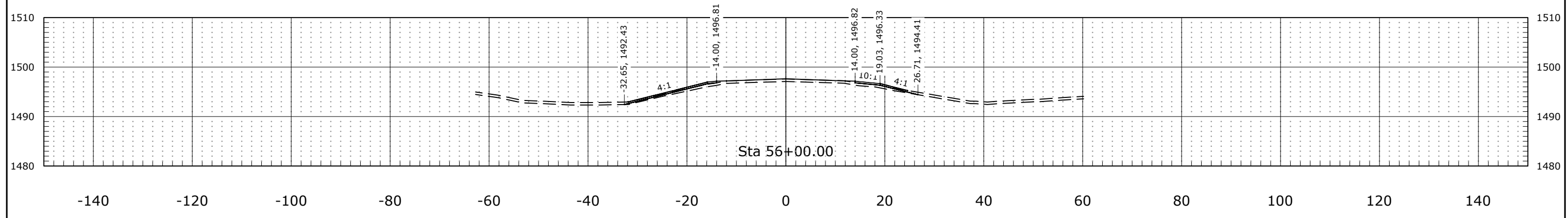
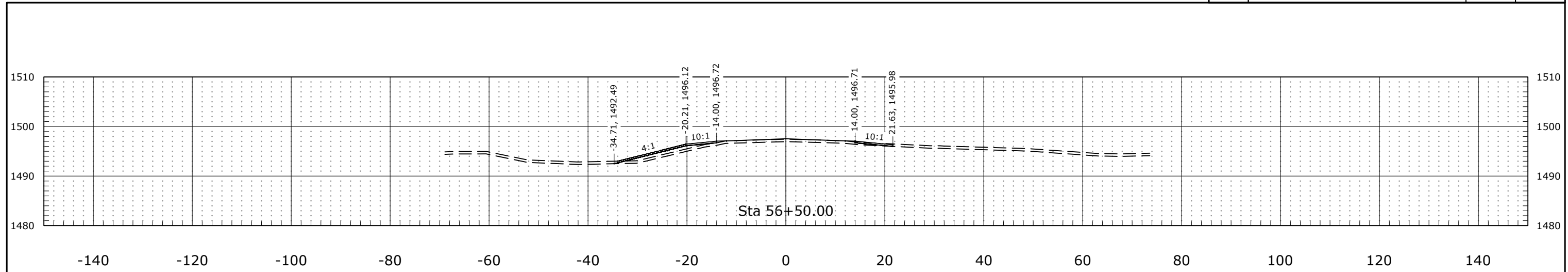
Mix Design	
¾" minus Rock	800 lbs
Sand	2,300 lbs
Fly Ash	100 lbs
Cement	560 lbs
Air	5%
Slump	5" to 6"

The grout shall be fluid on placement to flow around and fill voids in the backfill area. The grout shall be included in price bid for precast units.

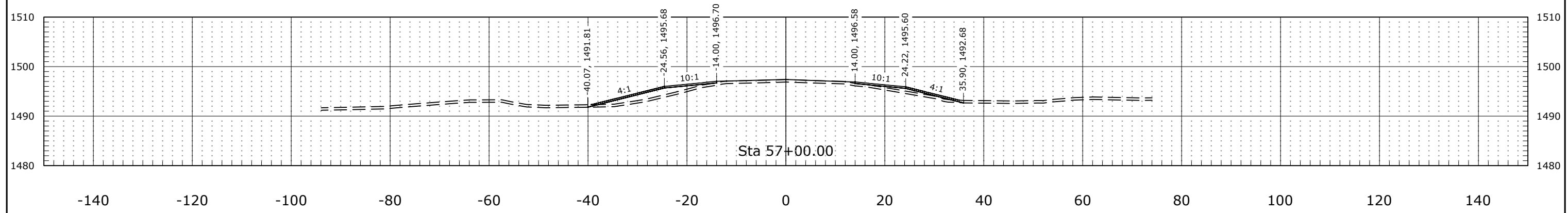
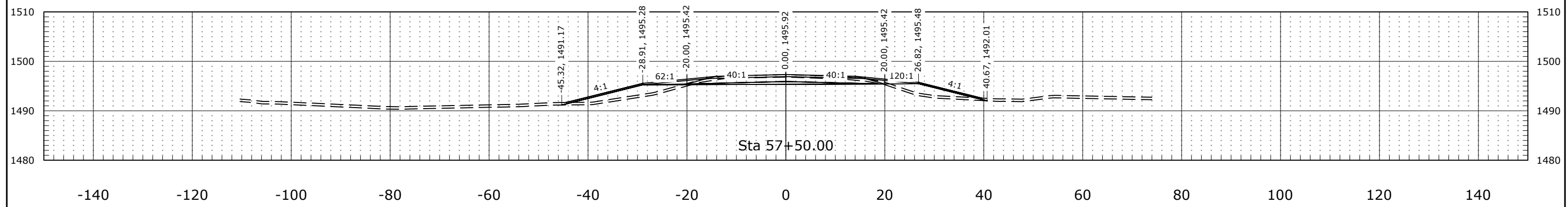
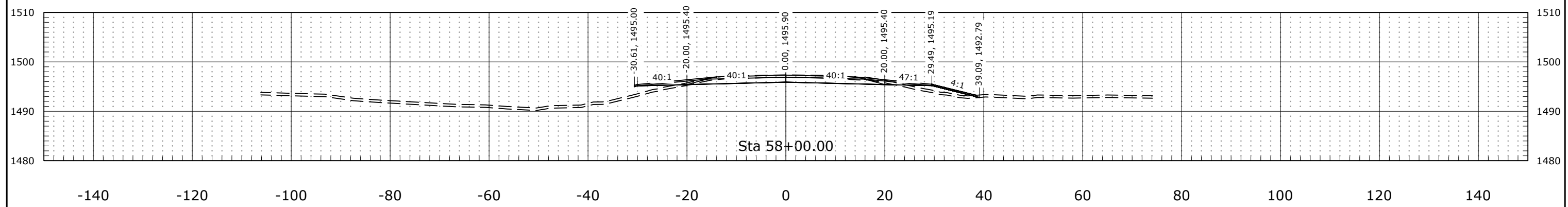
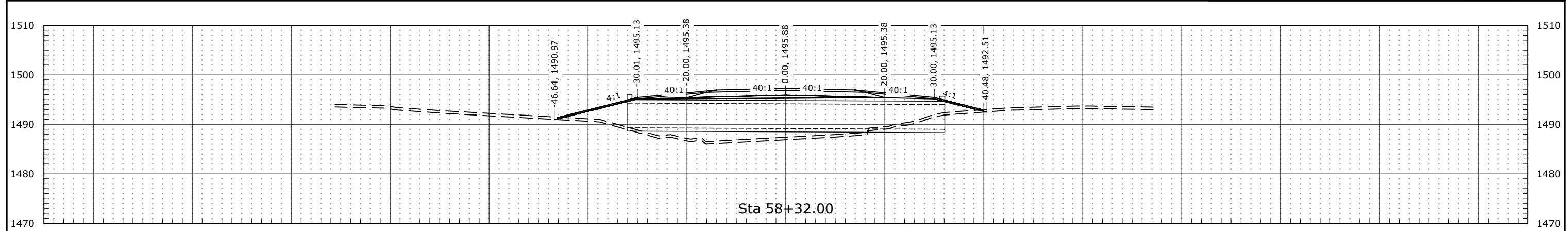
Payment shall be limited to the price bid for the Precast Box Sections and End Sections.

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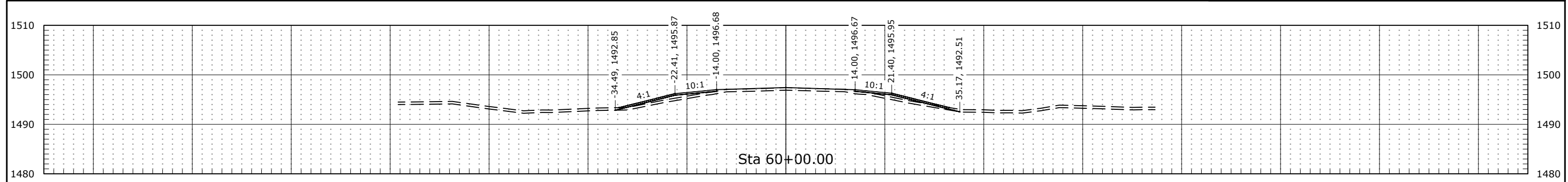
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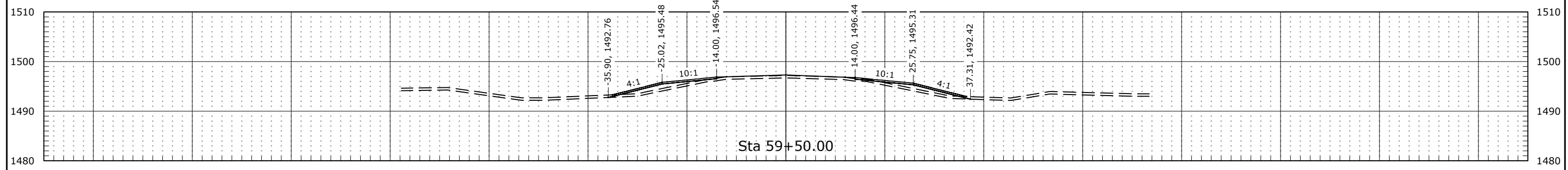
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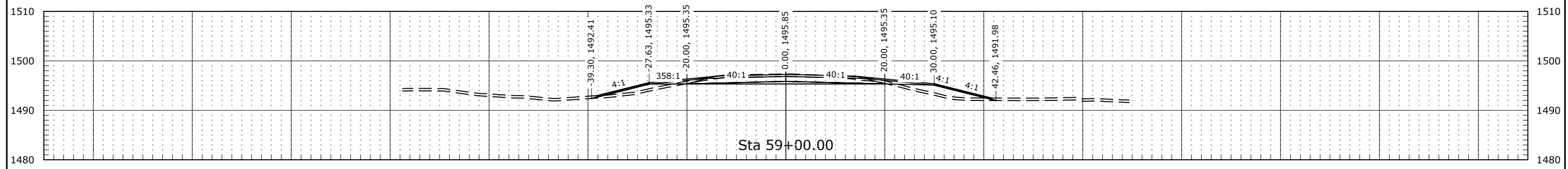
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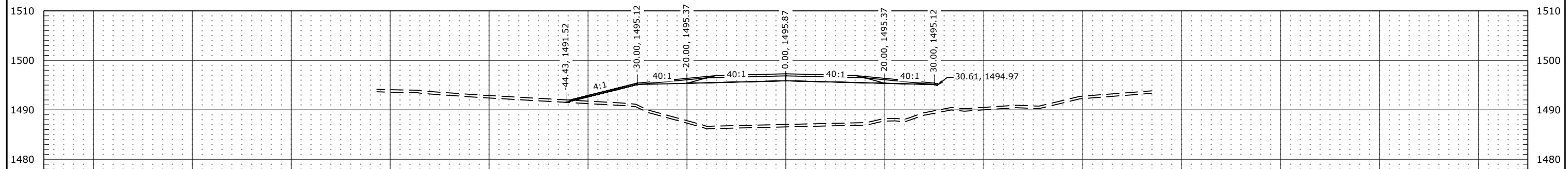
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Sta 59+50.00

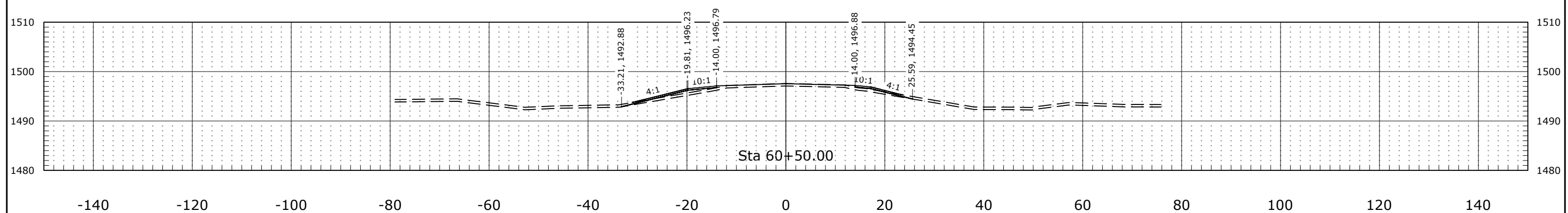
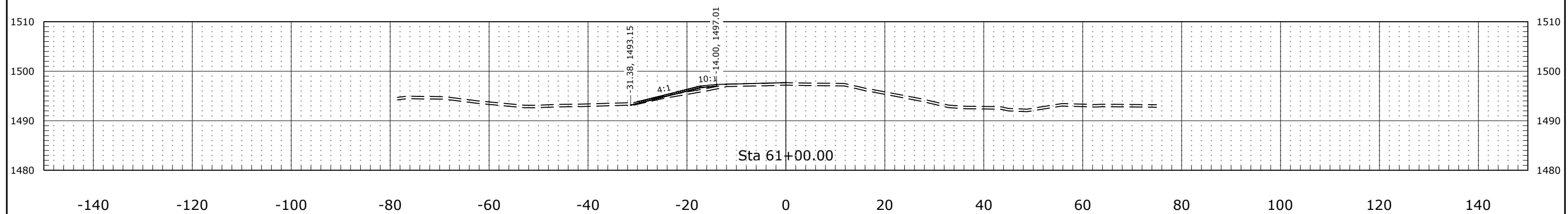
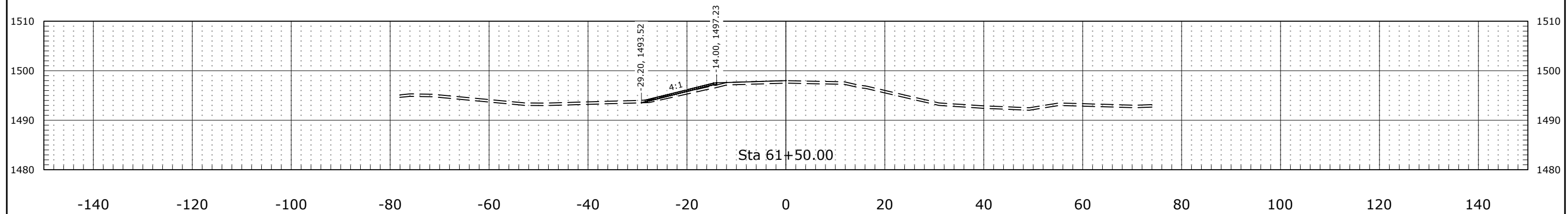


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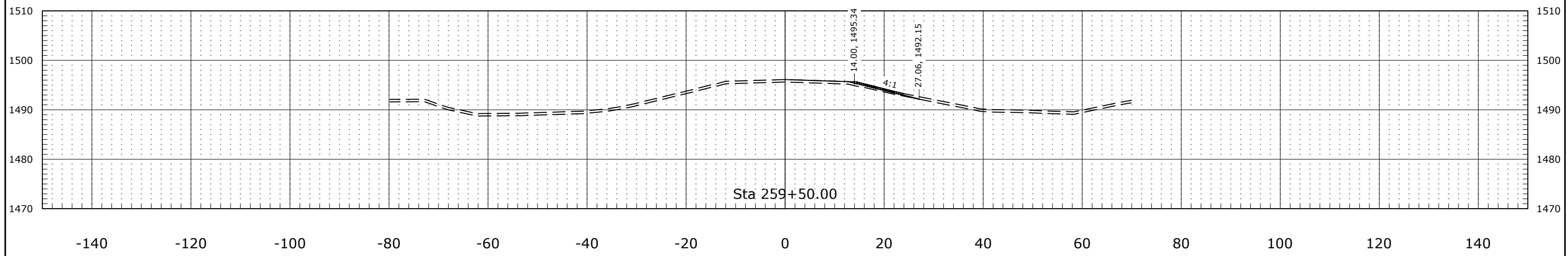
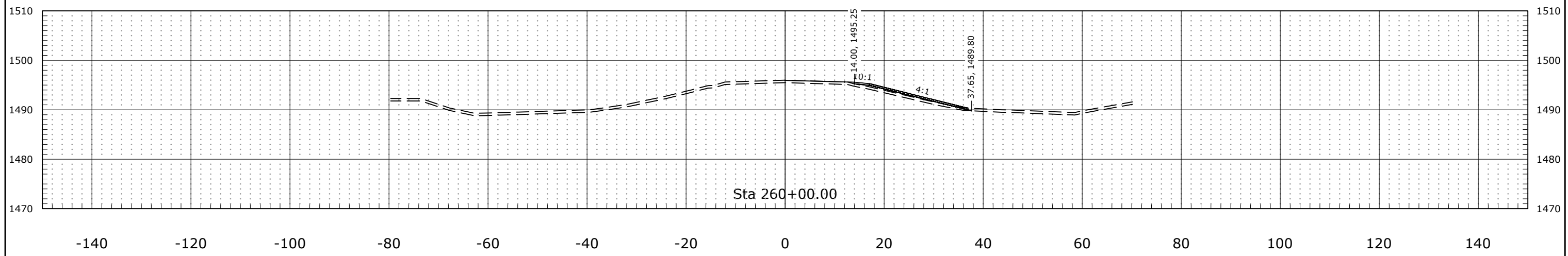
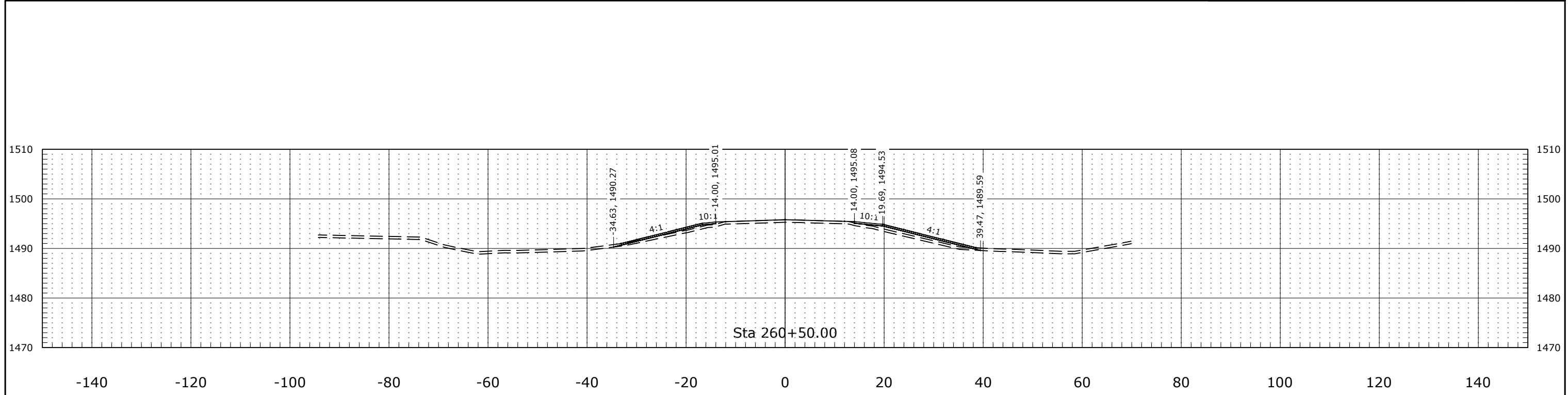


