DESIGN DATA - Structure 0094-931.897				
Traffic	Average Daily			
Current 2026	Pass: N/A	Trucks: N/A	Total: 2,833	
Forecast 2046	Pass: N/A	Trucks: N/A	Total: 4,563	
Clear Zone Distance: 30', 4:1 Inslopes	Design Speed: 55			
Minimum Sight Dist. for Stopping: Use Existing	Bridges: HL-93			
Sight Dist. for No Passing Zone: Use Existing				
Pavement Design Life 20 Years				

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	23770	1	1

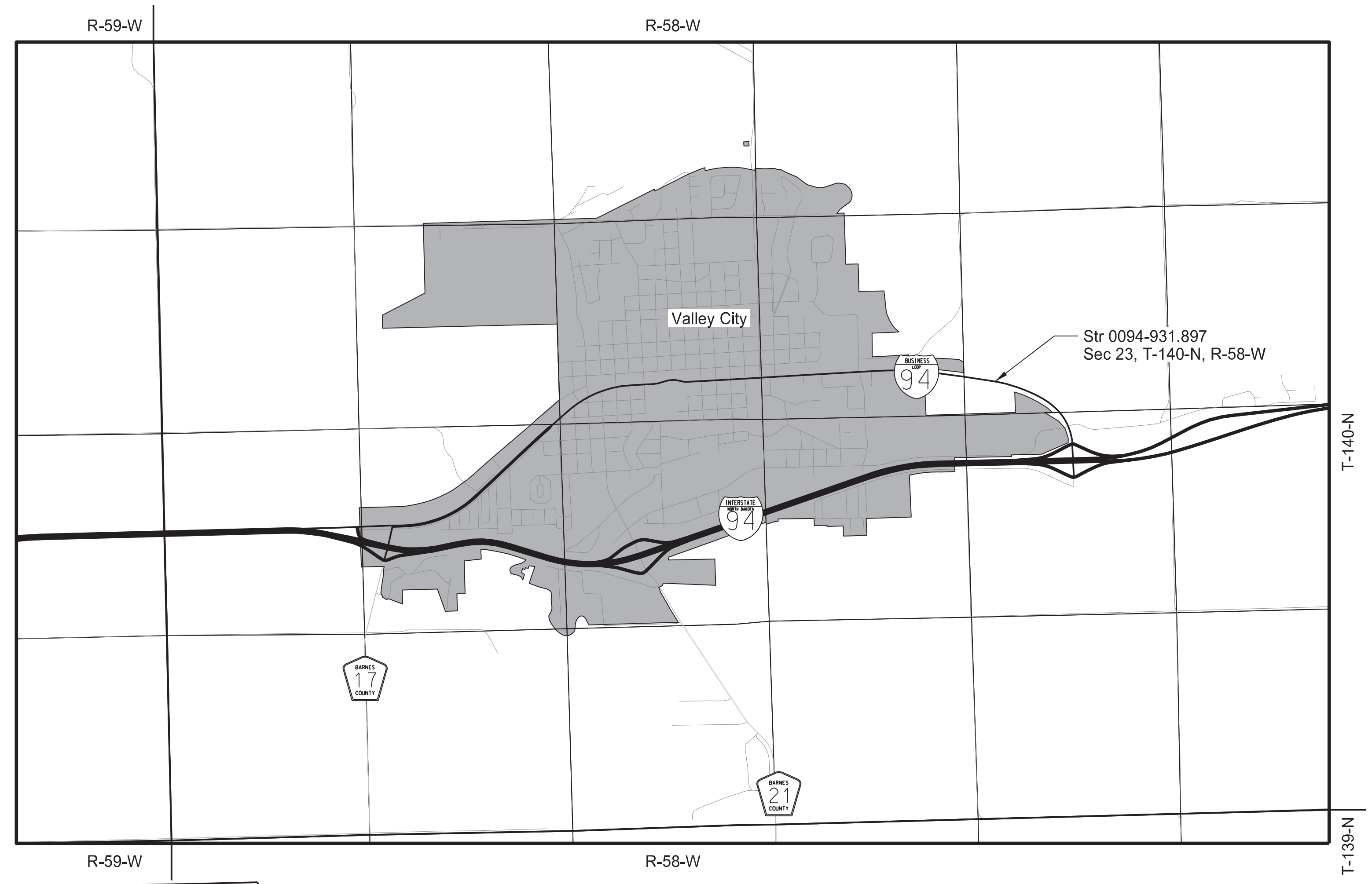
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

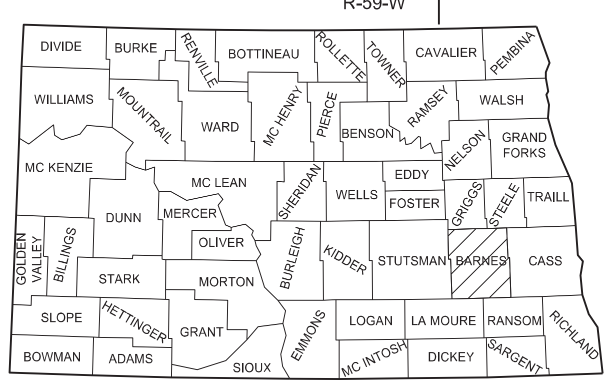
SS-2-999(069)

Barnes County
Structure 0094-931.897 ~ 1 mile East of Sheyenne River
Structure Replacement, Grading, Hot Mix Asphalt, Aggregate Base
Remove and Reset Guardrail, Signing, Pavement Markings, & Incidentals

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	7/1/2024
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
Structure 0094-931.897	0.044	0.044





STATE COUNTY MAP

DESIGNER	Adam McGill, PE
DESIGNER	Jonathon Backer, PE
DESIGNER	Kathryn DeWitt, PE
DESIGNER	Mason Heustis
DESIGNER	Marcus Rosing
DESIGNER	Ryan Bergum
DESIGNER	Jack Hamond

ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT

KLJ

REGISTERED PROFESSIONAL ENGINEER
ADAM J. MCGILL
PE-7565
DATE 04/30/25
NORTH DAKOTA

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PSP 66(24)	Permits and Environmental Considerations
SP 490(24)	Commercial Grade Hot Mix Asphalt
SP 489(24)	Temporary Water Diversion
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SSP 1	Temporary Erosion and Sediment Best Management Practices
SSP 2	Federal Migratory Bird Treaty Act

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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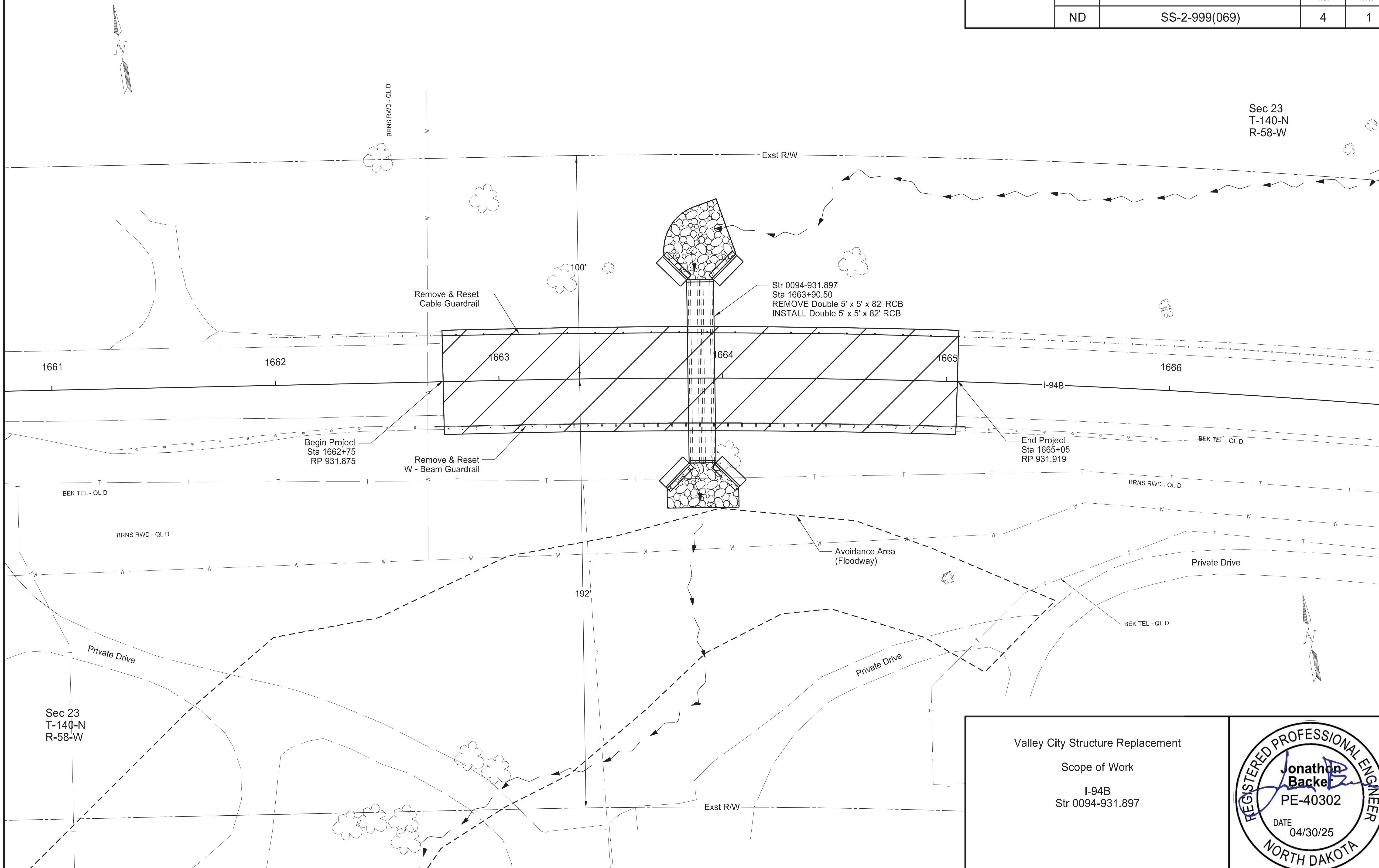

Valley City Structure Replacement

Scope of Work

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	6	1

NOTES

108-100 WEEKLY PLANNING & REPORTING MEETING: A weekly planning and reporting meeting is required.

108-P01 CONTRACT TIME FOR COMPLETION: 30 calendar days are allowed to complete all work on this project. The Engineer will begin charging calendar days on the day the Contractor starts work at the site, or on the starting date specified in the Proposal, whichever date is earlier. The ‘start of work at the site’ will be considered the first day that work has an impact on the travelling public (speed reduction, lane closure, road closure, etc.)

Calendar days will be charged until all work, including, but not limited to, temporary stream diversion, structure removal, structure replacement, backfill, aggregate base course, hot mix asphalt, grading, permanent erosion control, rumble strips, signing, and striping, is complete. Liquidated Damages for failure to complete all work within 30 calendar days will be charged at the rate specified within Standard Specification 108.07 B.1.

When work is complete, request final inspection in accordance with Standard Specification 105.15. If the Engineer determines that work is complete in accordance with the Contract, then time charges will be suspended for final cleanup items (often referred to as ‘punch-list items) which don’t impact the travelling public. The Engineer’s suspension of time charges is not a contractual right, and its application will be contingent upon the Contractor’s diligence in completing the punch list items.

109-P01 MEASUREMENT OF QUANTITIES: A prismoidal method was used for volume calculations of the earthwork items.

201-P01 CLEARING & GRUBBING: Remove existing brush, shrubbery, trees, and stumps/root systems within the limits as shown in the plans. Trees larger than three inches in diameter to be removed between November 1^{st} and April 14^{th}. Include all costs for the removals and disposals in the lump sum price bid for “CLEARING & GRUBBING”.

202-P01 REMOVAL OF BITUMINOUS SURFACING: Removal of Bituminous Surfacing consists of removing the existing bituminous pavement. Existing pavement thicknesses are based on the existing typical sections shown in Section 30, which were created from previous construction plans and maintenance data. The existing base is included in the excavation volumes listed in Section 10.

202-P02 REMOVAL OF RIPRAP-LOOSE ROCK: Remove the existing riprap at the locations shown in the plans. The existing riprap consists of rock and broken concrete, which may be grouted together. Dispose of all removed materials in accordance with NDDOT specifications at no additional cost to the Department. Include all labor, materials, and equipment necessary for removal and disposal in the price bid for “REMOVAL OF RIPRAP – LOOSE ROCK.”

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

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

203-P01 COMMON EXCAVATION-TYPE A: The Engineer will pay plan quantity for Common Excavation-Type A. Field measurements will not be taken. Excess material to become property of the Contractor.

210-P01 BOX CULVERT EXCAVATION: Estimated earthwork quantities are included in Section 10 Sheet 1 and do not include the area of “BOX CULVERT EXCAVATION” show on Section 170 Sheet 2.

251-P01 SEEDING CLASS II & HYDRAULIC MULCH: A discretionary quantity of 0.2 acres of SEEDING CLASS II and HYDRAULIC MULCH have been included in the quantities to account for temporary access routes that the Contractor may need to establish from adjacent approaches to place riprap at the box culvert.

260-P01 SILT FENCE: Do not trench silt fence when in a wetland.

704-P01 TRAFFIC CONTROL DEVICES: The traffic control devices list was developed using the detour layout provided in Section 100. Reopen the roadway to traffic within 30 calendar days per note 108-P01. Do not use 12^{th} Ave SE for construction traffic.

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 05/05/25
NORTH DAKOTA

ENVIRONMENTAL NOTES

ENVIRONMENTAL NOTES (EN): The North Dakota Department of Transportation has made environmental commitments to secure approval of this project. The following environmental notes are requirements to comply with these commitments:

EN-1 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-2 THREATENED AND ENDANGERED SPECIES: The project is located near/within suitable habitat for the species listed in the following table:

SPECIES	HABITAT	PRESENCE
Dakota Skipper	Native Prairie	Year-Round
Northern Long-Eared Bat	Forested/Wooded Areas/Bridges/Box Culverts/Caves/Mines	Active Season: April 15 - October 31* Inactive Season: Nov 1 – April 14*

*Time frames can differ slightly, depending on the year

If any of the above threatened and endangered species are identified within 1 mile of the project, the Contractor will notify the Engineer immediately and cease construction activities in the vicinity until an avoidance area is established. The Engineer will establish an avoidance area that is at least a 0.5 mile and immediately coordinate with the USFWS (701-355-8513), FHWA (701-221-9464), and NDDOT Environmental and Transportation Services (701-328-2592). The Contractor will not resume work within the avoidance area until the Engineer has confirmed with the agencies that work may proceed (either the species have left the area, or approved avoidance/minimization measures have been implemented).

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.

NOTIFICATIONS TO BE FILED BY CONTRACTOR:

EN-4 FAA Notice: Notification is required for work within 3 nautical miles of the airport. Complete the Federal Aviation Administration Notice of Proposed Construction or Alteration Form 7460-1 in accordance with 14 CFR 77.7 and 77.9 (at least 45 days before the start date of the proposed construction or alteration or the date an application for a construction permit is filed, whichever is earliest) (online at http://oeaaa.faa.gov).

