	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	22673	1	1

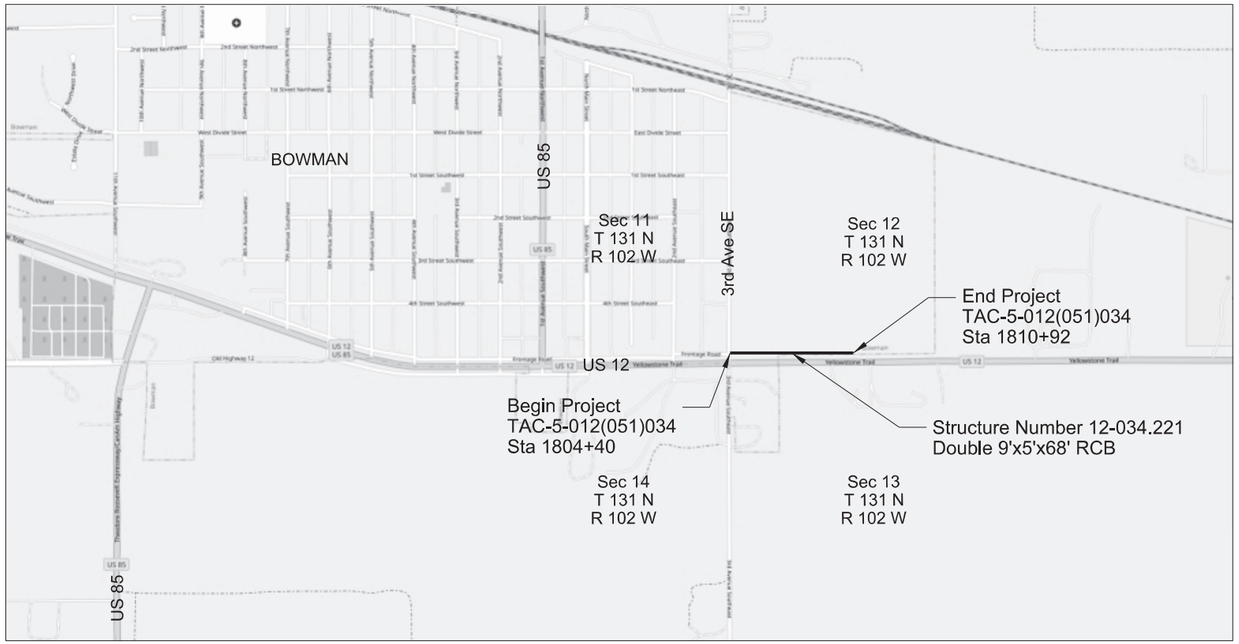
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

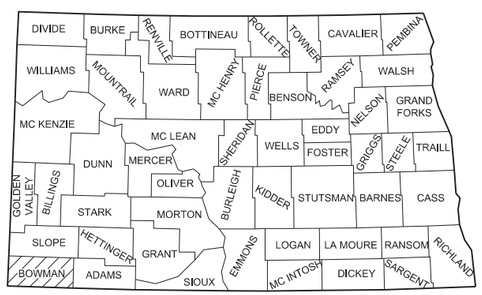
TAC-5-012(051)034

Bowman County
City of Bowman
US Highway 12 - 3rd Ave SE to Bronson's Marketplace
Concrete Shared Use Path, Culverts, and Incidentals

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	10/1/2022
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
TAC-5-012(051)034	0.12	0.12





STATE COUNTY MAP

DESIGNER
William Doerr

DESIGNER
Rylan Limesand

DESIGNER
Jon Brosz

ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT

Orn, Chad M.
03/18/22

BROSZ ENGINEERING, INC.

REGISTERED PROFESSIONAL ENGINEER
WILLIAM DOERR
PE-7113
DATE 03/16/2022
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-5-012(051)034	2	1

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PLAN SECTIONS

LIST OF STANDARD DRAWINGS

SPECIAL PROVISIONS

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	4	1

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Scope of Work

City of Bowman

Shared Use Path Project

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-5-012(051)034	6	1

NOTES

100-P01 TIED PROJECT: This project is tied to project HEN-5-012(053)034, PCN 22831 which consists of widening for eastbound left turn lanes, westbound right turn lanes, lighting and a box culvert extension along US Highway 12 on the east edge of Bowman.

105-P01 UTILITIES: No utility relocations or adjustments are planned. All utilities on the project need to be protected and remain in existing location.

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

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

203-P01 EMBANKMENT: The embankment required for the shared use path will tie into the embankment from tied project HEN-5-012(053)034. Place the embankment material concurrently for both projects according to the finished surface.

203-P02 TOPSOIL: All work associated with removing, stockpiling, and placing topsoil will be paid for on tied project HEN-5-012(053)034 and is not included in this project.

251-P01 SEEDING: All work associated with seeding will be paid for on tied project HEN-5-012(053)034 and is not included in this project.

253-P01 HYDRAULIC MULCH: All work associated with hydraulic mulch will be paid for on tied project HEN-5-012(053)034 and is not included in this project.

624-P01 PEDESTRIAN RAILING FOOTING: Install concrete footings for the pedestrian railing as shown in Section 20 and Section 170. The footings for the railing shall consist of an 18-inch diameter and 5-feet deep reinforced concrete foundation. Place reinforcing steel as shown in the details. Include all costs associated with installing the concrete footings for the pedestrian railing in the price bid for Pedestrian Railing.

704-P01 TRAFFIC CONTROL: Install portable work zone traffic control devices for protection of the public and protection of work. Keep the shared use path closed to pedestrians until the project has been approved for use by the Engineer.

Install portable work zone traffic control devices by utilizing devices from tied project HEN-5-012(053)034. Portable work zone traffic control devices used on this project will be paid for once, on project HEN-5-012(053)034.

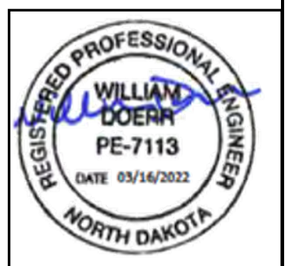
714-P01 APPROACH PIPE CONDUIT: Furnish and install a 45° bend for the 18-inch approach pipe extension as shown in the plans. Include all costs associated with furnishing and installing the 45° bend in the price bid for Pipe Conduit 18IN - Approach.

714-P02 PIPE EXTENSIONS: Remove the silted-in material from the existing 18 and 24-inch approach culverts before extending the culvert. Include the cost of removing the silt in the price bid for Pipe Conduit 24IN – Approach and Pipe Conduit 18IN - Approach.

750-P01 REINFORCED SIDEWALK CONCRETE: Furnish and install Concrete Class AE with synthetic macrofiber reinforcement. Dosage for synthetic macrofibers will be determined based on the required residual strength in accordance with ASTM C1609 and ACI 544.4r-18. Submit a mix design to the Engineer for approval. Base the required residual strength on the slab thickness and equivalent of #4 rebar at 18-inch O.C.

750-P02 SIDEWALK CONCRETE: Saw all contraction joints a minimum of 1/3 the depth of the concrete. Saw joints the same day as placement to prevent uncontrolled cracking. Seal all contraction joints per Section 826.

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

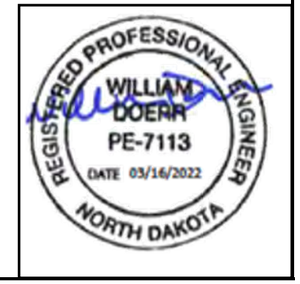


STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-5-012(051)034	6	2

ENVIRONMENTAL NOTES

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

EN-1 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.



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-5-012(051)034	8	1
	HEN-5-012(053)034		

Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline:				TOTAL
103	0100	CONTRACT BOND	L SUM	0.2				0.2
203	0140	BORROW-EXCAVATION	CY	1427				1427
216	0100	WATER	M GAL	18				18
302	0120	AGGREGATE BASE COURSE CL 5	TON	181				181
624	0123	PEDESTRIAN RAILING	LF	74.5				74.5
702	0100	MOBILIZATION	L SUM	0.2				0.2
704	1000	TRAFFIC CONTROL SIGNS	UNIT	28				28
704	1054	SIDEWALK BARRICADE	EA	4				4
706	0500	AGGREGATE LABORATORY	EA	0.2				0.2
714	4099	PIPE CONDUIT 18IN-APPROACH	LF	19				19
714	4106	PIPE CONDUIT 24IN-APPROACH	LF	40				40
714	9660	REMOVE & RELAY END SECTION-ALL TYPE & SIZES	EA	2				2
750	0101	SIDEWALK CONCRETE REINF	SY	807				807
750	2115	DETECTABLE WARNING PANELS	SF	72				72
762	1104	PVMT MK PAINTED 4IN LINE	LF	65				65
762	1124	PVMT MK PAINTED 24IN LINE	LF	108				108

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-5-012(051)034	10	1

BASIS OF ESTIMATE

Location	Embankment (CY)	203-0140 Borrow Excavation (CY) Pay Item
	B	C = B-A
1804+40 to 1810+92 (Shared Use Path)	1427	1427
Total	1427	1427

Surfacing
Sidewalk Concrete @ 111.1 SY/Sta.
Aggregate Base Course CL 5 @ 1.875 Ton/CY
(1.5 Ton/Cy at 25% Shrinkage)
Aggregate Base Course CL 5 @ 25.5 Ton/Sta.

Water
20 Gal/Ton for Aggregates
10 Gal/CY for Embankment

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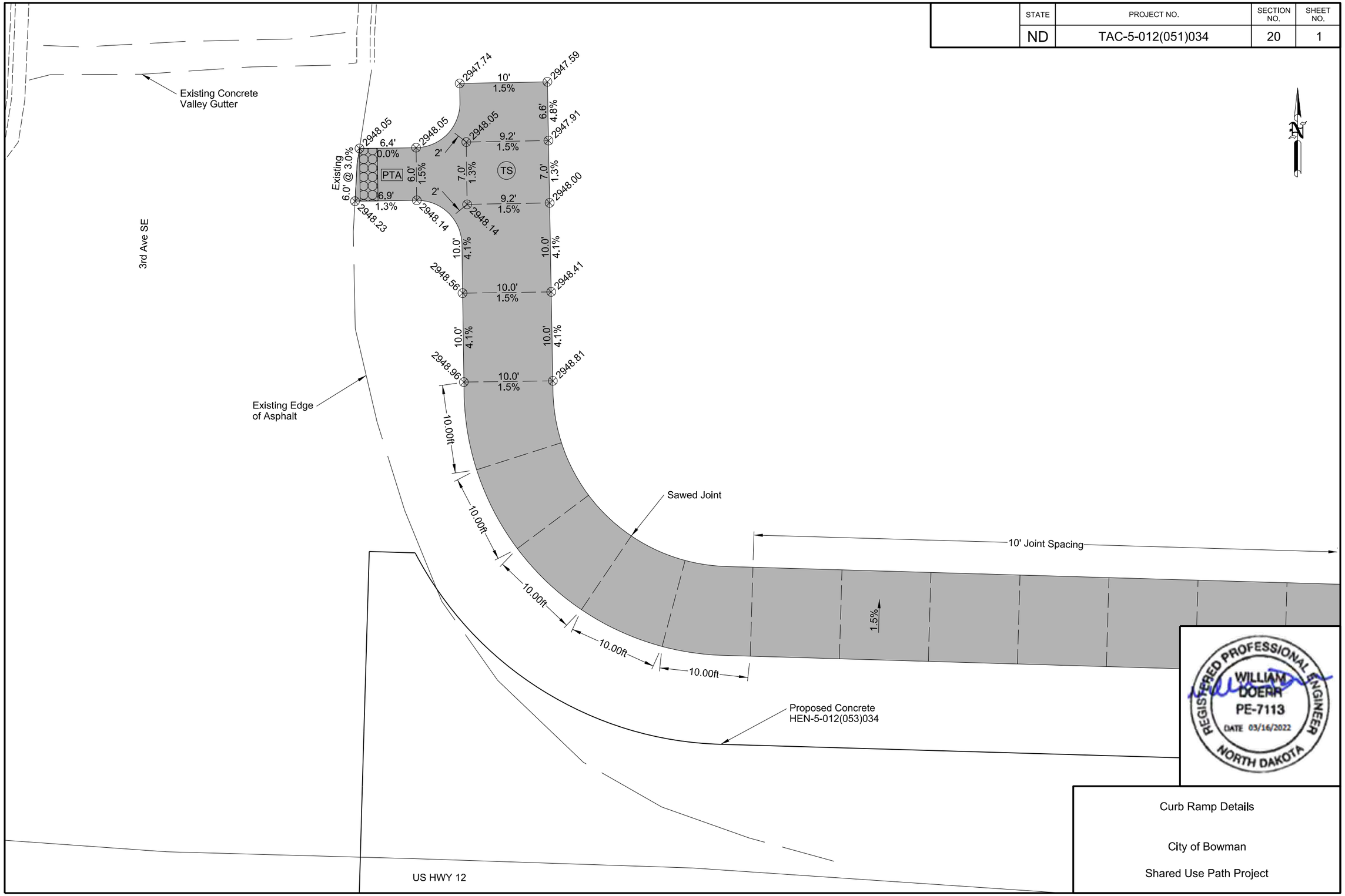
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	20	1



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	20	2

Bronson's Marketplace

Existing
10.0' @ 1.4%

2951.20

2951.34

10.0'
1.4%

L

10.0'
1.5%

10.00ft

2951.34

10.0'
1.5%

2951.49

6 @ 10.17' Spacing

Existing Edge
of Concrete

Sawed Joint

Proposed Concrete
HEN-5-012(053)034

3 @ 11.67' Spacing

2953.16

13.2'
0.2%

2953.18

10.0'
1.5%

L

13.0' @ 1.5%
Existing

5.0'
1.4%

2953.31

2953.38

Sawed Joint

2953.40

16.0'
0.8%

13.0' @ 2.8%
Existing

2953.27

PTA

10.0'
1.5%

TS

10.0'
1.5%

2953.42

7.9'
4.5%

2953.77

10.0'
1.5%

2953.42

2953.57

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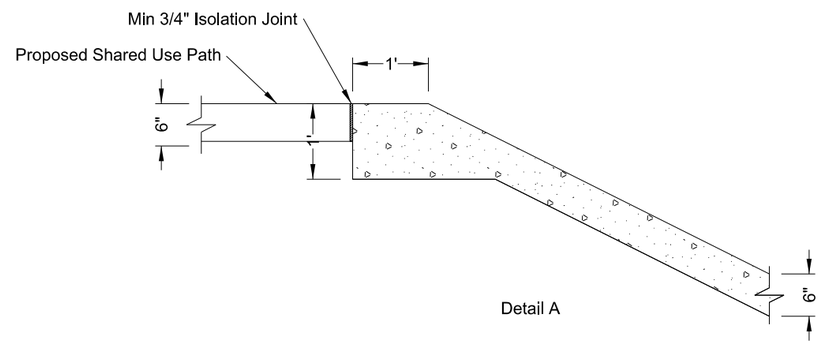
Curb Ramp Details

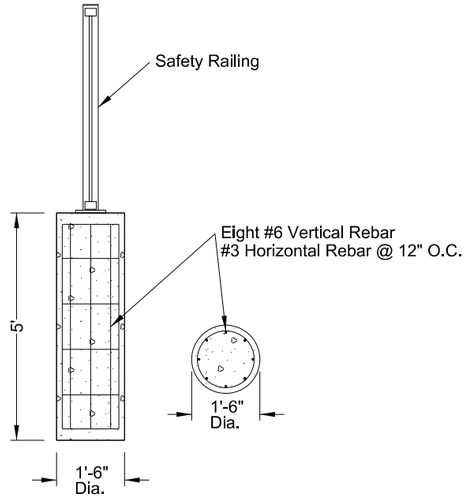
City of Bowman

Shared Use Path Project

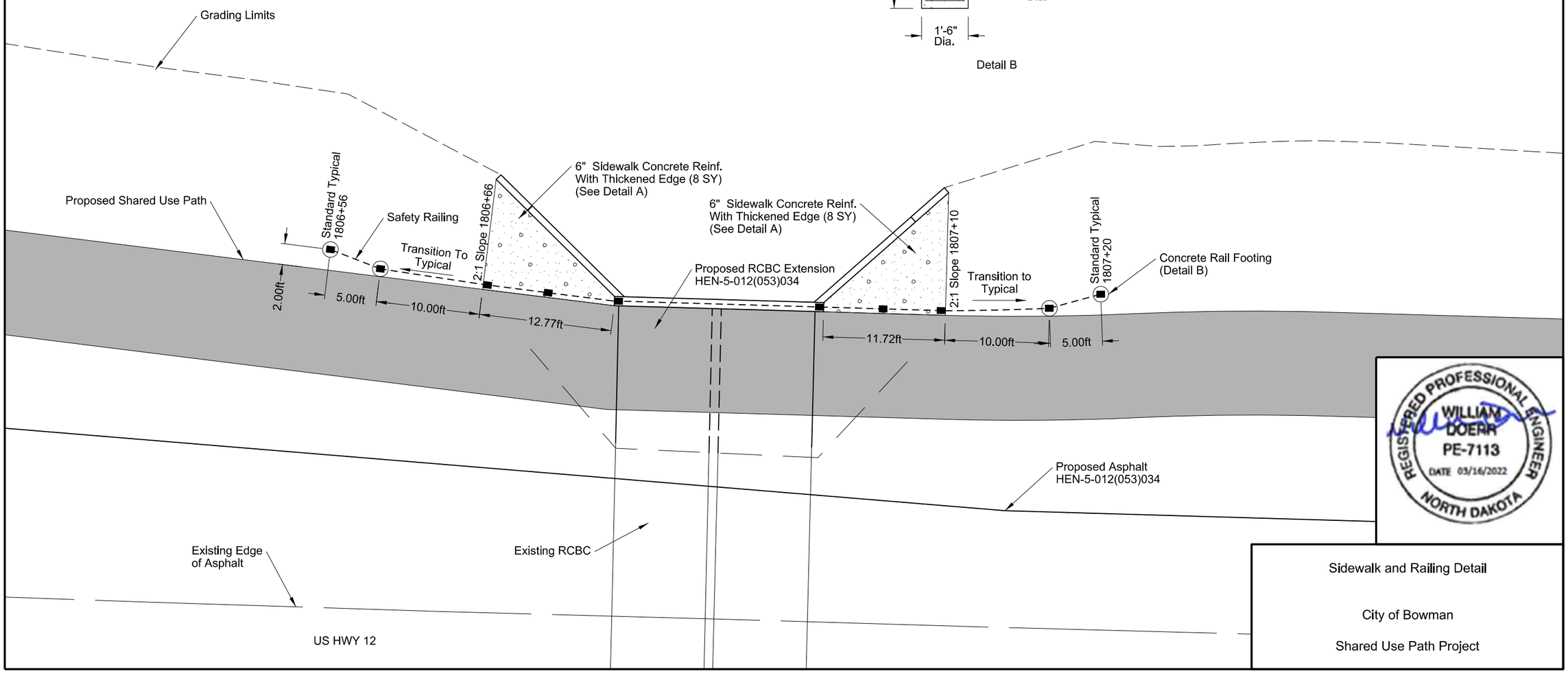
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	20	3



