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DESIGN DATA				
Traffic	Average Daily			
Current 2024	Pass: 2980	Trucks: 450	Total: 3430	
Forecast 2044	Pass: 3695	Trucks: 585	Total: 4280	
Clear Zone Distance: 26'		Design Speed: 45mph		
Minimum Sight Dist. for Stopping: 360'		Bridges: HL-93		
Sight Dist. for No Passing Zone: 700'				
Pavement Design Life 20 (years)				
Design Accumulated One-way flexible ESALs: 1,416,615				

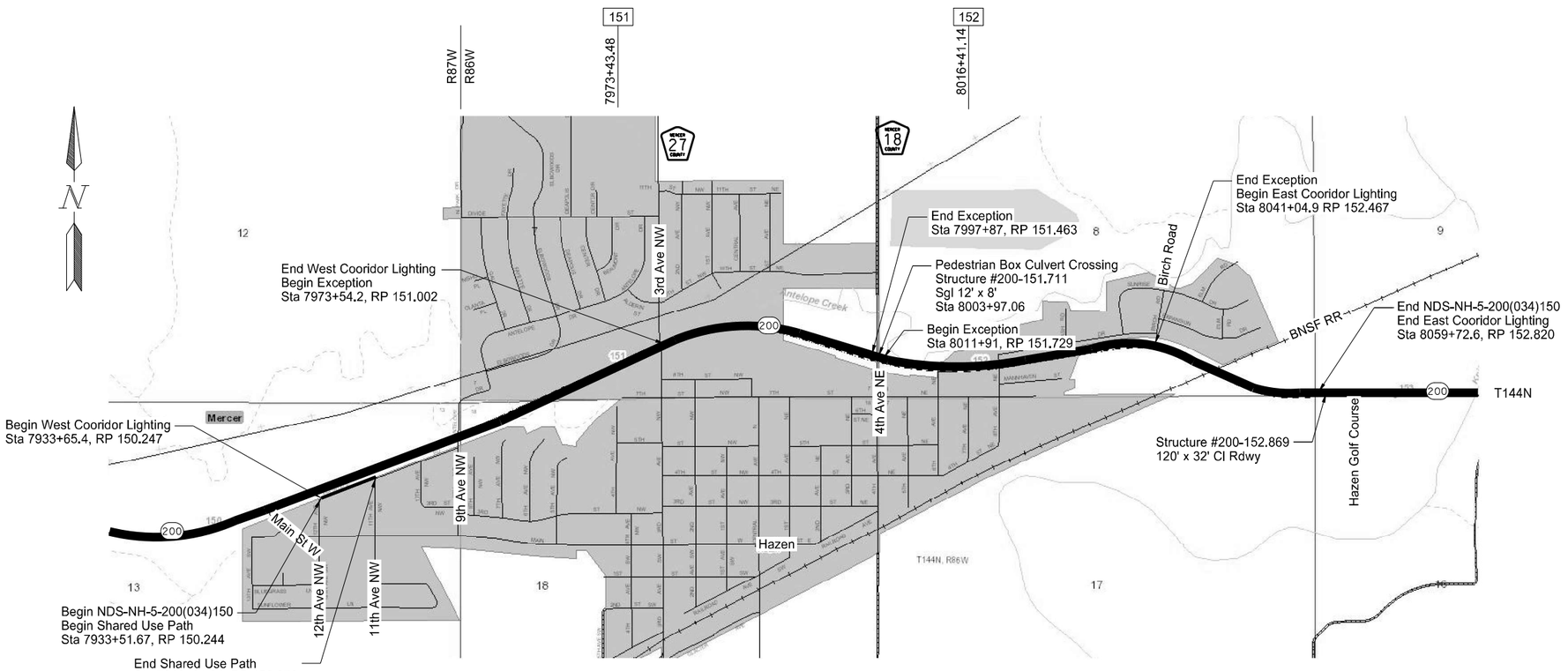
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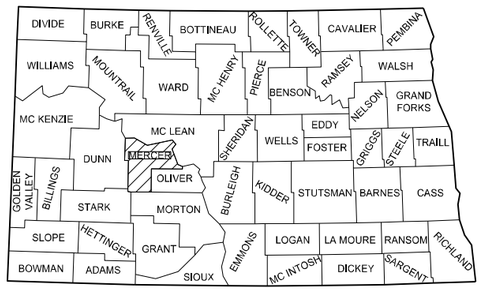
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

NDS-NH-5-200(034)150
Mercer County
Main St W - Hazen Golf Course
Lighting, Bikeway/Walkway, Pedestrian Box Culvert

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
NDS-NH-5-200(034)150	1.377	2.576





STATE COUNTY MAP

DESIGNER
Austin Becker
DESIGNER
Stacy Flaten
DESIGNER
Dylan Weber

ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT

Jonathan Kettering
09/01/26

Ackerman-Estvold

REGISTERED PROFESSIONAL ENGINEER
AUSTIN T. BECKER
PE-27997
DATE
09/01/26
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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SSP 4	Longitudinal Joint Density
SSP 10	E-Ticketing
PSP 27(24)	Permits and Environmental Considerations
SP 251(24)	Utility Coordination
SP 253(24)	Temporary Pedestrian Facilities
SP 366(24)	Structural and Channel Excavation Foundation Fill and Preparation
SP 664(24)	Airport Coordination

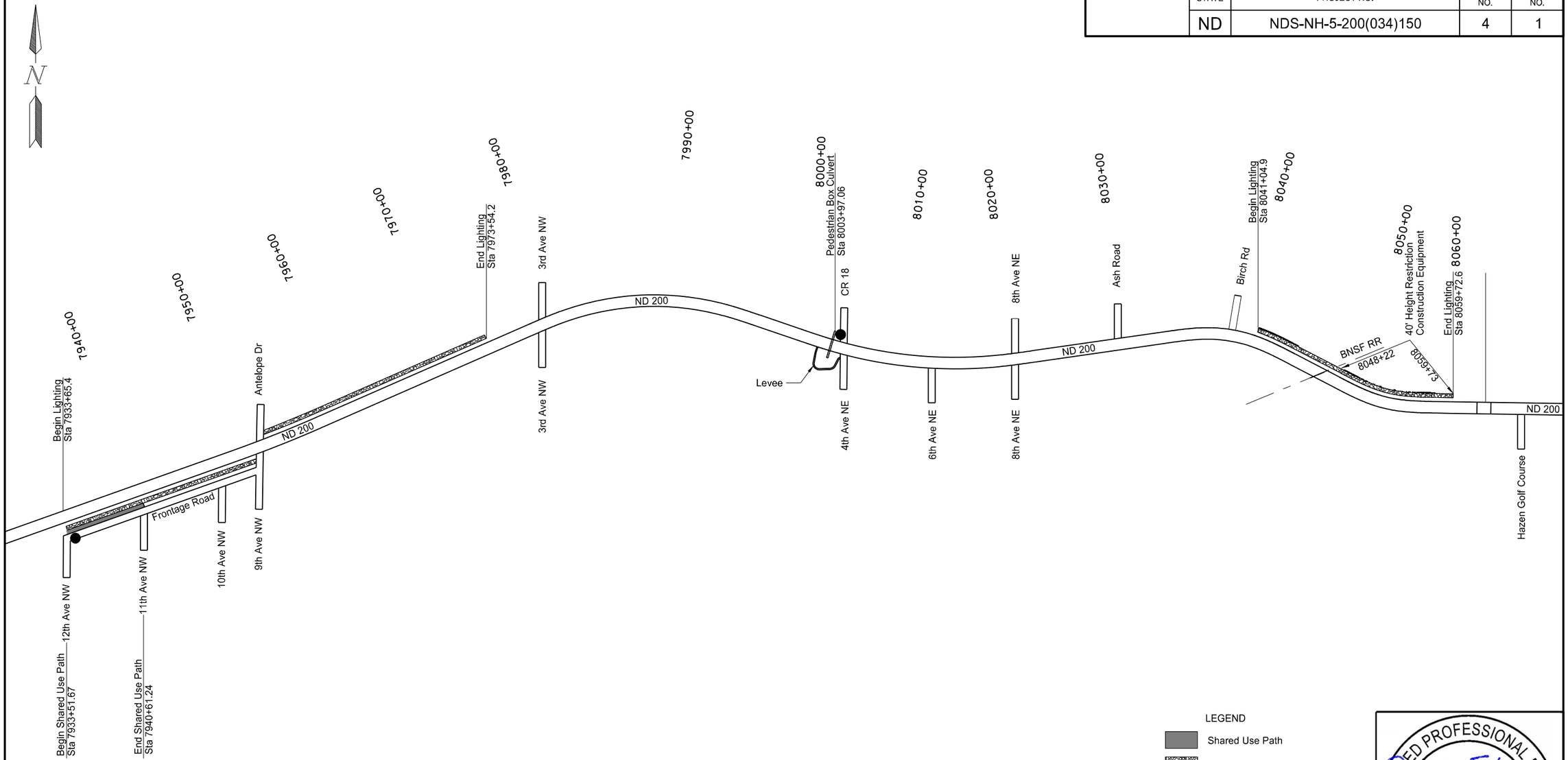
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LEGEND

- Shared Use Path
- Lighting
- Pedestrian Box Culvert
- Curb Ramp

REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/6/25
NORTH DAKOTA

Scope of Work

ND 200
Main St W - Hazen Golf Course

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

107-P01 MAINTAINING TRAFFIC – UNEVEN SHOULDER: If a shoulder and the adjacent lane are uneven due to milling or paving operations, the requirements of Section 704.04 O, "Traffic Control for Uneven Pavement" apply. If the uneven shoulder and adjacent lane are due to other circumstance, the contents of this note apply. If, at the end of the work-day, drop-offs greater than 2 inches and less than 18 inches or slopes steeper than 4:1 exist between the edge of a traffic lane and the outside edge of the proposed roadway, perform one of the following actions:

- Construct a traversable wedge in the area of the drop-off or steep slope; or
- Close the lane adjacent to the drop-off or steep slope and provide 24-hour flagging or pilot car operations.

When constructing a wedge, construct a wedge composed of aggregate or earthen materials with a 4:1 or flatter slope along the entire length of the area. Compact materials using Type C compaction, as specified in 203.04 G.4, "Compaction Control Type C".

Install stackable vertical panels that meet the requirements of Section 704.03 H, "Stackable Vertical Panel", along the edge of the driving lane closest to the wedge.

The Engineer will measure stackable vertical panels as specified in Section 704.05, "Method of Measurement" and will pay for panels as specified in Section 704.06, "Basis of Payment".

The Engineer will not measure material used to construct the wedge. Include the cost of materials, equipment, labor, and incidentals required for this operation in the price bid for Aggregate Base Course CL 5.

If a 4:1 or flatter wedge is not installed, provide 24 hour flagging or pilot car operations and associated traffic control at no additional cost to the Department.

107-P02 HEIGHT RESTRICTION FOR CONSTRUCTION EQUIPMENT: Between Sta 8048+22 and Sta 8059+73, construction equipment is restricted to a height of 40 feet or less due to the Airport restrictions. Equipment height will be measured from the centerline of the roadway and will include the extended height of the construction equipment.

202-P01 REMOVAL OF PAVEMENT: Removal of pavement includes removing bituminous pavement and aggregate base.

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 LEVEE FILL: On-site clay, free of organic material, is to be used as embankment for the levee construction. However, Atterberg limits and gradation testing of the soil will be conducted by the Engineer at the time of construction for verification of the geotechnical analysis. Place embankment in lifts not to exceed 8 inches of loose material. Compact material to at least 95 percent of the maximum dry density as determined according to ND T-99 with moisture content no less than 3.0 percentage points below the optimum moisture, and no more than 3.0 percentage points above the optimum moisture. The Engineer will collect material and conduct compaction testing at random sample locations at a rate of 1 test per 8” lift. Include all costs for placing, drying, and compacting the material in the unit price for “Common Excavation – Type A”.

704-200 STATE FURNISHED MEDIAN BARRIER: Obtain (29) 22.5” x 12.5’ concrete barriers. They can be picked up and returned to the Belfield yard at 801 1st Ave NE in Belfield ND 58622. Contact the Dickinson District office at 701-227-6500 to facilitate the exchanges.

If returning barriers with connection components, coordinate the delivery location for the connecting components with the Engineer. Some 4 inch x 4 inch boards are available at the return location. Provide any additional 4 inch x 4 inch boards necessary to stack barriers. The boards will become property of the Department.

Include all costs associated with median barriers in the contract unit price for “State Furnished Median Barrier”.

704-P01 TRAFFIC CONTROL FOR BITUMINOUS PAVEMENT: Provide traffic control consisting of a temporary road closure, flagging, and shoulder closures.

1. Standard D-704-15, layout A: To be used any time conditions exist.
2. Standard D-704-15, layout B: For temporary bypass for box culvert installations.
3. Standard D-704-20, layout G as the basis of the Terminal Signing
4. Standard D-704-22, layouts K and L: For construction trucks hauling material.
5. Standard D-704-24, layouts R and S: For shoulder work.
6. Standard D-704-26, layouts BB, CC, EE, and GG: For paving operations.
7. Standard D-704-26, layout JJ: For box culvert installation.

714-P01 FLAP GATE: Install a 24” Watermain F-10 Cast Iron Drainage Gate Flatback with Taper Setting Collar.

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DATE 1/8/26
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

754-P01 STOP SIGNS - REFLECTIVE STRIPS: Install 2 inch wide red reflective strips on the side of the sign support that faces the same direction as the sign. Begin the strip at the bottom of the sign face and stop the strip 2 feet above the sign support base.

Use reflective material that meets the requirements of Section 894.02 E, "Type XI Retroreflective Sheeting".

Install the strips on STOP signs at the following locations: 8004+77 Lt

Include the cost of furnishing and installing retroreflective strips in the contract unit price for "Steel Galvanized Posts – Telescoping Perforated Tube".

754-P02 REMOVE SIGN FOUNDATION: Remove City of Hazen sign and foundation at 8004+47 Rt. Include the cost of removal and disposal of sign and foundation in contract unit price for "Remove Sign Foundation".

772-009 PADLOCKS: Obtain padlocks for feed points from the City of Hazen:
Dave Brousseau, City of Hazen Public Works Director
146 Main St E
Hazen, ND 58545
701-880-0473
hazennd_pw@westriv.com

772-P01 REMOVE FLASHING BEACON: Include the cost of disconnecting the electrical wires and removing the wood pole, flasher cabinet, feed point, and meter at 8006+00 Rt in the contract unit price for "Remove Flashing Beacon".

894-050 ALUMINUM HARDWARE FOR SIGNS: The chromate seal specified in Section 894.03 A.1, "General" for aluminum hardware is not required.

970-320 TRASH RECEPTACLE: Remove the existing trash receptacle located along the shared use path at 8004+08 – 57' Lt and reset it along the shared use path at 8004+43 – 49' Lt. All costs associated with removal and resetting of the existing trash receptacle will be included in the price bid for "Trash Receptacle".

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

770-P01 FEED POINT-PEDESTRIAN LIGHTING: Provide a 120/240 Volt Feed Point cabinet for the pedestrian underpass tunnel. The feed point will provide two (2) circuits to the underpass tunnel: one operating 24 hours/day for some lights, the other turning on the remaining lights during daytime hours and off at night. Provide all controls and/or contactors required for a fully functioning underpass lighting system.

770-P02 ORNAMENTAL LIGHT STANDARD 13FT MT HT: 10' extruded aluminum 5" pole with 17" round base, total overall lighting unit height to be 13' from grade to top of luminaire, paint finish black. Duct seal all conduit stubs in concrete foundations. Provide poles from the list below or approved equal.

Decorative Pole	Catalog Number
Holophane Wadsworth	WDA 10 F5J 17D C03 BK ABG BABA RFD355000
Sternberg	Augusta 4210FP5-.188/BK
PEMCO	PLB112510F188T300NBK

770-P03 LED LUMINAIRE: Provide post-top luminaires that meet the following:

Light Source	LED
Light Output	5,000 lm to 5,400 lm
Wattage	50W to 60W
Color Temperature	4000K ± 300K
Operating Temperature Range	-40°C to +40°C
Luminaire Housing	Die Cast Aluminum
Vibration Testing	ANSI/NEMA C136.31 Level 2, 3G
Surge Suppression Rating	ANSI/IEEE C62.41 Cat C
Outdoor rating for housing, wiring, drivers	ANSI C136.25 IP-65
Tool-less access	Yes

Ensure Effective Projected Area of the luminaire does not exceed the capacity of the light standard.

The lighting system for the trail that will be using this LED luminaire was designed using these values:

Roadway Classification	Pedestrian and Bicycle Way
Average Maintained Illuminance	2.0 foot-candles
Illuminance Uniformity Ratio	3.0:1
Light Loss Factor	0.81

Provide LED luminaires from the list below, or approved equal, for ornamental light standards along the trail.

LED Luminaire	Catalog Number
AEL American Revolution	247L P153 ZT MVOLT 40K R2 AY BK PR7 SH SCC TL BAA
Cooper Lighting	BABA-UTLD-PA1-50W-740-U-T2U-BK
PEMCO	HER1WA50W4KU2YNPCR7BK

Include all costs associated with the LED lighting system in the contract unit price for "Lighting System A".

770-P04 UNDERPASS LIGHT UNIT CEILING MTD – 50 WATT: Provide LED luminaires for the pedestrian underpass below and according to the plans. Use the luminaires listed below or approved equal.

LED Luminaire	Catalog Number
Holophane Wall Pack	W4PLED_10C700_40K_T3M
Cooper Lighting	WPSLED15S
Hubbell Killark	KWPL434

The lighting system was designed using these values:

ANSI/IES RP-8-18 Guidelines	Pedestrian Underpass
Average Maintained Illuminance – Daytime	9.3 foot-candles, EV min 4.6
Average Maintained Illuminance – Nighttime	3.4 foot-candles, EV, min 1.9
Illuminance Uniformity Ratio	3.0:1
Light Loss Factor	0.81

Include all costs associated with the LED lighting system in the contract unit price for "Lighting System A".

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NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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ENVIRONMENTAL NOTES

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

NOTIFICATIONS TO BE FILED BY CONTRACTOR:
EN-1 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).

Permits Required:
Conditional Letter of Map Revision (CLOMR) –Federal Emergency Management Agency (FEMA)
Letter of Map Revision (LOMR) - Federal Emergency Management Agency (FEMA)
Construction Permit - ND Department of Water Resources
Discharge Storm Water Permit – ND Department of Health
Floodplain Permit – ND State Water Commission

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DATE 10/31/25
NORTH DAKOTA

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

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY				TOTAL
103	0100	CONTRACT BOND	L SUM	1				1
201	0330	CLEARING & GRUBBING	L SUM	1				1
202	0114	REMOVAL OF CONCRETE PAVEMENT	SY	129				129
202	0130	REMOVAL OF CURB & GUTTER	LF	14				14
202	0132	REMOVAL OF BITUMINOUS SURFACING	SY	188				188
202	0136	REMOVAL OF PAVEMENT	TON	1092				1092
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES	EA	1				1
202	0312	REMOVE EXISTING FENCE	LF	438				438
203	0101	COMMON EXCAVATION-TYPE A	CY	2597				2597
203	0109	TOPSOIL	CY	1531				1531
210	0050	BOX CULVERT EXCAVATION	EA	1				1
210	0210	FOUNDATION FILL	CY	1925				1925
210	0250	BOX CULVERT FOUNDATION AGGREGATE	CY	140				140
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1				1
216	0100	WATER	M GAL	98				98
251	0200	SEEDING CLASS II	ACRE	2.13				2.13
251	2000	TEMPORARY COVER CROP	ACRE	2.13				2.13
253	0201	HYDRAULIC MULCH	ACRE	4.26				4.26
255	0102	ECB TYPE 2	SY	60				60
261	0112	FIBER ROLLS 12IN	LF	3556				3556
261	0113	REMOVE FIBER ROLLS 12IN	LF	1851				1851
261	0120	FIBER ROLLS 20IN	LF	70				70
261	0121	REMOVE FIBER ROLLS 20IN	LF	30				30
302	0120	AGGREGATE BASE COURSE CL 5	TON	1509				1509
430	0043	SUPERPAVE FAA 43	TON	525				525
430	1000	CORED SAMPLE	EA	11				11
602	1131	CLASS AE-3 CONCRETE-BOX CULVERT	CY	146				146
612	0114	REINFORCING STEEL-GRADE 60-BOX CULVERT	LBS	30711				30711
624	0124	PEDESTRIAN FENCE	LF	53				53
702	0100	MOBILIZATION	L SUM	1				1
704	0100	FLAGGING	MHR	700				700
704	1000	TRAFFIC CONTROL SIGNS	UNIT	2958				2958
704	1039	ATTENUATION DEVICE-TYPE B-45	EA	1				1
704	1052	TYPE III BARRICADE	EA	10				10
704	1054	SIDEWALK BARRICADE	EA	6				6
704	1058	PEDESTRIAN WALKWAY	LF	195				195
704	1060	DELINEATOR DRUMS	EA	64				64
704	1067	TUBULAR MARKERS	EA	92				92
704	1080	STACKABLE VERTICAL PANELS	EA	71				71
704	1500	OBLITERATION OF PAVEMENT MARKING	SF	1740				1740
704	2108	TEMPORARY CURB RAMP	EA	1				1
704	3511	STATE FURNISHED MEDIAN BARRIER	LF	360				360
706	0500	AGGREGATE LABORATORY	EA	1				1
706	0550	BITUMINOUS LABORATORY	EA	1				1
706	0600	CONTRACTOR'S LABORATORY	EA	1				1
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	210				210
714	4106	PIPE CONDUIT 24IN-APPROACH	LF	112				112

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Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY				TOTAL
714	4125	PIPE CONDUIT 48IN	LF	28				28
714	4165	PIPE CONDUIT 24IN-JACKED OR BORED	LF	82				82
714	5055	PIPE CORR STEEL .064IN 48IN	LF	4				4
714	9912	FLAP GATE 24IN	EA	1				1
720	0110	RIGHT OF WAY MARKERS	EA	6				6
720	0130	IRON PIN R/W MONUMENTS	EA	6				6
722	0200	MANHOLE 108IN	EA	1				1
722	1200	MANHOLE RISER 108IN	LF	7.72				7.72
748	0140	CURB & GUTTER-TYPE I	LF	14				14
750	0115	SIDEWALK CONCRETE 4IN	SY	1319				1319
750	0150	SIDEWALK TRENCH DRAIN	EA	1				1
750	2115	DETECTABLE WARNING PANELS	SF	36				36
752	0700	FENCE WOVEN WIRE	LF	599				599
752	0993	FENCE TERMINAL	EA	4				4
752	2995	CORNER ASSEMBLY-WOOD POST	EA	1				1
752	3120	CORNER ASSEMBLY WOVEN WIRE	EA	1				1
754	0110	FLAT SHEET FOR SIGNS-TYPE XI REFL SHEETING	SF	17				17
754	0112	FLAT SHEET FOR SIGNS-TYPE IV REFL SHEETING	SF	3				3
754	0155	DELINEATORS-TYPE A-DOUBLE SIDED	EA	2				2
754	0206	STEEL GALV POSTS-TELESCOPING PERFORATED TUBE	LF	53				53
754	0592	RESET SIGN PANEL	EA	2				2
754	1104	REMOVE SIGN FOUNDATION	EA	1				1
762	0111	EPOXY PVMT MK 12IN LINE	LF	869				869
762	0112	EPOXY PVMT MK MESSAGE	SF	128				128
762	0114	EPOXY PVMT MK 6IN LINE	LF	7250				7250
762	0117	EPOXY PVMT MK 24IN LINE	LF	60				60
770	0003	LIGHTING SYSTEM A	EA	1				1
770	4540	RELOCATE LIGHT STANDARD	EA	1				1
772	3150	REMOVE FLASHING BEACON SYSTEM	EA	1				1
930	8230	SHORING	EA	2				2
970	0320	TRASH RECEPTACLE	EA	1				1

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BASIS OF ESTIMATE

Water
25 MGal/Mile for Dust Palliative
20 Gal/Ton for Aggregates
10 Gal/CY for Embankment

Removal of Pavement
Aggregate Base @ 1.875 Ton/CY
Bituminous Pavement @ 2 Ton/CY
Concrete Pavement @ 2 Ton/CY

Pavement
Aggregate Base Course CL 5 @1.875 Ton/CY
Tack Coat @ 0.05 Gal/SY - incidental
Superpave FAA 43 @ 2 Ton/CY
PG 58S-28 Asphalt Cement @ 6% - incidental

HMA Cored Samples

	A	B		C			
Specification Section	**Distance (Ft)÷1000**	**Lanes**	**Joints**	**Lifts**	**Quantity (A x B x C)**	**Quantity (1 per mile)**	**Unit**
430.04 I.2.b(1), "General"	194 / 1000=1	4	N/A	2	8	N/A	EA
SSP 4 Longitudinal Joint Density in HMA Pavements (Centerline)	194 / 1000=1	N/A	1	2	2	N/A	EA
430.04 I.2.b(2),"Pavement Thickness Determination Cores"					N/A	1	EA
				Total	10	1	EA

REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 9/23/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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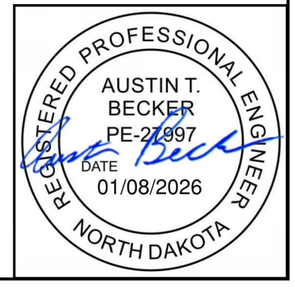
Earthwork Summary

Location	Excavation Volume	Embankment Volume	Compacted Volume	Common Excavation – Type A (Pay Item)	Borrow Excavation (2)	Topsoil (Pay Item)
	(CY)	(CY)	(CY)	(CY)	(CY)	(CY)
	A	B	C = B * 1.25	D = A	E = C – A	
Frontage Road	100	1	2	100	-98	195
ND 200 Pedestrian Box Culvert & Levee	2,497	3,299	4,124	2,497	1,627	1336
Box Culvert Excavation (1)	1,985	-	-	Note (1)	-1,985	
			Total	**2,597**	**-456 (3)**	**1531**

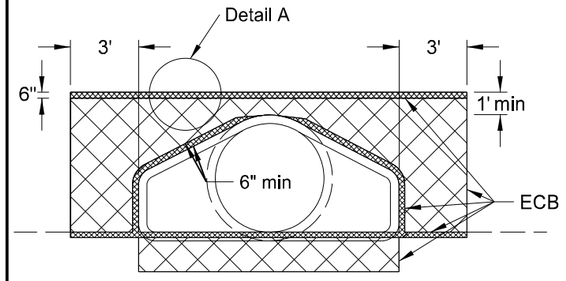
(1) Box Culvert Excavation quantities for informational purposes only. Excavated material to be utilized on site to construct levee and shared used path embankment. Excavation required for box culvert installation per detail shown on Section 170 sheet 3 to be paid under Bid Item 210-0050 Box Culvert Excavation.

(2) Borrow excavation needed to construct levee and shared use path embankment to be generated from the excavation for the box culvert.

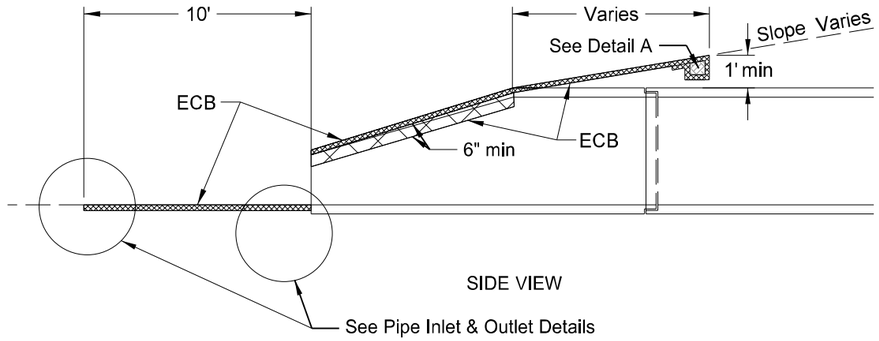
(3) A net of 456 CY of excess material is expected. Any excess material not utilized to be removed and all costs included under Bid Item 210-0050 Box Culvert Excavation.



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	20	1

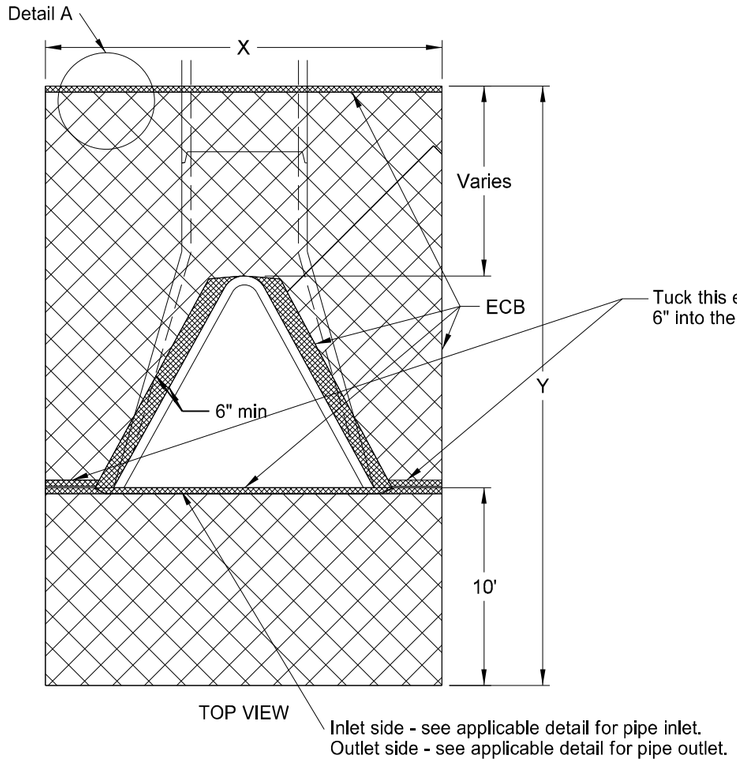


FRONT VIEW



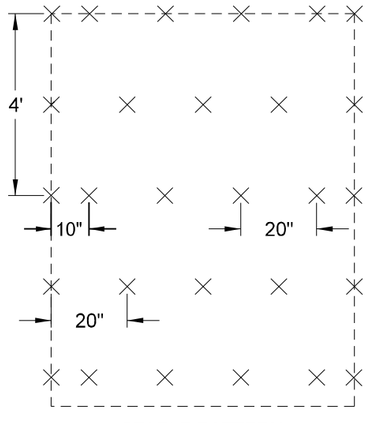
SIDE VIEW

Location to be Protected	Culvert Type Appr/CL	Pipe Diam. (inch)	No.	Unit Quantity (SY)	Total Quantity
Station					ECB Type 2 (SY)
8004+11 Lt	Appr	24	1	20	20
8005+02 Rt	Appr	48	1	27	27
				Total =	47



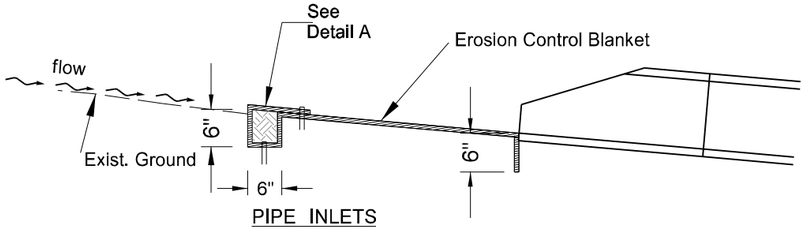
TOP VIEW

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

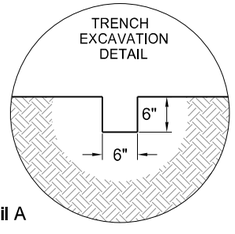


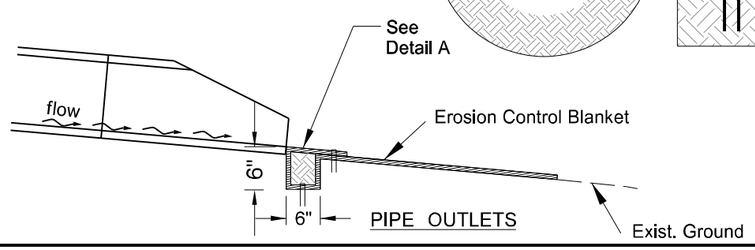
STAPLE PATTERN

CENTERLINE CULVERTS				
DIA	X	Y	Surface area to be protected	ECB
In	Ft	Ft	SF	SY
24	10.5	17.6	172.1	20
48	13.8	20.0	238.0	27
Note: Quantities based on 4:1 slope.				

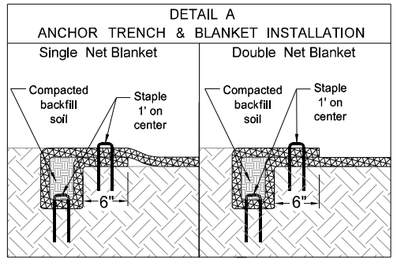


PIPE INLETS





PIPE OUTLETS



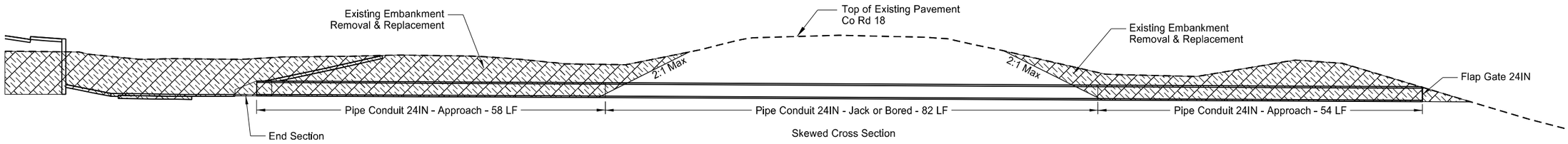
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 9/29/25
NORTH DAKOTA

Details

ND 200
Main St W-Hazen Golf Course

Erosion Control at Culvert Flared End Sections

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	20	2



Skewed Cross Section

Note: See Standard Drawing D-714-16

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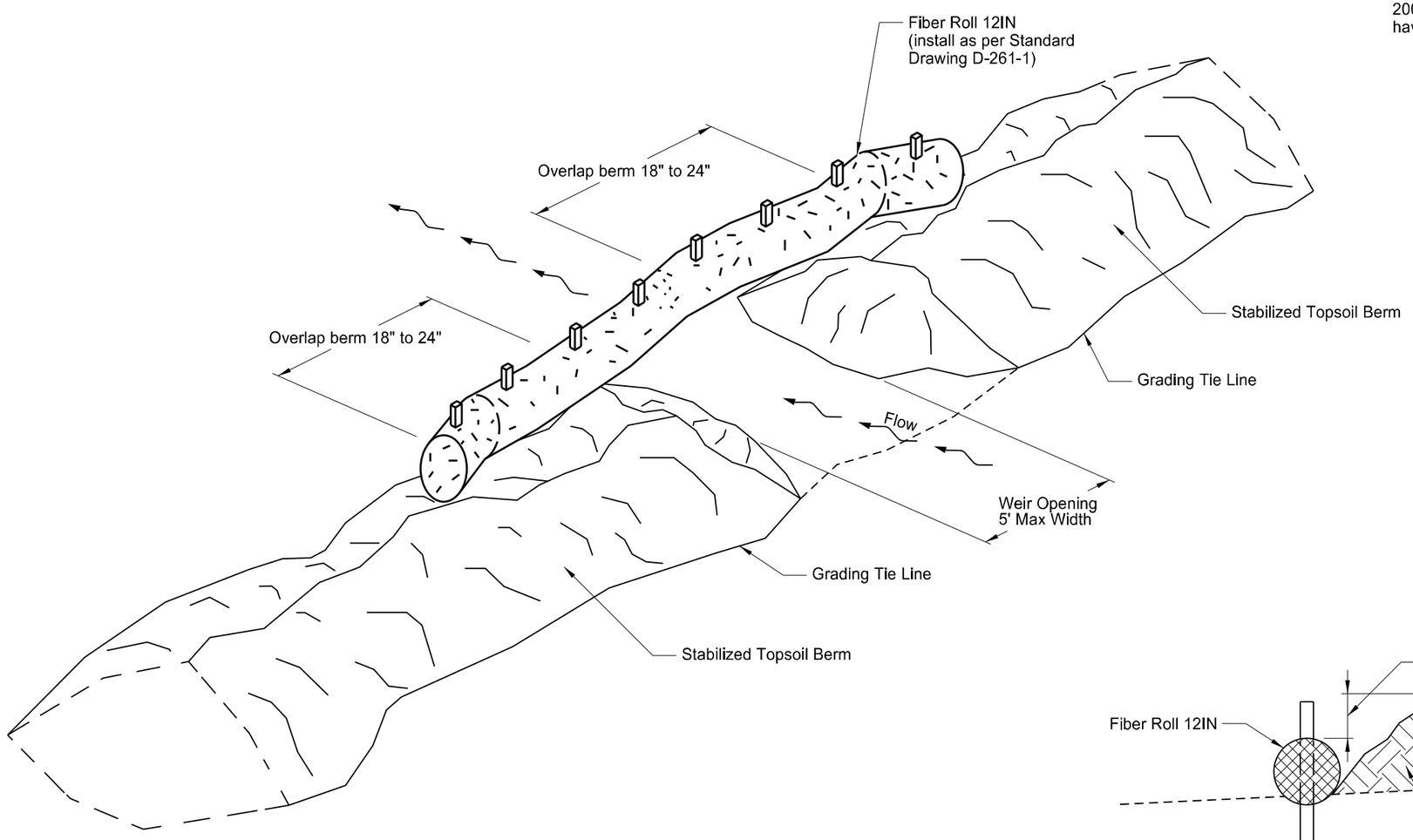
Details

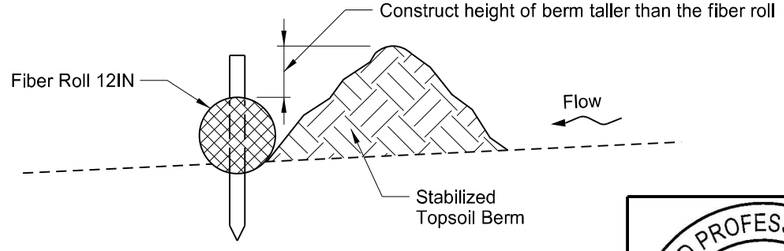
ND 200
Main St W - Hazen Golf Course

Jack or Bored Pipe
Co Rd 18

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	20	3

200 LF of Fiber Roll 12IN and 200 LF of Remove Fiber Roll 12IN have been included in the quantities for use at weirs.





Topsoil Berm Detail

Notes:

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

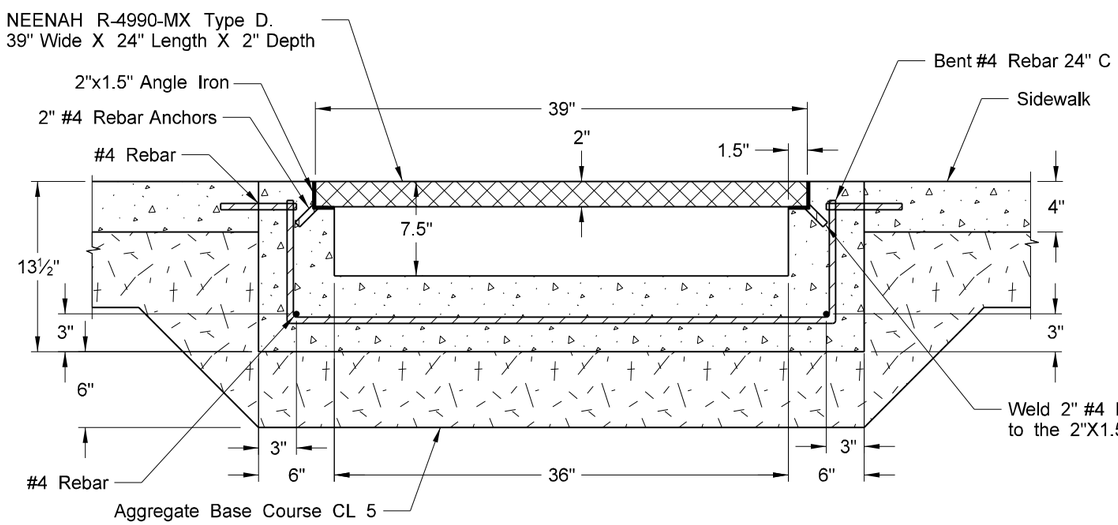
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 9/29/25
NORTH DAKOTA

Details

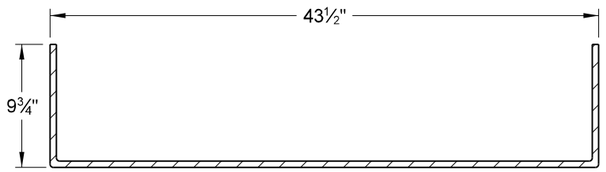
ND 200
Main St W - Hazen Golf Course

Temporary Topsoil Berm and Weir Detail

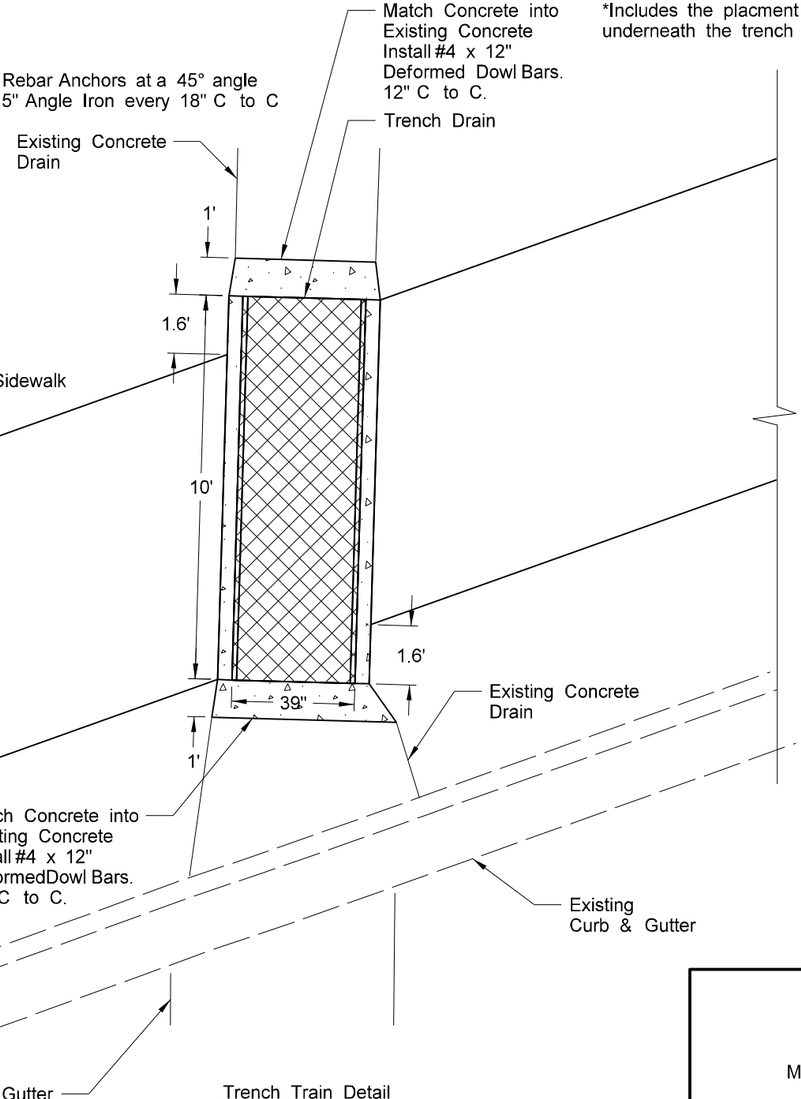
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	20	4



Sidewalk Trench Drain Detail



Bent Rebar Detail



Trench Train Detail

NOTES

One location (See Plan & Profile Sheets)

Approximate lengths:
1 trench drain approximately 10' length

*Verify exact length required in the field prior to fabrication.