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline:						TOTAL
103	0100	CONTRACT BOND	L SUM	1						1
201	0330	CLEARING & GRUBBING	L SUM	1						1
202	0104	REMOVAL OF STRUCTURE	EA	1						1
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	1140						1140
202	0400	REMOVAL OF RIPRAP - LOOSE ROCK	CY	18						18
203	0101	COMMON EXCAVATION-TYPE A	CY	223						223
203	0109	TOPSOIL	CY	194						194
210	0050	BOX CULVERT EXCAVATION	EA	1						1
210	0210	FOUNDATION FILL	CY	282						282
210	0250	BOX CULVERT FOUNDATION AGGREGATE	CY	97						97
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1						1
216	0100	WATER	M GAL	21						21
251	0200	SEEDING CLASS II	ACRE	0.41						0.41
253	0201	HYDRAULIC MULCH	ACRE	0.42						0.42
255	0103	ECB TYPE 3	SY	994						994
256	0200	RIPRAP GRADE II	CY	99						99
260	0200	SILT FENCE SUPPORTED	LF	21						21
260	0201	REMOVE SILT FENCE SUPPORTED	LF	21						21
261	0112	FIBER ROLLS 12IN	LF	833						833
261	0113	REMOVE FIBER ROLLS 12IN	LF	409						409
262	0100	FLOTATION SILT CURTAIN	LF	80						80
262	0101	REMOVE FLOTATION SILT CURTAIN	LF	80						80
302	0120	AGGREGATE BASE COURSE CL 5	TON	581						581
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT	TON	437						437
606	2505	DBL 5FT X 5FT PRECAST RCB CULVERT	LF	82						82
606	6505	DBL 5FT X 5FT PRECAST RCB END SECTION	EA	2						2
702	0100	MOBILIZATION	L SUM	1						1
704	0100	FLAGGING	MHR	40						40
704	1000	TRAFFIC CONTROL SIGNS	UNIT	1098						1098
704	1052	TYPE III BARRICADE	EA	8						8
704	1080	STACKABLE VERTICAL PANELS	EA	47						47
706	0500	AGGREGATE LABORATORY	EA	1						1
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	155						155
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	146						146
752	0905	TEMPORARY FENCE	LF	234						234
760	0025	SINUSOIDAL RUMBLE STRIP - ASPHALT SHOULDER	MILE	0.21						0.21
760	0027	SINUSOIDAL RUMBLE STRIP - ASPHALT CENTERLINE	MILE	0.11						0.11
762	1104	PVMT MK PAINTED 4IN LINE	LF	519						519
764	0151	REMOVE W-BEAM GUARDRAIL & POSTS	LF	238						238
764	1010	RESET 3-CABLE GUARDRAIL	LF	231						231
764	1050	RESET W-BEAM GUARDRAIL	LF	238						238
764	2020	REMOVE 3-CABLE GUARDRAIL & POSTS	LF	231						231
900	1000	TEMPORARY STREAM DIVERSION	EA	1						1

MAINLINE PAVING SUMMARY								
Begin Station	End Station	Length	Cross-Sectional Area (See Typical Sections)		302 0120 AGGREGATE BASE COURSE CL 5	TACK COAT*	PRIME COAT*	430 0500 COMMERCIAL GRADE HOT MIX ASPHALT
			Aggregate Base	HMA				
		(LF)	(SF)	(SF)	(TON)	(GAL)	(GAL)	(TON)
1662+75	1665+05	230	36.34	25.61	581	138	423	437
					581	138	423	437

*Include in the Unit Bid Price for "COMMERCIAL GRADE HOT MIX ASPHALT"

216 0100 WATER					
Roadway	Site Location	Material	Basis	Basis Quantity	Quantity (MGAL)
I-94B	Structure 0094-931.897	Dust Palliative	25 MGal/Mile	0.04	1
		Aggregate Base Course CL 5	15 Gal/Ton	581	12
		Embankment	10 Gal/CY	711	8
				Total =	21

LOCATION	EARTHWORK SUMMARY				TOPSOIL SUMMARY
	Excavation	Embankment 1	Excess Material 2	203 0101 COMMON EXCAVATION-TYPE A	203 0109 TOPSOIL
	(CY)	(CY)	(CY)	(CY)	(CY)
		A	C = B - A	B	D
I-94 Business Route	223	152	71	223	194
TOTAL =	223	152	71	223	194

Notes:

1 Additional 25% volume for shrinkage.

2 Excess material to become property of the contractor.

3 Earthwork Summary does not include area of excavation and backfill as shown in Section 170.

SPEC	CODE	BID ITEM	QTY	UNIT
203	0101	COMMON EXCAVATION-TYPE A		
		Structure 0094-931.897	223	CY
203	0109	TOPSOIL		
		Structure 0094-931.897	194	CY
216	0100	WATER		
		Structure 0094-931.897	21	M GAL
302	0120	AGGREGATE BASE COURSE CL 5		
		Structure 0094-931.897	581	TON
430	0500	COMMERCIAL GRADE HOT MIX ASPHALT		
		Structure 0094-931.897	437	TON

Water

25 MGAL / MILE for Dust Palliative
20 GAL / TON for Aggregate
10 GAL / CY for Embankment

Materials

Aggregate Base Course CL 5 @ 1.875 TON / CY
Commercial Grade Asphalt @ 2.0 TON / CY
Tack Coat @ 0.05 GAL / SY
Prime Coat @ 0.35 GAL / SY

Valley City Structure Replacement

Basis of Estimate / Earthwork Summary

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

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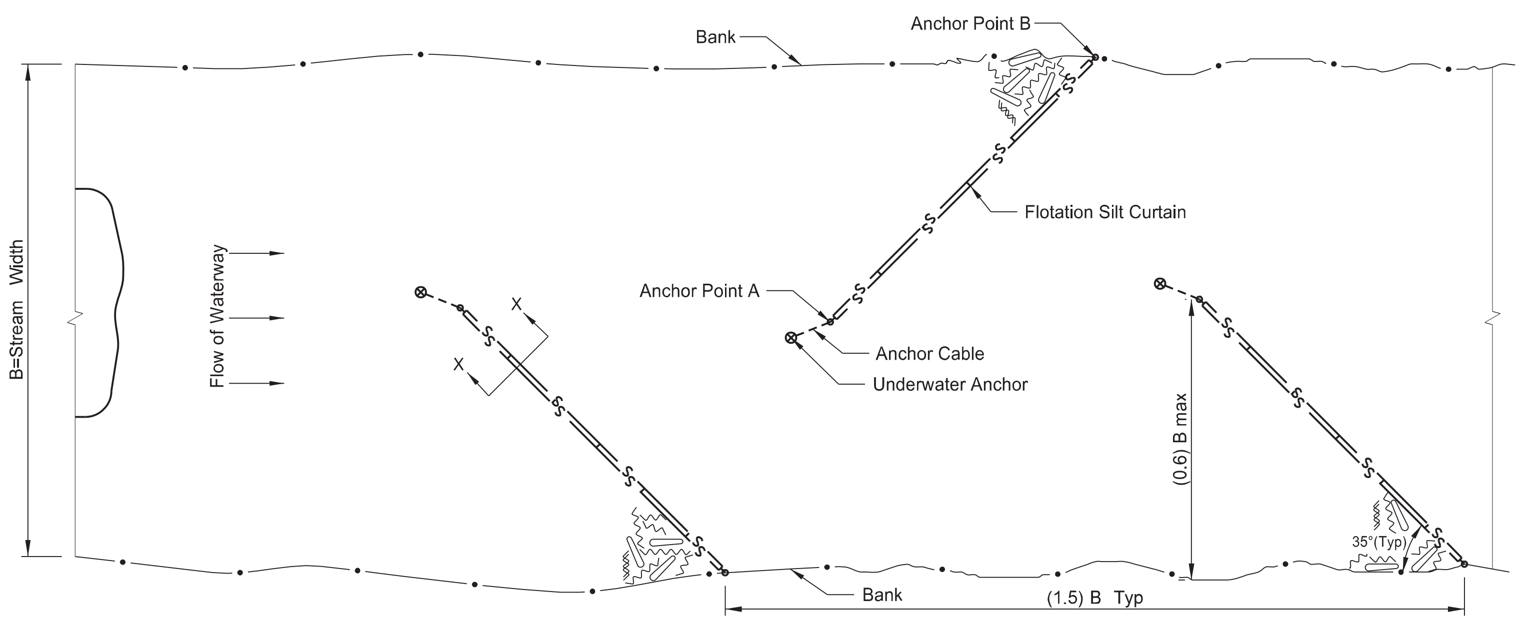
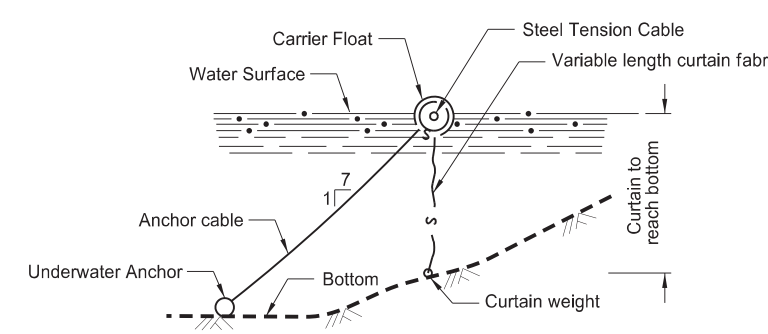


PLAN VIEW
FLOTATION SILT CURTAIN - TYPE HERRING BONE PATTERN

DESIGN GUIDELINES:
When temporary work encroaches more than ⅓ width of the stream
Or where stream width doesn't allow use of Type Moving Water



SECTION X-X
FLOTATION SILT CURTAINS

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

Valley City Structure Replacement

General Details
Flotation Silt Curtain Detail

I-94B
Str 0094-931.897

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Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

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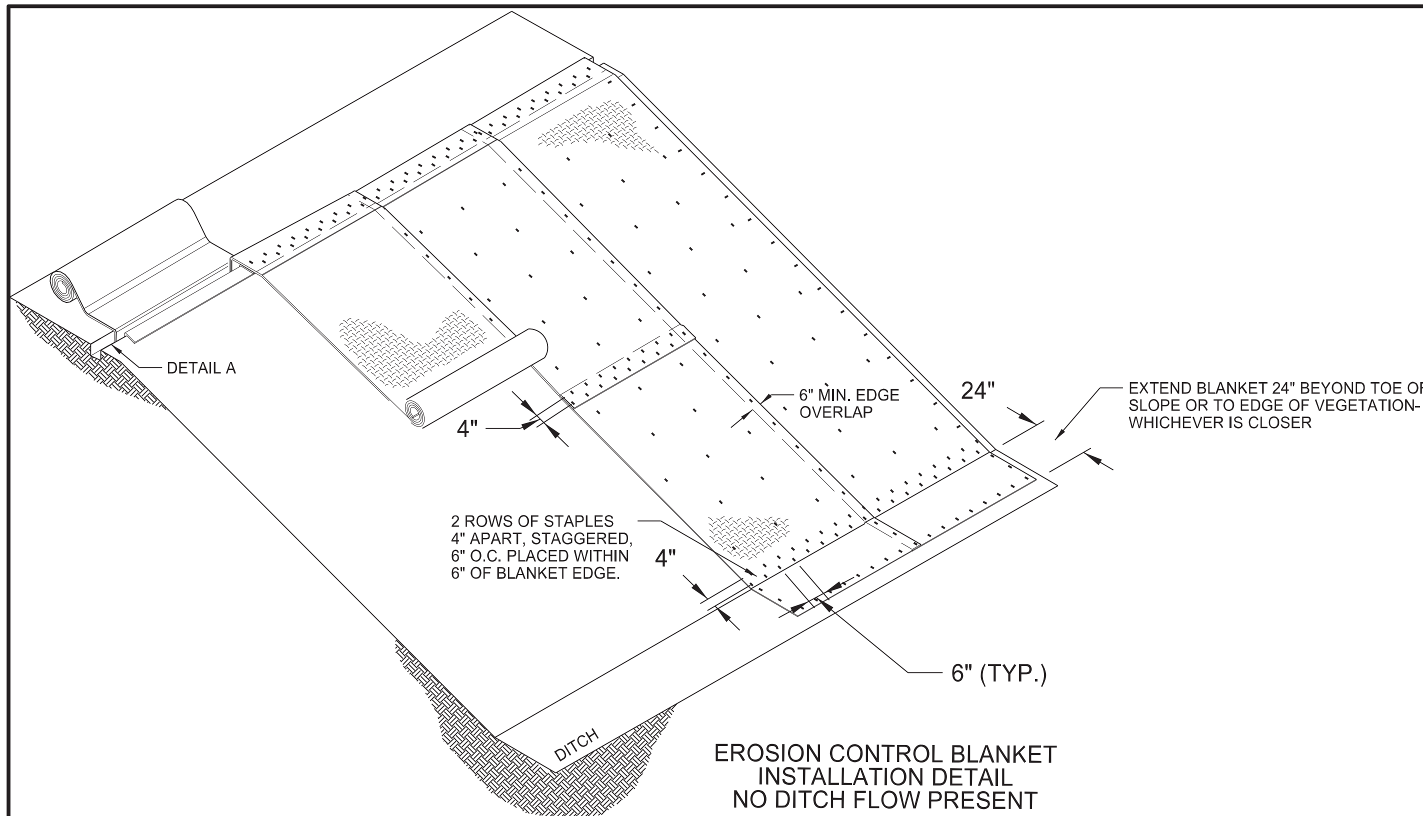
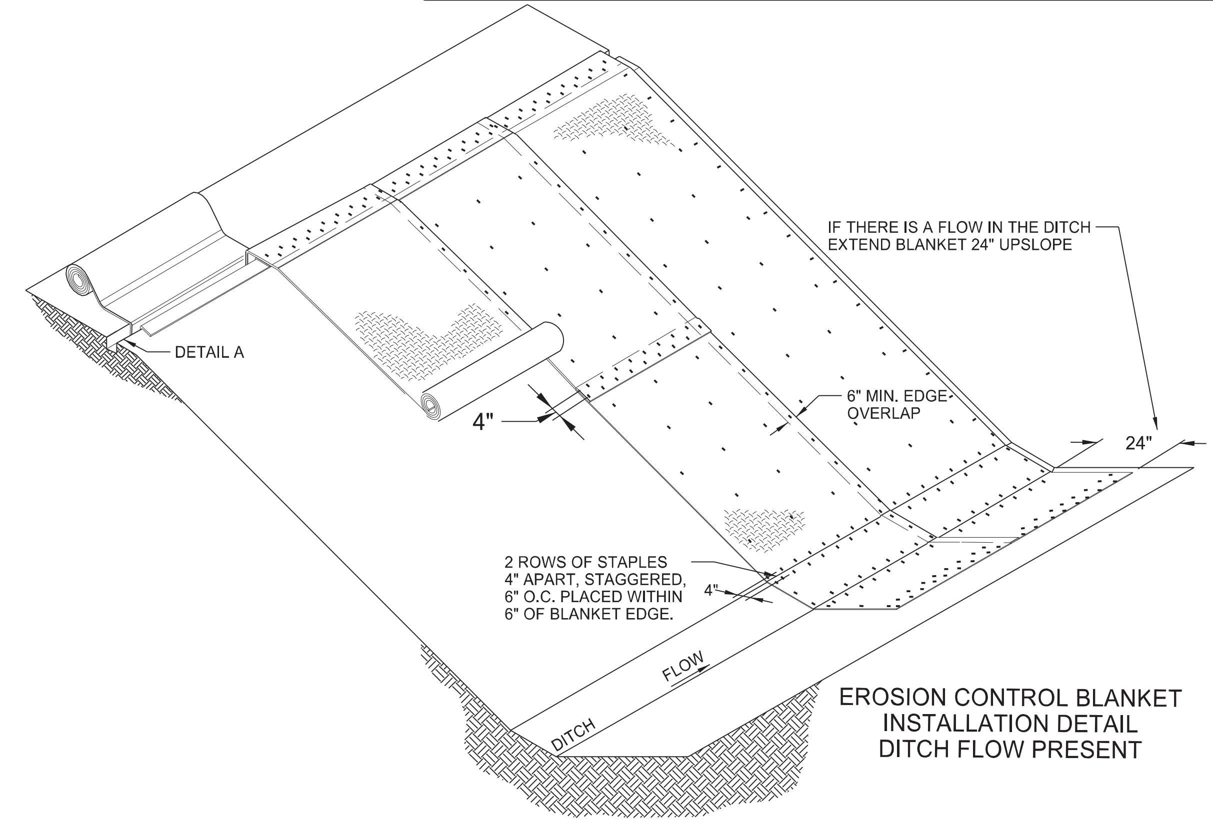
	ND	SS-2-999(069)	20	2