Detail A



Detail B



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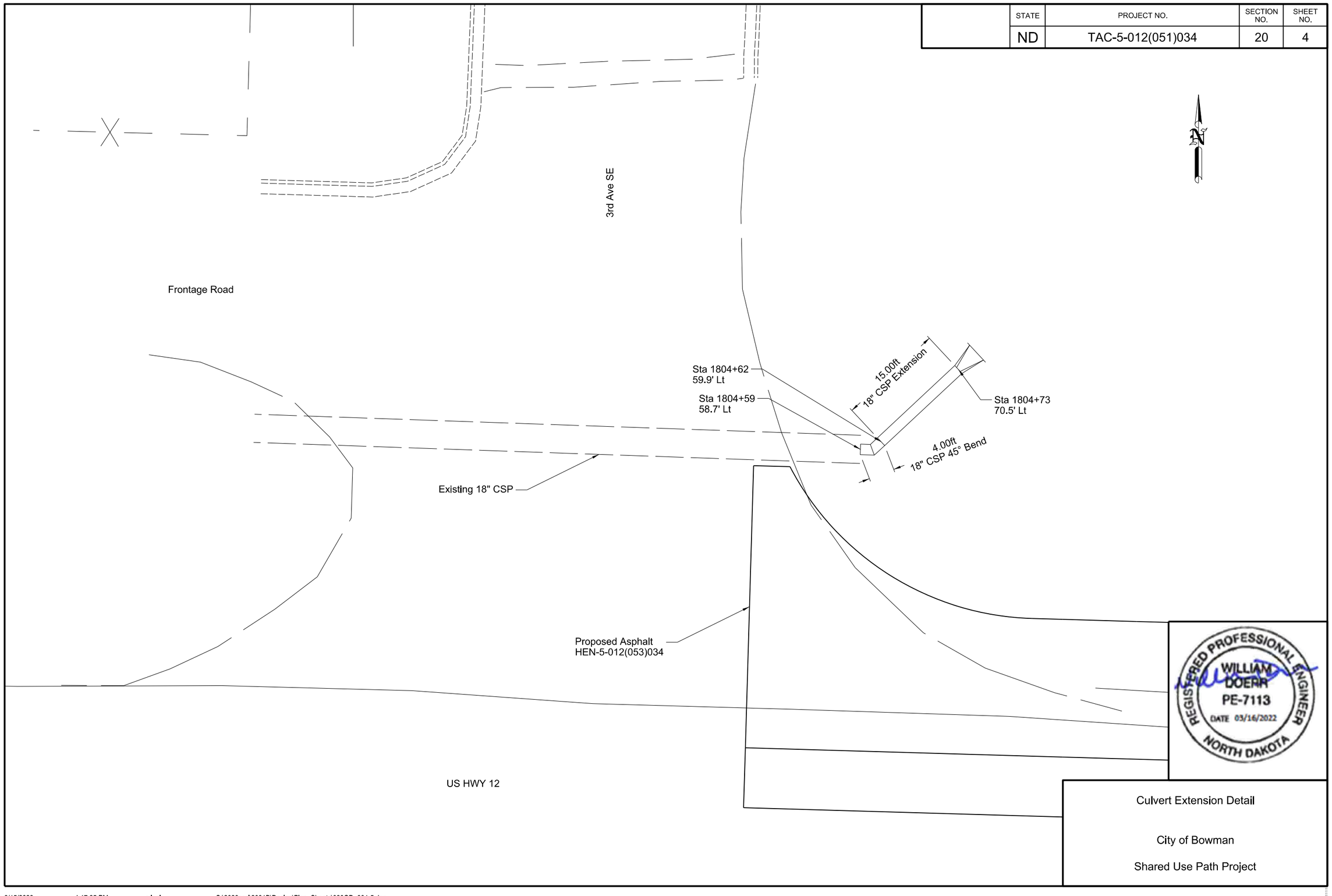
Sidewalk and Railing Detail

City of Bowman

Shared Use Path Project

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	20	4



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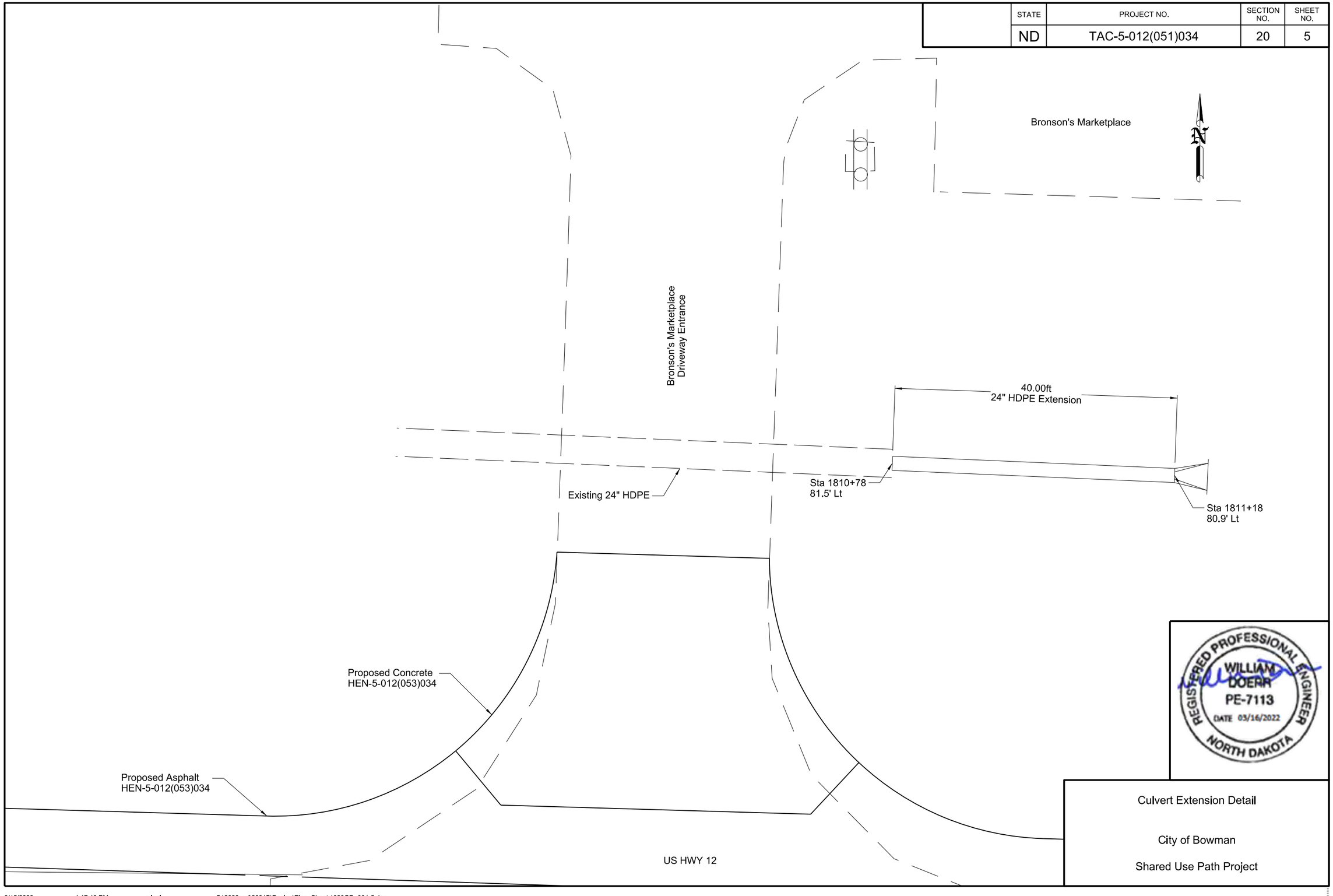
Culvert Extension Detail

City of Bowman

Shared Use Path Project

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	20	5



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Culvert Extension Detail

City of Bowman

Shared Use Path Project

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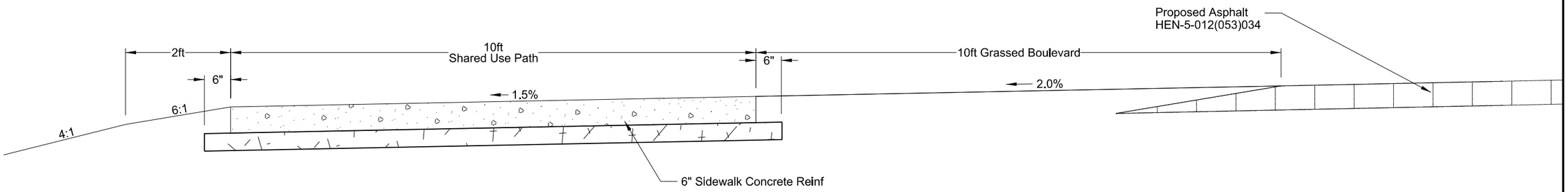
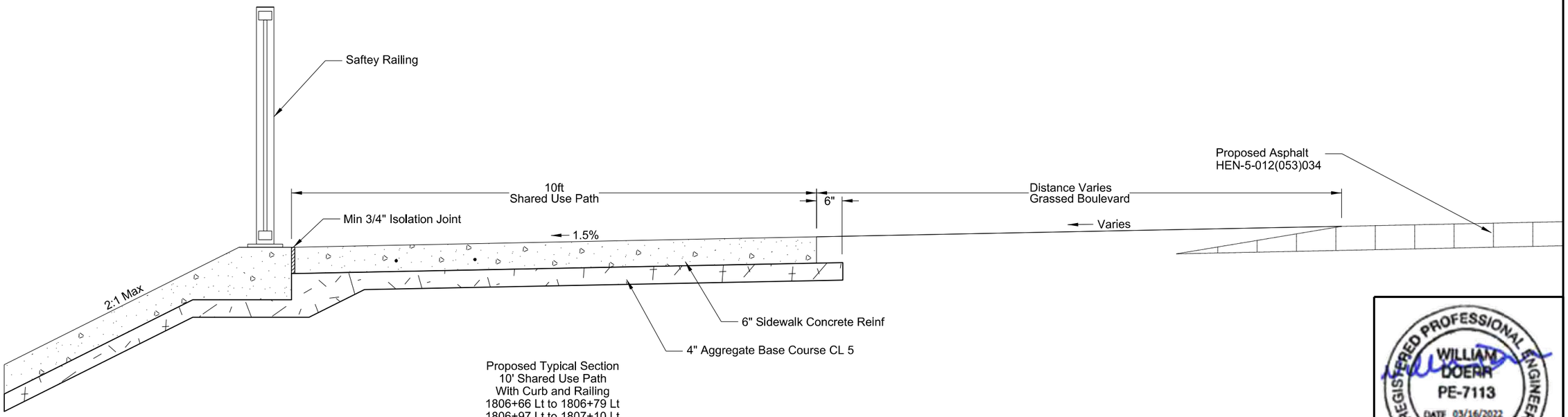
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	30	1



Proposed Typical Section
10' Shared Use Path
1804+40 Lt to 1806+56 Lt
1807+20 Lt to 1810+92 Lt



Proposed Typical Section
10' Shared Use Path
With Curb and Railing
1806+66 Lt to 1806+79 Lt
1806+97 Lt to 1807+10 Lt

See 200-3 for Typical Across RCBC 1806+79 Lt to 1806+97 Lt

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DATE 03/16/2022
NORTH DAKOTA

Proposed Typical Section

City of Bowman

Shared Use Path Project

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coating	Steel Pipe Corrugations or Spiral Rib	Steel Pipe Minimum Thickness	R1 Fabric (Pay Item)	End Section*		Applicable Backfill Detail
				Inch	Bid Item	LF							Begin	End	
				Inch				Inch	Type	Inch	Inch	SY	EA	EA	Plan/Standard
1804+59	58.7' Lt	1840+62	59.9' Lt	18	Pipe Conduit 24IN - Approach	45° Bend 4	Corrugated Steel Pipe	18		2-2/3" x 1/2"			R & R		Specification 714.04 A
1804+62	59.9 'Lt	1804+73	70.5' Lt	18	Pipe Conduit 24IN - Approach	15	Corrugated Steel Pipe	18		2-2/3" x 1/2"					Specification 714.04 A
1810+78	81.5' Lt	1811+18	80.9' Lt	24	Pipe Conduit 24IN - Approach	40	High-Density Polyethylene (Type S)	24		2-2/3" x 1/2"				R & R	Specification 714.04 A

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Allowable Pipe List

City of Bowman

Shared Use Path Project

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-5-012(051)034	75	1

Wetland Impact Table

Wetland Number	Location	Wetland Feature	USACE Jurisdictional Wetlands[1]	Wetland Impacts Acre(s)		USFWS Easement Impacts Acre(s)		Wetland Mitigation											
								Mitigation Required			USACE/11990 Bank		11990 Bank		USFWS Bank		Onsite			
				Temp.	Perm.	Temp.	Perm.	EO 11990	USACE	USFWS	Location	Acre(s)	Location	Acre(s)	Location	Acre(s)	Mitigation Location; Ratio	Acre(s)	Constructed Site #	Constructed Size Acre(s)
1a	Sec.13, T131N, R102W	Artificial	Yes	0.0	0.0			N	N	N										
1b	Sec. 12, T131N, R102W	Artificial	Yes	0.0	0.0			N	N	N										
				0.0	**0.0**															

[1] A wetland Jurisdictional Determination was issued by the USACE on 10/16/2020; NWO-2020-01862-BIS.

Impact Summary Table

Permanent Impact Summary		Temporary Impacts and additional information	
Wetland Type	**Total (Acres)**	**Wetland Type**	**Total (Acres/Lf)**
Natural/JD	0.00	**Temporary JD**	0.00
Natural/Non-JD	0.00	**Non-JD Temporary**	0.00
Artificial/JD	0.00	**Permanent JD > 0.10**	0.00
Artificial /Non-JD	0.00	**Permanent OW**	0.00
Total	**0.00**	**Temporary OW**	0.00

Mitigation Summary Table

	Location	Onsite Acre(s)	11990 Bank Acre(s)	USACE/11990 Bank Acre(s)	USFWS Bank Acre(s)
USACE Only	N/A	0.00		0.00	
EO 11990 Only	N/A	0.00	0.00		
USACE/11990	N/A	0.00		0.00	
USFWS	N/A				0.00
	Total	**0.00**	**0.00**	**0.00**	**0.00**

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Wetlands Mitigation and Environmental

City of Bowman

Shared Use Path Project

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	75	2

*Temporary and Permanent impacts to Wetland 1b are covered on tied project HEN-5-012(053)034

Legend

DELINEATED WETLAND

FLOW ARROW

N

Scale: 1"=40.00

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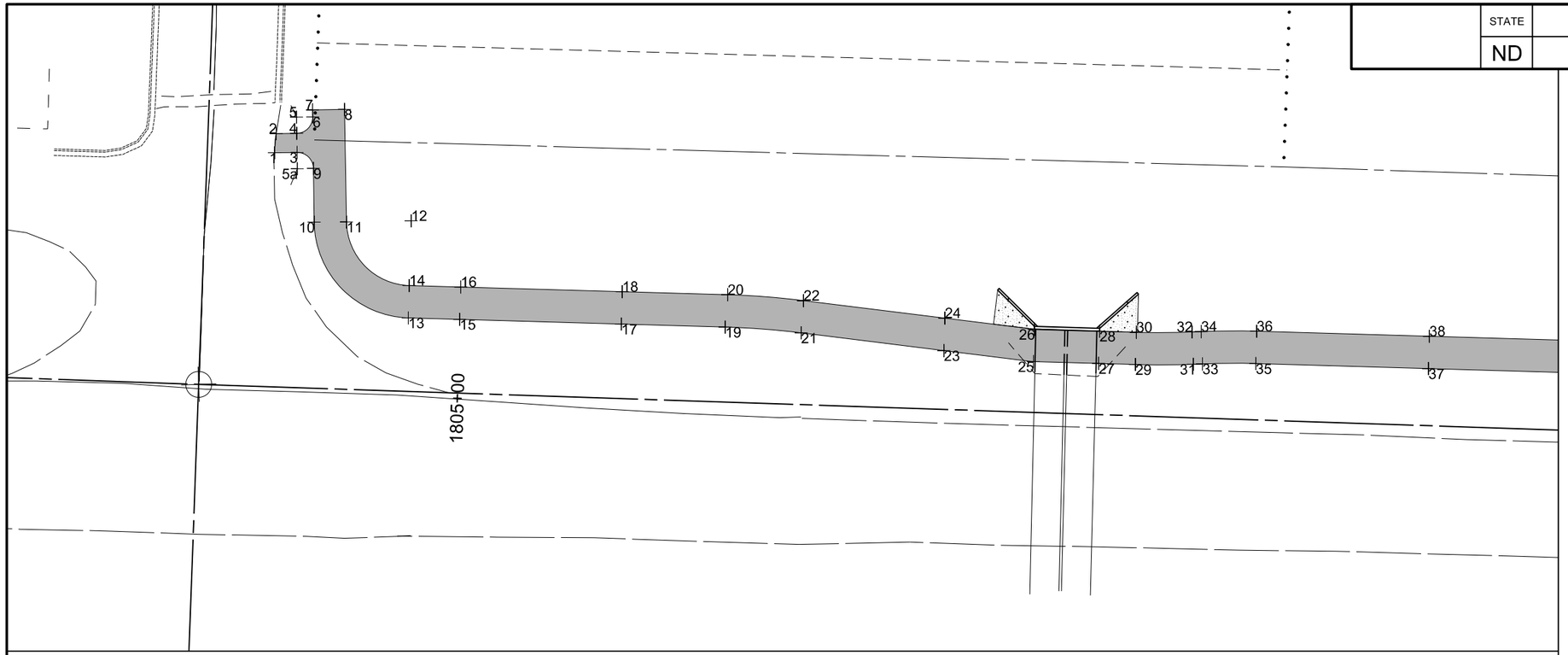
Wetland Impacts

City of Bowman

Shared Use Path Project

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-5-012(051)034	82	1



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DATE 03/16/2022
NORTH DAKOTA

Survey Data Layout

City of Bowman

Shared Use Path Project

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	82	2

Point	Northing	Easting	Station	Offset	Elevation	Description
1	199622.15	1236666.40	1804+41.25	95.30	2948.23	Edge of Concrete
2	199628.08	1236666.90	1804+41.59	101.23	2948.05	Edge of Concrete
3	199622.25	1236673.34	1804+48.19	95.60	2948.14	Edge of Concrete/POB
4	199628.16	1236673.25	1804+47.93	101.51	2948.05	Edge of Concrete/POB
5	199633.16	1236673.18	1804+47.72	106.50	-	Radius Point (5')
5a	199617.25	1236673.41	1804+48.40	90.60	-	Radius Point (5')
6	199633.23	1236678.18	1804+52.71	106.72	2947.84	Edge of Concrete/POE
7	199635.39	1236678.15	1804+52.62	108.87	2947.74	Edge of Concrete
8	199635.57	1236688.00	1804+62.46	109.34	2947.59	Edge of Concrete
9	199617.32	1236678.41	1804+53.40	90.81	2948.33	Edge of Concrete/POE
10	199600.70	1236678.64	1804+54.11	74.21	2948.96	Edge of Concrete/POB
11	199600.75	1236688.64	1804+64.11	74.55	2948.81	Edge of Concrete/POB
12	199601.11	1236708.63	1804+84.09	75.50	-	Radius Point (20')
13	199571.13	1236707.76	1804+84.09	45.50	2950.20	Edge of Concrete/POE
14	199581.12	1236708.05	1804+84.09	55.50	2950.05	Edge of Concrete/POE
15	199570.66	1236723.67	1805+00.00	45.50	2950.78	Edge of Concrete
16	199580.66	1236723.96	1805+00.00	55.50	2950.59	Edge of Concrete
17	199569.21	1236773.65	1805+50.00	45.50	2950.58	Edge of Concrete
18	199579.20	1236773.94	1805+50.00	55.50	2950.43	Edge of Concrete
19	199568.19	1236808.39	1805+84.76	45.50	2950.66	Edge of Concrete/POB
20	199578.19	1236808.68	1805+84.76	55.50	2950.53	Edge of Concrete/POB
21	199566.79	1236826.71	1806+06.03	44.64	2950.77	Edge of Concrete/POE
22	199576.42	1236827.94	1806+04.05	54.59	2950.63	Edge of Concrete/POE
23	199561.00	1236873.45	1806+50.00	40.20	2950.92	Edge of Concrete
24	199571.04	1236873.74	1806+50.00	50.25	2950.77	Edge of Concrete
25	199557.62	1236900.70	1806+77.33	37.62	2951.01	Edge of Concrete/RCBC
26	199567.60	1236901.46	1806+77.81	47.62	2950.86	Edge of Concrete/RCBC
27	199557.02	1236921.17	1806+97.82	37.62	2951.11	Edge of Concrete/RCBC
28	199567.01	1236921.61	1806+97.96	47.62	2950.96	Edge of Concrete/RCBC
29	199556.63	1236934.56	1807+11.21	37.62	2951.11	Edge of Concrete/POB