*Sidewalk Trench Drain as shown, or approved equal

*Includes tying into the existing concrete drain

*Includes the placment of Aggregate Base Course CL 5 underneath the trench drain

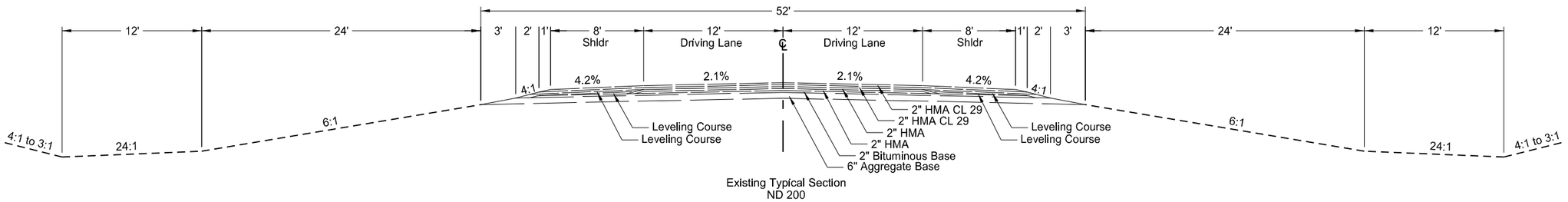
REGISTERED PROFESSIONAL ENGINEER
AUSTIN T. BECKER
PE-27997
DATE 01/08/2026
NORTH DAKOTA

Details

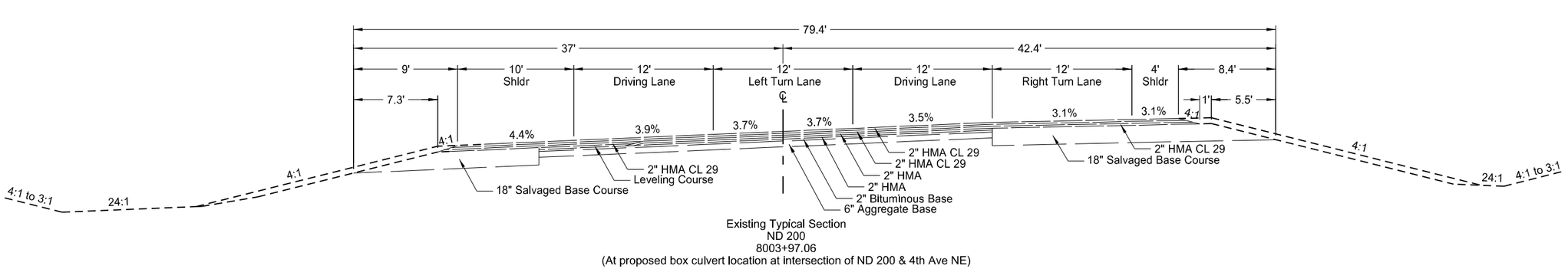
ND 200
Main St W - Hazen Golf Course

Trench Drain Installation (or approved equal)

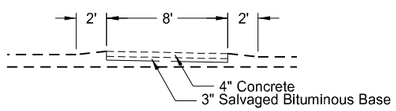
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	30	1



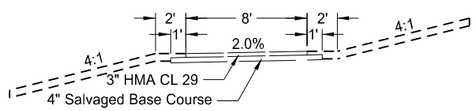
Existing Typical Section
ND 200



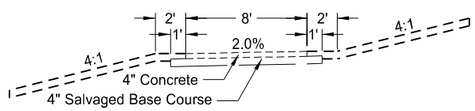
Existing Typical Section
ND 200
8003+97.06
(At proposed box culvert location at intersection of ND 200 & 4th Ave NE)



Shared Use Path
Along Frontage Road



Shared Use Path
ND 200 (north side)



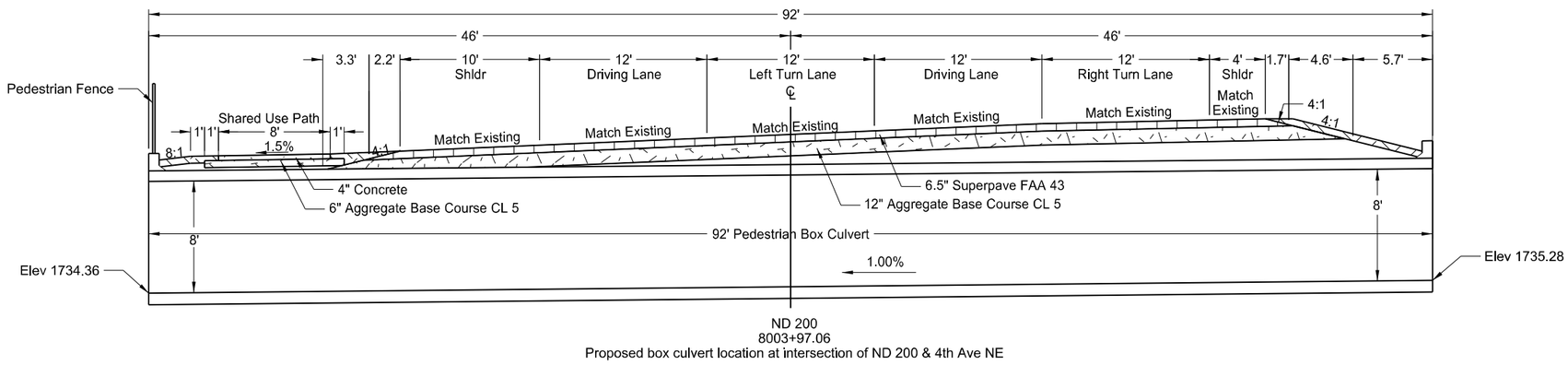
Shared Use Path
ND 200 (south side)

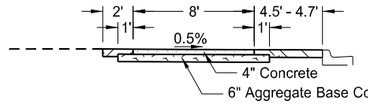
REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 9/23/25
NORTH DAKOTA

Existing Typical Section

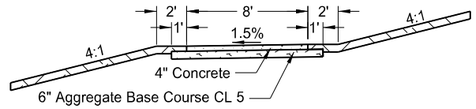
ND 200
Main St W - Hazen Golf Course

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	30	2





Shared Use Path
Along Frontage Road
11th Ave NW to 12th Ave NW



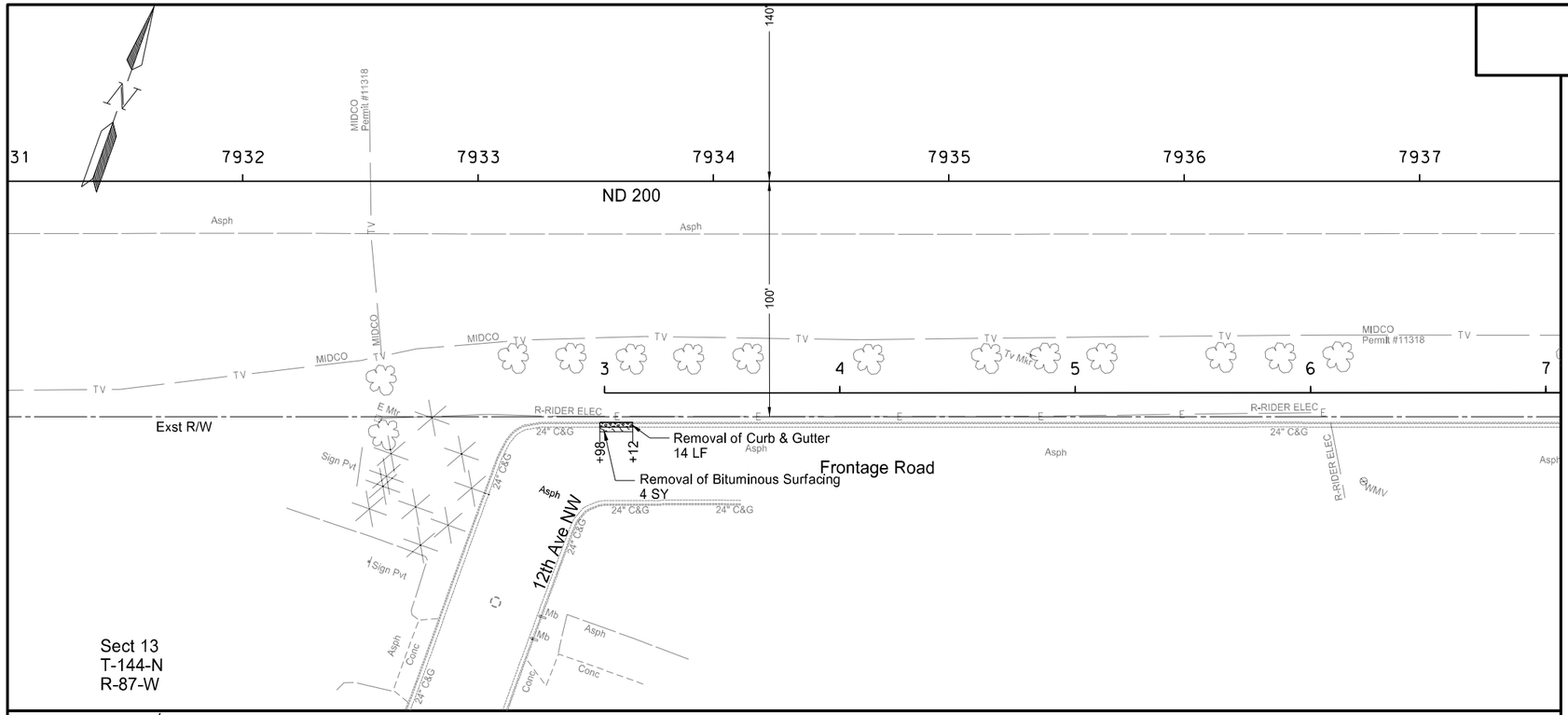
Shared Use Path
ND 200 & 4th Ave NE
NW & SW Quadrants

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STACY FLATEN
PE-8772
DATE 9/23/25
NORTH DAKOTA

Proposed Typical Section

ND 200
Main St W - Hazen Golf Course

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	40	1



SPEC	CODE	BID ITEM	QTY	UNIT
202	0114	REMOVAL OF CONCRETE PAVEMENT		
		9+62.76 - 8.89' Rt to 9+67.31 - 10.65' Rt to 9+67.37 - 2.2' Lt to 9+70.83 - 0.85' Lt (PR12SW)	5	SY
202	0130	REMOVAL OF CURB & GUTTER		
		2+98 to 3+12 Rt (PR12SW)	14	LF
202	0132	REMOVAL OF BITUMINOUS SURFACING		
		2+98 to 3+12 Rt (PR12SW)	4	SY

LEGEND

- Removal of Concrete Pavement
- Removal of Curb & Gutter
- Removal of Bituminous Surfacing
- Removal of Pavement

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STACY FLATEN
PE-8772
DATE 11/5/25
NORTH DAKOTA

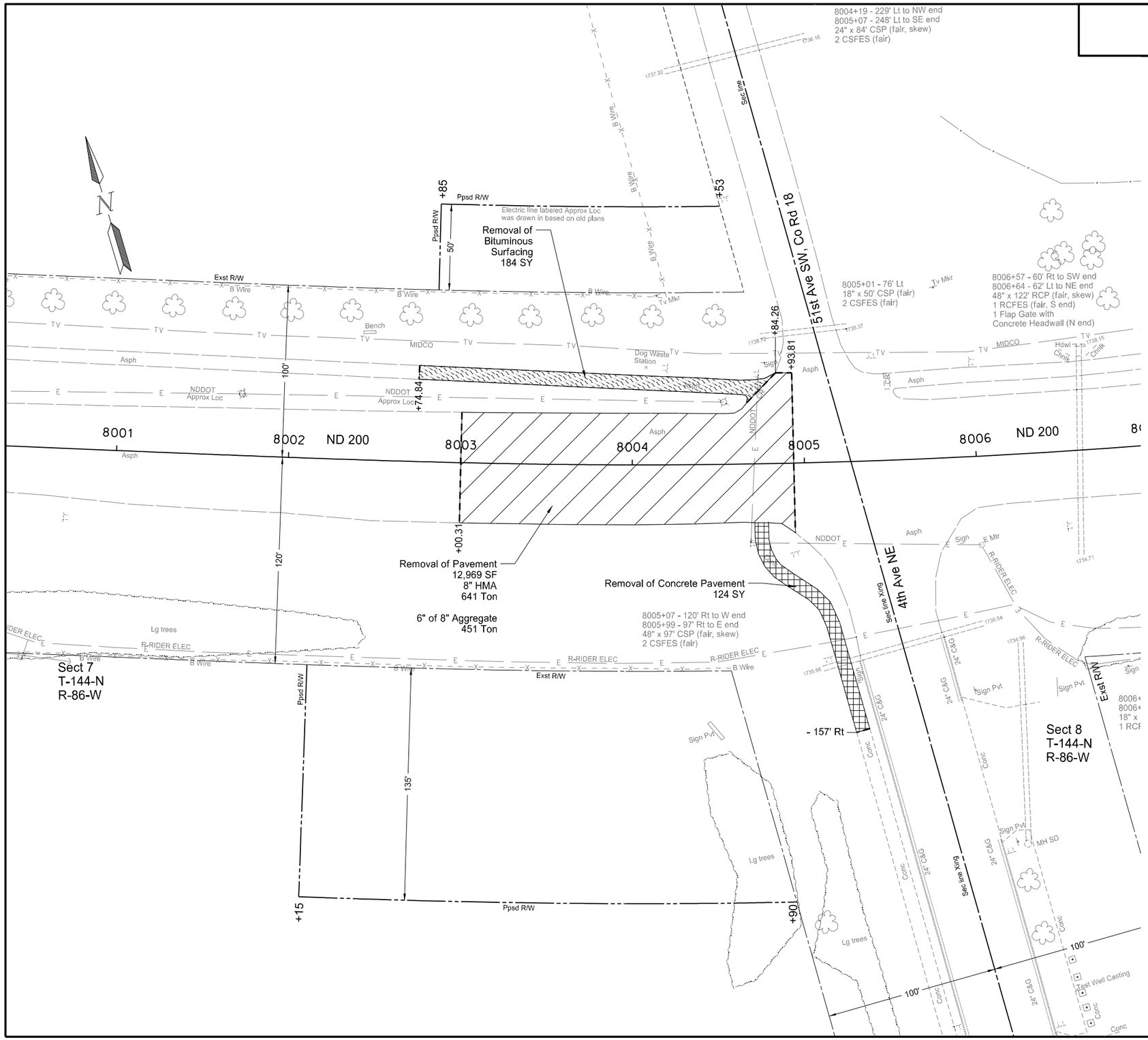
Removals

ND 200
Main St W - Hazen Golf Course

7931+15 to 7943+75

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	40	2

SPEC	CODE	BID ITEM	QTY	UNIT
202	0114	REMOVAL OF CONCRETE PAVEMENT		
		Sidewalk (south side of ND 200)	124	SY
202	0132	REMOVAL OF BITUMINOUS SURFACING		
		Sidewalk (north side of ND 200)	184	SY
202	0136	REMOVAL OF PAVEMENT		
		8003+00.31 to 8004+93.81 (ND 200)	1092	Ton



LEGEND

- Removal of Concrete Pavement
- Removal of Curb & Gutter
- Removal of Bituminous Surfacing
- Removal of Pavement

REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 11/5/25
NORTH DAKOTA

Removals

ND 200
Main St W - Hazen Golf Course

8000+45 to 8006+75

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	50	1

HYDRAULIC DATA FOR Project NDS-NH-5-200(034)150									
				25-YEAR DATA				100-YEAR DATA	
STATION	EXISTING PIPE	PROPOSED PIPE SIZE	DRAINAGE AREA (ACRES)	DESIGN DISCHARGE (CFS)	DESIGN HEADWATER (FT)	DESIGN VELOCITY (FPS)	DESIGN STAGE (NAVD 88)	100-YEAR DISCHARGE (CFS)	100-YEAR STAGE (NAVD 88)
8005+00 Lt	-	24” RCP	4.1	11.7	1.75	3.43	1735.83	17.9	1736.52

REGISTERED PROFESSIONAL ENGINEER
DYLAN P WEBER
PE-29356
DATE 10/23/25
NORTH DAKOTA

Culvert Hydraulic Data

ND 200
Main St W – Hazen Golf Course

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	50	2

MANHOLE SUMMARY

Manhole No.	1 – 108 In.	
Sta	8004+99.50 – 122’ Rt	
Top Elev.	1745.00	
Base Elev.	1735.28	
Invert Elev.	1735.66	
Riser	7.72 ft	
	48 In CSP E	1735.66
	48 In Conduit S	1735.73

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PE-8772
DATE 9/23/25
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	51	1

Begin Station / Location	Begin Offset	End Station / Location	End Offset	Pipe Installation (Pay Item)			Allowable Material	Required Diameter	Steel Pipe Coatings	Steel Pipe Corrugations or Spiral Ribs	Steel Pipe Minimum Thickness	Geosynthetic Material - Type G (Pay Item)	(*) End Sections		Applicable Backfill
				In	Bid Item	LF		In	Type		In	SY	Begin EA	End EA	
8004+11.14	70' Lt	8004+59.96	103' Lt	24	Pipe Conduit - Approach	58	Reinforced Concrete Pipe - Class **III (barrel length = 56 LF)**	24					FES		Specification 714.04 A
							Corrugated Steel Pipe	24	Z, A, P	2	0.064				
8004+59.96	103' Lt	8005+30.45	148' Lt	24	Jack or Bored Pipe Conduit	82	Reinforced Concrete Pipe - Class **III (barrel length = 82 LF)**	24							Section 20 Sheet 2
							Smooth Walled Steel	24			0.312				
8005+30.45	148' Lt	8005+77.82	178' Lt	24	Pipe Conduit - Approach	54	Reinforced Concrete Pipe - Class **III (barrel length = 54 LF)**	24						Flap Gate	Specification 714.04 A
							Corrugated Steel Pipe	24	Z, A, P	2	0.064				
8004+99.88	126' Rt	8005+02.20	154' Rt	48	Pipe Conduit	28	Reinforced Concrete Pipe - Class **III (barrel length = 24 LF)**	48						FES	Standard D-714-27
							Corrugated Steel Pipe	48	Z, A, P	2, 3, 5	0.064, 0.105, 0.064				
							Spiral Rib Steel Pipe	48	Z, A, P	3/4, 1	0.064				
8005+03.72	121' Rt	8005+07.47	120' Rt	48	Pipe Corr. Steel (Extension)	4	Corrugated Steel Pipe	48	Z, A, P	2	0.064				Specification 714.04 A

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

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

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

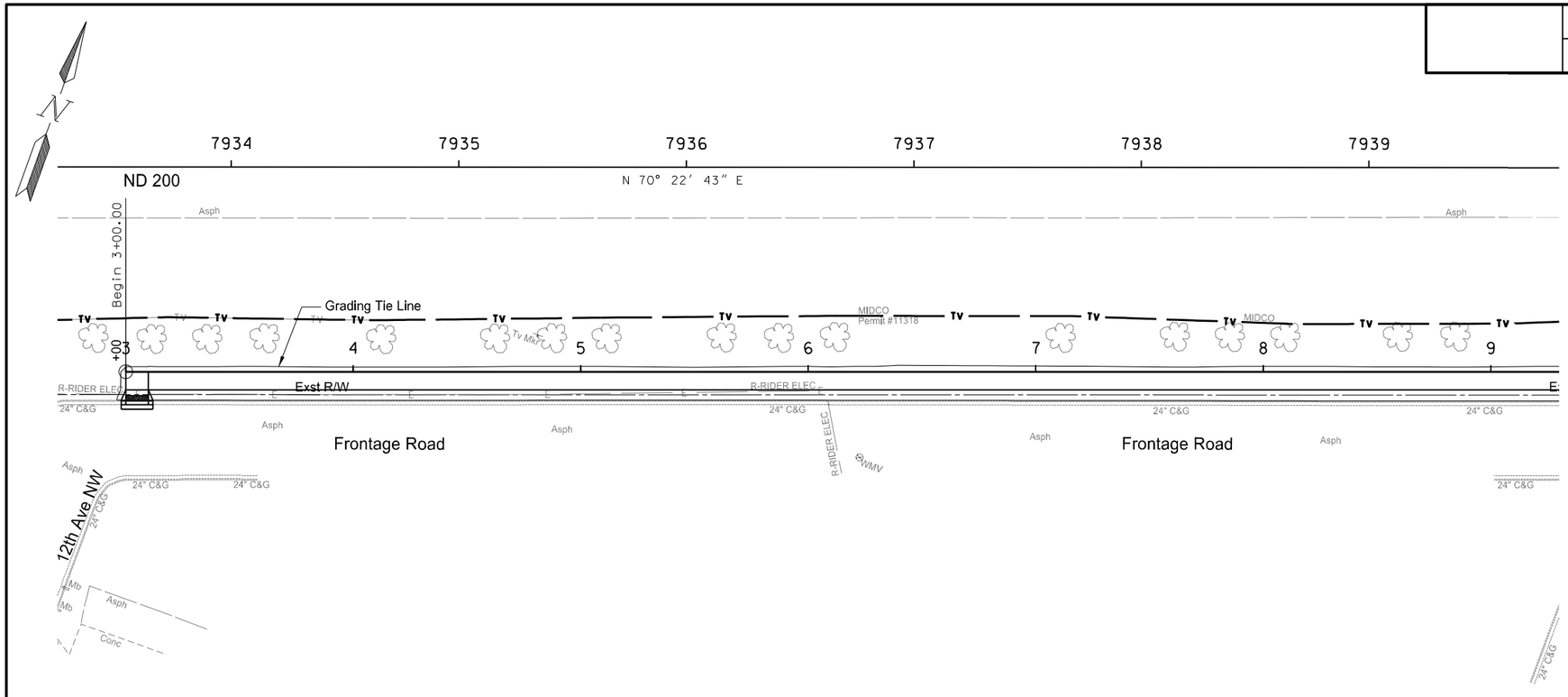
(*) End sections are measured and paid for separately for pipe extensions.
FES = Flared End Section
TES = Traversable End Section

REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 9/29/25
NORTH DAKOTA

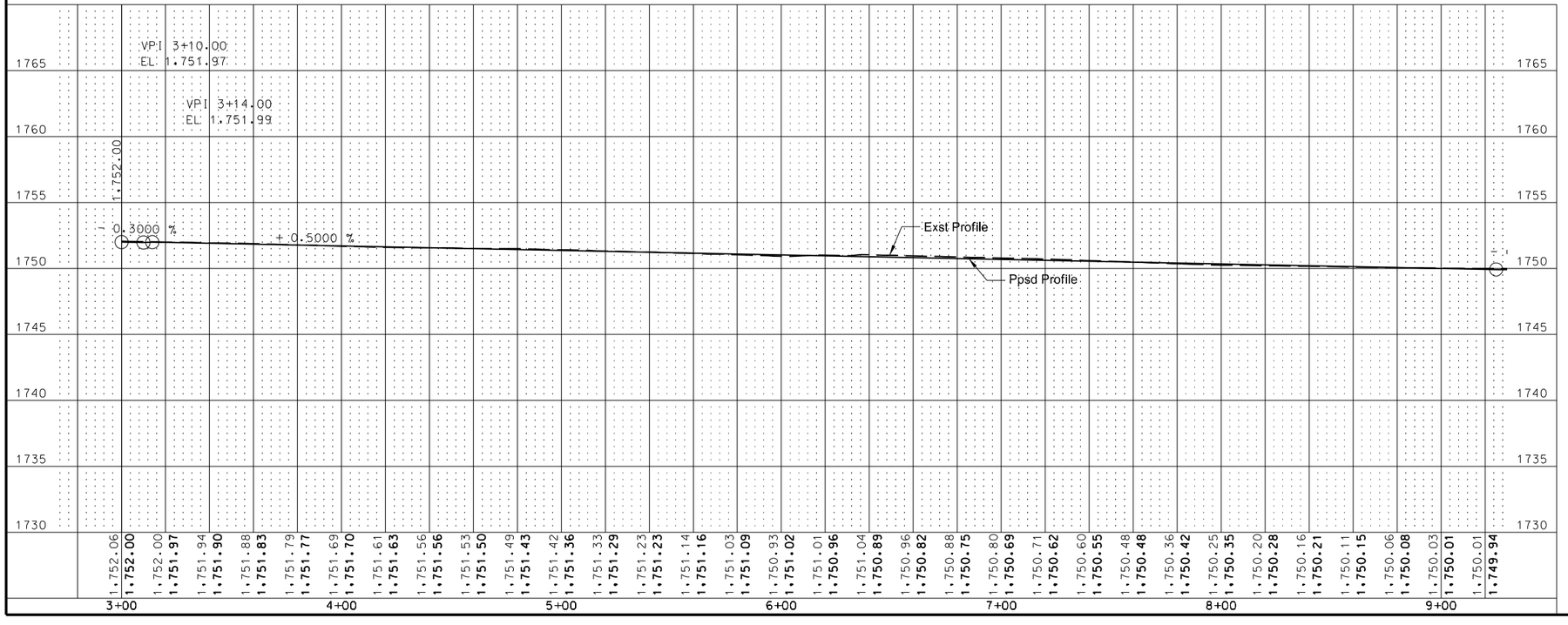
Allowable Pipe List

ND 200
Main St W – Hazen Golf Course

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	60	1



SPEC	CODE	BID ITEM	QTY	UNIT
302	0120	AGGREGATE BASE COURSE CL 5		
		Frontage Road Sdwk 3+00 to 9+00	212	TON
430	0043	SUPERPAVE FAA 43		
		Frontage Road 2+98 to 3+12	2	TON
748	0140	CURB & GUTTER-TYPE 1		
		Frontage Road 2+98 to 3+12	14	LF
750	0115	SIDEWALK CONCRETE 4IN		
		Frontage Road Sdwk 3+00 to 9+00	540	SY
750	2115	DETECTABLE WARNING PANELS		
		Frontage Road Sdwk 3+00 (2' x 10')	20	SF



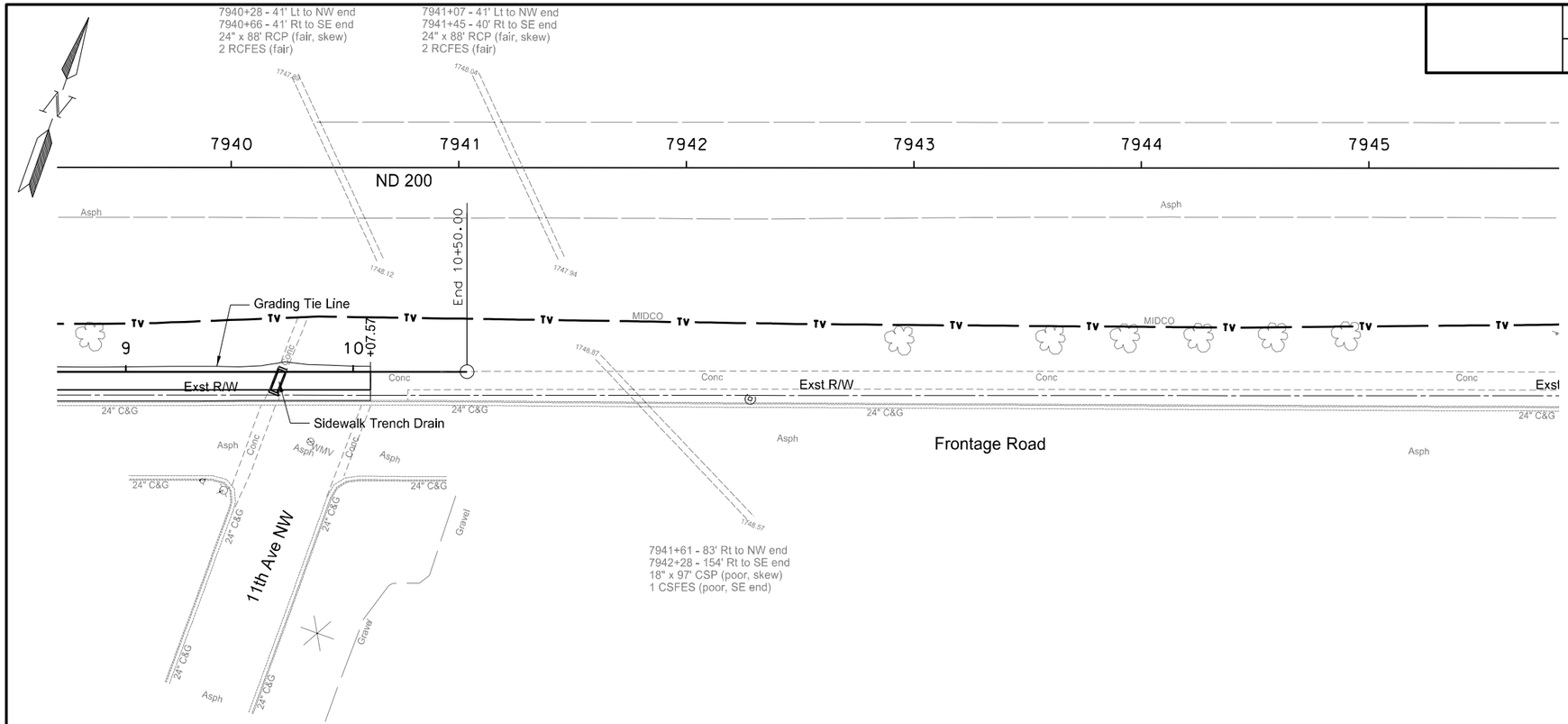
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 1/9/26
NORTH DAKOTA

Plan & Profile

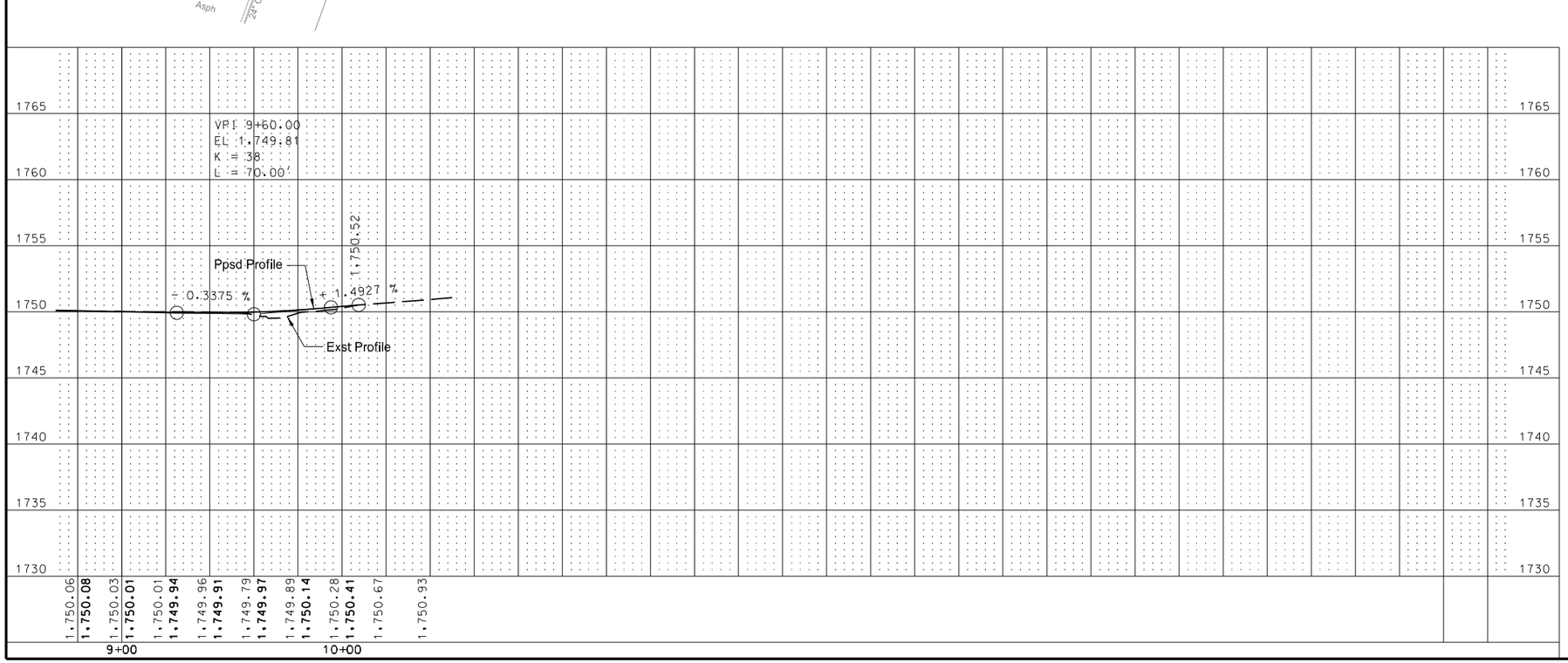
ND 200
Main St W - Hazen Golf Course

Frontage Road Shared Use Path
3+00 to 9+00

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	60	2



SPEC	CODE	BID ITEM	QTY	UNIT
302	0120	AGGREGATE BASE COURSE CL 5		
		Frontage Road Sdwk 9+00 to 10+07.57	37	TON
750	0115	SIDEWALK CONCRETE 4IN		
		Frontage Road Sdwk 9+00 to 10+07.57	93	SY
750	0150	SIDEWALK TRENCH DRAIN		
		Frontage Road Sdwk 9+68	1	EA



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STACY LATEN
PE-8772
DATE 1/9/26
NORTH DAKOTA

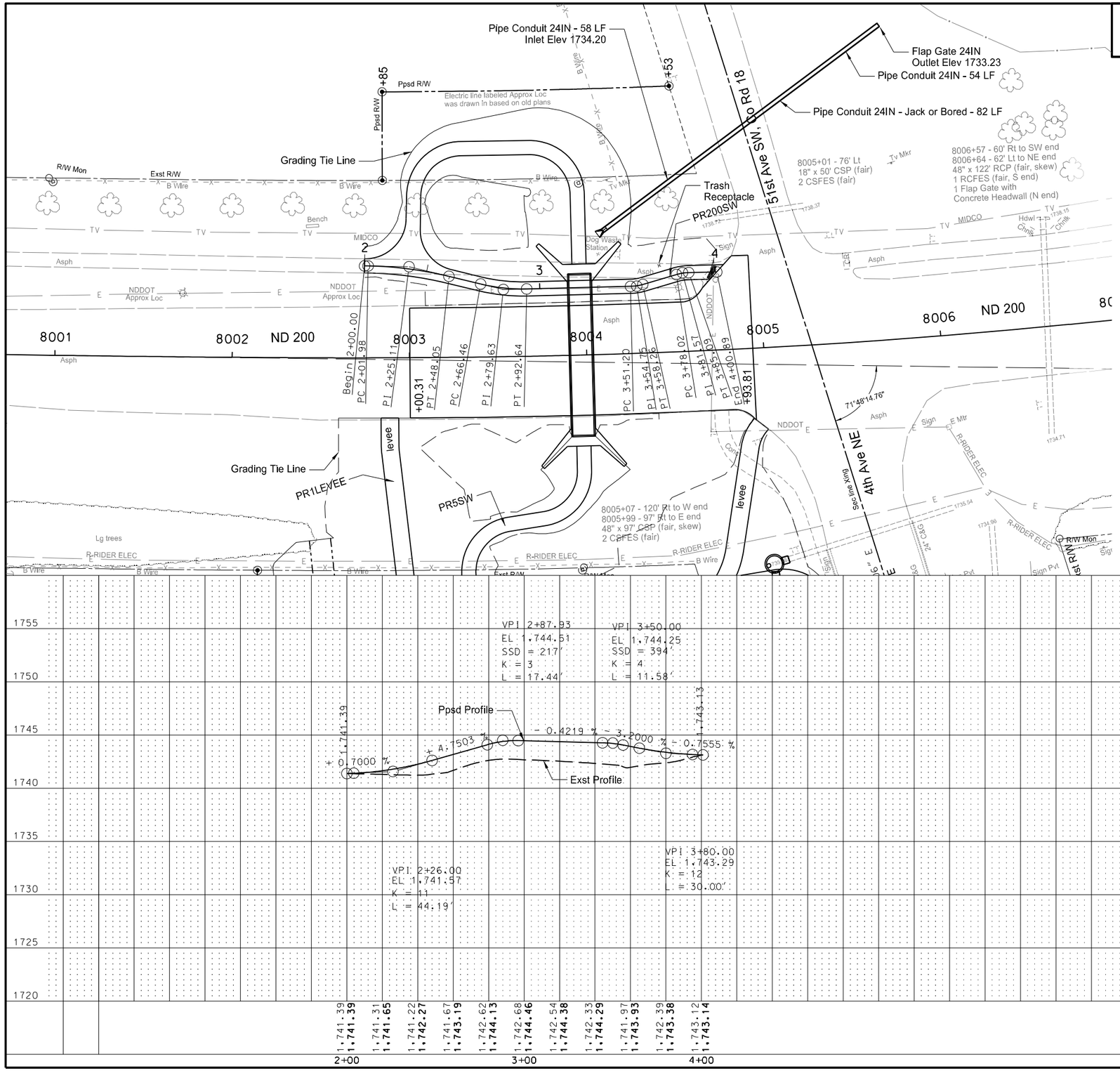
Plan & Profile

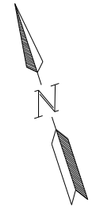
ND 200
Main St W - Hazen Golf Course

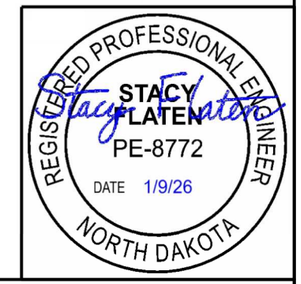
Frontage Road Shared Use Path
9+00 to 10+07.57

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	60	3

SPEC	CODE	BID ITEM	QTY	UNIT
302	0120	AGGREGATE BASE COURSE CL 5		
		Sdwk 2+00 to 4+00.89 (PR200SW)	69	TON
714	4106	PIPE CONDUIT 24IN-APPROACH		
		8004+11.14 - 70' Lt to 8004+59.96 - 103' Lt (EX200)	58	LF
		8005+30.45 - 148' Lt to 8005+77.82 - 178' Lt (EX200)	54	LF
714	4165	PIPE CONDUIT 24IN-JACKED OR BORED		
		8004+59.96 - 103' Lt to 8005+30.45 - 148' Lt (EX200)	82	LF
714	9912	FLAP GATE 24IN		
		8005+77.82 - 178' Lt (EX200)	1	EA
750	0115	SIDEWALK CONCRETE 4IN		
		Sdwk 2+00 to 4+00.89 (PR200SW)	178	SY
750	2115	DETECTABLE WARNING PANELS		
		Sdwk 4+00 (PR200SW) (2' x 8')	16	SF
970	0320	TRASH RECEPTACLE		
		ND 200 8004+43 - 49' Lt (EX200)	1	EA







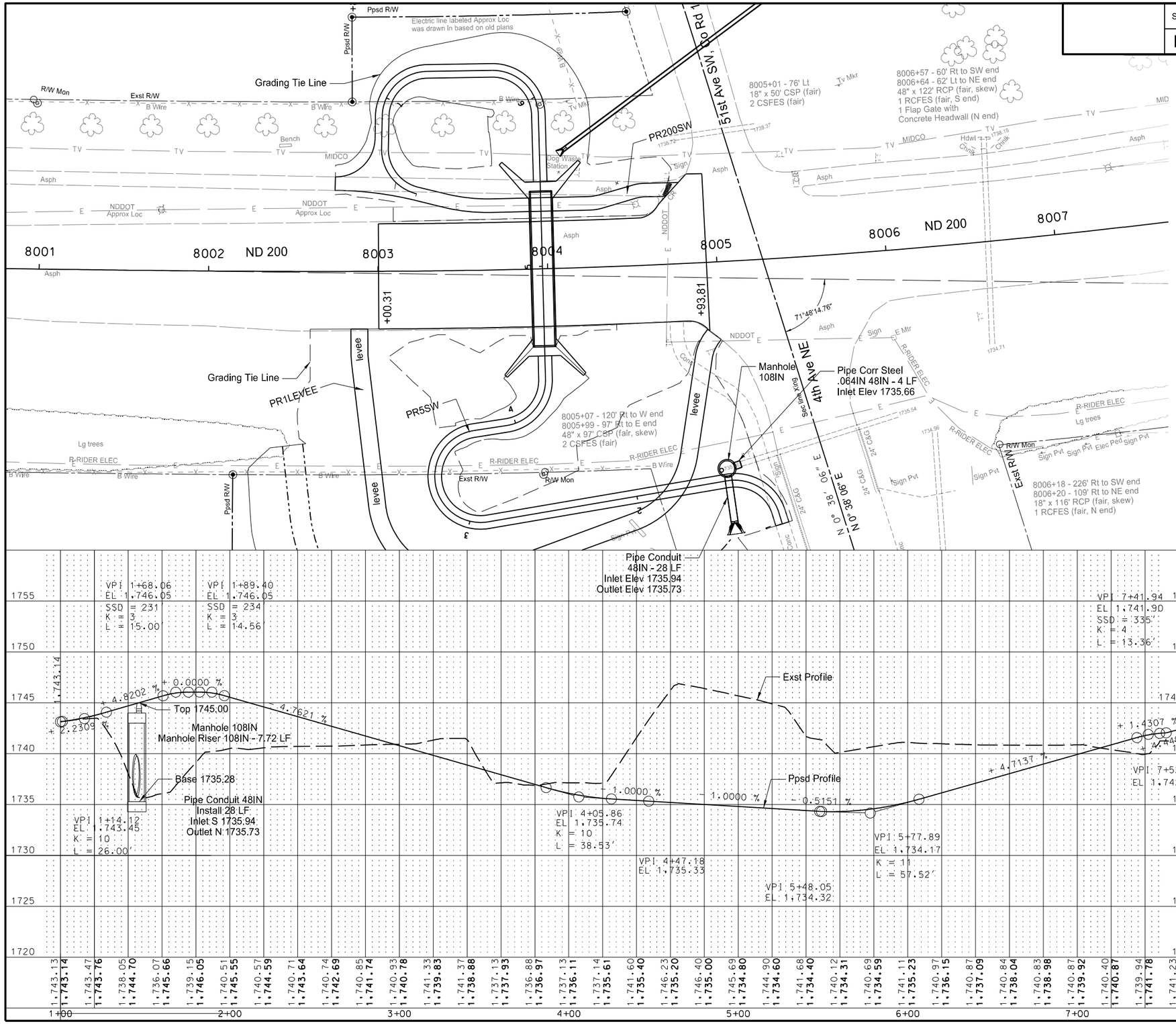
Plan & Profile

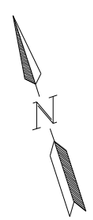
ND 200
Main St W - Hazen Golf Course

Shared Use Path (PR200SW)
2+00 to 4+00.89

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	60	4

SPEC	CODE	BID ITEM	QTY	UNIT
202	0169	REMOVAL OF END SECTION-ALL TYPES & SIZES		
		8005+07.47 - 120' Rt (EX200)	1	EA
302	0120	AGGREGATE BASE COURSE CL 5		
		Sdwk 1+00 to 4+47.18 (PR5SW)	121	TON
		Sdwk 5+49.85 to 7+52.27 (PR5SW)	77	TON
		ND 200 8003+00.31 to 8004+93.81 (EX200)	993	TON
430	0043	SUPERPAVE FAA 43		
		ND 200 8003+00.31 to 8004+93.81 (EX200)	523	TON
714	4125	PIPE CONDUIT 48IN		
		8004+99.88 - 126' Rt to 8005+02.20 - 154' Rt (EX200)	28	LF
714	5055	PIPE CORR STEEL .064IN 48IN		
		8005+03.72 - 121' Rt to 8005+07.47 - 120' Rt (EX200)	4	LF
722	0200	MANHOLE 108IN		
		8004+99.5 - 122' Rt (EX200)	1	EA
722	1200	MANHOLE RISER 108IN		
		8004+99.5 - 122' Rt (EX200)	7.72	LF
750	0115	SIDEWALK CONCRETE 4IN		
		Sdwk 1+00 to 4+47.18 (PR5SW)	309	SY
		Sdwk 5+49.85 to 7+52.27 (PR5SW)	199	SY





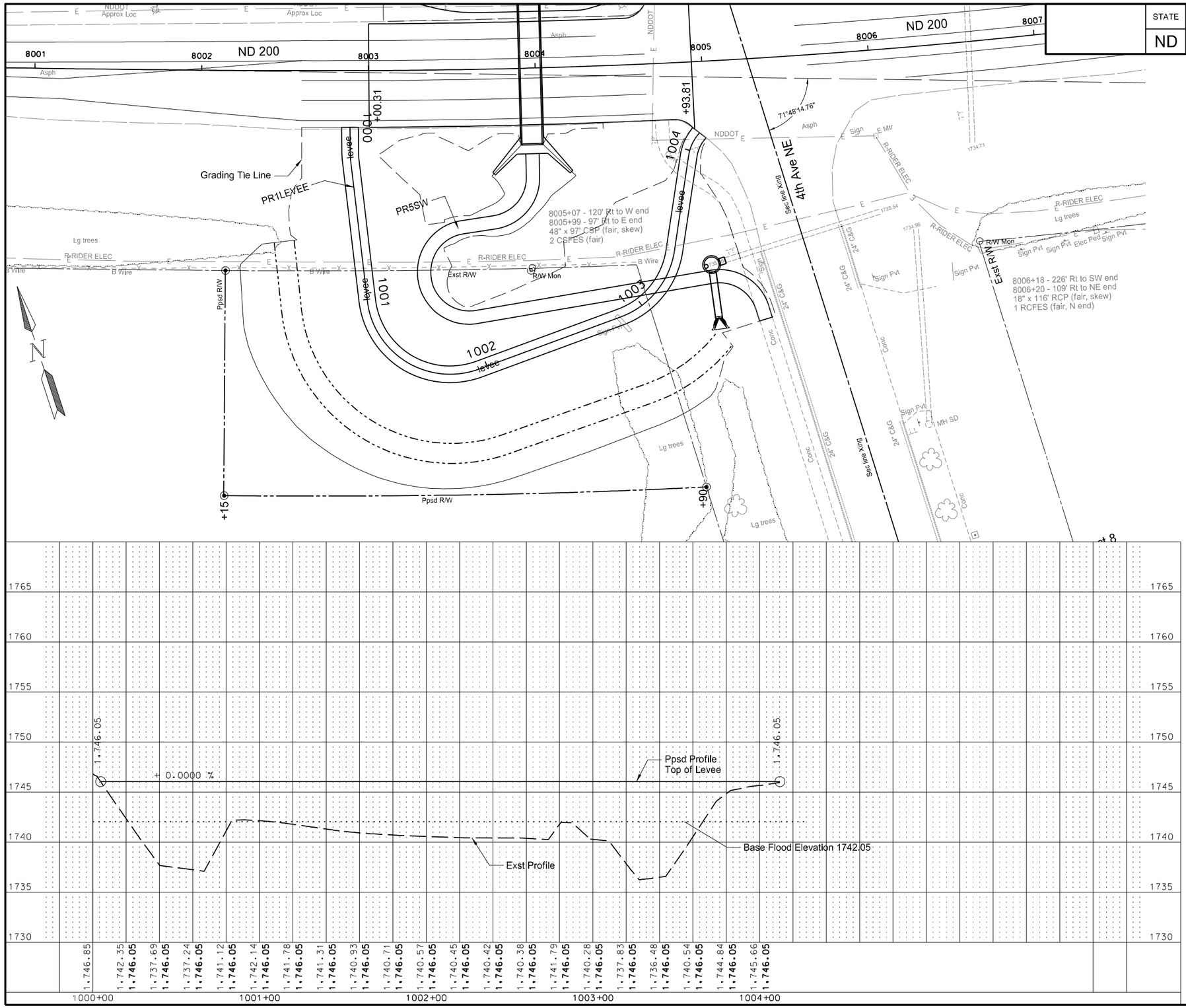


Plan & Profile

ND 200
Main St W - Hazen Golf Course

Shared Use Path (PR5SW)
1+00 to 7+52.27

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	60	5



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Plan & Profile

ND 200
Main St W - Hazen Golf Course

Levee (PR1Levee)
1000+00 to 1004+12.16

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	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)
1	Sec.13, T144N, R87W	Created	No	0	0	0	0	N	N	N										
2	Sec. 13, T144N, R87W	Created	No	0	0	0	0	N	N	N										
3	Sec.8, T144N, R86W	Created	Yes	0	0	0	0	N	N	N										
				0	**0**	**0**	**0**					**0**		**0**		**0**		**0**		0

Other Waters Impact Table

Other Waters											Other Water Mitigation				
			Size				Impacts to Other Waters				Mitigation Required				
							Acre(s)		Linear Feet						
Number	Location	Type	Acre(s)	Linear Feet	Feature	USACE Jurisdictional[1]	Temp	Perm	Temp	Perm	EO 11990	USACE	USFWS	Mitigation Location; ratio	Method
OW 1a	Sec.18 & 7, T144N, R86W	Stream	0.03	38	Natural	Yes	0	0	0	0	N	N	N	NA	NA
OW 1b	Sec. 7, T144N, R86W	Stream	0.01	19	Natural	Yes	0	0	0	0	N	N	N	NA	NA
		Totals	**0.04**	**57**			**0**	**0**	**0**	**0**					

Other Water - Drainages Impact Table

Other Waters											Other Water Mitigation				
			Size				Impacts to Other Waters				Mitigation Required				
							Acre(s)		Linear Feet						
Number	Location	Type	Acre(s)	Linear Feet	Feature	USACE Jurisdictional[1]	Temp	Perm	Temp	Perm	EO 11990	USACE	USFWS	Mitigation Location; ratio	Method
OW 2-D	Sec.8, T144N, R86W	Constructed discharge channel with rill	0.02	71	Natural	Yes	0	0	0	0	N	N	N	NA	NA
		Totals	**0.02**	**71**			**0**	**0**	**0**	**0**					

[1] A wetland Jurisdictional Determination was issued by the USACE on 12/2/2021; NWO-2007-03831-BIS.