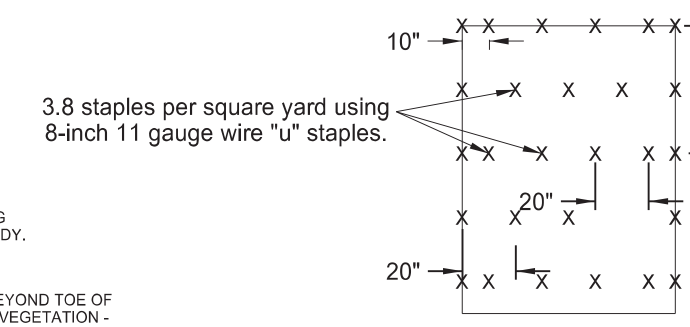
EROSION CONTROL BLANKET
INSTALLATION DETAIL
NO DITCH FLOW PRESENT



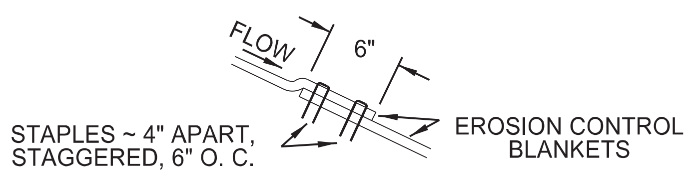
EROSION CONTROL BLANKET
INSTALLATION DETAIL
DITCH FLOW PRESENT

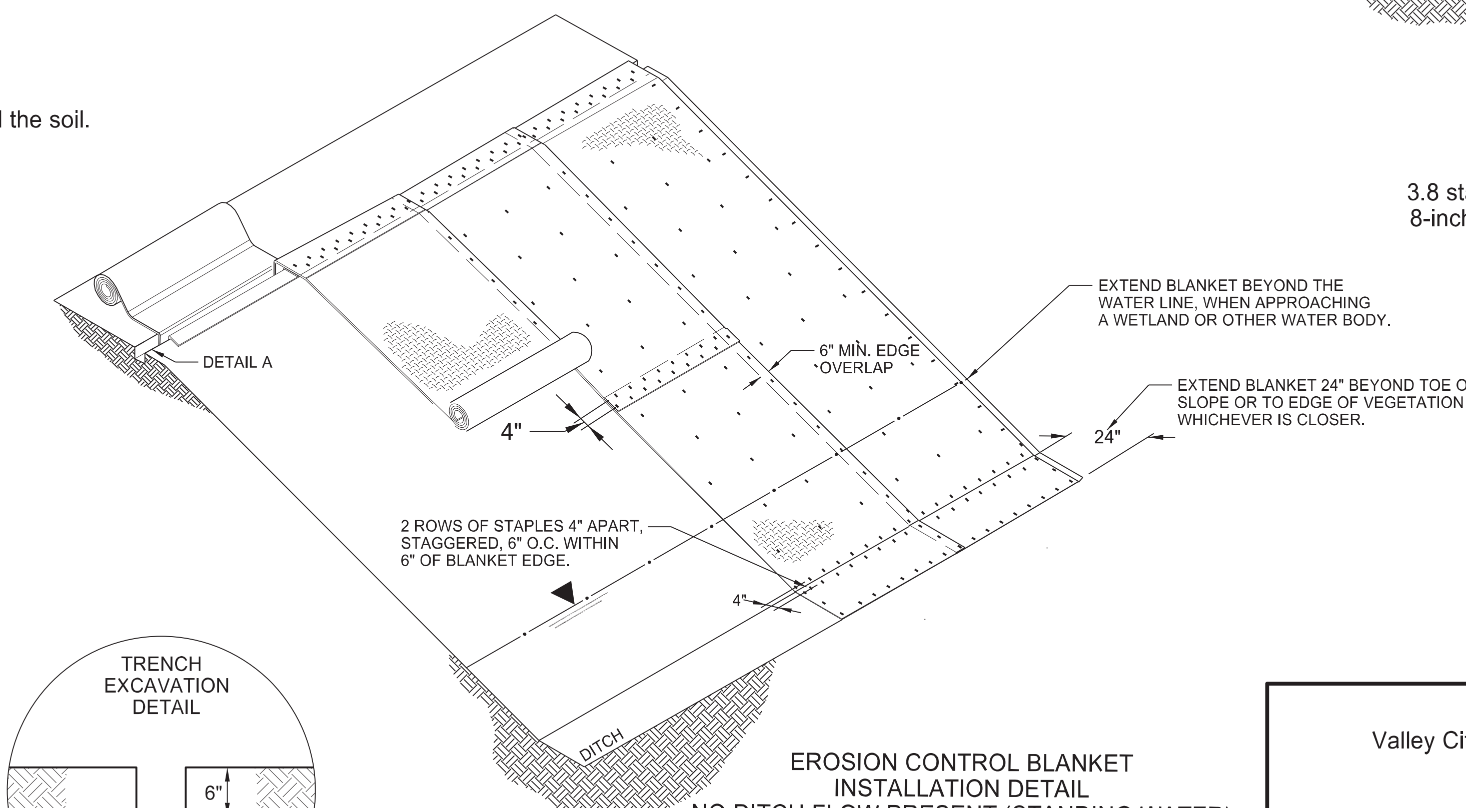
INSTALLATION STEPS:

1. Prepare smooth slope per spec. section 255
2. Amend soil and seed, as specified.
3. Dig anchor trench. Set aside native soil removed from trench.
4. Secure blanket in anchor trench, staking or stapling blanket as shown.
5. Replace native soil previously removed from trench.
6. Staple blanket as shown so there are no gaps between the blanket and the soil. Staple while unrolling blanket to minimize walking on blanket.
7. Install splices a minimum 24 inches prior to toe of slope.



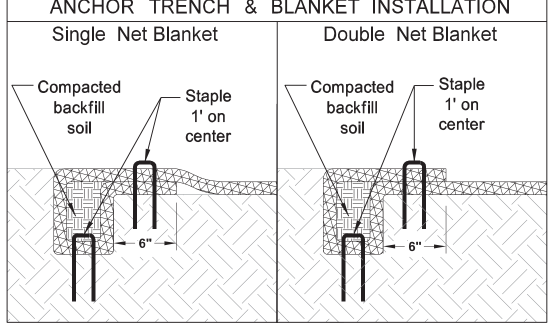
STAPLE PATTERN

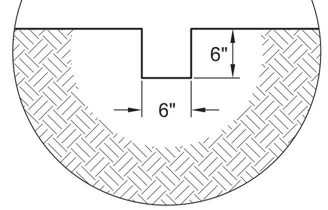




EROSION CONTROL BLANKET
INSTALLATION DETAIL
NO DITCH FLOW PRESENT (STANDING WATER)

DETAIL A
ANCHOR TRENCH & BLANKET INSTALLATION





NOTE:
Install Single Net Blanket with netting on top of installed blanket.

Valley City Structure Replacement

General Details
Slope Erosion Control Blanket Installation Details

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

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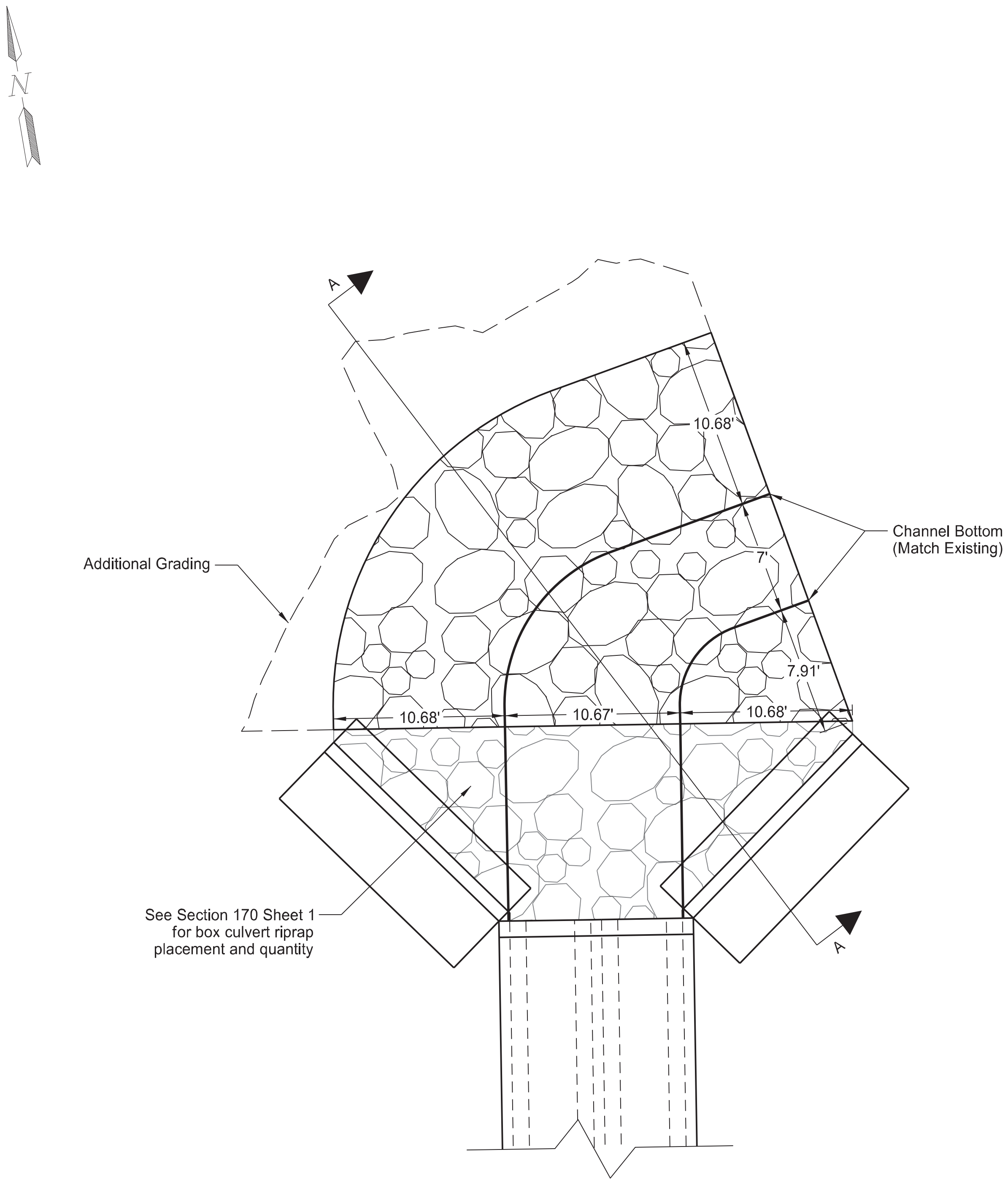
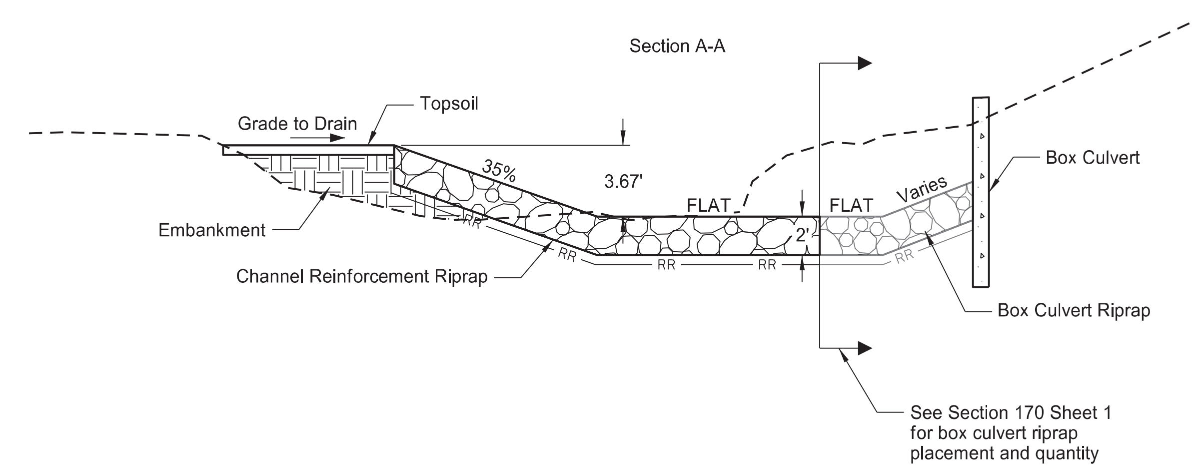
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-2-999(069)	20	3



North End of Box Culvert



Note:
Excavation and embankment for channel reinforcement to be included in the unit price bid for BOX CULVERT EXCAVATION.

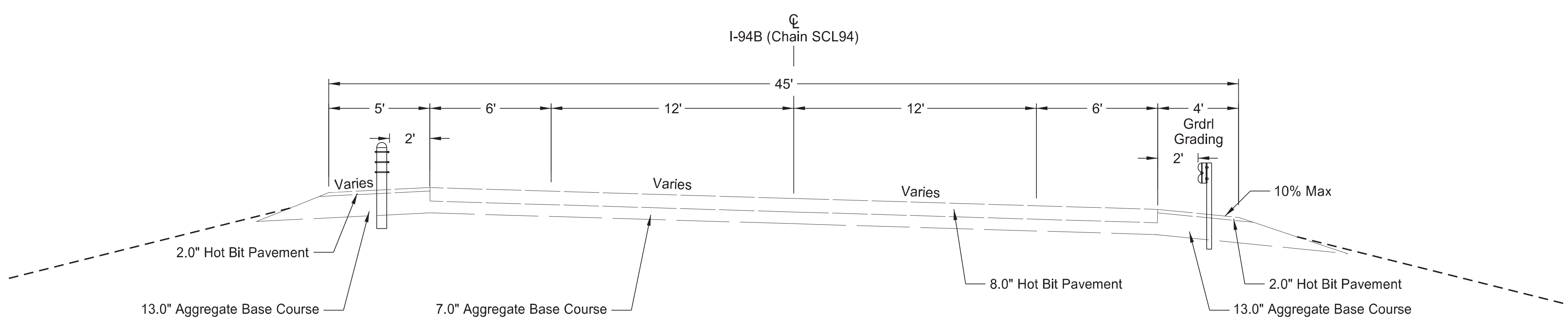
Valley City Structure Replacement

General Details
Channel Reinforcement

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	30	1



Existing Typical Section
Sta 1662+75 to 1665+05

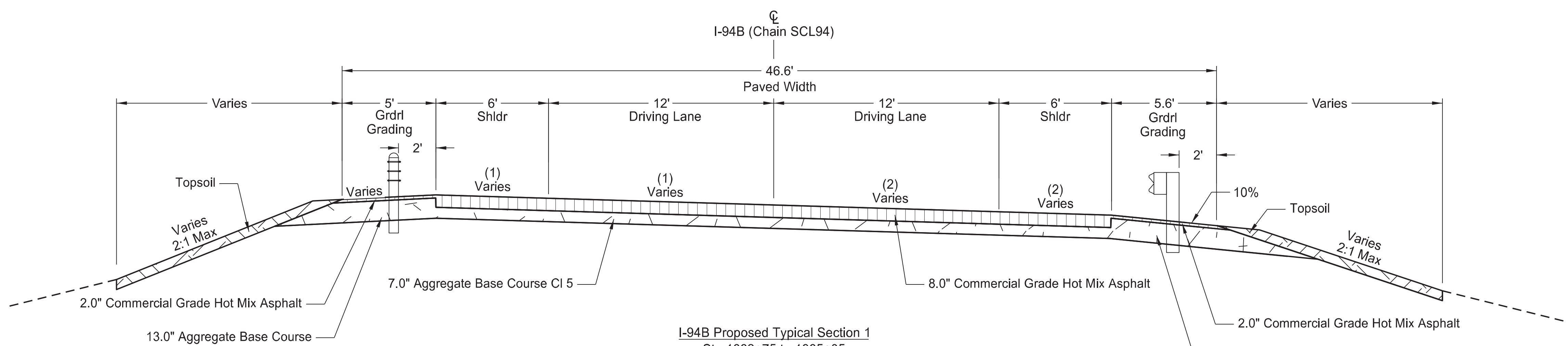
Valley City Structure Replacement

Existing Typical Sections

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	30	2



I-94B Proposed Typical Section 1
Sta 1662+75 to 1665+05

Station	Cross Slope Left (1)	Cross Slope Right (2)
1662+75.00	-0.2%	-2.7%
1663+51.60	-2.7%	-2.7%
1663+73.05	-3.4%	-3.4%
1664+52.91	-3.4%	-3.4%
1664+77.42	-3.4%	-4.2%
1665+05.00	-2.5%	-5.1%