Point	Northing	Easting	Station	Offset	Elevation	Description
30	199566.63	1236934.87	1807+11.23	47.62	2950.97	Edge of Concrete/POB
31	199556.71	1236948.74	1807+25.38	38.11	2951.16	Edge of Concrete/POE
32	199566.70	1236948.32	1807+24.68	48.08	2951.03	Edge of Concrete/POE
33	199556.95	1236954.97	1807+31.61	38.43	2951.20	Edge of Concrete/POB
34	199566.95	1236954.58	1807+30.92	48.51	2951.05	Edge of Concrete/POB
35	199557.02	1236968.69	1807+45.02	39.00	2951.29	Edge of Concrete/POE
36	199567.02	1236968.39	1807+45.02	49.00	2951.16	Edge of Concrete/POE
37	199555.42	1237023.35	1808+00.00	39.00	2951.66	Edge of Concrete
38	199565.42	1237023.64	1808+00.00	49.00	2951.51	Edge of Concrete
39	199553.97	1237073.33	1808+50.00	39.00	2952.02	Edge of Concrete
40	199563.96	1237073.62	1808+50.00	49.00	2951.87	Edge of Concrete
41	199552.51	1237123.31	1809+00.00	39.00	2952.37	Edge of Concrete
42	199562.50	1237123.60	1809+00.00	49.00	2952.22	Edge of Concrete
43	199551.05	1237173.29	1809+50.00	39.00	2952.82	Edge of Concrete
44	199561.05	1237173.58	1809+50.00	49.00	2952.67	Edge of Concrete
45	199549.59	1237223.27	1810+00.00	39.00	2953.29	Edge of Concrete
46	199559.59	1237223.56	1810+00.00	49.00	2953.12	Edge of Concrete
47	199549.10	1237240.38	1810+17.12	39.00	2953.38	Edge of Concrete
48	199558.85	1237248.85	1810+25.31	49.00	2953.18	Edge of Concrete
49	199547.43	1237297.46	1810+74.23	39.00	2953.77	Edge of Concrete
50	199557.67	1237289.57	1810+66.05	49.00	2953.40	Edge of Concrete
51	199557.20	1237305.61	1810+82.09	49.00	2953.27	Edge of Concrete
52	199546.91	1237315.26	1810+92.04	39.00	2953.57	Edge of Concrete
53	199556.85	1237315.60	1810+92.09	49.00	2953.42	Edge of Concrete
54	199587.68	1237306.66	1810+82.25	79.50	2952.31	Edge of Concrete
55	199587.34	1237316.66	1810+92.25	79.50	2952.46	Edge of Concrete
56	199618.17	1237307.71	1810+82.41	110.01	2951.34	Edge of Concrete
57	199617.82	1237317.71	1810+92.41	109.95	2951.49	Edge of Concrete
58	199628.16	1237308.06	1810+82.47	120.01	2951.20	Edge of Concrete
59	199627.93	1237318.06	1810+92.47	120.07	2951.34	Edge of Concrete

REGISTERED PROFESSIONAL ENGINEER
WILLIAM DOERR
PE-7113
DATE 03/16/2022
NORTH DAKOTA

Survey Data Layout

City of Bowman

Shared Use Path Project

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	TAC-5-012(051)034	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
D3-36	36"x6"	STREET NAME SIGN (Sign and installation only)		6	
G20-1-60	60"x24"	ROAD WORK NEXT __ MILES		34	
G20-1b-60	60"x24"	WORK IN PROGRESS/ NO WORK IN PROGRESS (Sign and installation only)		26	
G20-2-48	48"x24"	END ROAD WORK		19	
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)		18	
G20-10-108	108"x48"	CONTRACTOR SIGN		64	
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS		37	
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW		30	
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)		10	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR ARROW RIGHT or LEFT		23	
M5-1-21	21"x15"	ARROW AHD AND RT or LT(Mounted on route marker post)		7	
M5-2-21	21"x15"	ARROW AHD UP & RT or LT (Mounted on route marker post)		7	
M6-1-21	21"x15"	ARROW RT or LT (Mounted on route marker post)		7	
M6-2-21	21"x15"	ARROW UP & RT or LT (Mounted on route marker post)		7	
M6-3-21	21"x15"	ARROW AHD (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP		32	
R1-1a-18	18"x18"	STOP and SLOW PADDLE Back to Back		5	
R1-2-60	60"x60"	YIELD		29	
R2-1-48	48"x60"	SPEED LIMIT __		39	
R2-1a-24	24"x18"	MINIMUM FEE $80 (Mounted on Speed Limit post)		10	
R3-7-48	48"x48"	LEFT or RIGHT LANE MUST TURN LEFT or RIGHT		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT SYMBOL		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-36	36"x12"	ONE WAY RIGHT or LEFT		13	
R7-1-12	12"x18"	NO PARKING		11	
R9-9-24	**24"X12"**	**SIDEWALK CLOSED**	**4**	**7**	**28**
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED		28	
R11-2a-48	48"x30"	STREET CLOSED		28	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY		31	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC		31	
W1-3-48	48"x48"	RIGHT or LEFT SHARP REVERSE CURVE ARROW		35	
W1-4-48	48"x48"	RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-4b-48	48"x48"	DOUBLE RIGHT or LEFT REVERSE CURVE ARROW		35	
W1-6-48	48"x24"	LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD SYMBOL		35	
W3-3-48	48"x48"	SIGNAL AHEAD SYMBOL		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"	RIGHT or LEFT LANE TRANSITION SYMBOL		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 SYMBOL		35	
W8-1-48	48"x48"	BUMP		35	
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-9a-48	48"x48"	SHOULDER DROP-OFF		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
W8-12-48	48"x48"	NO CENTER STRIPE		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT.		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT.		35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W12-2-48	48"x48"	LOW CLEARANCE SYMBOL		35	
W13-1-24	24"x24"	__ MPH ADVISORY SPEED PLATE (Mounted on warning sign post)		11	
W13-4-48	48"x60"	RAMP ARROW		39	
W14-3-48	48"x36"	NO PASSING ZONE		23	
W20-1-48	48"x48"	ROAD WORK AHEAD or _FT or _ MILE		35	
W20-2-48	48"x48"	DETOUR AHEAD or __FT		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT.		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT.		35	
W20-5-48	48"x48"	RIGHT or LEFT LANE CLOSED AHEAD or __ FT.		35	
W20-7a-48	48"x48"	FLAGGING SYMBOL		35	
W20-7k-24	24"x18"	__ FEET (Mounted on warning sign post)		10	
W20-8-48	48"x48"	STREET CLOSED		35	
W20-51-48	48"x48"	EQUIPMENT WORKING		35	
W20-52-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)		12	
W21-1a-48	48"x48"	WORKERS SYMBOL		35	
W21-2-48	48"x48"	FRESH OIL		35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT		35	
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.		35	
W21-6a-48	48"x48"	SURVEY CREW AHEAD		35	
W21-50-48	48"x48"	BRIDGE PAINTING AHEAD or __ FT.		35	
W21-51-48	48"x48"	MATERIAL ON ROADWAY		35	
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK		35	
	24"x24"	TAKE TURNS (6" D letters) (Mounted on stop sign post)		11	

SPECIAL SIGNS

SPEC & CODE

704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	28

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	FLAGGING	MHR	
704-1041	ATTENUATION DEVICE-TYPE B-55	EACH	
704-1043	ATTENUATION DEVICE-TYPE B-65	EACH	
704-1044	ATTENUATION DEVICE-TYPE B-70	EACH	
704-1050	TYPE I BARRICADES	EACH	
704-1051	TYPE II BARRICADES	EACH	
704-1052	TYPE III BARRICADES	EACH	
704-1054	**SIDEWALK BARRICADE**	**EACH**	**4**
704-1060	DELINEATOR DRUMS	EACH	
704-1065	TRAFFIC CONES	EACH	
704-1067	TUBULAR MARKERS	EACH	
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1081	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	
704-1088	SEQUENCING ARROW PANEL - TYPE C - CROSSOVER	EACH	
704-1095	TYPE B FLASHERS	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	
772-2110	FLASHING BEACON - POST MOUNTED	EACH	

NOTE:
If additional signs are required, units will be calculated using the formula from Section III-19.06 of the Design Manual.
http://www.dot.nd.gov/

REGISTERED PROFESSIONAL ENGINEER
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NORTH DAKOTA

Traffic Control Devices List

City of Bowman

Shared Use Path Project

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	100	2

REGISTERED PROFESSIONAL ENGINEER
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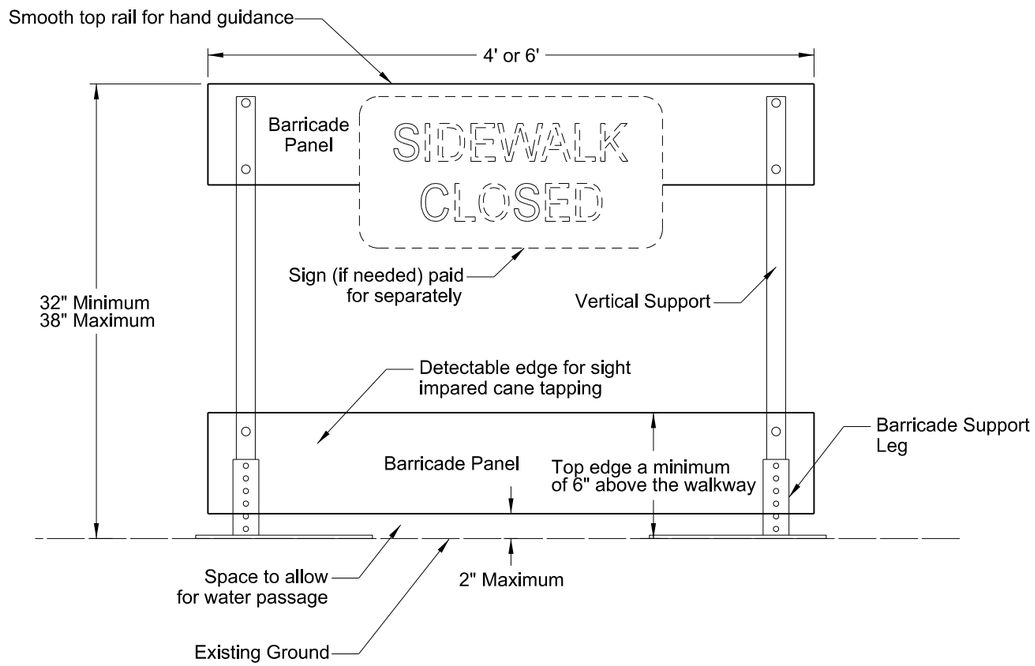
NORTH DAKOTA

Work Zone Traffic Control

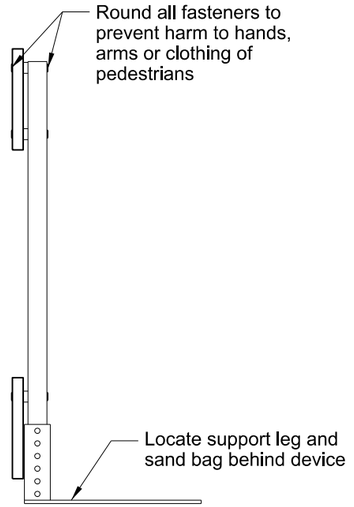
City of Bowman

Shared Use Path Project

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	100	3



Front View

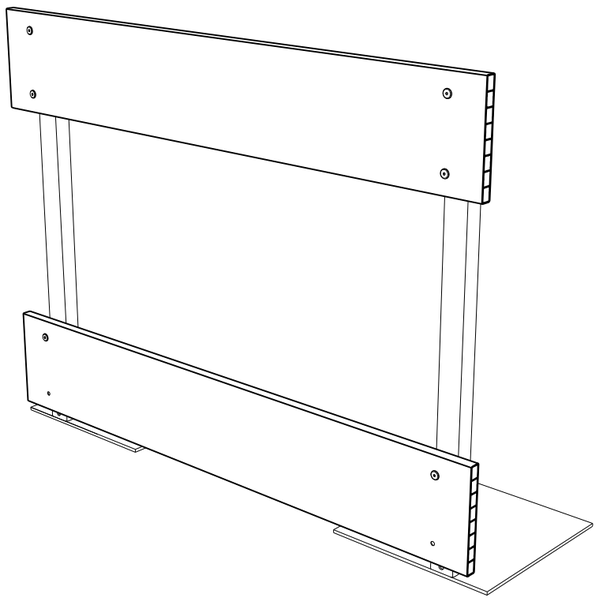


End View

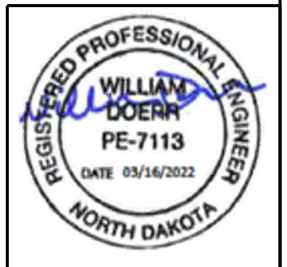
NOTES:

Sidewalk Barricades

1. Provide self standing sidewalk barricade with no supports extending into the pedestrians path.
2. Use orange or orange and white diagonal striped barricade panels contrasting with the walkway surface.
3. Provide ADA compliant and NCHRP 350 or Mash Test Level 3 (TL3) approved sidewalk barricades.
4. Include all costs to furnish, maintain and remove sidewalk barricades in the price bid for "Sidewalk Barricade".



Perspective View



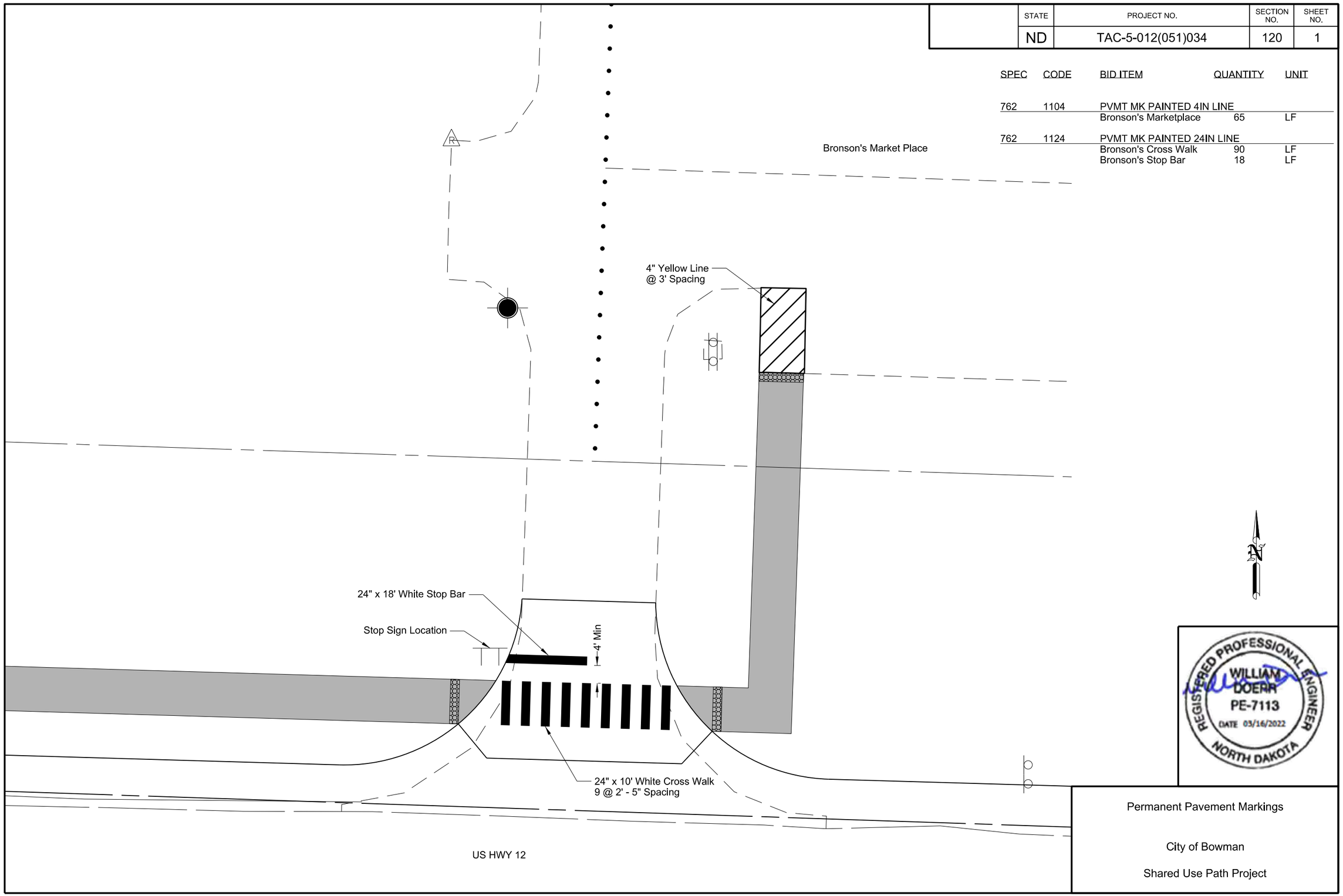
Work Zone Traffic Control
Sidewalk Barricade

City of Bowman

Shared Use Path Project

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	120	1

SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	1104	PVMT MK PAINTED 4IN LINE		
		Bronson's Marketplace	65	LF
762	1124	PVMT MK PAINTED 24IN LINE		
		Bronson's Cross Walk	90	LF
		Bronson's Stop Bar	18	LF