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NORTH DAKOTA

Wetlands Mitigation and Environmental

ND 200
Main St W – Hazen Golf Course

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	75	2

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)	0.000	**Temporary Wetland JD**	0.000
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**	0.000
Total	**0.000**	**Temporary OW**	0.000
JD Natural (Cut)	0.000	**Permanent OW-d**	0.000
JD Artificial (Cut)	0.000	**Temporary OW-d**	0.000
Non-JD Natural (Cut)	0.000		
Non-JD Artificial (Cut)	0.000		
Total	**0.000**		

Mitigation Summary Table

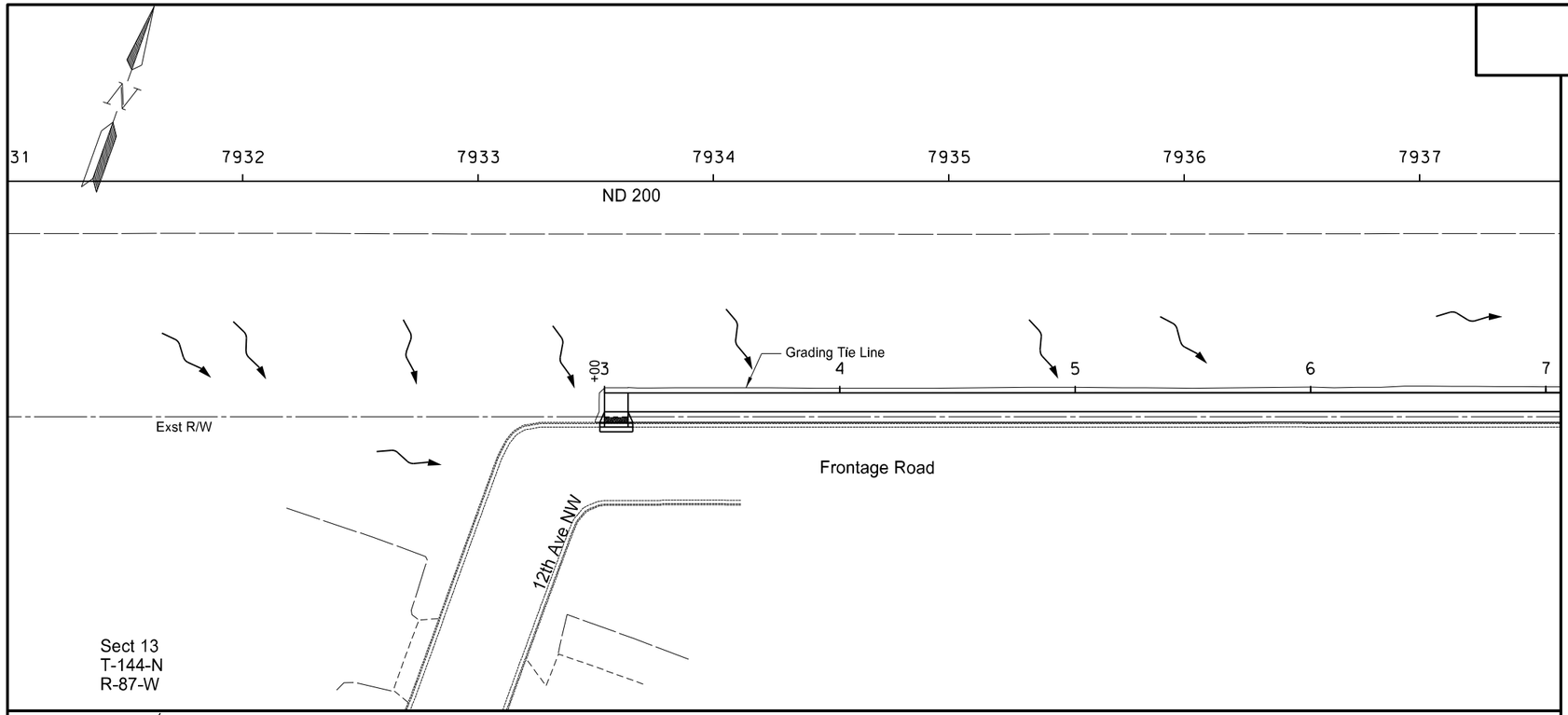
	Location	Ditch Shift Acre(s)	Onsite Acre(s)	11990 Bank Acre(s)	USACE/11990 Bank Acre(s)	USFWS Bank Acre(s)
USACE Only						
EO 11990 Only						
USACE/11990						
USFWS						
	Total	**0**	**0**	**0**	**0**	**0**

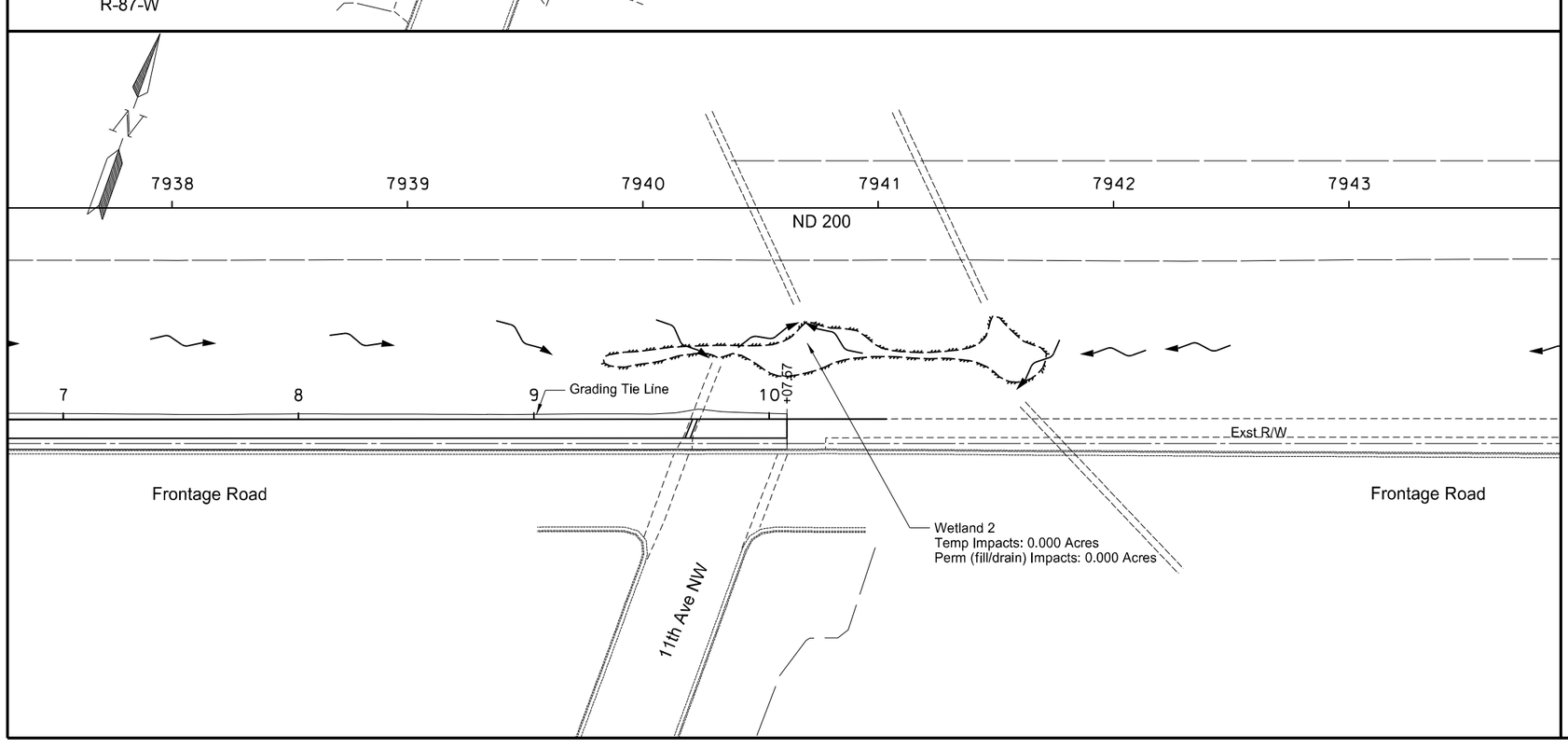
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NORTH DAKOTA

Wetlands Mitigation and Environmental

ND 200
Main St W – Hazen Golf Course

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	75	3





Grading Tie Line (Fill)

Grading Tie Line (Cut)

Grading Tie Line (Transition)

Ditch

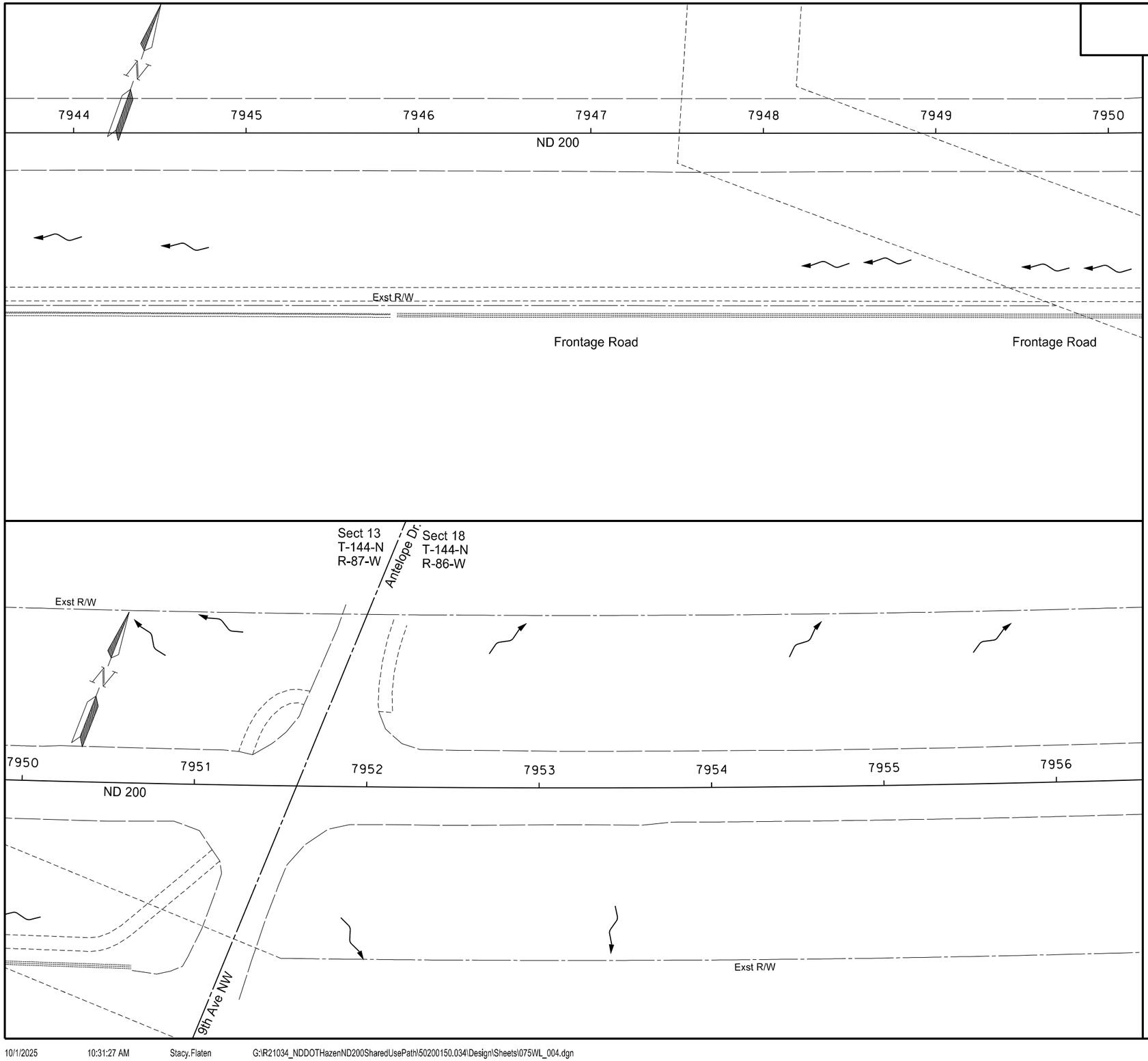
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DATE 10/1/25
NORTH DAKOTA

Wetland Impacts

ND 200
Main St W - Hazen Golf Course

7931+15 to 7943+75

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	75	4



Grading Tie Line (Fill)

Grading Tie Line (Cut)

Grading Tie Line (Transition)

Ditch

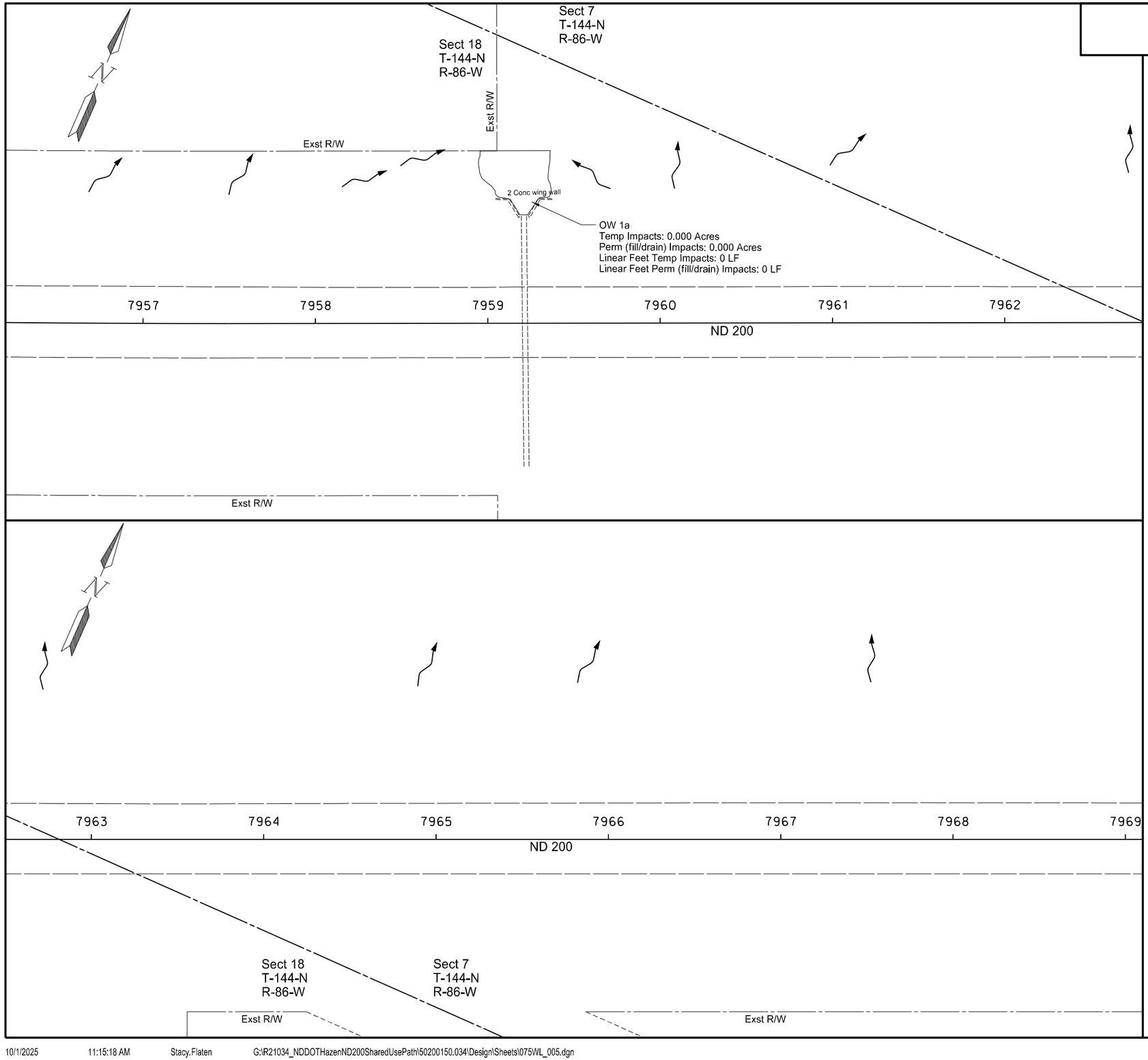
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STACY LATEN
PE-8772
DATE 10/1/25
NORTH DAKOTA

Wetland Impacts

ND 200
Main St W - Hazen Golf Course

7943+75 to 7956+35

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	75	5



Grading Tie Line (Fill)

Grading Tie Line (Cut)

Grading Tie Line (Transition)

Ditch

REGISTERED PROFESSIONAL ENGINEER
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NORTH DAKOTA

Wetland Impacts

ND 200
Main St W - Hazen Golf Course

7956+35 to 7968+95

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	75	6

OW 1b
Temp Impacts: 0.000 Acres
Perm (fill/drain) Impacts: 0.000 Acres
Linear Feet Temp Impacts: 0 LF
Linear Feet Perm (fill/drain) Impacts: 0 LF

7969 7970 7971 7972 7973 7974 7975

ND 200

Exst R/W

Sect 7
T-144-N
R-86-W

3rd Ave NW
Co Rd 27

7976 7977 7978 7979 7980 7981

ND 200

3rd Ave NW

Exst R/W

Sect 7
T-144-N
R-86-W

Grading Tie Line (Fill)

Grading Tie Line (Cut)

Grading Tie Line (Transition)

Ditch

REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 10/1/25
NORTH DAKOTA

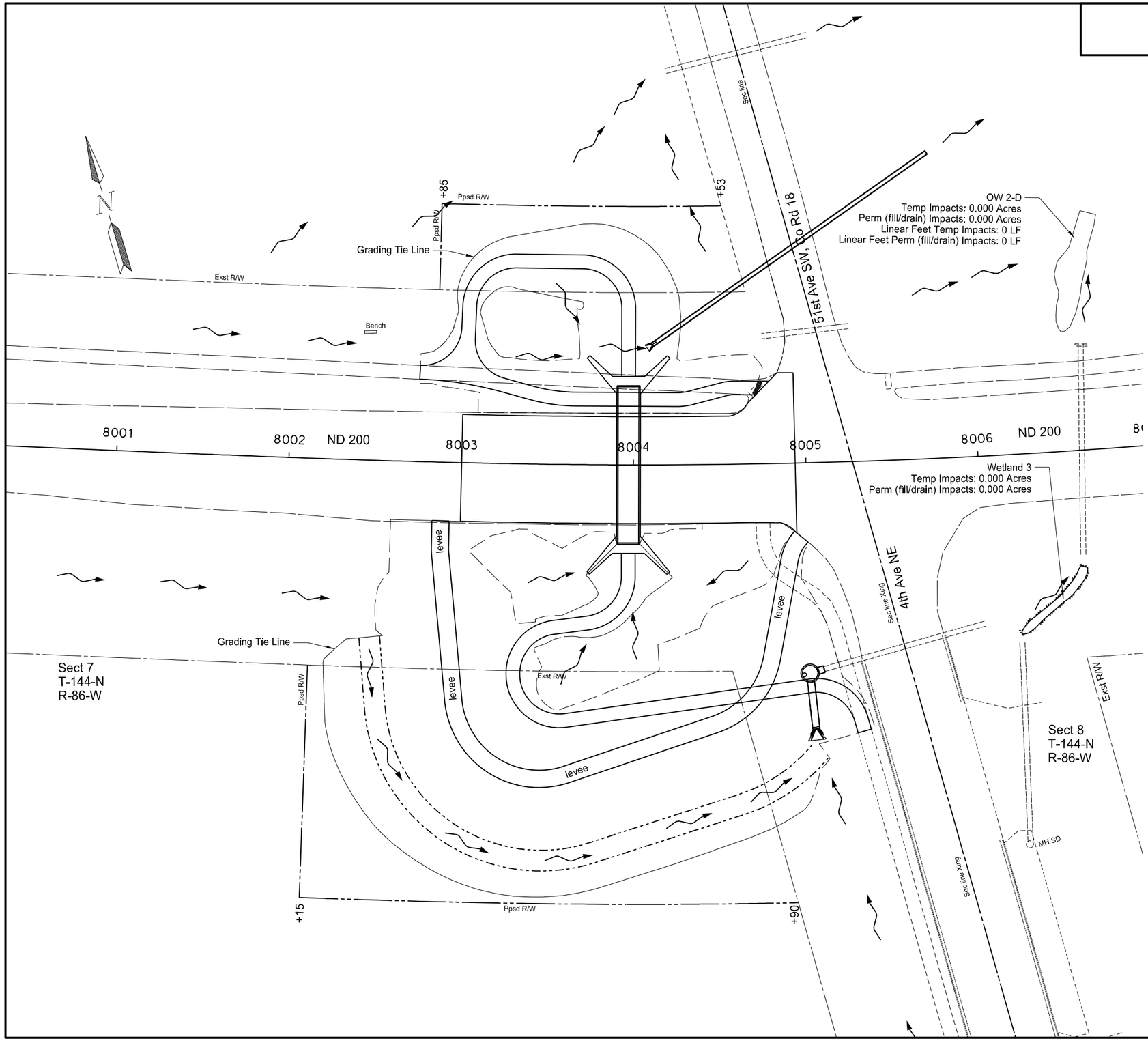
Stacy Flaten

Wetland Impacts

ND 200
Main St W - Hazen Golf Course

7968+95 to 7981+55

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	75	7



— — Grading Tie Line (Fill)

——— Grading Tie Line (Cut)

· · · · · · Grading Tie Line (Transition)

— · — — Ditch

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DATE 10/1/25
NORTH DAKOTA

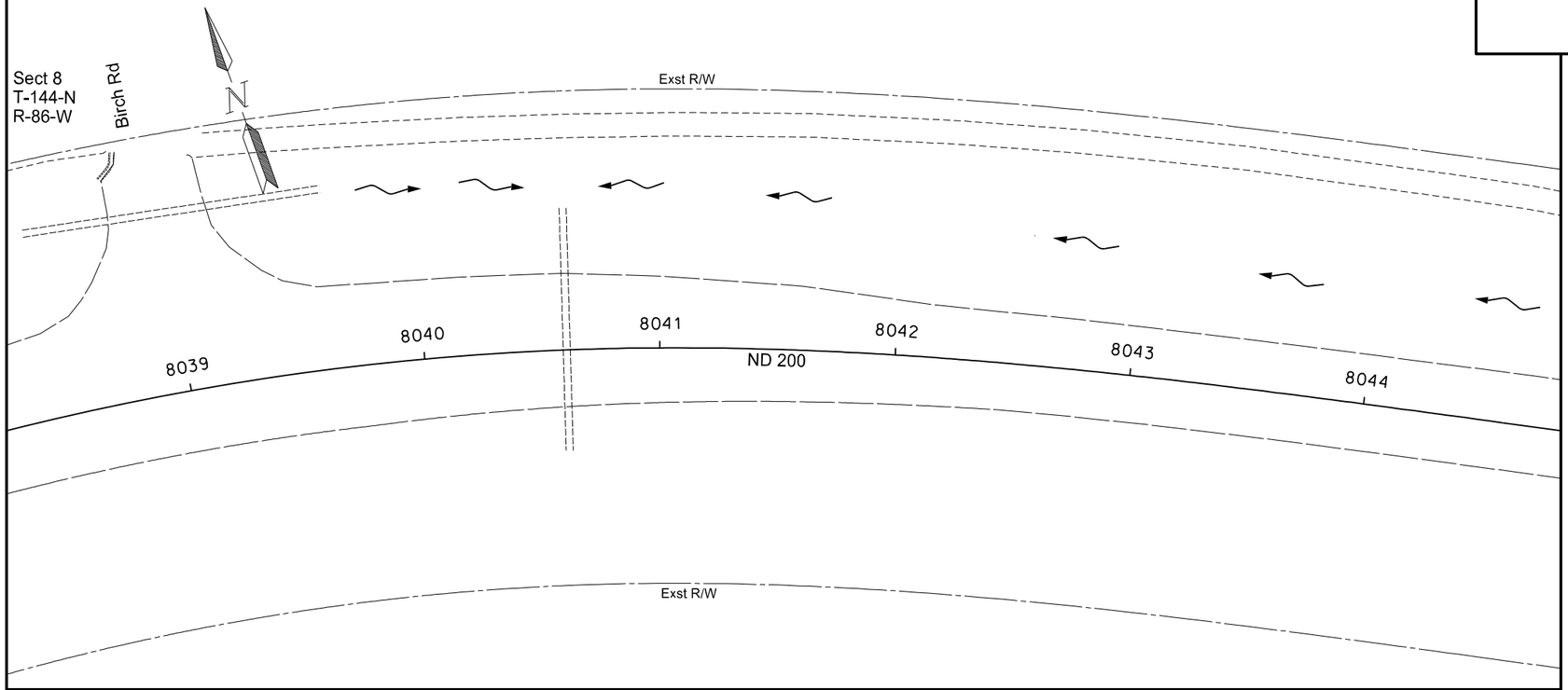
Stacy Flaten

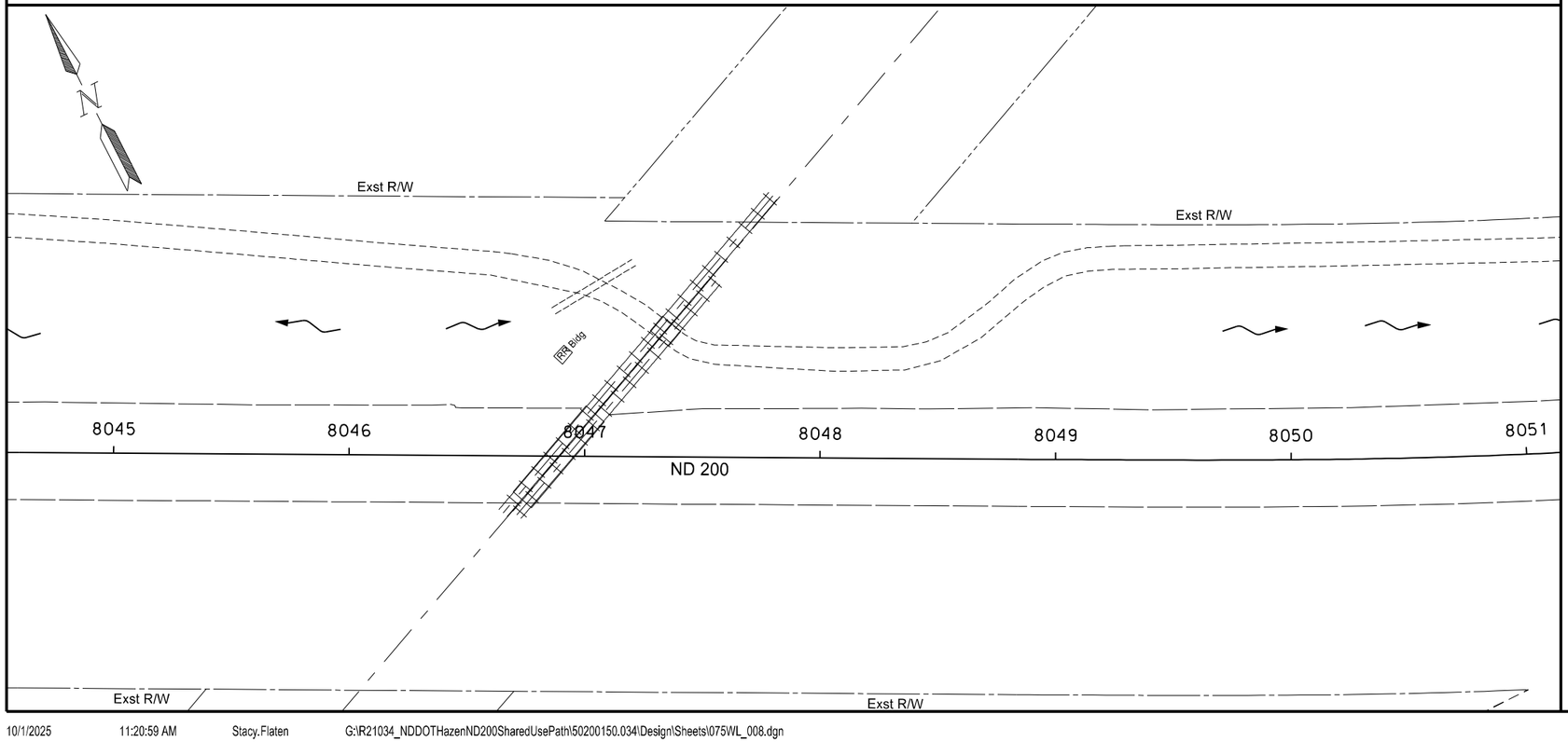
Wetland Impacts

ND 200
Main St W - Hazen Golf Course

8000+45 to 8006+75

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	75	8





Grading Tie Line (Fill)

Grading Tie Line (Cut)

Grading Tie Line (Transition)

Ditch

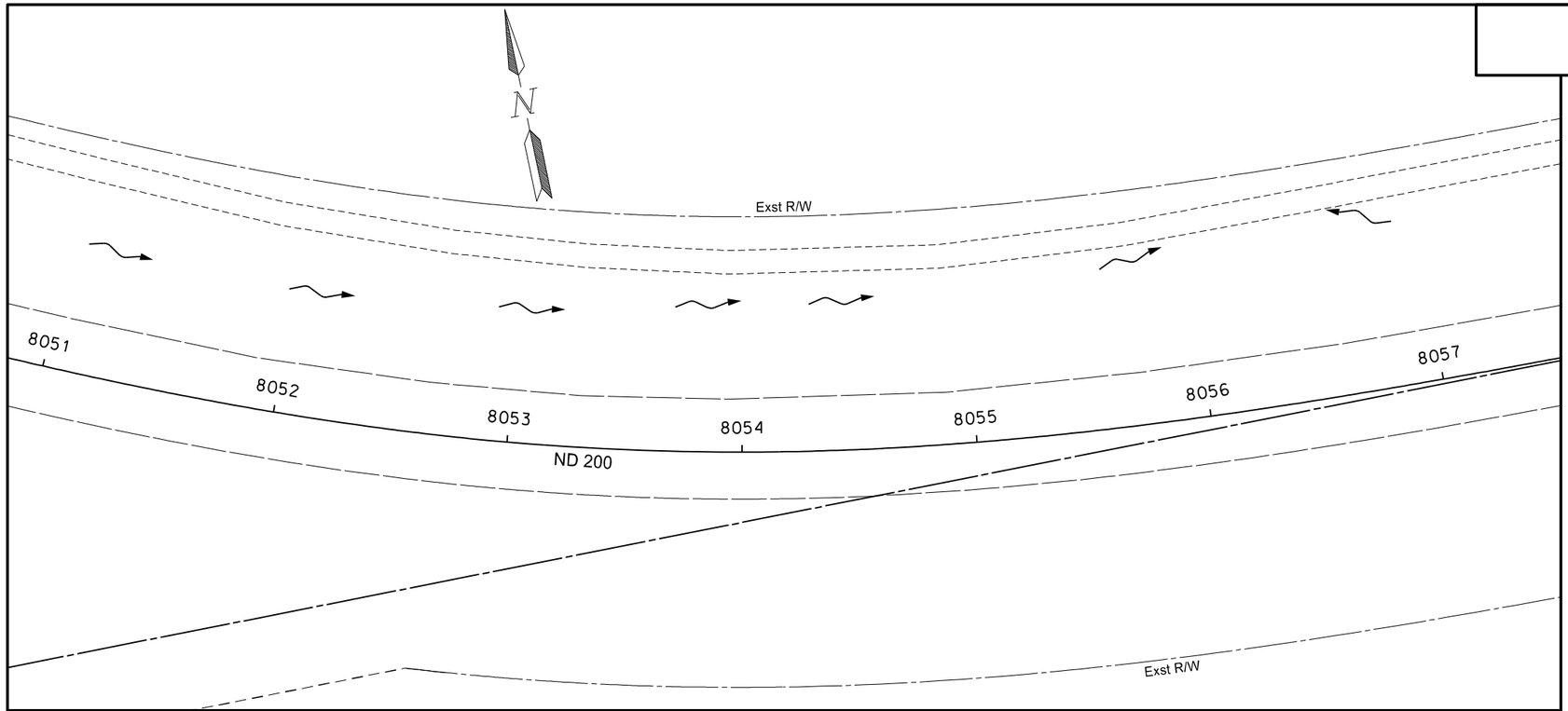
REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 10/1/25
NORTH DAKOTA

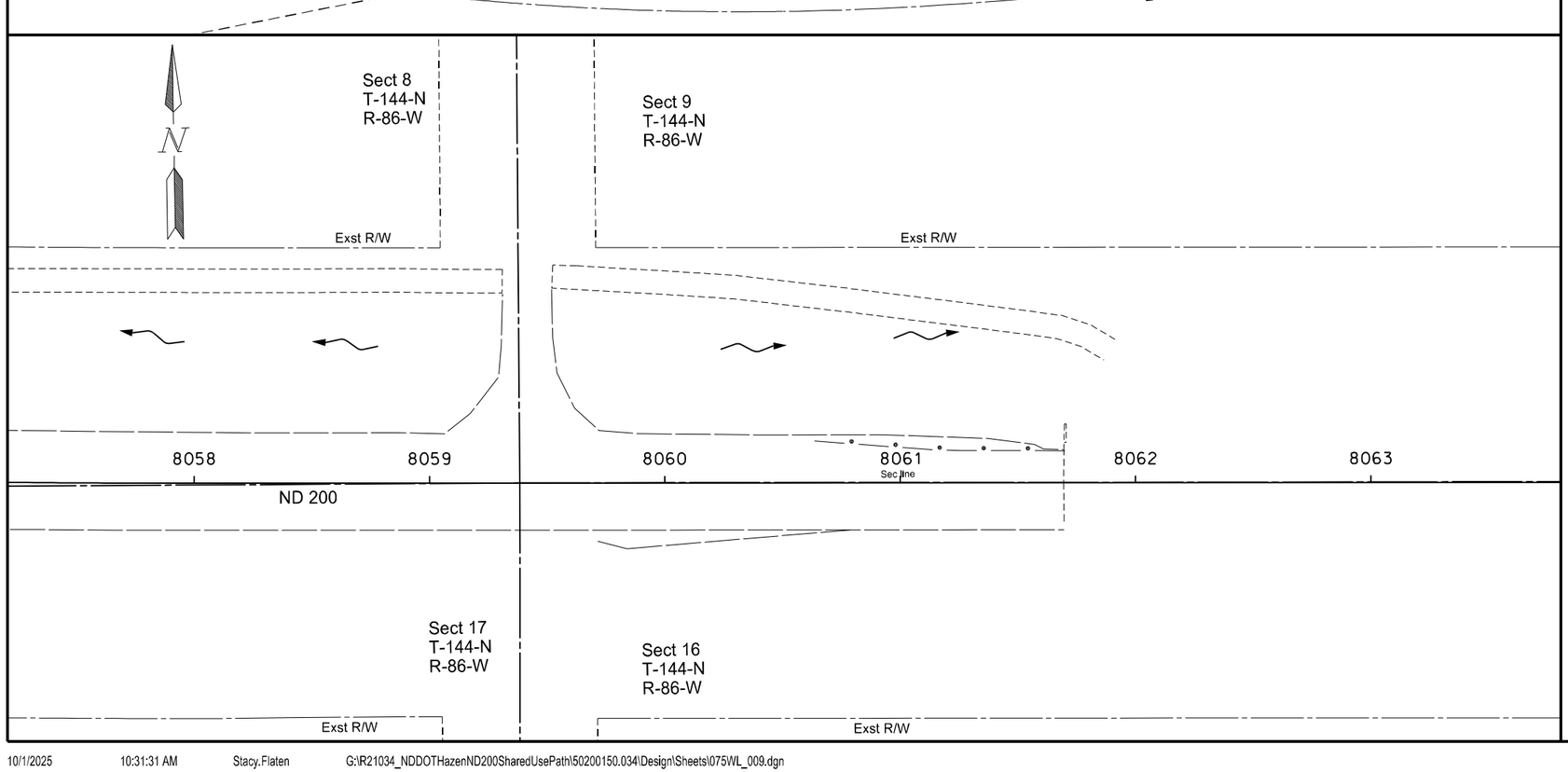
Wetland Impacts

ND 200
Main St W - Hazen Golf Course

8038+25 to 8050+85

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	75	9





— — Grading Tie Line (Fill)

——— Grading Tie Line (Cut)

. . . . . Grading Tie Line (Transition)

-·-·- Ditch

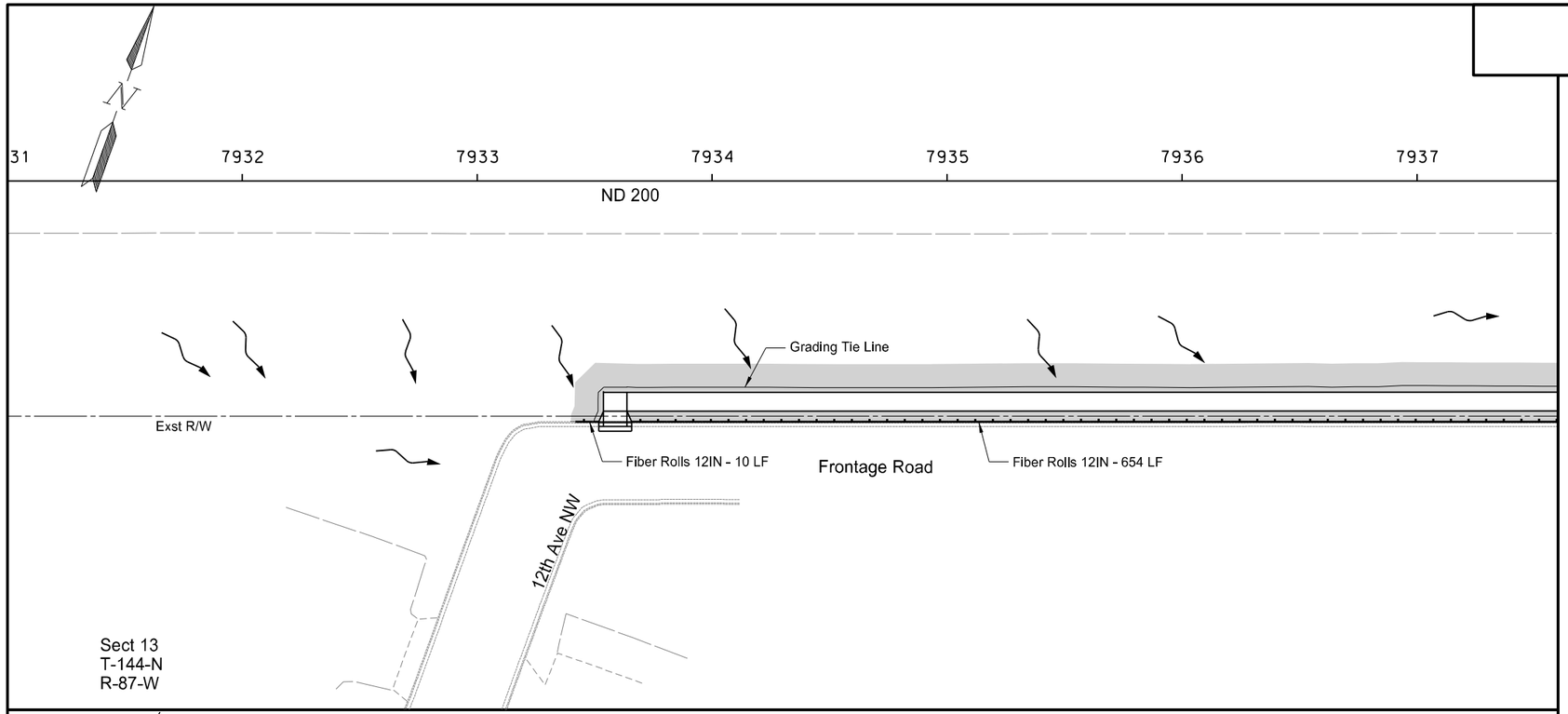
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/1/25
NORTH DAKOTA

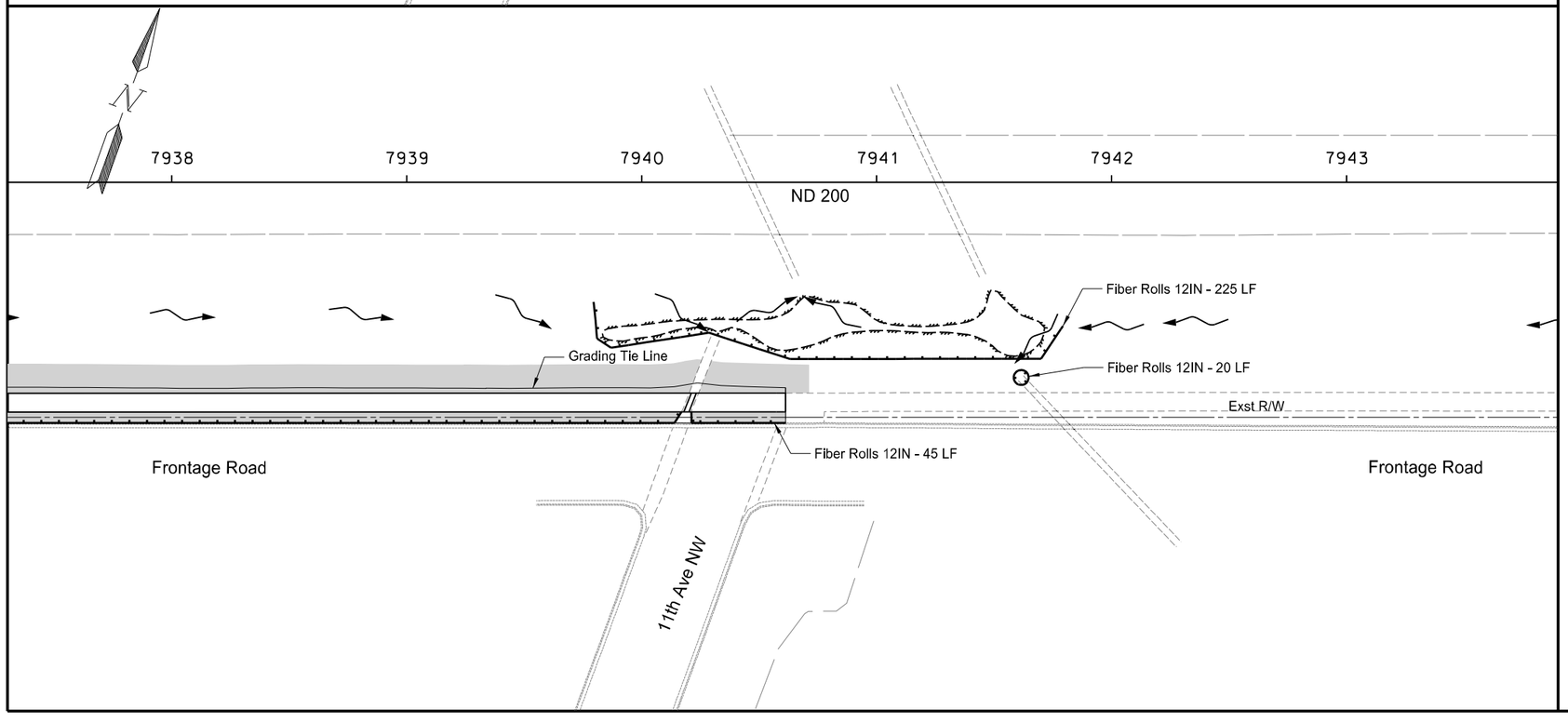
Wetland Impacts

ND 200
Main St W - Hazen Golf Course

8050+85 to 8063+45

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	76	1





SPEC	CODE	BID ITEM	UNIT	QUANTITY
251	2000	TEMPORARY COVER CROP		
		Frontage Road	ACRE	0.29
253	201	HYDRAULIC MULCH		
		Frontage Road	ACRE	0.29
261	112	FIBER ROLLS 12IN		
		7933+42 - 102' Rt to 7933+52 - 102' Rt	LF	10
		7933+66 - 102' Rt to 7940+17 - 98' Rt	LF	654
		Wetland	LF	225
		7940+21 - 98' Rt to 7940+61 - 102' Rt	LF	45
		End Section 7941+61 - 83' Rt	LF	20
261	113	REMOVE FIBER ROLLS 12IN		
		7933+42 - 102' Rt to 7933+52 - 102' Rt	LF	10
		7933+66 - 102' Rt to 7940+17 - 98' Rt	LF	654
		Wetland	LF	225
		7940+21 - 98' Rt to 7940+61 - 102' Rt	LF	45
		End Section 7941+61 - 83' Rt	LF	20

LEGEND

- Temporary Cover Crop Hydraulic Mulch
- Fiber Rolls 12IN
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Grading Tie Line (Transition)
- Ditch

REGISTERED PROFESSIONAL ENGINEER
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DATE 10/15/25
NORTH DAKOTA

Temporary Erosion Control

ND 200
Main St W - Hazen Golf Course

7931+15 to 7943+75

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	76	2

SPEC	CODE	BID ITEM	UNIT	QUANTITY
251	2000	TEMPORARY COVER CROP		
		N side of ND 200	ACRE	0.51
		S side of ND 200	ACRE	1.33
253	201	HYDRAULIC MULCH		
		N side of ND 200	ACRE	0.51
		S side of ND 200	ACRE	1.33
261	112	FIBER ROLLS 12IN		
		End Section 8004+19 - 229' Lt	LF	20
		End Section 8004+75 - 74' Lt	LF	20
		8002+86 - 99' Lt to 8004+45 - 149' Lt	LF	204
		8002+16 - 222' Rt to 8005+01 - 211' Rt	LF	365
		8005+63 - 139' Lt to 8005+67 - 201' Lt	LF	88
261	113	REMOVE FIBER ROLLS 12IN		
		End Section 8004+19 - 229' Lt	LF	20
		End Section 8004+75 - 74' Lt	LF	20
		8002+86 - 99' Lt to 8004+45 - 149' Lt	LF	204
		8002+16 - 222' Rt to 8005+01 - 211' Rt	LF	365
		8005+63 - 139' Lt to 8005+67 - 201' Lt	LF	88
261	120	FIBER ROLLS 20IN		
		End Section 8005+07 - 120' Rt	LF	30
261	121	REMOVE FIBER ROLLS 20IN		
		End Section 8005+07 - 120' Rt	LF	30

Fiber Rolls 12IN - 20 LF
Fiber Rolls 12IN - 88 LF
Fiber Rolls 12IN - 204 LF
+85
+53
Grading Tie Line
Exst R/W
51st Ave SW, Co Rd 18
Fiber Rolls 12IN - 20 LF
8001
8002
ND 200
8003
8004
8005
8006
ND 200
levee
levee
levee
Fiber Rolls 20IN - 30 LF
4th Ave NE
Exst R/W
Sect 7
T-144-N
R-86-W
Sect 8
T-144-N
R-86-W
MH SD
Grading Tie Line
+15
+90
Fiber Rolls 12IN - 365 LF

LEGEND

- Temporary Cover Crop Hydraulic Mulch
- Fiber Rolls 12IN or 20IN
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Grading Tie Line (Transition)
- Ditch

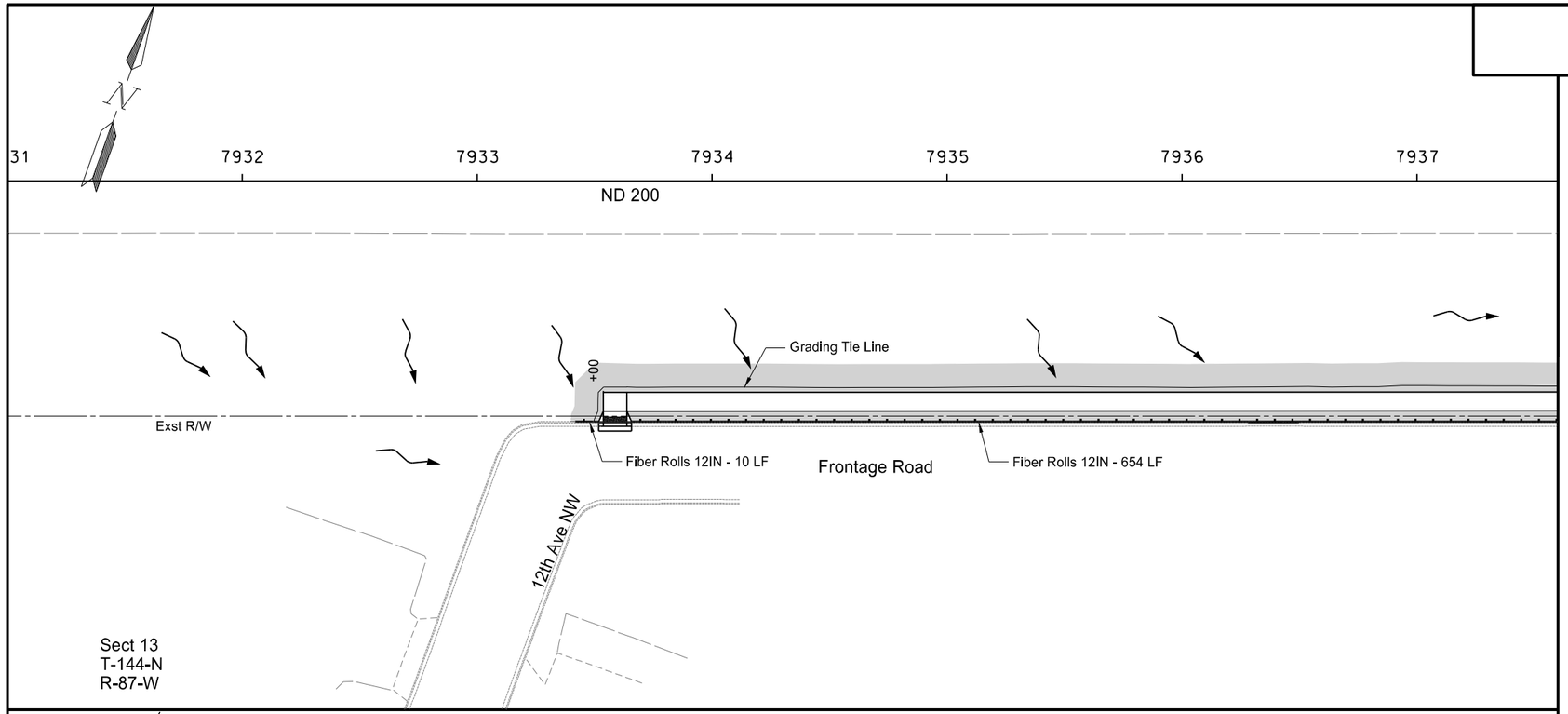
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/15/25
NORTH DAKOTA

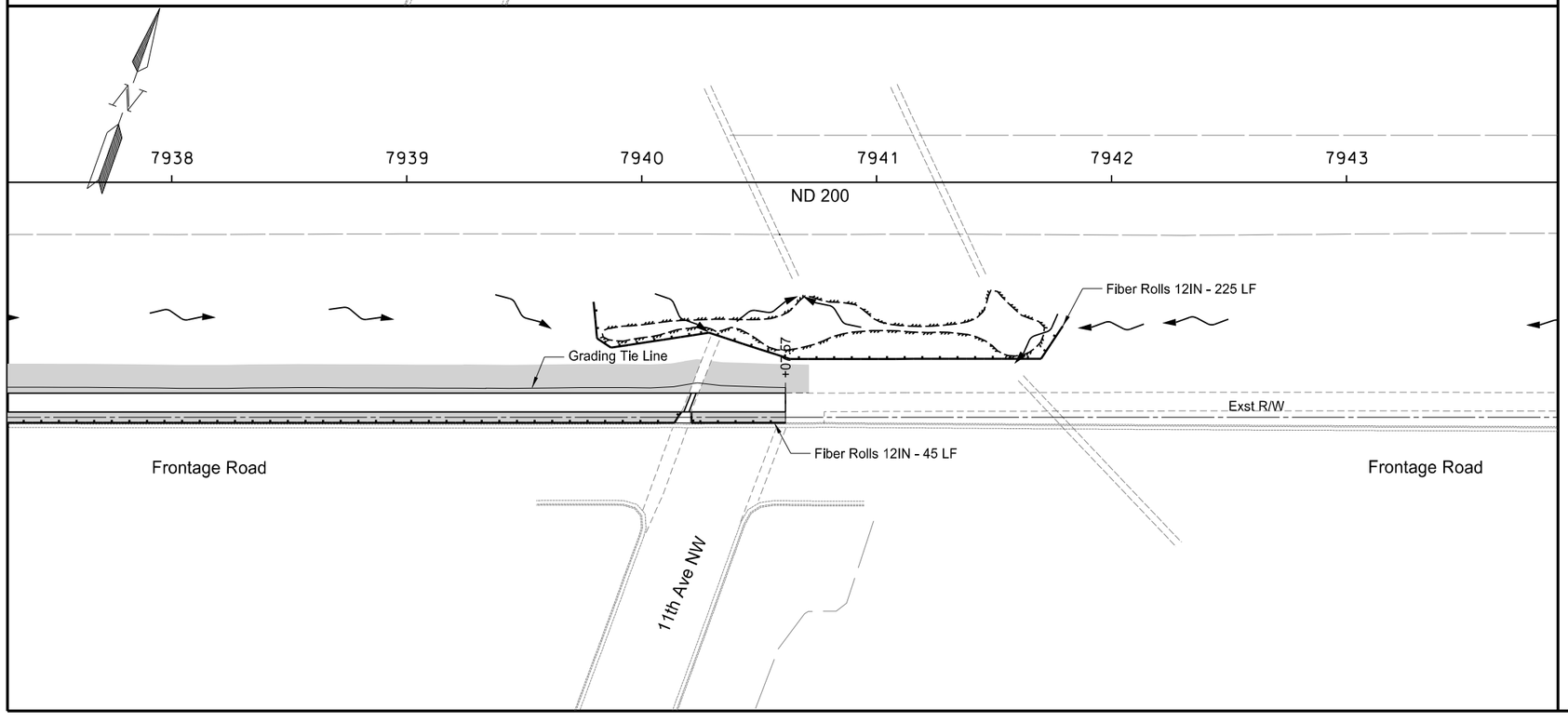
Temporary Erosion Control

ND 200
Main St W - Hazen Golf Course

8000+45 to 8006+75

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	77	1





SPEC	CODE	BID ITEM	UNIT	QUANTITY
251	200	SEEDING CLASS II		
		Frontage Road	ACRE	0.29
253	201	HYDRAULIC MULCH		
		Frontage Road	ACRE	0.29
261	112	FIBER ROLLS 12IN		
		7933+42 - 102' Rt to 7933+52 - 102' Rt	LF	10
		7933+66 - 102' Rt to 7940+17 - 98' Rt	LF	654
		Wetland	LF	225
		7940+21 - 98' Rt to 7940+61 - 102' Rt	LF	45