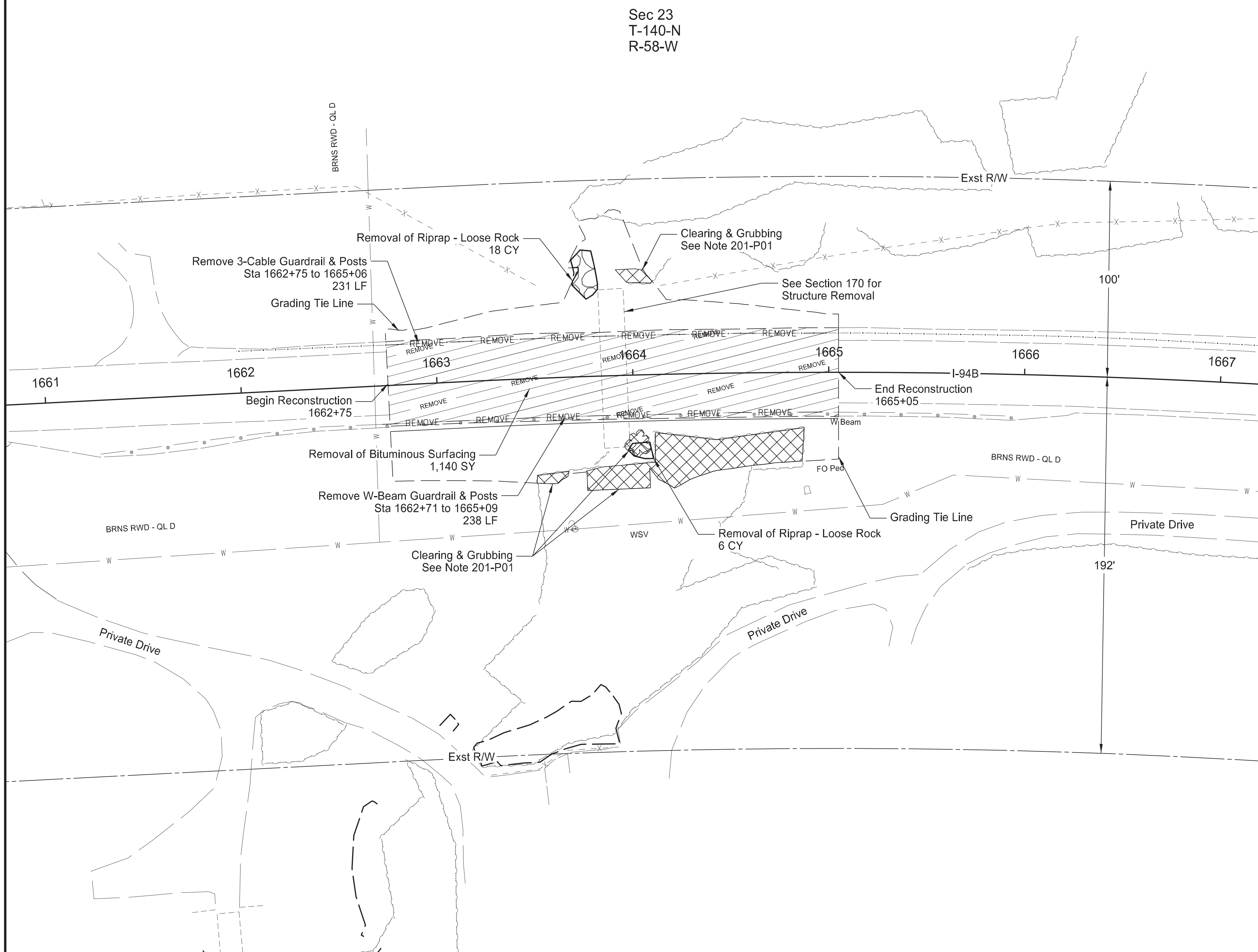
Valley City Structure Replacement

Proposed Typical Sections

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	40	1



SPEC	CODE	BID ITEM	QTY	UNIT
201	0330	CLEARING & GRUBBING		
		Sta 1661+00 to Sta 1667+00	1	L SUM
202	0132	REMOVAL OF BITUMINOUS SURFACING		
		Sta 1661+00 to Sta 1667+00	1,140	SY
202	0400	REMOVAL OF RIPRAP - LOOSE ROCK		
		Sta 1662+00 to Sta 1665+40 Lt	18	CY
764	0151	REMOVE W-BEAM GUARDRAIL & POSTS		
		Sta 1661+26 to Sta 1665+96 Rt	238	LF
764	2020	REMOVE 3-CABLE GUARDRAIL & POSTS		
		Sta 1662+00 to Sta 1665+40 Lt	231	LF

LEGEND

—REMOVE—	Removal of W-Beam Guardrail & Posts / Remove 3-Cable Guardrail & Posts
REM	Removal of Bituminous Surfacing
	Removal of Riprap - Loose Rock
	Clearing & Grubbing

N

Valley City Structure Replacement

Removals

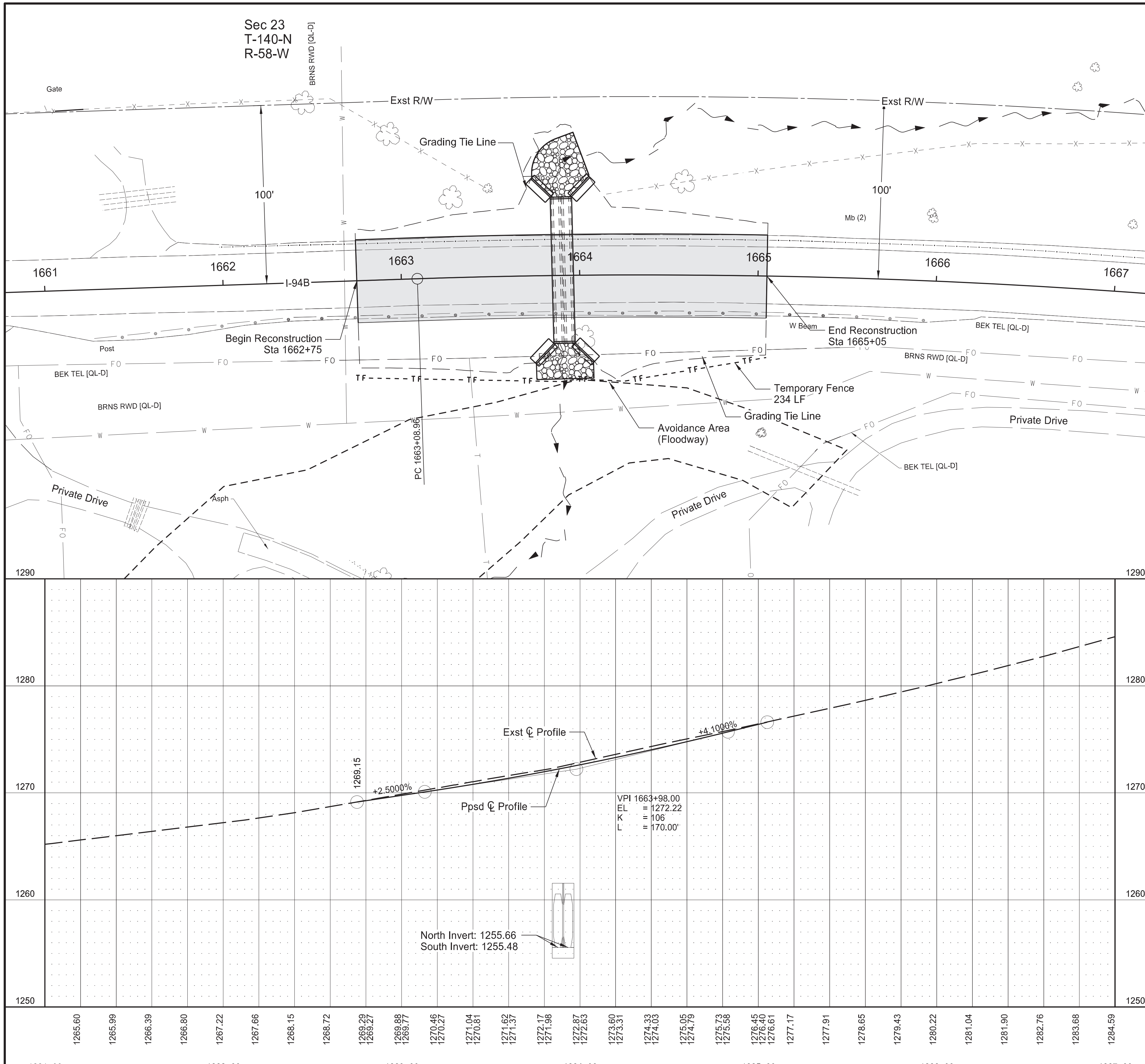
Sta 1661+00 to 1667+00 (SCL94)

Structure 0094-931.897
I-94B

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	60	1

SPEC	CODE	BID ITEM	QTY	UNIT
752	0905	TEMPORARY FENCE		
		Sta 1662+70 to Sta 1665+05 Rt	234	LF



LEGEND

TF - - - - - TF - - - Temporary Fence

Valley City Structure Replacement

Plan & Profile

Sta 1661+00 to 1667+00 (SCL94)

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

4/30/2025 9:07:33 AM JonathonBacker K:\Projects\State\ND\DOT\2302-00377.1_VariousStructuresVC\CAD\20999.069\Design\Plans\060\060PP_001_I-94B.dgn

Wetland Impact Table

Wetland Number	Location	Wetland Type	Wetland Feature	USACE Jurisdictional Wetlands (1)	Wetland Impact: Wetland Impacts Acre(s)			Wetland Impact: USFWS Easement Impacts Acre(s)		Wetland Mitigation: Mitigation Proposed			USACE/11990 Bank		11990 Bank		USFWS Bank		Onsite Mitigation Method			Onsite Constructed Location	
					Temp.	Perm. (Fill/Drain)	Perm. (Cut)	Temp.	Perm.	EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)	Mitigation Location; Ratio	Ditch Shift Acre(s)	Onsite Acre(s)	Onsite Constructed Site #	Onsite Constructed Size Acre(s)
1a	Sec 23, T-140-N, R-58-W	Basin	Natural	Y	0.006	0.002				Y	N				Anderson Bank	0.002							
1d	Sec 23, T-140-N, R-58-W	Basin	Natural	Y	0.004	0.006				Y	N				Anderson Bank	0.006							
1e	Sec 23, T-140-N, R-58-W	Ditch	Created	Y																			
1f	Sec 23, T-140-N, R-58-W	Basin	Natural	Y																			
2	Sec 23, T-140-N, R-58-W	Basin	Natural	Y																			
				Totals	0.010	0.008	-	-	-					-		0.008		-		-	-		-

Impact Summary Table

Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	Total Acre(s)	Water Type	Total Acre(s)
Natural/JD (Fill/Drain)	0.008	Temporary Wetland JD	0.010
Natural/Non-JD (Fill/Drain)	0.000	Non-JD Wetland Temporary	0.000
Artificial/JD (Fill/Drain)	0.000		
Artificial/Non-JD (Fill/Drain)	0.000	Permanent OW	0.025
Total	0.008	Temporary OW	0.008
JD Natural (Cut)	-	Permanent OW-d	-
JD Artificial (Cut)	-	Temporary OW-d	-
Non-JD Natural (Cut)	-		
Non-JD Artificial (Cut)	-		
Total	-		

Other Waters Impact Table

Number	Location	Type	Feature	USACE Jurisdictional (1)	Impacts to Other Waters: Acres				Linear Feet		Other Water Mitigation: Mitigation Proposed			USACE Mitigation Bank	
					Temp.	Permanent: Total	Perm. (Loss)	Perm. (No Loss)	Perm. (Loss)	Perm. (No Loss)	EO 11990	USACE	USFWS	Location	Acre(s)
1b	Sec 23, T-140-N, R-58-W	Stream	Natural	Y	0.004	0.016	0.012	0.004	12	20	N	N	N		
1c	Sec 23, T-140-N, R-58-W	Stream	Natural	Y	0.004	0.009	0.001	0.008	10	10	N	N	N		
				Totals	0.008	0.025	0.013	0.012	22	30					-

(1) A wetland Jurisdictional Determination was issued by the USACE on 4/8/2023; NWO-2024-00489-BIS.

Mitigation Summary Table

	Location	Ditch Shift Acre(s)	Onsite Acre(s)	11990 Bank Acre(s)	USACE/11990 Bank Acre(s)	USFWS Bank Acre(s)
USACE Only	Onsite					
EO 11990 Only	Anderson Bank			0.008		
USACE/11990	Onsite					
USFWS						
	Total			0.008		

Valley City Structure Replacement

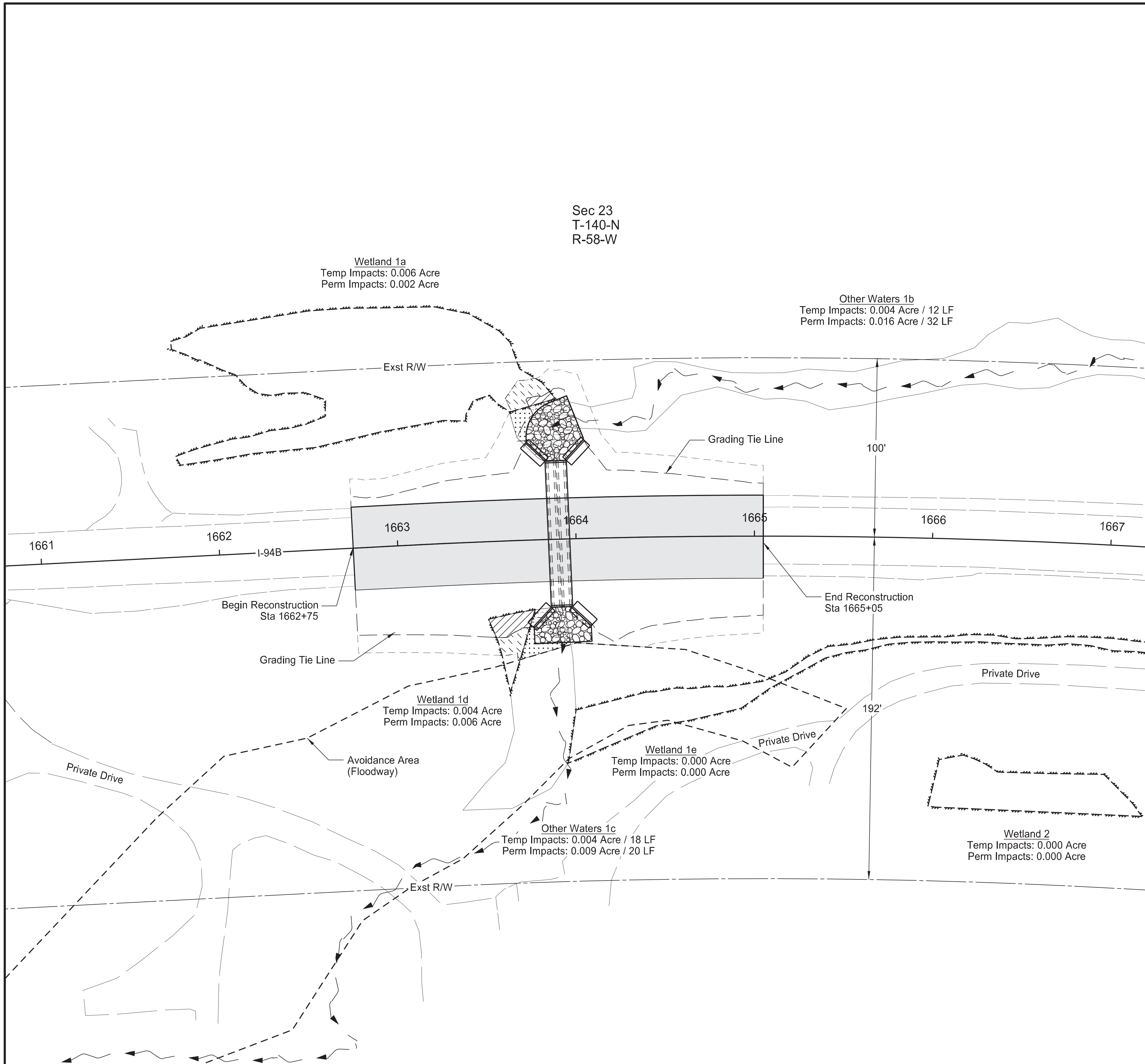
Wetlands, Mitigation, and Environmental

Wetland Impacts Table

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	75	2



LEGEND

- Wetland Impact Permanent
- Wetland Impact Temporary
- Other Water Impacts Temporary
- Other Water Impacts Permanent
- Existing Delineated Wetland
- Existing Other Waters
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Grading Tie Line (Transition)