REGISTERED PROFESSIONAL ENGINEER
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DATE 03/16/2022
NORTH DAKOTA

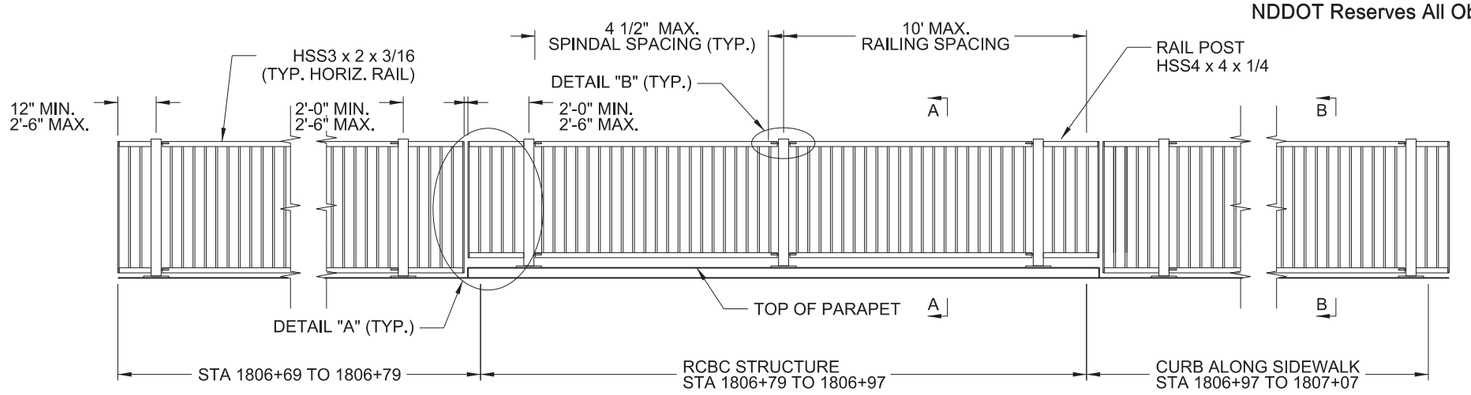
Permanent Pavement Markings

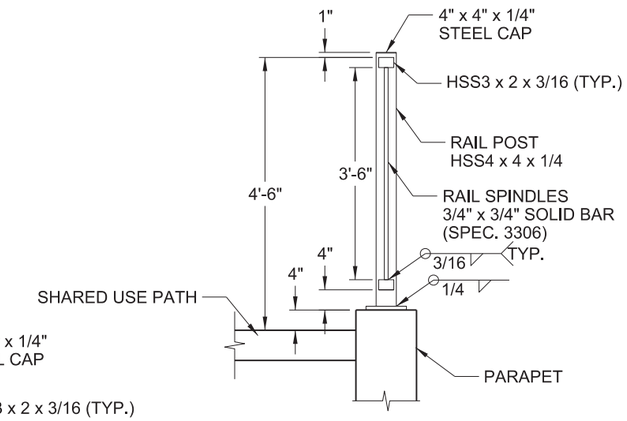
City of Bowman

Shared Use Path Project

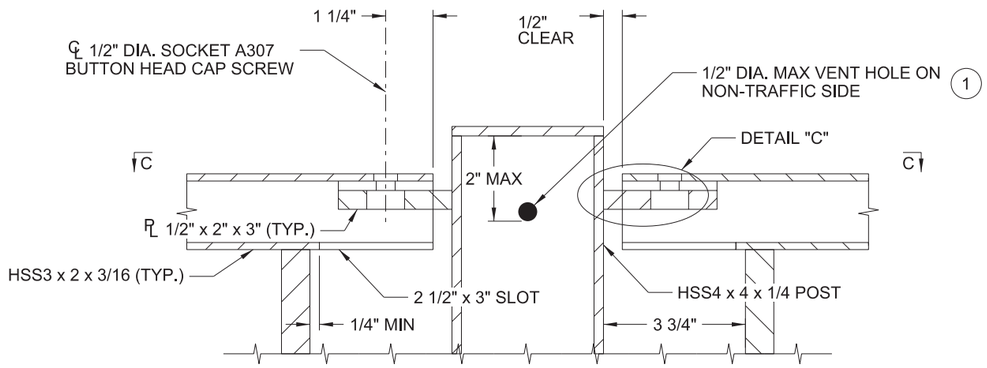
23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	TAC-5-012(051)034	170	1

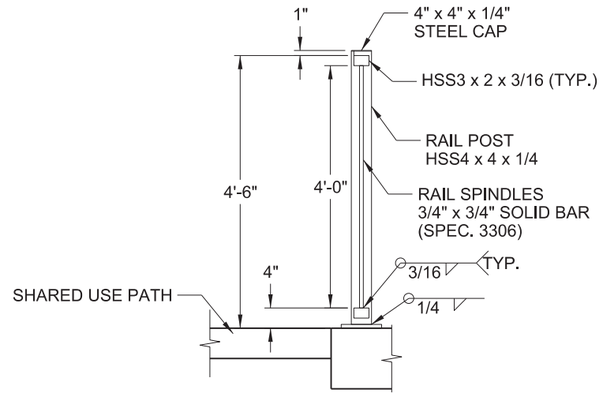




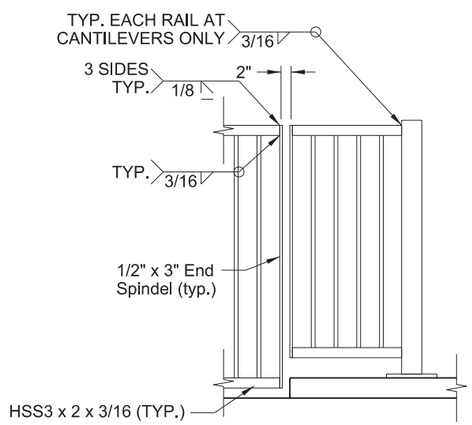
SECTION A-A



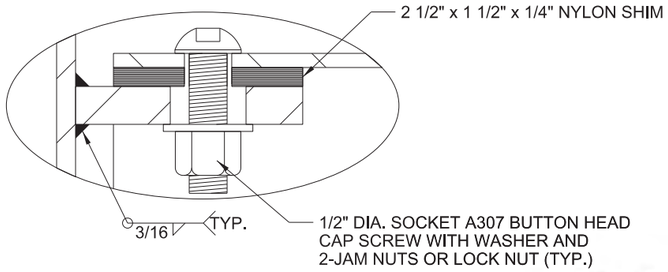
DETAIL "B"



SECTION B-B



DETAIL "A"



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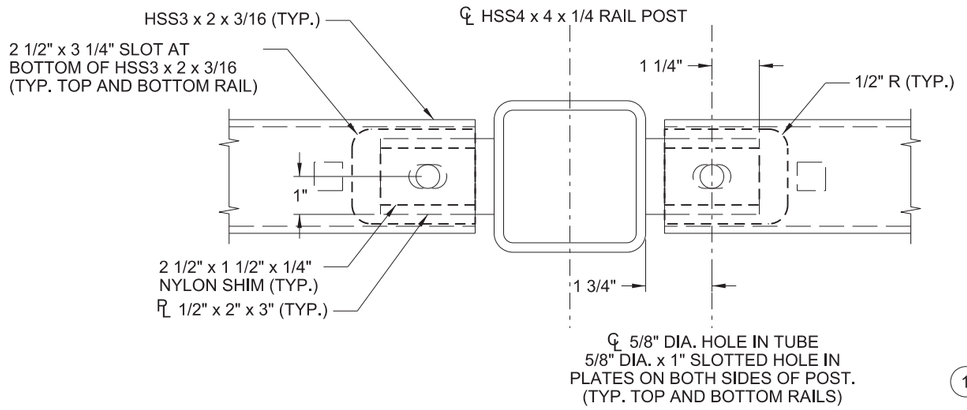

SECTION C-C

GENERAL NOTES

(1) DRILL VENT HOLE IN THE RAIL POST WITHIN 2" OF THE UNDERSIDE OF THE CAP, ON THE NON-TRAFFIC SIDE OF THE POST AS NECESSARY TO FACILITATE GALVANIZING. MAXIMUM HOLE SIZE IS 1/2" DIA.

REGISTERED PROFESSIONAL ENGINEER
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PRECAST CONCRETE
DOUBLE BOX CULVERT EXTENSION

SAFETY RAILING
DETAILS & LAYOUT

TAC-5-012(051)034
STATION: 1806+88

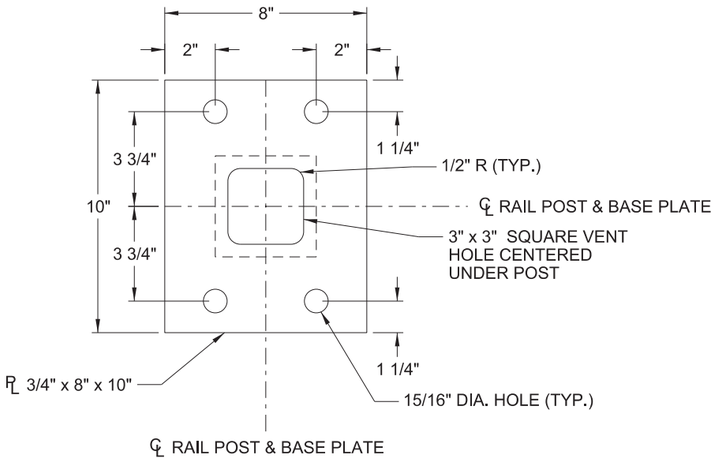
ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

Ketterling, Jonathan
03/17/22

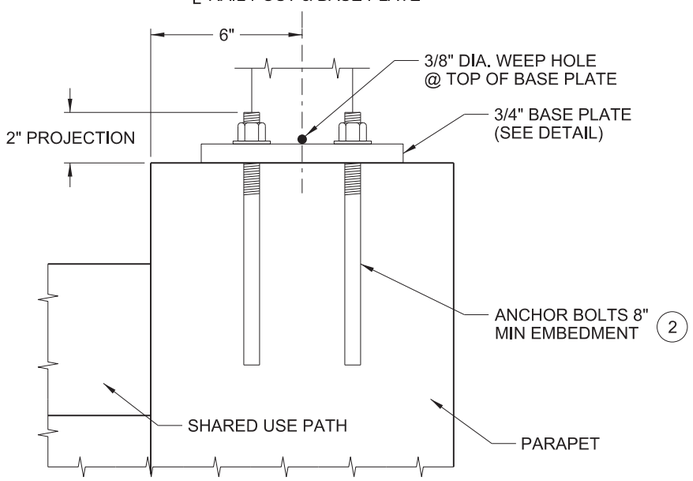
DocuSign

23 U.S.C. 409
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	TAC-5-012(051)034	170	2



BASE PLATE DETAIL



ANCHOR DETAIL

GENERAL NOTES

PAYMENT LENGTH SHALL BE MEASURED AS THE OUT TO OUT LENGTH ALONG THE CENTERLINE OF THE RAILING BETWEEN THE OUTSIDE ENDS, WITH DEDUCTIONS FOR THE LENGTH OF CONCRETE POSTS, IF PRESENT.

PROVIDE A500, GRADE B STRUCTURAL STEEL TUBING (HSS) IN THE RAIL CONFORMING TO SPEC. 3361. PROVIDE ALL OTHER STEEL IN ACCORDANCE WITH SPEC. 3306.

GALVANIZE BOLTS, NUTS, ASHERS AND ANCHORS IN ACCORDANCE WITH SPEC. 3392. GALVANIZE ALL OTHER STRUCTURAL STEEL IN ACCORDANCE WITH SPEC. 3394, AFTER FABRICATION.

SEE SPECIAL PROVISIONS FOR COATING TO BE APPLIED TO METAL RAILING.

CURVE HORIZONTAL RAILS WHERE APPLICABLE AND PLACE RAILS PARALLEL TO THE EDGE OF SIDEWALK PROFILE.

DRILL 1/2" DIA. MAX. VENT HOLES ON THE UNDERSIDE OF RAIL TUBES AS NECESSARY TO FACILITATE GALVANIZING.

(2) ADHESIVE ANCHOR WITH 5/8" DIA. ANCHOR ROD IN ACCORDANCE WITH SPEC. 3385, TYPE A WITH HEX NUT AND WASHER. PROVIDE AN ADHESIVE WITH A MINIMUM CHARACTERISTIC BOND STRENGTH IN UNCRACKED CONCRETE OF 1.5 KSI. EMBED THE ANCHOR NO LESS THEN 8" REGARDLESS OR CHARACTERISTIC BOND STRENGTH. DRILL THROUGH REINFORCEMENT (IF ENCOUNTERED) TO ACHEIVE MINIMUM EMBEDMENT. ENSURE HEX NUT IS IN CONTACT WITH THE ADJACENT SURFACE AND TORQUE TO 60 FT-LBS UNLESS A HIGHER TORQUE IS RECOMMENDED BY THE MANUFACTURER. PROOF LOAD TO 8.8 KIPS. REFER TO THE APPROVED/QUALIFIED PRODUCTS LIST AND THE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.

REGISTERED PROFESSIONAL ENGINEER
WILLIAM DOERR
PE-7113
DATE 03/17/2022
NORTH DAKOTA

PRECAST CONCRETE
DOUBLE BOX CULVERT EXTENSION

SAFETY RAILING
DETAILS & LAYOUT

TAC-5-012(051)034
STATION: 1806+88

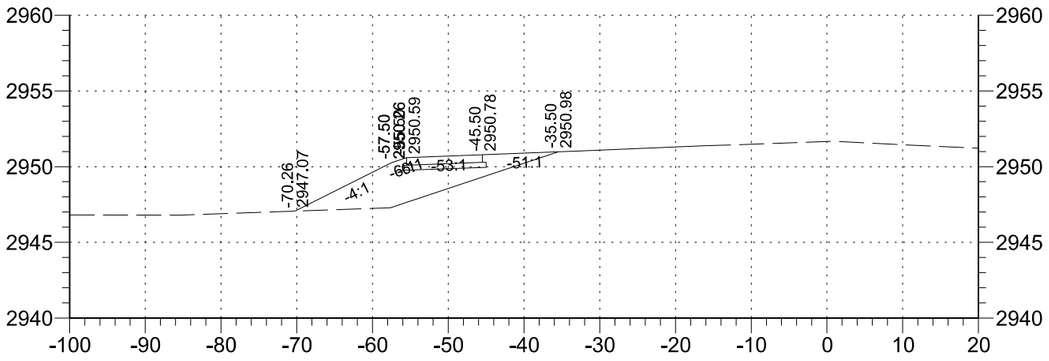
ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

Ketterling, Jonathan
03/17/22

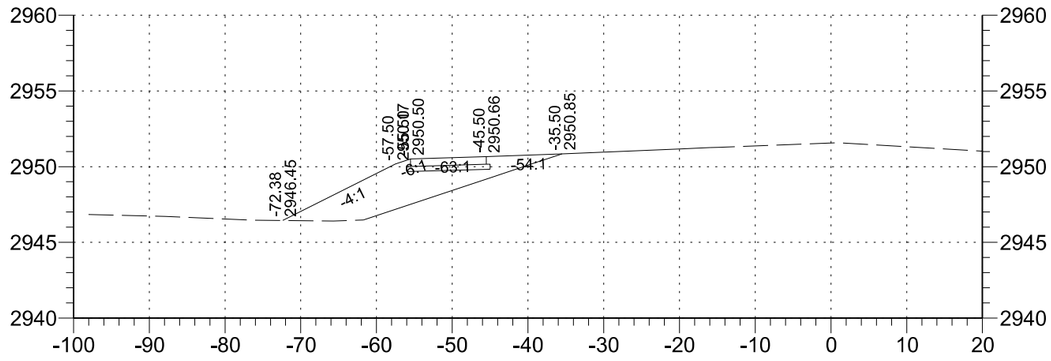
DocuSign

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(034)051	200	1

Existing ground reflects the finished surface from tied project HEN-5-012(053)034. Refer to the cross sections from project HEN-5-012(053)034 for more information



1805+00



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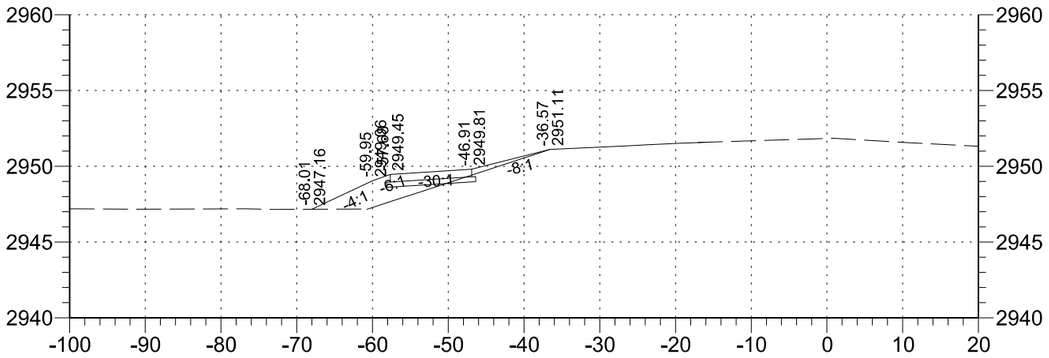

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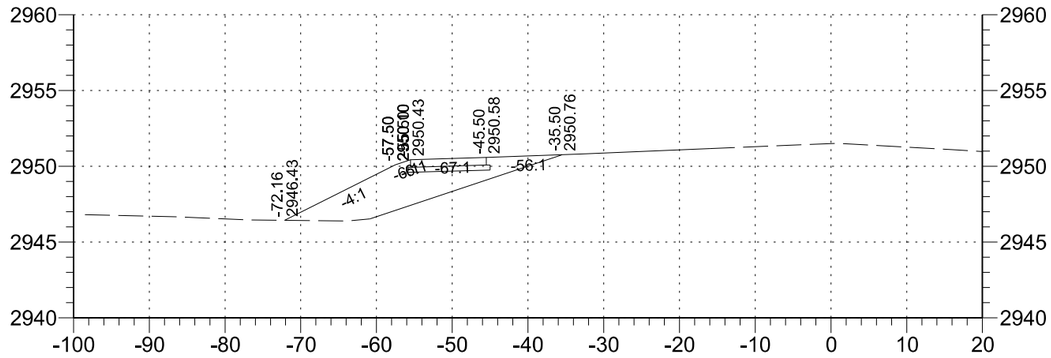

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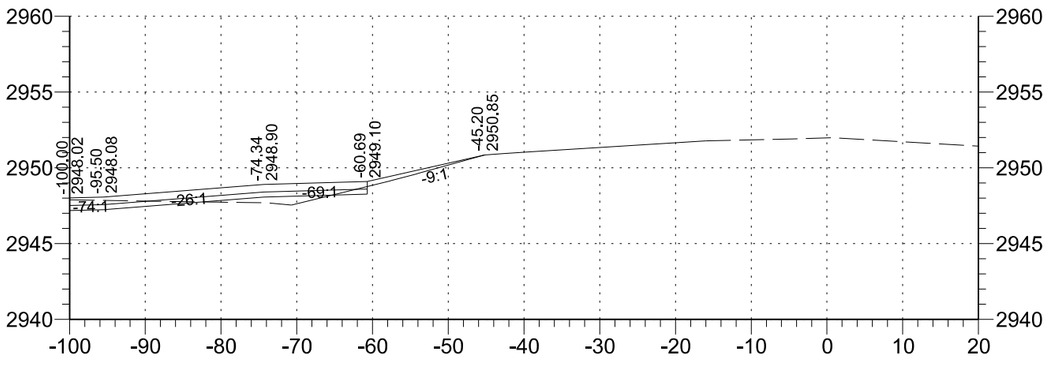
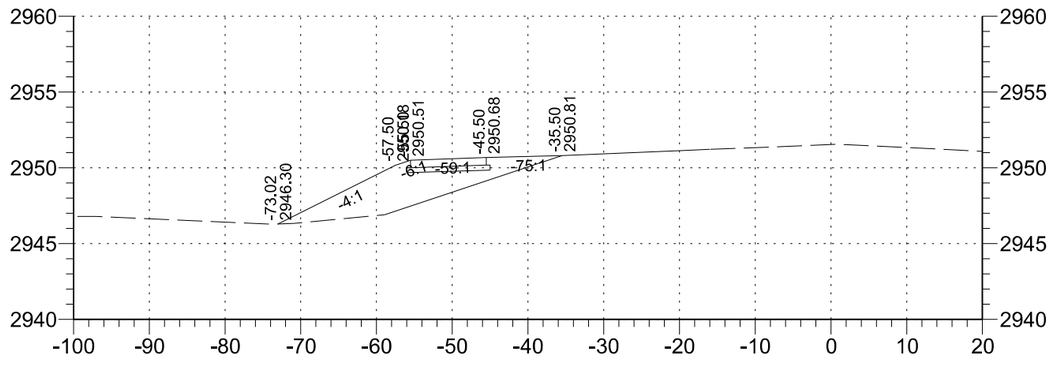