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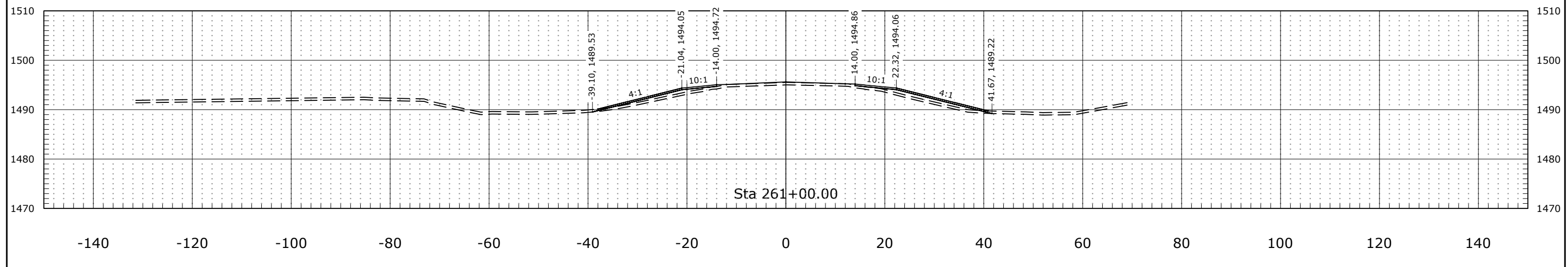
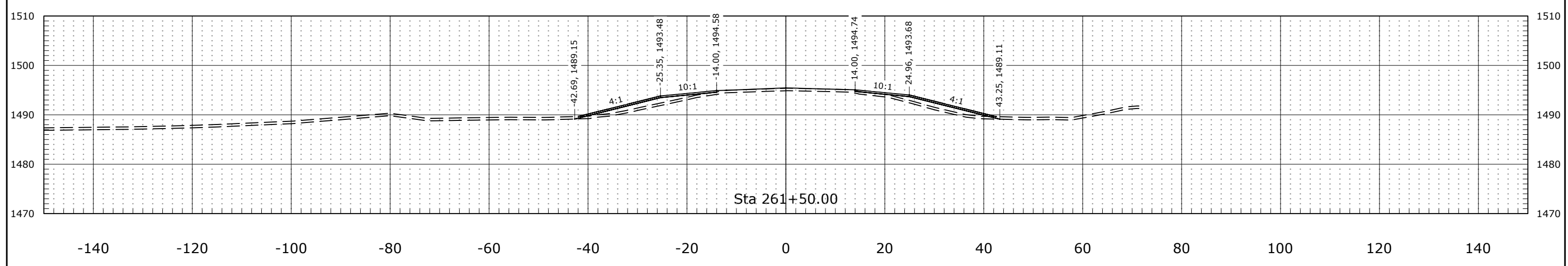
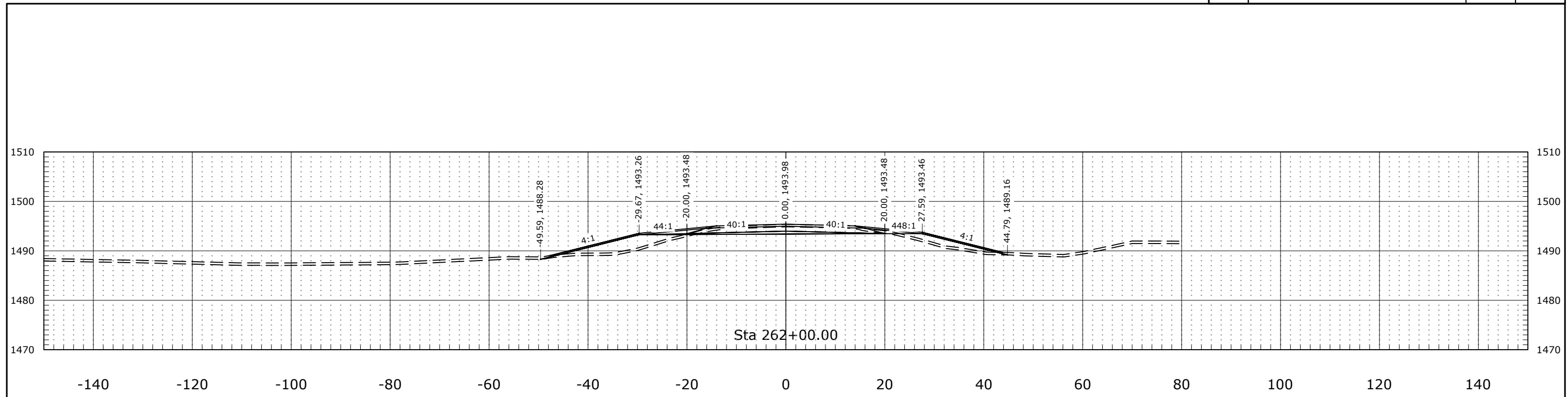
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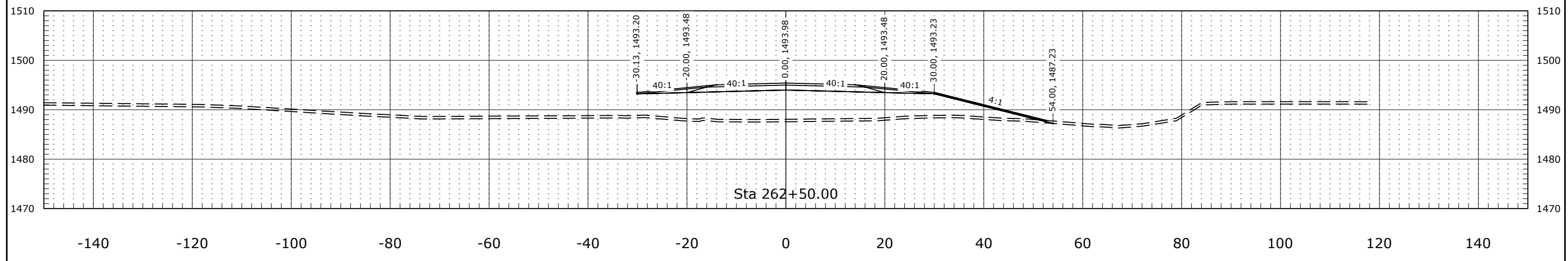
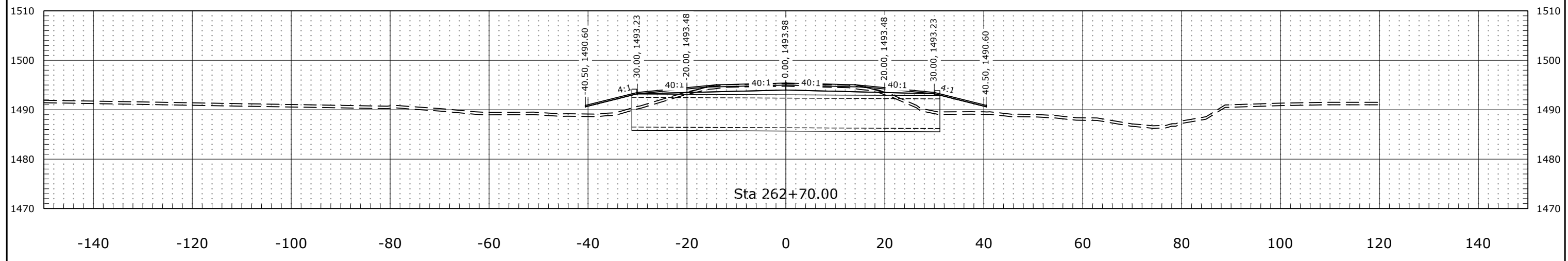
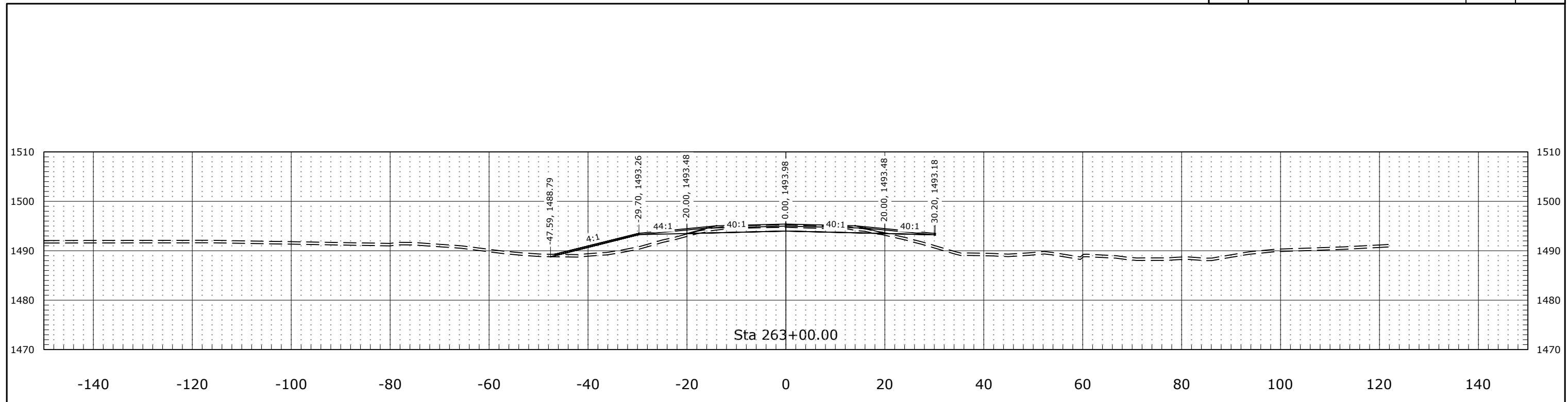
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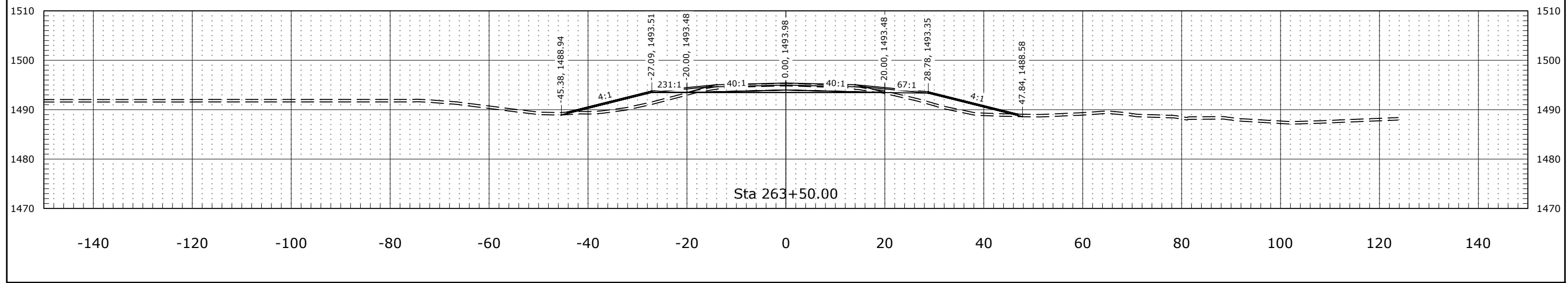
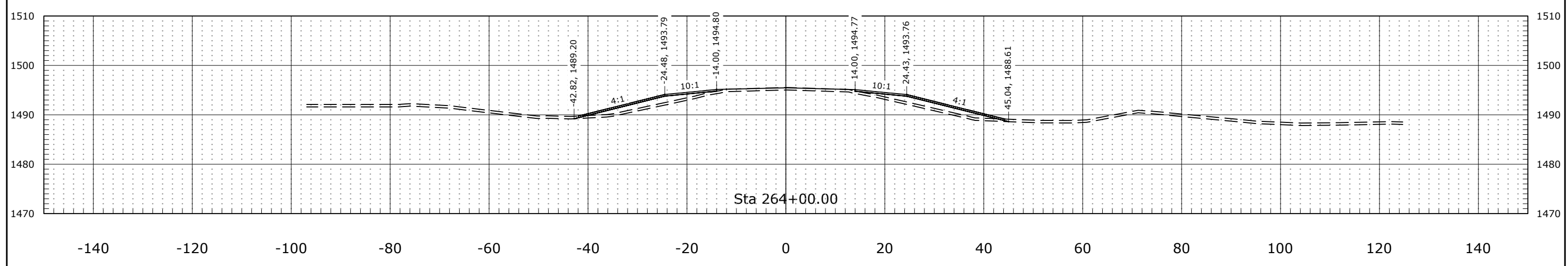
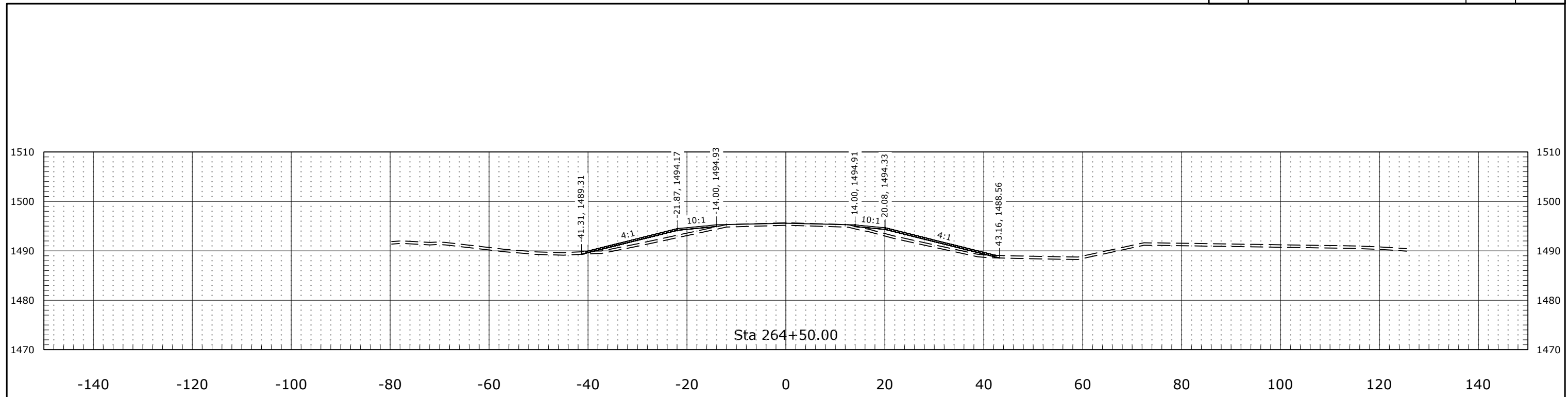
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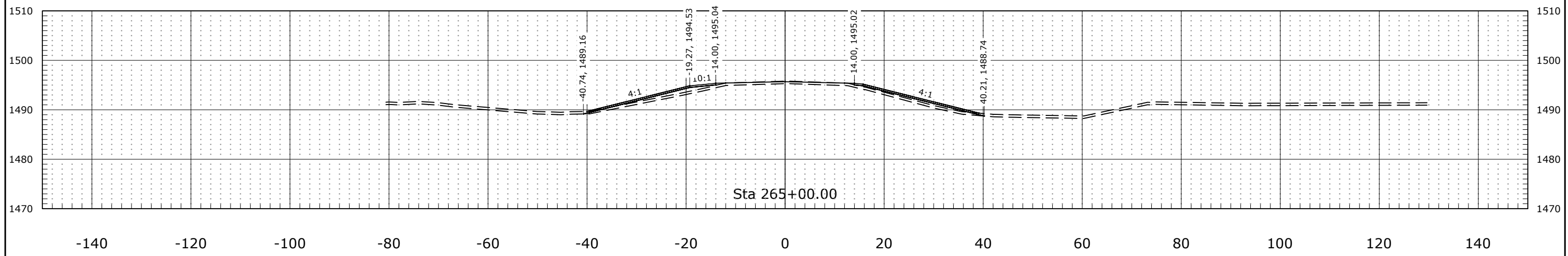
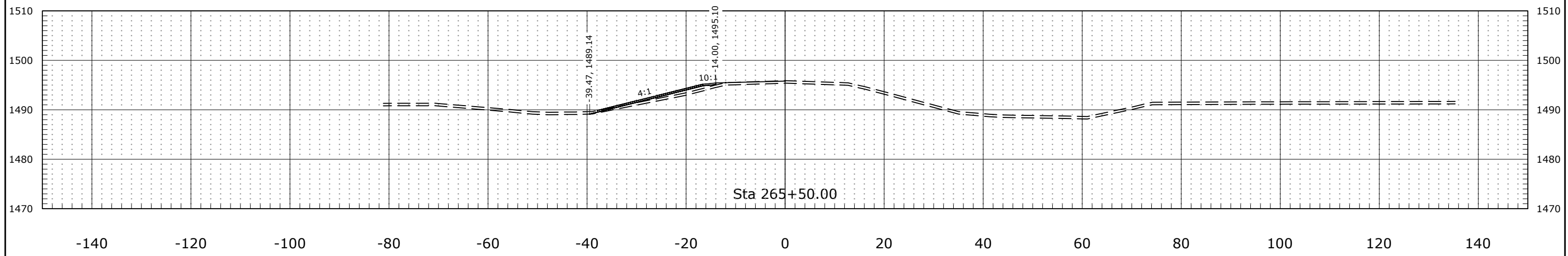
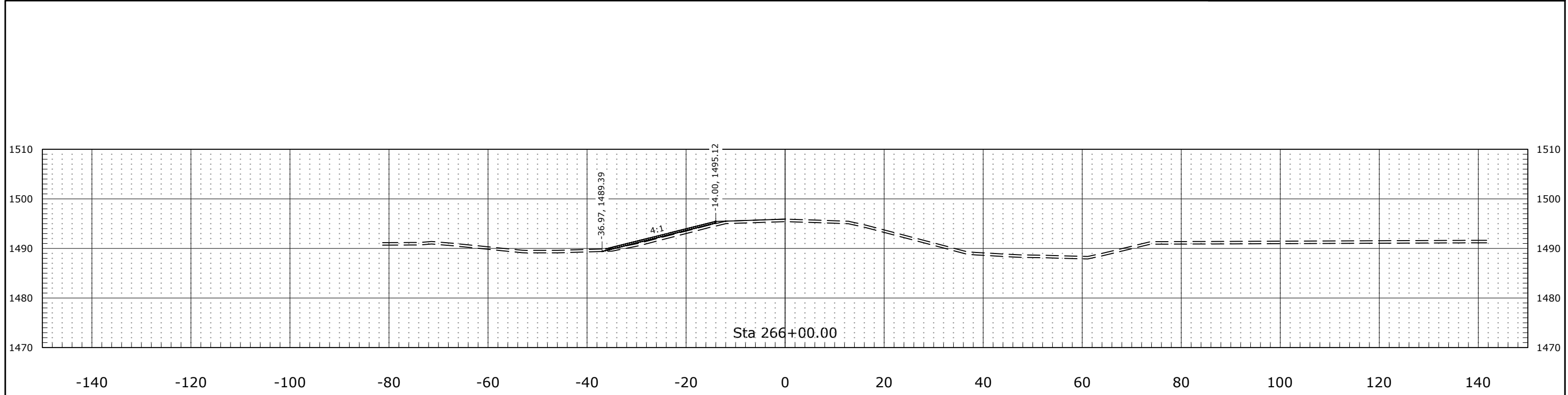
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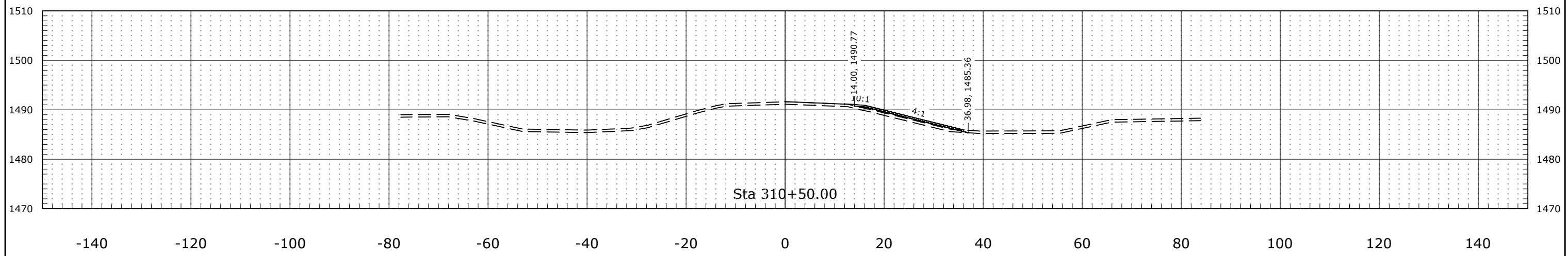
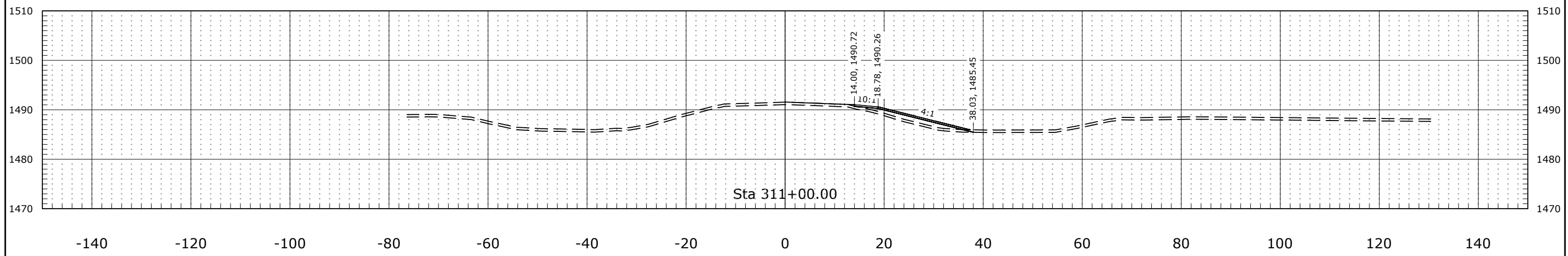
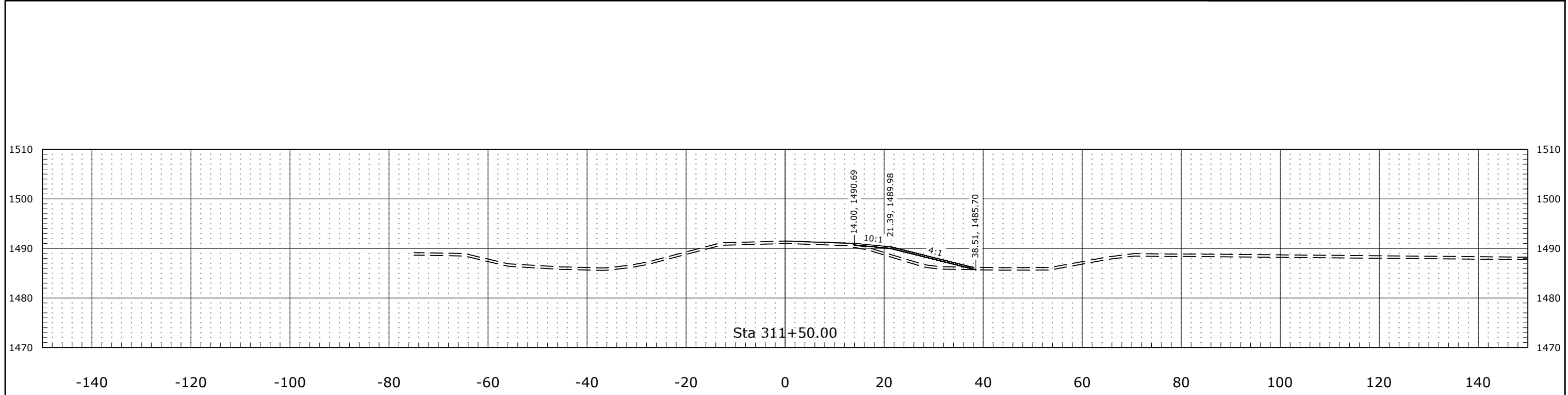
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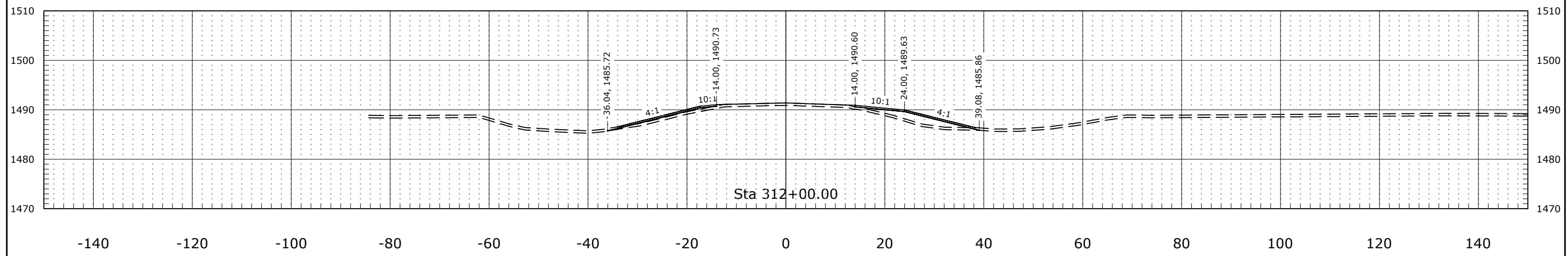
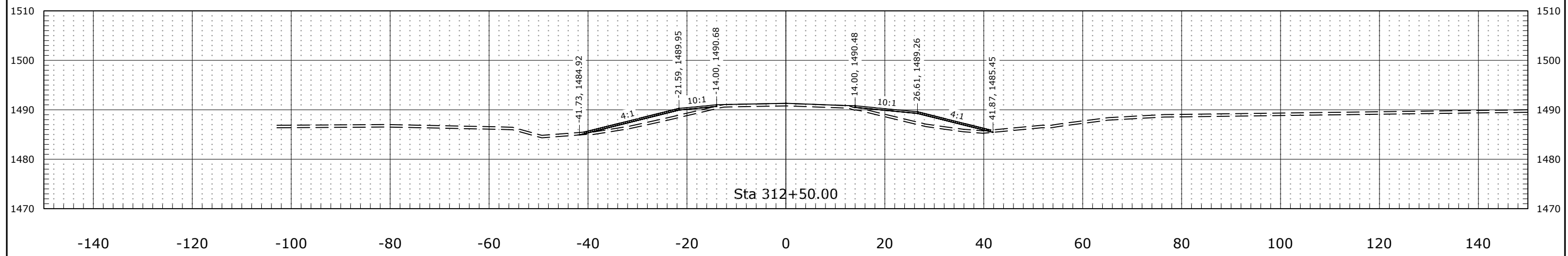
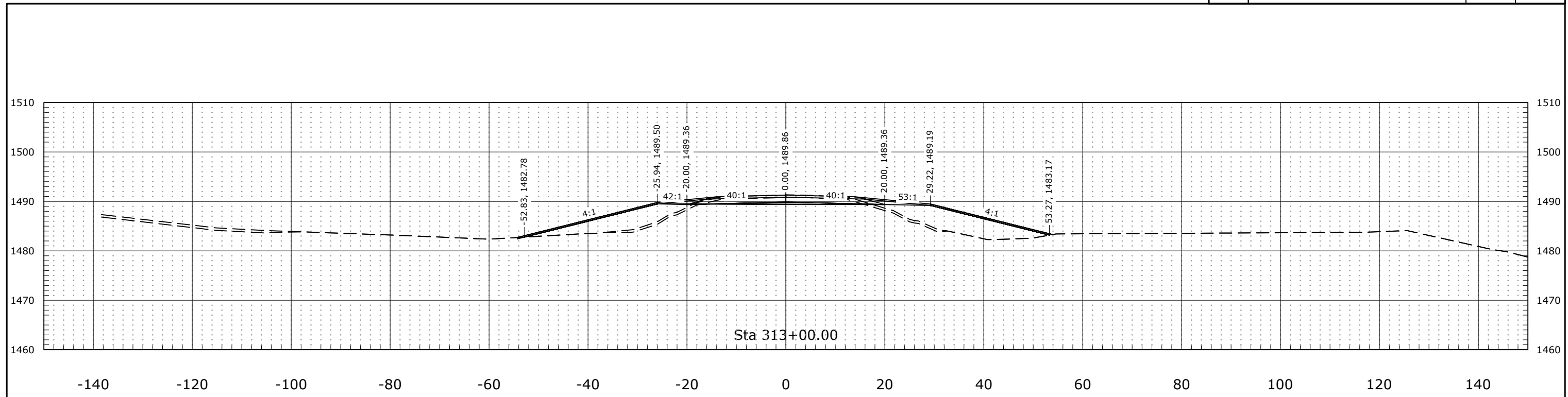
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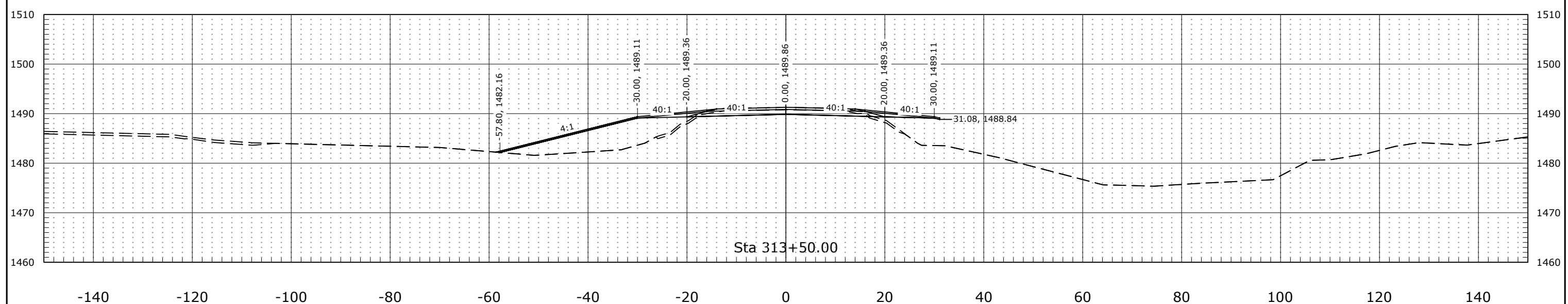
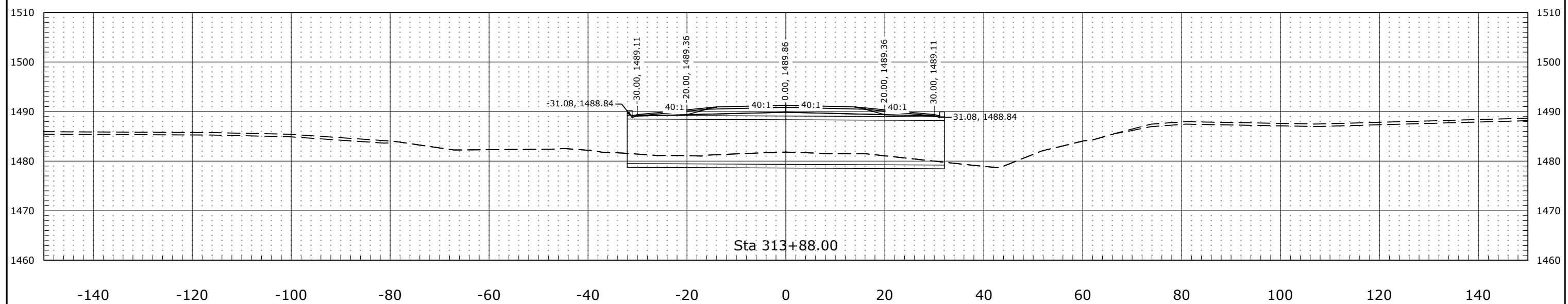
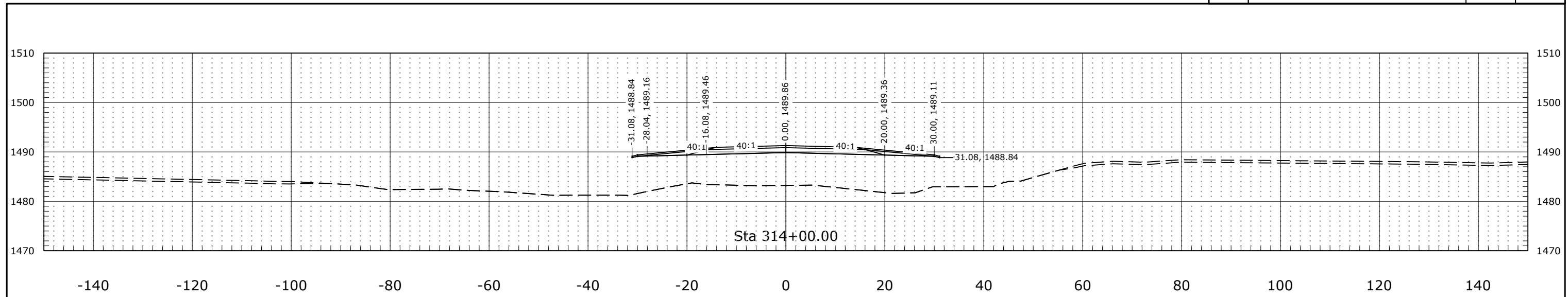
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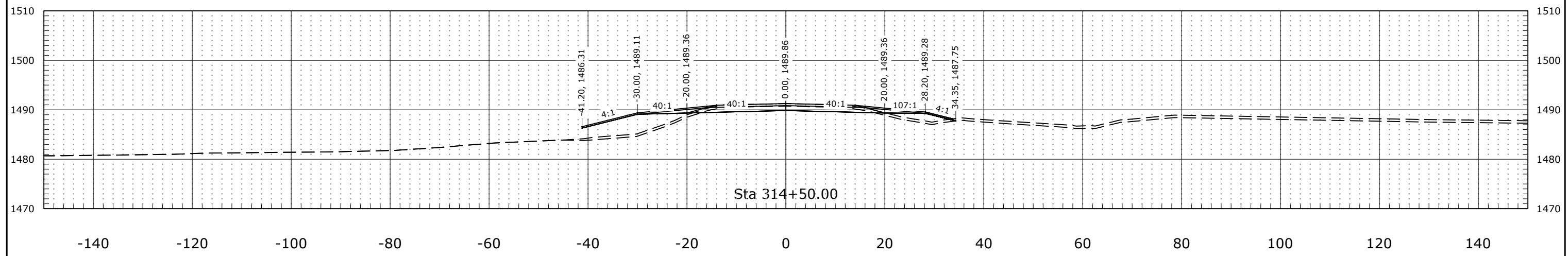
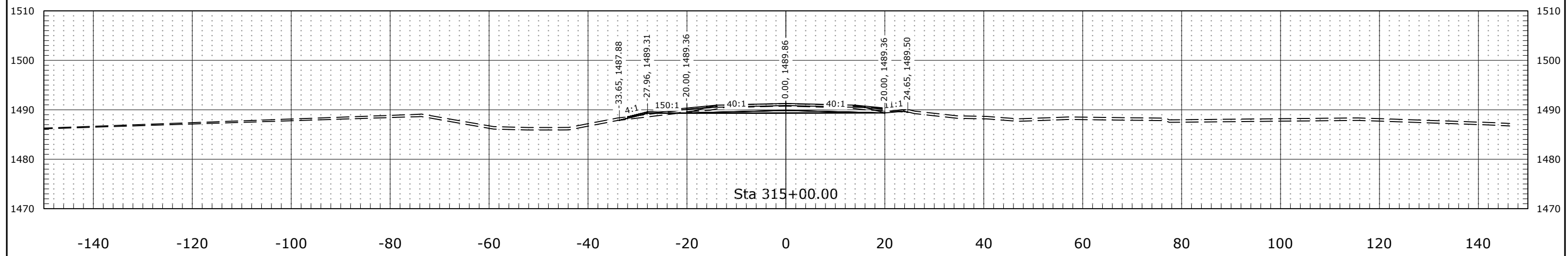
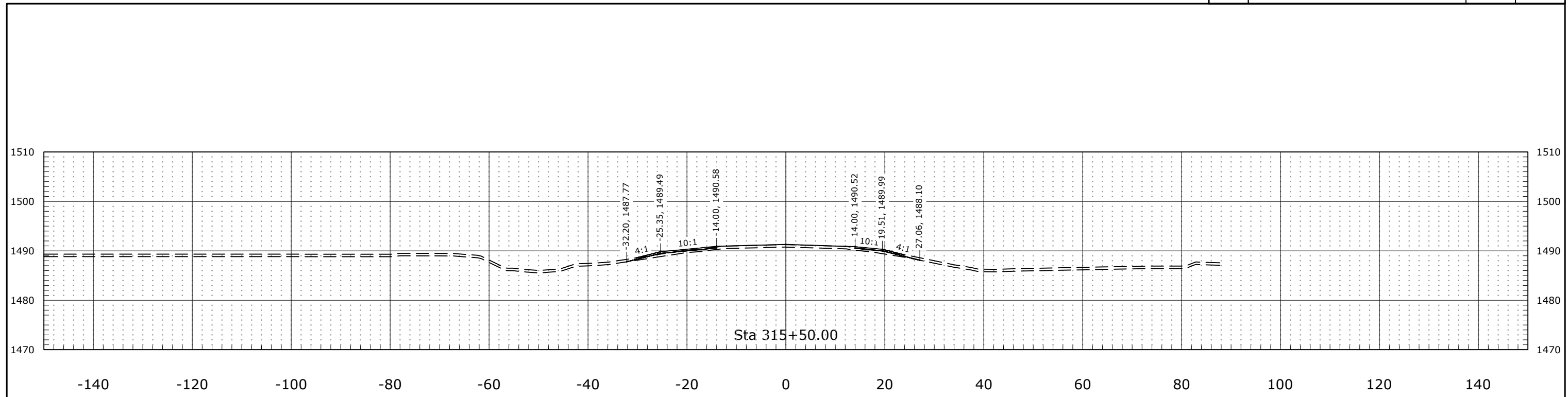
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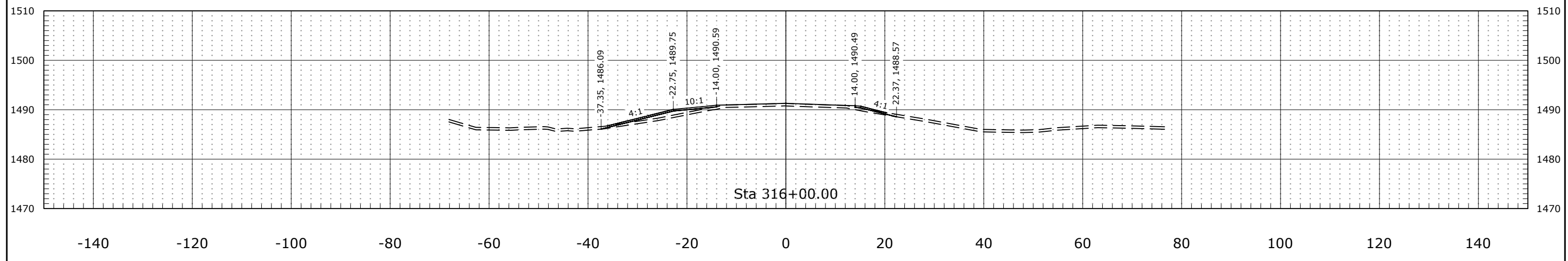
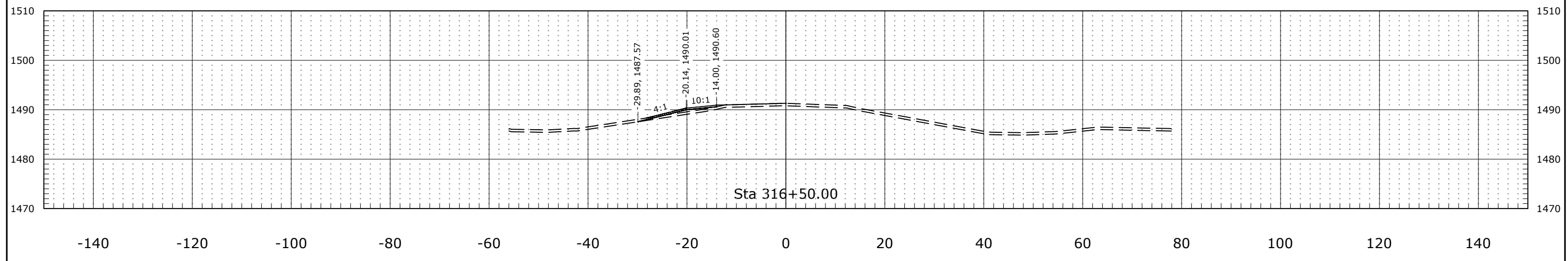
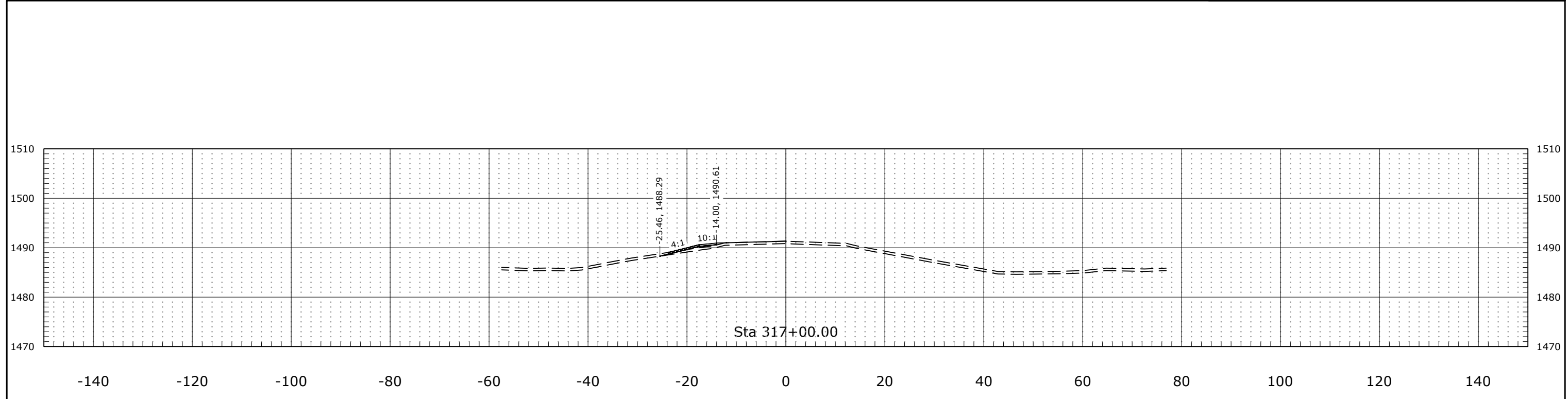
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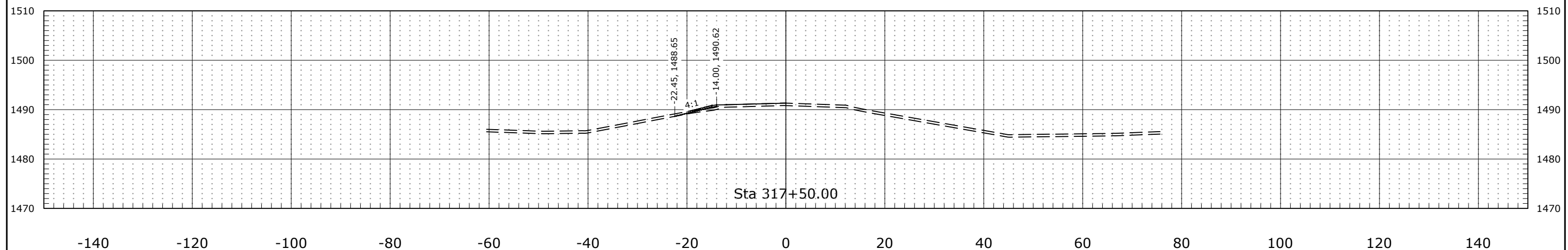
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NDDOT ABBREVIATIONS