LEGEND

- Seeding Class II Hydraulic Mulch
- Fiber Rolls 12IN
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Grading Tie Line (Transition)
- Ditch

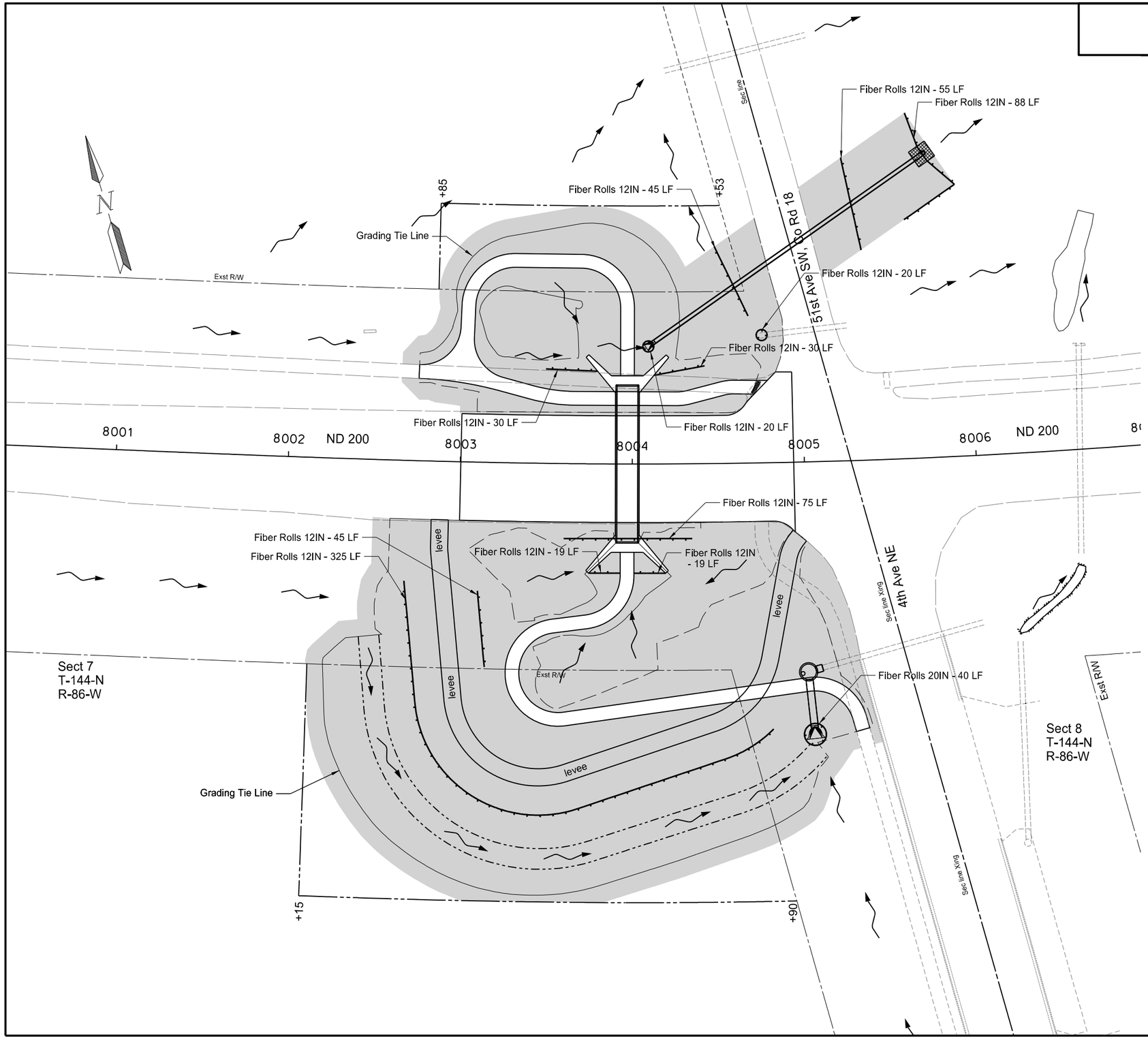
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STACY FLATEN
PE-8772
DATE 1/23/26
NORTH DAKOTA

Permanent Erosion Control

ND 200
Main St W - Hazen Golf Course

7931+15 to 7943+75

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	77	2



SPEC	CODE	BID ITEM	UNIT	QUANTITY
251	0200	SEEDING CLASS II		
		N side of ND 200	ACRE	0.51
		S side of ND 200	ACRE	1.33
253	0201	HYDRAULIC MULCH		
		N side of ND 200	ACRE	0.51
		S side of ND 200	ACRE	1.33
255	0102	ECB TYPE 2		
		8005+78 - 178' Lt (pipe outlet)	SY	13
261	0112	FIBER ROLLS 12IN		
		8002+69 - 70' Rt to 8004+79 - 155' Rt	LF	325
		8003+11 - 75' Rt to 8003+16 - 119' Rt	LF	45
		8003+49 - 55' Lt to 8003+79 - 54' Lt	LF	30
		8003+60 - 44' Rt to 8004+35 - 44' Rt	LF	75
		8003+75 - 64' Rt to 8003+93 - 63' Rt	LF	19
		8004+01 - 63' Rt to 8004+19 - 64' Rt	LF	19
		End Section 8004+11 - 70' Lt	LF	20
		8004+13 - 52' Lt to 8004+43 - 57' Lt	LF	30
		8004+50 - 125' Lt to 8004+69 - 85' Lt	LF	45
		End Section 8004+75 - 74' Lt	LF	20
		8005+27 - 176' Lt to 8005+37 - 122' Lt	LF	55
		8005+63 - 139' Lt to 8005+67 - 201' Lt	LF	88
261	0120	FIBER ROLLS 20IN		
		End Section 8005+02 - 154' Rt	LF	40

LEGEND

- ECB Type 2
- Seeding Class II Hydraulic Mulch
- Fiber Rolls 12IN or 20IN
- Grading Tie Line (Fill)
- Grading Tie Line (Cut)
- Grading Tie Line (Transition)
- Ditch

REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 1/23/26
NORTH DAKOTA

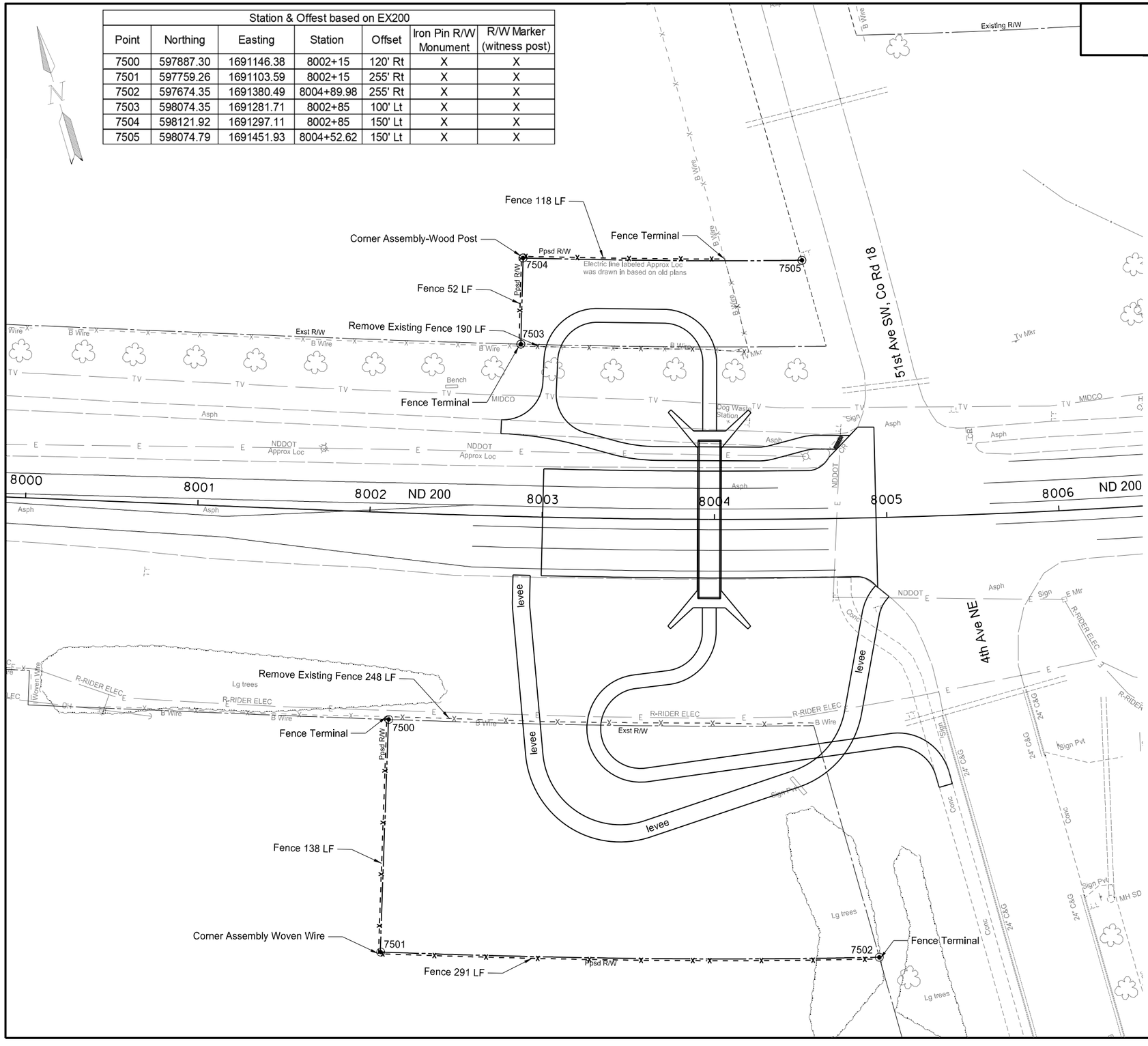
Permanent Erosion Control

ND 200
Main St W - Hazen Golf Course

8000+45 to 8006+75

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	80	1

Station & Offset based on EX200						
Point	Northing	Easting	Station	Offset	Iron Pin R/W Monument	R/W Marker (witness post)
7500	597887.30	1691146.38	8002+15	120' Rt	X	X
7501	597759.26	1691103.59	8002+15	255' Rt	X	X
7502	597674.35	1691380.49	8004+89.98	255' Rt	X	X
7503	598074.35	1691281.71	8002+85	100' Lt	X	X
7504	598121.92	1691297.11	8002+85	150' Lt	X	X
7505	598074.79	1691451.93	8004+52.62	150' Lt	X	X



SPEC	CODE	BID ITEM	QTY	UNIT
202	0312	REMOVE EXISTING FENCE		
		8002+84 - 99' Lt to 8004+06 - 151' Lt	190	LF
		8002+14 - 118' Rt to 8004+56 - 118' Rt	248	LF
720	0110	RIGHT OF WAY MARKERS		
		8002+15 - 120' Rt	1	EA
		8002+15 - 255' Rt	1	EA
		8002+85 - 100' Lt	1	EA
		8002+85 - 150' Lt	1	EA
		8004+52.62 - 150' Lt	1	EA
		8004+89.98 - 255' Rt	1	EA
720	0130	IRON PIN R/W MONUMENTS		
		8002+15 - 120' Rt	1	EA
		8002+15 - 255' Rt	1	EA
		8002+85 - 100' Lt	1	EA
		8002+85 - 150' Lt	1	EA
		8004+52.62 - 150' Lt	1	EA
		8004+89.98 - 255' Rt	1	EA
752	0700	FENCE WOVEN WIRE		
		8002+14 - 118' Rt to 8004+90 - 256' Rt	429	LF
		8002+84 - 99' Lt to 8004+06 - 151' Lt	170	LF
752	0993	FENCE TERMINAL		
		8002+84 - 99' Lt	1	EA
		8002+14 - 118' Rt	1	EA
		8004+06 - 151' Lt	1	EA
		8004+90 - 256' Rt	1	EA
752	2995	CORNER ASSEMBLY-WOOD POST		
		8002+84 - 151' Lt	1	EA
752	3120	CORNER ASSEMBLY WOVEN WIRE		
		8002+14 - 256' Rt	1	EA

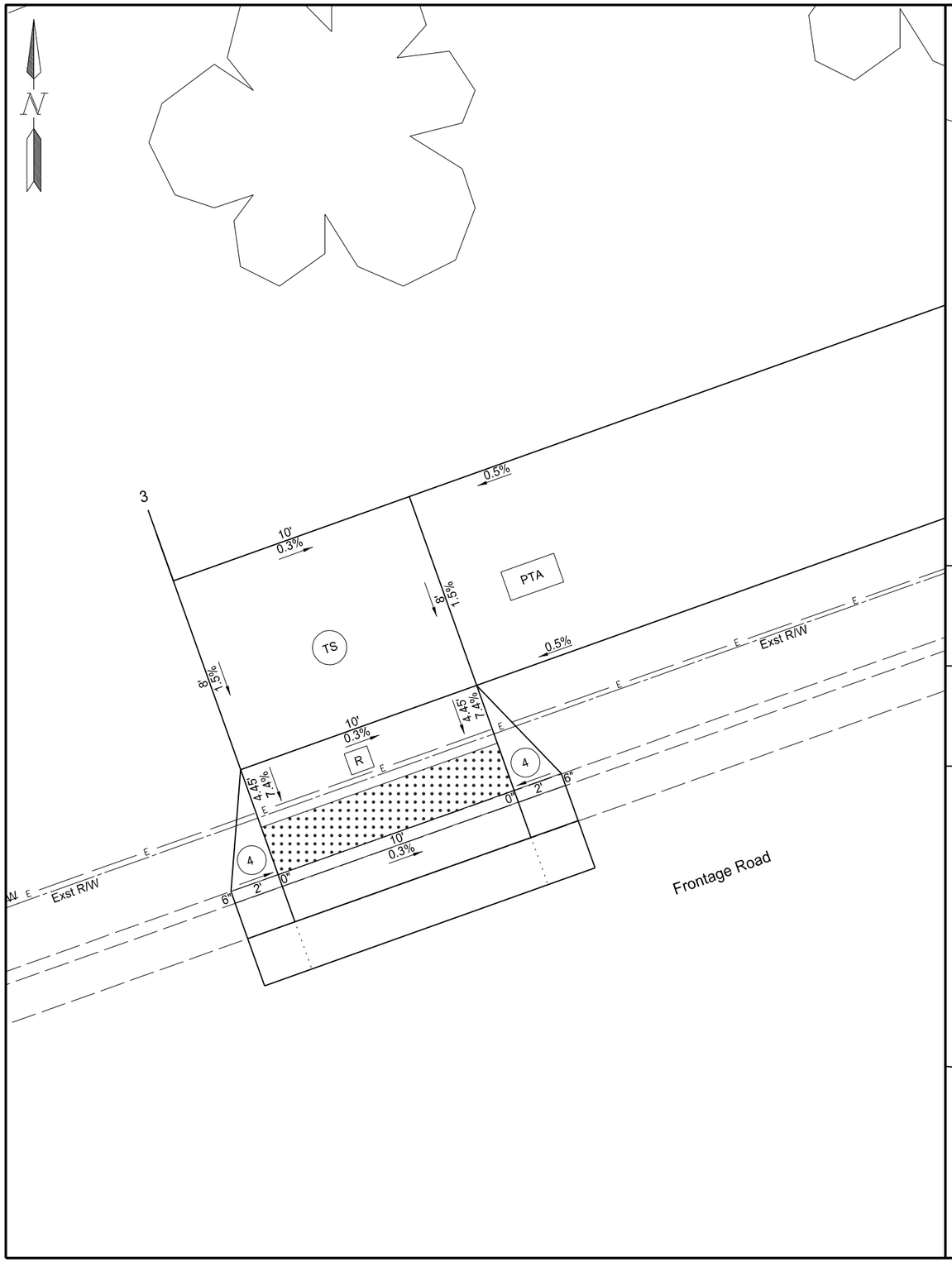
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 9/29/25
NORTH DAKOTA

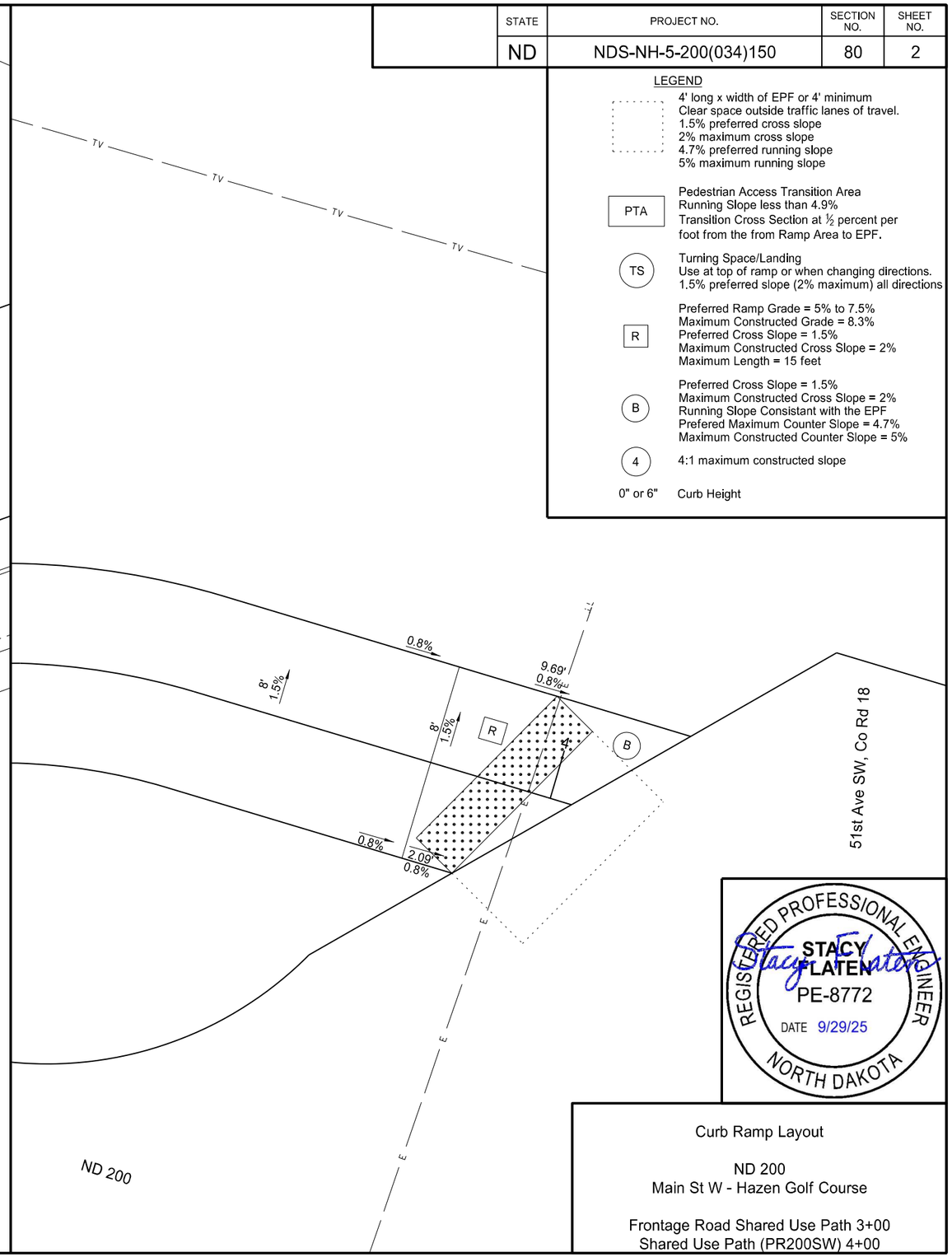
Fencing

ND 200
Main St W - Hazen Golf Course

ND 200 & 4th Ave NE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	80	2





LEGEND

- 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope, 2% maximum cross slope, 4.7% preferred running slope, 5% maximum running slope
- PTA — Pedestrian Access Transition Area. Running Slope less than 4.9%. Transition Cross Section at ½ percent per foot from the from Ramp Area to EPF.
- TS — Turning Space/Landing. Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions
- R — Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2%. Maximum Length = 15 feet
- B — Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2%. Running Slope Consistant with the EPF. Prefered Maximum Counter Slope = 4.7%. Maximum Constructed Counter Slope = 5%
- 4 — 4:1 maximum constructed slope
- 0" or 6" — Curb Height

REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 9/29/25
NORTH DAKOTA

Curb Ramp Layout

ND 200
Main St W - Hazen Golf Course

Frontage Road Shared Use Path 3+00
Shared Use Path (PR200SW) 4+00

PRELIMINARY SURVEY COORDINATE AND CURVE DATA - ND 200, Main St W - Hazen Golf Course

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	81	1

HORIZONTAL ALIGNMENT

PNT	STATION	NORTHING	EASTING
ND 200 (Chain EX200)			
BEG	7922+32.18	596,075.14	1,683,667.84
Qtr line	7923+52.52	596,115.55	1,683,781.20
PC	7949+43.25	596,985.53	1,686,221.49
Sec line	7951+58.53	597,057.83	1,686,424.29
PI	7953+46.53	597,120.95	1,686,601.35
PT	7957+49.49	597,282.75	1,686,970.76
Sec line	7962+81.19	597,496.06	1,687,457.80
TS	7977+28.25	598,076.61	1,688,783.30
Qtr line	7978+05.08	598,107.43	1,688,853.68
SC	7980+28.25	598,190.92	1,689,060.61
PI	7987+69.63	598,494.40	1,689,737.20
CS	7994+27.40	598,248.86	1,690,436.91
ST	7997+27.40	598,158.27	1,690,722.84
TS	8000+96.45	598,039.15	1,691,072.14
SC	8003+96.45	597,946.05	1,691,357.30
Sec line	8005+29.95	597,899.04	1,691,482.99
PI	8011+63.88	597,694.61	1,692,082.43
CS	8018+96.76	597,807.61	1,692,841.54
ST	8021+96.76	597,846.37	1,693,139.01
TS	8033+45.29	598,009.67	1,694,275.87
SC	8037+45.29	598,043.38	1,694,673.91
PI	8039+16.25	598,090.84	1,694,841.03
CS	8040+59.78	597,990.62	1,694,982.93
ST	8044+59.78	597,826.76	1,695,347.24
TS	8048+84.06	597,630.52	1,695,723.40
SC	8052+84.06	597,466.66	1,696,087.71
PI	8053+55.98	597,412.24	1,696,141.82
CS	8054+15.82	597,434.23	1,696,215.34
ST	8058+15.82	597,404.32	1,696,613.68
Sec line	8059+38.91	597,402.25	1,696,736.75
Glidepath	8079+60.64	597,369.54	1,698,758.22
Qtr line	8085+50.70	597,359.99	1,699,348.20

CURVE DATA

ARC DEFINITION

Curve ND2001	Curve ND2003
PI = 7953+46.53	PI = 8011+63.88
Delta = 4° 01' 52" (LT)	Delta = 27° 00' 17" (LT)
Da = 0° 30' 00"	Da = 1° 30' 00"
R = 11,459.16'	R = 3,819.72'
T = 403.28'	L = 1,500.31'
L = 806.24'	Ls = 300.00'
	Sc = 2° 15' 00"
Curve ND2002	Ts = 1,067.43'
PI = 7987+69.63	
Delta = 42° 29' 00" (RT)	
Da = 2° 30' 01"	
R = 2,291.58'	Curve ND2004
L = 1,399.15'	PI = 8039+16.25
Ls = 300.00'	Delta = 35° 43' 27" (RT)
Sc = 3° 45' 01"	Da = 5° 00' 00"
Ts = 1,041.38'	R = 1,145.92'
	L = 314.49'
	Ls = 400.00'
	Sc = 10° 00' 00"
	Ts = 570.95'
	Curve ND2005
	PI = 8053+55.98
	Delta = 26° 35' 17" (LT)
	Da = 5° 00' 00"
	R = 1,145.92'
	L = 131.76'
	Ls = 400.00'
	Sc = 10° 00' 00"
	Ts = 471.93'

US PUBLIC LAND SURVEY DATA

DESC.	SEC-TWP-RGE	NORTHING	EASTING
W Qtr Cor	Sec 7 T-144-N R-86-W	600127.72	1686469.75
C Sec	Sec 7 T-144-N R-86-W	600105.31	1688878.30
E Qtr Cor	Sec 7 T-144-N R-86-W	600080.17	1691507.16
E Qtr Cor	Sec 8 T-144-N R-86-W	600026.82	1696760.39
NW Sec Cor	Sec 13 T-144-N R-87-W	597558.74	1681167.87
N Qtr Cor	Sec 13 T-144-N R-87-W	597520.65	1683802.32
NE Sec Cor	Sec 13 T-144-N R-87-W	597502.27	1686431.43
S Qtr Cor	Sec 7 T-144-N R-86-W	597487.65	1688846.04
SE Sec Cor	Sec 7 T-144-N R-86-W	597460.24	1691478.13
S Qtr Cor	Sec 8 T-144-N R-86-W	597430.17	1694120.06
SE Sec Cor	Sec 8 T-144-N R-86-W	597402.32	1696736.25
C Sec	Sec 13 T-144-N R-87-W	594883.27	1683762.67
E Qtr Cor	Sec 13 T-144-N R-87-W	594863.41	1686389.05
E Qtr Cor	Sec 18 T-144-N R-86-W	594817.10	1691434.05
E Qtr Cor	Sec 17 T-144-N R-86-W	594720.82	1696693.30
S Qtr Cor	Sec 9 T-144-N R-86-W	597361.82	1699327.03

SURVEY CONTROL POINTS

PNT	NORTHING	EASTING	ELEV	STATION	OFFSET
CONTROL POINT DESCRIPTION					
PRIMARY CONTROL					
GPS 100	598301.65	1691515.47	1746.97	8004+52	386' Lt
Rebar with aluminum cap marked "GPS Control". 400' north of intersection of ND 200 & 4th Ave NE. On south side of approach, east of 4th Ave NE.					
GPS 101	595821.04	1682923.15	1760.63	N/A	N/A
Rebar with aluminum cap marked "GPS Control". 1260' west of intersection of ND 200 & Main St W. East side of approach, south of ND 200.					
GPS 102	597486.29	1697326.25	1732.67	8065+27	94' Lt
Rebar with aluminum cap marked "GPS Control". Across from Hazen Golf Course Entrance. On the west side of approach, north of ND 200.					

REFERENCE MARKERS

R Mkr #	Northing	Easting	Station	Offset
150	595974.85	1683469.36	N/A	N/A
151	597890.32	1688444.84	7973+43	35' Rt
152	597752.37	1692587.96	8016+41	37' Rt

NOTES: Sheet 1 of 1
Alignment from project NH-5-200(017)152, PCN 16162

Date Survey Completed 07/14/21

☐ Assumed Coordinates

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

DIGITAL SIGNATURE JASON E. MAIN
2025.09.23 14:06:01 -05'00

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

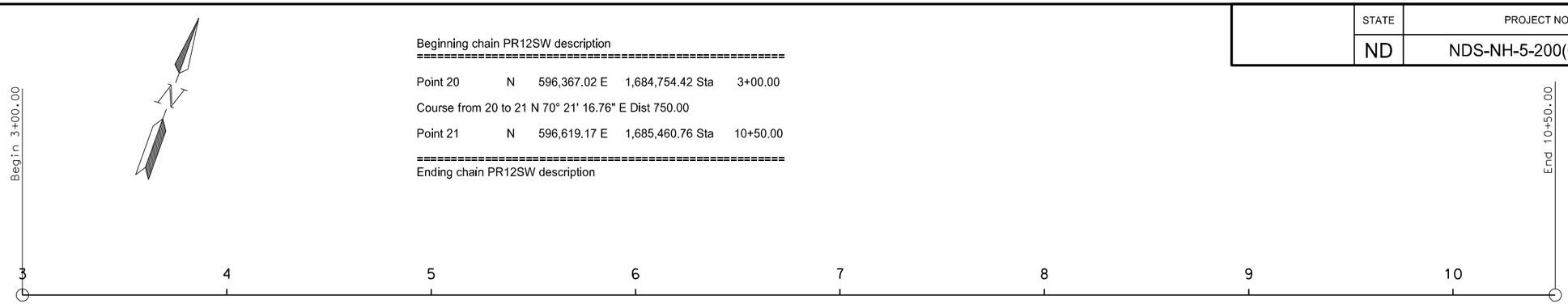
INITIALIZING BENCH MARK
NDGPS Stations (OPUS)

☒ NAVD-88
☐ NGVD-29

☐ GEOID 09 ☒ GEOID 12B
☐ GEOID 12A

REGISTERED PROFESSIONAL LAND SURVEYOR
JASON E. MAIN
LS-8134
DATE 9/23/25
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	82	1



Beginning chain PR12SW description
==========

Point 20 N 596,367.02 E 1,684,754.42 Sta 3+00.00

Course from 20 to 21 N 70° 21' 16.76" E Dist 750.00

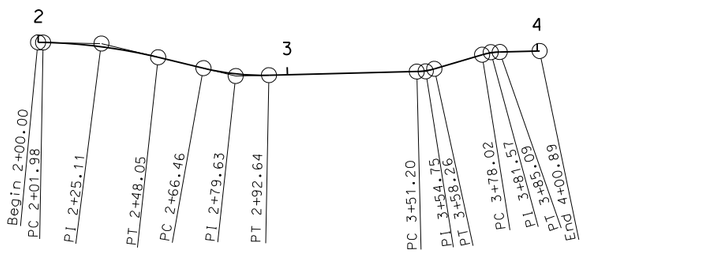
Point 21 N 596,619.17 E 1,685,460.76 Sta 10+50.00

==========
Ending chain PR12SW description



Curve PR200SW_3
PI = 2+25.11
Delta = 12° 34' 02" (RT)
Da = 27° 17' 01"
R = 210.00
T = 23.12
L = 46.06

Curve PR200SW_9
PI = 3+54.75
Delta = 15° 00' 00" (LT)
Da = 212° 12' 24"
R = 27.00
T = 3.55
L = 7.07



Curve PR200SW_6
PI = 2+79.63
Delta = 15° 00' 00" (LT)
Da = 57° 17' 45"
R = 100.00
T = 13.17
L = 26.18

Curve PR200SW_12
PI = 3+81.57
Delta = 15° 00' 00" (RT)
Da = 212° 12' 24"
R = 27.00
T = 3.55
L = 7.07

Beginning chain PR200SW description
==========

Point 22 N 598,031.67 E 1,691,257.22 Sta 2+00.00

Course from 22 to PC PR200SW 3 S 70° 52' 11.70" E Dist 1.98

Curve Data
——
Curve PR200SW 3
P.I. Station 2+25.11 N 598,023.44 E 1,691,280.94
Delta = 12° 34' 02.21" (RT)
Degree = 27° 17' 01.34"
Tangent = 23.12
Length = 46.06
Radius = 210.00
External = 1.27
Long Chord = 45.97
Mid. Ord. = 1.26
P.C. Station 2+01.98 N 598,031.02 E 1,691,259.09
P.T. Station 2+48.05 N 598,011.29 E 1,691,300.62
C.C. N 597,832.62 E 1,691,190.27
Back = S 70° 52' 11.70" E
Ahead = S 58° 18' 09.49" E
Chord Bear = S 64° 35' 10.60" E

Course from PT PR200SW 3 to PC PR200SW 6 S 58° 18' 09.49" E Dist 18.42

Curve Data
——
Curve PR200SW 6
P.I. Station 2+79.63 N 597,994.70 E 1,691,327.49
Delta = 15° 00' 00.00" (LT)
Degree = 57° 17' 44.81"
Tangent = 13.17
Length = 26.18
Radius = 100.00
External = 0.86
Long Chord = 26.11
Mid. Ord. = 0.86
P.C. Station 2+66.46 N 598,001.61 E 1,691,316.29
P.T. Station 2+92.64 N 597,990.91 E 1,691,340.10
C.C. N 598,086.70 E 1,691,368.83
Back = S 58° 18' 09.49" E
Ahead = S 73° 18' 09.49" E
Chord Bear = S 65° 48' 09.49" E

Course from PT PR200SW_6 to PC PR200SW_9 S 73° 18' 09.49" E Dist 58.55

Curve Data
——
Curve PR200SW_9
P.I. Station 3+54.75 N 597,973.07 E 1,691,399.59
Delta = 15° 00' 00.00" (LT)
Degree = 212° 12' 23.73"
Tangent = 3.55
Length = 7.07
Radius = 27.00
External = 0.23
Long Chord = 7.05
Mid. Ord. = 0.23
P.C. Station 3+51.20 N 597,974.09 E 1,691,396.18
P.T. Station 3+58.26 N 597,972.97 E 1,691,403.14
C.C. N 597,999.95 E 1,691,403.94
Back = S 73° 18' 09.49" E
Ahead = S 88° 18' 09.49" E
Chord Bear = S 80° 48' 09.49" E

Course from PT PR200SW 9 to PC PR200SW 12 S 88° 18' 09.49" E Dist 19.76

Curve Data
——
Curve PR200SW 12
P.I. Station 3+81.57 N 597,972.28 E 1,691,426.44
Delta = 15° 00' 00.00" (RT)
Degree = 212° 12' 23.73"
Tangent = 3.55
Length = 7.07
Radius = 27.00
External = 0.23
Long Chord = 7.05
Mid. Ord. = 0.23
P.C. Station 3+78.02 N 597,972.38 E 1,691,422.89
P.T. Station 3+85.09 N 597,971.25 E 1,691,429.84
C.C. N 597,945.39 E 1,691,422.09
Back = S 88° 18' 09.49" E
Ahead = S 73° 18' 09.49" E
Chord Bear = S 80° 48' 09.49" E

Course from PT PR200SW 12 to 23 S 73° 18' 09.49" E Dist 15.80

Point 23 N 597,966.71 E 1,691,444.98 Sta 4+00.89

==========
Ending chain PR200SW description

REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 9/23/25
NORTH DAKOTA

Survey Data Layout

ND 200
Main St W - Hazen Golf Course

PR12SW
PR200SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	82	2

Beginning chain PR1LEVEE description
==========

Point 44 N 597,945.66 E 1,691,244.15 Sta 1000+00.00

Course from 44 to PC PR1LEVEE 3 S 17° 49' 11.81" W Dist 14.48

Curve Data
——

Curve PR1LEVEE 3
P.I. Station 1000+17.33 N 597,929.16 E 1,691,238.85
Delta = 6° 30' 54.36" (LT)
Degree = 114° 35' 29.61"
Tangent = 2.85
Length = 5.69
Radius = 50.00
External = 0.08
Long Chord = 5.68
Mid. Ord. = 0.08
P.C. Station 1000+14.48 N 597,931.87 E 1,691,239.72
P.T. Station 1000+20.17 N 597,926.37 E 1,691,238.29
C.C. N 597,916.57 E 1,691,287.32
Back = S 17° 49' 11.81" W
Ahead = S 11° 18' 17.45" W
Chord Bear = S 14° 33' 44.63" W

Course from PT PR1LEVEE 3 to PC PR1LEVEE 6 S 11° 18' 17.45" W Dist 84.40

Curve Data
——

Curve PR1LEVEE 6
P.I. Station 1001+67.90 N 597,781.50 E 1,691,209.33
Delta = 103° 25' 32.76" (LT)
Degree = 114° 35' 29.61"
Tangent = 63.34
Length = 90.26
Radius = 50.00
External = 30.70
Long Chord = 78.49
Mid. Ord. = 19.02
P.C. Station 1001+04.56 N 597,843.61 E 1,691,221.75
P.T. Station 1001+94.82 N 597,783.84 E 1,691,272.63
C.C. N 597,833.81 E 1,691,270.78
Back = S 11° 18' 17.45" W
Ahead = N 87° 52' 44.70" E
Chord Bear = S 40° 24' 28.92" E

Course from PT PR1LEVEE 6 to PC PR1LEVEE 9 N 87° 52' 44.70" E Dist 90.61

Curve Data
——

Curve PR1LEVEE 9
P.I. Station 1003+15.00 N 597,788.29 E 1,691,392.73
Delta = 61° 12' 09.93" (LT)
Degree = 114° 35' 29.61"
Tangent = 29.57
Length = 53.41
Radius = 50.00
External = 8.09
Long Chord = 50.91
Mid. Ord. = 6.96
P.C. Station 1002+85.43 N 597,787.20 E 1,691,363.18
P.T. Station 1003+38.84 N 597,814.71 E 1,691,406.01
C.C. N 597,837.16 E 1,691,361.33
Back = N 87° 52' 44.70" E
Ahead = N 26° 40' 34.77" E
Chord Bear = N 57° 16' 39.73" E

Course from PT PR1LEVEE 9 to PC PR1LEVEE 12 N 26° 40' 34.77" E Dist 58.33

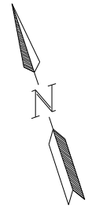
Curve Data
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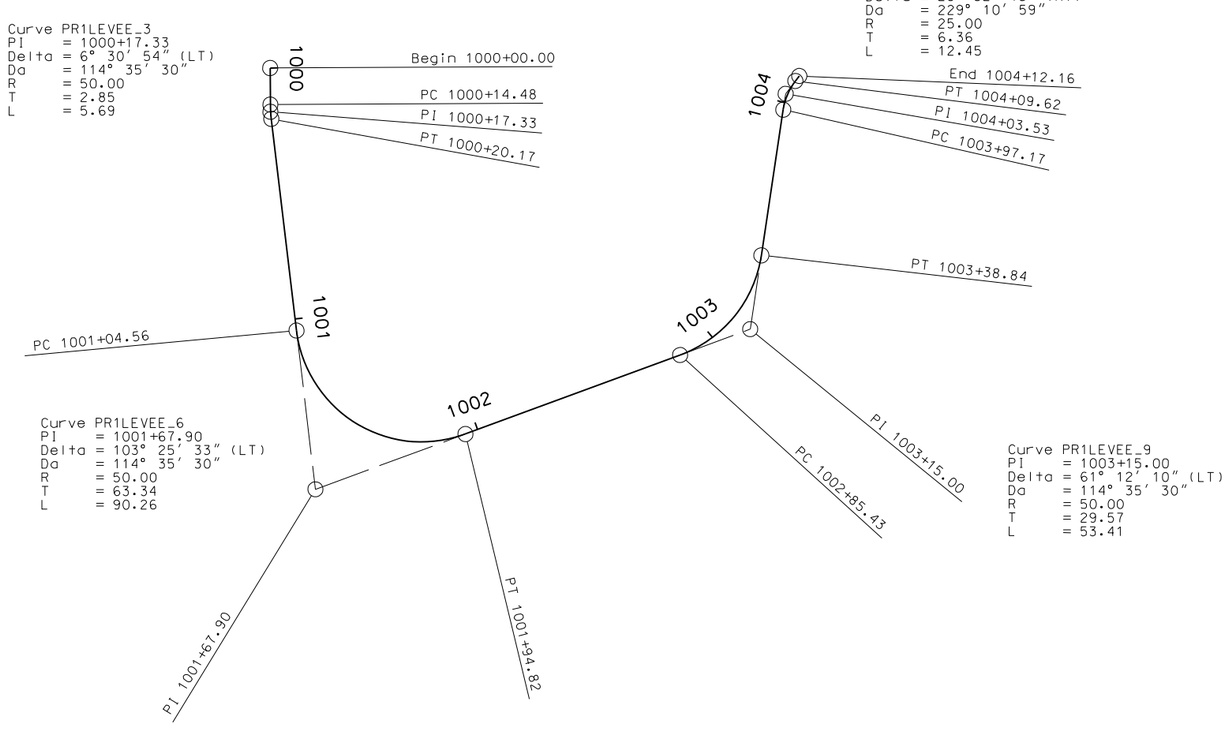
Curve PR1LEVEE 12
P.I. Station 1004+03.53 N 597,872.52 E 1,691,435.05
Delta = 28° 32' 14.77" (RT)
Degree = 229° 10' 59.22"
Tangent = 6.36
Length = 12.45
Radius = 25.00
External = 0.80
Long Chord = 12.32
Mid. Ord. = 0.77
P.C. Station 1003+97.17 N 597,866.84 E 1,691,432.19
P.T. Station 1004+09.62 N 597,876.15 E 1,691,440.27
C.C. N 597,855.61 E 1,691,454.53
Back = N 26° 40' 34.77" E
Ahead = N 55° 12' 49.54" E
Chord Bear = N 40° 56' 42.15" E

Course from PT PR1LEVEE 12 to 45 N 55° 12' 49.54" E Dist 2.53

Point 45 N 597,877.59 E 1,691,442.35 Sta 1004+12.16

==========
Ending chain PR1LEVEE description





REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 9/23/25
NORTH DAKOTA

Survey Data Layout

ND 200
Main St W - Hazen Golf Course

PR1LEVEE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	82	3

Beginning chain PR5SW description
==========

Point 47 N 597,758.96 E 1,691,445.69 Sta 1+00.00

Course from 47 to PC PR5SW 3 N 0° 36' 33.94" E Dist 7.15

Curve Data
———

Curve PR5SW 3
P.I. Station 1+30.71 N 597,789.66 E 1,691,446.01
Delta = 82° 12' 34.55" (LT)
Degree = 212° 12' 23.73"
Tangent = 23.56
Length = 38.74
Radius = 27.00
External = 8.83
Long Chord = 35.50
Mid. Ord. = 6.66
P.C. Station 1+07.15 N 597,766.10 E 1,691,445.76
P.T. Station 1+45.89 N 597,793.10 E 1,691,422.71
C.C. N 597,766.39 E 1,691,418.76
Back = N 0° 36' 33.94" E
Ahead = N 81° 36' 00.61" W
Chord Bear = N 40° 29' 43.34" W

Course from PT PR5SW 3 to PC PR5SW 6 N 81° 36' 00.61" W Dist 143.14

Curve Data
———

Curve PR5SW 6
P.I. Station 3+22.95 N 597,818.97 E 1,691,247.54
Delta = 102° 57' 56.22" (RT)
Degree = 212° 12' 23.73"
Tangent = 33.92
Length = 48.52
Radius = 27.00
External = 16.36
Long Chord = 42.25
Mid. Ord. = 10.19
P.C. Station 2+89.03 N 597,814.01 E 1,691,281.10
P.T. Station 3+37.55 N 597,850.56 E 1,691,259.90
C.C. N 597,840.72 E 1,691,285.05
Back = N 81° 36' 00.61" W
Ahead = N 21° 21' 55.61" E
Chord Bear = N 30° 07' 02.50" W

Course from PT PR5SW 6 to PC PR5SW 9 N 21° 21' 55.60" E Dist 0.50

Curve Data
———

Curve PR5SW 9
P.I. Station 3+59.88 N 597,871.35 E 1,691,268.04
Delta = 77° 54' 23.62" (RT)
Degree = 212° 12' 23.73"
Tangent = 21.83
Length = 36.71
Radius = 27.00
External = 7.72
Long Chord = 33.95
Mid. Ord. = 6.00
P.C. Station 3+38.05 N 597,851.02 E 1,691,260.08
P.T. Station 3+74.76 N 597,867.83 E 1,691,289.58
C.C. N 597,841.19 E 1,691,285.23
Back = N 21° 21' 55.61" E
Ahead = S 80° 43' 40.77" E
Chord Bear = N 60° 19' 07.42" E

Course from PT PR5SW 9 to PC PR5SW 12 S 80° 43' 40.77" E Dist 19.80

Curve Data
———

Curve PR5SW 12
P.I. Station 4+18.32 N 597,860.82 E 1,691,332.57
Delta = 82° 42' 01.01" (LT)
Degree = 212° 12' 23.73"
Tangent = 23.76
Length = 38.97
Radius = 27.00
External = 8.97
Long Chord = 35.68
Mid. Ord. = 6.73
P.C. Station 3+94.56 N 597,864.64 E 1,691,309.12
P.T. Station 4+33.53 N 597,883.59 E 1,691,339.35
C.C. N 597,891.29 E 1,691,313.47
Back = S 80° 43' 40.77" E
Ahead = N 16° 34' 18.22" E
Chord Bear = N 57° 55' 18.73" E

Course from PT PR5SW 12 to PC PR5SW 15 N 16° 34' 18.22" E Dist 155.78

Curve Data
———

Curve PR5SW 15
P.I. Station 6+16.01 N 598,058.49 E 1,691,391.39
Delta = 89° 21' 29.86" (LT)
Degree = 212° 12' 23.73"
Tangent = 26.70
Length = 42.11
Radius = 27.00
External = 10.97
Long Chord = 37.97
Mid. Ord. = 7.80
P.C. Station 5+89.32 N 598,032.90 E 1,691,383.78
P.T. Station 6+31.42 N 598,066.40 E 1,691,365.89
C.C. N 598,040.60 E 1,691,357.90
Back = N 16° 34' 18.22" E
Ahead = N 72° 47' 11.64" W
Chord Bear = N 28° 06' 26.71" W

Course from PT PR5SW 15 to PC PR5SW 18 N 72° 47' 11.64" W Dist 38.23

Curve Data
———

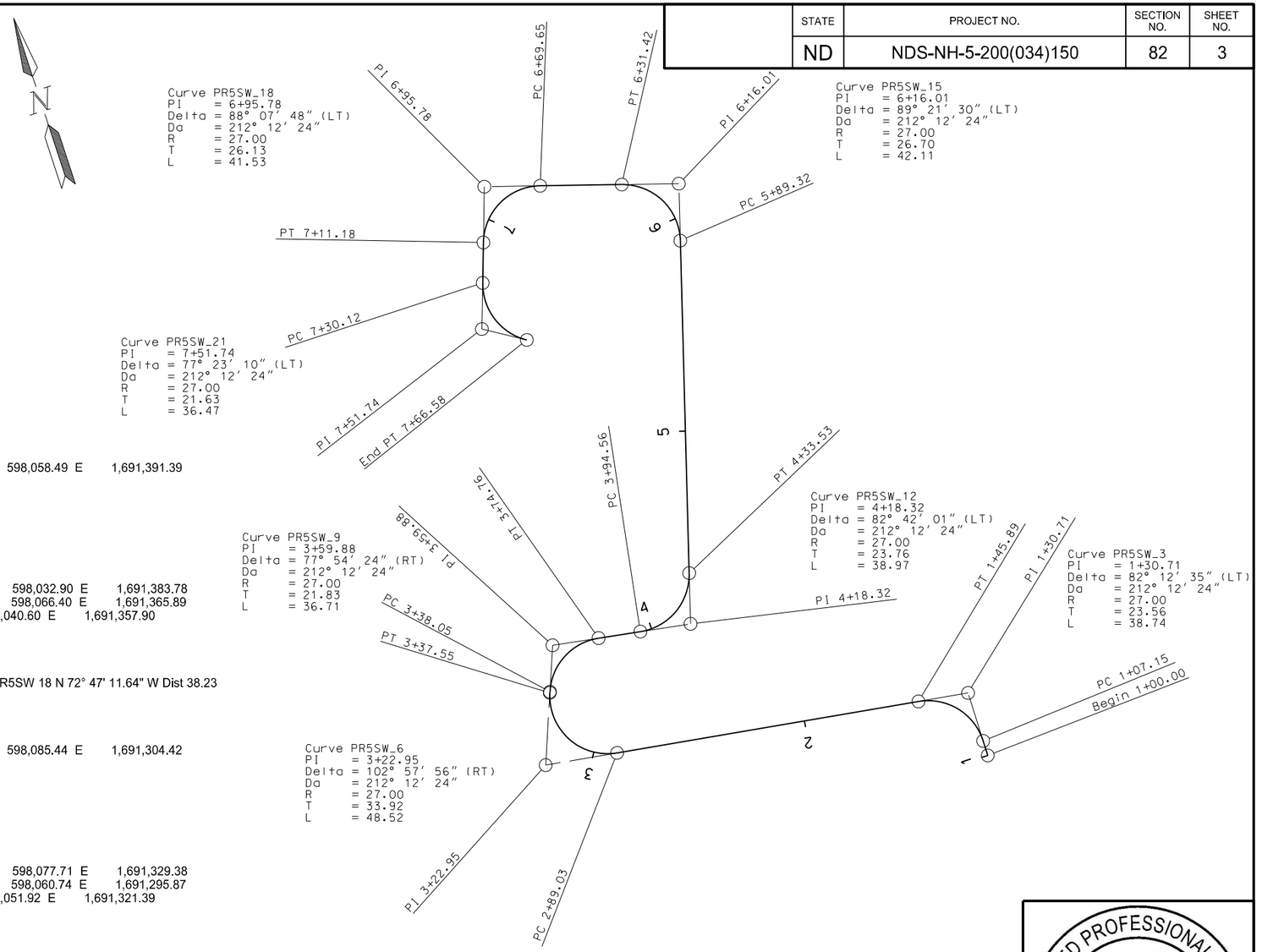
Curve PR5SW 18
P.I. Station 6+95.78 N 598,085.44 E 1,691,304.42
Delta = 88° 07' 47.52" (LT)
Degree = 212° 12' 23.73"
Tangent = 26.13
Length = 41.53
Radius = 27.00
External = 10.58
Long Chord = 37.56
Mid. Ord. = 7.60
P.C. Station 6+69.65 N 598,077.71 E 1,691,329.38
P.T. Station 7+11.18 N 598,060.74 E 1,691,295.87
C.C. N 598,051.92 E 1,691,321.39
Back = N 72° 47' 11.64" W
Ahead = S 19° 05' 00.84" W
Chord Bear = S 63° 08' 54.60" W