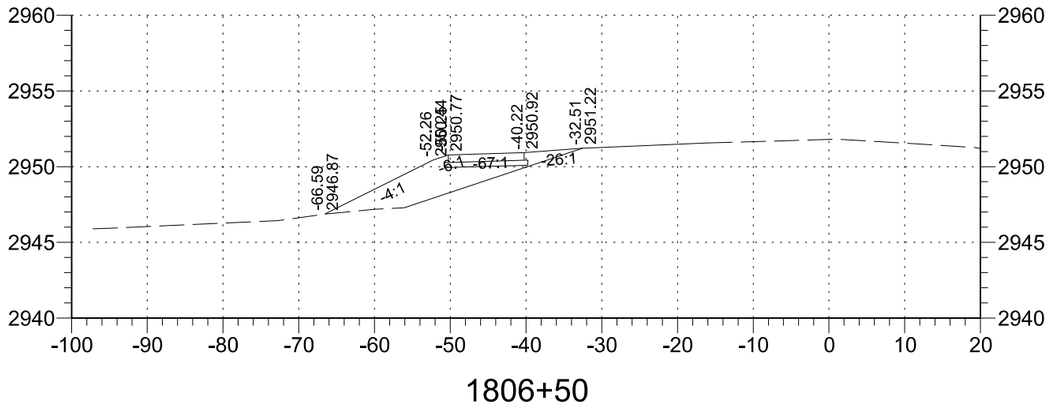
1804+58



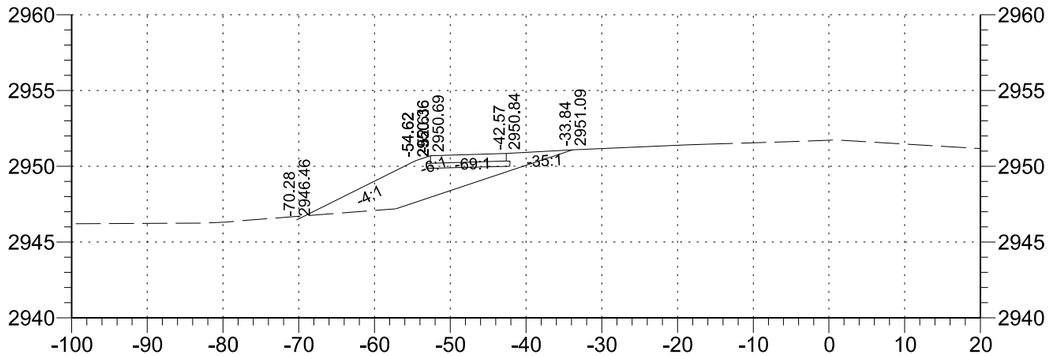
1805+25

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(034)051	200	2

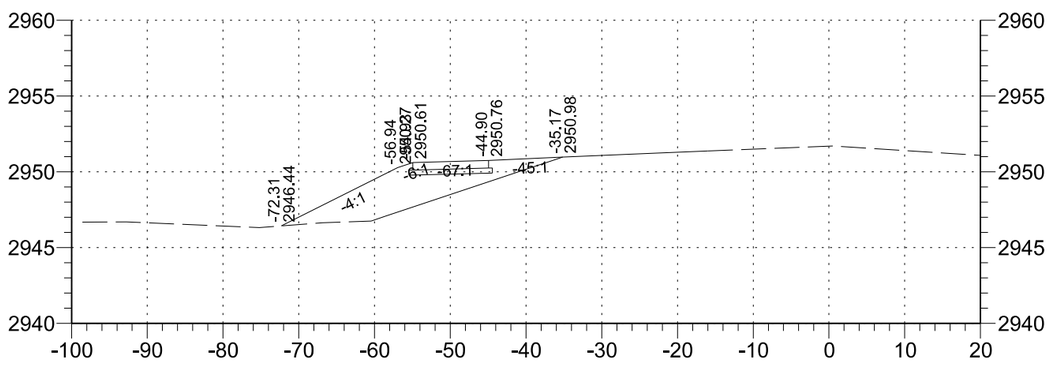
Existing ground reflects the finished surface from tied project HEN-5-012(053)034. Refer to the cross sections from project HEN-5-012(053)034 for more information



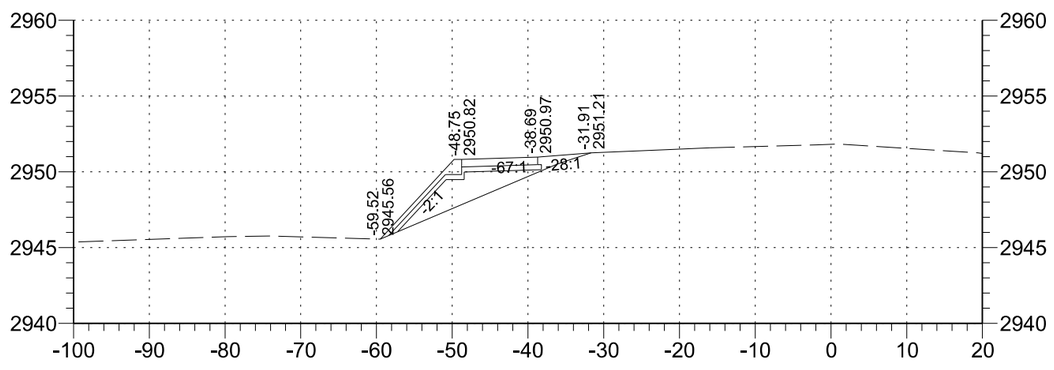
1806+50



1806+25



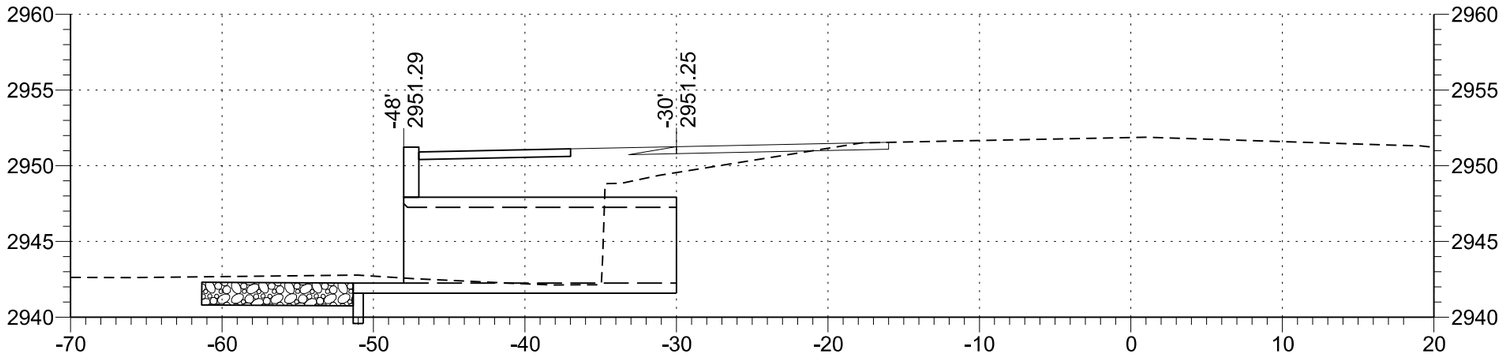
1806+00



1806+66

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(051)034	200	3

Existing ground reflects the finished surface from tied project HEN-5-012(053)034. Refer to the cross sections from project HEN-5-012(053)034 for more information



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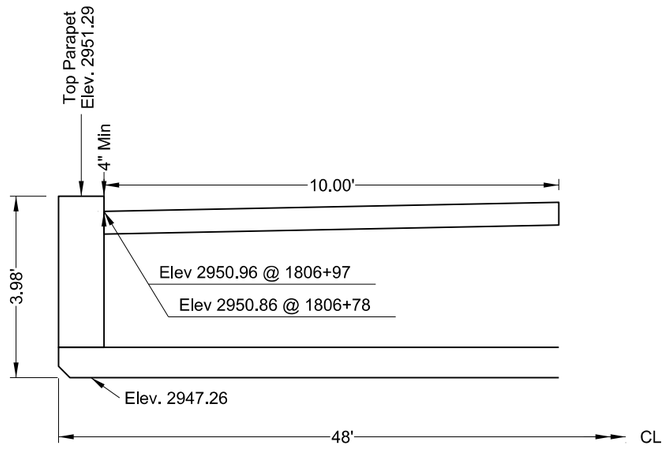
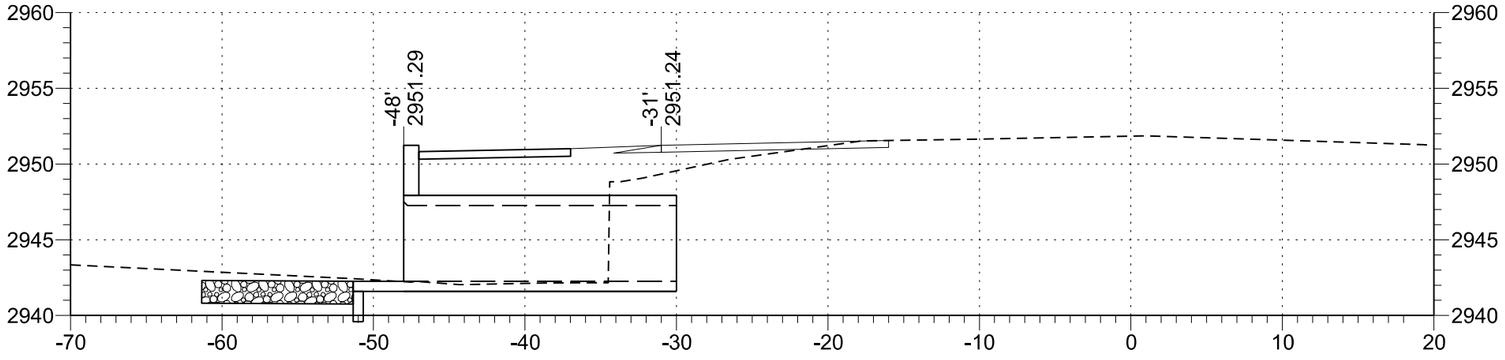
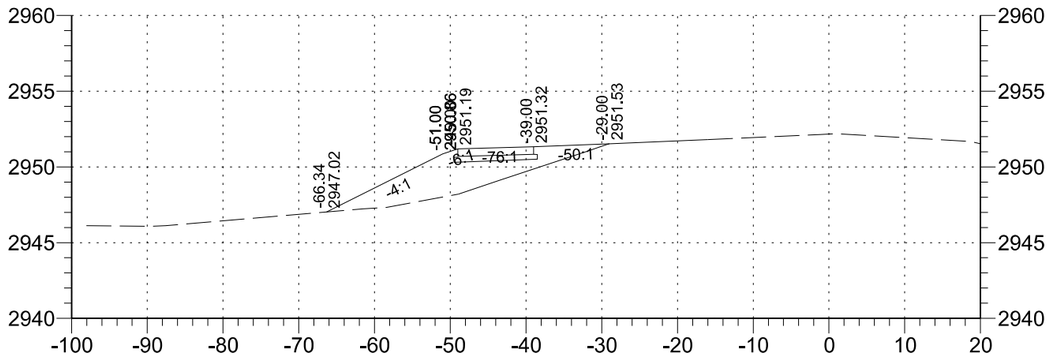




1806+78

Existing ground reflects the finished surface from tied project HEN-5-012(053)034. Refer to the cross sections from project HEN-5-012(053)034 for more information

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(034)051	200	4



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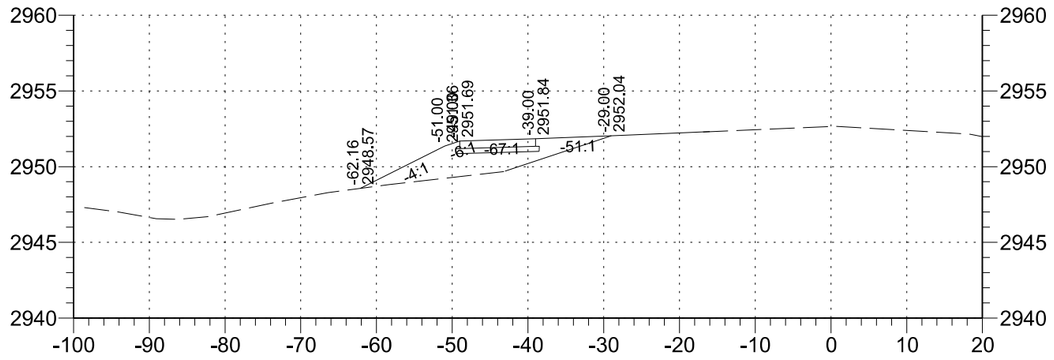
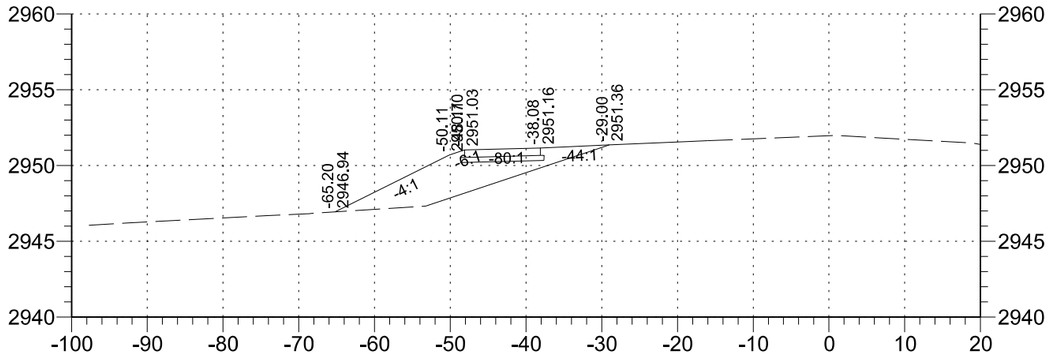
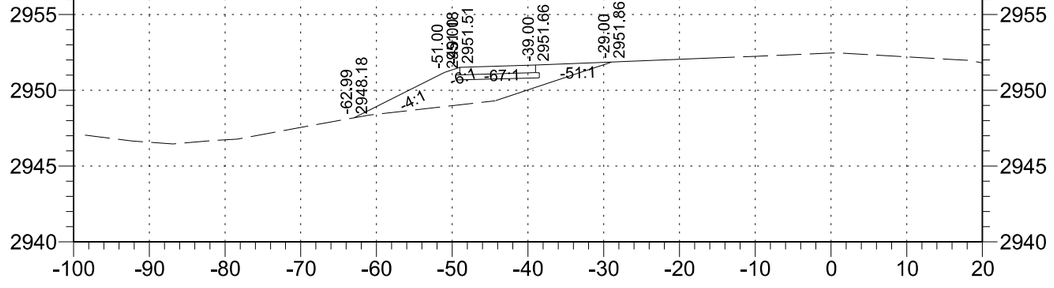


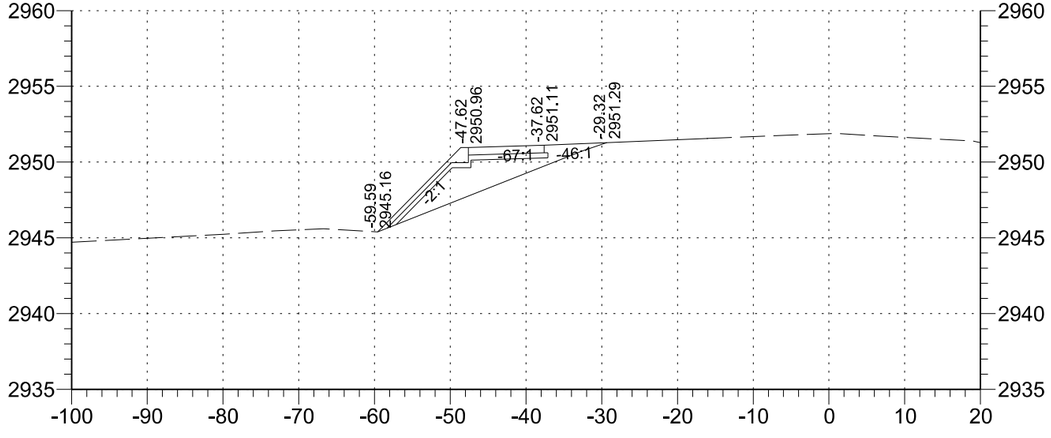
1808+25



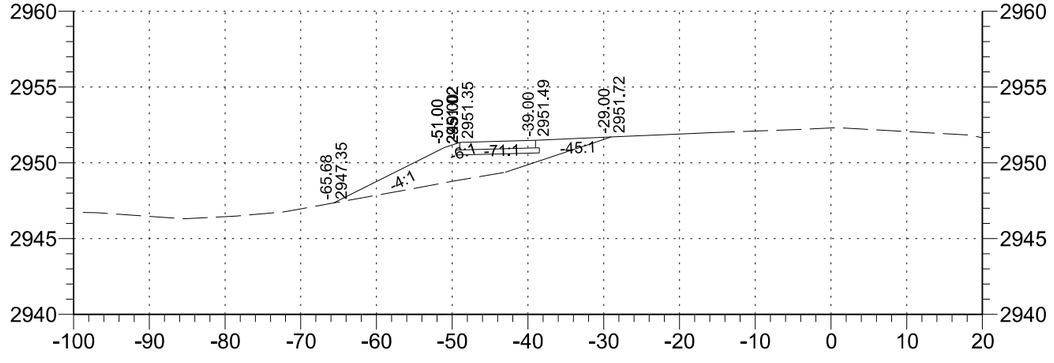
1807+25



1808+00



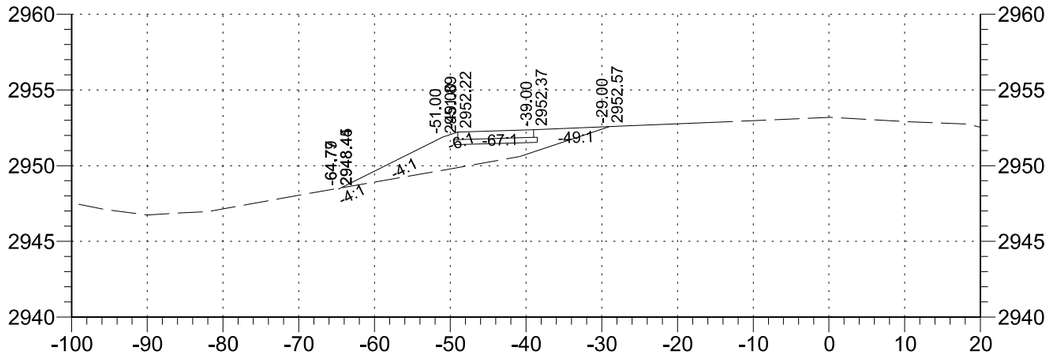
1807+10



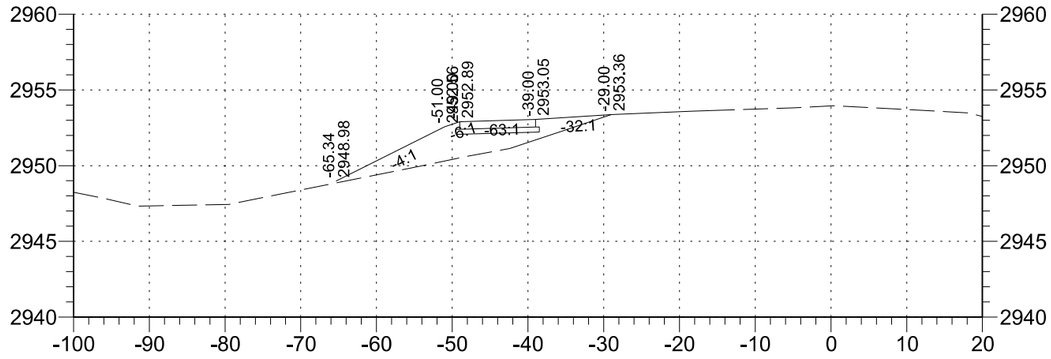
1807+75

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(034)051	200	5

Existing ground reflects the finished surface from tied project HEN-5-012(053)034. Refer to the cross sections from project HEN-5-012(053)034 for more information