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 C 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
 DInt delineate
 DIntr delineator
 Depr depression
 Desc description
 Det detail
 DWP detectable warning panel
 Dtr detour
 Dia or \emptyset 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

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NDDOT ABBREVIATIONS

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

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Salv	salvage(d)	Tel	telephone
San	sanitary sewer line	Tel B	Telephone Booth
Sec	section	Tel P	telephone pole
SL	section line	Tv	television
Sep	separation	Temp	temperature
Seq	sequence	Temp	temporary
Serv	service	TBM	temporary bench mark
Sht	sheet	T	thinwall tube sample
Shtng	sheeting	Ts	topsoil
Shldr	shoulder	Traf	traffic
Sw or Sdwk	sidewalk	TSCB	traffic signal control box
SD	sight distance	Tr	trail
SN	sign number	Transf	transformer
Sig	signal	Trans	transition
Sgl	single	TT	transmission tower
SRCP	slotted reinforced concrete pipe	TES	traversable end section
SC	slow curing	Trans	transverse
SS	slow setting	Trtd	treated
Sm	small	Trmt	treatment
S	South	Qc	triaxial compression
SE	South East	TERO	tribal employment rights ordinance
SW	South West	Tpl	triple
SB	Southbound	Typ	typical
Sp	spaces		
Spcl	special	Qu	unconfined compressive strength
SA	special assembly	Ugrnd	underground
SP	special provisions	Util	utility
G	specific gravity		
Spk	spike	VG	valley gutter
SB	split barrel sample	Vap	vapor
SH	sprinkler head	Vert	vertical
SV	sprinkler valve	VCP	vitrified clay pipe
Sq	square	Vol	volume
Stk	stake	VSFS	vehicle speed feedback sign
Std	standard		
N	standard penetration test	Wkwy	walkway
Std Specs	standard specifications	W	water content
Stm L	steam line	WGV	water gate valve
SEC	steel encased concrete	WL	water line
SMA	stone matrix asphalt	WM	water main
SSD	stopping sight distance	WMV	water main valve
SD	storm drain	W Mtr	water meter
St	street	WSV	water service valve
SPP	structural plate pipe	WW	water well
SPPA	structural plate pipe arch	Wrng	wearing
Str	structure	WIM	weigh in motion
Subd	subdivision	W	west
Sub	subgrade	WB	westbound
Sub Prep	subgrade preparation	Wrng	wiring
Ss	subsoil	W/	with
SS	supplement specification	W/o	without
Supp	supplemental	WC	witness corner
Surf	surfacing		
Surv	survey		
Sym	symmetrical		

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NDDOT ABBREVIATIONS

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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

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

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

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LINE STYLES

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Existing Topography

- Void — Void — Void — V 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
- - - - -x- - - - -x- 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
- x- - - -x- - - -x- Fence
- REMOVE — REMOVE — Remove Line
- ===== Wall
- ~ ~ ~ ~ ~ Retaining Wall (Plan View)
- ~ ~ ~ ~ ~ W-Beam w Posts
- — • — • — High Tension Cable Guardrail with Posts

Existing Utilities

- — — — — E — Existing Electrical
- — — — — FO — Existing Fiber Optic Line
- — — — — FO — Existing TV Fiber Optic
- — — — — G — Existing Gas Pipe
- — — — — OH — Existing Overhead Utility Line
- — — — — P — Existing Power
- — — — — PL — Existing Fuel Pipeline
- — — — — PL — Existing Undefined Above Ground Pipe Line
- - - - - SAN - - - - - Existing Sanitary Sewer
- - - - - SAN FM - - - - - Existing Sanitary Force Main
- - - - - SD - - - - - Existing Storm Drain
- - - - - SD FM - - - - - Existing Storm Drain Force Main
- - - - - Existing Culvert
- — — — — T — Existing Telephone Line
- — — — — TV — Existing TV Line
- — — — — W — 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

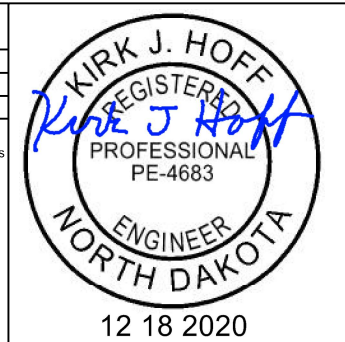
Traffic Utilities

- - - - - 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

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LINE STYLES

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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 Typical

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

Geotechnical

- D ----- D ----- Geotextile Fabric Type D
- **Geo** ----- **Geo** ----- Geogrid
- R ----- R ----- Geotextile Fabric Type R
- R ----- R ----- Geotextile Fabric Type R1
- RR ----- RR ----- Geotextile Fabric Type RR
- S ----- S ----- Geotextile Fabric Type S

Countours

- 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
- s ----- s ----- Floating Silt Curtain
- SF ----- SF ----- Silt Fence
- Excavation Limits
- Fiber Rolls

Environmental

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

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SYMBOLS



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



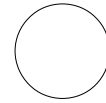
Existing Large Tree



Existing Small Tree



Existing Tree Trunk



Cairn or Stone Circle



Existing Artifact



Existing Satellite Dish



Existing Weather Station



Existing Windmill or Tower



Reinforced Pavement



Continuous Split Barrel Sample



Flight Auger Sample



Split Barrel Sample



Thinwall Tube Sample



Standard Penetration Test



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

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



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

12 18 2020

SYMBOLS

D-101-33

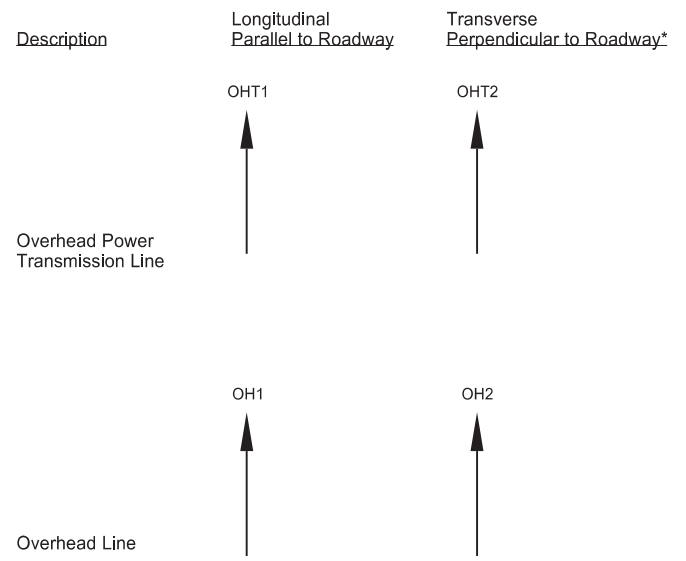
			Existing Manhole (Electrical, Gas, Telephone)			Cap or Stub Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water			
			Water Manhole (Exst, Exst with Valve)						
			Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)		Existing Pedestal Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined				
			Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)						
			Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)		Existing Pipe Vent Gas, Fuel, Sanitary, Storm Drain, Water, Undefined				
			Force Main Storm Drain Manhole (Exst, Exst with Valve)						
			Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)		Valve Exst Gas, Exst Water, Ppsd Water, Exst Undefined				
			Existing Water Appurtenance						
			Sprinkler Head (Exst, Ppsd)		Pump Sanitary, Storm Drain, Exst Water				
			Fire Hydrant (Exst, Ppsd)						
			Cleanout (Exst Sanitary, Underdrain)		Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)				
			Existing Catch Basin Inlet (Round, Square)						
			Existing Curb Inlet (Round, Square)		Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)				
			Existing Slotted Reinforced Concrete Pipe						
			Catch Basin (Riser 30 Inch, Beehive, Type A)			Existing Utility Marker			
			Inlet Mountable Curb (Type A, Type B)			Existing Meter			
			Inlet Saddle Base (Type 1, Type 2)			Existing Fuel Dispensers			
			Inlet Special (Catch Basin, Type 1, Type A)			Existing Fuel Filler Pipes			
			Inlet (Tee, Type 1, Type 2, Type 2 Double)			Existing Fuel Leak Sensors			
			Median Drain						
			Headwall (Exst, Ppsd, Ppsd Single with Vegetation Barrier, Ppsd Double with Vegetation Barrier)						

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

KIRK J. HOFF
REGISTERED
PROFESSIONAL
ENGINEER
NORTH DAKOTA
12 18 2020

Cross Section Legend

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



Light Standard - Multiple Variations
Concrete
Steel
Wood
with Traffic Signal

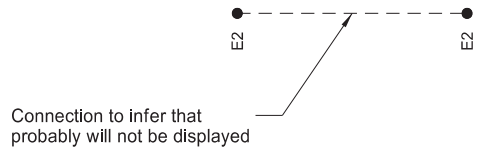
Pole - Multiple Variations
Utility
Brace
Feed Point
Guy
Power
Power Structure
Power with Light
Power with Transformer

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

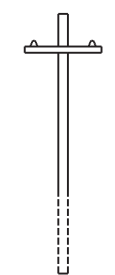
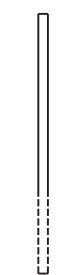
Anchor

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.



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.