N

Valley City Structure Replacement

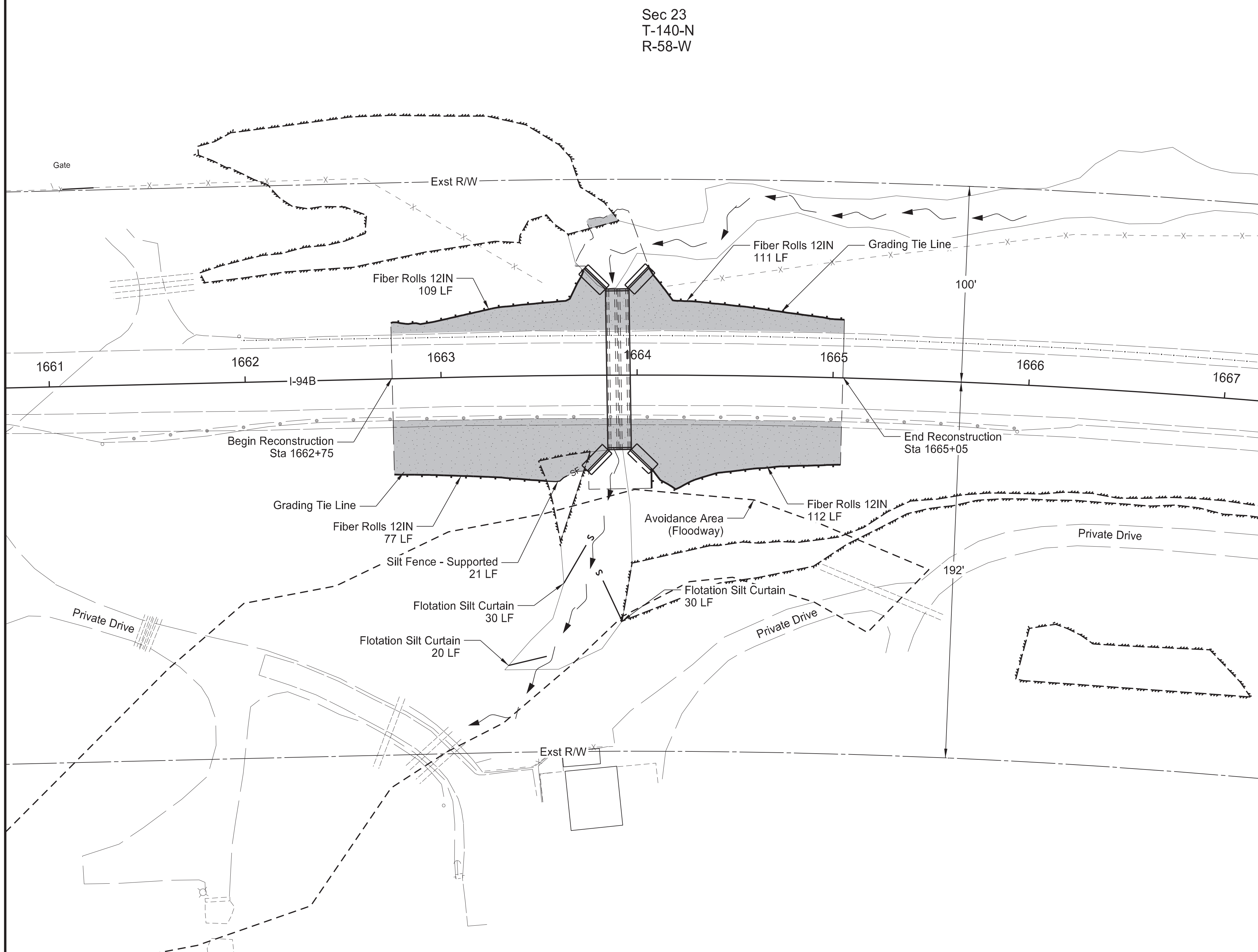
Wetlands, Mitigation, and Environmental

Sta 1661+00 to 1667+00 (SCL94)

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backe
PE-40302
DATE 04/30/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	76	1



SPEC	CODE	BID ITEM	QTY	UNIT
253	0201	HYDRAULIC MULCH		
		Sta 1661+00 to 1667+00	0.22	ACRE
260	0200	SILT FENCE SUPPORTED		
		Sta 1661+00 to 1667+01	21	LF
260	0201	REMOVE SILT FENCE SUPPORTED		
		Sta 1661+00 to 1667+02	21	LF
261	0112	FIBER ROLLS 12IN		
		Sta 1661+00 to 1667+00	409	LF
261	0113	REMOVE FIBER ROLLS 12IN		
		Sta 1661+00 to 1667+00	409	LF
262	0100	FLOTATION SILT CURTAIN		
		Sta 1661+00 to 1667+00	80	LF
262	0101	REMOVE FLOTATION SILT CURTAIN		
		Sta 1661+00 to 1667+00	80	LF

For ditch grades encountered in the field not listed, use the following spacing:

Spacing = { Diameter of Roll (ft) - Entrenchment (ft) } / Slope (ft/ft)

DITCH FIBER SPACING

Ditch Grade	Spacing (ft)
<0.5%	200
1%	85
2%	40
3%	30
4%	20

LEGEND

	Fiber Rolls 12IN
SF	Silt Fence Supported
S	Flotation Silt Curtain
	Hydraulic Mulch

N

Valley City Structure Replacement

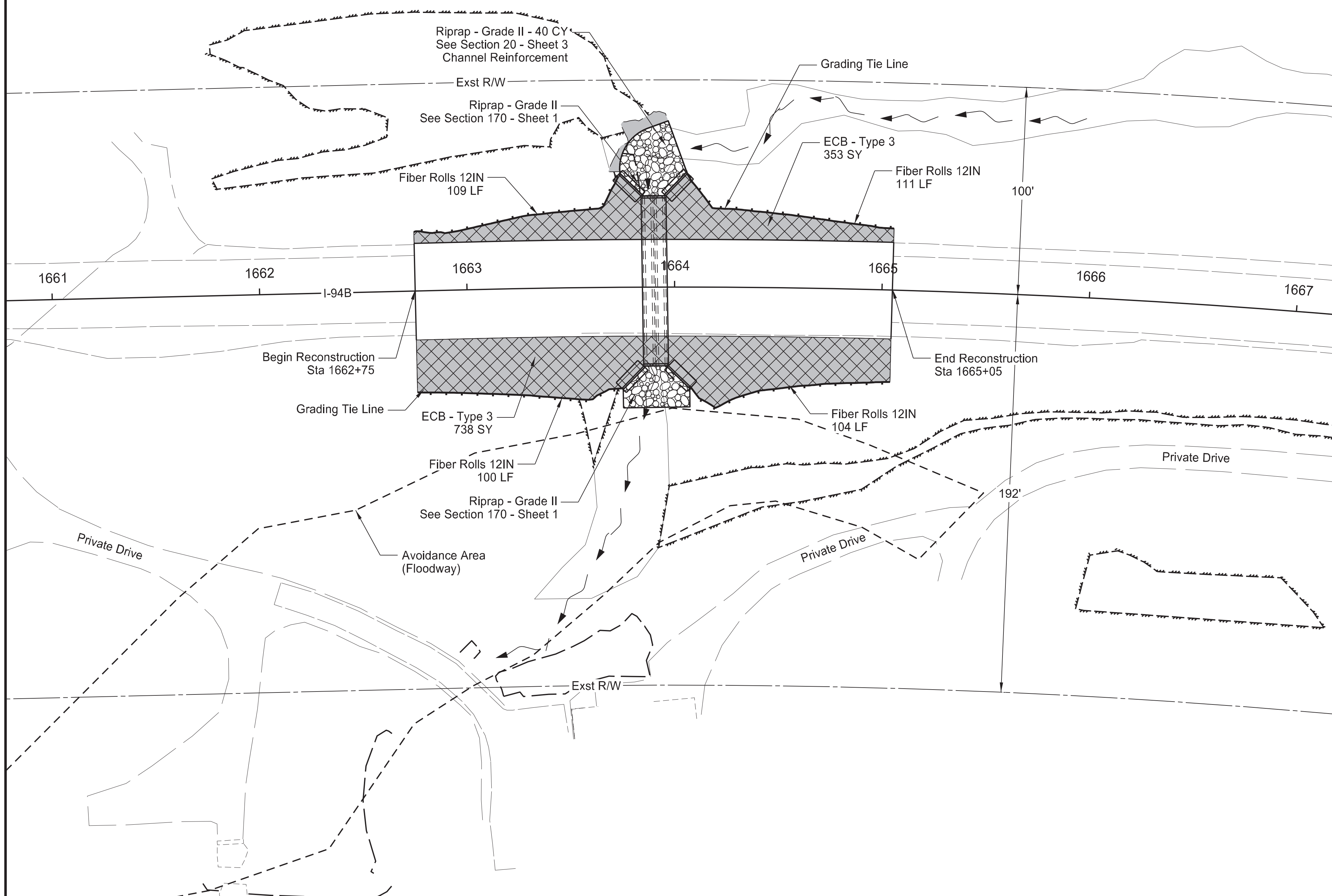
Temporary Erosion Control

Sta 1661+00 to 1667+00 (SCL94)

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	77	1



SPEC	CODE	BID ITEM	QTY	UNIT
251	0200	SEEDING CLASS II		
		Sta 1661+00 to 1667+00	0.21	ACRE
255	0103	ECB TYPE 3		
		Sta 1661+00 to 1667+00	994	SY
256	0200	RIPRAP GRADE II		
		Channel Reinforcement	40	CY
261	0112	FIBER ROLLS 12IN		
		Sta 1661+00 to 1667+00	424	LF
709	0155	GEOSYNTHETIC MATERIAL TYPE RR		
		Channel Reinforcement	60	SY

For ditch grades encountered in the field not listed, use the following spacing:
Spacing = { Diameter of Roll (ft) - Entrenchment (ft) } / Slope (ft/ft)

DITCH FIBER SPACING

Ditch Grade	Spacing (ft)
<0.5%	200
1%	85
2%	40
3%	30
4%	20

LEGEND

- Fiber Rolls 12IN
- Seeding Class II
- ECB - Type 3

N

Valley City Structure Replacement

Permanent Erosion Control

Sta 1661+00 to 1667+00 (SCL94)

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - VARIOUS STRUCTURES VALLEY CITY DISTR

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
I-94B (Chain SCL94)			
Beg/Sec line Xing	1655+75.07	468,387.47	2,599,474.79
PC	1663+08.96	468,282.74	2,600,201.16
PI	1670+73.27	468,173.66	2,600,957.65
PT	1678+17.66	467,781.91	2,601,613.93
PC	1678+24.98	467,778.16	2,601,620.22
Sec line Xing	Bk Tan 1686+09.78	467,394.83	2,602,041.49
PI	1686+09.77	467,375.90	2,602,294.08
PT	1692+60.92	466,591.47	2,602,317.91
End	1696+43.03	466,209.53	2,602,329.51

CURVE DATA

ARC DEFINITION

I-94B (Chain SCL94)

Curve	
PI	= 1670+73.27
Delta	= 22°37'48" (Rt)
Da	= 01°30'00"
R	= 3,819.83'
T	= 764.31'
Curve	
PI	= 1686+09.77
Delta	= 57°25'33" (Rt)
Da	= 03°59'57"
R	= 1,432.69'
T	= 784.80'
L	= 1,435.94'

US PUBLIC LAND SURVEY DATA

T-140-N R-58-W

CORNER	IRN	NORTHING	EASTING
SE Cor Sec 15	9-G	472,687.13	2,599,327.90
W 1/4 Cor Sec 23	9-H	470,047.30	2,599,419.08
SW Cor Sec 23	9-J	467,407.91	2,599,507.58
C Sec Sec 23	10-H	470,138.35	2,602,070.84
S 1/4 Cor Sec 23	10-J	467,493.06	2,602,162.89
SW Cor Sec 13	11-G	472,880.64	2,604,629.54
E 1/4 Cor Sec 23	11-H	470,229.71	2,604,723.04
SE Cor Sec 23	11-J	467,578.12	2,604,816.92
CS1/16 Cor Sec 23	10-H.5	468,815.54	2,602,116.64
W 1/16 Cor Sec 23	9.5-J	467,450.34	2,600,835.20

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET	ALIGNMENT	MONUMENT
PRIMARY CONTROL							
GPS-4	466,424.02	2,602,227.34	1,359.17	1694+26	96' Rt	SCL94	Rebar with Plastic Cap NDDOT GPS Control
GPS-476	464,420.61	2,584,069.92	1,266.68	N/A	N/A	SCL94	#5 x 18" Rebar w/ 1-1/2" Alum Cap NDDOT GPS Control
VRS	473,404.36	2,589,695.69	1,400.00	N/A	N/A	N/A	VRS Mout Point PRS577263059467
SECONDARY CONTROL							
RTK-3	468,908.23	2,598,177.02	1,263.89	N/A	N/A	SCL94	#6 x 30" Rebar w/ 2" Alum Cap
RTK-13	467,978.09	2,601,150.94	1,310.40	1673+13	36' Rt	SCL94	#5 x 18" Rebar w/ Plastic Cap
RTK-14	468,323.60	2,600,083.95	1,266.32	1661+87	24' Lt	SCL94	#5 x 18" Rebar w/ Plastic Cap

REFERENCE MARKERS

#	NORTHING	EASTING	STATION	OFFSET	ALIGN
932	468,094.36	2,600,855.12	1669+93	33' Rt	SCL94

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

INITIALIZING BENCH MARK
NDGPS Stations, (OPUS)

- ☒ NAVD-88
- ☐ _______
- ☐ GEOID12A
- ☒ GEOID18
- ☐ _______

Date Survey
Completed 11/16/2023

- ☐ Assumed Coordinates
- ☒ All coordinates on this sheet are Barnes County ground coordinates. They are derived from the NAD83(2011) reference frame; North Dakota South Zone Combination Factor (cf) = 0.9998710