Course from PT PR5SW 18 to PC PR5SW 21 S 19° 05' 00.84" W Dist 18.94

Curve Data
———

Curve PR5SW 21
P.I. Station 7+51.74 N 598,022.41 E 1,691,282.61
Delta = 77° 23' 10.33" (LT)
Degree = 212° 12' 23.73"
Tangent = 21.63
Length = 36.47
Radius = 27.00
External = 7.59
Long Chord = 33.76
Mid. Ord. = 5.93
P.C. Station 7+30.12 N 598,042.85 E 1,691,289.68
P.T. Station 7+66.58 N 598,011.05 E 1,691,301.01
C.C. N 598,034.02 E 1,691,315.20
Back = S 19° 05' 00.84" W
Ahead = S 58° 18' 09.49" E
Chord Bear = S 19° 36' 34.32" E

==========
Ending chain PR5SW description



REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 9/23/25
NORTH DAKOTA

Survey Data Layout

ND 200
Main St W - Hazen Golf Course

PR5SW

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2		TOTAL 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**	**2**	**2**		**2**	**28**	**56**
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)					18	
G20-2-48	**48"x24"**	**END ROAD WORK**	**2**	**2**		**2**	**26**	**52**
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**	**5**	**5**		**5**	**43**	**215**
G20-52a-72	**72"x24"**	**ROAD WORK NEXT __ MILES RT or LT ARROW**	**1**	**1**		**1**	**36**	**36**
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $150 WHEN WORKERS PRESENT**	**2**	**2**		**2**	**59**	**118**
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)					11	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)					10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)					10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)					7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)					7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)					7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)					7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)					7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT					15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)					7	
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)					7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)					9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)					7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)					9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)					7	
R1-1-48	**48"x48"**	**STOP**	**1**	**1**		**1**	**32**	**32**
R1-2-60	60"x60"	YIELD					29	
R2-1-36	**36"x48"**	**SPEED LIMIT __ (Portable only)**	**8**	**8**		**8**	**30**	**240**
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**8**	**8**		**8**	**39**	**312**
R2-1aP-24	**24"x18"**	**MINIMUM FEE $150 (Mounted on Speed Limit post)**	**8**	**8**		**8**	**10**	**80**
R3-2-48	48"x48"	NO LEFT TURN					35	
R4-1-48	**48"x60"**	**DO NOT PASS**	**2**	**2**		**2**	**39**	**78**
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**	**2**		**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)					15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT					35	
W1-4-48	**48"x48"**	**REVERSE CURVE RIGHT or LEFT**	**4**	**4**		**4**	**35**	**140**
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT					35	
W1-6-48	**48"x24"**	**ONE DIRECTION LARGE ARROW**	**2**	**2**		**2**	**26**	**52**
W3-1-48	48"x48"	STOP AHEAD					35	
W3-3-48	48"x48"	SIGNAL AHEAD					35	
W3-4-48	**48"x48"**	**BE PREPARED TO STOP**	**4**	**4**		**4**	**35**	**140**
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**8**	**8**		**8**	**35**	**280**
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**	**2**	**2**		**2**	**35**	**70**
W8-3-48	48"x48"	PAVEMENT ENDS					35	
W8-7-48	48"x48"	LOOSE GRAVEL					35	
W8-11-48	**48"x48"**	**UNEVEN LANES**	**2**	**2**		**2**	**35**	**70**
W8-12-48	48"x48"	NO CENTER LINE					35	
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL					35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY					35	
W8-54-48	**48"x48"**	**TRUCKS ENTERING AHEAD or __ FT or _ MILE**	**2**	**2**		**2**	**35**	**70**
W8-55-48	**48"x48"**	**TRUCKS CROSSING AHEAD or __ FT or _ MILE**	**2**	**2**		**2**	**35**	**70**
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY					35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL					35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)					14	
W14-3-64	64"x48"	NO PASSING ZONE					28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)					10	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**8**	**8**		**8**	**35**	**280**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT or _ MILE					35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or _ MILE					35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or _ MILE					35	
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE					35	
W20-7-48	**48"x48"**	**FLAGGER**	**4**	**4**		**4**	**35**	**140**
W20-8-18	**18"x18"**	**STOP - SLOW PADDLE Back to Back**	**4**	**4**		**4**	**5**	**20**
W20-52P-54	**54"x12"**	**NEXT __ MILES (Mounted on warning sign post)**	**2**	**2**		**2**	**12**	**24**
W21-1-48	48"x48"	WORKERS					35	
W21-2-48	**48"x48"**	**FRESH OIL**	**2**	**2**		**2**	**35**	**70**
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or _ MILE					35	
W21-5-48	**48"x48"**	**SHOULDER WORK**	**2**	**2**		**2**	**35**	**70**
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	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED BY PHASE NO. 1	2		TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
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**	**2**	**2**		**2**	**35**	**70**
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	
R9-9-24	**24" x 12"**	**SIDEWALK CLOSED (Mounted on barricade)**	**6**	**6**		**6**	**3**	**18**
M4-9a-30	**30" x 24"**	**BIKE/PEDESTRIAN DETOUR**	**7**	**7**		**7**	**15**	**105**
M4-8A-24	**24" X 18"**	**END DETOUR**	**2**	**2**		**2**	**13**	**26**

SPECIAL SIGNS

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**2958**

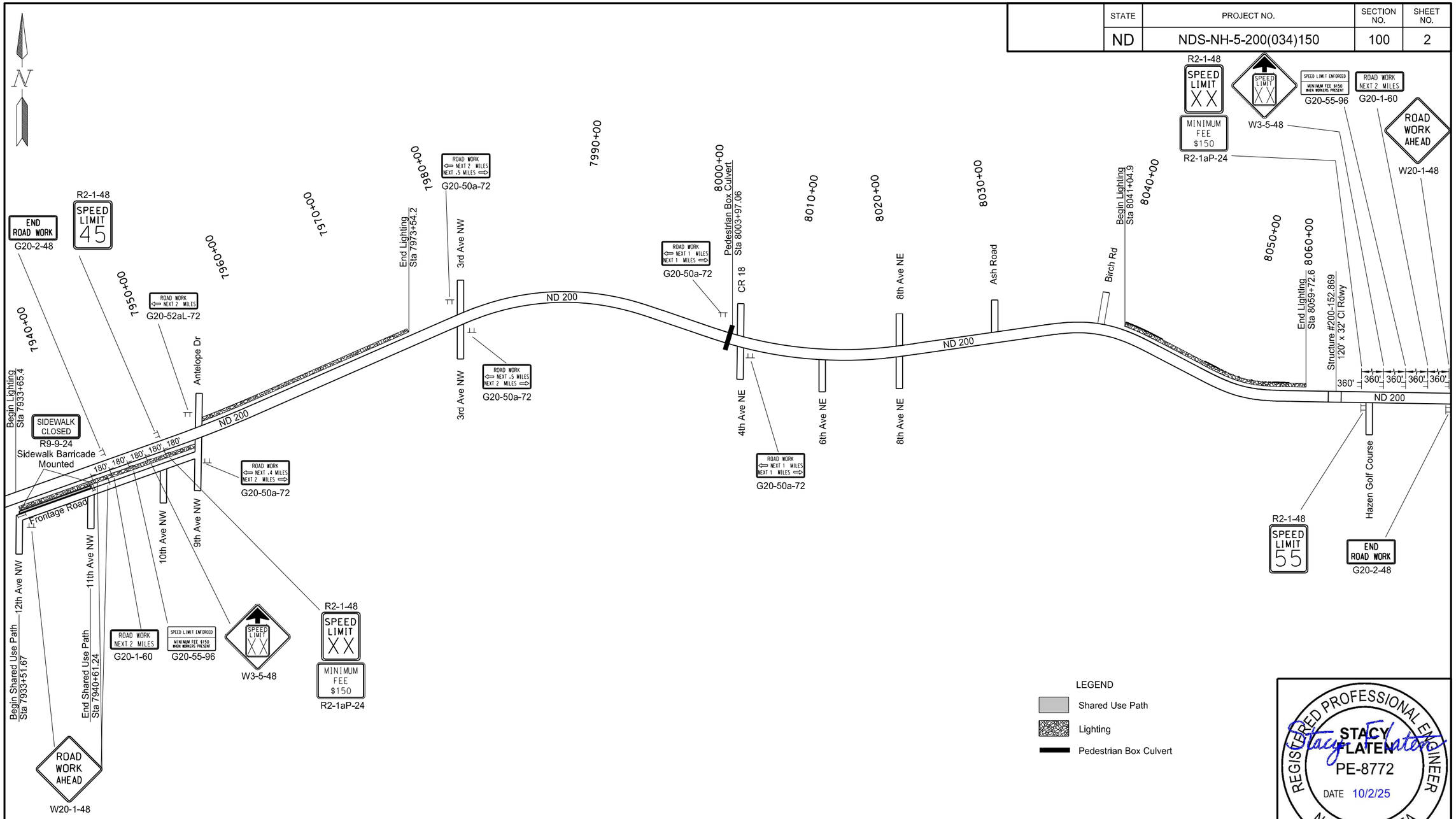
SPEC & CODE	DESCRIPTION	UNIT	QUANTITY BY PHASE NO. 1	2		TOTAL QUANTITY
704-0100	**FLAGGING**	MHR	**350**	**350**		**700**
704-1039	**ATTENUATION DEVICE-TYPE B-45**	EA	**1**	**1**		**1**
704-1048	PORTABLE RUMBLE STRIPS	EACH				
704-1050	TYPE I BARRICADES	EACH				
704-1052	**TYPE III BARRICADES**	EACH	**8**	**10**		**10**
704-1054	**SIDEWALK BARRICADE**	EA	**6**	**6**		**6**
704-1058	**PEDESTRIAN WALKWAY**	LF	**195**	**195**		**195**
704-1060	**DELINEATOR DRUMS**	EACH	**41**	**64**		**64**
704-1065	TRAFFIC CONES	EACH				
704-1067	**TUBULAR MARKERS**	EACH	**92**	**78**		**92**
704-1070	DELINEATOR	EACH				
704-1072	FLEXIBLE DELINEATORS	EACH				
704-1080	**STACKABLE VERTICAL PANELS**	EACH	**66**	**71**		**71**
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	**1300**	**440**		**1740**
704-2108	**TEMPORARY CURB RAMP**	EA	**1**	**1**		**1**
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF				
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH				
704-3511	**STATE FURNISHED MEDIAN BARRIER**	LF	**360**	**360**		**360**
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
STACY LATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

Traffic Control Devices List
ND 200
Main St W - Hazen Golf Course

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	100	2



LEGEND

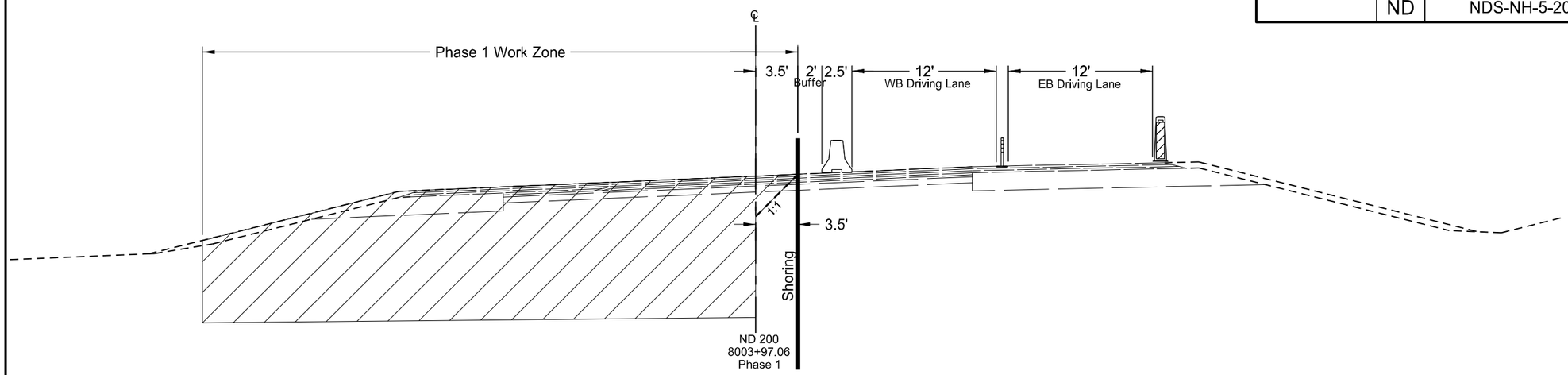
- Shared Use Path
- Lighting
- Pedestrian Box Culvert

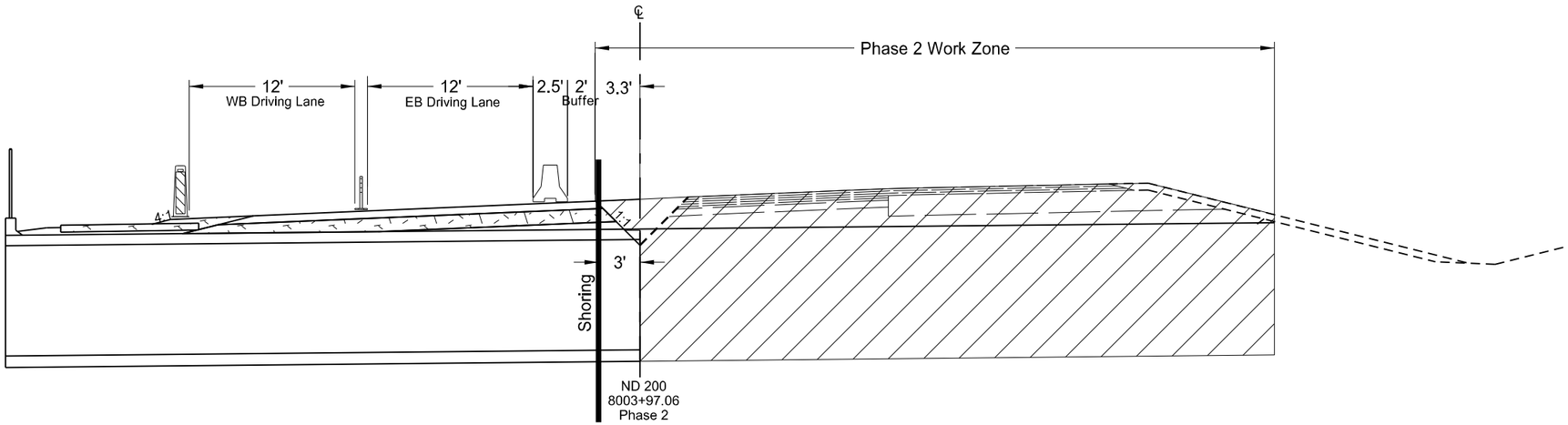
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

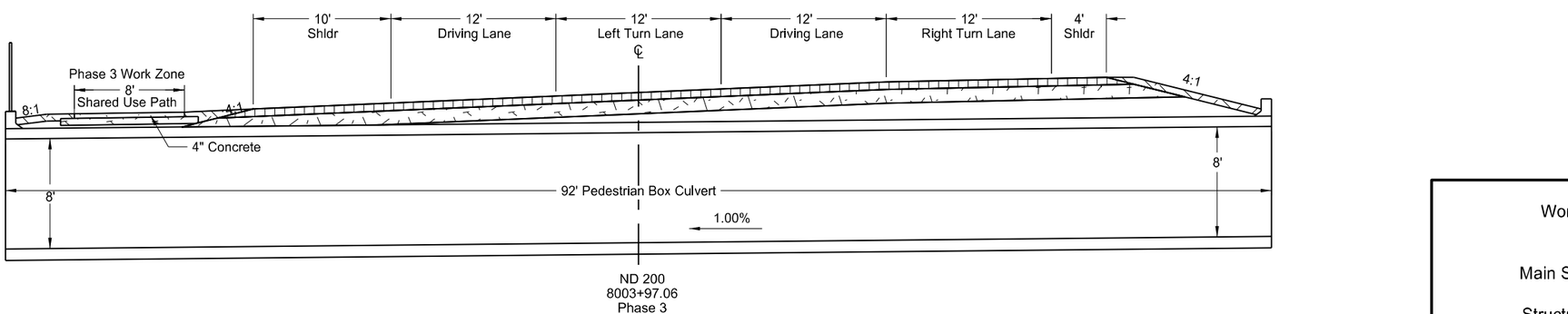
Work Zone Traffic Control

ND 200
Main St W - Hazen Golf Course

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	100	3







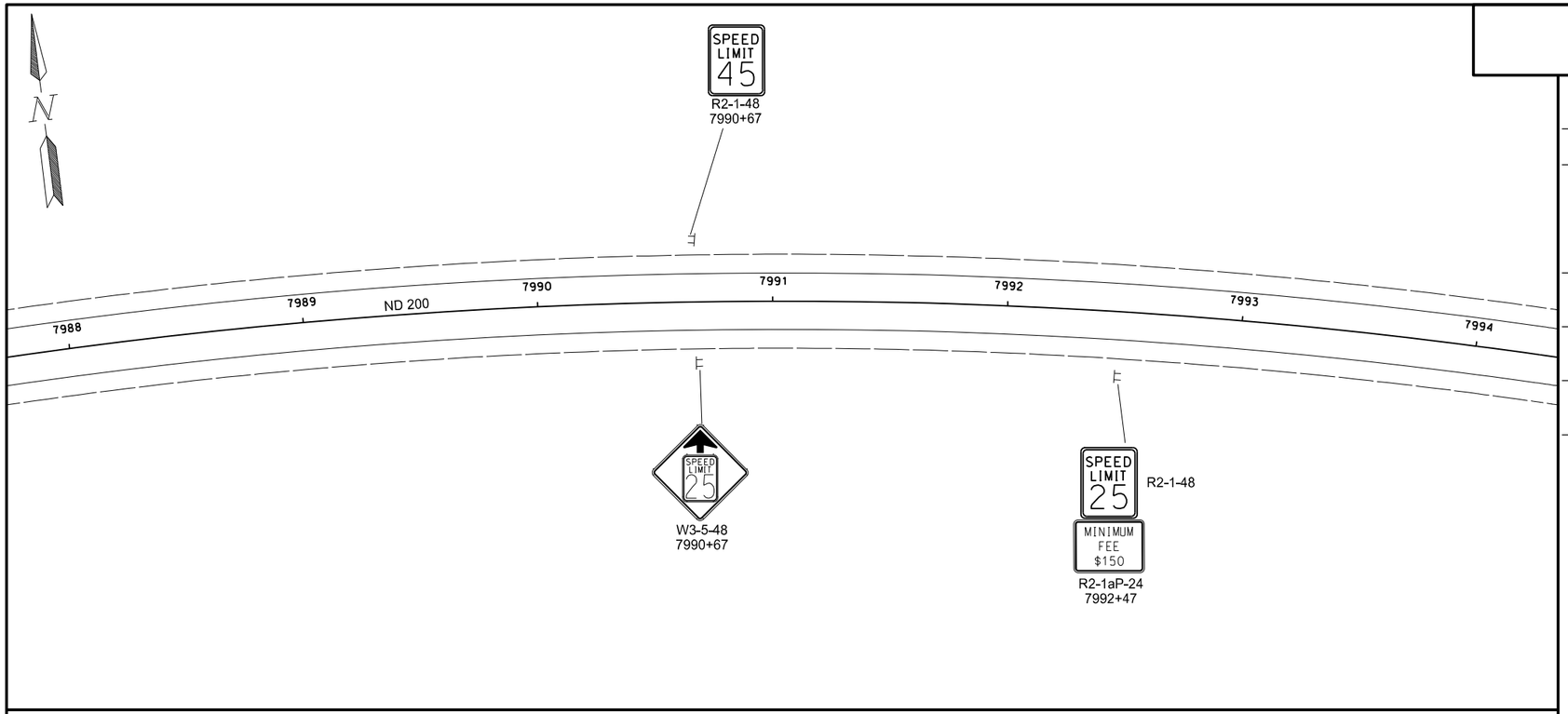
REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

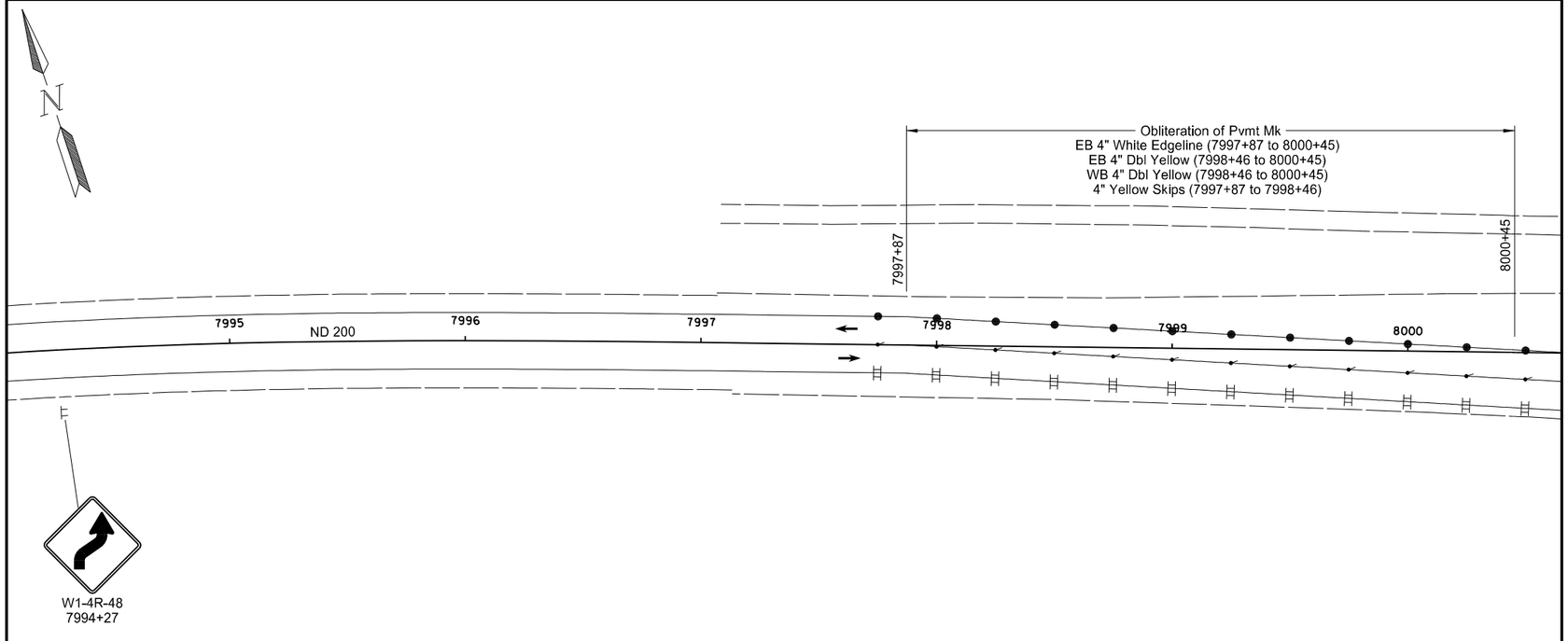
Work Zone Traffic Control

ND 200
Main St W - Hazen Golf Course

Structure 200-151.711 Phasing
8003+97.06

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	100	4





SPEC	CODE	BID ITEM	UNIT	QUANTITY
704	1000	TRAFFIC CONTROL SIGNS		
		R2-1-48 2 EA x 39 UNITS	UNIT	78
		R2-1aP-24	UNIT	10
		W1-4-48	UNIT	35
		W3-5-48	UNIT	35
704	1060	DELINEATOR DRUMS		
		ND 200	EA	11
704	1067	TUBULAR MARKERS		
		ND 200	EA	11
704	1080	STACKABLE VERTICAL PANELS		
		ND 200	EA	11
704	1500	OBLITERATION OF PAVEMENT MARKING		
		EB 4" White Edgeline (7997+87 to 8000+45)	SF	86
		EB 4" Dbl Yellow (7993+46 to 8000+45)	SF	133
		WB 4" Dbl Yellow (7998+46 to 8000+45)	SF	133
		4" Yellow Skips (7997+87 to 7998+46)	SF	7

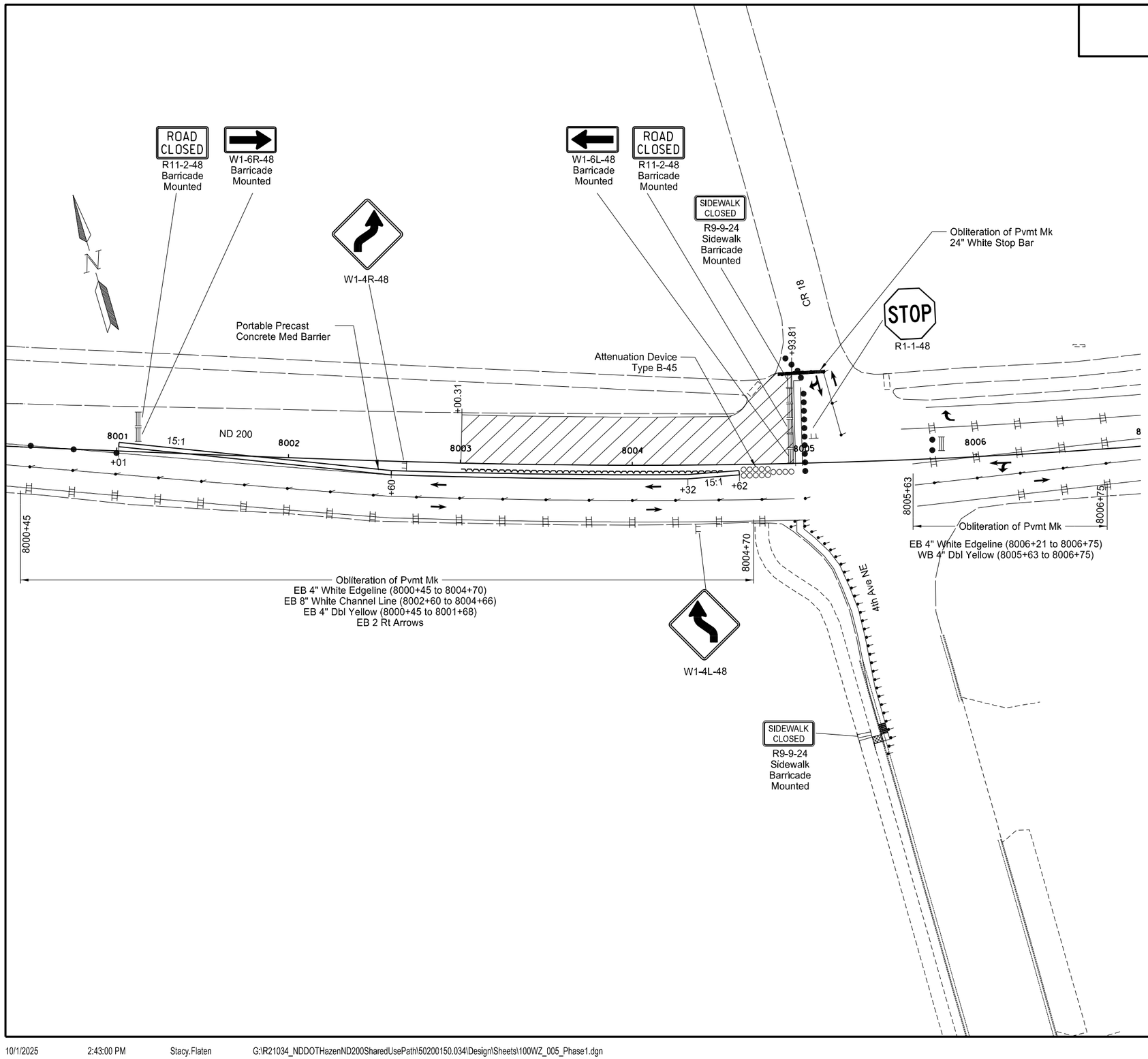
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

Work Zone Traffic Control

ND 200
Main St W - Hazen Golf Course

7987+85 to 8000+45
Phase 1

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	100	5



SPEC	CODE	BID ITEM	UNIT	QUANTITY
704	1000	TRAFFIC CONTROL SIGNS		
		R1-1-48	UNIT	32
		R9-9-24 2 EA x 3 UNITS	UNIT	6
		R11-2-48 2 EA x 12 UNITS	UNIT	24
		W1-4-48 2 EA x 35 UNITS	UNIT	70
		W1-6-48 2 EA x 26 UNITS	UNIT	52
704	1039	ATTENUATION DEVICE-TYPE B-45		
		8004+62	EA	1
704	1052	TYPE III BARRICADE		
		ND 200	EA	8
704	1054	SIDEWALK BARRICADE		
		4th Ave NW	EA	2
704	1058	PEDESTRIAN WALKWAY		
		CR 18	LF	50
		4th Ave NE	LF	145
704	1060	DELINEATOR DRUMS		
		ND 200	EA	5
		CR 18	EA	14
704	1067	TUBULAR MARKERS		
		ND 200	EA	27
		4th Ave NE (pedestrian walkway)	EA	33
704	1080	STACKABLE VERTICAL PANELS		
		ND 200	EA	31
704	1500	OBLITERATION OF PAVEMENT MARKING		
		EB 4" White Edgeline (8000+45 to 8004+70)	SF	142
		EB 8" White Channel Line (8002+60 to 8004+66)	SF	138
		EB 4" Dbl Yellow (8000+45 to 8001+68)	SF	82
		EB Rt Arrows (2EA x 16SF)	SF	32
		EB 4" White Edgeline (8006+21 to 8006+75)	SF	18
		WB 4" Dbl Yellow (8005+63 to 8006+75)	SF	75
		4th Ave NE, 24" White Stop Bar	SF	56
704	2108	TEMPORARY CURB RAMP		
		4th Ave NE	EA	1
704	3511	STATE FURNISHED MEDIAN BARRIER		
		ND 200	LF	360

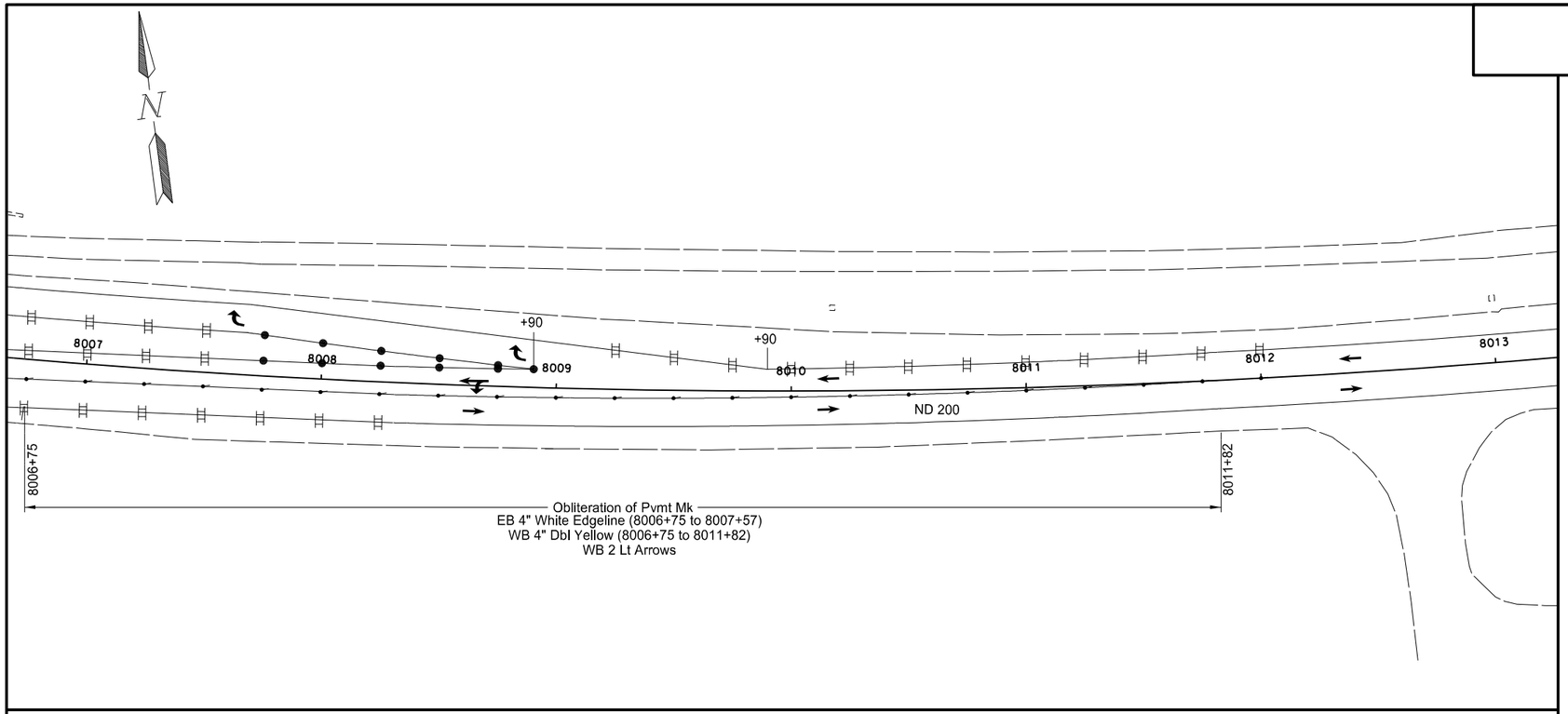
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

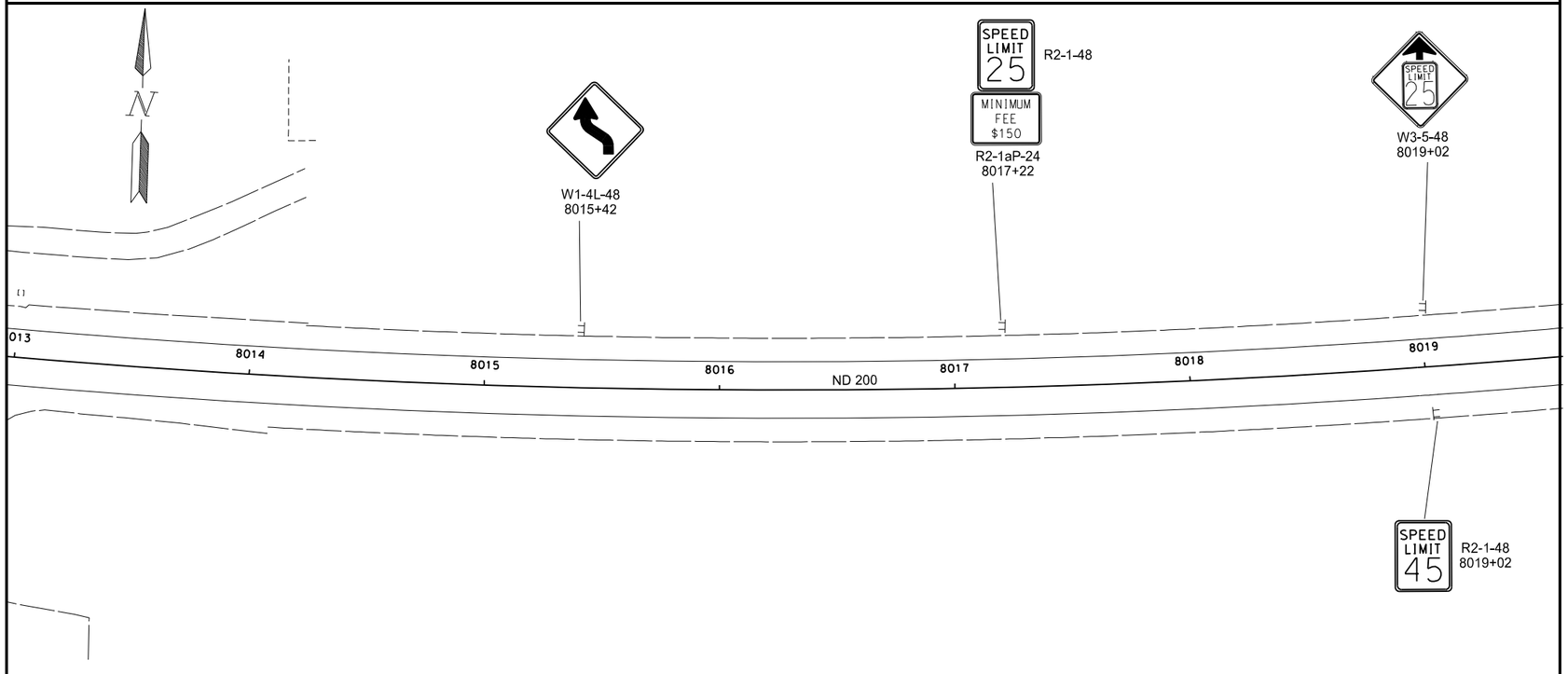
Work Zone Traffic Control

ND 200
Main St W - Hazen Golf Course

8000+45 to 8006+75
Phase 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	100	6





SPEC	CODE	BID ITEM	UNIT	QUANTITY
704	1000	TRAFFIC CONTROL SIGNS		
		R2-1-48 2 EA x 39 UNITS	UNIT	78
		R2-1aP-24	UNIT	10
		W1-4-48	UNIT	35
		W3-5-48	UNIT	35
704	1060	DELINEATOR DRUMS		
		ND 200	EA	11
704	1067	TUBULAR MARKERS		
		ND 200	EA	21
704	1080	STACKABLE VERTCAL PANELS		
		ND 200	EA	24
704	1500	OBLITERATION OF PAVEMENT MARKING		
		EB 4" White Edgeline (8006+75 to 8007+57)	SF	28
		WB 4" Dbl Yellow (8006+75 to 8011+82)	SF	338
		WB Rt Arrows (2EA x 16SF)	SF	32

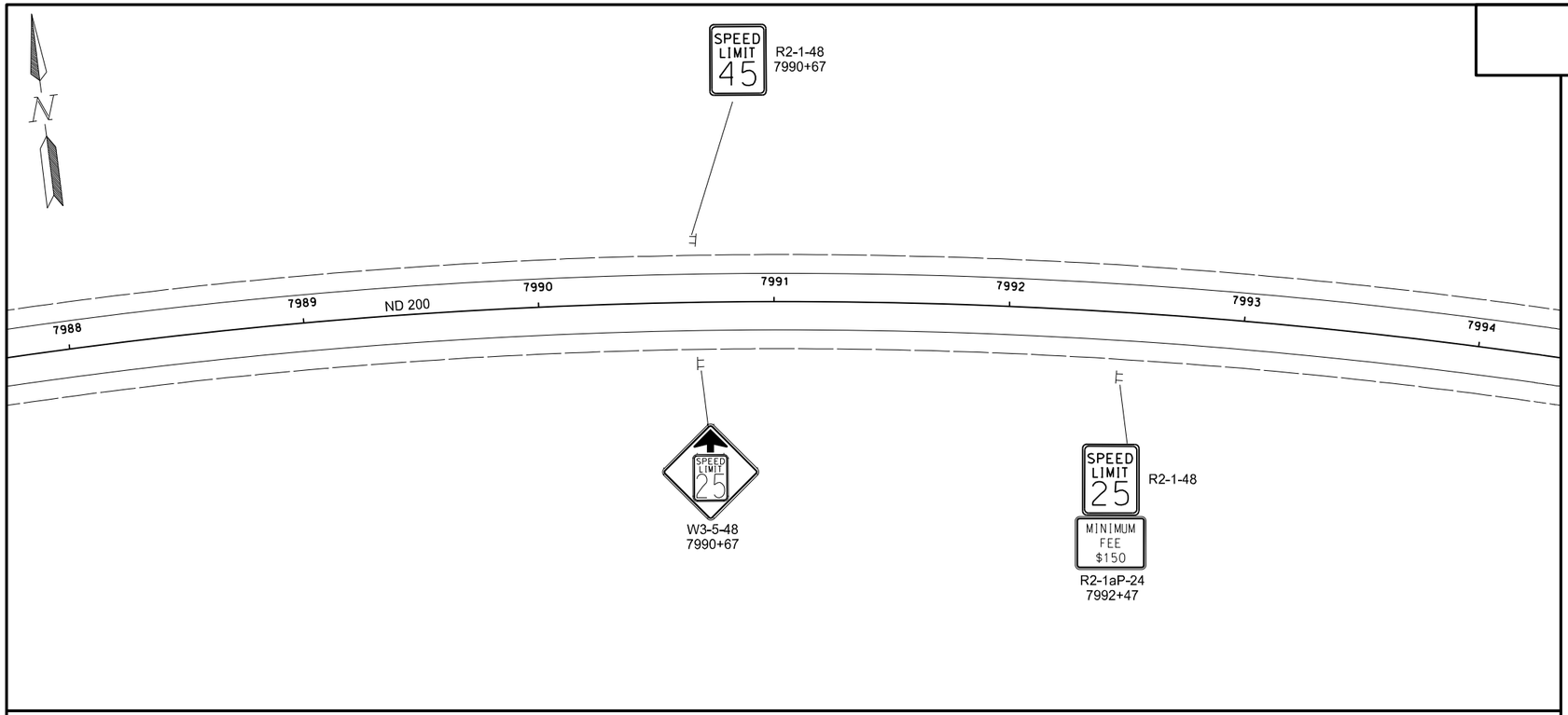
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

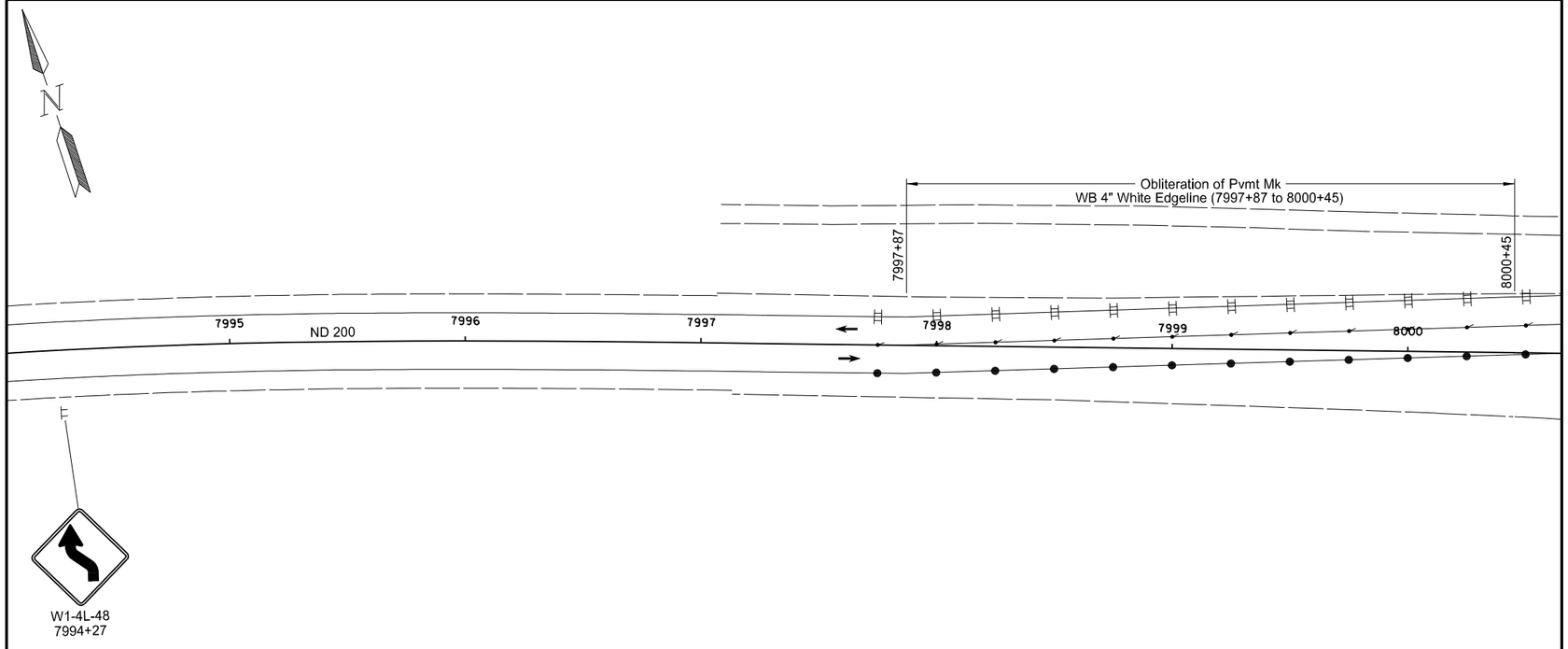
Work Zone Traffic Control

ND 200
Main St W - Hazen Golf Course

8006+75 to 8019+35
Phase 1

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	100	7





SPEC	CODE	BID ITEM	UNIT	QUANTITY
704	1000	TRAFFIC CONTROL SIGNS		
		R2-1-48 2 EA x 39 UNITS	UNIT	78
		R2-1aP-24	UNIT	10
		W1-4-48	UNIT	35
		W3-5-48	UNIT	35
704	1060	DELINEATOR DRUMS		
		ND 200	EA	11
704	1067	TUBULAR MARKERS		
		ND 200	EA	11
704	1080	STACKABLE VERTICAL PANELS		
		ND 200	EA	11
704	1500	OBLITERATION OF PAVEMENT MARKING		
		WB 4" White Edgeline (7997+87 to 8000+45)	SF	86

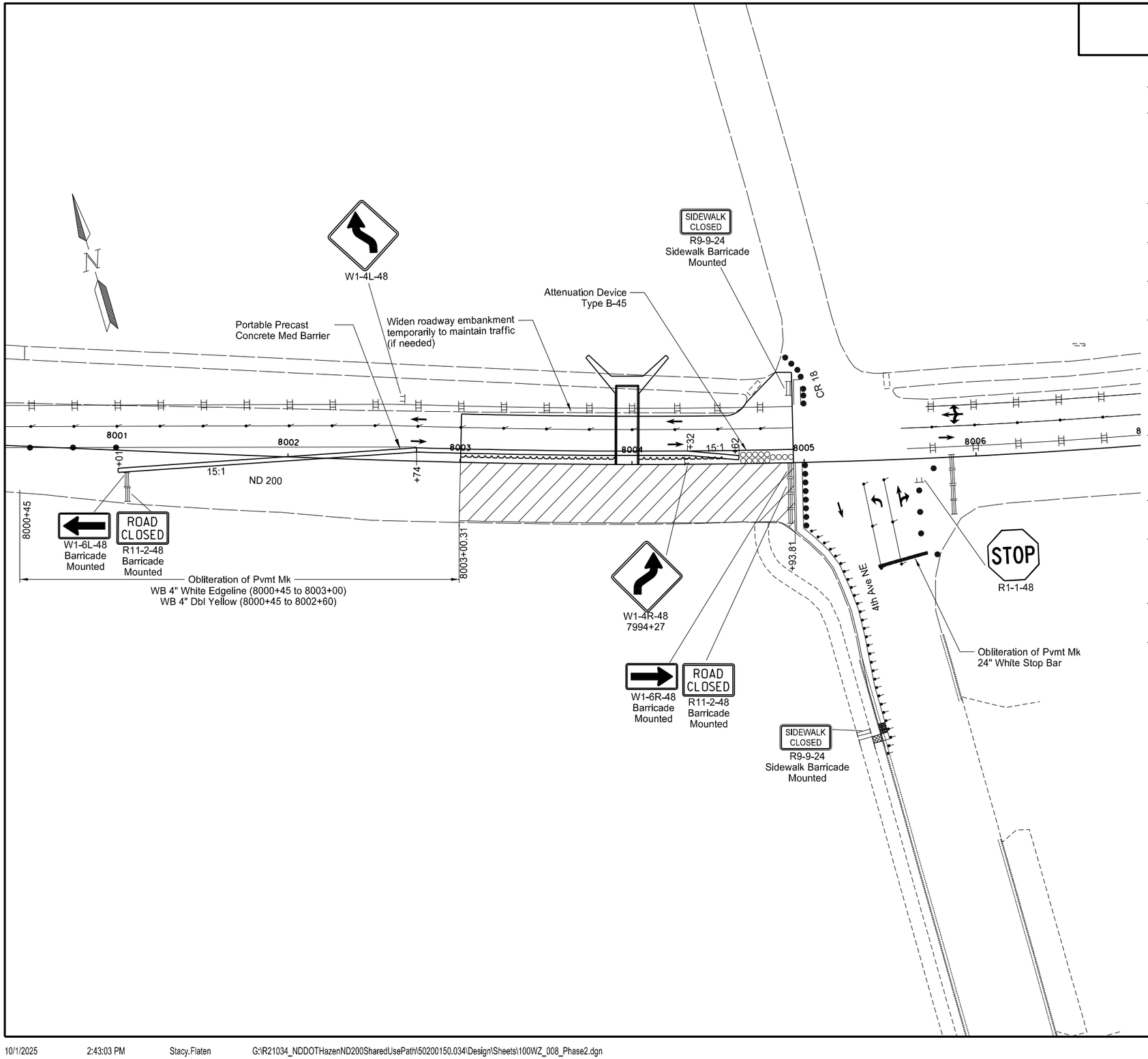
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

Work Zone Traffic Control

ND 200
Main St W - Hazen Golf Course

7987+85 to 8000+45
Phase 2

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	100	8



SPEC	CODE	BID ITEM	UNIT	QUANTITY
704	1000	TRAFFIC CONTROL SIGNS		
		R1-1-48	UNIT	32
		R9-9-24 2 EA x 3 UNITS	UNIT	6
		R11-2-48 2 EA x 12 UNITS	UNIT	24
		W1-4-48 2 EA x 35 UNITS	UNIT	70
		W1-6-48 2 EA x 26 UNITS	UNIT	52
704	1039	ATTENUATION DEVICE-TYPE B-45		
		8004+62	EA	1
704	1052	TYPE III BARRICADE		
		ND 200	EA	10
704	1054	SIDEWALK BARRICADE		
		4th Ave NW	EA	2
704	1058	PEDESTRIAN WALKWAY		
		CR 18	LF	15
		4th Ave NE	LF	180
704	1060	DELINEATOR DRUMS		
		ND 200	EA	3
		CR 18	EA	7
		4th Ave NE	EA	13
704	1067	TUBULAR MARKERS		
		ND 200	EA	23
		4th Ave NE (pedestrian walkway)	EA	29
		4th Ave NE	EA	6
704	1080	STACKABLE VERTICAL PANELS		
		ND 200	EA	28
704	1500	OBLITERATION OF PAVEMENT MARKING		
		WB 4" White Edgeline (8000+45 to 8003+00)	SF	85
		WB 4" Dbl Yellow (8000+45 to 8002+60)	SF	144
		4th Ave NE, 24" White Stop Bar	SF	60
704	2108	TEMPORARY CURB RAMP		
		4th Ave NE	EA	1
704	3511	STATE FURNISHED MEDIAN BARRIER		
		ND 200	LF	360