1809+00



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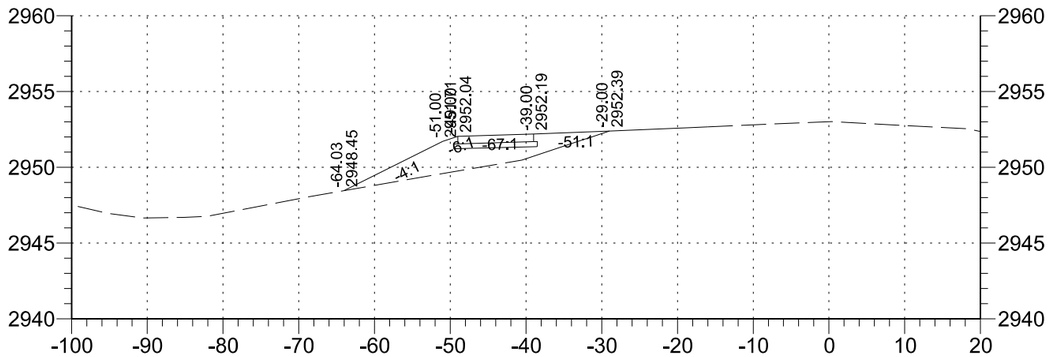
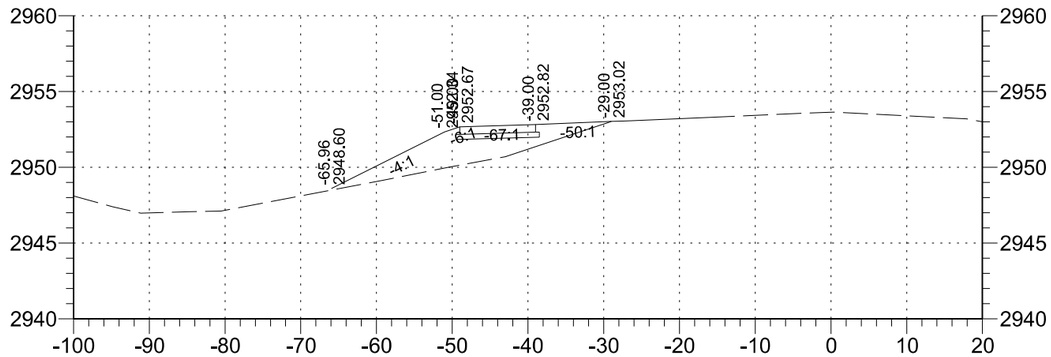
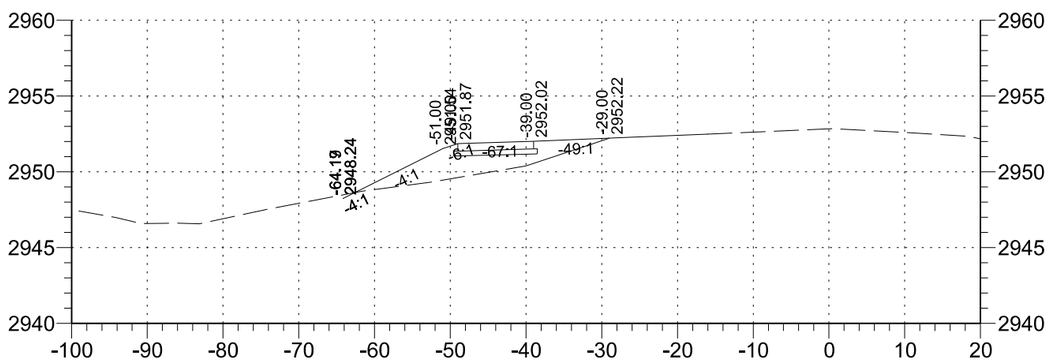


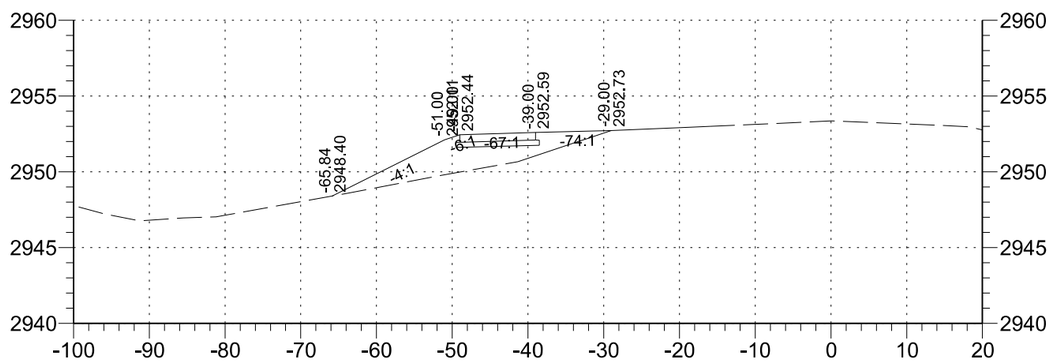
1808+75



1809+50



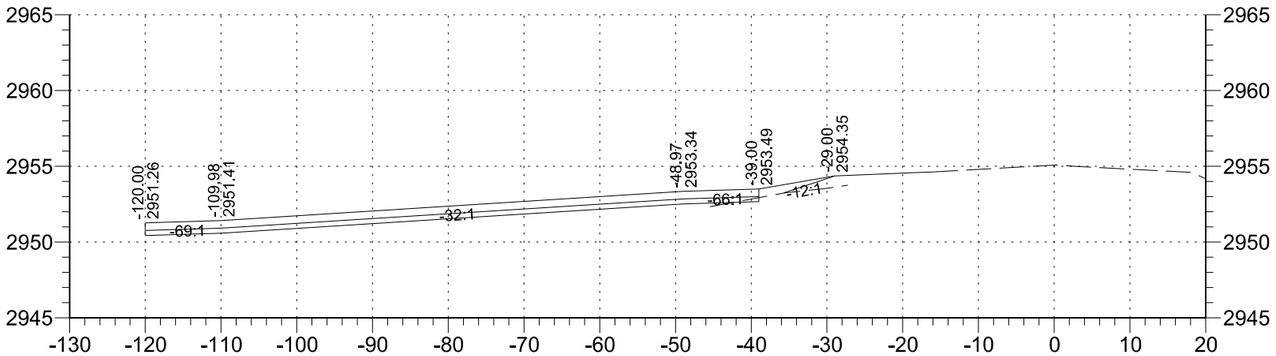
1808+50



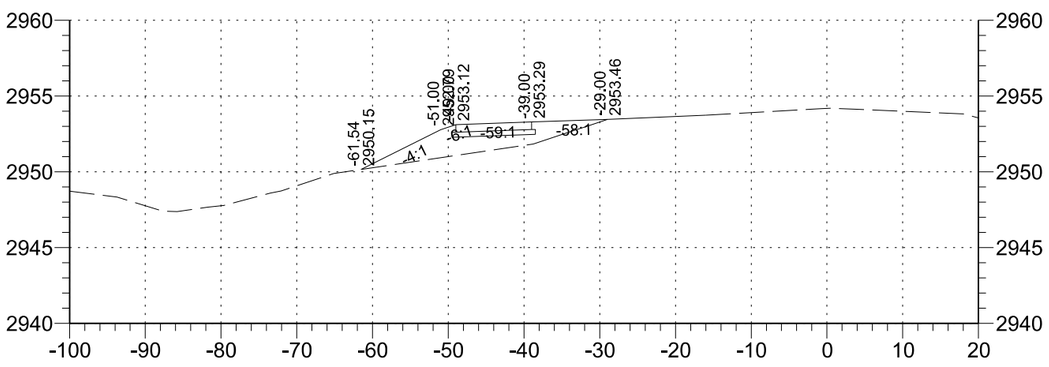
1809+25

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	TAC-5-012(034)051	200	6

Existing ground reflects the finished surface from tied project HEN-5-012(053)034. Refer to the cross sections from project HEN-5-012(053)034 for more information



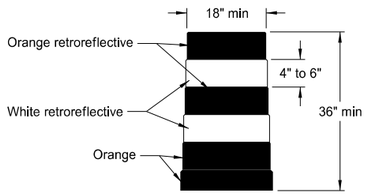
1810+87



1810+00

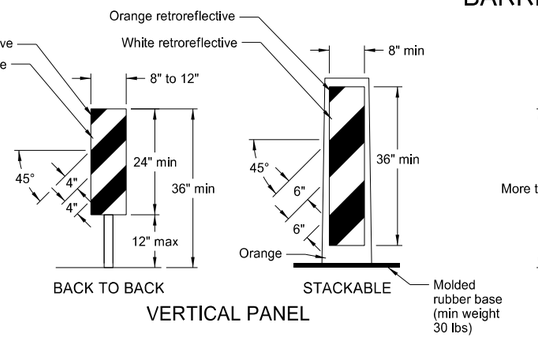
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



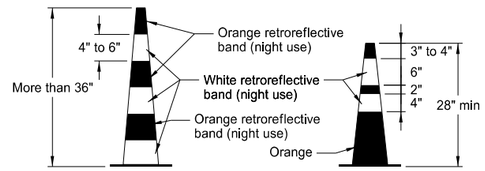
DELINEATOR DRUM

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



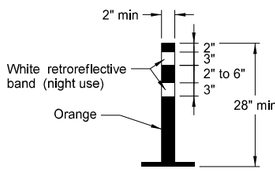
VERTICAL PANEL

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



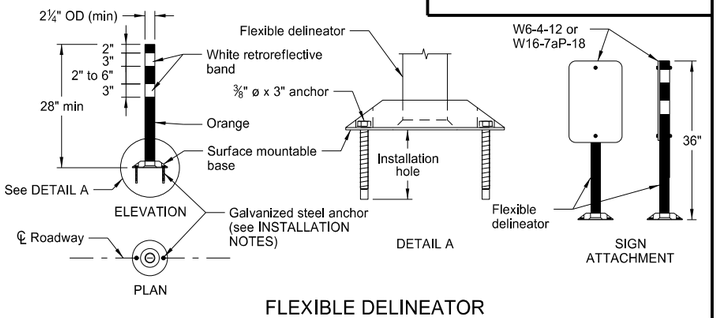
TRAFFIC CONE

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



TUBULAR MARKER

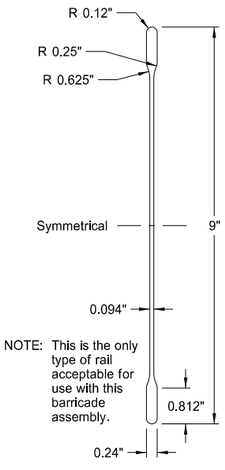
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



FLEXIBLE DELINEATOR

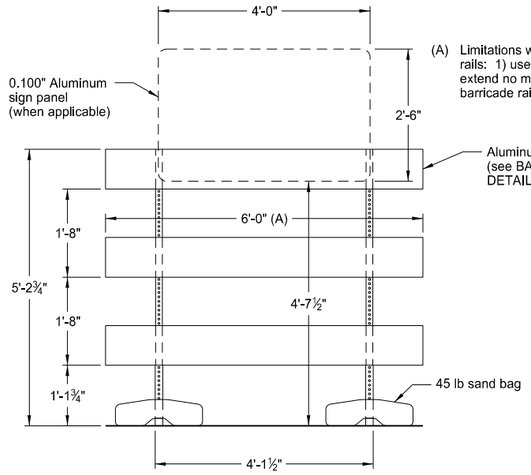
INSTALLATION NOTES:

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



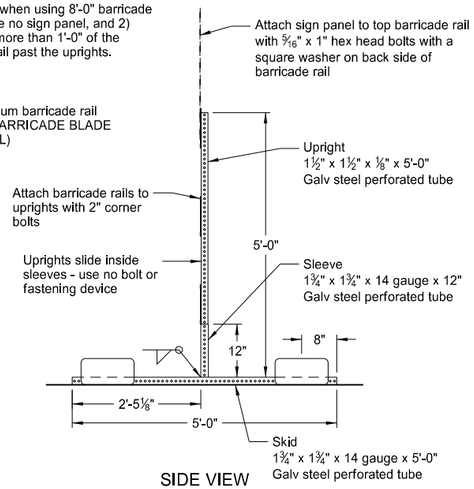
NOTE: This is the only type of rail acceptable for use with this barricade assembly.

BARRICADE BLADE DETAIL



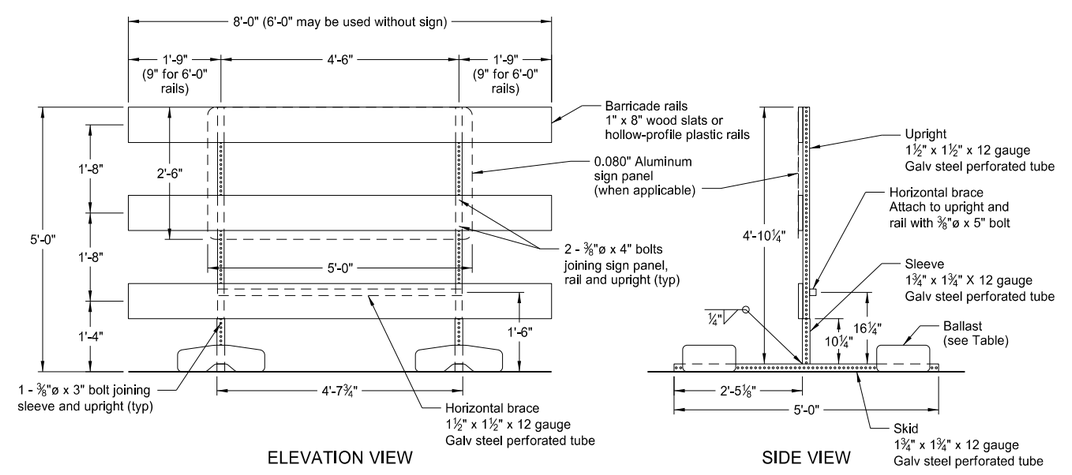
(A) Limitations when using 8'-0" barricade rails: 1) use no sign panel, and 2) extend no more than 1'-0" of the barricade rail past the uprights.

ELEVATION VIEW



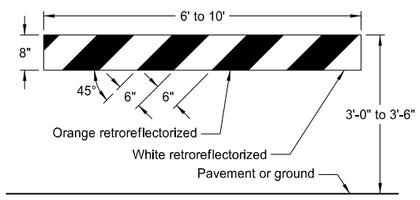
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

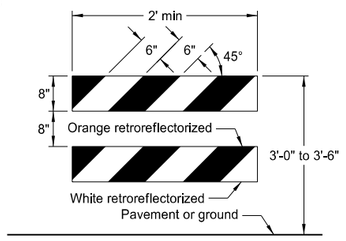


BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

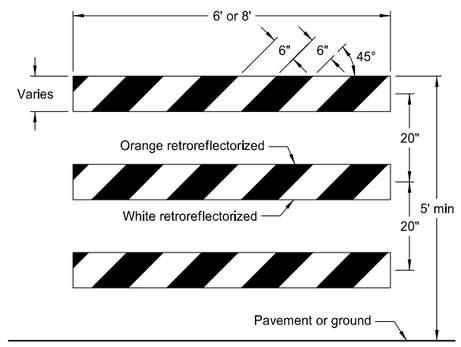
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the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



TYPE I BARRICADE

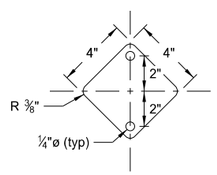


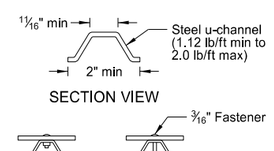
TYPE II BARRICADE

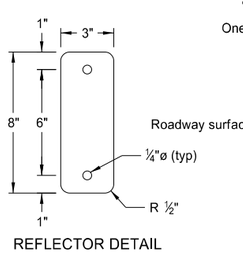


TYPE III BARRICADE

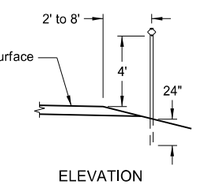
BARRICADE RAIL DETAILS







REFLECTOR DETAIL



ELEVATION

DELINEATORS

MINIMUM BALLAST
(For each side of barricade support)

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

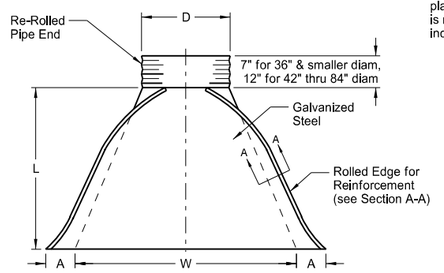
Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

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

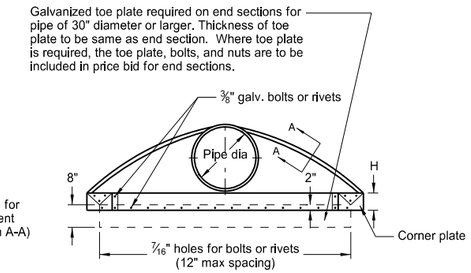
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

ROUND CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS

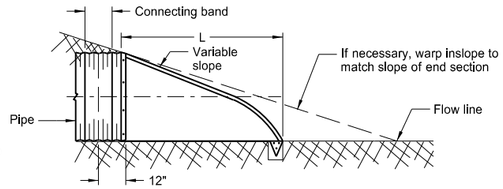
D-714-4



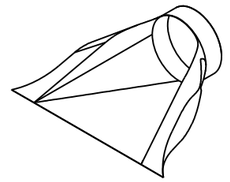
PLAN VIEW



ELEVATION VIEW



TYPICAL CROSS SECTION
(showing connector section)



PERSPECTIVE VIEW

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

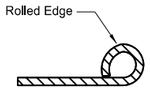
* These sizes have 0.109" sides and 0.138" center panels.

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

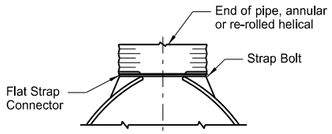
Manufacturers tolerances of above dimensions will be allowed.

Splices to be the lap riveted type.

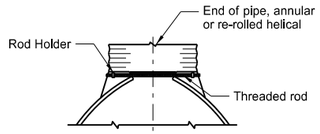
Multiple panel bodies shall have lap seams which are to be tightly joined with ⅜" dia. galv. bolts or rivets. Nuts to be torqued to 25 foot-lbs ±.