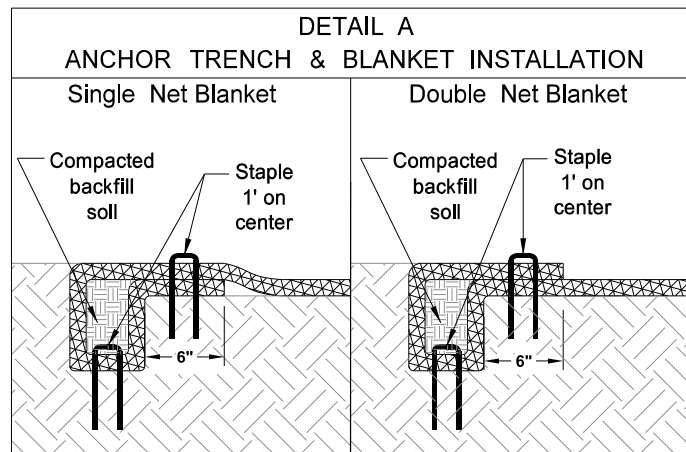


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-20-18	
REVISIONS	
DATE	CHANGE
6/14/2023	CADD Standards Update

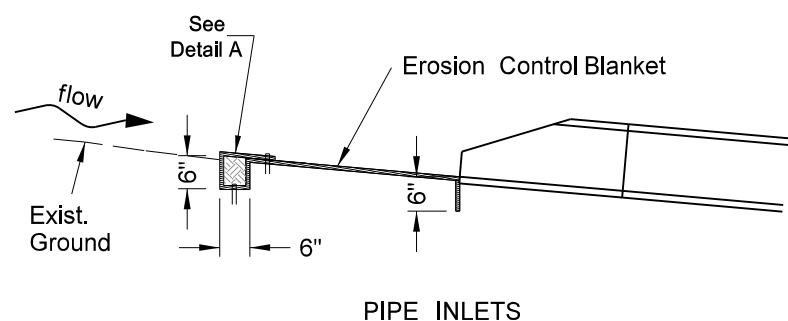
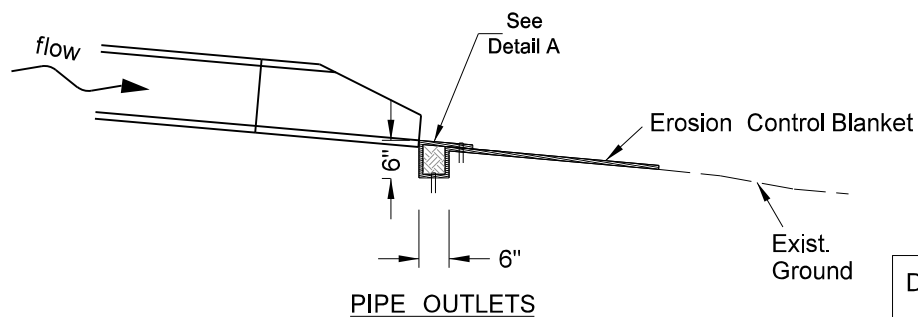
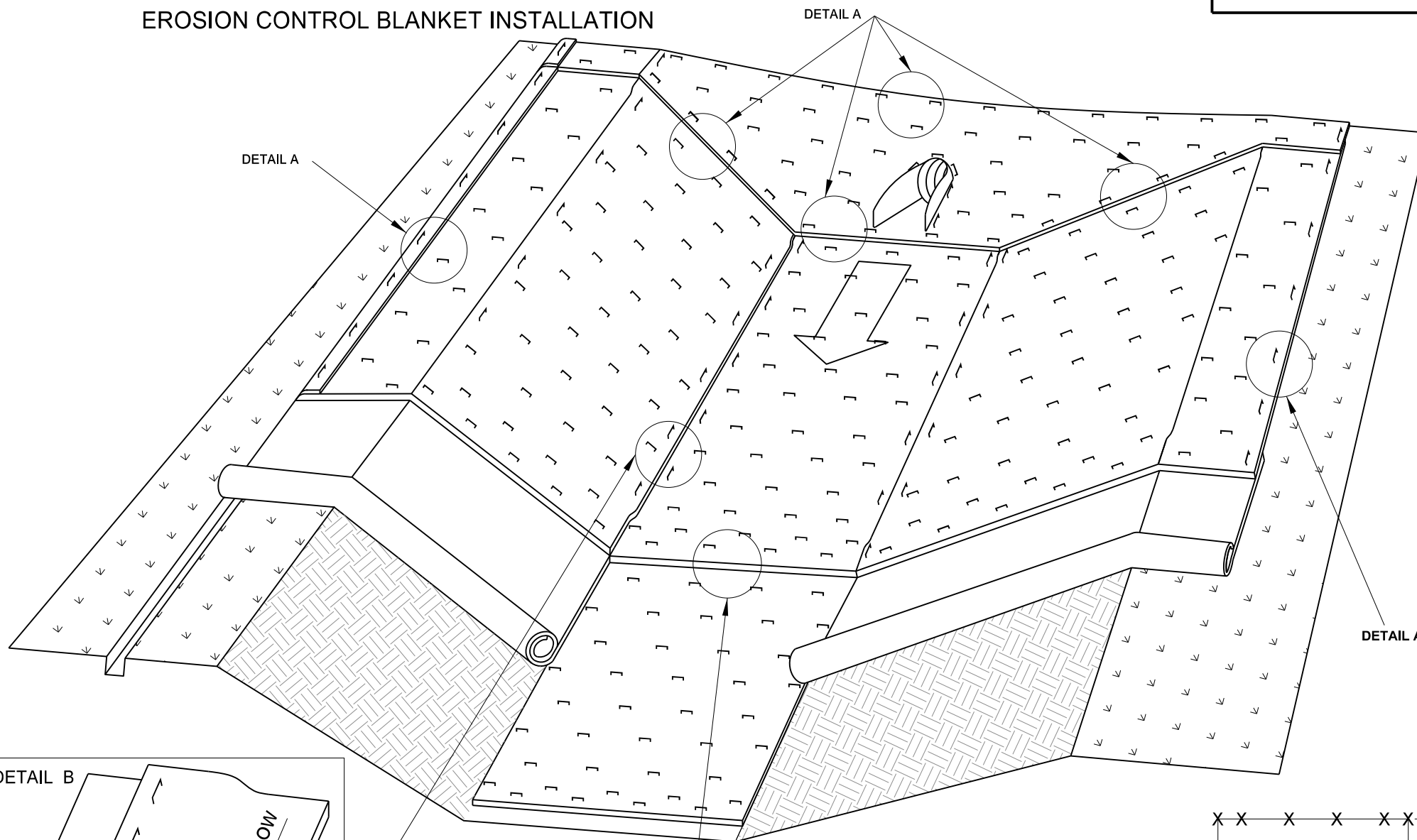


06/14/23

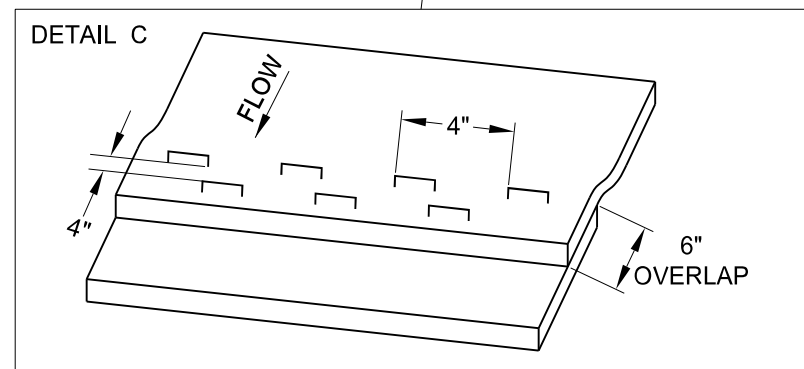
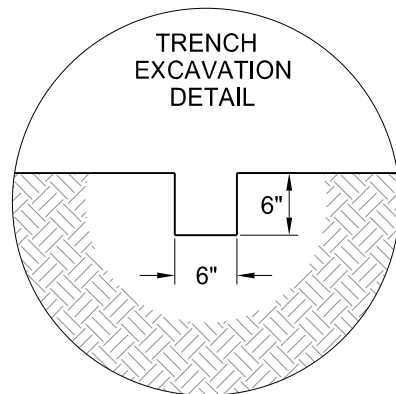
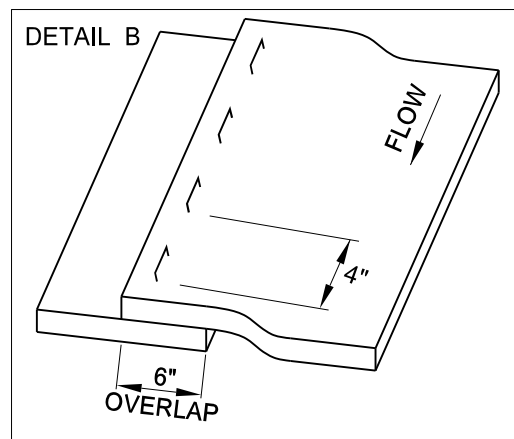
EROSION AND SILTATION CONTROL
EROSION CONTROL BLANKET INSTALLATION



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

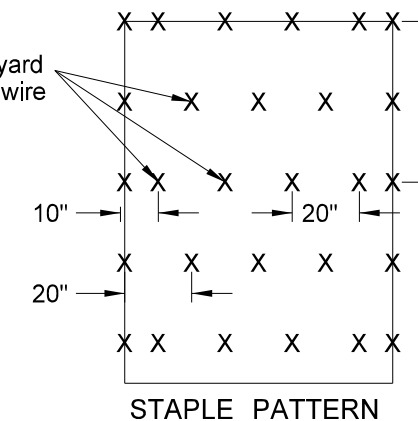


INSTALLATION AT PIPE ENDS



BLANKET LAYOUT
CHANNEL OR SLOPE INSTALLATION

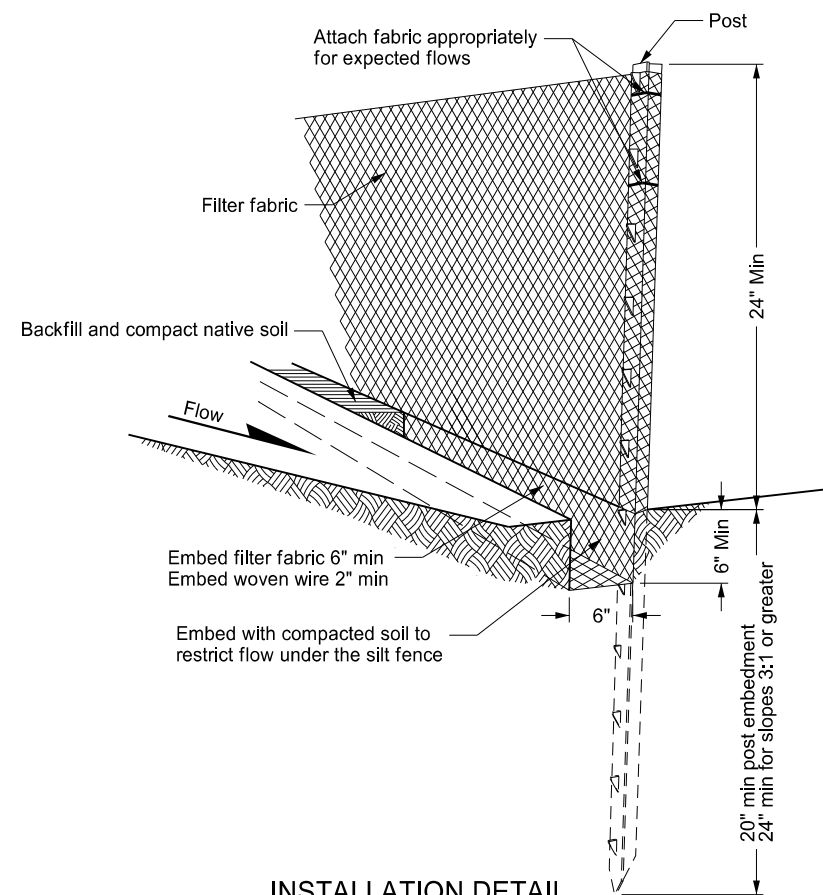
3.8 staples per square yard using 8-inch 11 gauge wire "u" staples.



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.

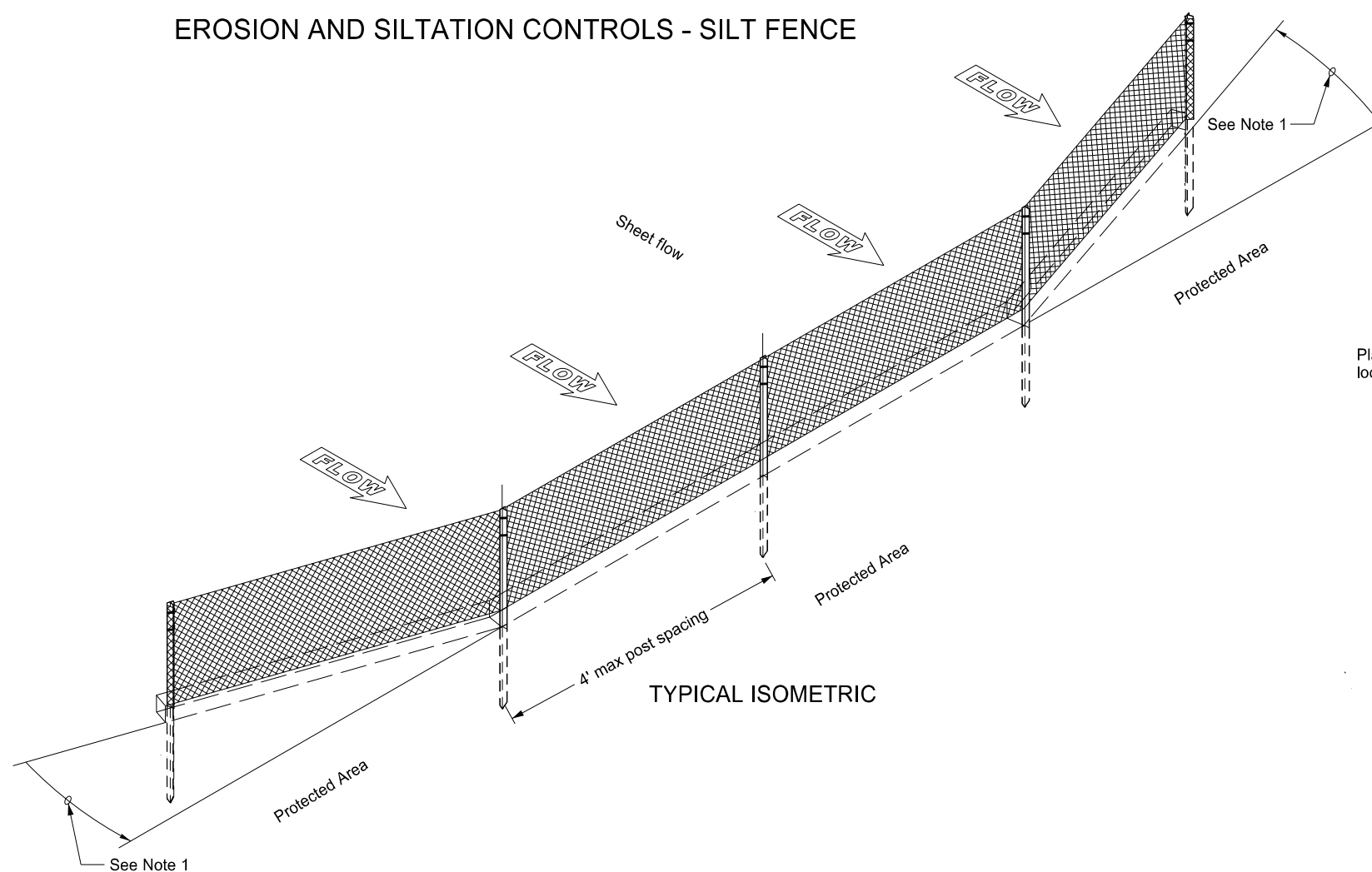
This document was originally issued and sealed by
Kirk J Hoff,
Registration Number
PE- 4683,
on 08/27/19 and the original document is stored at the North Dakota Department of Transportation

EROSION AND SILTATION CONTROLS - SILT FENCE

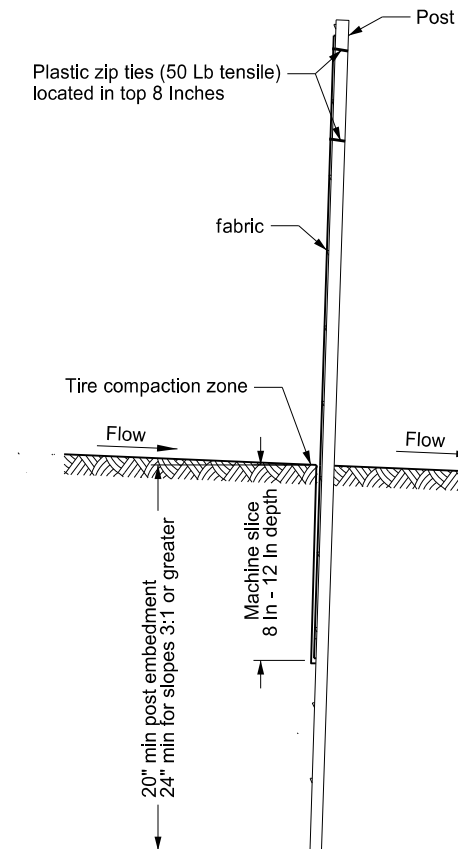


INSTALLATION DETAIL

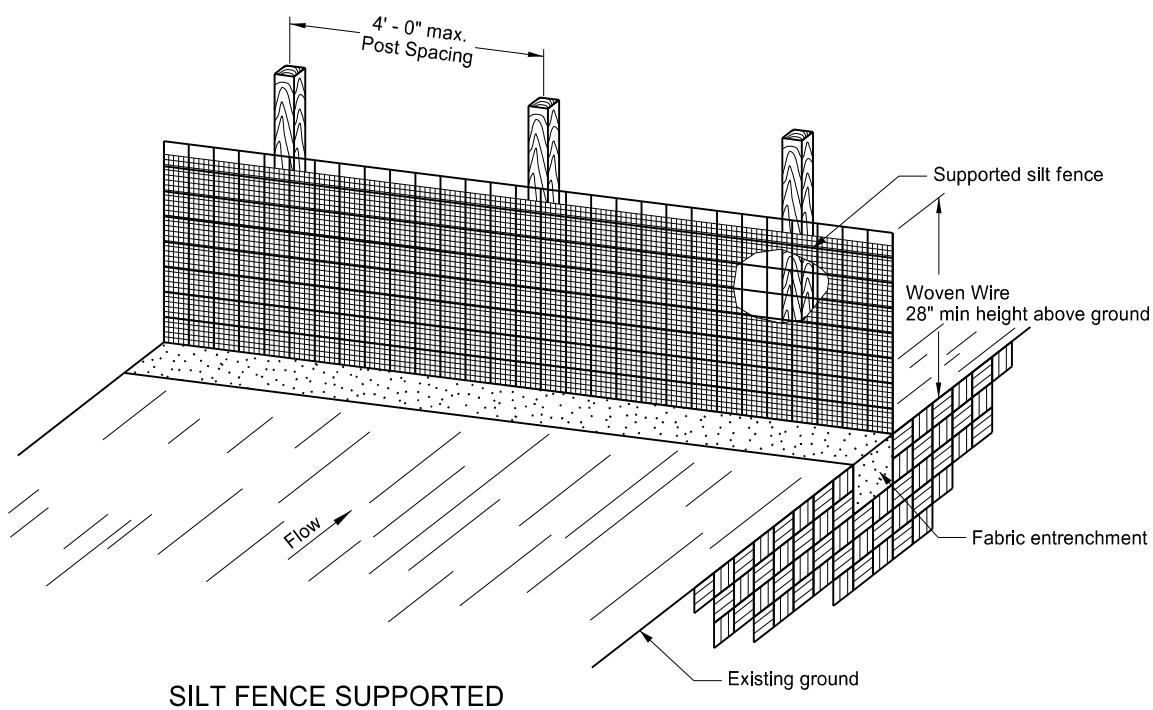
Minimize disturbance of ground around trench and smooth surface after excavation to avoid concentrating flows. Compact to prevent undercutting flows.



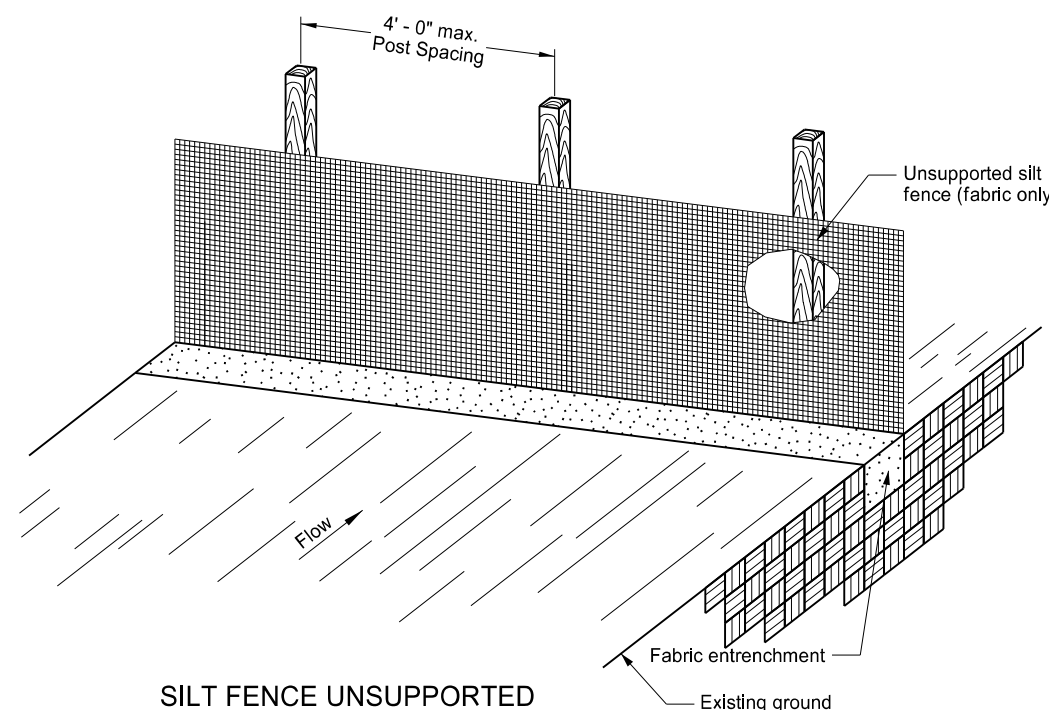
TYPICAL ISOMETRIC



MACHINE SLICED SILT FENCE



SILT FENCE SUPPORTED



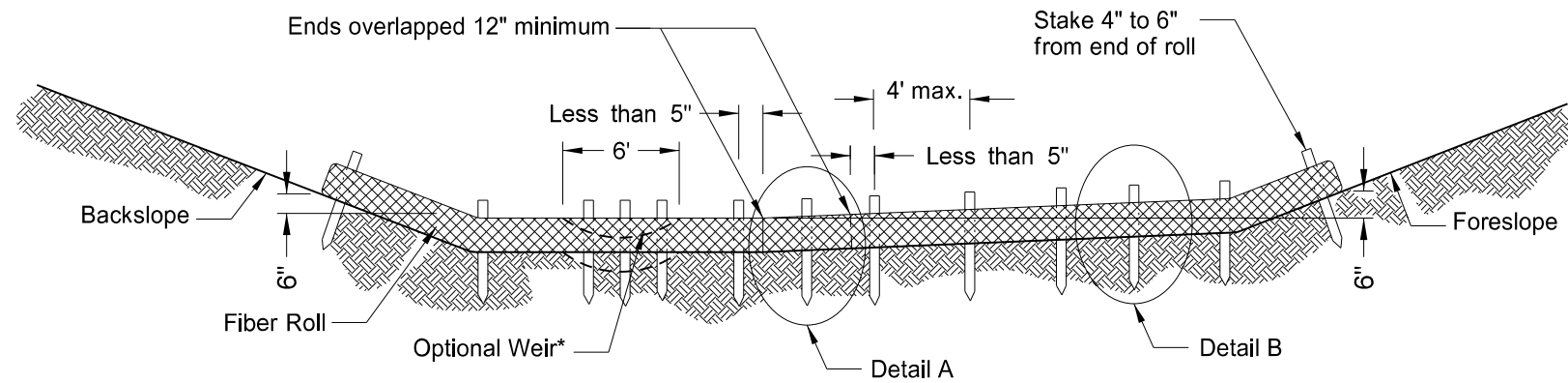
SILT FENCE UNSUPPORTED

- 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.