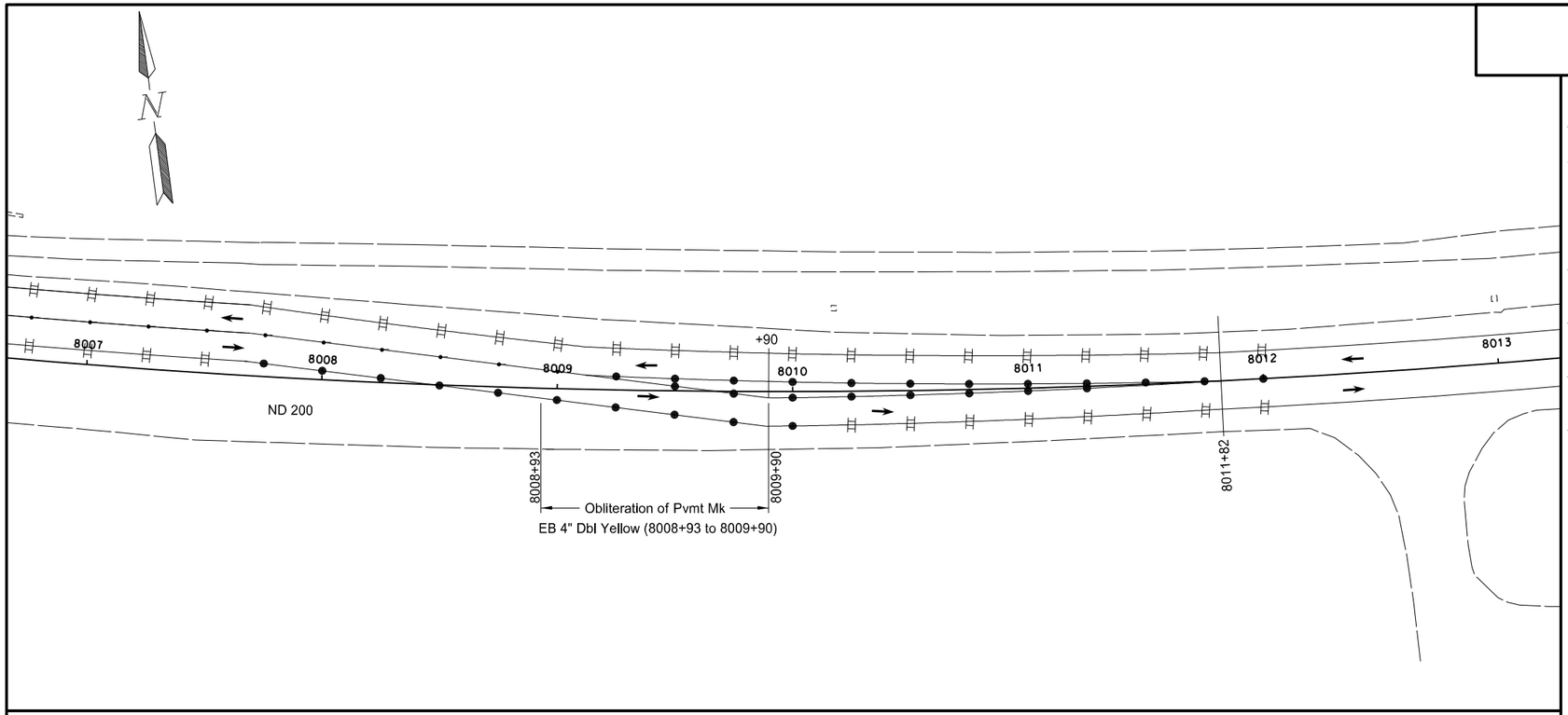
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

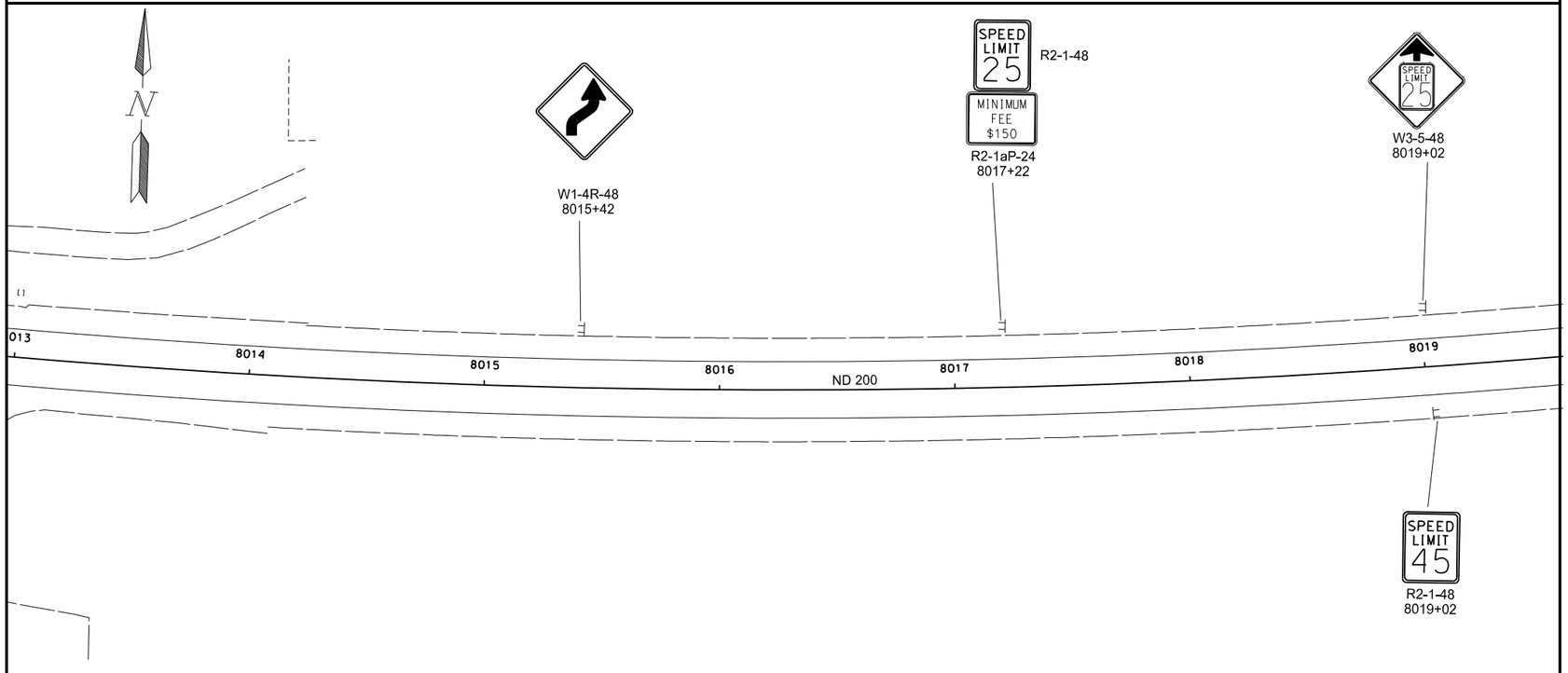
Work Zone Traffic Control

ND 200
Main St W - Hazen Golf Course

8000+45 to 8006+75
Phase 2

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	100	9





SPEC	CODE	BID ITEM		UNIT	QUANTITY
704	1000	TRAFFIC CONTROL SIGNS			
		R2-1-48	2 EA x 39 UNITS	UNIT	78
		R2-1aP-24		UNIT	10
		W1-4-48		UNIT	35
		W3-5-48		UNIT	35
704	1060	DELINEATOR DRUMS			
		ND 200		EA	30
704	1067	TUBULAR MARKERS			
		ND 200		EA	9
704	1080	STACKABLE VERTICAL PANELS			
		ND 200		EA	32
704	1500	OBLITERATION OF PAVEMENT MARKING			
		EB 4" Dbl Yellow (8008+93 to 8009+90)		SF	65

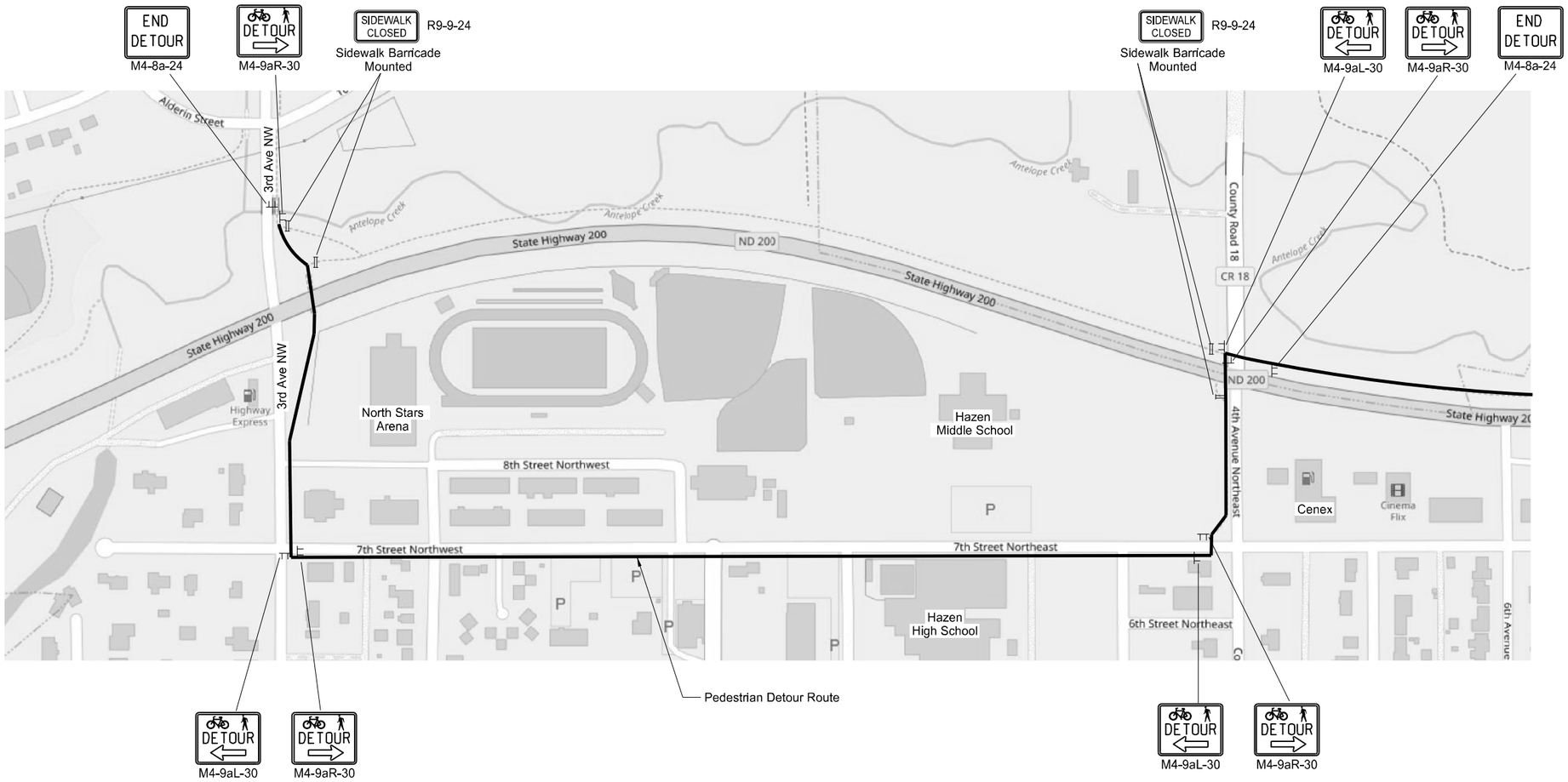
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

Work Zone Traffic Control

ND 200
Main St W - Hazen Golf Course

8006+75 to 8019+35
Phase 2

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	100	10



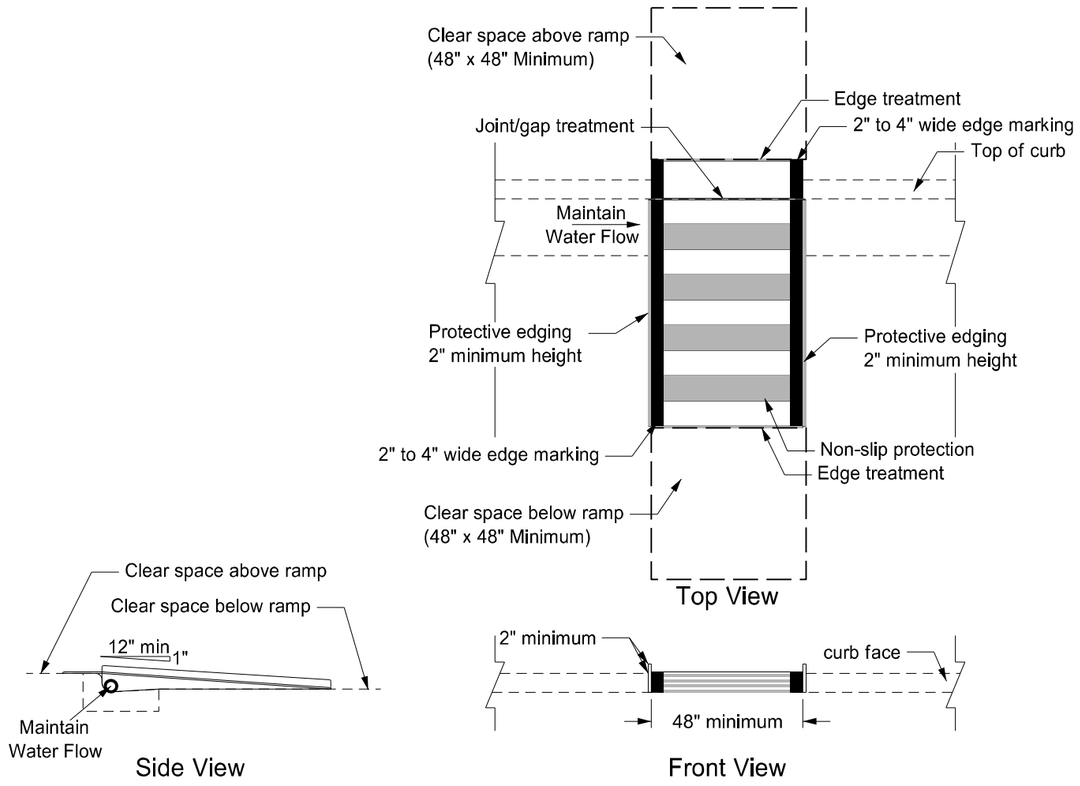
REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

Work Zone Traffic Control

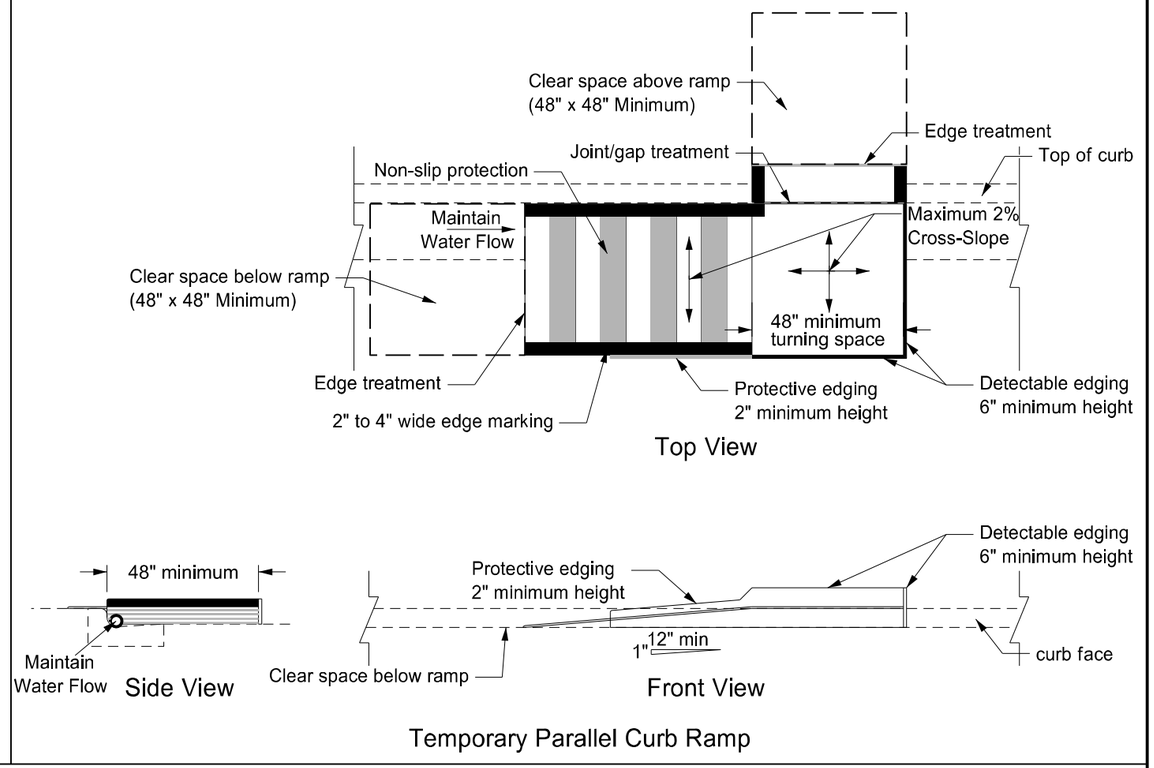
ND 200
Main St W - Hazen Golf Course

Pedestrian Detour

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	100	11

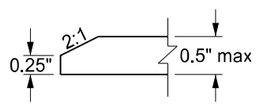


Temporary Perpendicular Curb Ramp



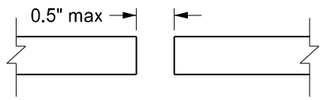
Temporary Parallel Curb Ramp

Edge Treatment



Maximum Surface
Height Change Detail

Joint/Gap Treatment



Maximum Width
Lateral Joints or Gaps

REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

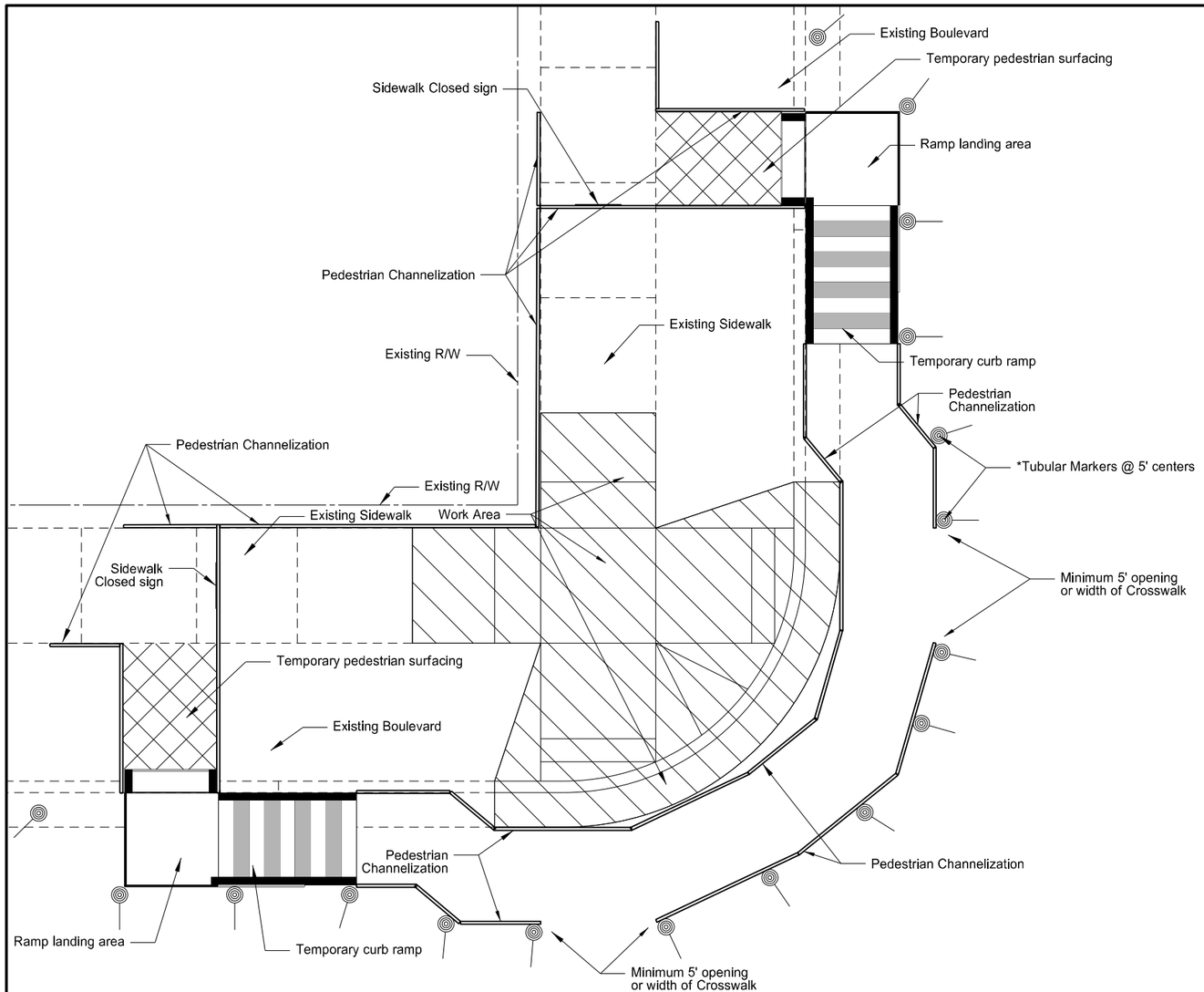
Work Zone Traffic Control

ND 200
Main St W - Hazen Golf Course

Temporary Pedestrian Curb Ramp Details

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	100	12

*NOTE: Eliminate tubular markers if pedestrian channelization is retro-reflective



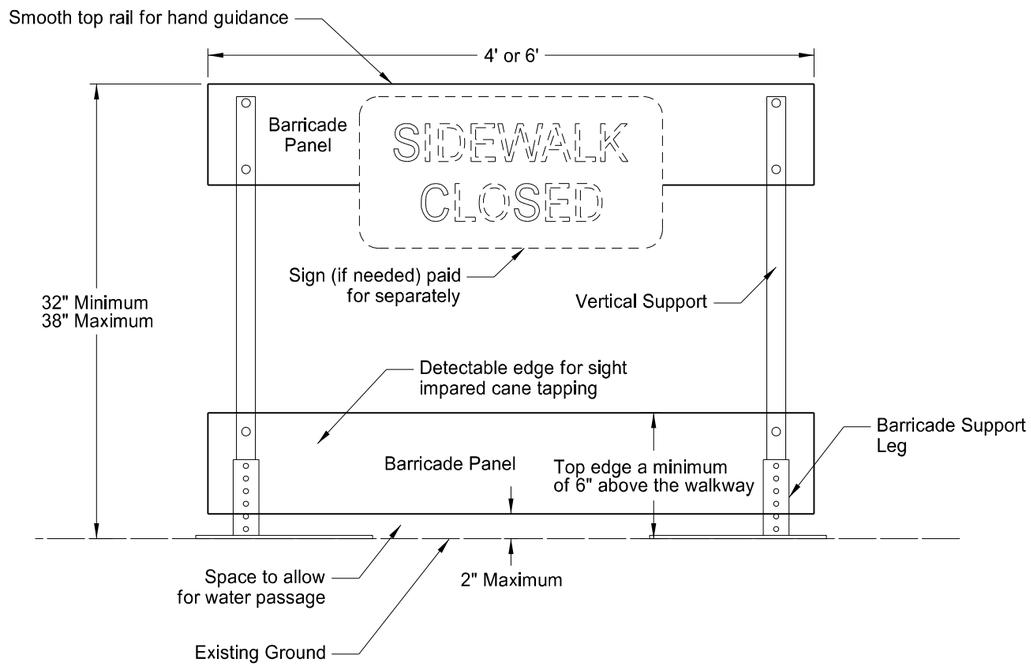
REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

Details

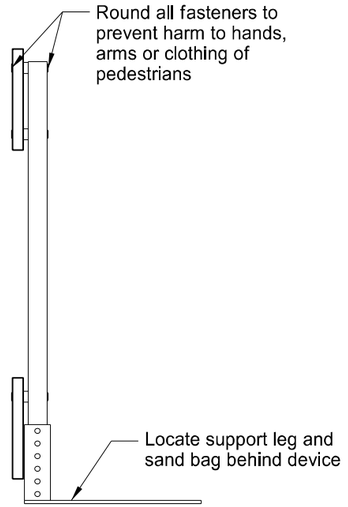
ND 200
Main St W - Hazen Golf Course

Temporary Pedestrian Access Route

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	100	13



Front View

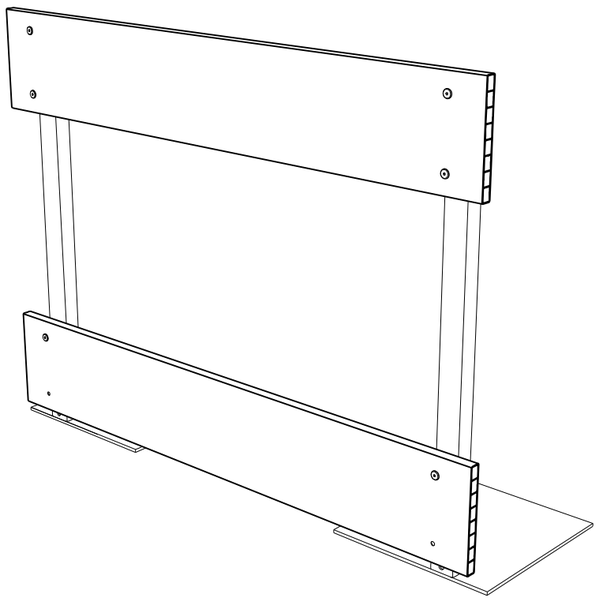


End View

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

REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 10/2/25
NORTH DAKOTA

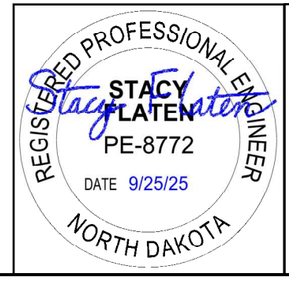
Work Zone Traffic Control

ND 200
Main St W - Hazen Golf Course

Sidewalk Barricade

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	N.D.	NDS-NH-5-200(034)150	110	1

Station / RP	Sign No.	Assembly No.	Flat Sheet For Signs IV SF	Flat Sheet For Signs XI SF	Sign Support Length 1st LF	2nd LF	3rd LF	4th LF	Vert Clear-ance FT	Support Size	Max Post Len LF	Sleeve Length 1st LF	2nd LF	3rd LF	4th LF	Sleeve Size	Anchor EA	Anchor LF	Anchor Size	Reset Sign Panel EA	Reset Sign Support EA	Break-Away EA	Comments
8004+28 Lt		29	3.0		6.4				4.0	2 x 2 12 ga	13.6						1	4	2.25 x 2.25 12 ga				
8004+55 Lt		14		4.0	6.9				4.0	2 x 2 12 ga	13.0						1	4	2.25 x 2.25 12 ga				
8004+77 Lt	S.A. 5E			13.3	12.7				7.0	2.25 x 2.25 12 ga	13.7	3.8				2.5 x 2.5 12 ga	1	4	3 x 3 7 ga	1		1	
8004+82 Rt		400			10.5				7.0	2.25 x 2.25 12 ga	11.2						1	4	2.5 x 2.5 12 ga	1			
Sub Total			3.0	17.3		**Total**	36.5										**Total**	16.0		2	0	1	
Grand Total			**3.0**	**17.3**		**Total**	**36.5**										**Total**	**16**	**0**	**2**	**0**	**1**	

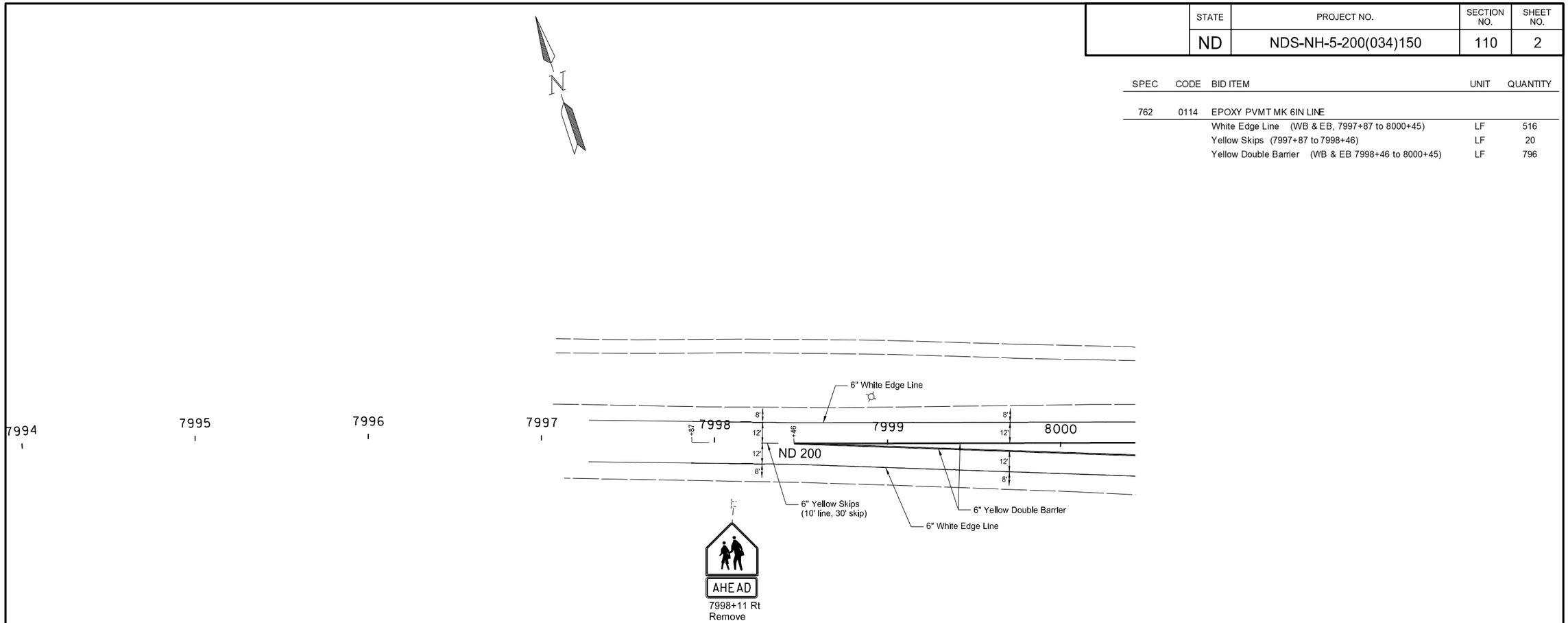


Sign Summary
Perforated Tube

ND 200
Main St W - Hazen Golf Course

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	110	2

SPEC	CODE	BID ITEM	UNIT	QUANTITY
762	0114	EPOXY PVMT MK 6IN LINE		
		White Edge Line (WB & EB, 7997+87 to 8000+45)	LF	516
		Yellow Skips (7997+87 to 7998+46)	LF	20
		Yellow Double Barrier (WB & EB 7998+46 to 8000+45)	LF	796



REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 9/25/25
NORTH DAKOTA

Signing & Pavement Marking Layout

ND 200
Main St W - Hazen Golf Course

7994+15 to 8000+45

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	110	3

SPEC	CODE	BID ITEM	UNIT	QUANTITY
754	0155	DELINEATORS-TYPE A-DOUBLE SIDED		
		8002+28 Lt	EA	1
		8003+60 Rt	EA	1
754	1104	REMOVE SIGN FOUNDATION		
		8004+47 Rt	EA	1
762	0111	EPOXY PVMT MK 12IN LINE		
		White Channel Line		
		EB Lt Turn Lane (8002+60 to 8004+85)	LF	225
		EB Rt Turn Lane (8002+60 to 8004+85)	LF	225
		WB Rt Turn Lane (3005+57 to 8006+75)	LF	118
		WB Lt Turn Lane (8005+60 to 8006+75)	LF	115
762	0112	EPOXY PVMT MK MESSAGE		
		Arrow (Lt) 16 SF x 2 EA	SF	32
		Arrow (Rt) 16 SF x 2 EA	SF	32
762	0114	EPOXY PVMT MK 6IN LINE		
		White Edge Line		
		WB (8000+45 to CR 18)	LF	492
		EB (8000+45 to 4th Ave NE)	LF	544
		WB (CR 18 to 8006+75)	LF	191
		EB (4th Ave NE to 8006+75)	LF	172
		Yellow Double Barrier		
		(8000+45 to 8004+85)	LF	1310
		(8005+63 to 8006+75)	LF	224
		White Crosswalk	LF	127
762	0117	EPOXY PVMT MK 24IN LINE		
		CR 18 Stop Bar	LF	30
		4th Ave NE	LF	30

Remove/Reset 8 St SW
Remove/Reset 53 Av SW
8 St SW Reset
53 Av SW Reset
Remove STOP R1-1-48
8004+77 Lt
8004+77 Lt
Special Assembly 5E
8004+74 Lt
Remove
8004+55 Lt
In Place to Remain
SPEED LIMIT 45
8001+73 Lt
Mounted on Light Pole
In Place to Remain
NO MOTOR VEHICLES
8004+21 Lt
Remove
NO MOTOR VEHICLES
8004+55 Lt
R5-3-24
Assembly 14
BIKE ROUTE
8004+28 Lt
D11-1-24
Assembly 29
NORTH DAKOTA 200
MERCER 18 COUNTY
8005+41 Lt
In Place to Remain
NO MOTOR VEHICLES
8005+98 Lt
In Place to Remain
51st Ave SW, Co Rd 18
6" White Edge Line
12" White Channel Line
24" White Stop Bar
Sign
8'
12" White Crosswalk
Delineator-Type A - Double Sided
8002+28 Lt
6" White Edge Line
8001
8002
ND 200
8003
8004
8005
8006
ND 200
6" Yellow Double Barrier
6" White Edge Line
12" White Channel Line
Delineator-Type A - Double Sided
8003+60 Rt
levee
levee
levee
levee
24" White Stop Bar
4th Ave NE
6" White Edge Line
6" Yellow Double Yellow
Sign
STOP
8005+89 Rt
In Place to Remain
SPEED LIMIT 45
8006+51 Rt
In Place to Remain
Sign Pvt
Sign Pvt
Sign
Sign
JCT
MERCER 18 COUNTY
TRUCK PARKING
8000+71 Rt
In Place to Remain
8004+68 Rt
Remove
8004+47 Rt
Remove Sign
Foundation
NORTH DAKOTA 200
8004+82 Rt
Reset sign on
new support
Assembly 400
NORTH DAKOTA 200
8004+93 Rt
Remove/
Reset
NO MOTOR VEHICLES
BIKE ROUTE
8005+11 Rt
Remove
BUSINESS DISTRICT
SNOW EMERGENCY ROUTE
NORTH DAKOTA WELLHEAD PROTECTION
NEXT 1/2 MILES
LIONS INTERNATIONAL
8005+28 Rt
In Place to Remain
Sign Pvt

REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 9/25/25
NORTH DAKOTA

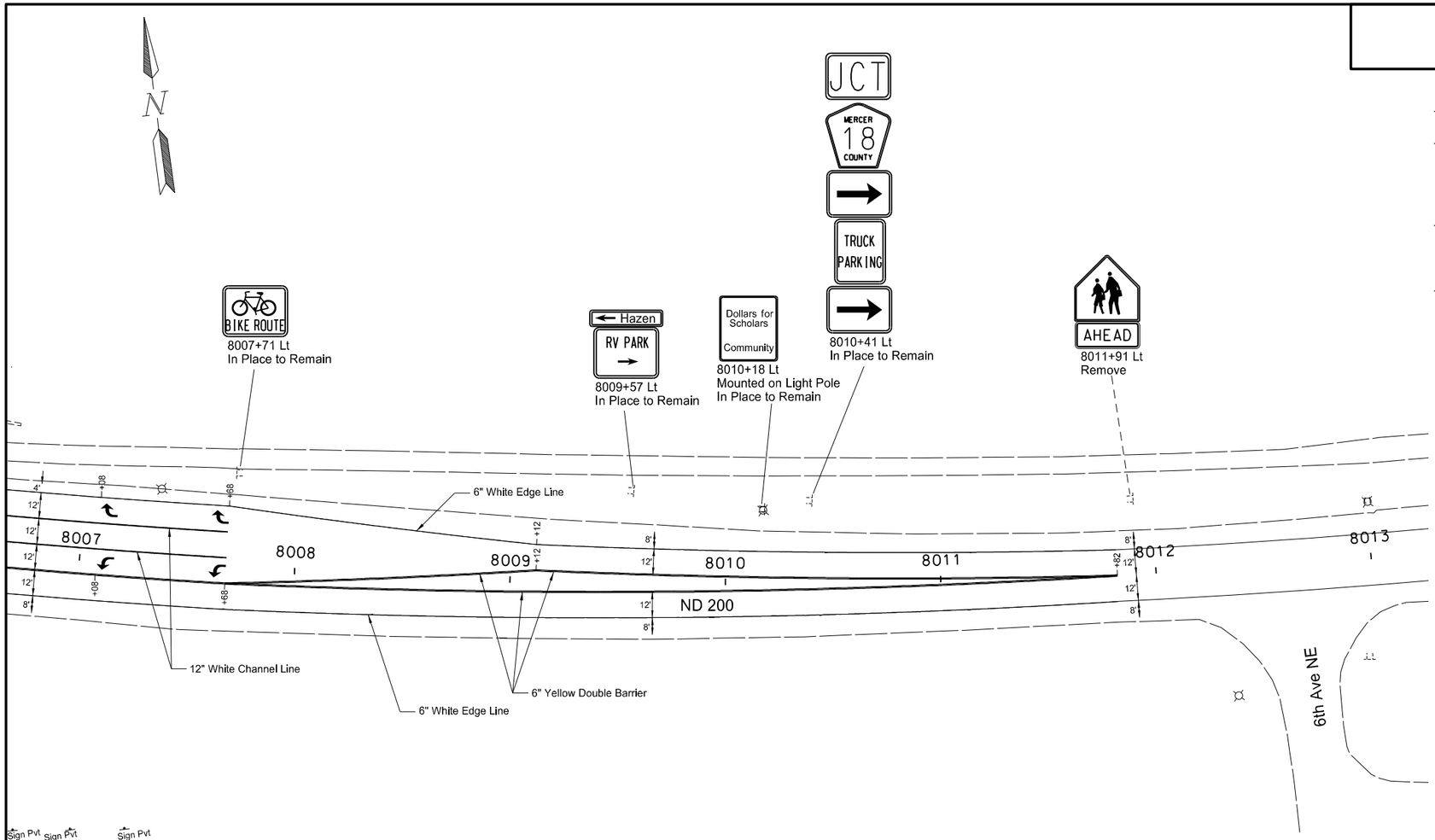
Signing & Pavement Marking Layout

ND 200
Main St W - Hazen Golf Course

8000+45 to 8006+75

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	110	4

SPEC	CODE	BID ITEM	UNIT	QUANTITY
762	0111	EPOXY PVMT MK 12N LINE		
		White Channel Line		
		WB Rt Turn Lane (3006+75 to 8007+68)	LF	93
		WB Lt Turn Lane (8006+75 to 8007+68)	LF	93
762	0112	EPOXY PVMT MK MESSAGE		
		Arrow (Lt) 16 SF x 2 EA	SF	32
		Arrow (Rt) 16 SF x 2 EA	SF	32
762	0114	EPOXY PVMT MK 6IN LINE		
		White Edge Line		
		WB (8006+75 to 8011+82)	LF	507
		EB (8006+75 to 8011+82)	LF	507
		Yellow Double Barrier		
		(8006+75 to 8011+82)	LF	1844



REGISTERED PROFESSIONAL ENGINEER
STACY FLATEN
PE-8772
DATE 9/25/25
NORTH DAKOTA

Signing & Pavement Marking Layout

ND 200
Main St W - Hazen Golf Course

8006+75 to 8013+05

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	140	1

Point	Station	Remove Conduit		Remove Cable
		Length (ft)	Size	Length (ft)
2	8001+69.2 - 35.5' Lt.	280	2"	1144
3	8004+46.8 - 36.4' Lt.			

Lighting - Removals		
No.	Station	Note
3	8004+46.8 - 36.4' Lt.	1

Removal Notes:

1-Remove light standard, street light luminaire, and concrete foundation.
Light standard and luminaire to be relocated on new foundation.

REMOVE LIGHT STANDARD	REMOVE STREET LIGHT LUMINAIRE	REMOVE CONCRETE FOUNDATION	REMOVE CONDUIT	REMOVE UNDERGROUND WIRE	RELCOATE LIGHT STANDARD
EA	EA	EA	LF	LF	EA
1	1	1	280	1144	1

Note:
These items shall not be bid seperately but shall be included in item "RELOCATE LIGHT STANDARD"

REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

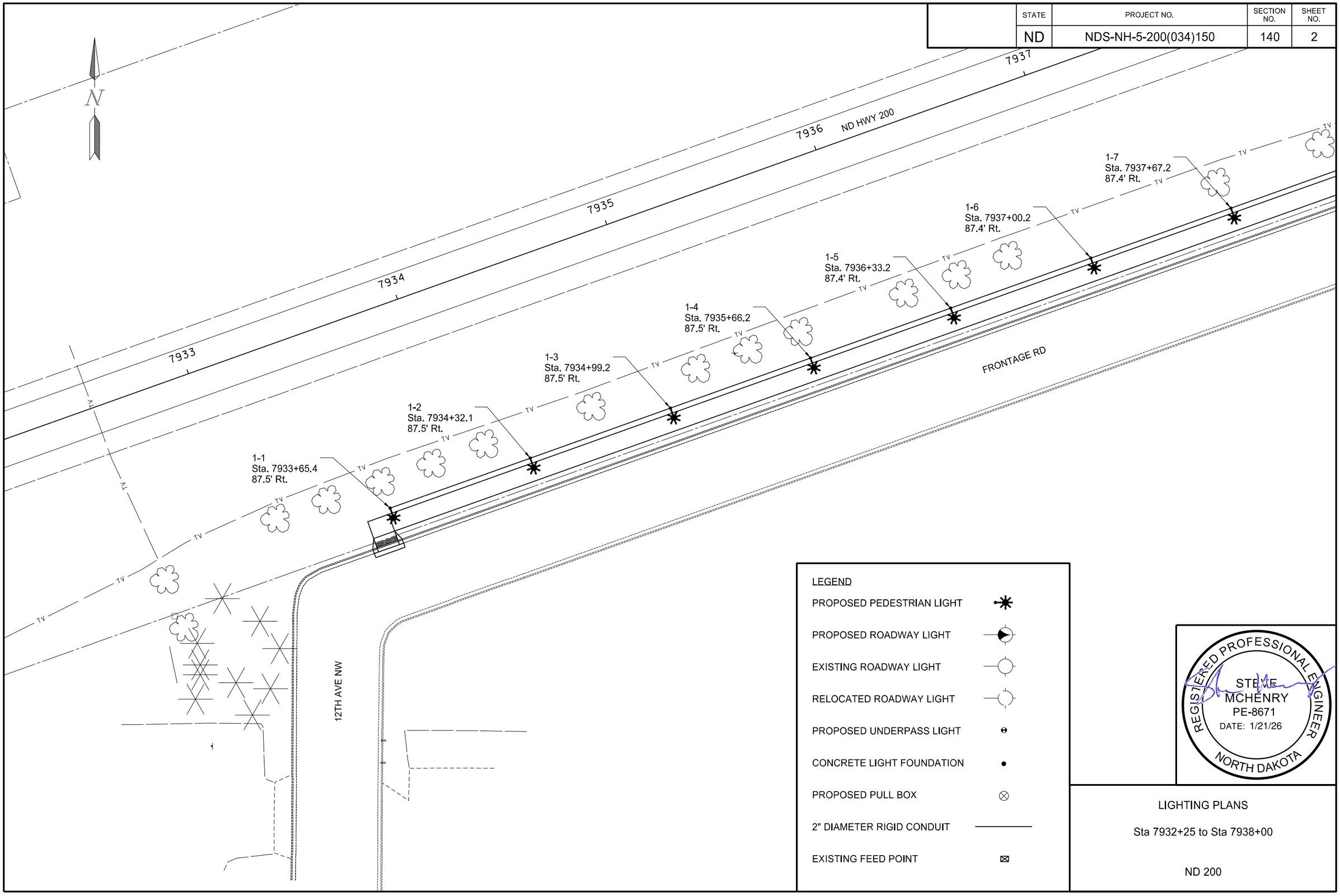
LIGHTING REMOVAL PLAN

Sta 8001+25 TO Sta 8007+50

ND 200

1/20/2026 10:18:52 AM AJEmerson H:\Projects\14000\14303\Design\Plan\140LT_001_LTG.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	140	2



LEGEND

- PROPOSED PEDESTRIAN LIGHT
- PROPOSED ROADWAY LIGHT
- EXISTING ROADWAY LIGHT
- RELOCATED ROADWAY LIGHT
- PROPOSED UNDERPASS LIGHT
- CONCRETE LIGHT FOUNDATION
- PROPOSED PULL BOX
- 2" DIAMETER RIGID CONDUIT
- EXISTING FEED POINT

REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING PLANS

Sta 7932+25 to Sta 7938+00

ND 200

1/20/2026 10:19:28 AM AJEmerson H:\Projects\14000\14303\Design\Plan\140LT_002_LTG.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS- NH-5-200(034)150	140	3

N

7944
7943
7942
7941
7940
7939

ND HWY 200

FRONTAGE RD

11TH AVE NW

1-16
Sta. 7943+70.2
87.1' Rt.

1-15
Sta. 7943+03.2
87.2' Rt.

1-14
Sta. 7942+36.2
87.2' Rt.

1-13
Sta. 7941+71.9
87.3' Rt.

1-12
Sta. 7941+02.2
87.4' Rt.

1-11
Sta. 7940+35.2
87.4' Rt.

1-10
Sta. 7939+68.2
87.4' Rt.

1-9
Sta. 7939+01.2
87.4' Rt.

1-8
Sta. 7938+34.2
87.4' Rt.

TV

LEGEND

- PROPOSED PEDESTRIAN LIGHT
- PROPOSED ROADWAY LIGHT
- EXISTING ROADWAY LIGHT
- RELOCATED ROADWAY LIGHT
- PROPOSED UNDERPASS LIGHT
- CONCRETE LIGHT FOUNDATION
- PROPOSED PULL BOX
- 2" DIAMETER RIGID CONDUIT
- EXISTING FEED POINT

REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING PLANS

Sta 7938+00 TO Sta 7944+50

ND 200

1/20/2026 10:20:59 AM AJEmerson H:\Projects\14000\14303\Design\Plan\140LT_003_LTG.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	140	4

N

7950
7949
7948
7947
7946
7945

ND HWY 200

FRONTAGE RD

10TH AVE NW

FO

TV

1-25
Sta. 7949+73.0
87.2' Rt.

1-24
Sta. 7949+06.0
87.2' Rt.

1-23
Sta. 7948+39.0
87.2' Rt.

1-22
Sta. 7947+72.0
87.1' Rt.

1-21
Sta. 7947+05.1
87.1' Rt.

1-20
Sta. 7946+38.0
87.1' Rt.

1-19
Sta. 7945+70.1
87.1' Rt.

1-18
Sta. 7945+04.1
87.1' Rt.

1-17
Sta. 7944+37.0
87.1' Rt.

LEGEND

- PROPOSED PEDESTRIAN LIGHT
- PROPOSED ROADWAY LIGHT
- EXISTING ROADWAY LIGHT
- RELOCATED ROADWAY LIGHT
- PROPOSED UNDERPASS LIGHT
- CONCRETE LIGHT FOUNDATION
- PROPOSED PULL BOX
- 2" DIAMETER RIGID CONDUIT
- EXISTING FEED POINT

REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING PLANS

Sta 7944+50 to Sta 7950+50

ND 200

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	140	5

N

2-2
Sta. 7953+93.1
32.0' Lt.

Service connection provided by power utility owner (Roughrider Electric Co-op)

2-1
Sta. 7952+24.8
37.7'Lt

FP2 TYPE II
Sta. 7952+24.8
47.1' Lt

ANTELOPE DR

7955

7954

7953

ND HWY 200

7952

7951

FP1 TYPE II
Sta. 7950+79.5
62.1' Rt

Service connection provided by power utility owner (Roughrider Electric Co-op)

3 Tel FO Ped

1-26
Sta. 7950+40.0
87.8' Rt.