REGISTERED PROFESSIONAL ENGINEER & LAND SURVEYOR
CARL P. OLSON
PE-4687
LS-4687
DATE 04/30/25
NORTH DAKOTA

NOTES: Sheet 1 of 1
Control was developed from OPUS solutions.
Trimble VRS network was used for this project.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE		35	
G20-1-60	60"x24"	ROAD WORK NEXT __ MILES		28	
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)		18	
G20-2-48	48"x24"	END ROAD WORK		26	
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)		18	
G20-4b-36	36"x30"	WAIT FOR PILOT CAR		18	
G20-50a-72	**72"x36"**	**ROAD WORK NEXT __ MILES RT & LT ARROWS**	**9**	**43**	**387**
G20-52a-72	**72"x24"**	**ROAD WORK NEXT __ MILES RT or LT ARROW**	**2**	**36**	**72**
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE $80 WHEN WORKERS PRESENT		59	
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		11	
M1-2-24	**24"x24"**	**OFF-INTERSTATE ROUTE MARKER (Post and installation only)**	**10**	**10**	**100**
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	**24"x12"**	**EAST (Mounted on route marker post)**	**4**	**7**	**28**
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	**24"x12"**	**WEST (Mounted on route marker post)**	**5**	**7**	**35**
M4-8-24	**24"x12"**	**DETOUR (Mounted on route marker post)**	**11**	**7**	**77**
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)		7	
M4-10-48	**48"x18"**	**DETOUR (INSIDE ARROW) RIGHT or LEFT (Post mounted)**	**2**	**24**	**48**
M5-1-21	**21"x15"**	**ADVANCE TURN ARROW RT or LT(Mounted on route marker post)**	**2**	**7**	**14**
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		9	
M5-2-21	**21"x15"**	**ADVANCE TURN DIAGONAL ARROW RT or LT(Mounted on route marker post)**	**3**	**7**	**21**
M6-1-21	**21"x15"**	**DIRECTIONAL ARROW RT or LT (Mounted on route marker post)**	**4**	**7**	**28**
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		9	
M6-3-21	**21"x15"**	**DIRECTIONAL ARROW UP (Mounted on route marker post)**	**2**	**7**	**14**
R1-1-48	48"x48"	STOP		32	
R1-2-60	60"x60"	YIELD		29	
R2-1-36	36"x48"	SPEED LIMIT __ (Portable only)		30	
R2-1-48	48"x60"	SPEED LIMIT __		39	
R2-1aP-24	24"x18"	MINIMUM FEE $80 (Mounted on Speed Limit post)		10	
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)		14	
R7-1-12	12"x18"	NO PARKING ANY TIME		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	**48"x30"**	**ROAD CLOSED (Mounted on barricade)**	**2**	**12**	**24**
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)		12	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-4a-60	**60"x30"**	**STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)**	**2**	**15**	**30**
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT		35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT		35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT		35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD		35	
W3-3-48	48"x48"	SIGNAL AHEAD		35	
W3-4-48	48"x48"	BE PREPARED TO STOP		35	
W3-5-48	48"x48"	SPEED REDUCTION AHEAD		35	
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT		35	
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC		35	
W8-1-48	48"x48"	BUMP		35	
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
W8-12-48	48"x48"	NO CENTER LINE		35	
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT or _ MILE		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT or _ MILE		35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)		14	
W14-3-64	64"x48"	NO PASSING ZONE		28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)		10	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**4**	**35**	**140**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT or _ MILE		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or _ MILE		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or _ MILE		35	
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE		35	
W20-7-48	48"x48"	FLAGGER		35	
W20-8-18	18"x18"	STOP - SLOW PADDLE Back to Back		5	
W20-52P-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)		12	
W21-1-48	48"x48"	WORKERS		35	
W21-2-48	48"x48"	FRESH OIL		35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or _ MILE		35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-5-48	48"x48"	SHOULDER WORK		35	
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED		35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT or _ MILE		35	
W21-6-48	48"x48"	SURVEY CREW		35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT		35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY		35	
W21-52-48	48"x48"	PAVEMENT BREAKS		35	
W21-53-48	48"x48"	RUMBLE STRIPS AHEAD		35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK		35	
W24-1-48	48"x48"	DOUBLE REVERSE CURVE		35	

SPECIAL SIGNS

SS1	**42"x12"**	**MAIN ST**	**10**	**8**	**80**

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**1098**

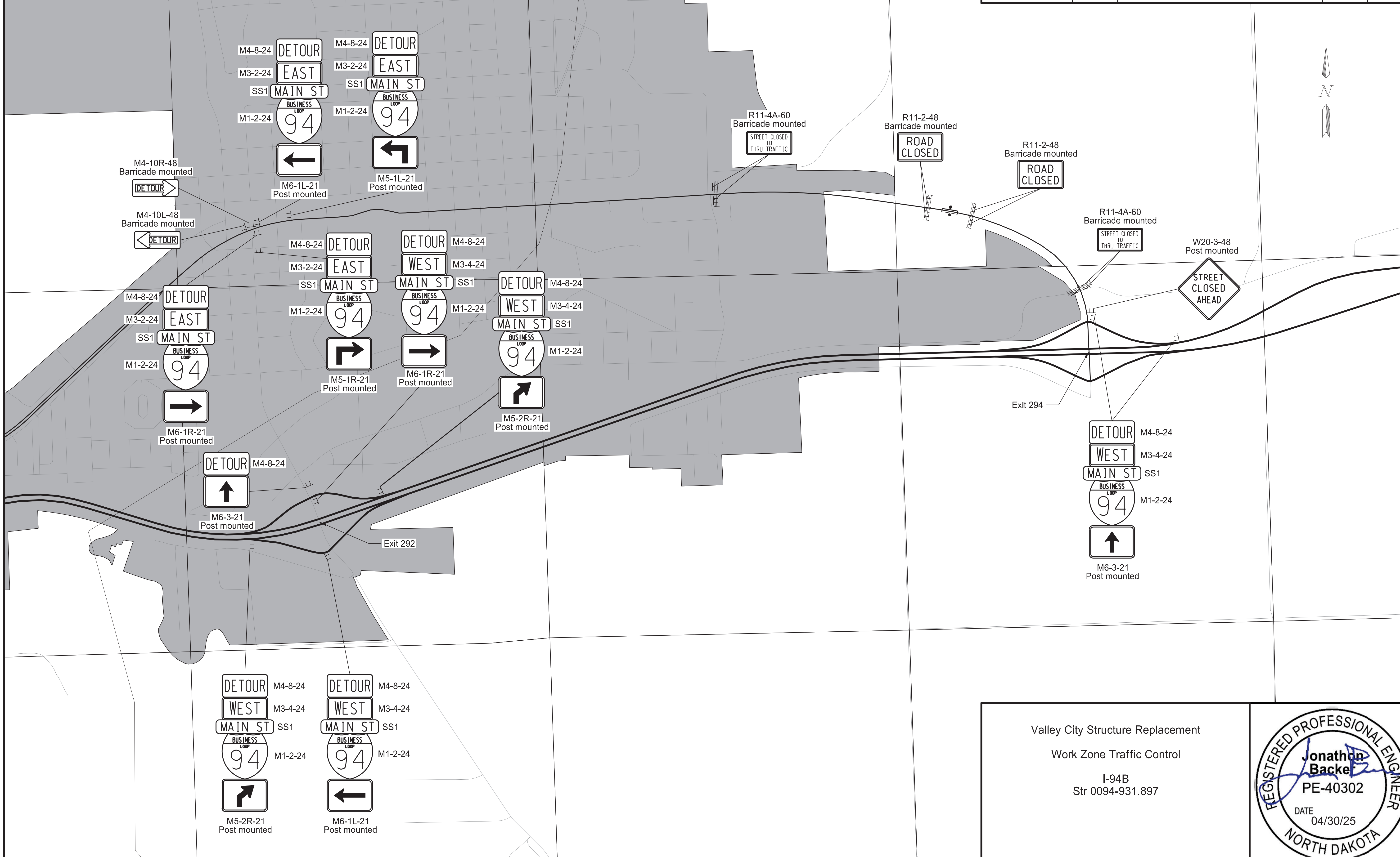
SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	**FLAGGING**	**MHR**	**40**
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH	
704-1048	PORTABLE RUMBLE STRIPS	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1052	**TYPE III BARRICADES**	**EACH**	**8**
704-1060	DELINEATOR DRUMS	EACH	
704-1065	TRAFFIC CONES	EACH	
704-1067	TUBULAR MARKERS	EACH	
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1080	**STACKABLE VERTICAL PANELS**	**EACH**	**47**
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
704-1087	SEQUENCING ARROW PANEL - TYPE C	EACH	
704-1500	OBLITERATION OF PVMT MK	SF	
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	

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

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backe
PE-40302
DATE 04/30/25
NORTH DAKOTA

Traffic Control Devices List
Valley City Structure Replacement
I-94B
Str 0094-931.897

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-2-999(069)	100	2



Valley City Structure Replacement

Work Zone Traffic Control

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

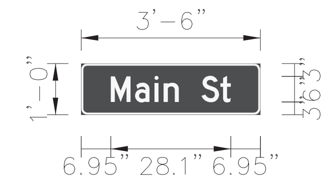
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	100	3

SIGN NUMBER	ND_D3-1 (Lines 1)
WIDTH X HEIGHT	3'-6" x 1'-0"
BORDER WIDTH	0.5" (inset 0")
CORNER RADIUS	1.5"
MOUNTING	Ground
BACKGROUND	TYPE: IV Reflective
	COLOR: Green
LEGEND/BORDER	TYPE: IV Reflective
	COLOR: White

SYMBOL	X	Y	WID	HT	ANGLE

STATION(S):
none

AREA: 3.5 Sq.Ft.



Dimensions are in inches.tenths

Letter locations are panel edge to lower left corner

PANEL STYLE: ND_911_6in_Border.ssl

LETTER POSITION (X)							LENGTH	SIZE	SERIES
M	a	i	n		S	t	28.14	6/4.5	D 2000
6.93	12.63	17.19	19.35	23.43	28.23	32.67			

Valley City Structure Replacement

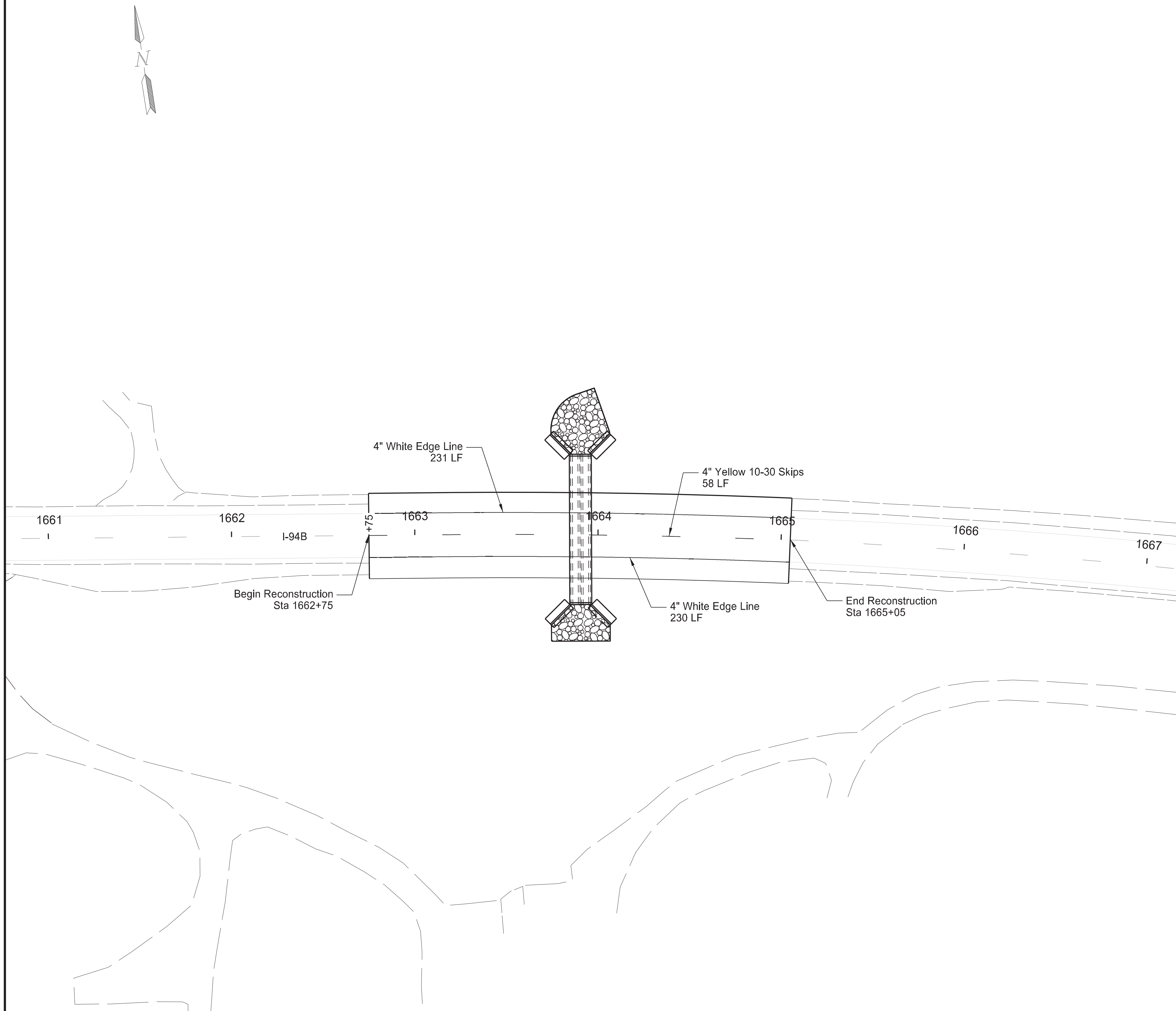
Work Zone Traffic Control
Sign Details

I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	120	1

SPEC	CODE	BID ITEM	QTY	UNIT
762	1104	PVMT MK PAINTED 4IN LINE		
		Skips 10-30 (Yellow)	58	LF
		Edge Line (White)	461	LF



Valley City Structure Replacement

Pavement Marking

Sta 1661+00 to 1667+00 (SCL94)

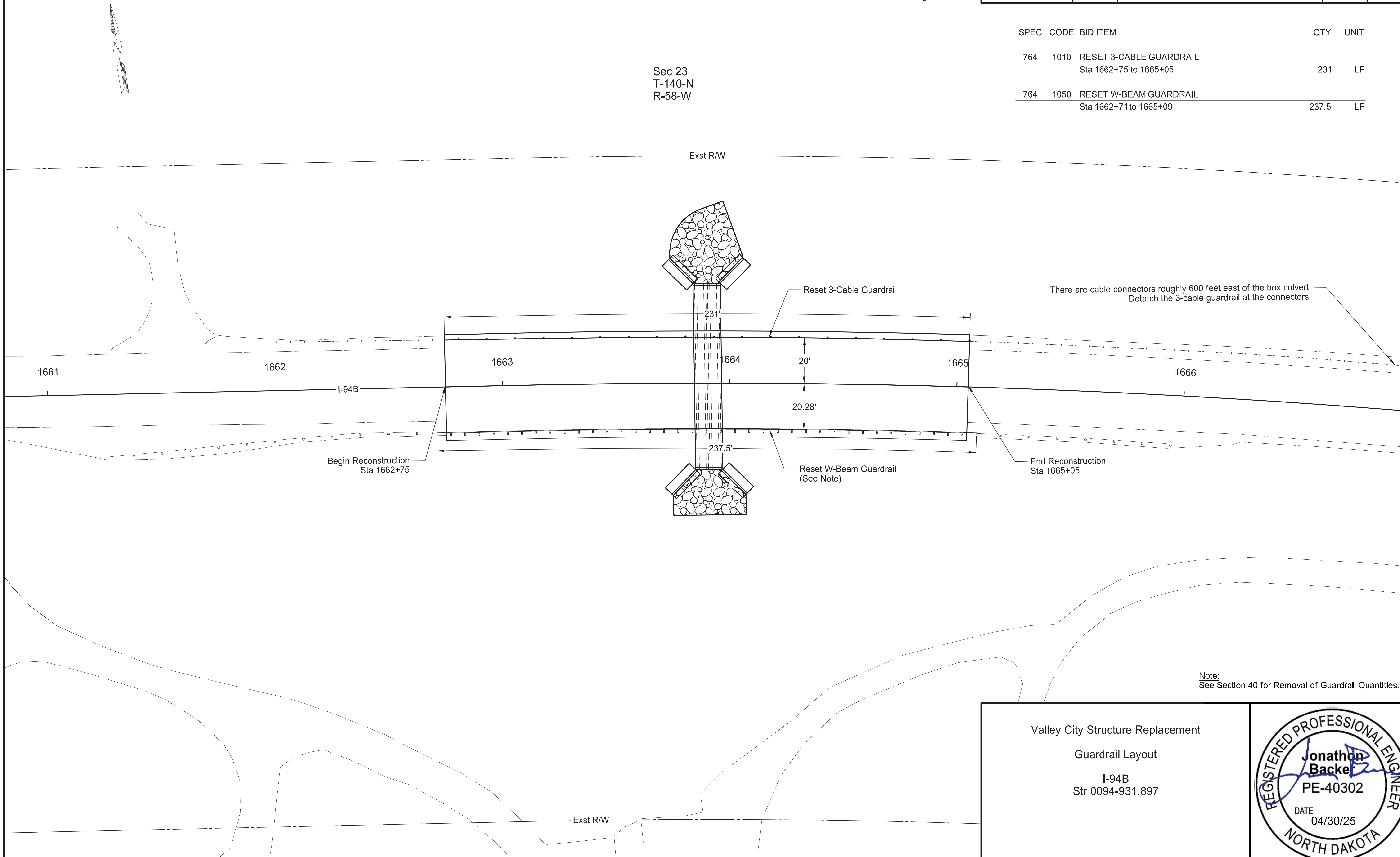
I-94B
Str 0094-931.897

REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA

23 U.S.C. § 407 Documents
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	130	1

SPEC	CODE	BID ITEM	QTY	UNIT
764	1010	RESET 3-CABLE GUARDRAIL		
		Sta 1662+75 to 1665+05	231	LF
764	1050	RESET W-BEAM GUARDRAIL		
		Sta 1662+71to 1665+09	237.5	LF