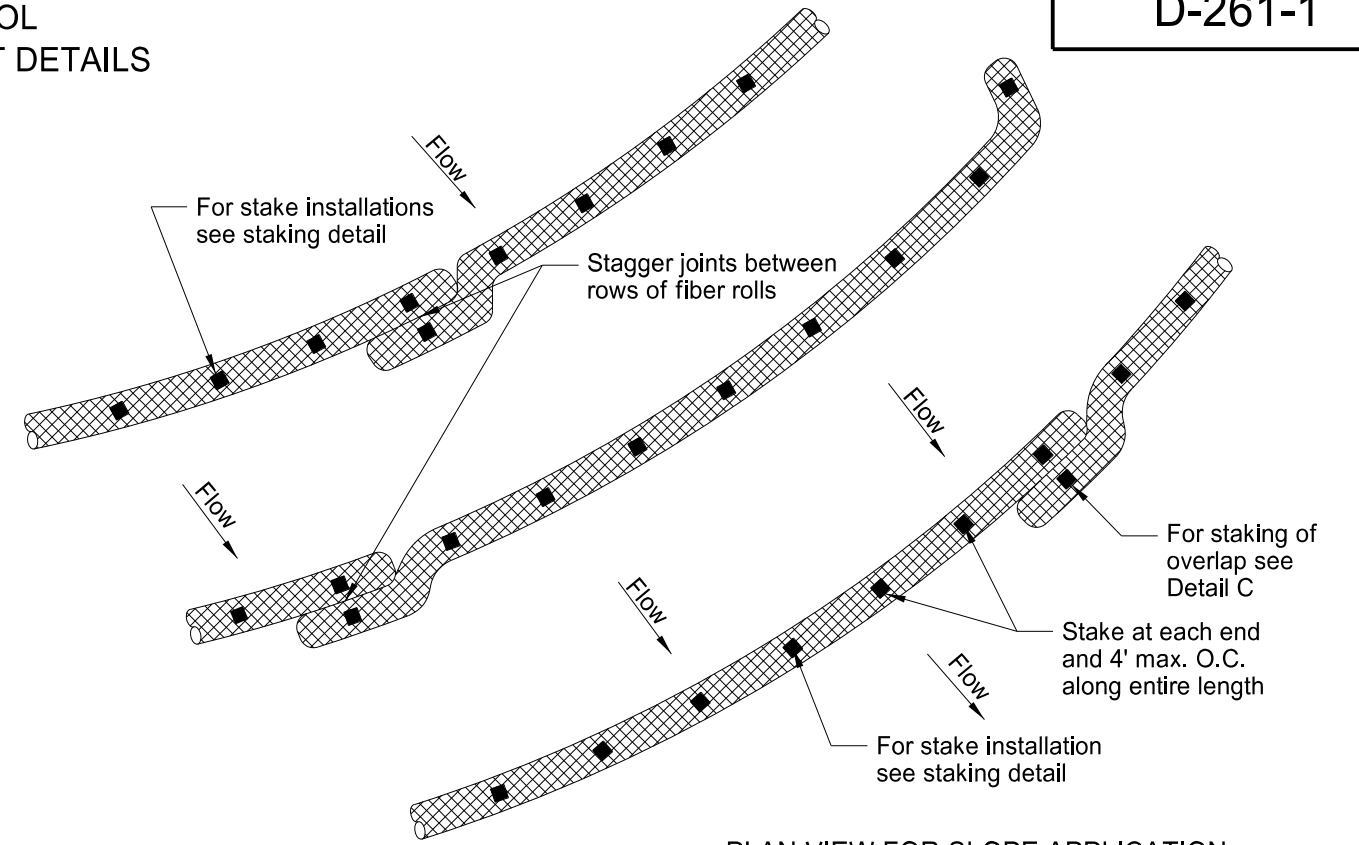
This document was originally issued and sealed by
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 PE- 4683,
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 of Transportation

EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS

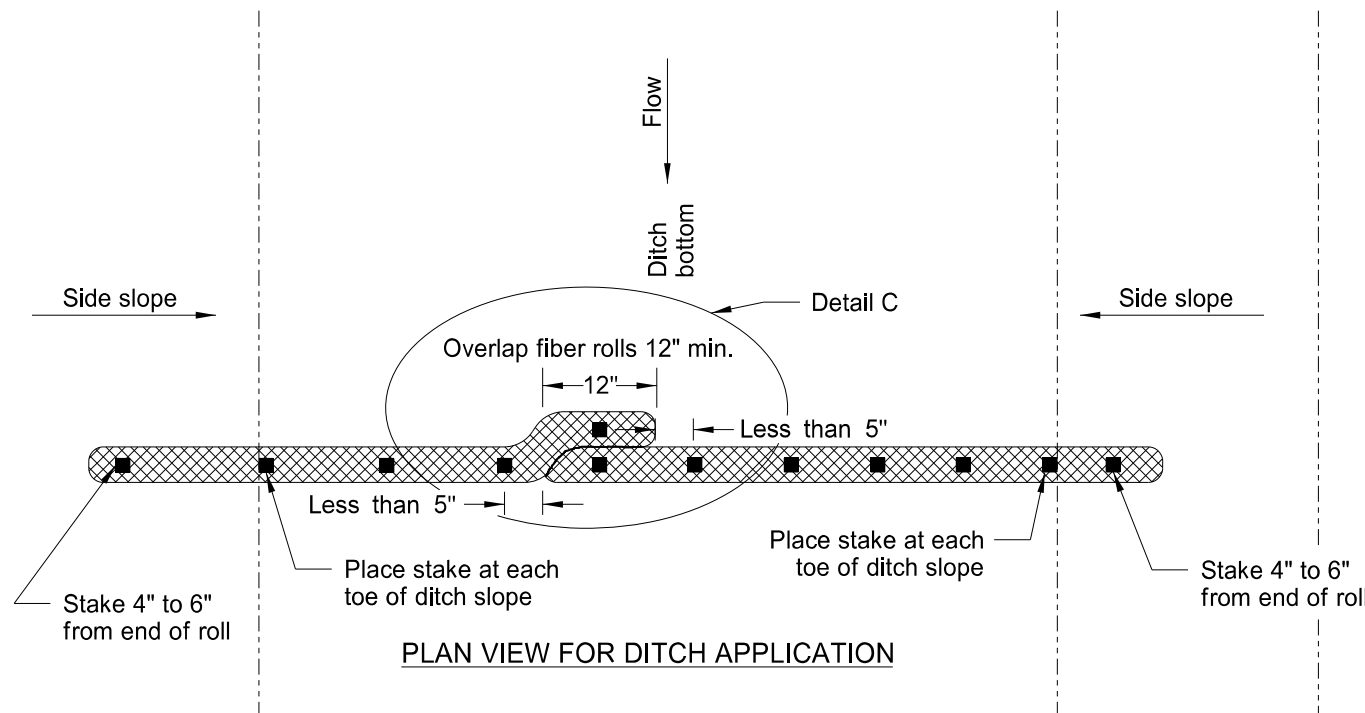


*Optional Weir. Use in flat areas, such as the Red River Valley, where there is potential for water to back up on adjacent property. Lower fiber roll enough to prevent water from backing up on adjacent property. Do not use 20-inch fiber rolls in flat areas where there is potential for water to back up on adjacent property.

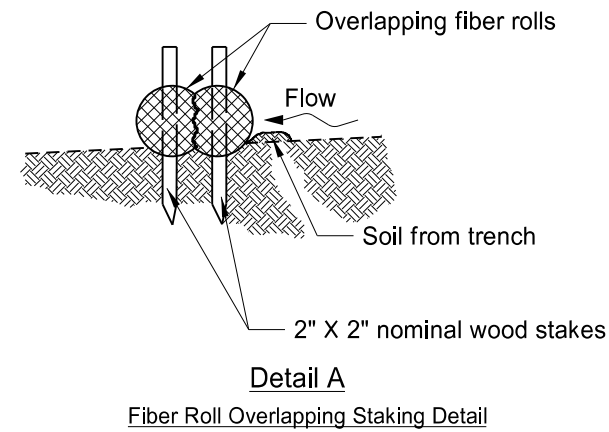
12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



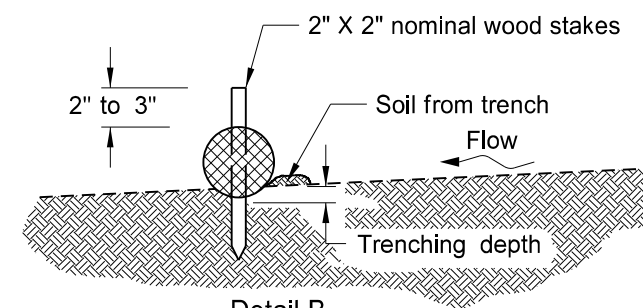
PLAN VIEW FOR SLOPE APPLICATION



PLAN VIEW FOR DITCH APPLICATION



Detail A
Fiber Roll Overlapping Staking Detail



Detail B
Fiber Roll Staking Detail

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"

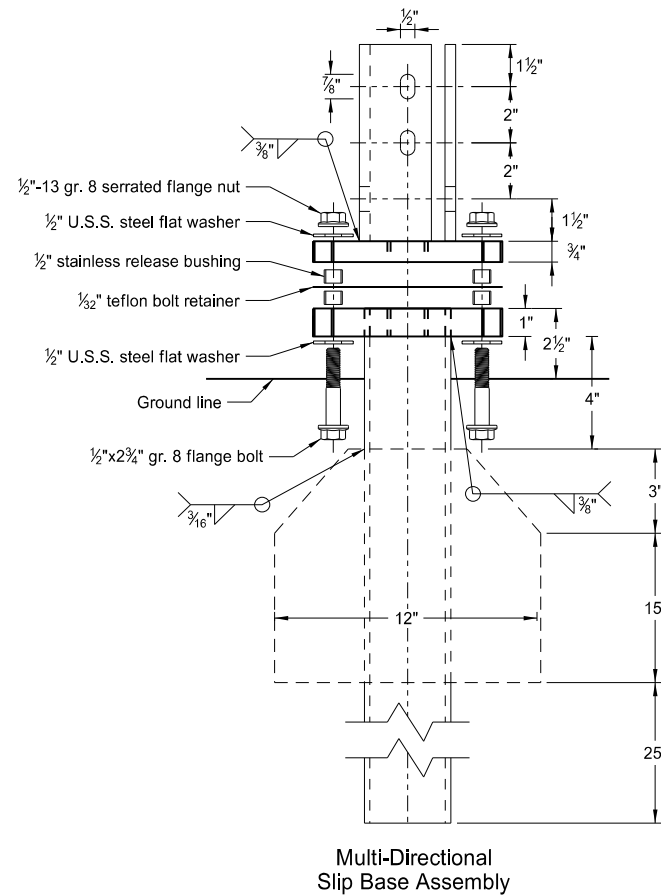
NOTE: Runoff must not be allowed to run under or around roll.

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

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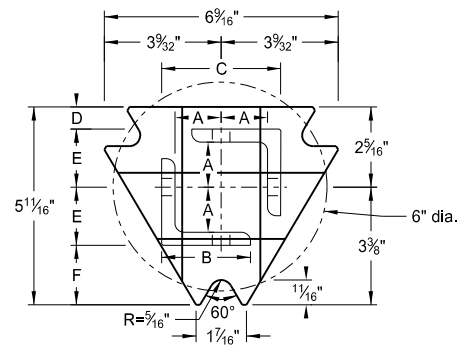
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

Perforated Tube



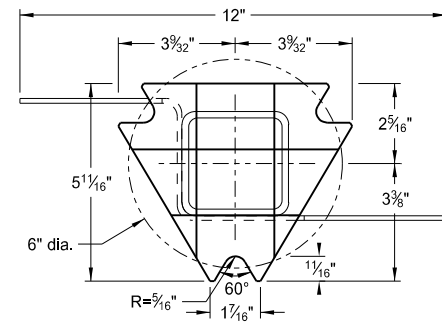
Multi-Directional Slip Base Assembly

Traffic Flow

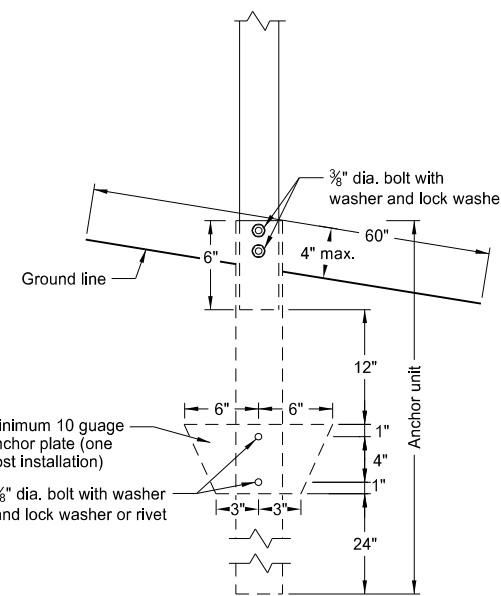


Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2 1/2" x 2 1/2" x 3/8" ASTM A36 structural angle

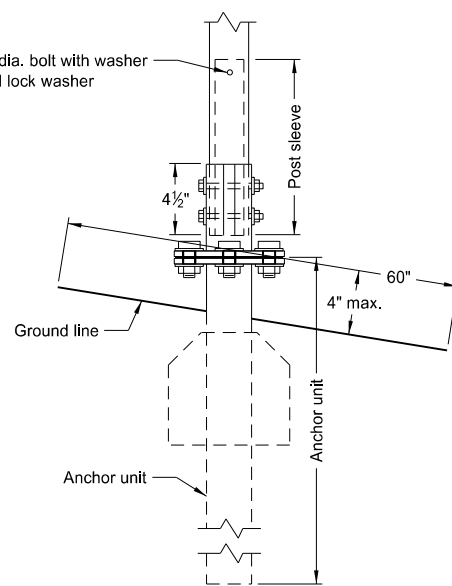
Traffic Flow



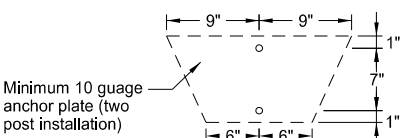
Bottom Soil Stub
Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50



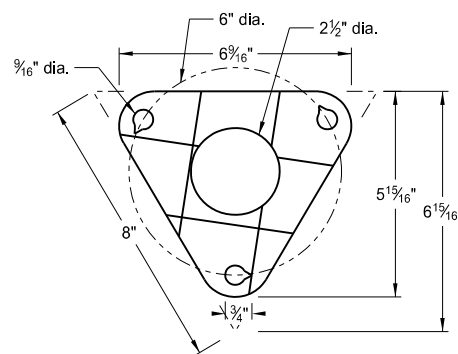
Anchor Unit and Post Assembly



Multi-Directional Slip Base Anchor Unit and Post Sleeve Assembly



Minimum 10 gauge anchor plate (two post installation)



Bolt Retainer for Base Connection
Bolt Retainer- 1/2" 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 Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/2	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	12			Yes	
2	2 1/4	10	2	12	Yes	
2	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	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
1 1/2 x 1 1/2	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
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	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
2 3/16" x 10 ga.	1 5/16"	2 1/2"	3 1/2"	2 5/32"	1 33/64"	1 7/8"
2 1/2" x 10 ga.	1 3/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"

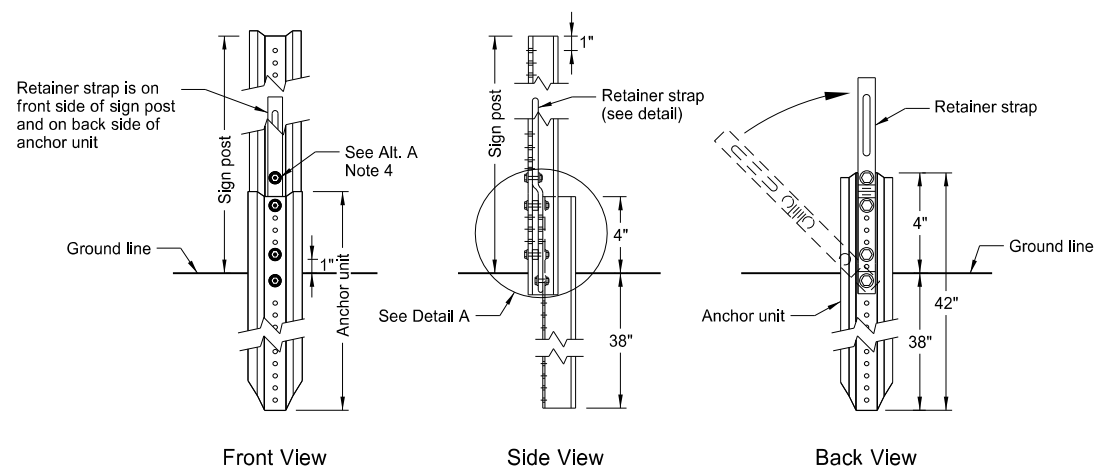
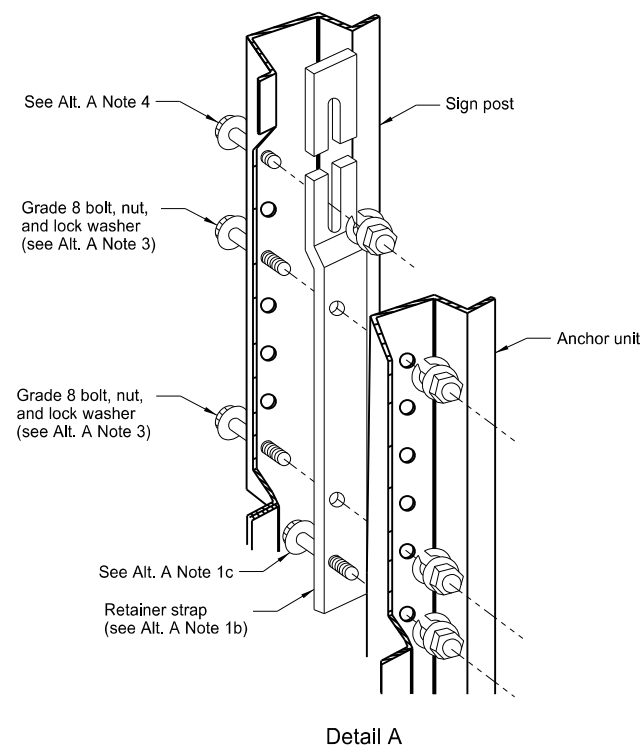
(A) Use breakaway base when support is placed in weak soils. Engineer determines if soils are weak.

(B) For additional wind load, insert the 2 3/16" x 10 ga. into 2 1/2" x 10 ga.

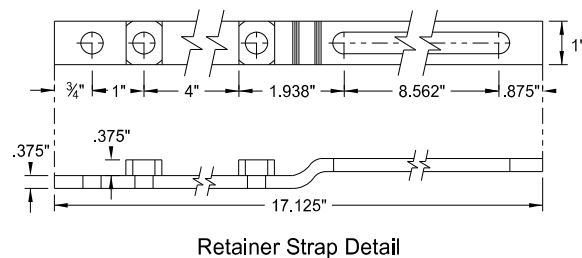
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp

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

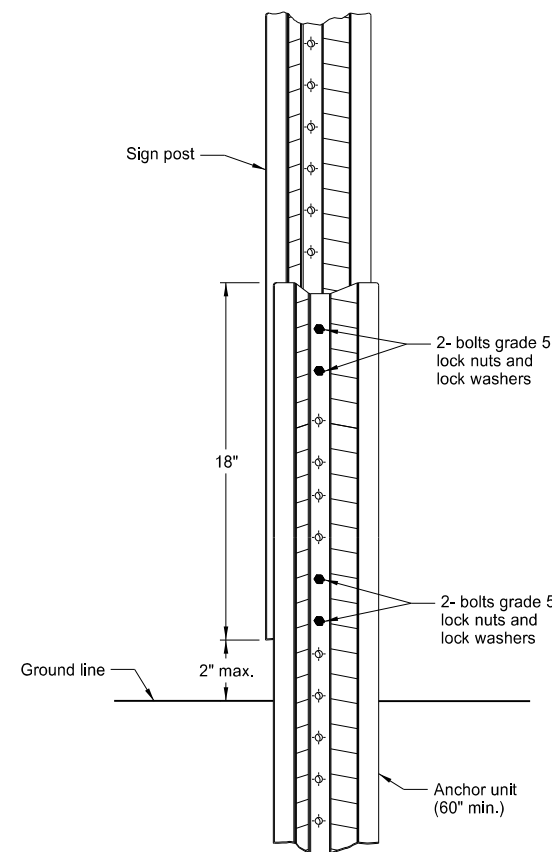
U-Channel Post



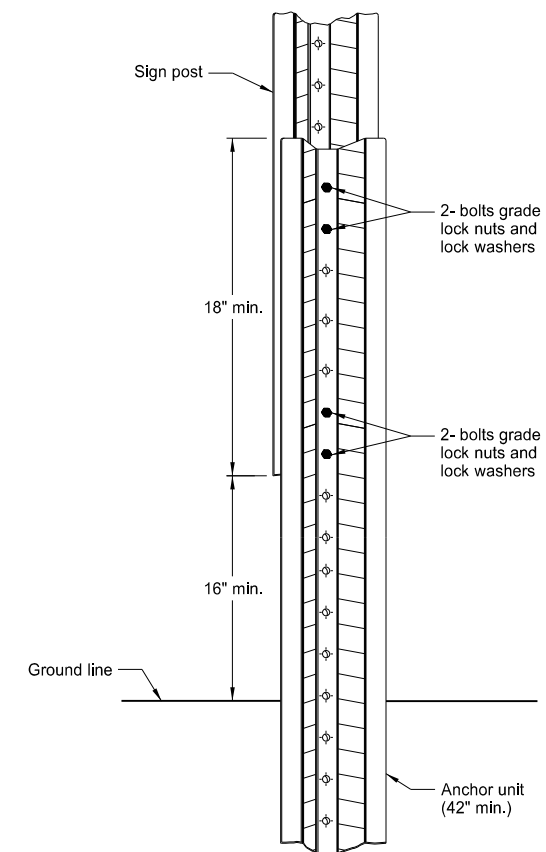
Breakaway U-Channel Detail Alternate A
Install a maximum of 2 posts within 7'.



Retainer Strap Detail



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'.

Alternate A Steps of Installation:

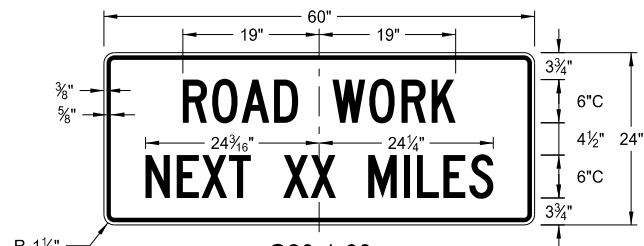
1. a) Drive anchor unit to within 12" of ground level.
b) Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
d) Rotate strap 90° to left.
2. a) Drive anchor 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 10-03-19	Updated to active voice New Design Engr PE Stamp

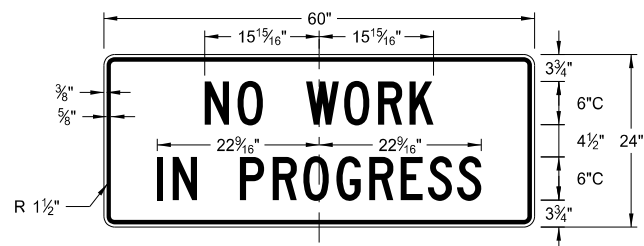
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Registration Number
PE- 4683,
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CONSTRUCTION SIGN DETAILS
 TERMINAL AND GUIDE SIGNS

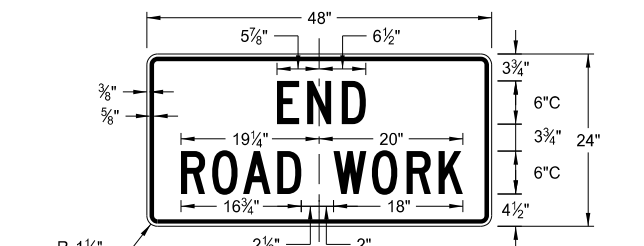
D-704-9



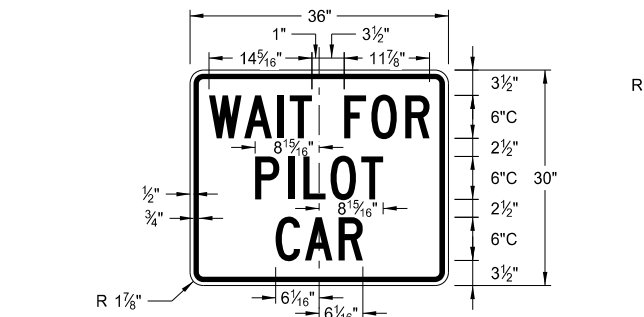
G20-1-60
 Legend: black (non-refl)
 Background: orange



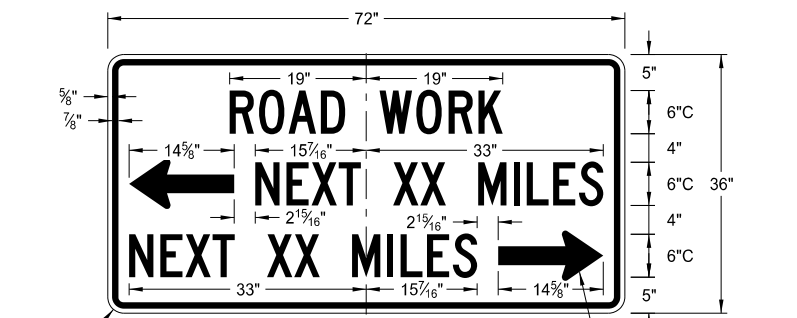
G20-1b-60
 Legend: black (non-refl)
 Background: orange



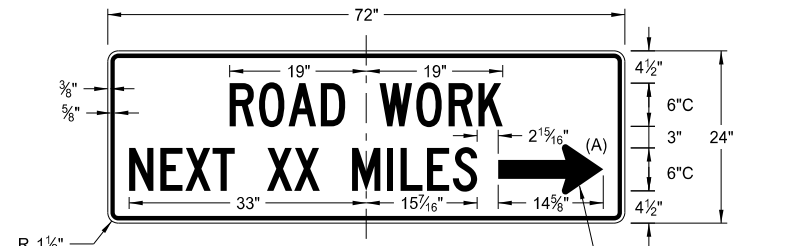
G20-2-48
 Legend: black (non-refl)
 Background: orange



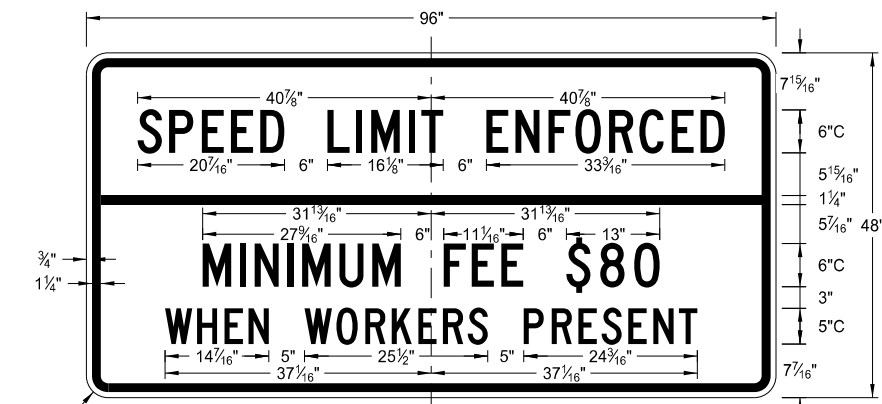
G20-4b-36
 Legend: black (non-refl)
 Background: orange