FRONTAGE RD

9TH AVE NW

OH

TV

FO

LEGEND

PROPOSED PEDESTRIAN LIGHT	✱
PROPOSED ROADWAY LIGHT	◐
EXISTING ROADWAY LIGHT	○
RELOCATED ROADWAY LIGHT	○
PROPOSED UNDERPASS LIGHT	⊖
CONCRETE LIGHT FOUNDATION	•
PROPOSED PULL BOX	⊗
2" DIAMETER RIGID CONDUIT	——
EXISTING FEED POINT	⊠

REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

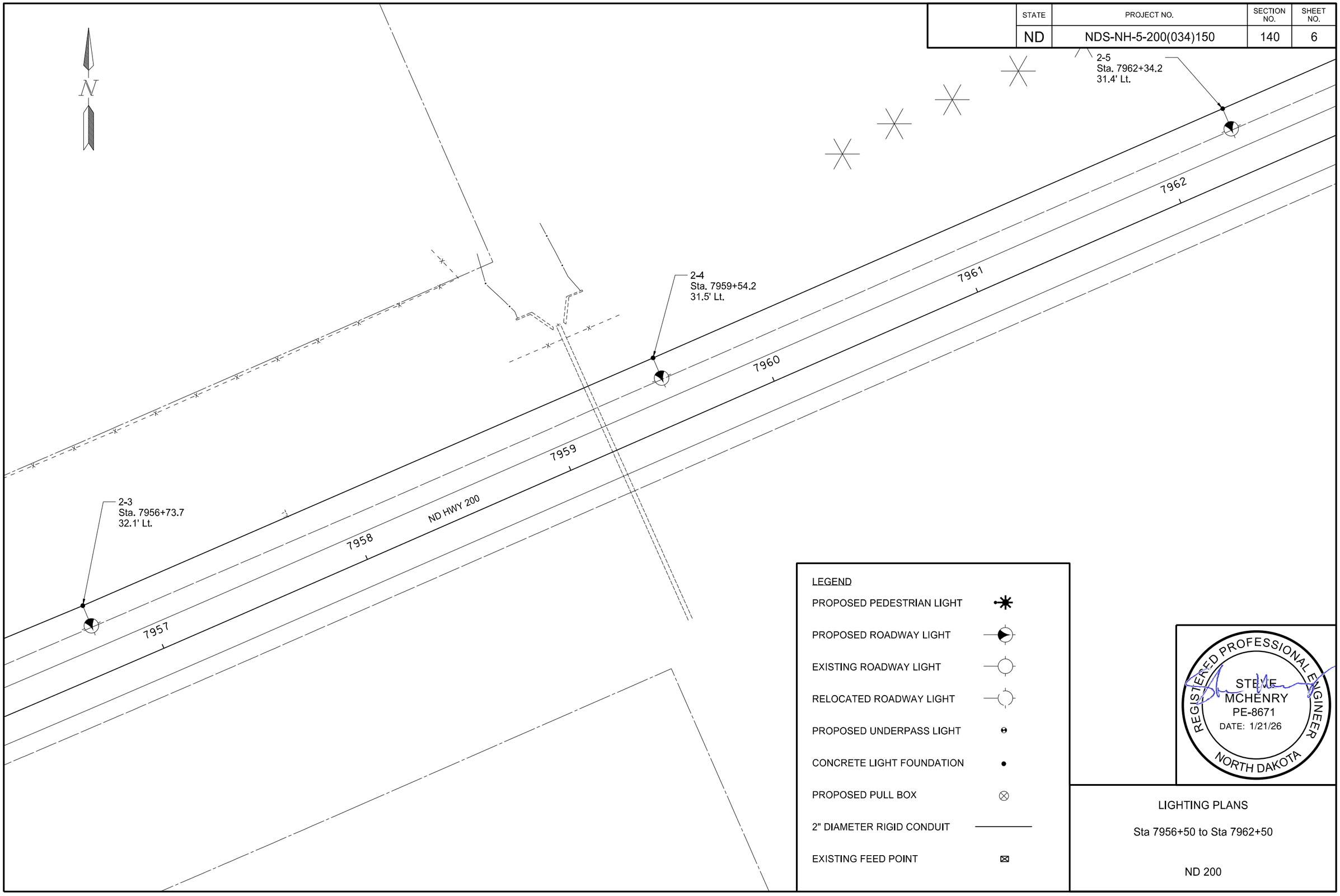
LIGHTING PLAN

Sta 7950+50 to Sta 7956+50

ND 200

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	140	6



LEGEND

- PROPOSED PEDESTRIAN LIGHT
- PROPOSED ROADWAY LIGHT
- EXISTING ROADWAY LIGHT
- RELOCATED ROADWAY LIGHT
- PROPOSED UNDERPASS LIGHT
- CONCRETE LIGHT FOUNDATION
- PROPOSED PULL BOX
- 2" DIAMETER RIGID CONDUIT
- EXISTING FEED POINT

REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

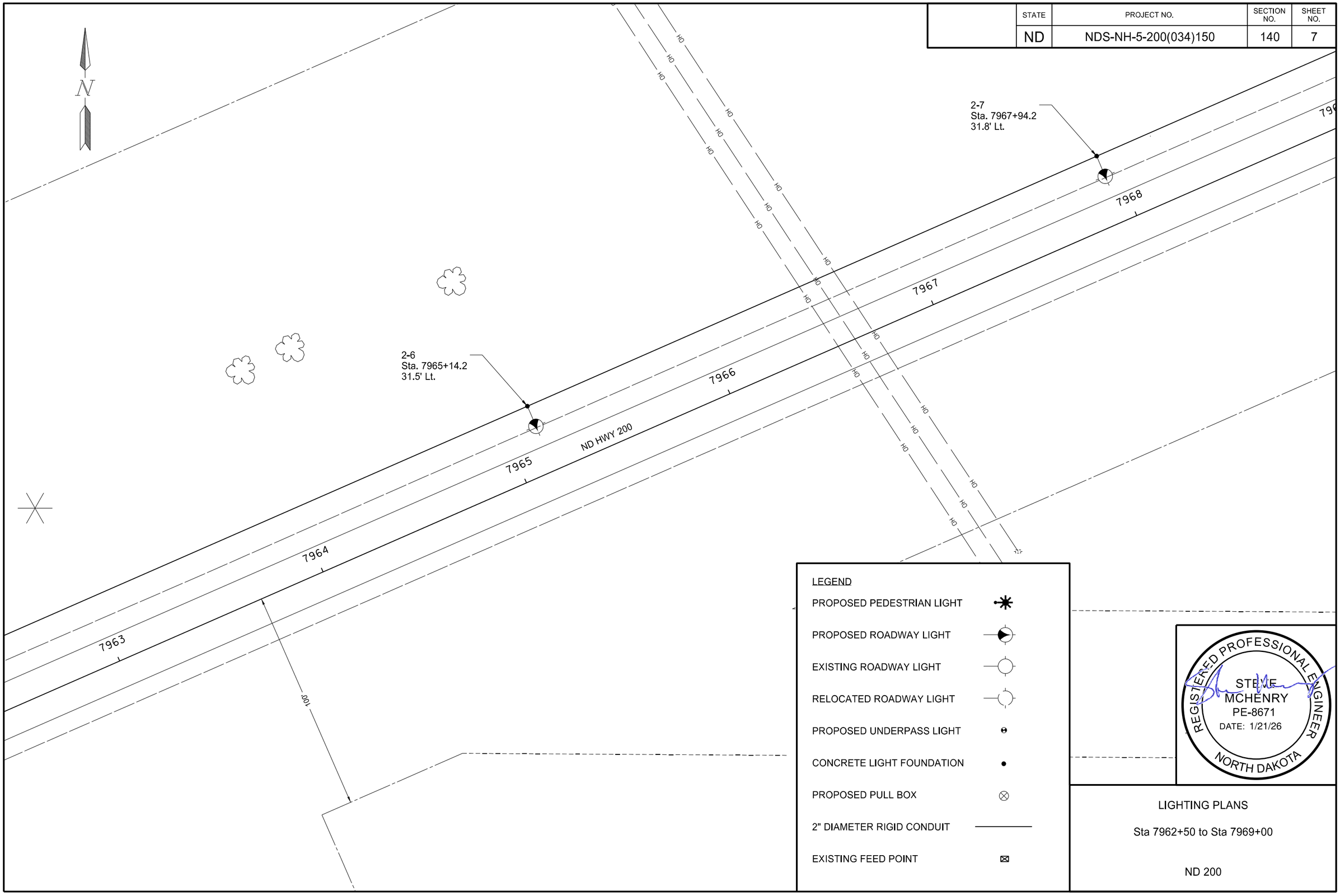
LIGHTING PLANS

Sta 7956+50 to Sta 7962+50

ND 200

1/20/2026 10:23:47 AM AJEmerson H:\Projects\14000\14303\Design\Plan\140LT_006_LTG.dgn

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	140	7



LEGEND

- PROPOSED PEDESTRIAN LIGHT
- PROPOSED ROADWAY LIGHT
- EXISTING ROADWAY LIGHT
- RELOCATED ROADWAY LIGHT
- PROPOSED UNDERPASS LIGHT
- CONCRETE LIGHT FOUNDATION
- PROPOSED PULL BOX
- 2" DIAMETER RIGID CONDUIT
- EXISTING FEED POINT

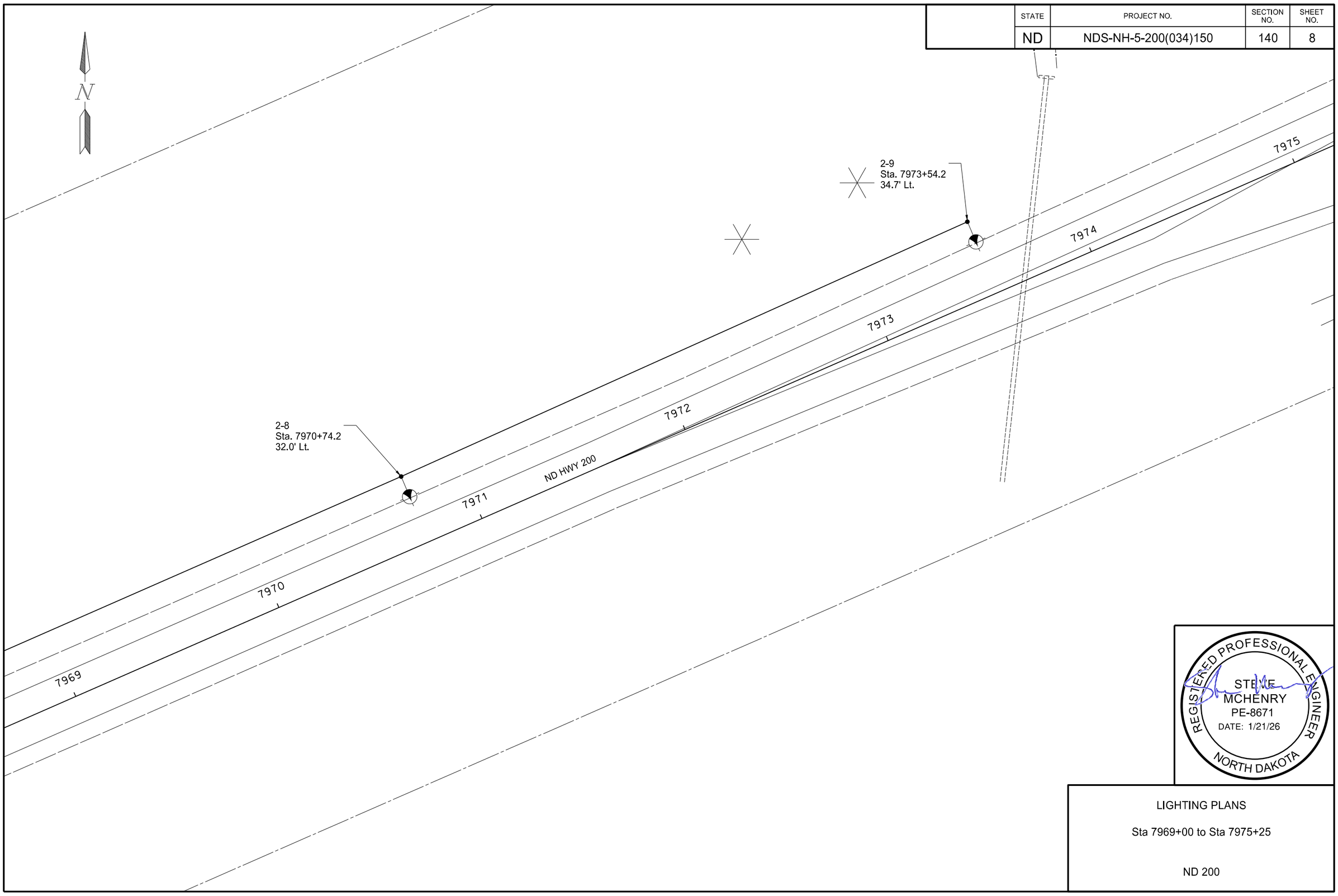
REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING PLANS

Sta 7962+50 to Sta 7969+00

ND 200

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	140	8



REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING PLANS

Sta 7969+00 to Sta 7975+25

ND 200

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	140	9

3-PB1
Sta. 8004+30.0
56.4' Lt.

F&I CONDUIT, WIRE AND PULL BOX, WIRE INTO PED TUNNEL CONDUIT BY STRUCTURES TO PED TUNNEL LIGHTING UNITS.

53RD AVE NW

FP3 TYPE II
Sta. 8004+46.7
56.9' Lt.

INSTALL RELOCATED LIGHTING UNIT AND WIRE TO LIGHTING UNIT 2, STATION 8001+69.2.

3-2
Sta. 5+28.6

3-1
Sta. 5+38.6

3-4
Sta. 5+08.6

3-3
Sta. 5+18.6

3-6
Sta. 4+88.6

3-5
Sta. 4+98.6

3-8
Sta. 4+68.6

3-7
Sta. 4+78.6

3-9
Sta. 4+58.6

3-3
Sta. 8004+46.8
36.4' Lt.

8003
8004
8005
8006
8007
8008
1000
1001
1002
1003
1004

ND HWY 200

Exst R/W

LEGEND

- PROPOSED PEDESTRIAN LIGHT
- PROPOSED ROADWAY LIGHT
- EXISTING ROADWAY LIGHT
- RELOCATED ROADWAY LIGHT
- PROPOSED UNDERPASS LIGHT
- CONCRETE LIGHT FOUNDATION
- PROPOSED PULL BOX
- 2" DIAMETER RIGID CONDUIT
- EXISTING FEED POINT

N

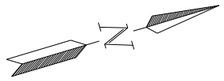
REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

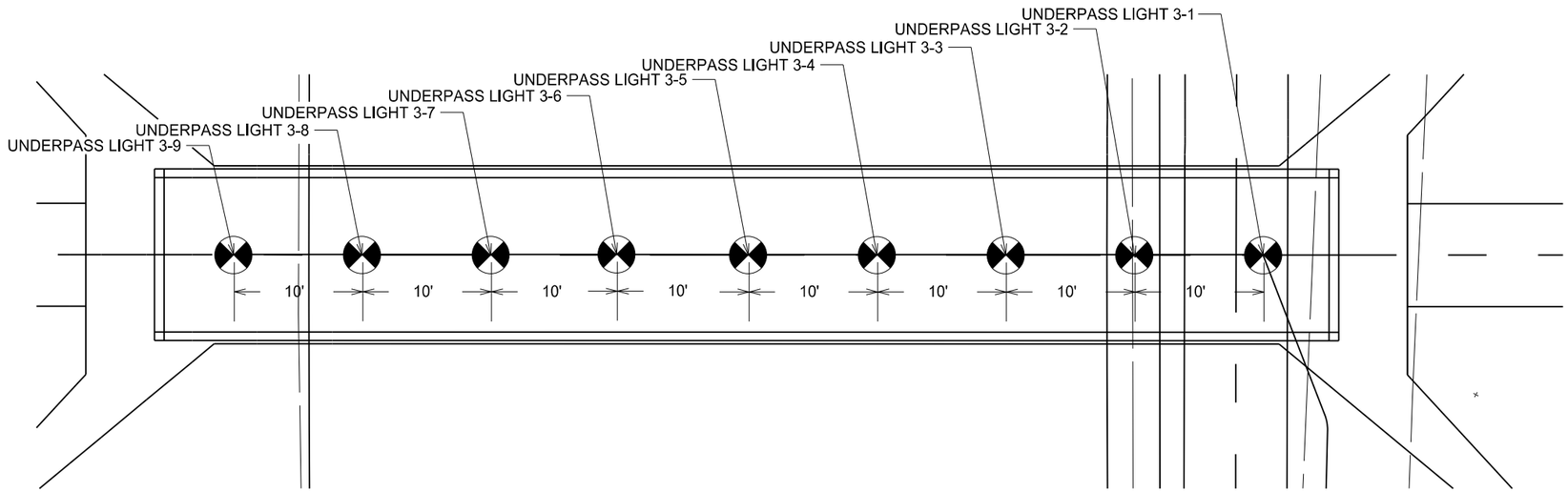
LIGHTING PLAN

Sta 8001+25 TO Sta 8007+50

ND 200

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	140	10

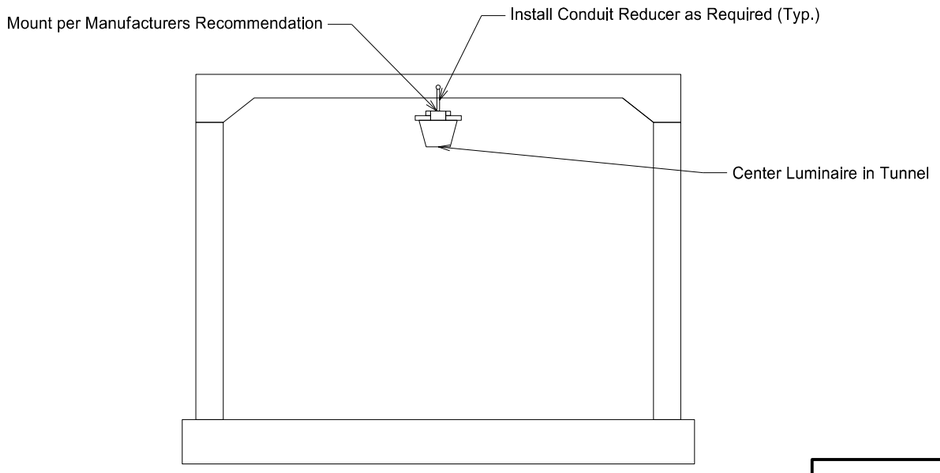




Pedestrian Underpass Lighting Layout Detail

Point	Station	Conduit Runs		Cable Runs	
		Length (ft)	Size	Length (ft)	Type
FP3	8004+46.7 - 56.9' Lt.	17	2"	177	6 - NO 10 TYPE RHW
3-PB1	8004+30.0 - 56.4' Lt.			59	2 - NO 12 TYPE THW
3-PB1	8004+30.0 - 56.4' Lt.	48	3/4"	162	3 - NO 10 TYPE RHW
3-1	5+38.6			54	1 - NO 12 TYPE THW
3-1 to	5+38.6	20	3/4"	78	3 - NO 10 TYPE RHW
3-3	5+18.6			26	1 - NO 12 TYPE THW
3-3 to	5+18.6	20	3/4"	78	3 - NO 10 TYPE RHW
3-5	4+98.6			26	1 - NO 12 TYPE THW
3-5 to	4+98.6	20	3/4"	78	3 - NO 10 TYPE RHW
3-7	4+78.6			26	1 - NO 12 TYPE THW
3-7 to	4+78.6	20	3/4"	78	3 - NO 10 TYPE RHW
3-9	4+58.6			26	1 - NO 12 TYPE THW

3-PB1 to	8004+30.0 - 56.4' Lt.	58	3/4"	192	3 - NO 10 TYPE RHW
3-2	5+28.6			64	1 - NO 12 TYPE THW
3-2 to	5+28.6	20	3/4"	78	3 - NO 10 TYPE RHW
3-4	5+08.6			26	1 - NO 12 TYPE THW
3-4 to	5+08.6	20	3/4"	78	3 - NO 10 TYPE RHW
3-6	4+88.6			26	1 - NO 12 TYPE THW
3-6 to	4+88.6	20	3/4"	78	3 - NO 10 TYPE RHW
3-8	4+68.6			26	1 - NO 12 TYPE THW



Pedestrian Underpass Lighting North Elevation Detail

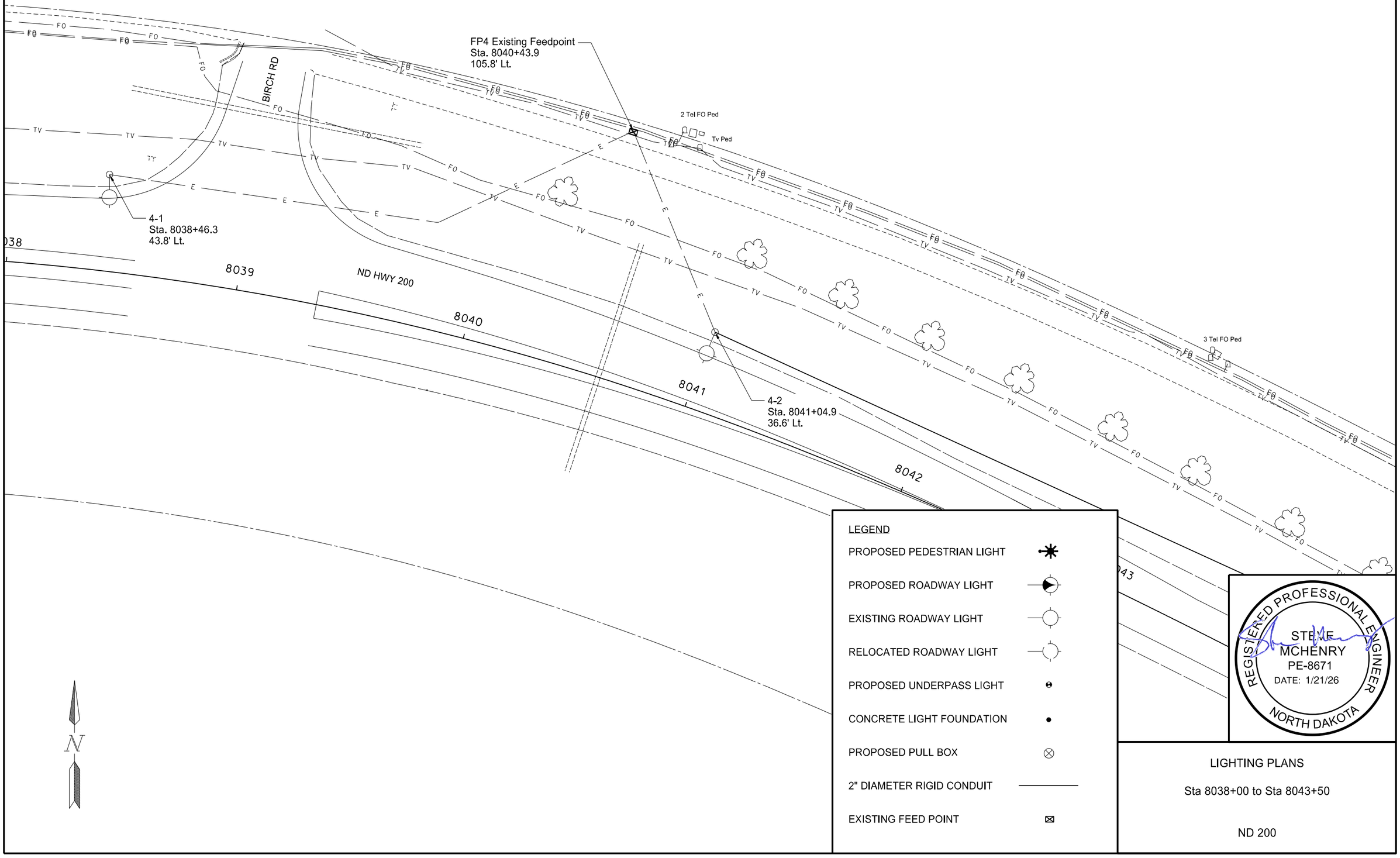
REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING LAYOUTS

PEDESTRIAN UNDERPASS

ND 200

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	140	11



LEGEND

- PROPOSED PEDESTRIAN LIGHT
- PROPOSED ROADWAY LIGHT
- EXISTING ROADWAY LIGHT
- RELOCATED ROADWAY LIGHT
- PROPOSED UNDERPASS LIGHT
- CONCRETE LIGHT FOUNDATION
- PROPOSED PULL BOX
- 2" DIAMETER RIGID CONDUIT
- EXISTING FEED POINT

REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING PLANS

Sta 8038+00 to Sta 8043+50

ND 200

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	140	12

LEGEND

PROPOSED PEDESTRIAN LIGHT

PROPOSED ROADWAY LIGHT

EXISTING ROADWAY LIGHT

RELOCATED ROADWAY LIGHT

PROPOSED UNDERPASS LIGHT

CONCRETE LIGHT FOUNDATION

PROPOSED PULL BOX

2" DIAMETER RIGID CONDUIT

EXISTING FEED POINT

3 Tel FO Ped
Tel FO Ped
Tel FO Ped
Tv Ped
Tel FO Ped
Tel FO Ped
Tel FO Ped
Tv Ped
8044
8045
8046
8047
8048
ND HWY 200
4-3
Sta. 8043+53.8
31.0' Lt.
4-4,5
Sta. 8046+04.3
31.1' Lt.
5-1,2
Sta. 8048+22.1
30.5' Lt.
N

REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING PLANS

Sta 8043+50 to Sta 8048+50

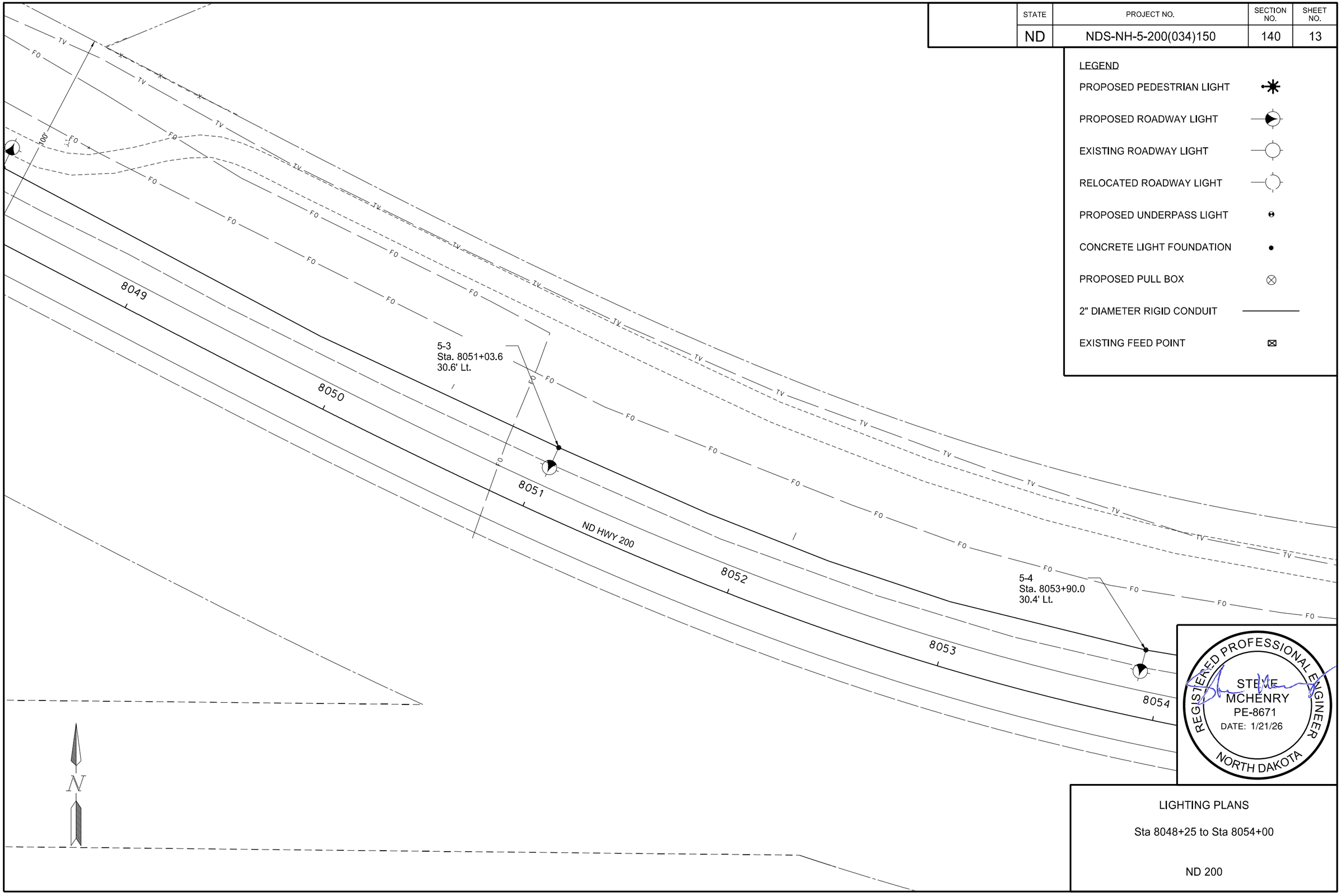
ND 200

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	140	13

LEGEND

- PROPOSED PEDESTRIAN LIGHT
- PROPOSED ROADWAY LIGHT
- EXISTING ROADWAY LIGHT
- RELOCATED ROADWAY LIGHT
- PROPOSED UNDERPASS LIGHT
- CONCRETE LIGHT FOUNDATION
- PROPOSED PULL BOX
- 2" DIAMETER RIGID CONDUIT
- EXISTING FEED POINT



REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING PLANS

Sta 8048+25 to Sta 8054+00

ND 200

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	140	14

FP5 TYPE II
Sta. 8058+36.7
-76.4' Lt.

Service connection provided by power utility owner (Roughrider Electric Co-op). Power pedestal located near 8058+36.3, -92.7' Lt.

5-5
Sta. 8056+78.3
29.3' Lt.

5-PB1
Sta. 8059+07.4
28.4' Lt.

5-6
Sta. 8059+72.6
29.3' Lt.

8054 8055 8056 8057 8058 8059

TV FO W E RR ELEC 1/2" conduit

N

LEGEND

- PROPOSED PEDESTRIAN LIGHT
- PROPOSED ROADWAY LIGHT
- EXISTING ROADWAY LIGHT
- RELOCATED ROADWAY LIGHT
- PROPOSED UNDERPASS LIGHT
- CONCRETE LIGHT FOUNDATION
- PROPOSED PULL BOX
- 2" DIAMETER RIGID CONDUIT
- EXISTING FEED POINT

REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING PLANS

Sta 8054+00 to Sta 8060+00

ND 200

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)156	140	15

Point	Station	Conduit Runs		Cable Runs	
		Length (ft)	Size	Length (ft)	Type
1-1 to	7933+65.4 - 87.5' Rt.	67	2"	219	3 - NO 4 TYPE RHW
1-2	7934+32.1 - 87.5' Rt.			73	1 - NO 6 TYPE THW
1-2 to	7934+32.1 - 87.5' Rt.	67	2"	219	3 - NO 4 TYPE RHW
1-3	7934+99.2 - 87.5' Rt.			73	1 - NO 6 TYPE THW
1-3 to	7934+99.2 - 87.5' Rt.	67	2"	219	3 - NO 4 TYPE RHW
1-4	7935+66.2 - 87.5' Rt.			73	1 - NO 6 TYPE THW
1-4 to	7935+66.2 - 87.5' Rt.	68	2"	222	3 - NO 4 TYPE RHW
1-5	7936+33.2 - 87.4' Rt.			74	1 - NO 6 TYPE THW
1-5 to	7936+33.2 - 87.4' Rt.	67	2"	219	3 - NO 4 TYPE RHW
1-6	7937+00.2 - 87.4' Rt.			73	1 - NO 6 TYPE THW
1-6 to	7937+00.2 - 87.4' Rt.	68	2"	222	3 - NO 4 TYPE RHW
1-7	7937+67.2 - 87.4' Rt.			74	1 - NO 6 TYPE THW
1-7 to	7937+67.2 - 87.4' Rt.	68	2"	222	3 - NO 4 TYPE RHW
1-8	7938+34.2 - 87.4' Rt.			74	1 - NO 6 TYPE THW
1-8 to	7938+34.2 - 87.4' Rt.	68	2"	222	3 - NO 4 TYPE RHW
1-9	7939+01.2 - 87.4' Rt.			74	1 - NO 6 TYPE THW
1-9 to	7939+01.2 - 87.4' Rt.	68	2"	222	3 - NO 4 TYPE RHW
1-10	7939+68.2 - 87.4' Rt.			74	1 - NO 6 TYPE THW
1-10 to	7939+68.2 - 87.4' Rt.	67	2"	219	3 - NO 4 TYPE RHW
1-11	7940+35.2 - 87.4' Rt.			73	1 - NO 6 TYPE THW
1-11 to	7940+35.2 - 87.4' Rt.	67	2"	219	3 - NO 4 TYPE RHW
1-12	7941+02.2 - 87.4' Rt.			73	1 - NO 6 TYPE THW
1-12 to	7941+02.2 - 87.4' Rt.	70	2"	228	3 - NO 4 TYPE RHW
1-13	7941+71.9 - 87.3' Rt.			76	1 - NO 6 TYPE THW
1-13 to	7941+71.9 - 87.3' Rt.	65	2"	213	3 - NO 4 TYPE RHW
1-14	7942+36.2 - 87.2' Rt.			71	1 - NO 6 TYPE THW
1-14 to	7942+36.2 - 87.2' Rt.	68	2"	222	3 - NO 4 TYPE RHW
1-15	7943+03.2 - 87.2' Rt.			74	1 - NO 6 TYPE THW
1-15 to	7943+03.2 - 87.2' Rt.	67	2"	219	3 - NO 4 TYPE RHW
1-16	7943+70.2 - 87.1' Rt.			73	1 - NO 6 TYPE THW
1-16 to	7943+70.2 - 87.1' Rt.	68	2"	222	3 - NO 4 TYPE RHW
1-17	7944+37.0 - 87.1' Rt.			74	1 - NO 6 TYPE THW
1-17 to	7944+37.0 - 87.1' Rt.	68	2"	222	3 - NO 4 TYPE RHW
1-18	7945+04.1 - 87.1' Rt.			74	1 - NO 6 TYPE THW
1-18 to	7945+04.1 - 87.1' Rt.	67	2"	219	3 - NO 4 TYPE RHW
1-19	7945+70.1 - 87.1' Rt.			73	1 - NO 6 TYPE THW
1-19 to	7945+70.1 - 87.1' Rt.	68	2"	222	3 - NO 4 TYPE RHW
1-20	7946+38.0 - 87.1' Rt.			74	1 - NO 6 TYPE THW

Point	Station	Conduit Runs			Cable Runs	
		Length (ft)	Dir Bore Length (ft)	Size	Length (ft)	Type
1-20 to	7946+38.0 - 87.1' Rt.	68		2"	222	3 - NO 4 TYPE RHW
1-21	7947+05.1 - 87.1' Rt.				74	1 - NO 6 TYPE THW
1-21 to	7947+05.1 - 87.1' Rt.	68		2"	222	3 - NO 4 TYPE RHW
1-22	7947+72.0 - 87.1' Rt.				74	1 - NO 6 TYPE THW
1-22 to	7947+72.0 - 87.1' Rt.	67		2"	219	3 - NO 4 TYPE RHW
1-23	7948+39.0 - 87.2' Rt.				73	1 - NO 6 TYPE THW
1-23 to	7948+39.0 - 87.2' Rt.	68		2"	222	3 - NO 4 TYPE RHW
1-24	7949+06.0 - 87.2' Rt.				74	1 - NO 6 TYPE THW
1-24 to	7949+06.0 - 87.2' Rt.	68		2"	222	3 - NO 4 TYPE RHW
1-25	7949+73.0 - 87.2' Rt.				74	1 - NO 6 TYPE THW
1-25 to	7949+73.0 - 87.2' Rt.	67		2"	219	3 - NO 4 TYPE RHW
1-26	7950+40.0 - 87.8' Rt.				73	1 - NO 6 TYPE THW
1-26 to	7950+40.0 - 87.8' Rt.	44		2"	171	3 - NO 4 TYPE RHW
FP1	7950+79.5 - 62.1' Rt				57	1 - NO 6 TYPE THW
FP2	7952+24.8 - 47.1' Lt.	10		2"	69	3 - NO 4 TYPE RHW
2-1	7952+24.8 - 37.7'Lt				23	1 - NO 6 TYPE THW
2-1	7952+24.8 - 37.7'Lt	171		2"	531	3 - NO 4 TYPE RHW
2-2	7953+93.1 - 32.0' Lt.				177	1 - NO 6 TYPE THW
2-2	7953+93.1 - 32.0' Lt.	280		2"	858	3 - NO 4 TYPE RHW
2-3	7956+73.7 - 32.1' Lt.				286	1 - NO 6 TYPE THW
2-3	7956+73.7 - 32.1' Lt.	280		2"	858	3 - NO 4 TYPE RHW
2-4	7959+54.2 - 31.5' Lt.				286	1 - NO 6 TYPE THW
2-4	7959+54.2 - 31.5' Lt.	280		2"	858	3 - NO 4 TYPE RHW
2-5	7962+34.2 - 31.4' Lt.				286	1 - NO 6 TYPE THW
2-5	7962+34.2 - 31.4' Lt.	281		2"	861	3 - NO 4 TYPE RHW
2-6	7965+14.2 - 31.5' Lt.				287	1 - NO 6 TYPE THW
2-6	7965+14.2 - 31.5' Lt.	280		2"	858	3 - NO 4 TYPE RHW
2-7	7967+94.2 - 31.8' Lt.				286	1 - NO 6 TYPE THW
2-7	7967+94.2 - 31.8' Lt.	281		2"	861	3 - NO 4 TYPE RHW
2-8	7970+74.2 - 32.0' Lt.				287	1 - NO 6 TYPE THW
2-8	7970+74.2 - 32.0' Lt.	281		2"	861	3 - NO 4 TYPE RHW
2-9	7973+54.2 - 34.7' Lt.				287	1 - NO 6 TYPE THW

REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

LIGHTING PLAN

Quantities

ND 200

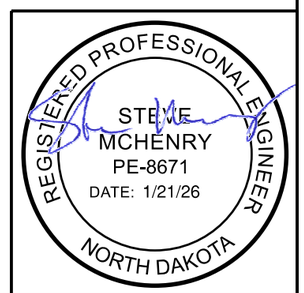
Quantities - (A)																		
CONCRETE FOUNDATION-HIGHWAY LIGHTING	CONCRETE FOUNDATION-FEED POINT-TYPE B	PULL BOX	3/4 IN DIAMETER RIGID CONDUIT	2IN DIAMETER RIGID CONDUIT	UNDERGROUND CONDUCTOR NO4-TYPE RHW	UNDERGROUND CONDUCTOR NO10-TYPE RHW	UNDERGROUND CONDUCTOR NO6-TYPE THW	UNDERGROUND CONDUCTOR NO12-TYPE THW	FEED POINT-PEDESTRIAN LIGHTING	FEED POINT-TYPE II-PAD MOUNTED	LT STD 8FT MA 40FT MT HT	LT STD TWIN 8FT MA 40FT MT HT	ORNAMENTAL LT STD 13FT MT HT	LED LUMINAIRE	LED LUMINAIRE - TYPE A	UNDERPASS LIGHT UNIT CEILING MTD - 50 WATT	RELOCATE LIGHT STANDARD	LIGHTING SYSTEM A
EA	EA	EA	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	LF	EA	EA
43	4	2	246	5833	18480	1077	6160	359	1	3	14	2	26	26	18	9	1	1

(A) DO NOT BID SEPERATELY BUT INCLUDE ALL IN THE ITEM "LIGHTING SYSTEM A"

Point	Station	Conduit Runs		Cable Runs	
		Length (ft)	Size	Length (ft)	Type
4-2	8041+04.9 - 36.6' Lt.	256	2"	786	3 - NO 4 TYPE RHW
4-3	8043+53.8 - 31.0' Lt.			262	1 - NO 6 TYPE THW
4-3	8043+53.8 - 31.0' Lt.	252	2"	774	3 - NO 4 TYPE RHW
4-4,5	8046+04.3 - 31.1' Lt.			258	1 - NO 6 TYPE THW

Point	Station	Conduit Runs		Cable Runs	
		Length (ft)	Size	Length (ft)	Type
EX-2	8001+69.2 - 35.5' Lt.	280	2"	858	3 - NO 4 TYPE RHW
EX-3	8004+46.8 - 36.4' Lt.			286	1 - NO 6 TYPE THW

Point	Station	Conduit Runs			Cable Runs	
		Length (ft)	Dir Bore Length (ft)	Size	Length (ft)	Type
5-1,2	8048+22.1 - 30.5' Lt.	280		2"	858	3 - NO 4 TYPE RHW
5-3	8051+03.6 - 30.6' Lt.				286	1 - NO 6 TYPE THW
5-3	8051+03.6 - 30.6' Lt.	281		2"	861	3 - NO 4 TYPE RHW
5-4	8053+90.0 - 30.4' Lt.				287	1 - NO 6 TYPE THW
5-4	8053+90.0 - 30.4' Lt.	282		2"	864	3 - NO 4 TYPE RHW
5-5	8056+78.3 - 29.3' Lt.				288	1 - NO 6 TYPE THW
5-5	8056+78.3 - 29.3' Lt.	229		2"	705	3 - NO 4 TYPE RHW
5-PB1	8059+07.4 - 28.4' Lt.				235	1 - NO 6 TYPE THW
5-PB1	8059+07.4 - 28.4' Lt.		66	2"	216	3 - NO 4 TYPE RHW
5-6	8059+72.6 - 29.3' Lt.				72	1 - NO 6 TYPE THW
5-PB1	8059+07.4 - 28.4' Lt.	79		2"	255	3 - NO 4 TYPE RHW
FP5	8058+36.7 - 76.4' Lt.				85	1 - NO 6 TYPE THW

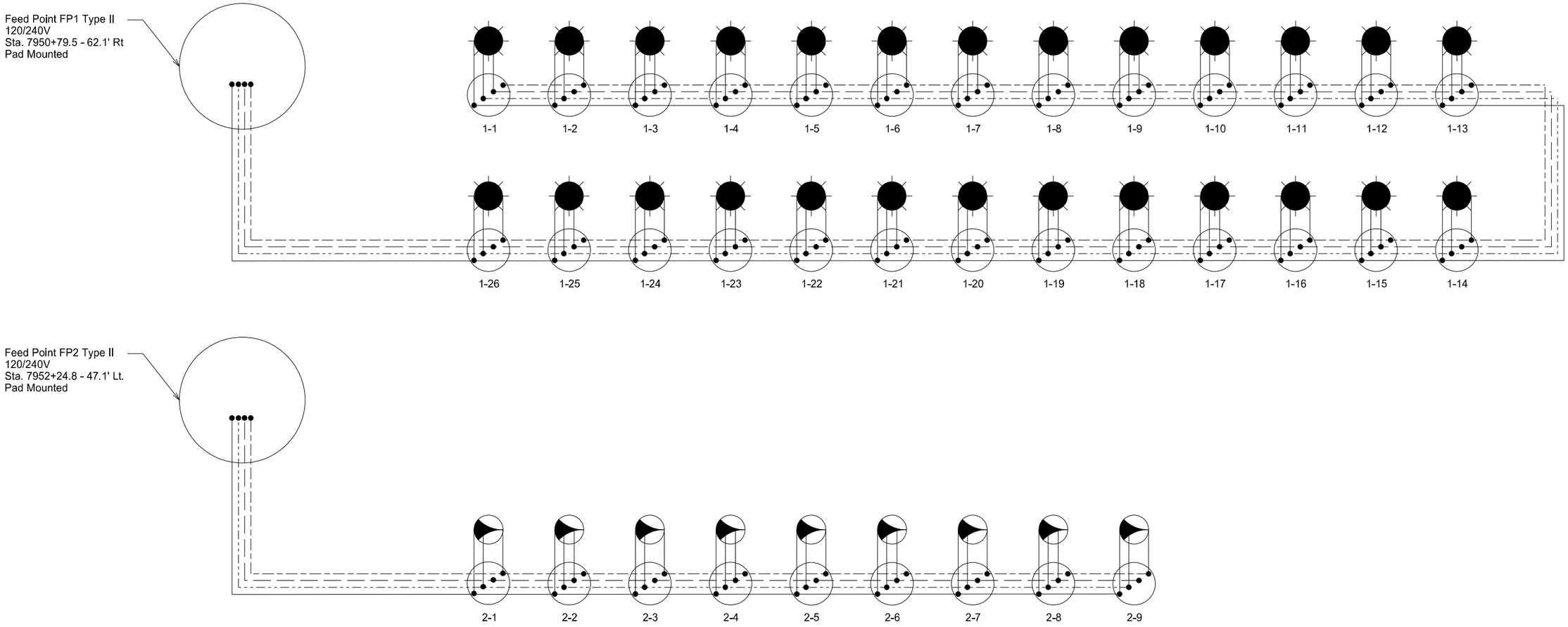


LIGHTING PLAN

Quantities

ND 200

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	140	17



Wiring Schematic Legend

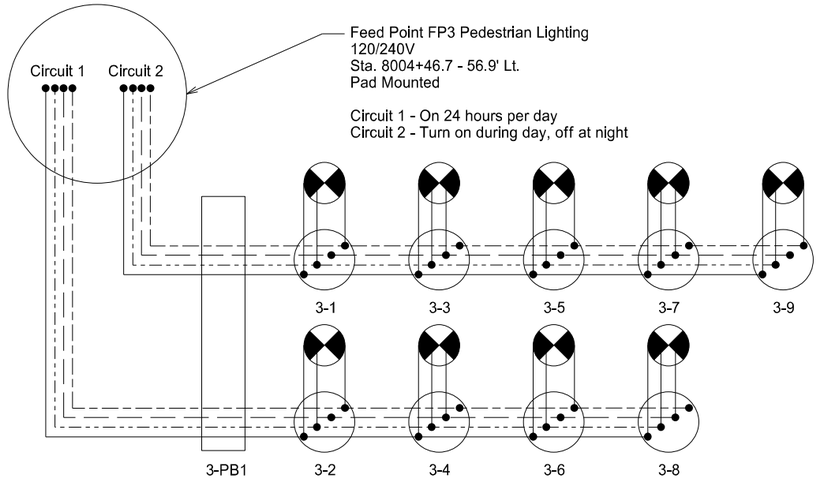
- Proposed Luminaire, 40' MH
- Proposed Luminaire, 13' MH
- Existing Luminaire
- Proposed Conductor Connection
- Proposed Conductor Phase 1
- Proposed Conductor Phase 2
- Proposed Conductor Phase 3
- Proposed Conductor Ground
- Proposed Luminaire, Underpass
- Proposed Light Standard
- Existing Light Standard
- Proposed Pull Box

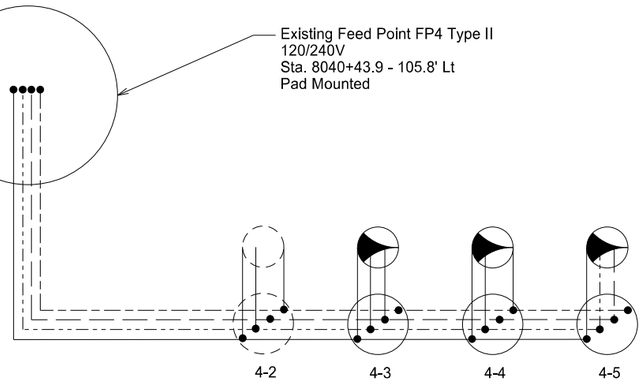
REGISTERED PROFESSIONAL ENGINEER
STEVE MCHENRY
PE-8671
DATE: 1/21/26
NORTH DAKOTA

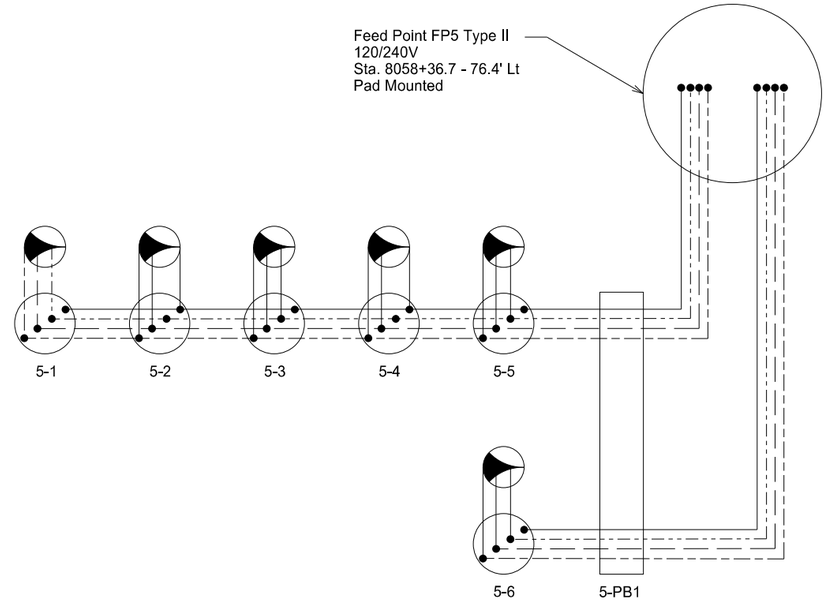
WIRING SCHEMATIC - FP1, FP2

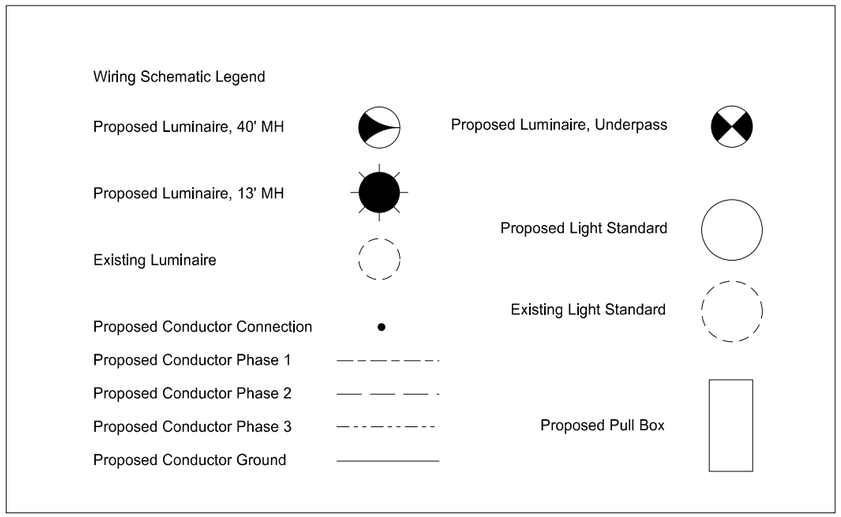
ND 200

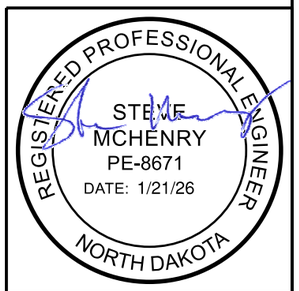
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	140	18