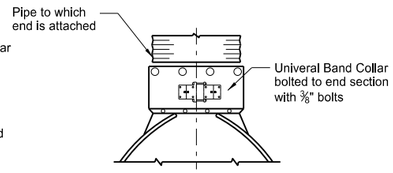
SECTION A-A



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



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

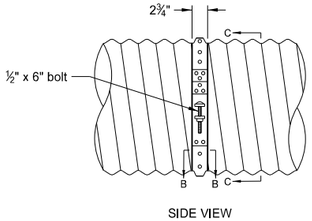


TYPE #3
For all pipe sizes

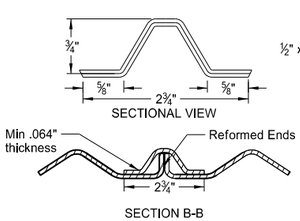
COUPLING BAND DIMENSIONS				
COUPLING TYPE	CORRUGATION PITCH x DEPTH	PIPE SIZE	COUPLING BAND LENGTH	MIN. BAND THICKNESS
Hat Band	2⅔" x ½"	12" - 48"	2¾"	.064"
Annular Band	2⅔" x ½"	12" - 72"	12"	.052"
		78" - 84"	12"	.079"
	3" x 1"	48" - 120"	14"	.052"
Hugger Band	2⅔" x ½" Rerolled End	12" - 72"	10½"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

NOTES:

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

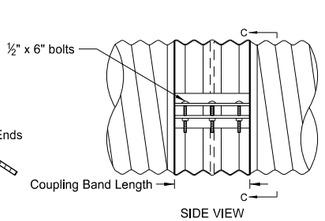


SIDE VIEW

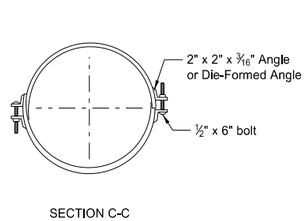


SECTION B-B

HAT BAND FOR FLANGED END PIPE

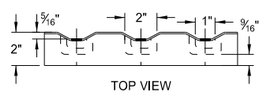


SIDE VIEW



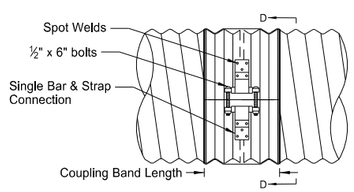
SECTION C-C
Angle Connection

ANNULAR BAND

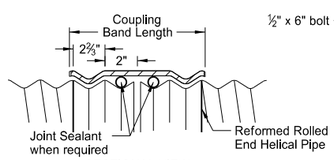


TOP VIEW

Die-Formed Angle Connector

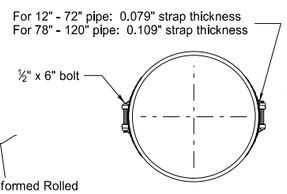


SIDE VIEW

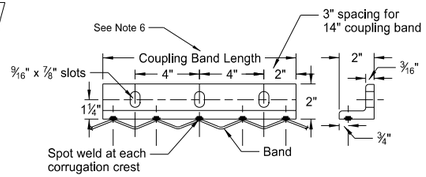


SECTIONAL VIEW

HUGGER COUPLING BAND

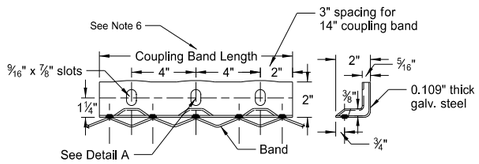


SECTION D-D
Bar & Strap Connection



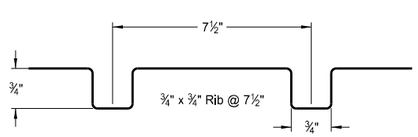
SIDE VIEW END VIEW

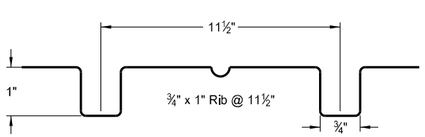
2" x 2" x 3/16" Angle Connector



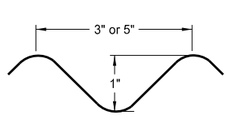
SIDE VIEW END VIEW

Die-Formed Angle Connector

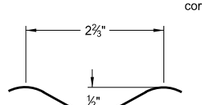




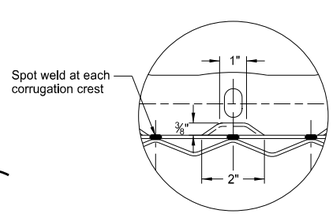
SPIRAL RIB CORRUGATIONS



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



2⅔" x ½" CORRUGATIONS



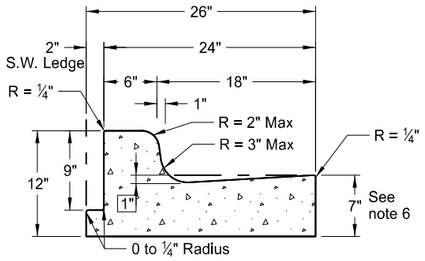
Detail A

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

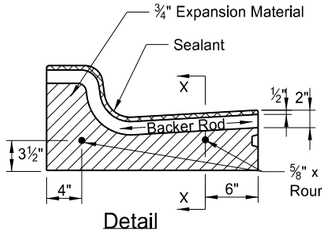
This document was originally issued and sealed by Jon Ketterling Registration Number PE-4684, on 9/18/19 and the original document is stored at the North Dakota Department of Transportation

Curb & Gutter and Valley Gutter

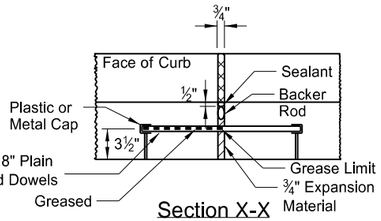
D-748-1



Curb & Gutter Type 1 (Sec. A & B)
Adjacent to Concrete Sidewalk, Median, or Parking Lot.
(Sec. A shown. See Sec B for additional details.)

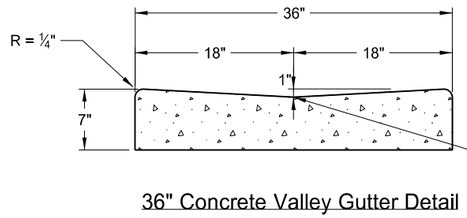


Detail

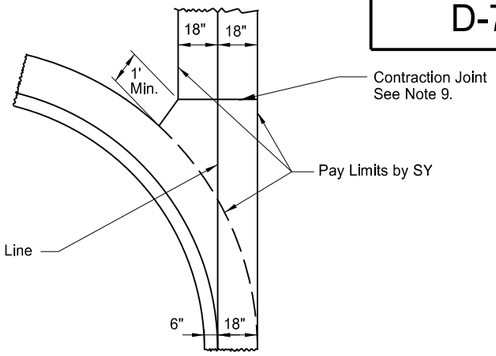


Section X-X

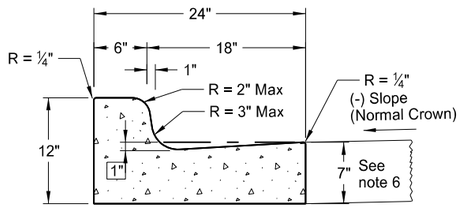
Isolation Joint



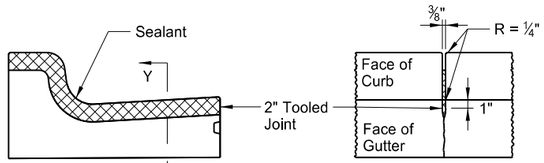
36" Concrete Valley Gutter Detail



36" Concrete Valley Gutter Plan



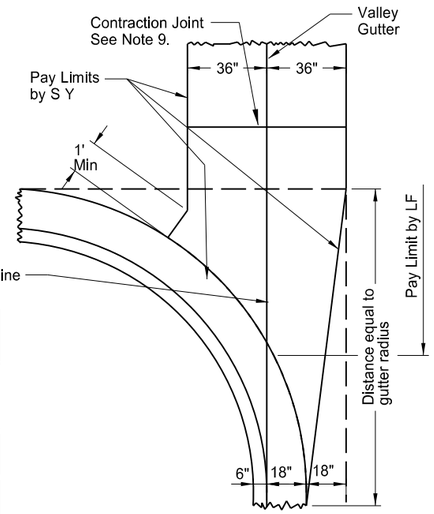
Curb & Gutter Type 1 (Sec. A)



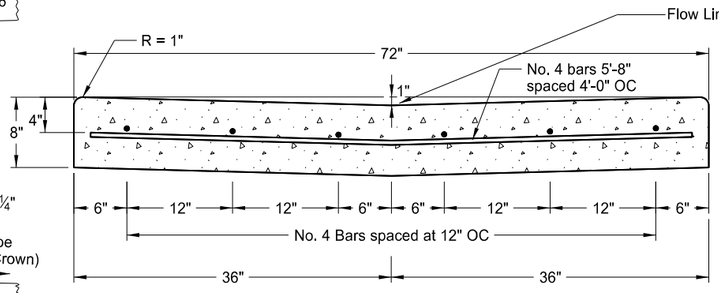
Detail
(10' Max Spacing)

Section Y-Y

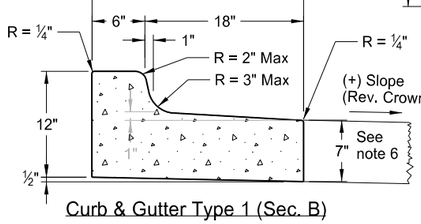
Contraction Joint



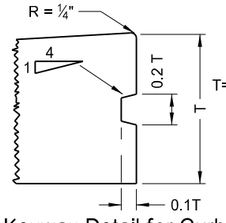
72" Concrete Valley Gutter Plan



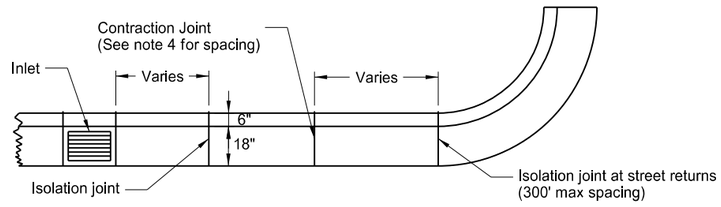
72" Concrete Valley Gutter Detail



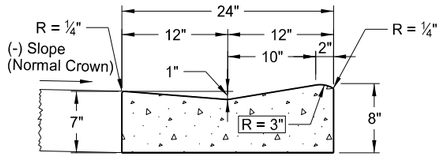
Curb & Gutter Type 1 (Sec. B)



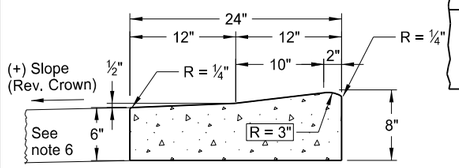
Keyway Detail for Curb & Gutter
(To be used with PCC Pavement and Drives)



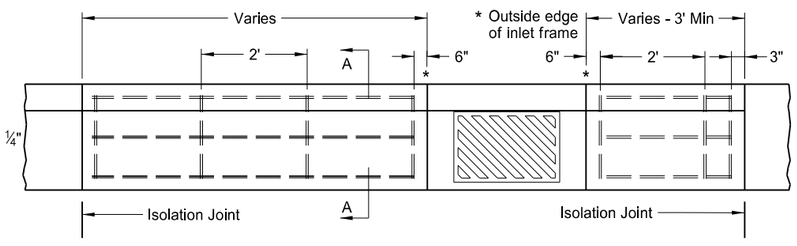
Joint Location Detail



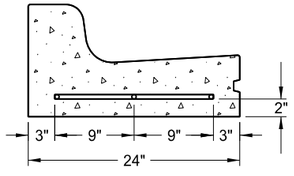
Mountable Curb & Gutter Type 1 (Sec. A)



Mountable Curb & Gutter Type 1 (Sec. B)



Curb & Gutter Reinforcing at Inlets



Section A-A

NOTE: Use #4 deformed reinforcing bars without splices. Include all costs for reinforcing bars at inlet locations (even inlets located on radii) in the price bid for "Curb and Gutter - Type 1." Extend reinforcement to the second joint (rebar placed through the first joint) in cases where the 3' min. panel length cannot be obtained.

NOTES:

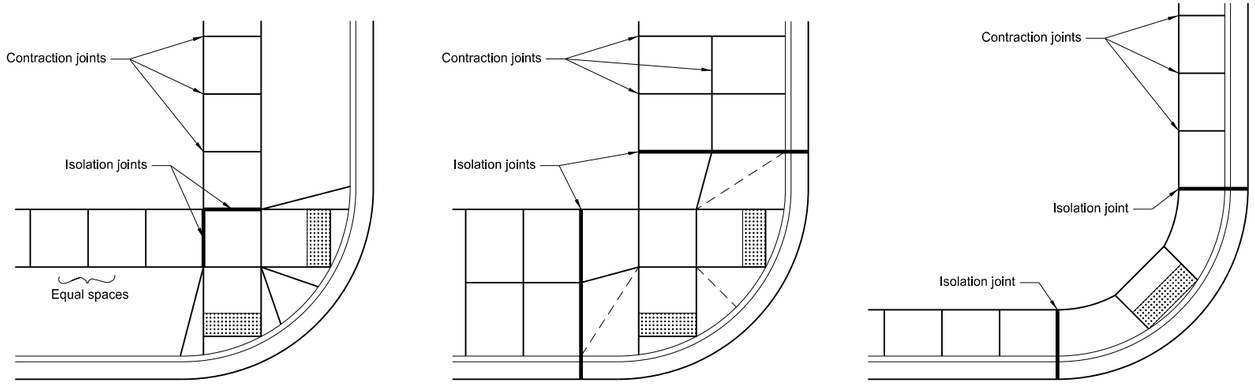
1. Use Curb and Gutter Type 1 (Sec. A & B). Use section "A" with (-) pavement slopes and section "B" with (+) pavement slopes.
2. Contraction Joints: Tool the Curb & Gutter 2" as shown on the contraction joint details.
3. Isolation Joints: Use ¾" expansion joint filler for isolation joint material. Form the backer rod and joint sealant opening with a pre-cut piece of wood or other material approved by the engineer. Dowel supports are not required on the second pour at a cold joint. Install plastic or metal caps and greased dowels in the cold joint for the second pour.
4. Joint Spacing: For hot bituminous pavements use a 10' max joint spacing for the curb and gutter with panels on each side of the inlets. For concrete pavements match the joint spacing for the curb and gutter to the pavement joint on PCC Pavements (approximately 15' spacing.)
5. Joint sealing: Seal contraction and isolation joints as shown in the details. Use joint sealant for contraction joints that conforms to section 826.02B. Use sealant for expansion joints specified in note 3 above. Tool and install sealant in accordance with the manufacturer's recommendations.
6. Face of Gutter Depth: For hot bituminous pavement use 7" gutter depth as shown. For PCC pavements, match the gutter depth to the depth of adjacent PCC pavement or to construct a 7" depth as shown.
7. Tie curb and gutter to abutting PCC pavement with No. 3 bars, 1'-6" in length, spaced at 4' centers.
8. On street returns and other locations where new curb and gutter ends and does not abut existing curb and gutter, taper the last two (2) feet of the curb from 6" in height to 0". Install a 1/2" premolded full depth isolation joint, the same shape as the curb and gutter just ahead of the taper. Install an 18" tie bar across the joint.
9. Valley Gutter Joints: Form, saw, or score ⅛" min. to ⅜" max. width contraction joints (a minimum 2" depth) at approx 10' intervals. Seal the joints with hot poured elastic type joint sealer (Section 826.02A.2 of the Standard Specifications.) Include all costs for the joint and sealant in the price bid for Valley Gutter.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-7-2013	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engr PE Stamp.

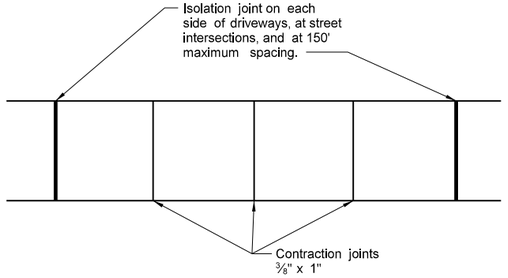
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 8-27-19 and the original document is stored at the North Dakota Department of Transportation

SIDEWALK

D-750-2



Typical Joint Layouts



NOTES:

1. Curb ramp and detectable warning panel layouts for informational purposes only. See Standard Drawing D-750-3 for curb ramp and detectable warning panel details.
2. Joint Spacing: Vary transverse contraction joint spacing from 4' to 6' to create approximate square panels.

   Use longitudinal contraction joints when sidewalk width is 8' or greater, and space at half the sidewalk width.

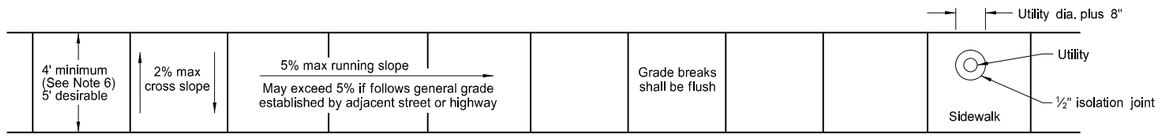
   Saw or groove contraction joints to a minimum depth of 1/3 the depth of the concrete.

   When sidewalk is adjacent to curb & gutter, vary the sidewalk joint spacing to match curb & gutter joints.

   Use isolation joints between separate concrete pours, or between old and new concrete.
3. Include all costs for labor, equipment, and material necessary to construct contraction and isolation joints in the price bid for sidewalk concrete.
4. Use 4" sidewalk concrete thickness unless otherwise specified.
5. Use 4" base material thickness unless otherwise specified. Include all costs for labor and materials necessary to place the base material in the price bid for "Salvage Base Course" or "Aggregate Base Course CL 5."

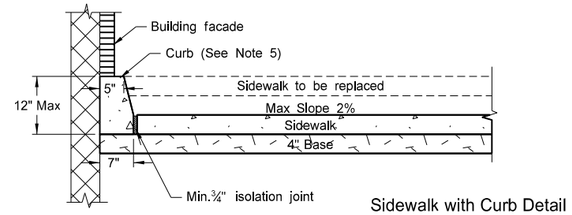
   Modify existing ground slope with landscaping as needed. If not possible, such as adjacent buildings, use a vertical curb as shown in the detail below. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Sidewalk Width & Grade: Provide a continuous 4' min clear width pedestrian access route with max 2% concrete cross slope, excluding flares. The width of the curb cannot be counted as part of the pedestrian access route.

   When clear width of pedestrian access routes is less than 5.0', provide passing spaces at a maximum of 200' with a minimum size of 5.0' by 5.0'.

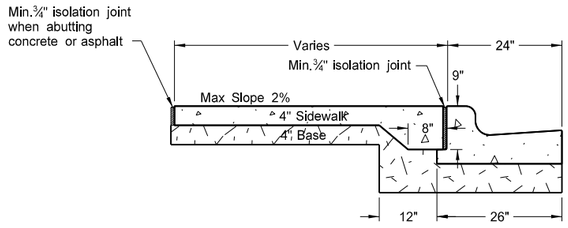


Sidewalk Width and Grade

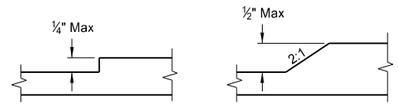
Utility Blockout



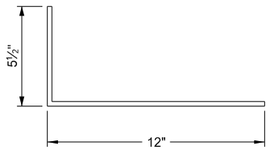
Sidewalk with Curb Detail
(Building face application)



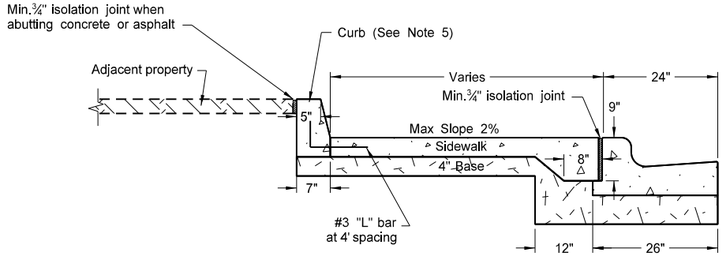
Sidewalk Detail
(Installed adjacent to curb and gutter)



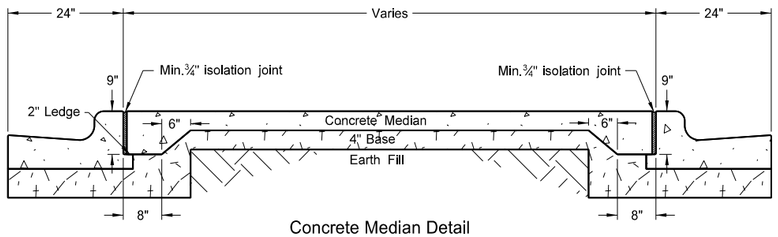
Vertical Discontinuities
(As needed for utility covers, vaults, grating, etc..)