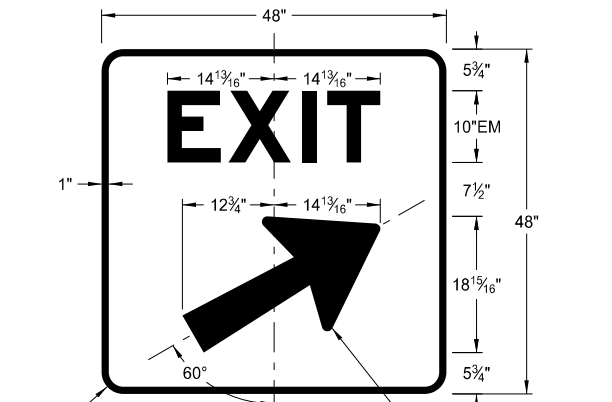
G20-50a-72
 Legend: black (non-refl)
 Background: orange



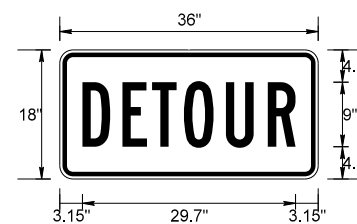
G20-52a-72
 Legend: black (non-refl)
 Background: orange



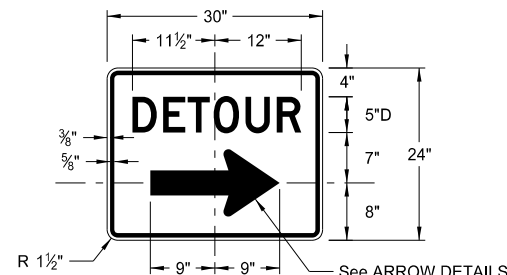
G20-55-96
 Legend: black (non-refl)
 Background: orange



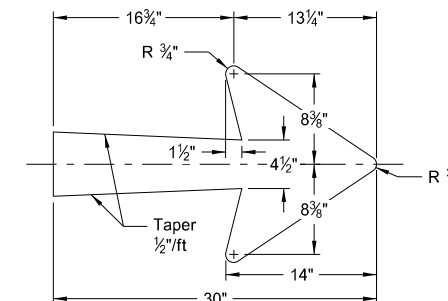
E5-1(L or R)-48
 Legend: white
 Background: green (orange optional)



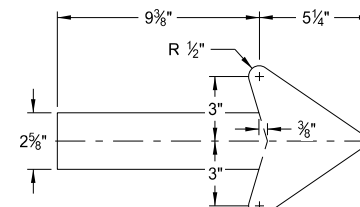
M4-8-36
 Legend: black (non-refl)
 Background: orange



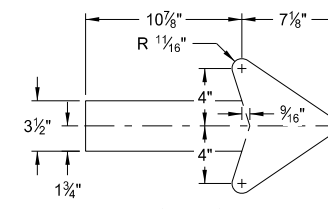
M4-9(L or R)-30 &
 M4-9-30
 Legend: black (non-refl)
 Background: orange



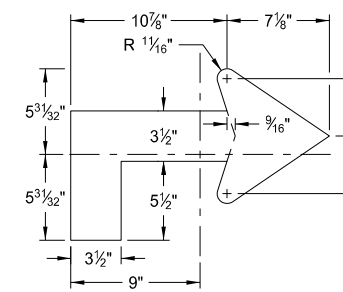
E5-1-48



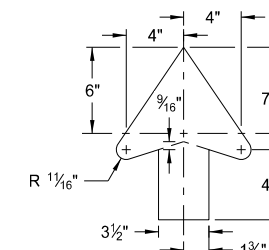
G20-50a-72
 G20-52a-72



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



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



M4-9-30
 Straight

ARROW DETAILS

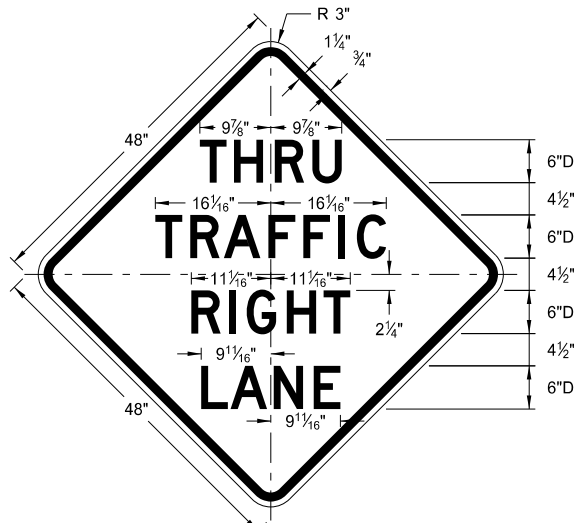
NOTES:

(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

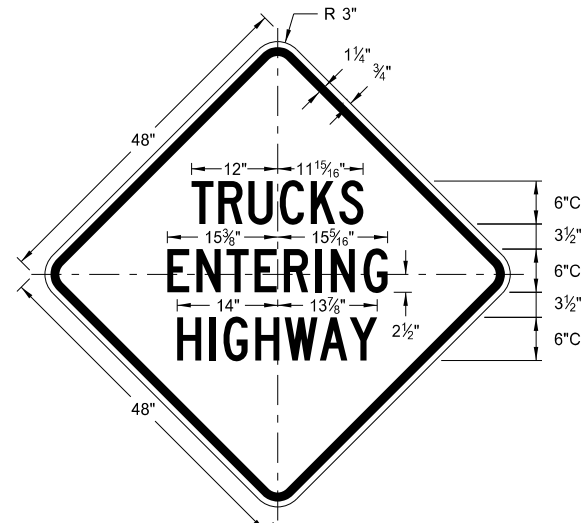
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 of Transportation

CONSTRUCTION SIGN DETAILS
WARNING SIGNS



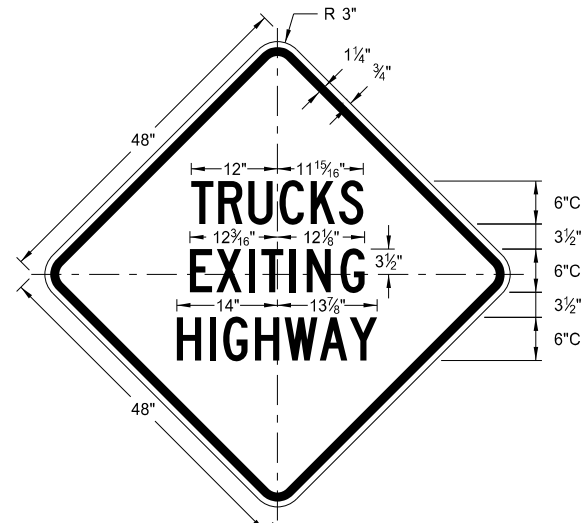
W5-8-48

Legend: black (non-refl)
Background: orange



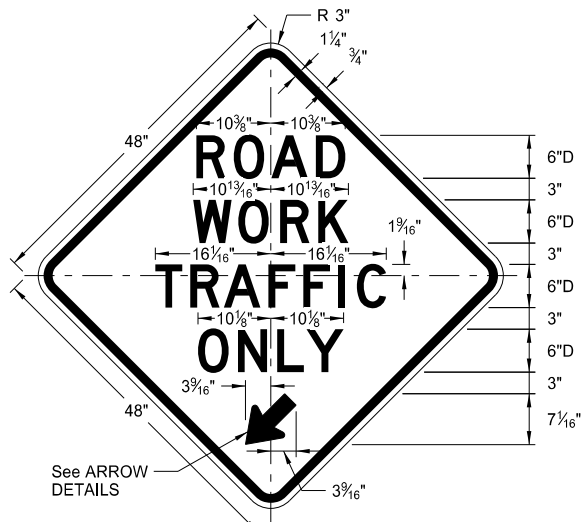
W8-53-48

Legend: black (non-refl)
Background: orange



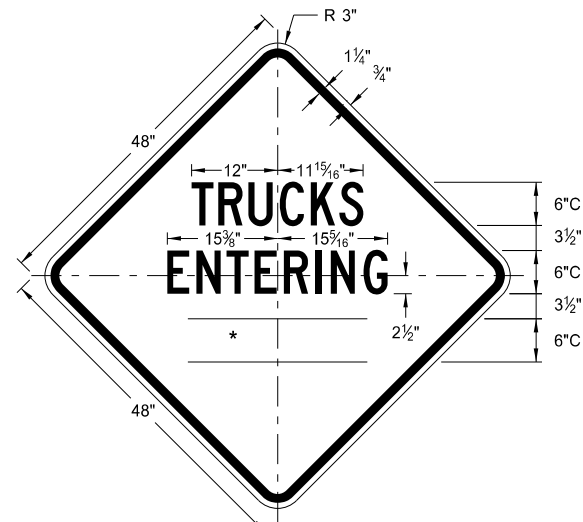
W8-56-48

Legend: black (non-refl)
Background: orange



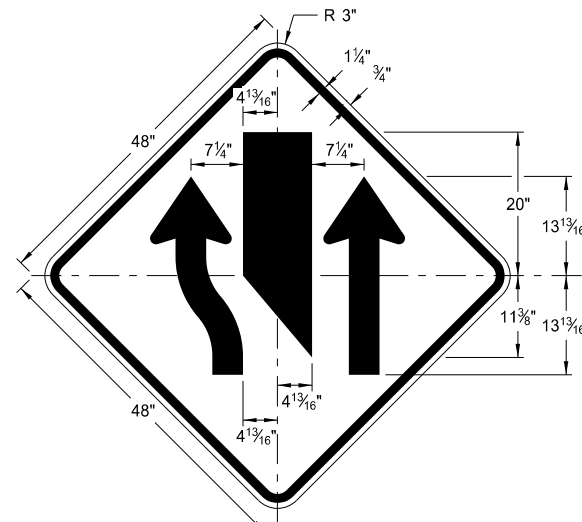
W5-9-48

Legend: black (non-refl)
Background: orange



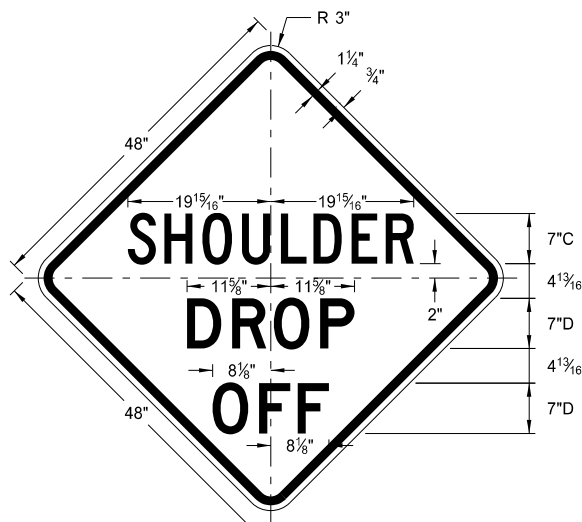
W8-54-48

Legend: black (non-refl)
Background: orange



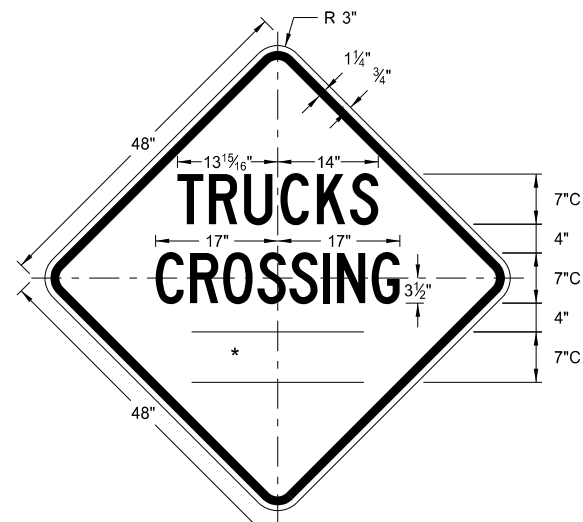
W9-3a-48

Legend: black (non-refl)
Background: orange



W8-9a-48

Legend: black (non-refl)
Background: orange

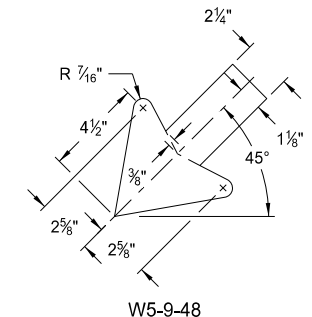


W8-55-48

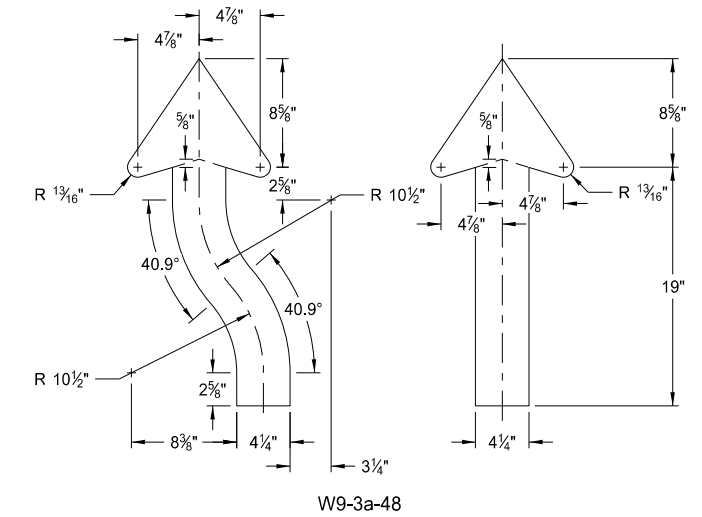
Legend: black (non-refl)
Background: orange

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



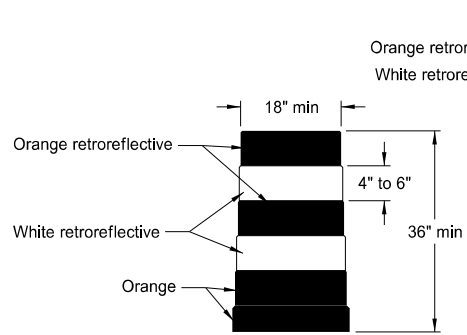
W9-3a-48

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

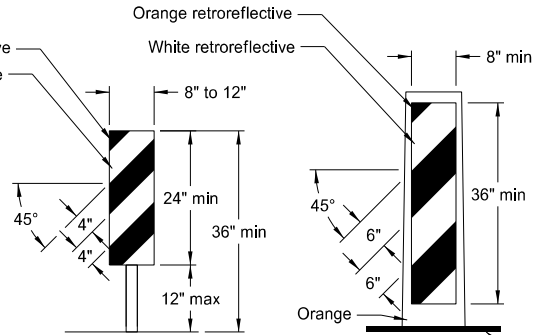
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BARRICADE AND CHANNELIZING DEVICE DETAILS



DELINEATOR DRUM

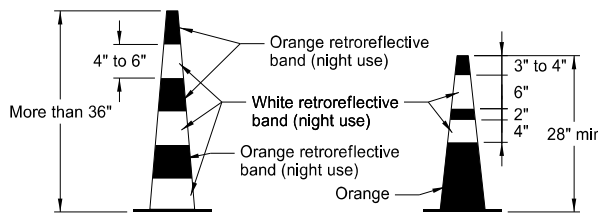
Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflectORIZED spaces between the horizontal orange and 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

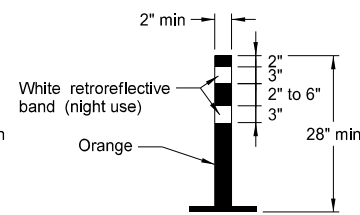
Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective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

Molded rubber base (min weight 30 lbs)



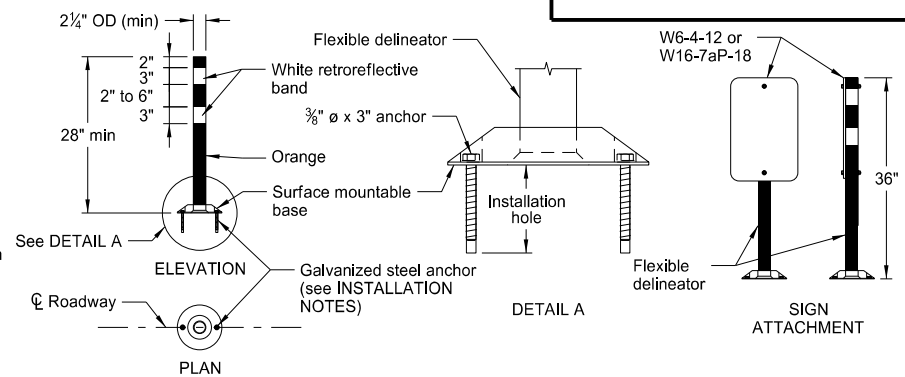
TRAFFIC CONE

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

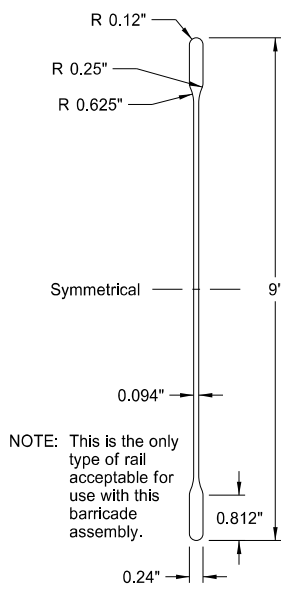
Provide retroreflectORIZATION of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



FLEXIBLE DELINEATOR

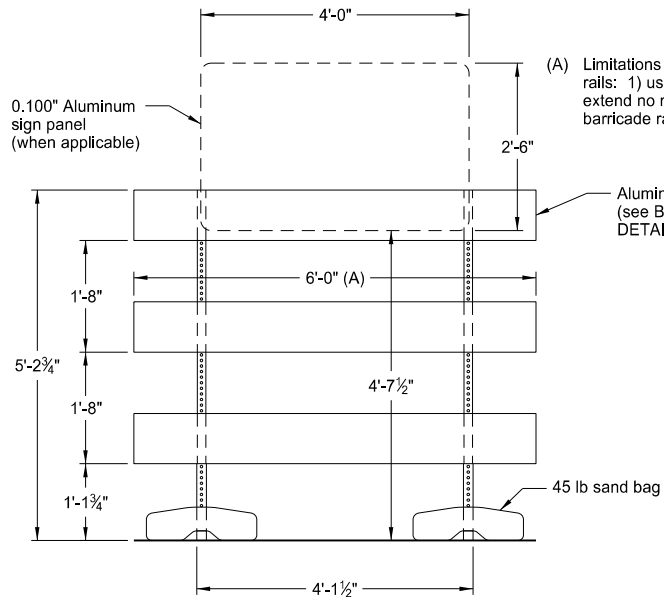
INSTALLATION NOTES:

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.



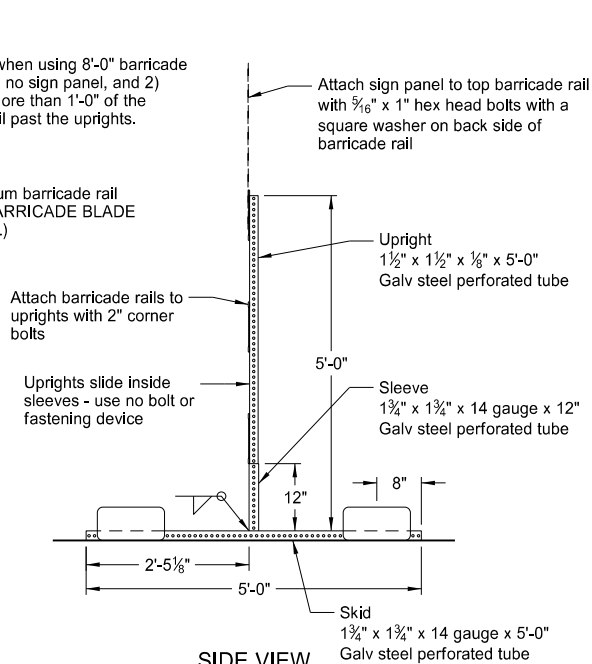
BARRICADE BLADE DETAIL

NOTE: This is the only type of rail acceptable for use with this barricade assembly.



ELEVATION VIEW

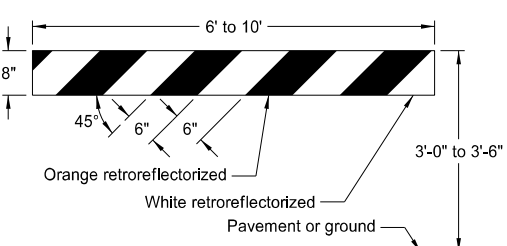
BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)



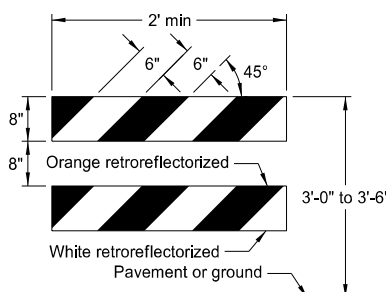
SIDE VIEW

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".

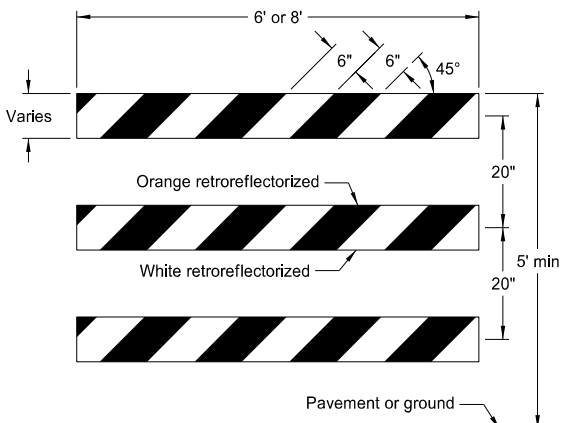


TYPE I BARRICADE

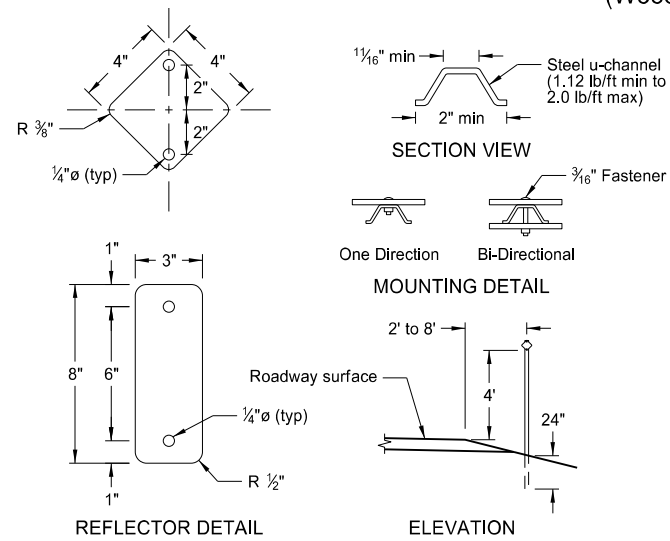


TYPE II BARRICADE

BARRICADE RAIL DETAILS



TYPE III BARRICADE



REFLECTOR DETAIL

ELEVATION

DELINEATORS

MINIMUM BALLAST (For each side of barricade support)

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

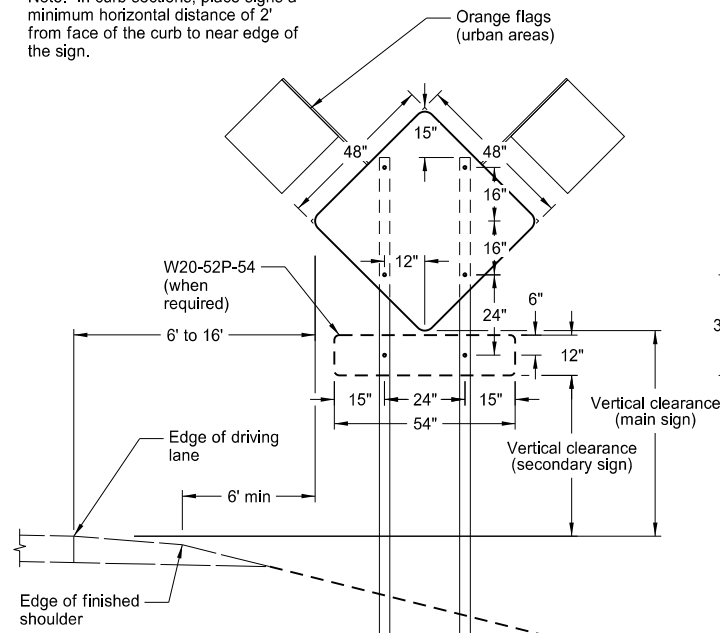
Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

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

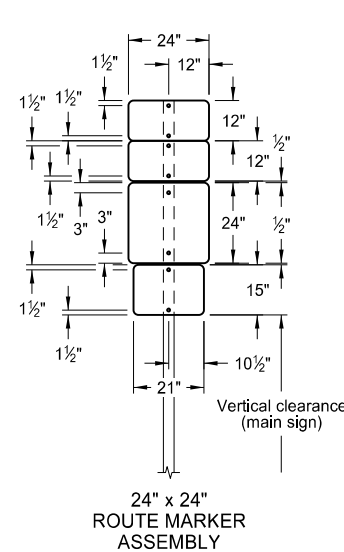
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CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