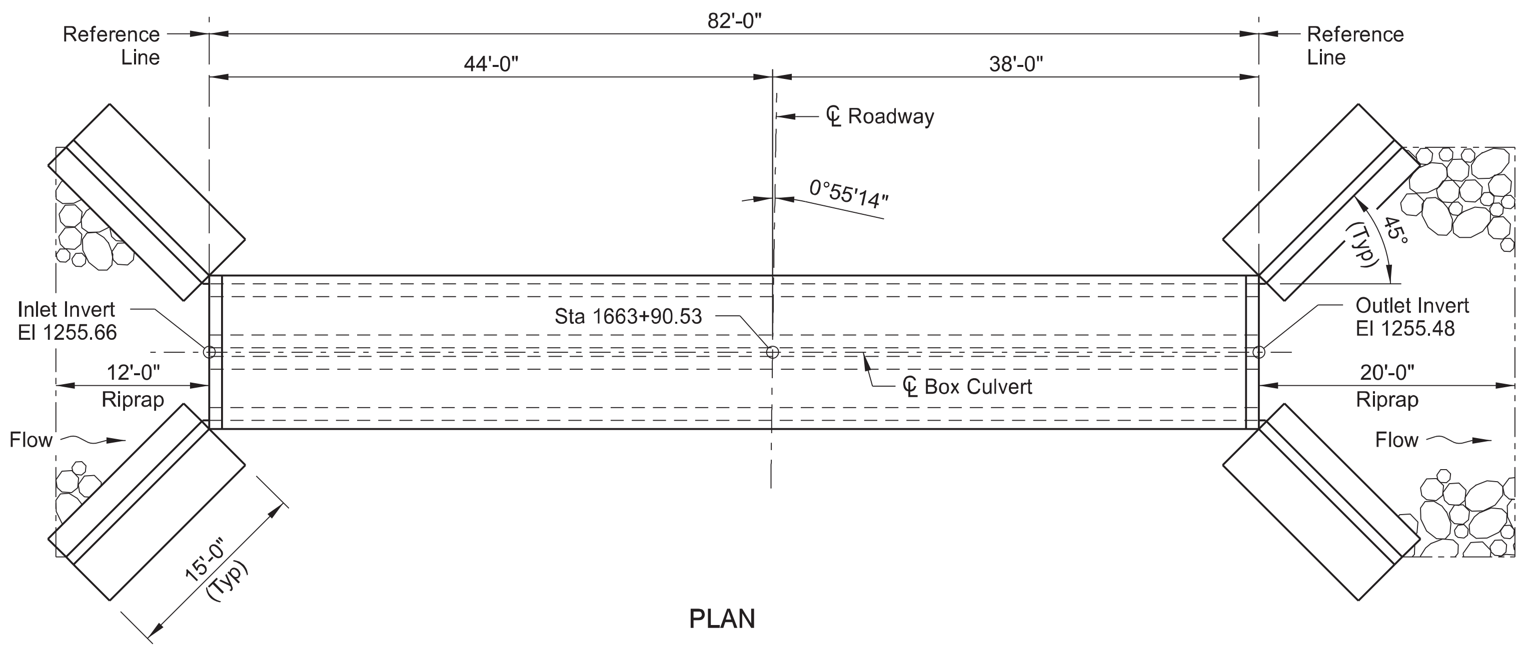
Note:
See Section 40 for Removal of Guardrail Quantities.

Valley City Structure Replacement

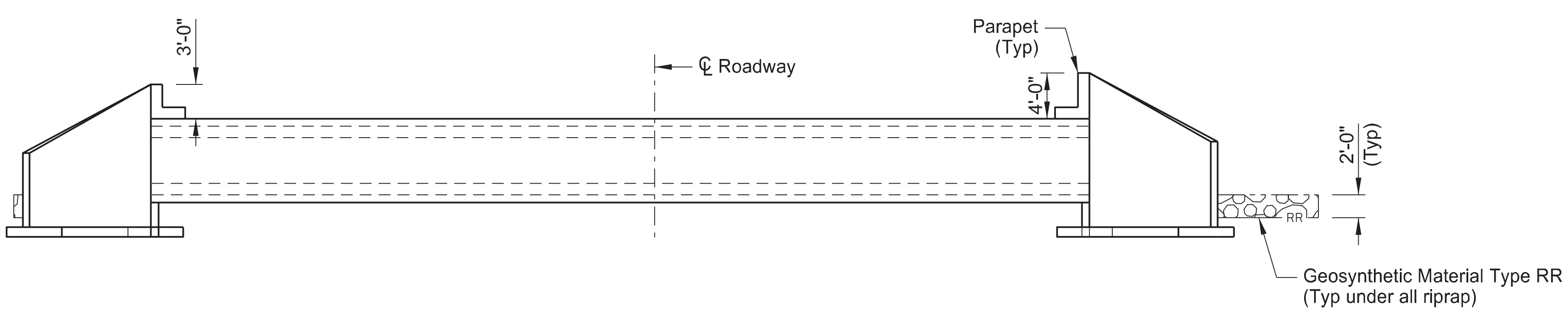
Guardrail Layout

I-94B
Str 0094-931.897

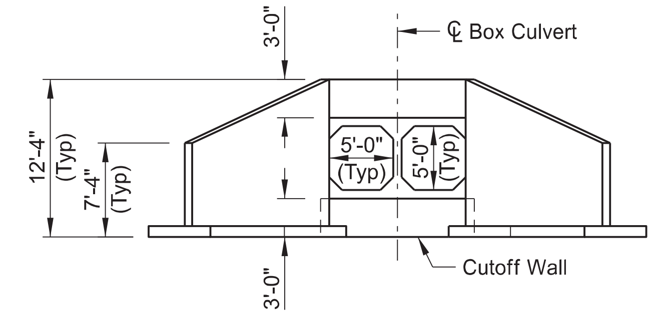
REGISTERED PROFESSIONAL ENGINEER
Jonathon Backer
PE-40302
DATE 04/30/25
NORTH DAKOTA



PLAN

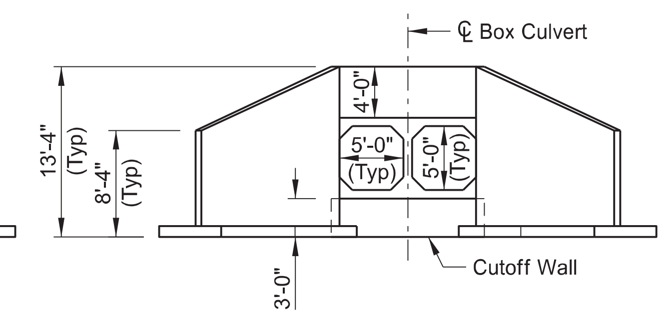


ELEVATION



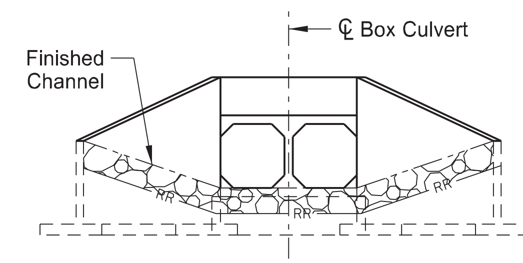
(Showing Dimensions)

NORTH END VIEW



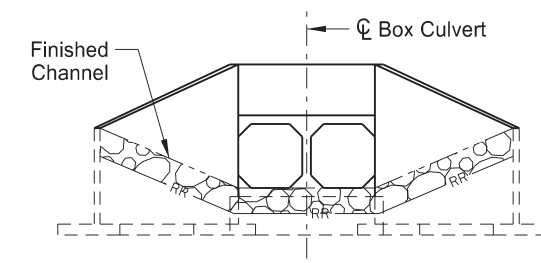
(Showing Dimensions)

SOUTH END VIEW



(Showing Finished Section)

NORTH END VIEW

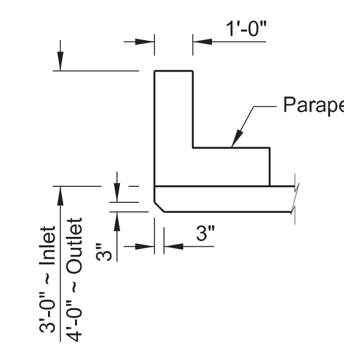


(Showing Finished Section)

SOUTH END VIEW

NOTE:

See Section 20, Sheet 3 for details showing additional channel reinforcement riprap.



ROOF CHAMFER & PARAPET DETAIL

SPECIAL PROVISIONS

SSP 2	MIGRATORY BIRD TREATY ACT
SP 489(24)	TEMPORARY WATER DIVERSION
SP 520(24)	STRUCTURAL AND CHANNEL EXCAVATION FOUNDATION FILL AND PREPARATION

STANDARD DRAWINGS

D-714-22

HL-93 DESIGN LOADING

INTERSTATE I-94

CLEAR SPAN 2X5' CLEAR HEIGHT 5'
MAXIMUM FILL 14' STATION 1663+90.53

PRECAST CONCRETE
DOUBLE BOX CULVERT LAYOUT

ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

DRAWING NO. 94-931.898-1

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
202	0105	REMOVAL OF STRUCTURE	L SUM	1
210	0050	BOX CULVERT EXCAVATION	EA	1
210	0210	FOUNDATION FILL	CY	282
210	0250	BOX CULVERT FOUNDATION AGGREGATE	CY	97
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
256	0200	RIPRAP GRADE II	CY	59
606	2505	DBL 5FT X 5FT PRECAST RCB CULVERT	LF	82
606	6505	DBL 5FT X 5FT PRECAST RCB END SECTION	EA	2
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	155
709	0155	GEOSYNTHETIC MATERIAL TYPE RR	SY	86
900	1000	TEMPORARY STREAM DIVERSION	EA	1

HYDRAULIC DATA:

Drainage Area	11.3	sq mi
Stream Gradient	0.004	ft/ft
Design Frequency	50	yr
Design Discharge	420.4	cfs
Design Headwater Stage	1262.90	ft
Design Tailwater Stage	1261.08	ft
Velocity Through Culvert	7.0	fps
100-Year Frequency Discharge	528.7	cfs
100-Year Frequency Headwater	1264.32	ft
Overtopping Stage	1270.67	ft
Overtopping Discharge	> 500 yr	cfs

REGISTERED PROFESSIONAL ENGINEER
JOSHUA R SCHROEDER
PE 5824
DATE 05/01/25
NORTH DAKOTA

NOTES

100 SCOPE OF WORK: Work at this site consists of removing and replacing an existing box culvert. The new box culvert is a double barrel 5' x 5' x 82' precast concrete box culvert.

202 REMOVAL OF STRUCTURE: The existing structure is a double barrel 5' x 5' cast-in-place concrete box culvert, 82'-0" long. Include all work required to remove the box culvert in the contract unit price for "REMOVAL OF STRUCTURE".

210 ORDINARY BACKFILL: Compact material as specified in Section 203.04 G.2.a, "ND T180".

606 JOINTS: Provide joints in accordance with Section 606.E.3, with the exception that a 12" minimum width waterproof membrane is allowable around the exterior surfaces of the box culvert walls and roof.

606 PRECAST BOX CULVERT DESIGN: Design the box culvert and box culvert end sections in accordance with the AASHTO LRFD Bridge Design Specifications, 9th Edition. Design the box culvert for HL-93 live load and a fill height range from 9 ft to 14 ft over the box culvert.

Additional Box Culvert Design Criteria:

Lateral Earth Pressure according to the NDDOT Design Manual Section IV-04.12.05, with the exception that an equivalent fluid weight of 60 pcf should be used, and for the unbalanced condition, use equivalent fluid weight of 60 pcf and 30 pcf.

Additional Wing Wall Design Criteria:

Dimension the wingwall footing to achieve a maximum bearing pressure of less than 2,500 psf. Design for lateral earth pressure taking into account the slope of the proposed ground above the wing walls.

Additional Parapet Design and Detail Criteria:

Design the parapets for the retained soil heights shown in the plans using an equivalent fluid weight of 60 pcf, and provide details to attach the parapets to the box culvert.

Load rate the box culvert in accordance with both the NDDOT Load Rating Manual and the AASHTO Manual for Bridge Evaluation, 2018 Edition, incorporating the latest Interim Revisions. Provide a box culvert design to achieve a rating factor greater than or equal to 1.0 for the design, legal, and permit trucks over the specified fill range. Include BrR Load Rating Summaries for 1' incremental fill depths throughout the fill range in the load rating report. Populate the NDDOT Load Rating Summary for the actual fill depth at the time of construction.

Include with the work drawing submittals a Load Rating Report sealed by a ND registered PE, and an AASHTOWare BrR Model of the structure in XML format and design calcs including any design data for the parapets and wingwalls.

606 PRECAST SECTION: Tie the barrel sections together using the 1" Φ "Hidden Tie" detail as shown on Standard Drawing D-714-22. Place ties in the exterior walls of each precast segment. Use two ties per exterior wall joint, located at the one-third points of the wall's clear height. Install the barrel sections with a maximum gap of ¾ inch wide.

Attach the wingwalls to the last barrel section. Provide a welded tie type system for the connections of the apron to the box and wingwalls. Connect the wingwalls to the last barrel section by the use of tie bolts, steel-bolted plates or other approved method so the inside corner surface is smooth.

Use ASTM A36 steel for bolts, plates, angles, and studs. Use heavy hex nuts meeting the requirements of ASTM A563 and washers meeting ASTM F436, Type 1. Provide welded pipe sleeves meeting the requirements of ASTM A53, Grade B. Galvanize hardware and structural steel according to Section 854.
Welders are to meet the requirements of Section 105.06 D. Galvanize field welds according to Section 854.02.

Do not cast lifting holes through the roof, walls, or floor of the precast barrel or precast end section. Provide cast-in-place anchors that are designed for lifting and handling the precast sections. Provide anchors that are part of a lifting system that has been designed for the anticipated loading that will result from lifting, moving, transporting, and setting the precast units. Galvanize all components of the lifting system that will remain part of the precast structure.

Single barrel box culvert sections will not be allowed.

Payment for "DBL 5Ft X 5Ft Precast RCB End Section" includes the parapet and wingwalls.