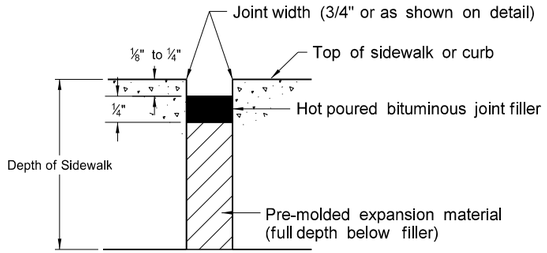
"L"Bar Detail
#3 Bar



Sidewalk with Curb Detail
(Adjacent property application)



Concrete Median Detail



Typical Isolation Joint Seal
(longitudinal and transverse)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Added sidewalk details for width and grade and passing lane requirements.
08-27-19	New Design Engineer PE Stamp.

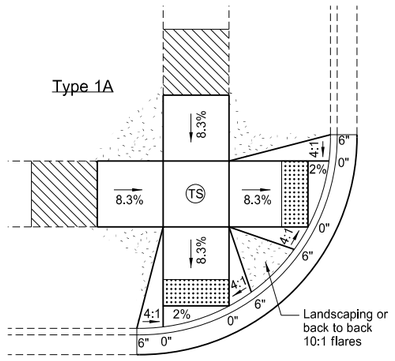
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 08/27/19 and the original document is stored at the North Dakota Department of Transportation

CURB RAMP DETAILS

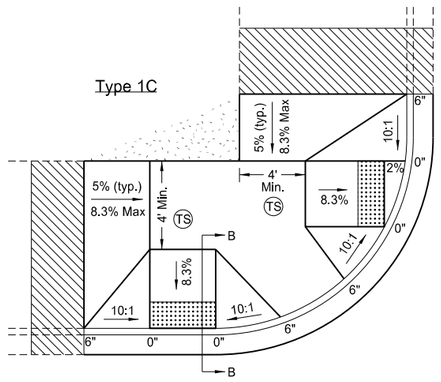
D-750-3

+More Right of Way — Less Right of Way-

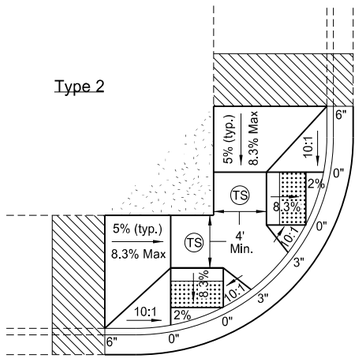
Type 1A



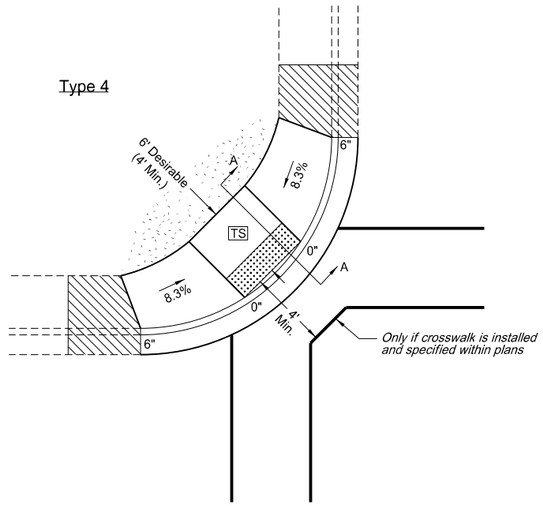
Type 1C



Type 2



Type 4



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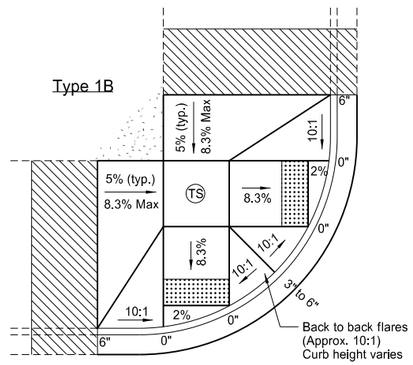

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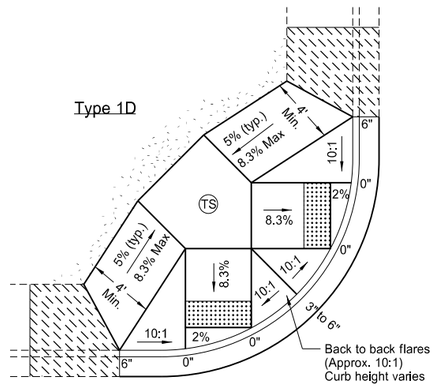

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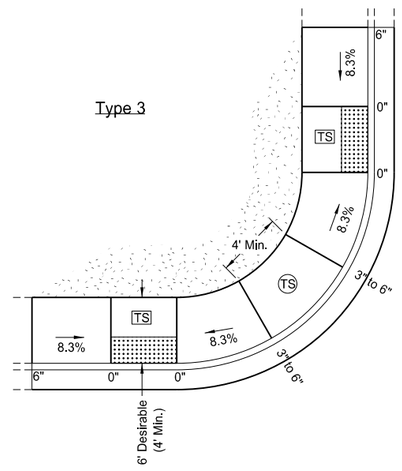
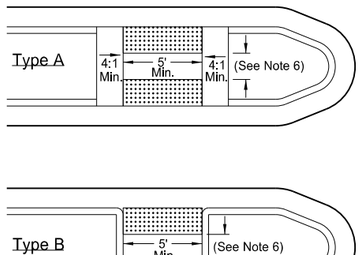
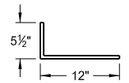
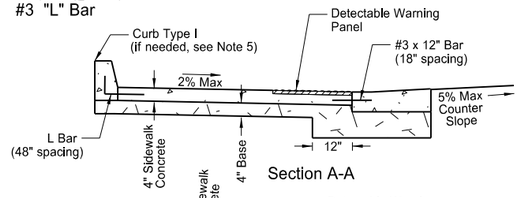
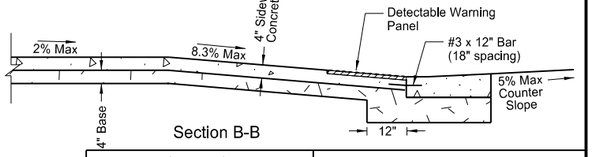


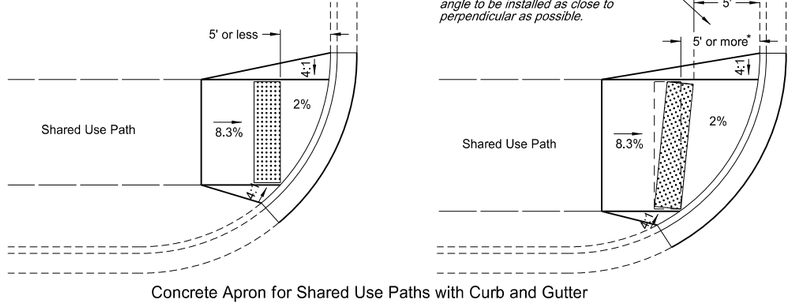
Median Refuge Islands (Cut-Through)



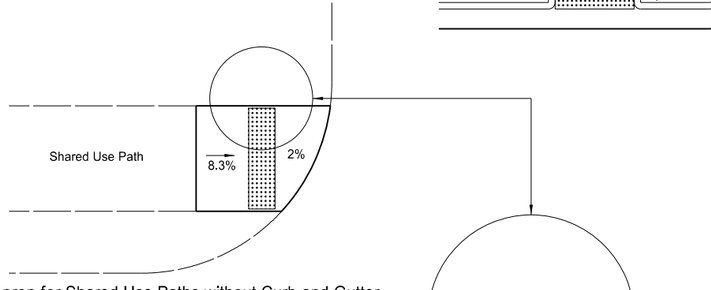




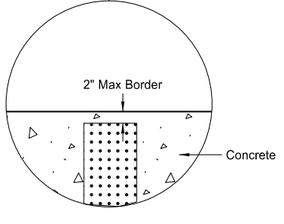


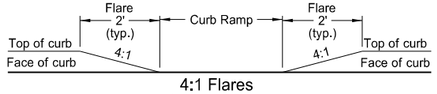


Concrete Apron for Shared Use Paths with Curb and Gutter

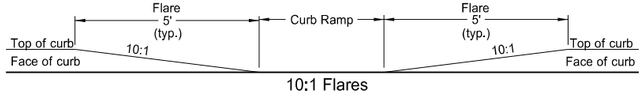


Concrete Apron for Shared Use Paths without Curb and Gutter





4:1 Flares
(To be used when flare is adjacent to landscaping)



10:1 Flares
(To be used when flare is adjacent to sidewalk)

NOTES:

1. Ramp width is the useable portion of the ramp, excluding flares. Match curb ramp width to existing sidewalk width (4' minimum or 5' for island ramps.) Match ramp width to existing shared use path width. Maximum ramp length is 15'.
2. Desirable turning space size is 5' x 5' or larger with a minimum size of 4' x 4'. The maximum slope for turning spaces is 2% in any direction.
3. Match detectable warning panel width to ramp width. Radial panels are allowed. Place detectable warning panel within the lower turning space.
4. Provide a continuous 4' minimum width pedestrian access route with max 2% concrete cross slope, excluding flares.
5. Modify existing ground slope with landscaping, as needed. If not possible, such as adjacent buildings, use a vertical curb as shown in the detail below. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Islands: If the grade of the island curb ramp is less than 2%, provide a minimum distance of 2' between warning panels. If the grade of the island curb ramp is steeper than 2%, provide a turning space between the ramps.

LEGEND:

- : Detectable Warning Panel
- : Landscaping
- : Transitional tie-in segment if needed for retrofits. Max grade slope 8.3%.
- TS : Upper Turning Space
- TS : Lower Turning Space
- 0", 3", or 6" : Curb Height
- 8.3% : All slopes shown are max grades. Flatter slopes may be used.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

11-26-13

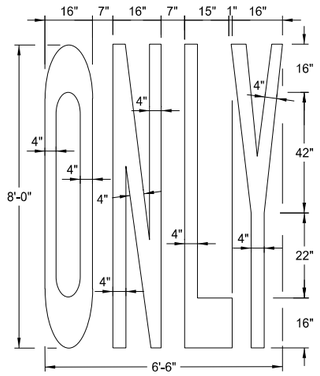
REVISIONS

DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Revised Notes, Revision for Turning Space, Added Passing Space Requirements, Turned Detectable Warning Panel

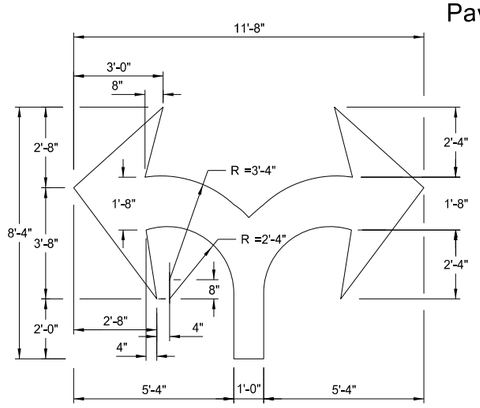
This document was originally issued and sealed by Roger Weigel, Registration Number PE-2930, on 09-05-2018 and the original document is stored at the North Dakota Department of Transportation

Pavement Marking Message Details

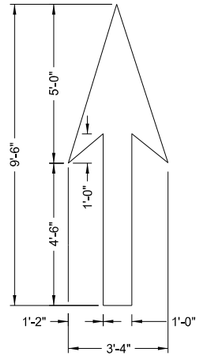
D-762-1



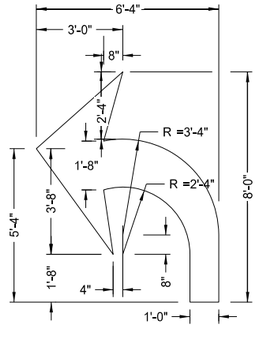
22 S. F.



29 S. F.



12 S. F.



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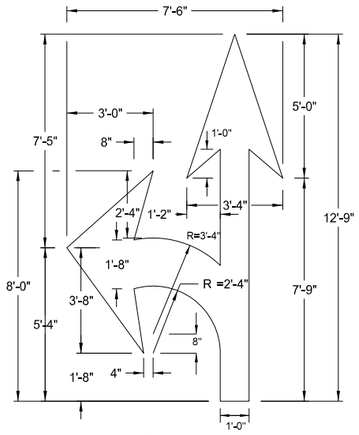
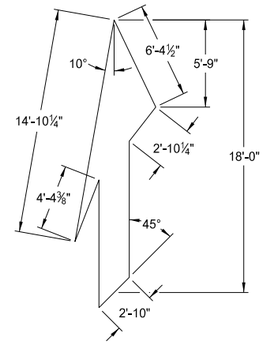
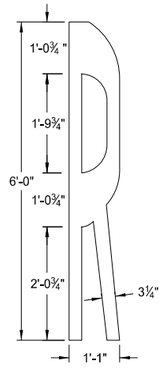


27 S. F.

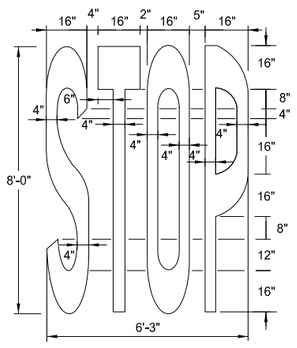


41 S. F.

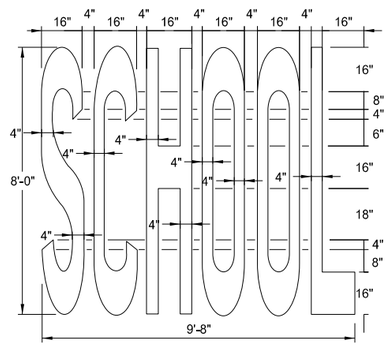
Note: Rotate merge arrow 20° from edge of roadway.



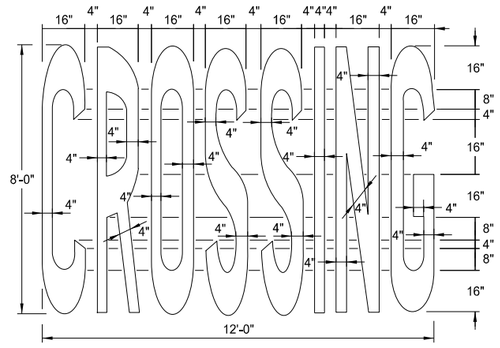
4 S. F.



22 S. F.



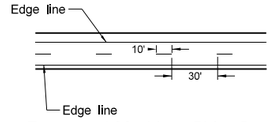
34.5 S. F.



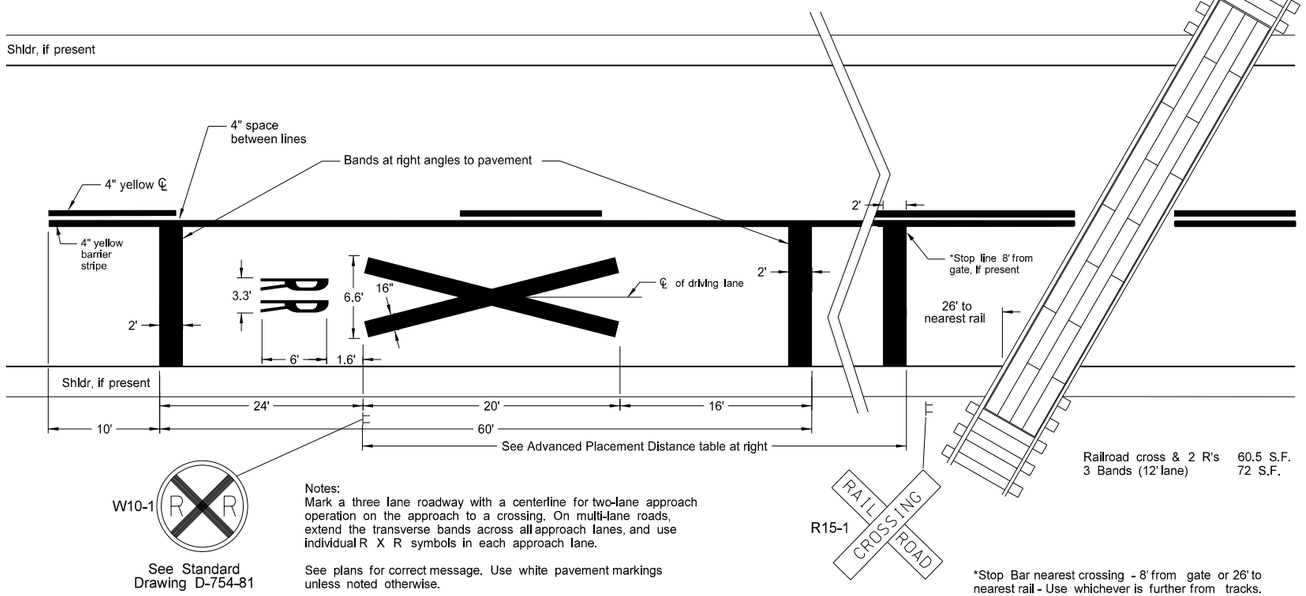
46 S. F.

Speed Limit	Chevron Width	Chevron Spacing 45° to Traffic
0-25 mph	8"	5'
30-40 mph	8"	15'
45 mph and above	12"	25'

Chevron Crosshatching Table



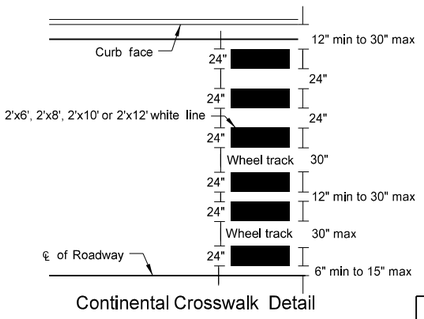
Centerline Pavement Marking Skip Spacing Detail



Notes:
Mark a three lane roadway with a centerline for two-lane approach operation on the approach to a crossing. On multi-lane roads, extend the transverse bands across all approach lanes, and use individual R X R symbols in each approach lane.

See plans for correct message. Use white pavement markings unless noted otherwise.

*Stop Bar nearest crossing - 8' from gate or 26' to nearest rail - Use whichever is further from tracks.



Continental Crosswalk Detail

Advance Placement Distance for Railroad Warning Signs	
Posted or 85th Percentile Speed	Advance Distance
20 mph	min. 100 ft
25 mph	min. 100 ft
30 mph	min. 100 ft
35 mph	min. 100 ft
40 mph	125 ft
45 mph	175 ft
50 mph	250 ft
55 mph	325 ft
60 mph	400 ft
65 mph	475 ft
70 mph	550 ft

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

12-6-11

REVISIONS

DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
01-28-2020	Revised min Stop Bar distance to rail.

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 1/28/2020 and the original document is stored at the North Dakota Department of Transportation