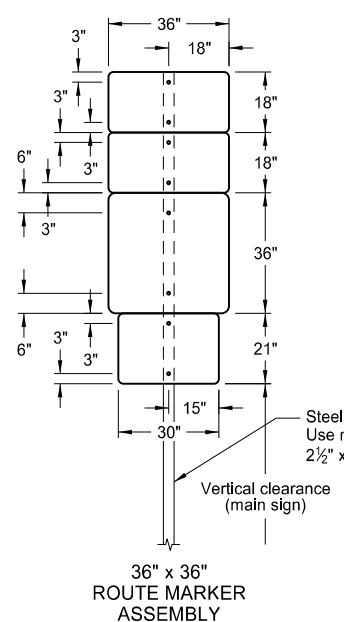
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



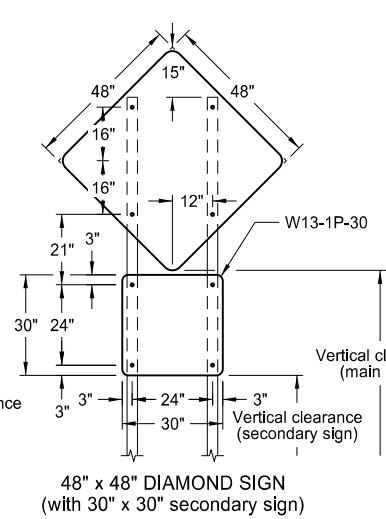
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



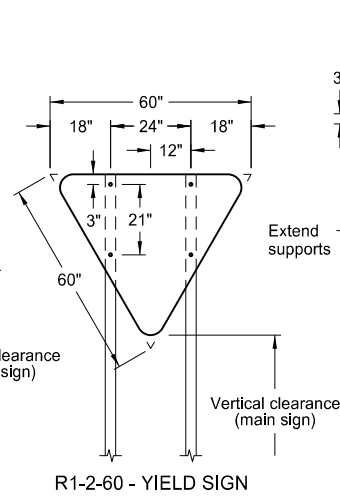
24" x 24" ROUTE MARKER ASSEMBLY



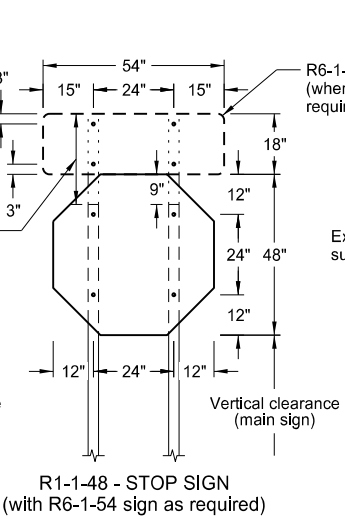
36" x 36" ROUTE MARKER ASSEMBLY



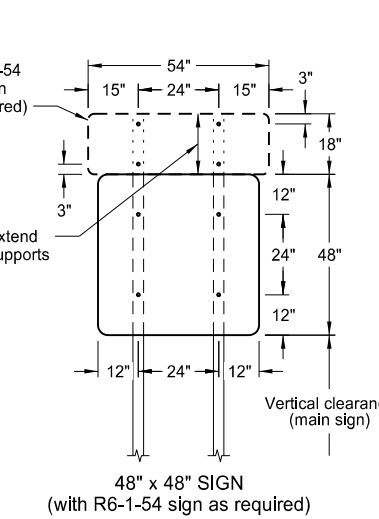
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



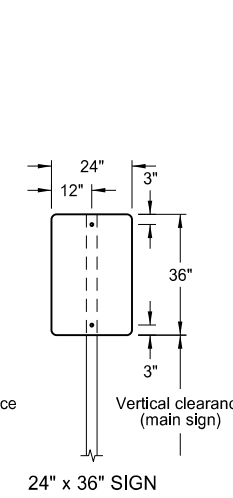
R1-2-60 - YIELD SIGN



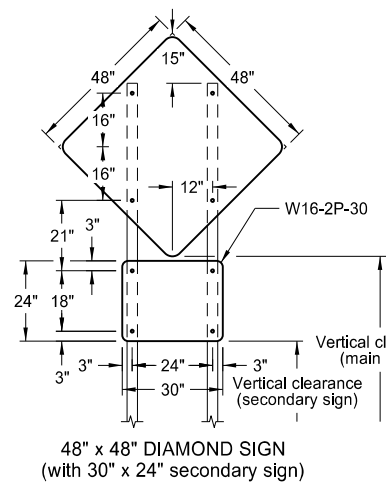
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



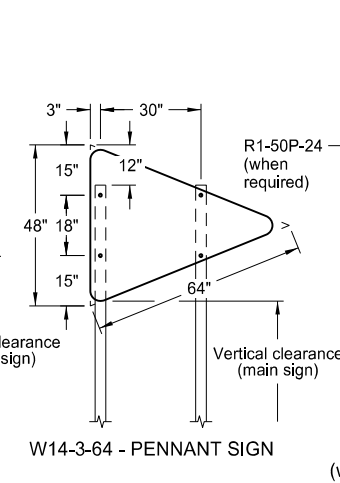
48" x 48" SIGN
(with R6-1-54 sign as required)



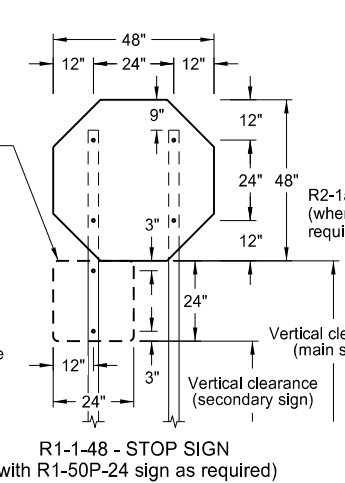
24" x 36" SIGN



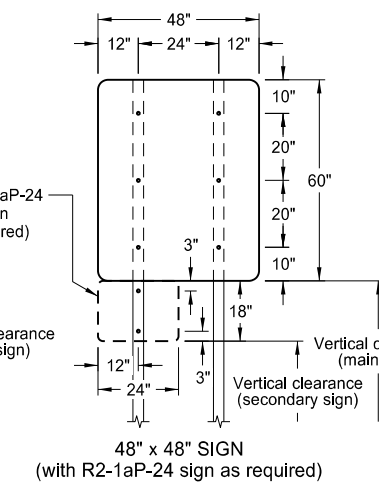
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



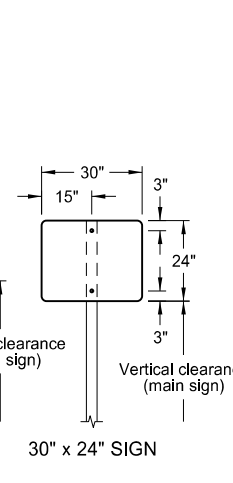
W14-3-64 - PENNANT SIGN



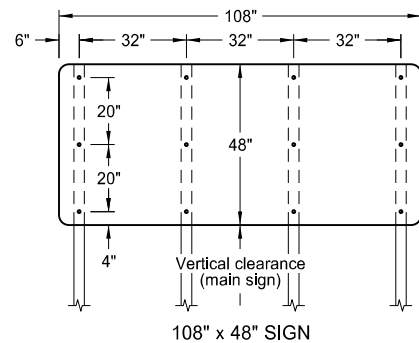
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



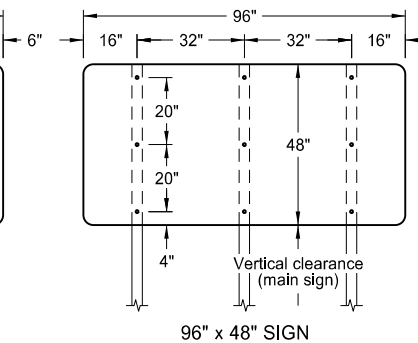
48" x 48" SIGN
(with R2-1aP-24 sign as required)



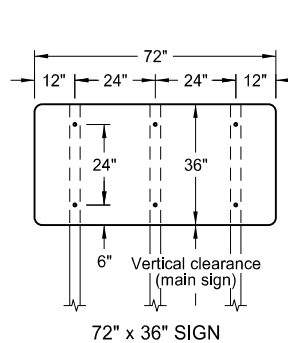
30" x 24" SIGN



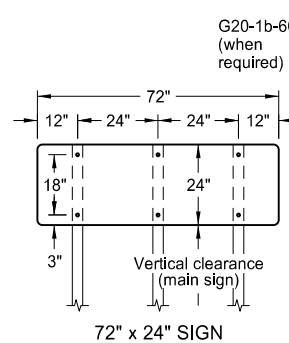
108" x 48" SIGN



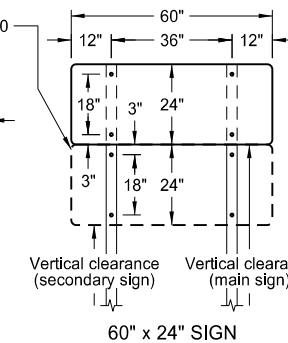
96" x 48" SIGN



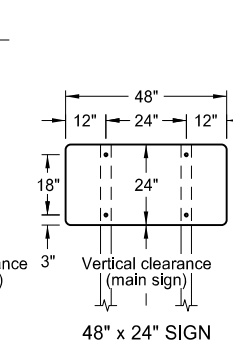
72" x 36" SIGN



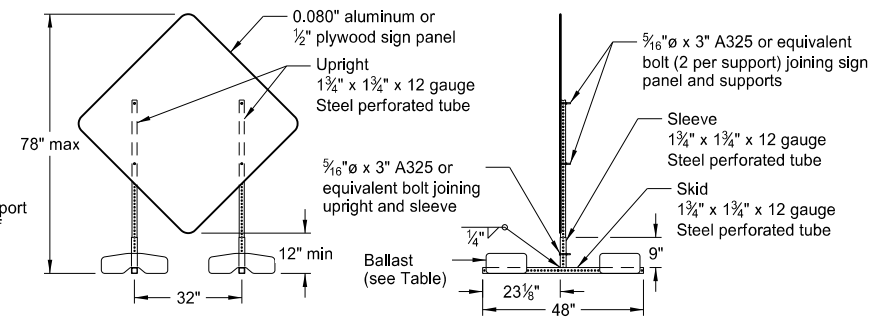
72" x 24" SIGN



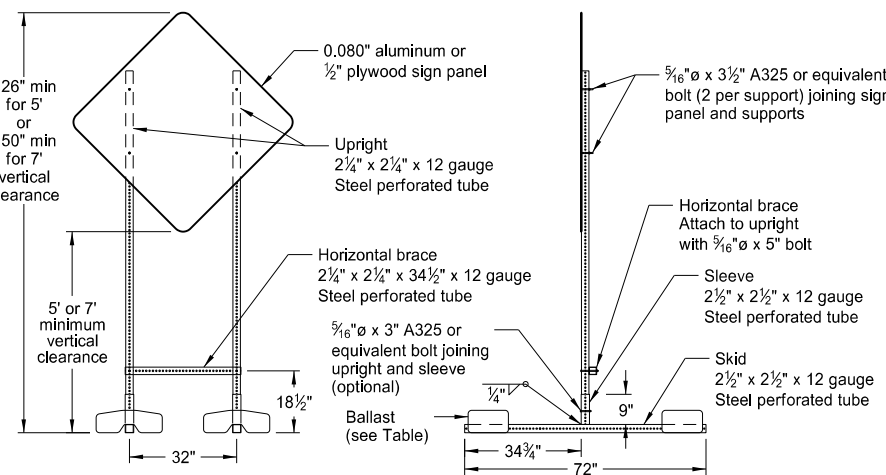
60" x 24" SIGN



48" x 24" SIGN



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

- 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 2 1/2" x 2 1/2" 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.
- Sign Panels: Provide sign panels made of 0.100" aluminum, 1/2" plywood, or other approved material, except where noted. Punch all holes round for 5/16" bolts.
- 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)
- 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

- 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.

- 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 unforeseen circumstances, such as equipment breakdowns, 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)

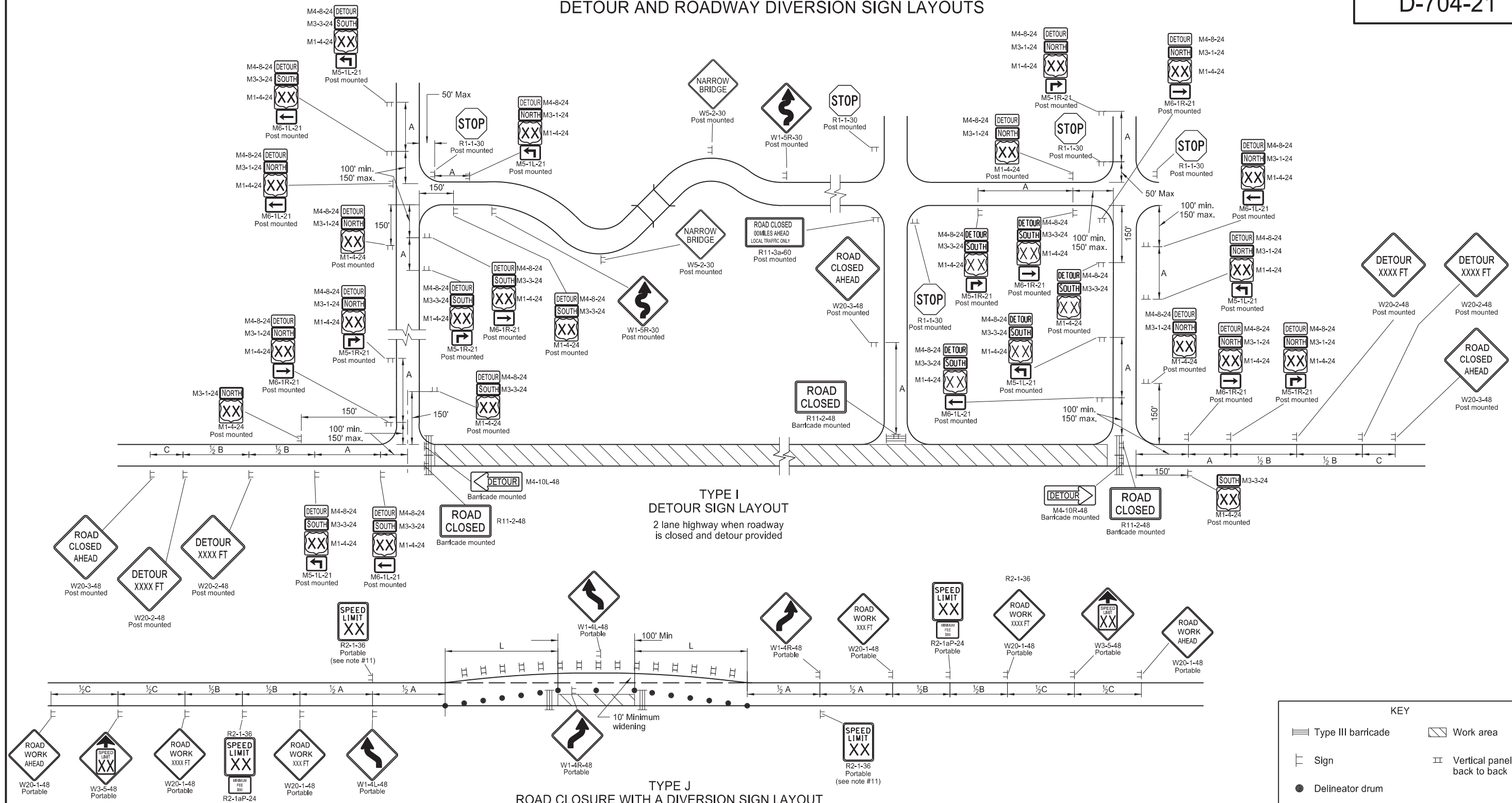
Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

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

DETOUR AND ROADWAY DIVERSION SIGN LAYOUTS



TYPE I
DETOUR SIGN LAYOUT
2 lane highway when roadway is closed and detour provided

TYPE J
ROAD CLOSURE WITH A DIVERSION SIGN LAYOUT
2 lane highway with widened section, traffic maintained in both directions.

Use layout when work is less than 5 days or is within a project.

- Notes:
- Variables
S= Numerical value of speed limit or 85th percentile. W= The width of taper.
L= Minimum length of taper, or $S \times W$ for freeways, expressways, and all other roads with speeds of 45 mph or greater, or $W \times S^2 / 60$ for urban, residential, and other streets with speeds of 40 mph or less.
 - Place barricades on moveable assemblies and signs on portable assemblies when on roadway.
 - Space delineator drums and vertical panels at dimension "S" for tapering traffic. Space delineator drums, tubular markers and vertical panels at 2 times "S" for tangents.
 - Determine the reduced speed limit based on the in place speed limit before construction. Where speed limits 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 $\frac{1}{2}$ B.
 - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inches 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.
 - Cover existing speed limit signs within a reduced speed limit zone.
 - Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - If the tangent between tapers is less than 600', as an option, use sign W24-1-48 in place of double reverse curve signs.
 - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
 - Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.

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
- Work area
- Sign
- Vertical panels back to back
- Delineator drum

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated notes & added spd limit
11-01-19	Revised sign #s and note 8
12-08-21	Added Dollars At Work sign
11-29-22	Removed Dollars At Work

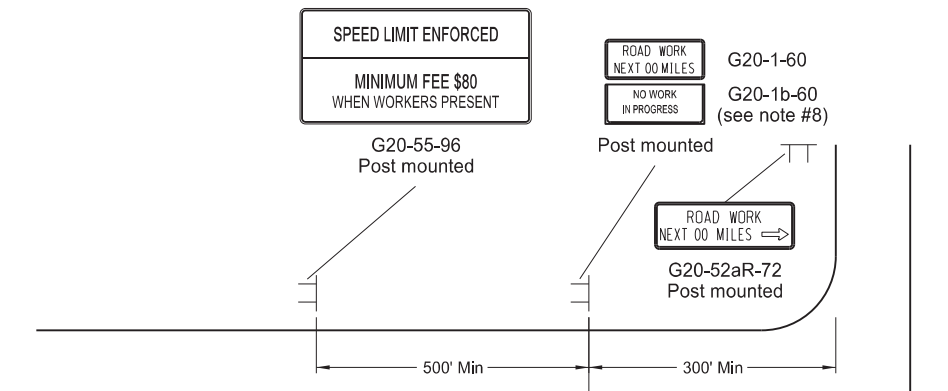
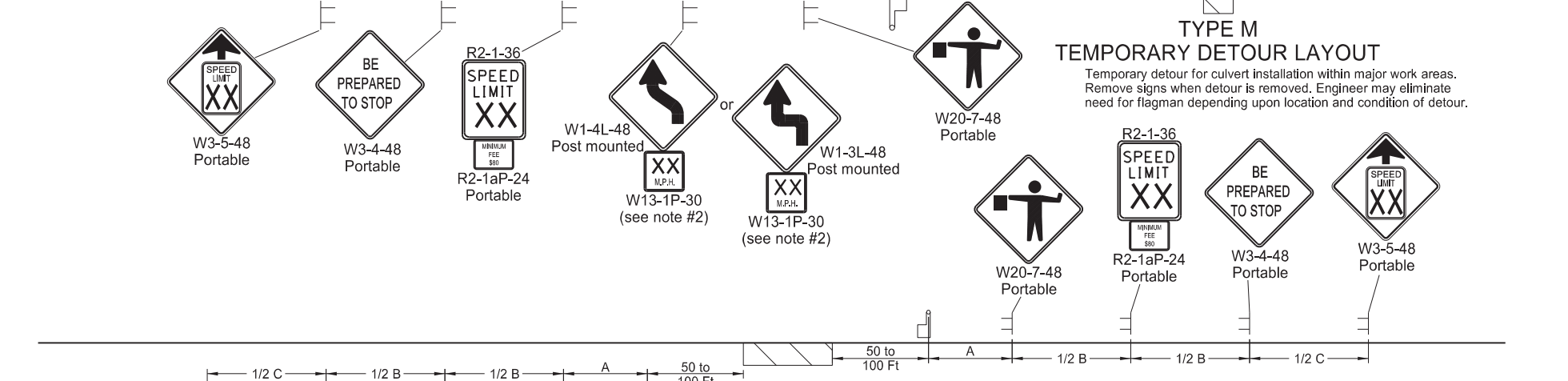
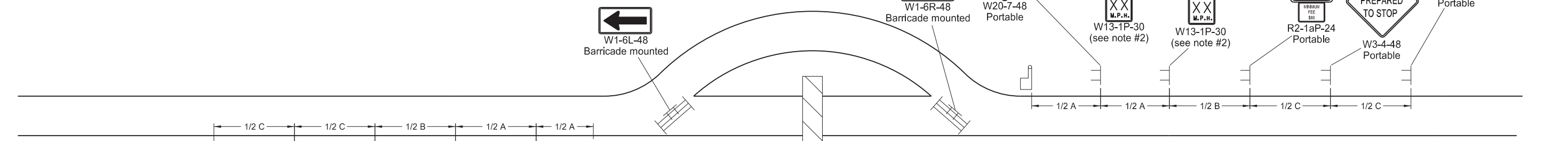
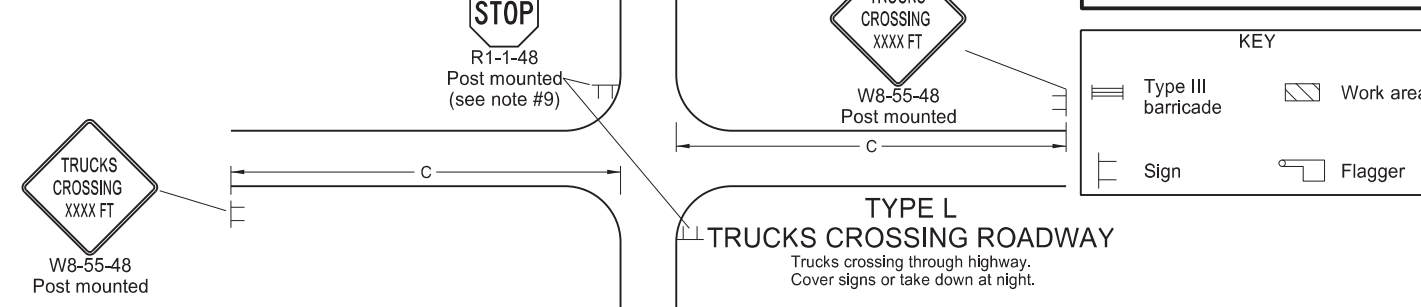
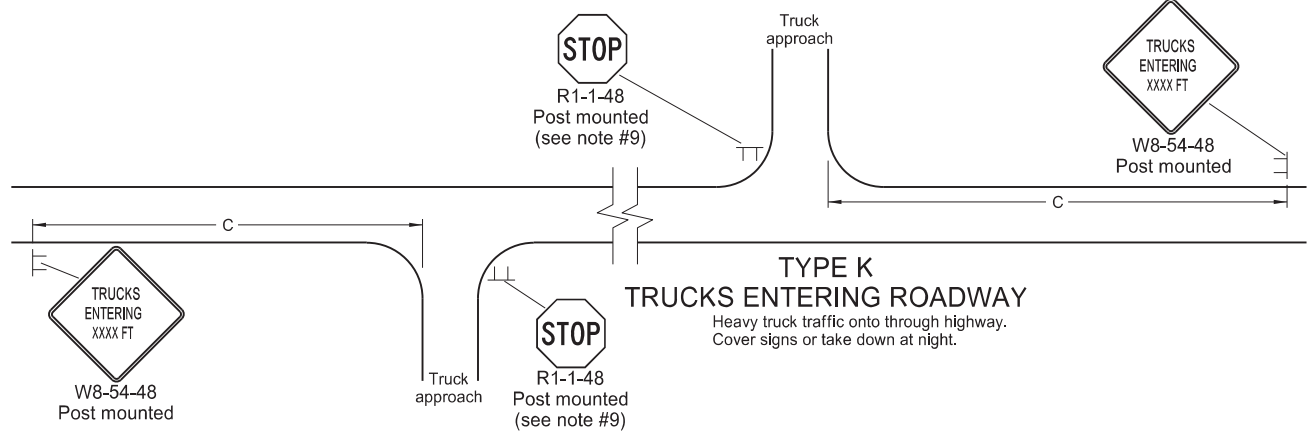
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
11/29/22

CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

D-704-22

KEY

- Type III barricade
- Sign
- Work area
- Flagger



- Notes:**
- Place barricades on a moveable assemblies and signs on portable assemblies when located on roadway.
 - Where necessary, safe speed to be determined by the Engineer.
 - 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 1/2 B.
 - 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.
 - Cover existing speed limit signs within a reduced speed zone.
 - Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - Install sign G20-1b-60 when work is suspended for winter.
 - If existing stop sign is in place, a 48" stop sign is not required.
 - 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.
 - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