REGISTERED PROFESSIONAL ENGINEER
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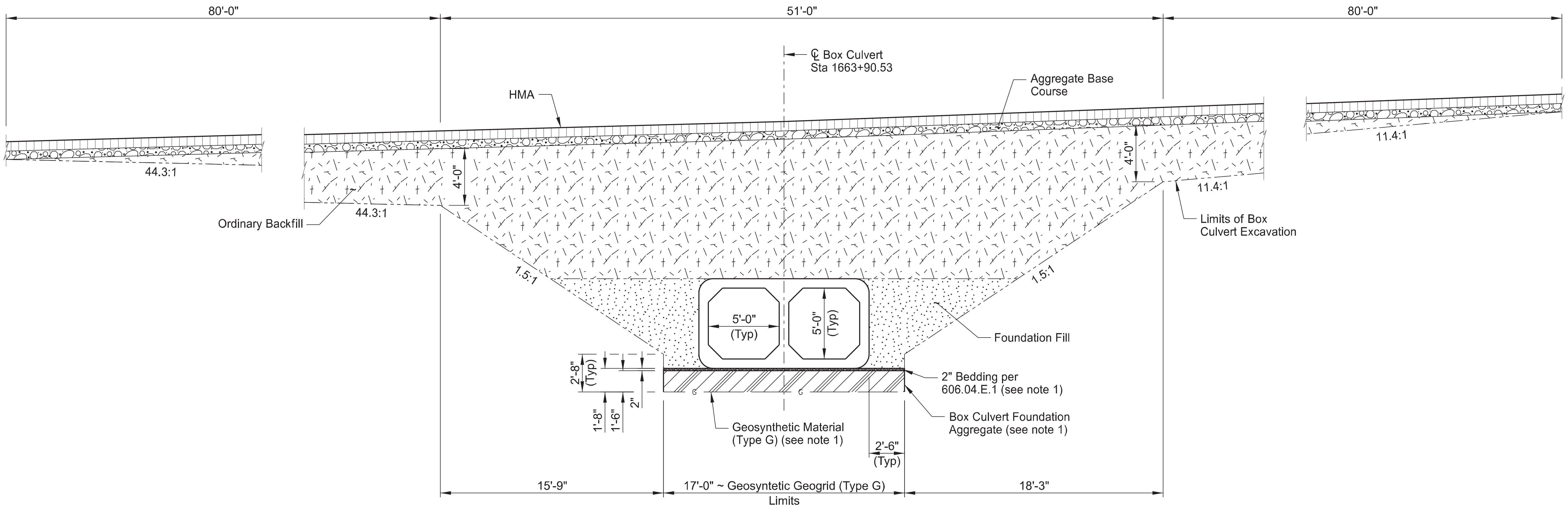
PE 5824
DATE 05/01/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	170	3



(SHOWING SECTION ALONG ℄ ROADWAY)

GEOSYNTHETIC GEOGRID PLACEMENT AND BACKFILL THROUGH EXISTING EMBANKMENT

NOTES:

1. Extend the geosynthetic, bedding material, and box culvert foundation aggregate material below the box culvert to the end of the box.

2. Provide bedding and backfill for the wingwalls as specified by the supplier of the precast components.

REGISTERED PROFESSIONAL ENGINEER
JOSHUA R SCHROEDER
PE 5824
DATE 05/01/25
NORTH DAKOTA

INTERSTATE I-94

EXCAVATION & FOUNDATION
FILL DETAIL

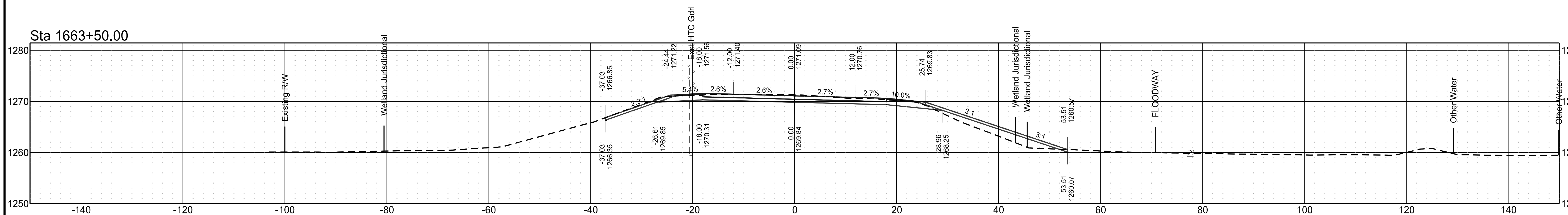
DRAWING NO. 94-931.898-3

Barnes County
Chain SCL94

Valley City Structure Replacement I-94B
I-94 Business Route
Str 0094-931.897

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-2-999(069)	200	1

Sta 1663+50.00



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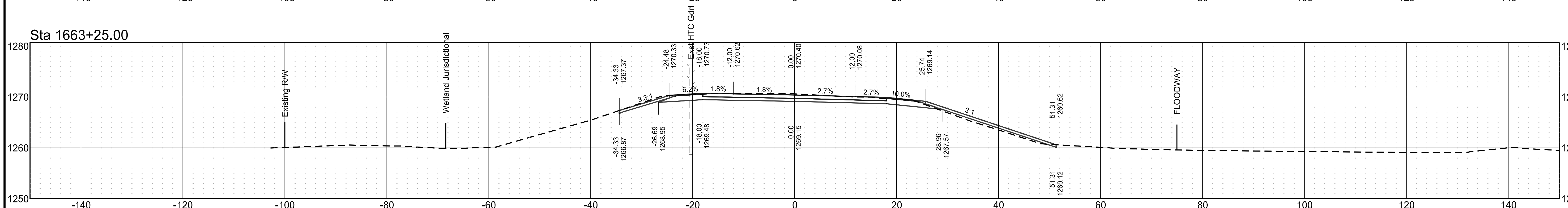
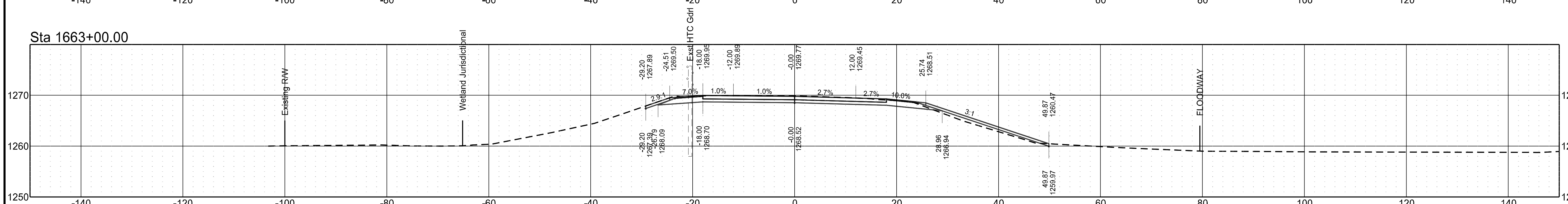
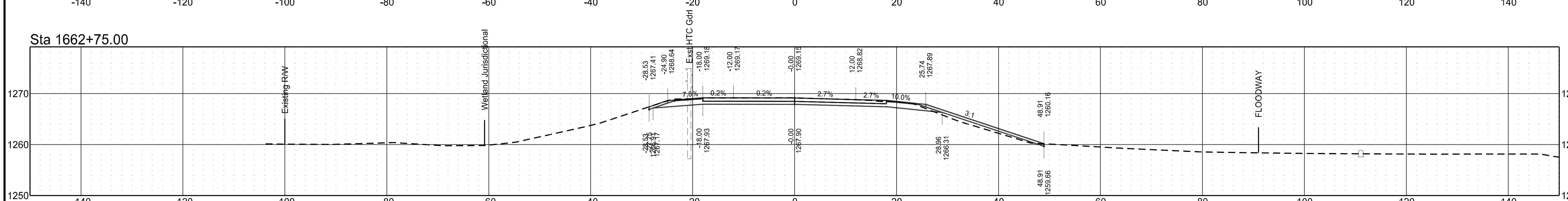


Sta 1663+00.00



Sta 1662+75.00

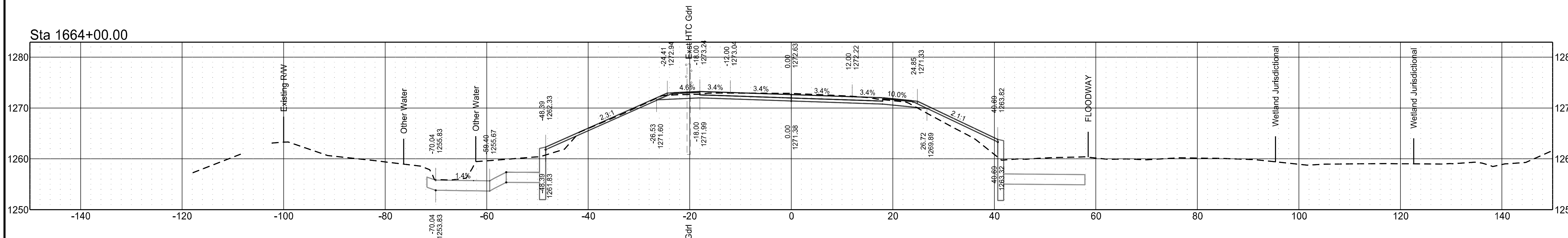


Barnes County
Chain SCL94

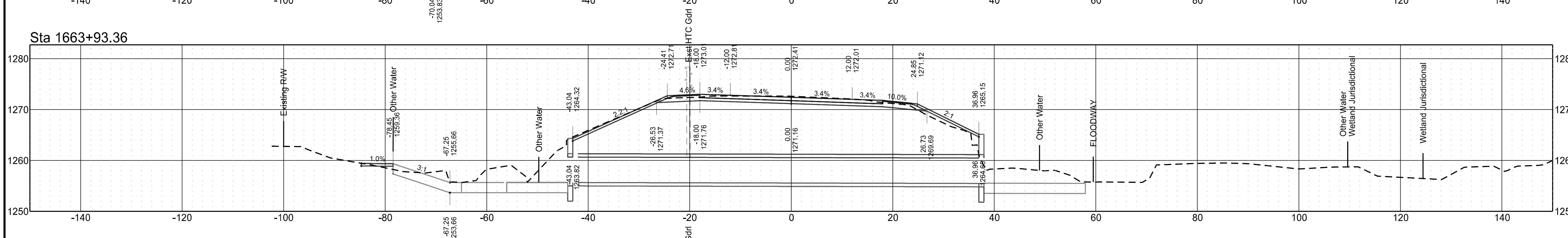
Valley City Structure Replacement I-94B
I-94 Business Route
Str 0094-931.897

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SS-2-999(069)	200	2

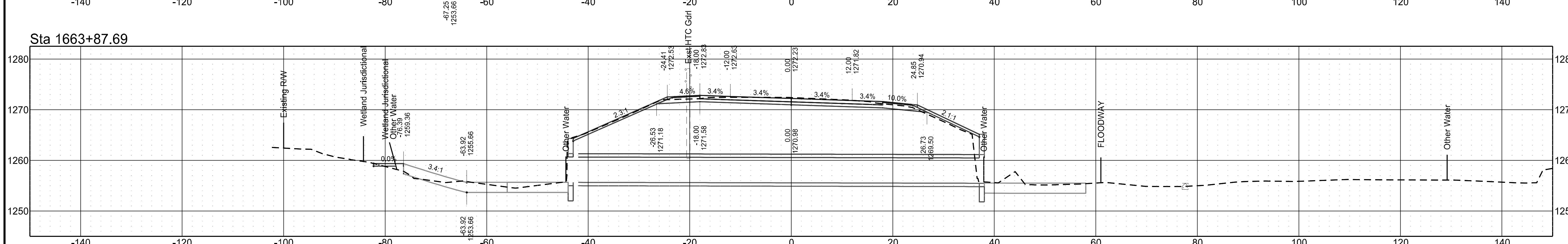
Sta 1664+00.00



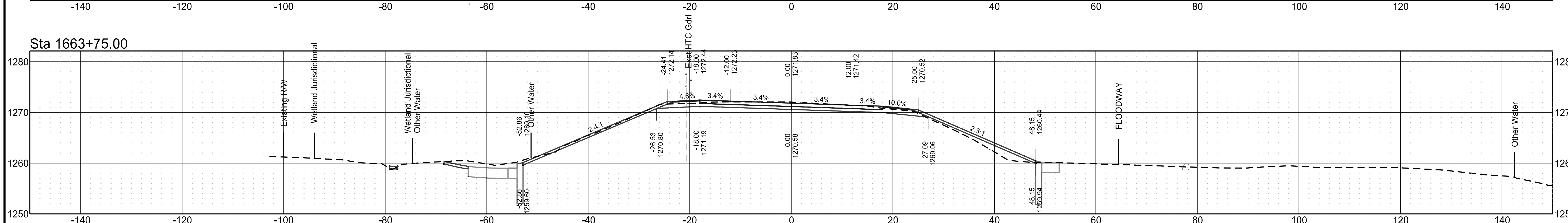
Sta 1663+93.36



Sta 1663+87.69



Sta 1663+75.00

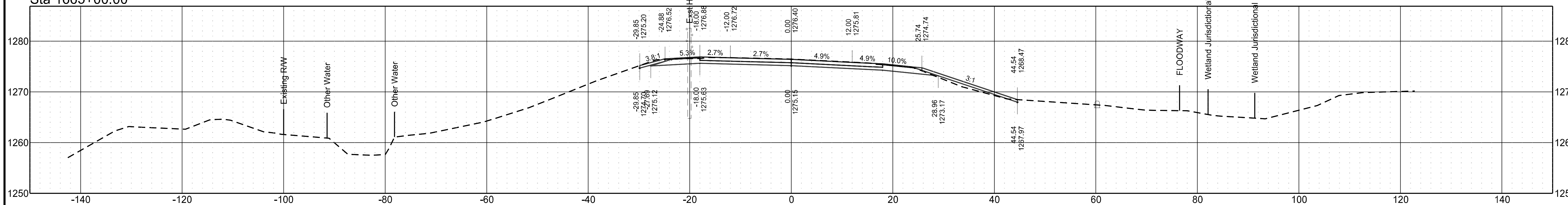


Barnes County
Chain SCL94

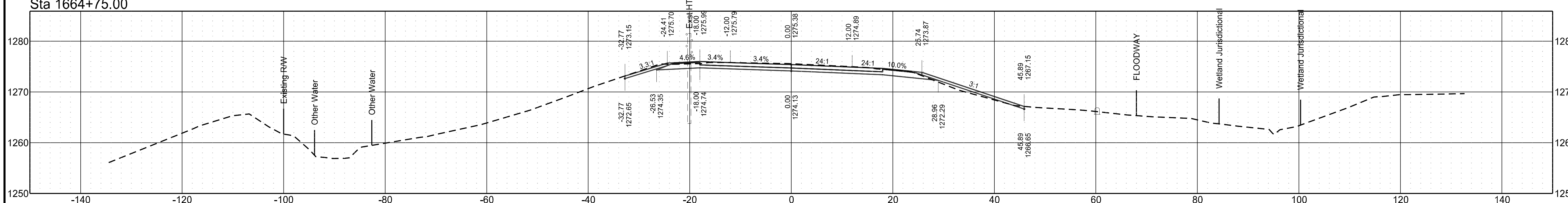
Valley City Structure Replacement I-94B
I-94 Business Route
Str 0094-931.897

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SS-2-999(069)	200	3

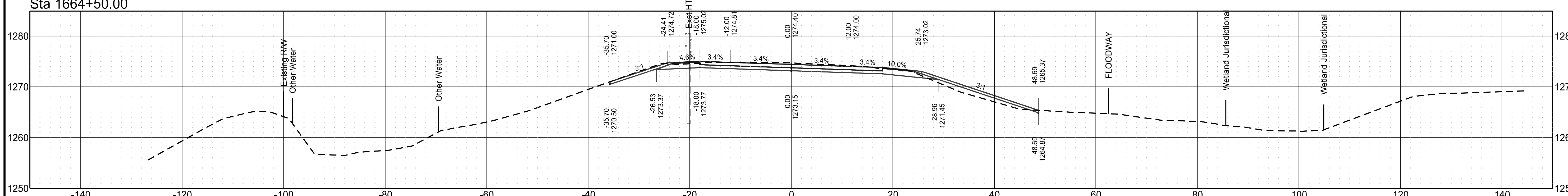
Sta 1665+00.00



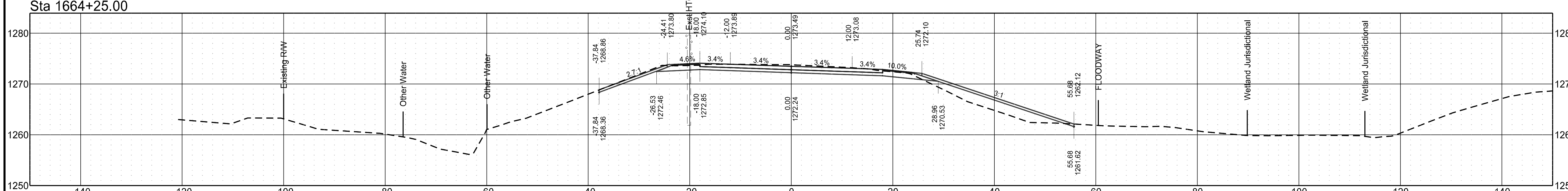
Sta 1664+75.00



Sta 1664+50.00



Sta 1664+25.00



Sta 1665+05.00