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

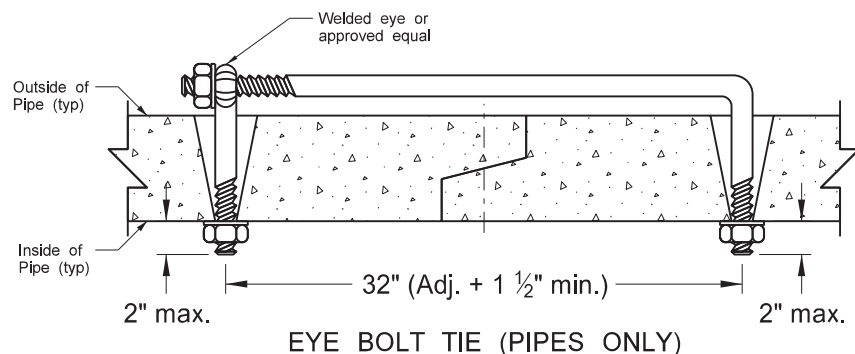
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work



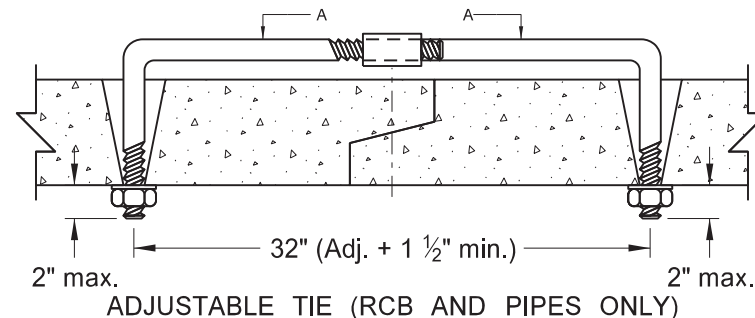
11/29/22

CONCRETE PIPE, CATTLE PASS, OR PRECAST CONCRETE BOX CULVERT TIES

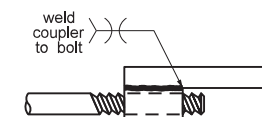
REQUIRED SIZE OF TIE BOLTS		
Pipe Size	Thread ϕ	XXS Pipe Sleeve Inner ϕ
18" - 24"	$\frac{5}{8}$ " See note 3	$\frac{3}{4}$ "
30" - 66"	$\frac{3}{4}$ "	1"
72" - 120"	1"	1 $\frac{1}{4}$ "
RCB/Cattle Pass		



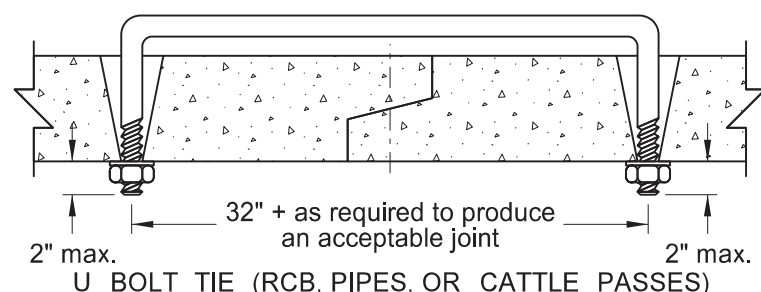
EYE BOLT TIE (PIPES ONLY)



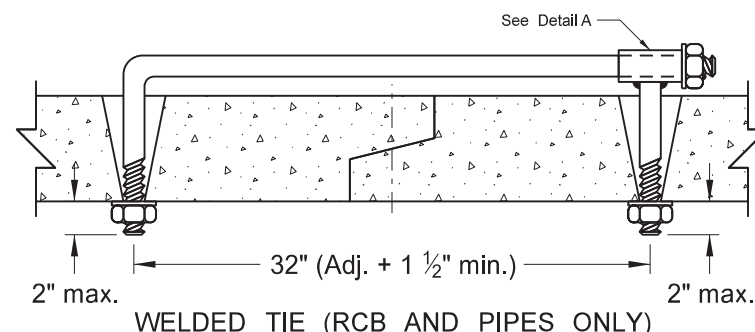
ADJUSTABLE TIE (RCB AND PIPES ONLY)



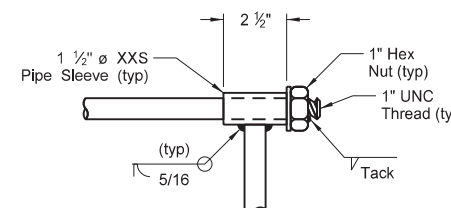
SECTION A-A



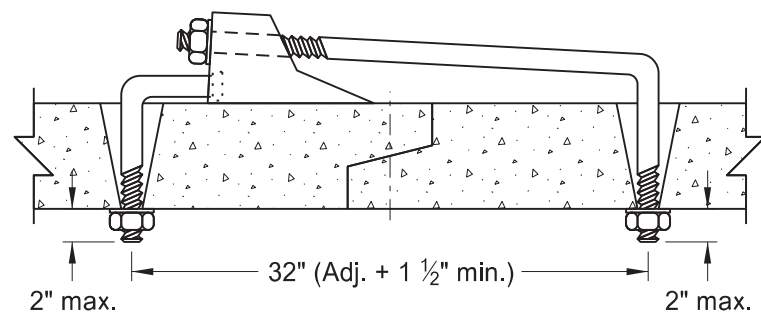
U BOLT TIE (RCB, PIPES, OR CATTLE PASSES)



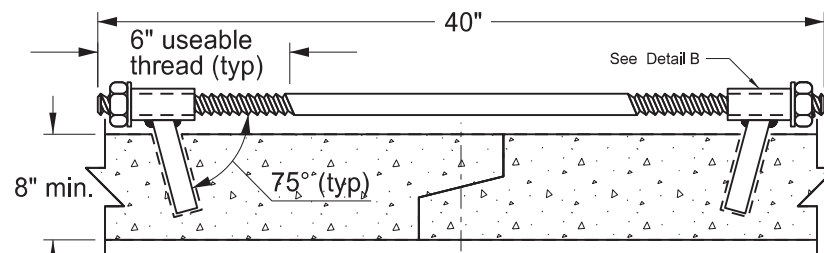
WELDED TIE (RCB AND PIPES ONLY)



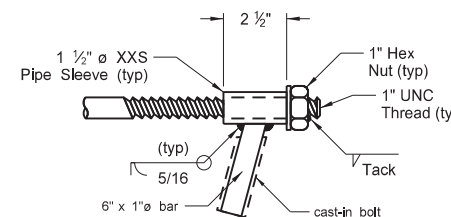
DETAIL A



CANOPY TIE (PIPES ONLY)

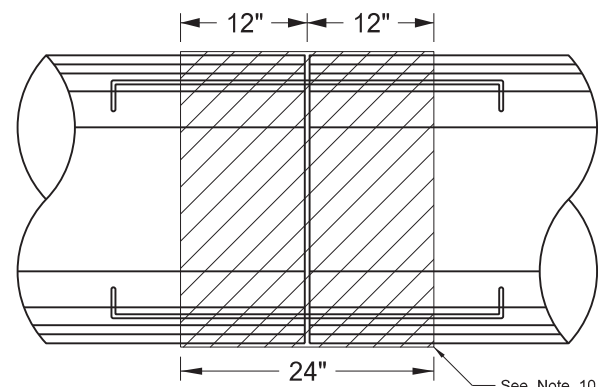


HIDDEN TIE (RCB ONLY)

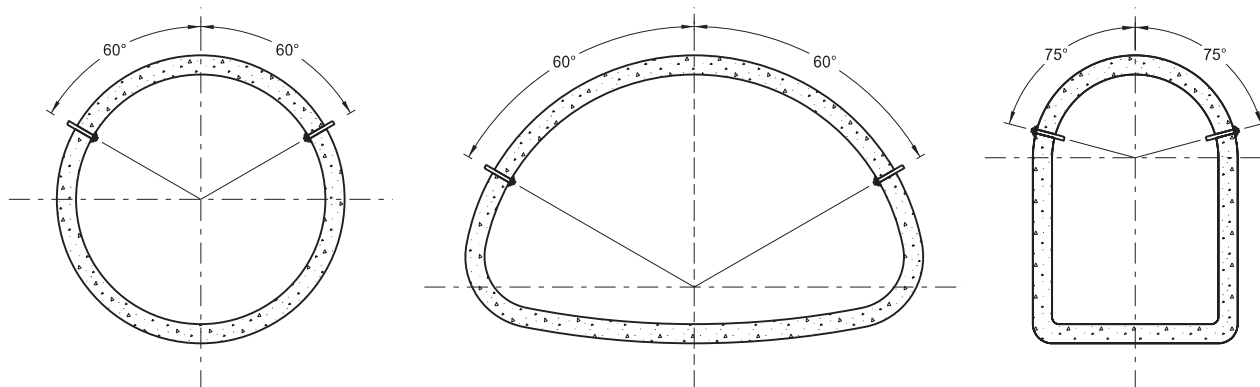


DETAIL B

- NOTES:
- The pipe size listed is the inside diameter of round pipe or the equivalent diameter of pipe arch.
 - Insert pipe ties from the inside of the pipes and grout in place for Cattle Pass and Jacked and Bored pipes. Jacked and bored pipes with a diameter of 24" or less do not require pipe ties.
 - Nuts and washers are not required on Jacked and Bored pipes or pipes with a 24" diameter or less. Insert and grout tie bars into place where nuts and washers are not used.
 - Do not use pipe ties to pull the pipe or RCB sections tight. The ties are only for holding sections together.
 - Use only tie bolt assemblies that have been hot dip galvanized in accordance with ASTM A 153.
 - Holes in pipes to accommodate tie bolts can be precast or drilled. Tapered holes are permitted when precast. Use holes that have a diameter 1/4" larger than the diameter of the thread. In precast RCB's, use holes that contain cast-in bolt sleeves with an inside diameter of 1 1/4".
 - Select the type of tie bolt used from those shown.
 - Include the cost of precasting or drilling the required holes and furnishing and installing the tie bolts in the price bid for the appropriate conduit or RCB pay item.
 - Tie all centerline and approach RCP culvert joints. Tie the first three joints including the end section of all free ends of storm drain systems. Free ends are defined as any storm drain end which does not terminate at an inlet or manhole. Outfall culverts with end sections which drain adjacent ditches are examples of free ends.
 - Place joint wrap prior to installing ties. Firmly secure the wrap around the full perimeter. For concrete pipes, overlap the joint by 12" in both directions. For box culverts, use a waterproof membrane that meets ASTM C877 (Type III). Provide a membrane that is a minimum of 12" wide and center it at the joint. Provide a minimum overlap of 2.5" at the seams.
 - Use tie bolts that conform to ASTM A 36. Use heavy hex nuts that conform to ASTM A 563. Use washers that conform to ASTM F 436, Type 1. Use welded pipe sleeves and cast-in bolt sleeves that conform to ASTM A 53, Grade B.
 - Tie RCB's at locations shown on the plans.



PLAN VIEW (PIPES ONLY)

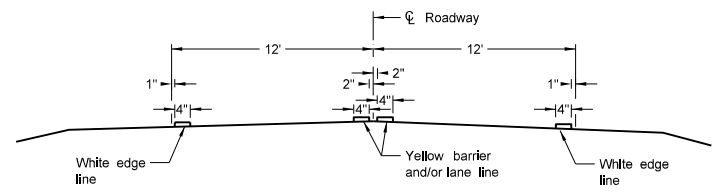


END VIEW

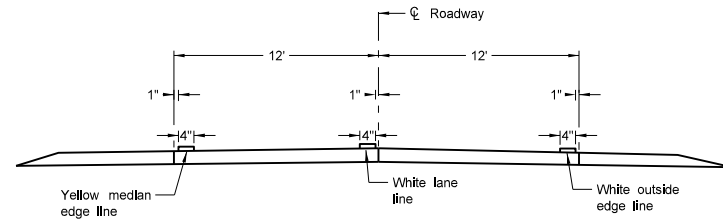
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-18-14	
REVISIONS	
DATE	CHANGE
7-21-15	Note 8
6-5-17	Notes 2-11, Table, Title, Labels
8-11-21	Notes 2-12, Table, Label



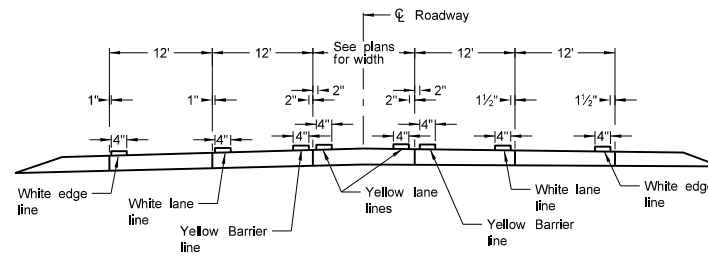
PAVEMENT MARKING



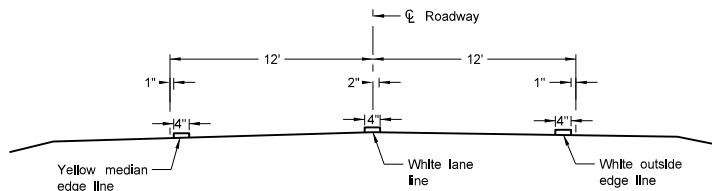
Two Lane Two Way
RURAL ROADWAY



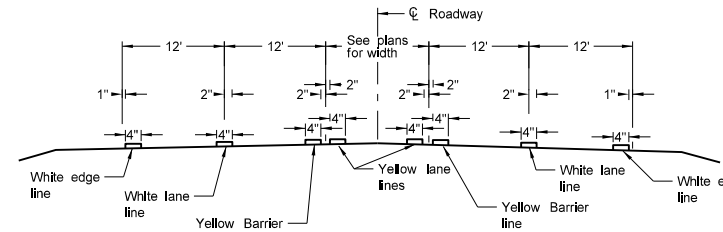
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



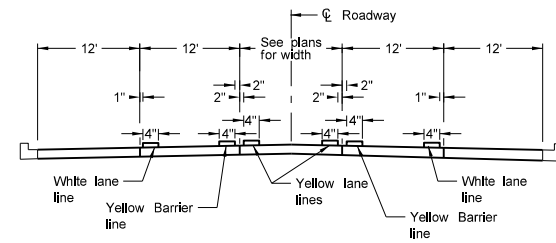
RURAL FIVE LANE ROADWAY
Concrete Section



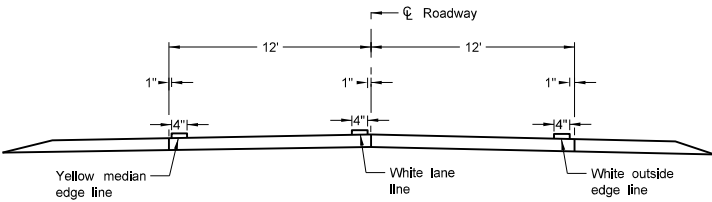
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



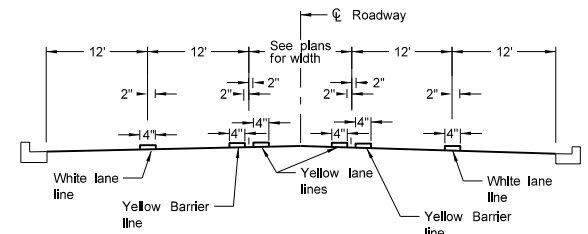
RURAL FIVE LANE ROADWAY
Asphalt Section



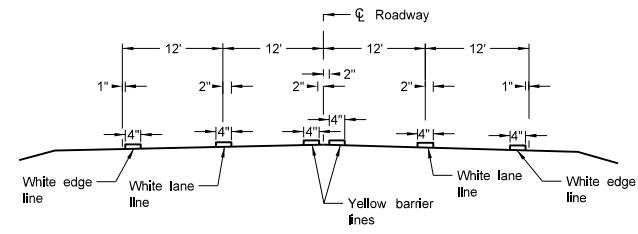
URBAN FIVE LANE SECTION
Concrete Section



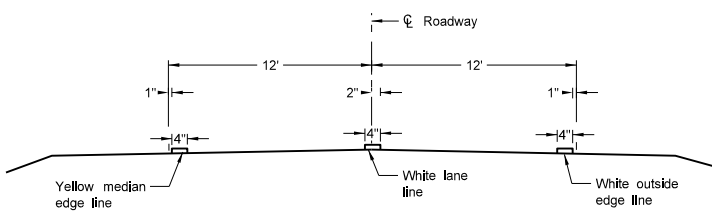
Two Lane Roadway
PRIMARY HIGHWAY
Concrete Section



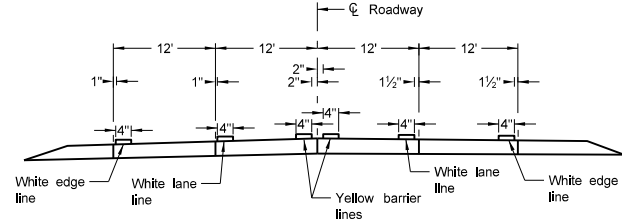
URBAN FIVE LANE SECTION
Asphalt Section



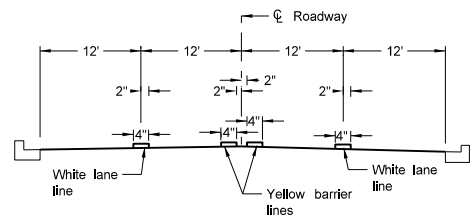
RURAL FOUR LANE ROADWAY
Asphalt Section



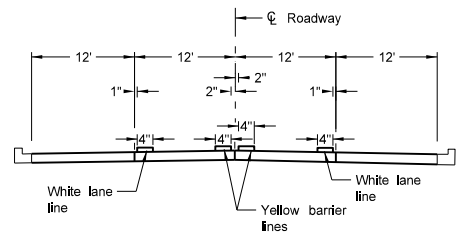
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



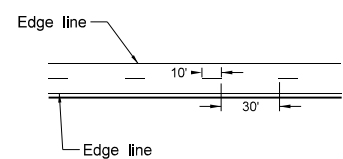
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



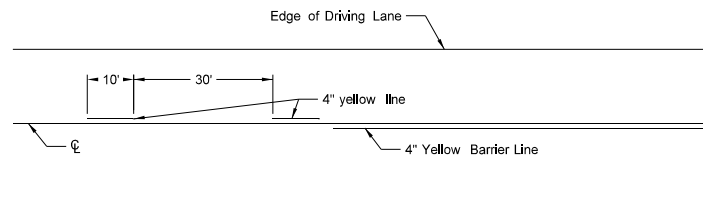
CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

NOTES:
1. Continue edge lines through private drives and field drives. Break edge lines for intersections.

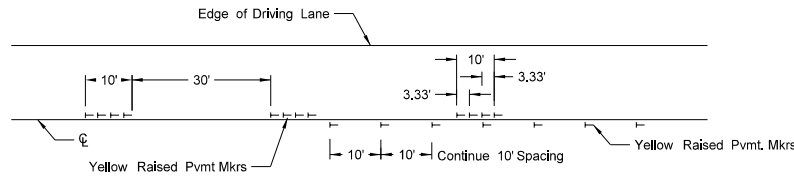
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.

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

SHORT-TERM PAVEMENT MARKING

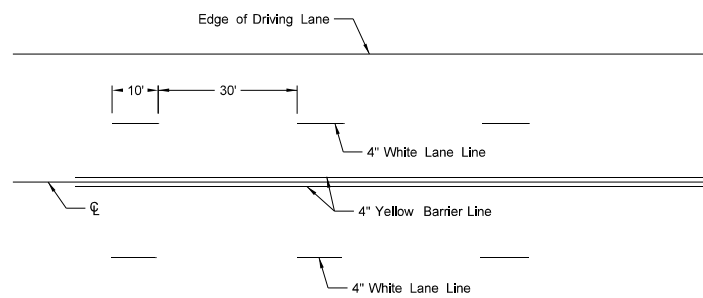


Painted or Tape Lines

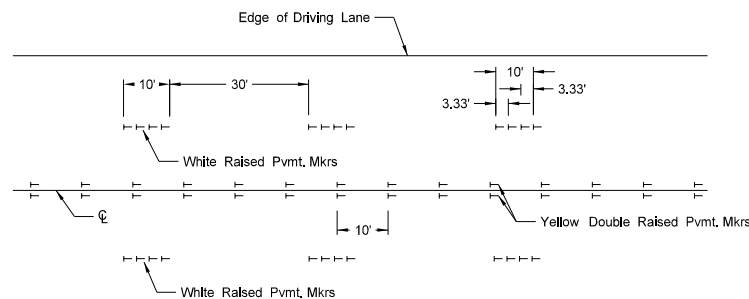


Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

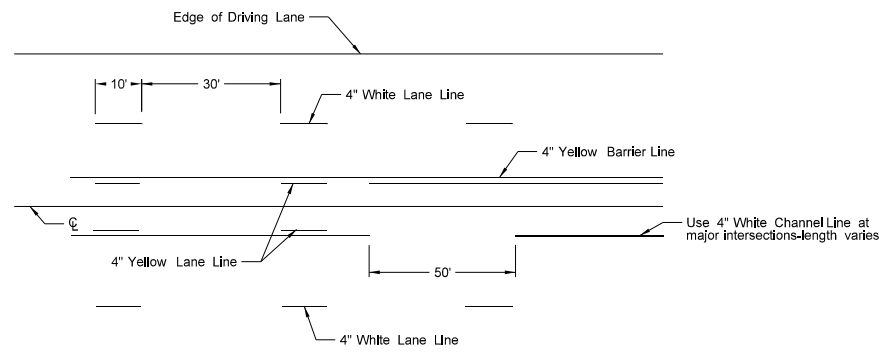


Painted or Tape Lines

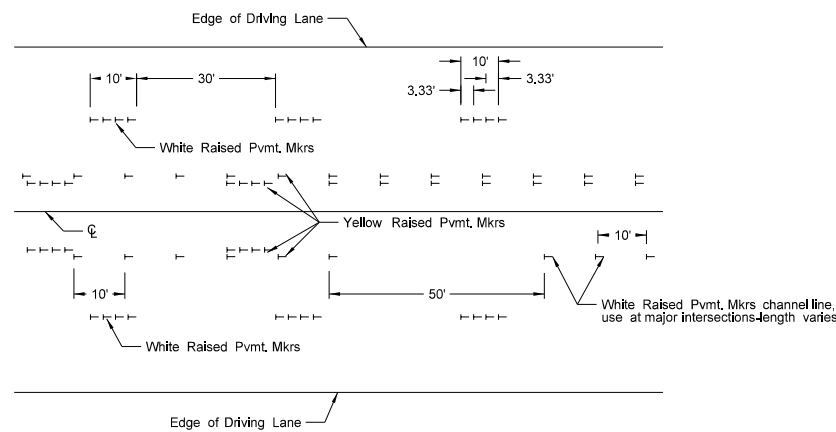


Raised Pavement Markers

FOUR LANE ROADWAY

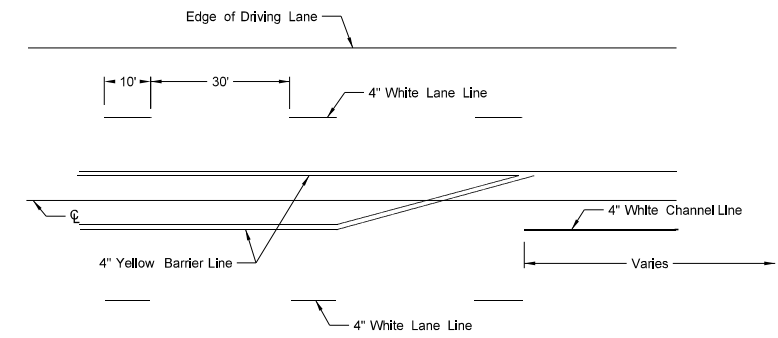


Painted or Tape Lines

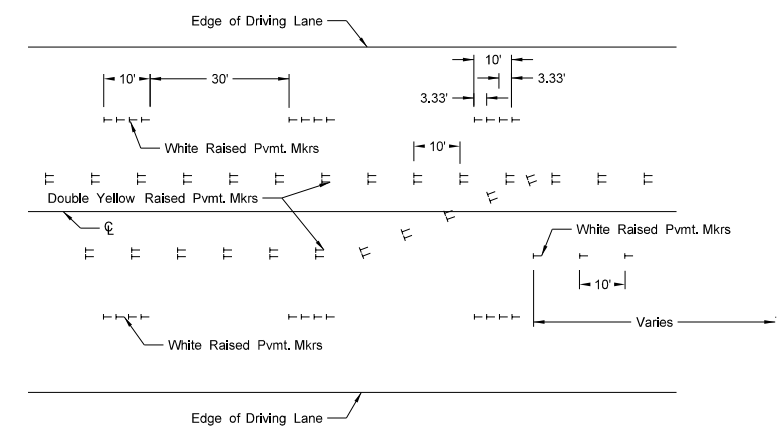


Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTES:

1. Place no passing zones on two-lane two-way roadways as shown. In lieu of short term no passing zone pavement markings, place no passing zone signs. Replace no passing zone signs with short term no passing zone pavement marking within three days.
2. Place short term center line stripe (paint) on top lift to match exact placement of permanent stripe.
3. Remove raised markers and tape markings after permanent pavement marking is installed.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
3-29-16	Re-numbered to be D-762-11 (previously was D-762-6)
10-17-17	Updated to active voice.
8-27-19	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