WIRING SCHEMATIC - FP3, FP4, FP5

ND 200

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	150	1

Spec	Code	Description	Qty	Unit
772	3150	Remove Flashing Beacon System 8004+74 - 52' Lt 8004+68 - 46' Rt	1	EA

8004+74 - 52' Lt
Remove

8004+68 - 46' Rt
Remove

8006+00 - 50' Rt
Remove wood pole,
flasher cabinet, and feed point

51st Ave SW, Co Rd 18

4th Ave NE

ND 200

8000 8001 8002 8003 8004 8005 8006 8007 8008

Existing R/W
Exst R/W
Ppsd R/W
Electric line labeled Approx Loc was drawn in based on old plans
B Wire
TV
MIDCO
NDDOT Approx Loc
Asph
Bench
Dog Waste Station
Sign
Tv Mkr
Hdwl
Chmk
Conc
NDDOT
E Mtr
R-RIDER ELEC
Lg trees
Woven Wire
OH
24" C&G
Sign Pvt
MH SD
Elec Ped
4 EL
Tel FO Ped Vault
W RIV TEL
FO
Wall Casting

REGISTERED PROFESSIONAL ENGINEER
STACY LATEN
PE-8772
DATE 9/25/25
NORTH DAKOTA

Flashing Beacon Removal

ND 200
Main St W - Hazen Golf Course

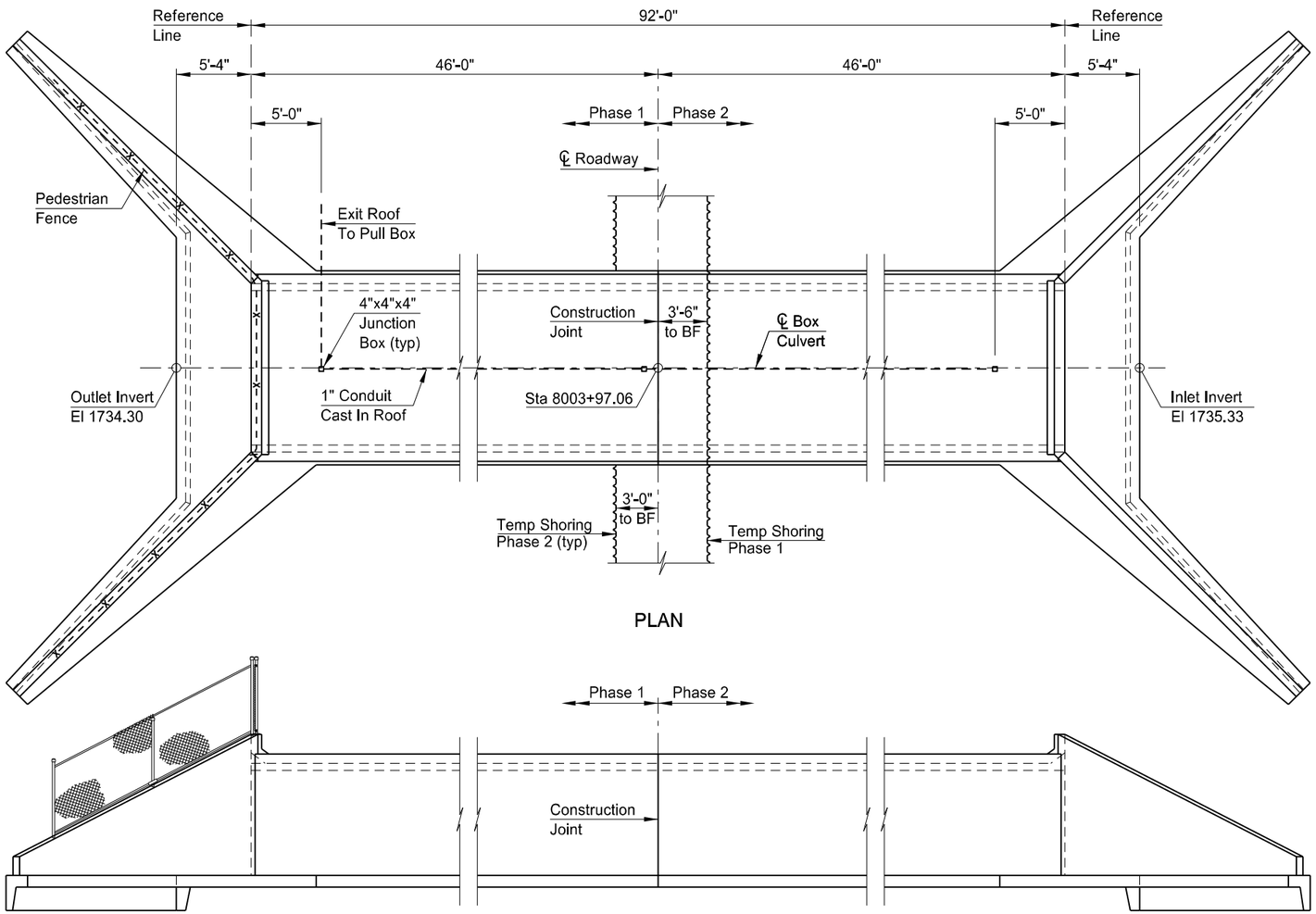
ND 200 & 4th Ave NE

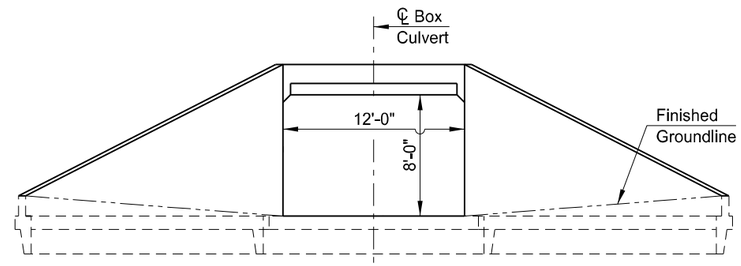
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23 U.S.C. 407
NDDOT Reserves All Objections

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	170	1





END VIEW

DESIGN STRENGTHS:

f'c = 4,000 psi ~ Class AE-3 Concrete
fy = 60,000 psi ~ Reinforcing Steel

Load & Resistance Factor Design

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
210	0050	BOX CULVERT EXCAVATION	EA	1
210	0210	FOUNDATION FILL	CY	1,925
210	0250	BOX CULVERT FOUNDATION AGGREGATE	CY	140
210	0405	FOUNDATION PREPARATION-BOX CULVERT	EA	1
602	1131	CLASS AE-3 CONCRETE-BOX CULVERT	CY	146.0
612	0114	REINFORCING STEEL-GRADE 60-BOX CULVERT	LBS	30,711
624	0124	PEDESTRIAN FENCE	LF	53.0
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	210
930	8230	SHORING	EA	2

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE 08/11/26
NORTH DAKOTA

SPECIAL PROVISIONS	
SP 366(24)	EXCAVATION & FOUNDATION FILL

HL-93 DESIGN LOADING

PEDESTRIAN UNDERPASS
HAZEN, ND

CLEAR SPAN 1 x 12' CLEAR HEIGHT 8'
MAX FILL 6' MIN FILL 1' STATION 8003+97.06

REINFORCED CONCRETE
SINGLE BOX CULVERT LAYOUT

ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

Jason Thorenson
08/11/26

Docusign Envelope ID: D66C2B04-1671-8E33-8063-39A89A5F82DE

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	170	2

NOTES

100 SCOPE OF WORK: Work at this site consists of building a new single barrel 12' x 8' x 92'-0" reinforced concrete box culvert. Construction of the box culvert will take place in two phases. Phase 1 includes the 46'-0" south segment of the structure and Phase 2 includes the remainder of the structure.

602 CLASS AE-3 CONCRETE: Design a mix that meets Section 802 and will attain a minimum compressive strength of 4,000 psi at 28-days. A mix design meeting Section 802 using a Well Graded or Optimized combined gradation will be permitted.

The Engineer will verify the mix design using materials that are to be used on the project.

Supply samples of materials as specified in the table below. Provide additional materials upon request.

Material	Sample Size
Cement	100 lbs
SCM	35 lbs
Aggregate	1000 lbs
Admixtures	½ pint each

Deliver the samples and the mix design, including the test results, to the Materials and Research Division a minimum of 14 calendar days before placing concrete. Attach a tag to all samples identifying the Department's project number and the type of material. On the day the material is delivered, provide the Engineer with a copy of the mix design and test results, and notify the Engineer the samples have been delivered.

Cast the following elements of each section in one continuous run:

1. Floor slab and wing footings
2. Each sidewall up to the bottom of fillets with its adjacent wings complete to the top
3. Roof slab and parapets

Allow the concrete in the walls to set at least two hours before the roof slab is poured.

602 WATERPROOFING MEMBRANE: Wrap a waterproofing membrane that meets the requirements of Section 602.03 B around the exterior surface of the sidewalls and the roof slab. Center the waterproof membrane (1'-0" minimum width) on the construction joint.

602 SURFACE FINISH "D": Apply Surface Finish "D" on the inside walls, ceiling, and exposed areas of the wings. Use sand surface finish color number 33578 meeting Aerospace Material Specification (AMS) Standard 595. Include this work in the price bid for Class AE-3 Concrete-Box Culvert.

612 REINFORCING STEEL: When the distance between end bars is not evenly divisible by bar spacing, adjust the odd distance by a few irregular spaces near the center, not at the ends of the culvert.

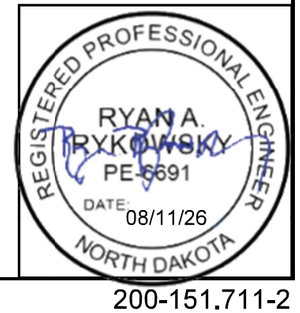
Place bolsters and bar supports for the roof steel at a maximum of 4 foot spacing.

Dimensions of bent bars are given out to out.

930 SHORING: Temporary shoring is required as shown on the Box Culvert Layout Sheet. The Contractor is responsible to design, construct, maintain, and remove the shoring.

Design shoring in accordance with the AASHTO Guide Design Specifications for Temporary Works, or other design standard as approved by the Engineer. Submit design calculations certified by a professional engineer registered in the state of North Dakota to the Engineer and allow one week for review.

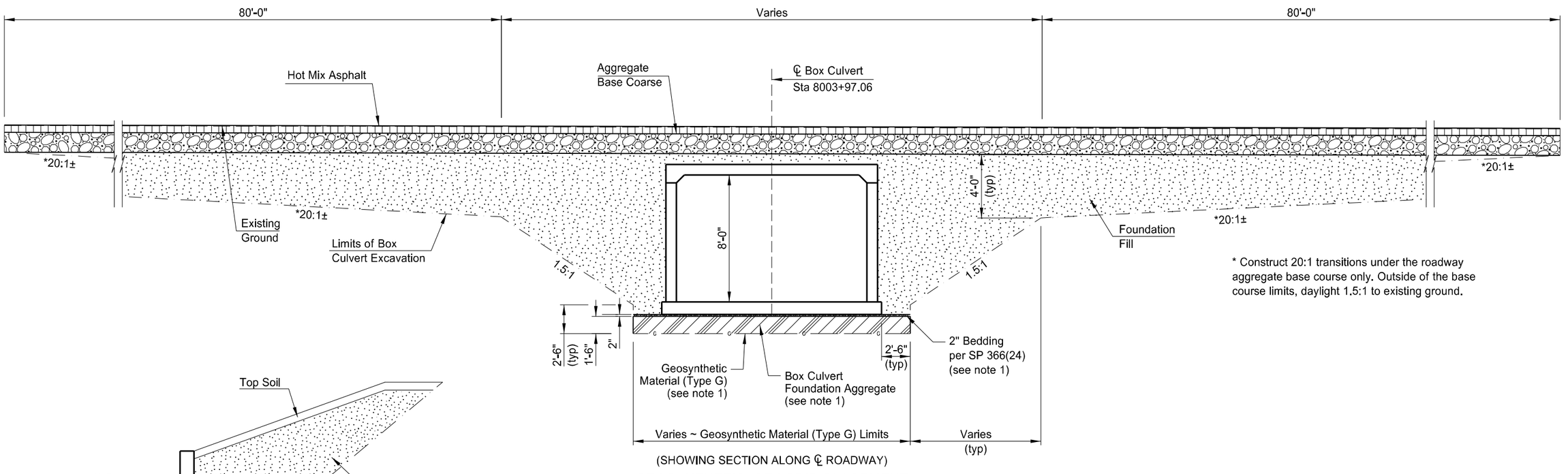
Include all labor, equipment, and material needed for this work in the bid item, "Shoring". A quantity of 1 EA will be paid for each construction phase.



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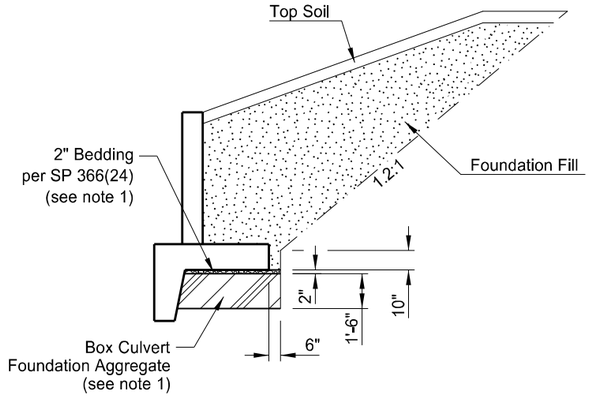
	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	170	3



(SHOWING SECTION ALONG ℄ ROADWAY)

GEOSYNTHETIC GEOGRID PLACEMENT AND BACKFILL THROUGH EXISTING EMBANKMENT

* Construct 20:1 transitions under the roadway aggregate base course only. Outside of the base course limits, daylight 1.5:1 to existing ground.



(SHOWING SECTION AT MID-HEIGHT)

WING BACKFILL DETAIL

NOTES:

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

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE 08/11/26
NORTH DAKOTA

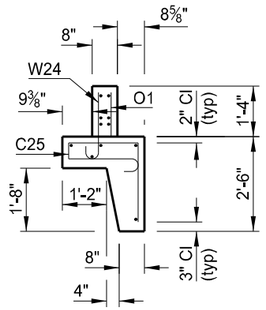
PEDESTRIAN UNDERPASS
HAZEN, ND

EXCAVATION & BACKFILL DETAIL

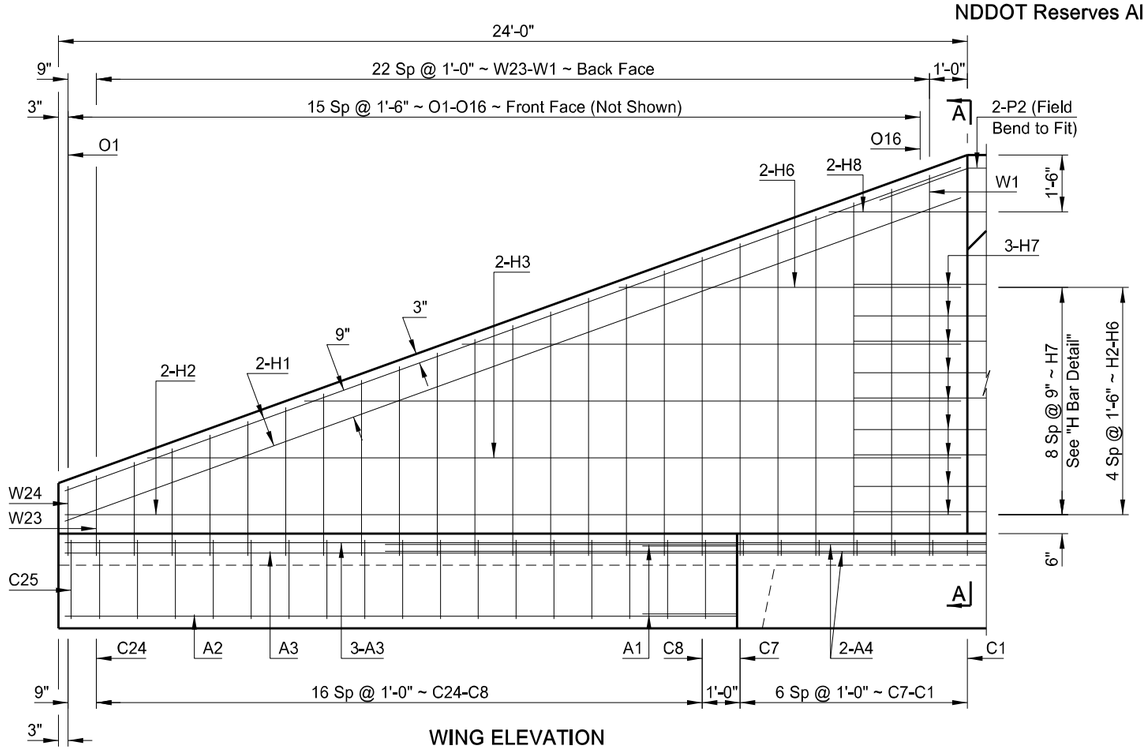
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23 U.S.C. 407
NDDOT Reserves All Objections

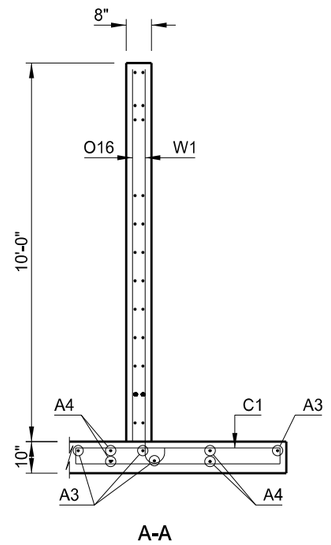
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	170	4



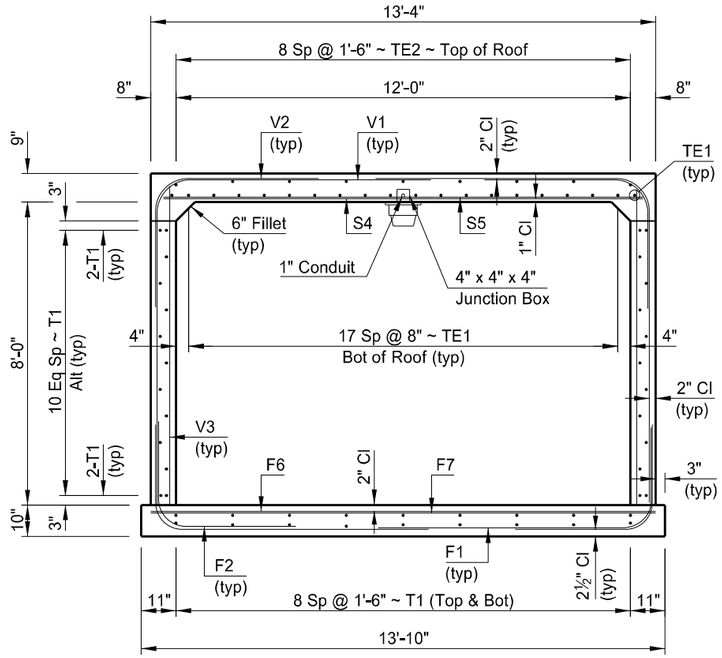
END VIEW



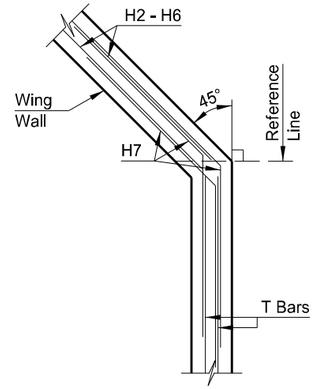
WING ELEVATION



A-A



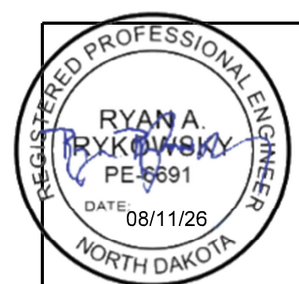
SECTION OF BARREL



H BAR DETAIL

NOTE:

The electrical boxes shall be 4" x 4" x 4" NEMA Type 1 enclosures made frome 16 gage galvanized steel. The cover shall be screwed to the box. The conduit shall be Type 40-heavy wall PVC. Pull wire shall be installed in the conduit. All material and labor to install the conduit, pull wire and electrical boxes shall be included in the Bid Item "Class AE-3 Concrete-Box Culvert".



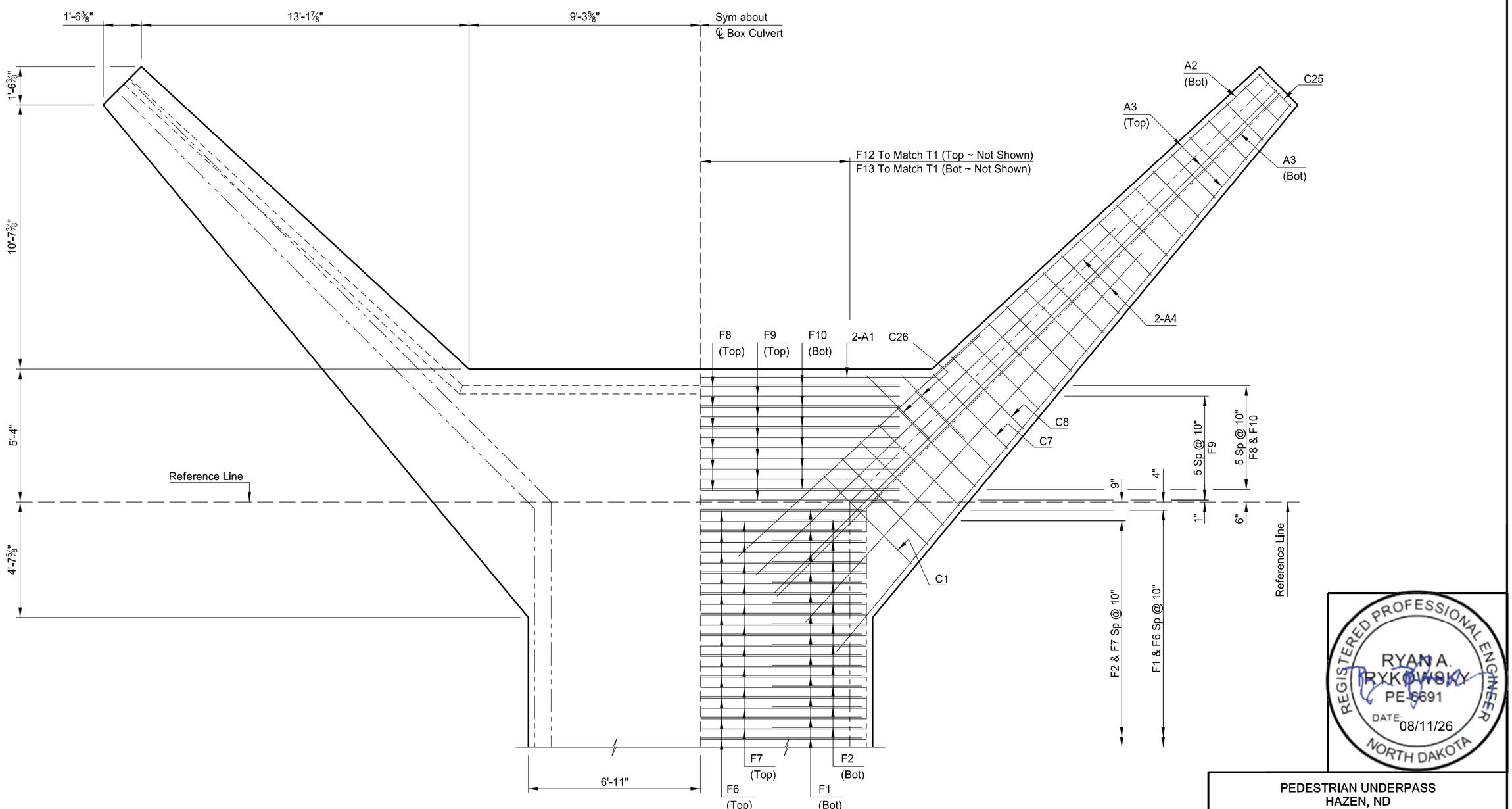
PEDESTRIAN UNDERPASS
HAZEN, ND

BARREL SECTION & WING DETAILS

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23 U.S.C. 407
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	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	170	5



(SHOWING DIMENSIONS) (SHOWING REINFORCING)

FLOOR PLAN

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 08/11/26
NORTH DAKOTA

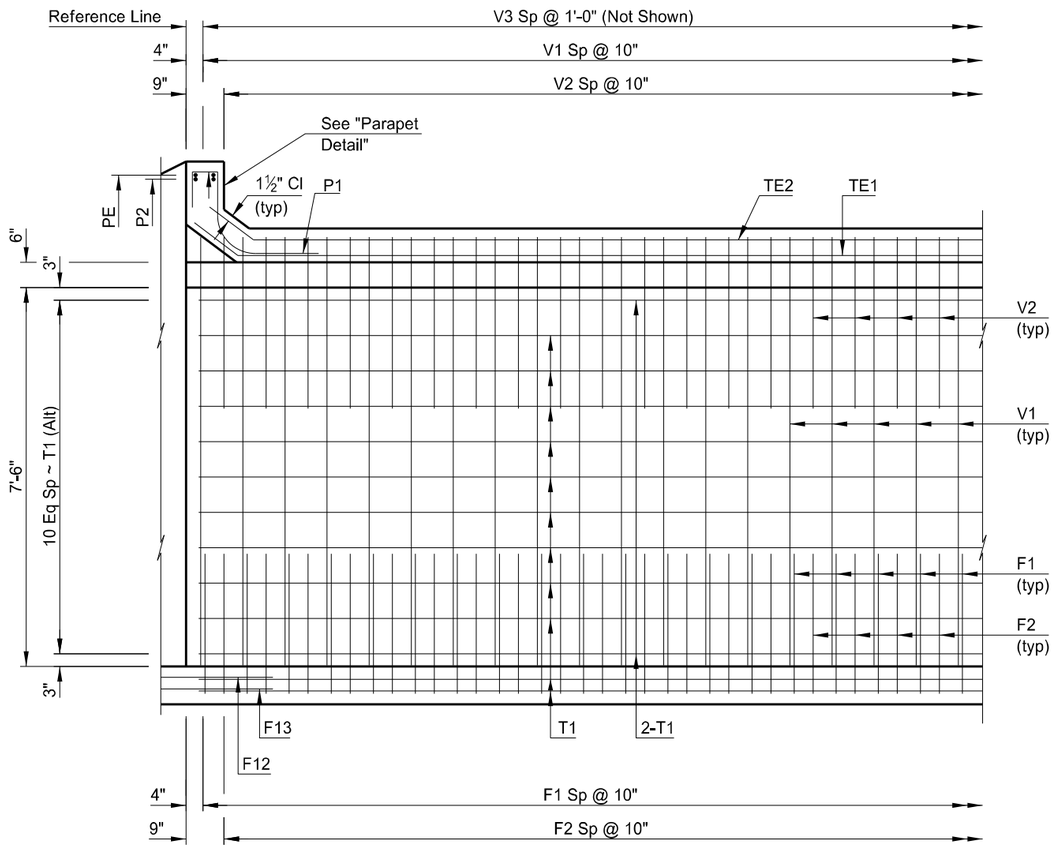
PEDESTRIAN UNDERPASS
HAZEN, ND

FLOOR DETAIL

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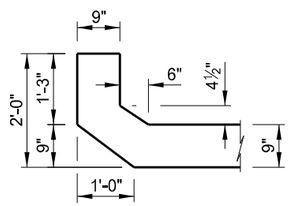
23 U.S.C. 407
NDDOT Reserves All Objections

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	170	6



OUTER WALL

LONGITUDINAL SECTION



PARAPET DETAIL

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 08/11/26
NORTH DAKOTA

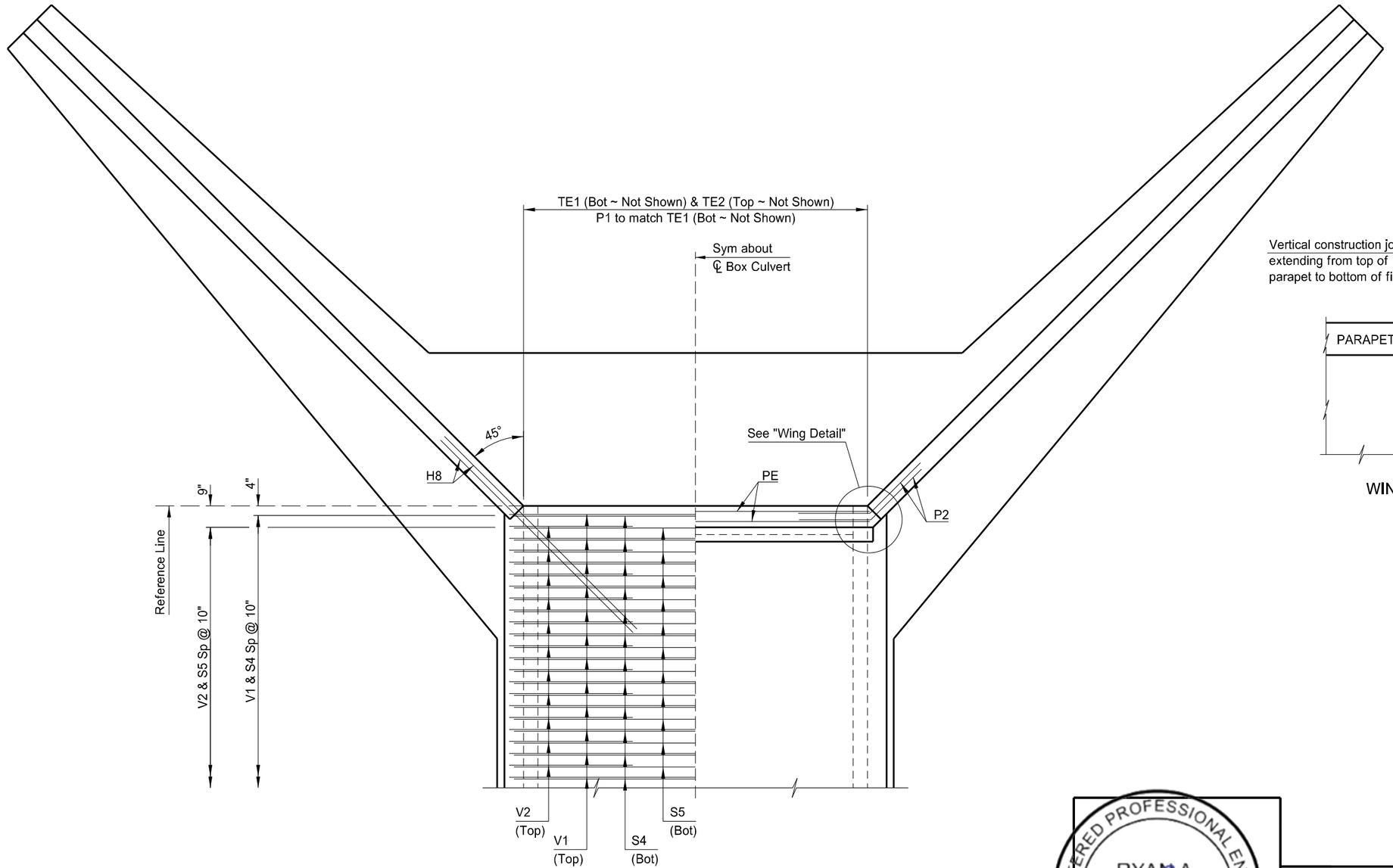
PEDESTRIAN UNDERPASS
HAZEN, ND

WALL DETAILS &
PARAPET DETAIL

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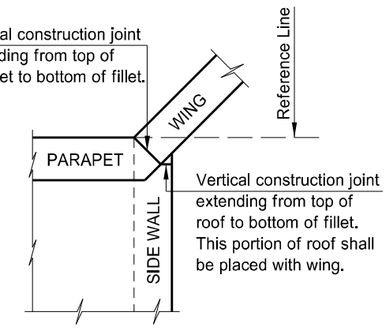
23 U.S.C. 407
NDDOT Reserves All Objections

STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	NDS-NH-5-200(034)150	170	7



(SHOWING ROOF REINFORCING) (SHOWING PARAPET REINFORCING)

ROOF PLAN



WING DETAIL

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
DATE: 08/11/26
NORTH DAKOTA

PEDESTRIAN UNDERPASS
HAZEN, ND

ROOF DETAILS

Docusign Envelope ID: D66C2B04-1671-8E33-8063-39A89A5F82DE

BAR LIST (CONSTANT)					BAR LIST (CONSTANT)					BAR LIST (VARIABLE)				
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W1	7	4	10'-10"	BENT	H8	6	8	9'-6"	STR.	V1	6	220	15'-5"	BENT
W2	7	4	10'-5"	BENT						V2	4	220	7'-4"	BENT
W3	7	4	10'-1"	BENT	O1-O16	4	4	84'-8"	STR.	V3	4	184	8'-5"	STR.
W4	7	4	9'-9"	BENT										
W5	7	4	9'-4"	BENT	A1	6	8	12'-10"	BENT	F1	6	220	9'-8"	BENT
W6	7	4	9'-0"	BENT	A2	6	4	17'-11"	STR.	F2	4	220	6'-1"	BENT
W7	7	4	8'-8"	BENT	A3	6	16	28'-7"	STR.	F6	6	110	13'-4"	STR.
W8	7	4	8'-3"	BENT	A4	6	16	20'-1"	STR.	F7	6	110	13'-4"	STR.
W9	6	4	7'-10"	BENT										
W10	6	4	7'-6"	BENT	P1	4	26	4'-7"	BENT	S4	6	110	12'-8"	STR.
W11	6	4	7'-1"	BENT	P2	6	8	5'-0"	BENT	S5	6	110	12'-8"	STR.
W12	5	4	6'-8"	BENT	PE	6	8	7'-0"	STR.					
W13	5	4	6'-4"	BENT						T1	4	44	92'-9"	STR.
W14	4	4	5'-10"	BENT	F8	6	12	16'-0"	STR.					
W15	4	4	5'-6"	BENT	F9	6	12	16'-0"	STR.	TE1	4	20	93'-5"	BENT
W16	4	4	5'-2"	BENT	F10	4	12	16'-0"	STR.	TE2	4	9	92'-9"	BENT
W17	4	4	4'-9"	BENT	F12	4	18	8'-7"	BENT					
W18	4	4	4'-5"	BENT	F13	4	18	6'-7"	STR.					
W19	4	4	4'-1"	BENT										
W20	4	4	3'-8"	BENT										
W21	4	4	3'-4"	BENT										
W22	4	4	3'-0"	BENT										
W23	4	4	2'-7"	BENT										
W24	4	4	2'-4"	BENT										
C1	5	4	11'-6"	BENT										
C2	5	4	11'-2"	BENT										
C3	5	4	11'-0"	BENT										
C4	5	4	10'-8"	BENT										
C5	5	4	10'-6"	BENT										
C6	5	4	10'-2"	BENT										
C7	5	4	9'-10"	BENT										
C8	4	4	11'-2"	BENT										
C9	4	4	10'-10"	BENT										
C10	4	4	10'-8"	BENT										
C11	4	4	10'-4"	BENT										
C12	4	4	10'-0"	BENT										
C13	4	4	9'-10"	BENT										
C14	4	4	9'-6"	BENT										
C15	4	4	9'-4"	BENT										
C16	4	4	9'-0"	BENT										
C17	4	4	8'-8"	BENT										
C18	4	4	8'-6"	BENT										
C19	4	4	8'-2"	BENT										
C20	4	4	8'-0"	BENT										
C21	4	4	7'-8"	BENT										
C22	4	4	7'-4"	BENT										
C23	4	4	7'-2"	BENT										
C24	4	4	6'-10"	BENT										
C25	4	4	6'-8"	BENT										
C26	4	8	5'-8"	BENT										
H1	7	16	25'-2"	STR.										
H2	4	8	23'-8"	STR.										
H3	4	8	21'-6"	STR.										
H4	4	8	17'-4"	STR.										
H5	4	8	13'-2"	STR.										
H6	4	8	9'-0"	STR.										
H7	4	108	6'-0"	BENT										

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NDDOT Reserves All Objections

	STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	170	8

CONCRETE QUANTITIES	
(ONE PHASE)	
ENTIRE FLOOR	30.4 CY
TWO OUTSIDE WALLS & TWO WINGS	23.7 CY
ENTIRE ROOF	18.9 CY
TOTAL	73.0 CY

REGISTERED PROFESSIONAL ENGINEER
RYAN A. RYKOWSKY
PE-6691
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QUANTITIES	
CLASS AE-3 CONCRETE	146.0 CY
REINFORCING STEEL	30,711 LBS

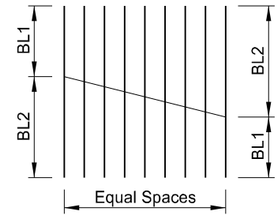
PEDESTRIAN UNDERPASS
HAZEN, ND

REINFORCING BAR LIST

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

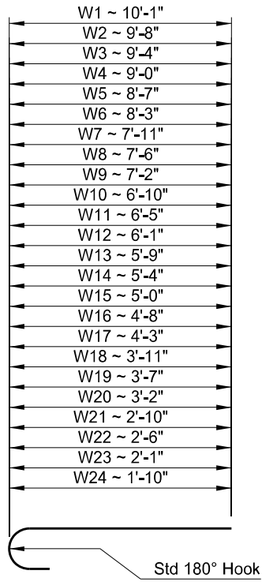
STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
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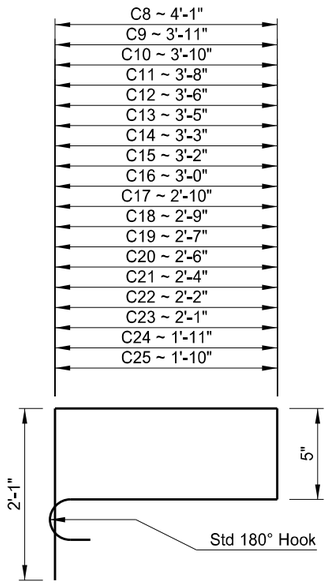
2 SETS SHOWN

MARK	LENGTH 1 SET	BL1	BL2	SPACES
O1-O16	84'-8"	1'-3"	9'-4"	15

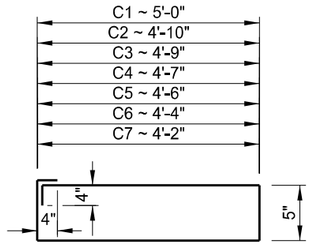
BAR CUTTING DETAILS



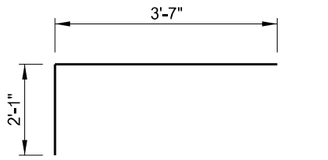
W1 - W24



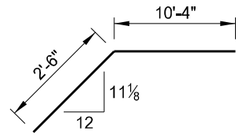
C8 - C25



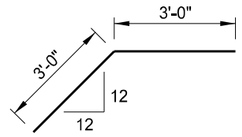
C1 - C7



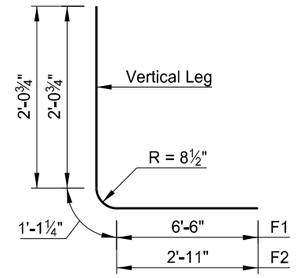
C26



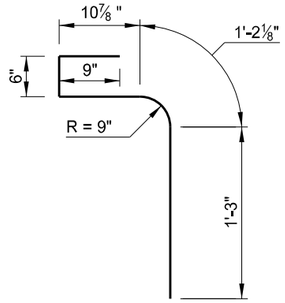
A1



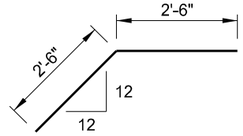
H7



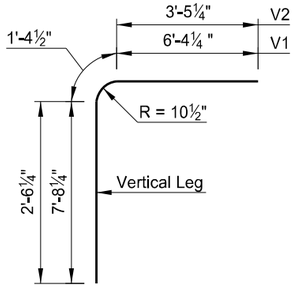
F1 & F2



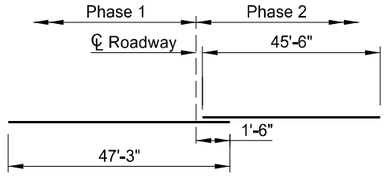
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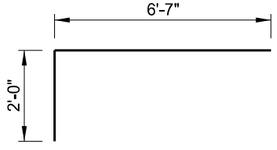
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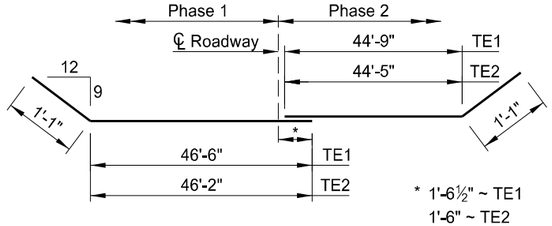
V1 & V2



T1



F12



TE1 & TE2

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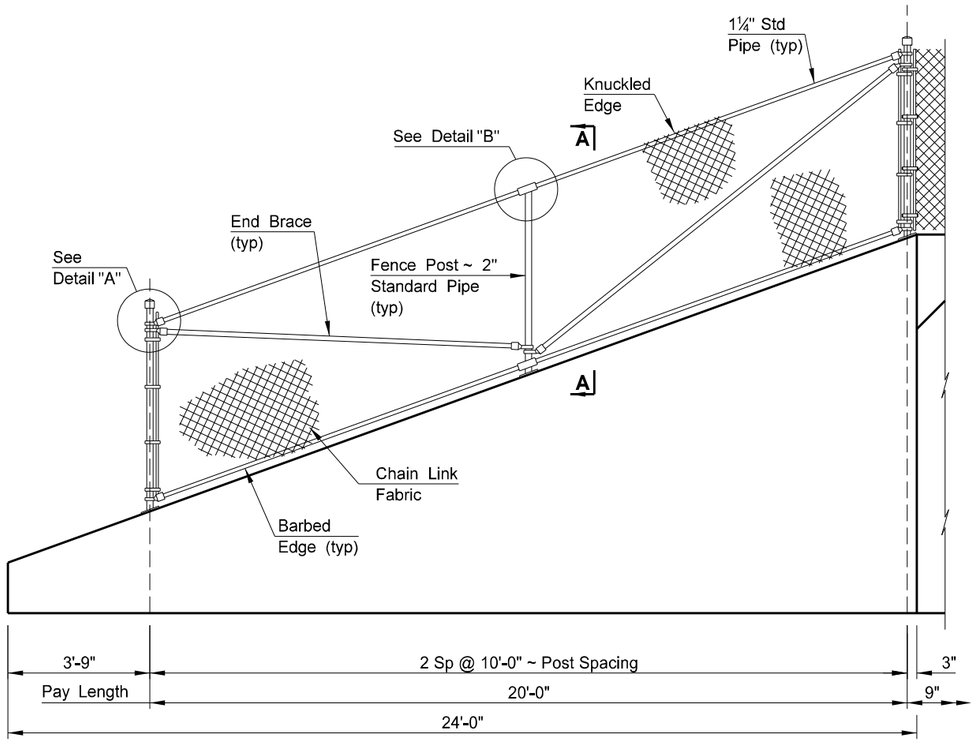
PEDESTRIAN UNDERPASS
HAZEN, ND

BAR DETAILS

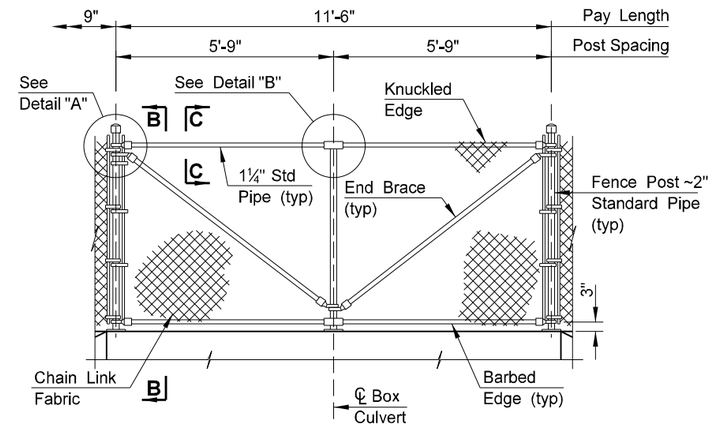
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WING WALL ELEVATION



PARAPET ELEVATION

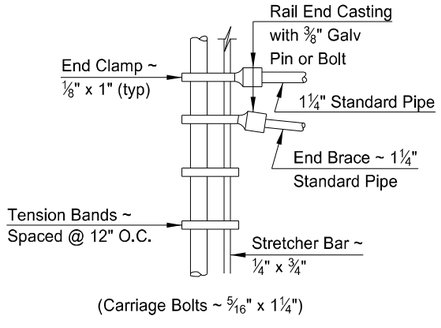
NOTES:

Provide fabric meeting AASHTO M 181 Type IV, Class B with 9 gage wire, 2 inch mesh, 60 inches high and the bottom selvage barbed.

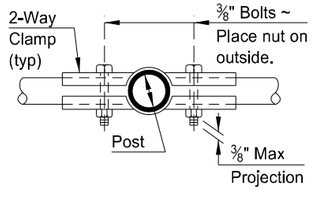
Supply posts, pipe rail and fittings meeting AASHTO M 181 Grade 1.

Furnish anchorage plates meeting ASTM A36. Hot-dip galvanize anchorage plates in accordance with Section 854 of the Standard Specifications. Use 100% bonded black vinyl coated fence fabric, pipe, posts, fittings, ties and hardware.

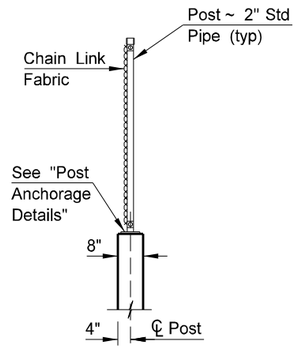
Anchor the base plates by either epoxying in ½" ø anchor bolts or placing them in the concrete during pouring. If the Contractor elects to drill the bolt holes, exercise caution to avoid damaging the concrete parapet or wing wall, and position the base plates as shown in the "ELEVATION" views. Ensure each anchor bolt has a minimum pullout capacity of 10,000 pounds and a minimum embedment of 8". Provide anchor bolts and nuts that conform to ASTM F1554 Grade 36 and ASTM A563 Grade A Hex, respectively. Supply washers that meet ASTM F436, Type 1. Hot-dip galvanize all bolts, nuts, and washers in accordance with AASHTO M 111 or AASHTO M 232, as applicable.



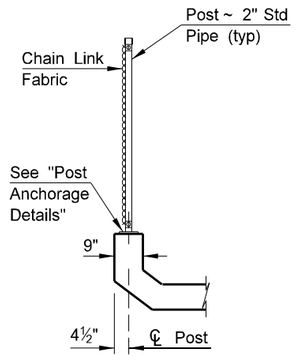
DETAIL "A"



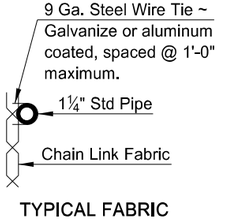
DETAIL "B"



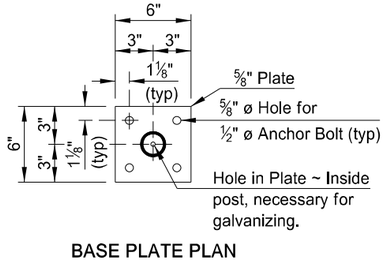
A-A



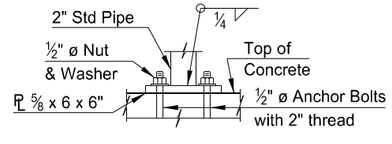
B-B



TYPICAL FABRIC ATTACHMENT
C-C



BASE PLATE PLAN



ELEVATION
FENCE POST ANCHORAGE DETAILS

REGISTERED PROFESSIONAL ENGINEER
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PE-6691
DATE: 08/11/26
NORTH DAKOTA

QUANTITIES

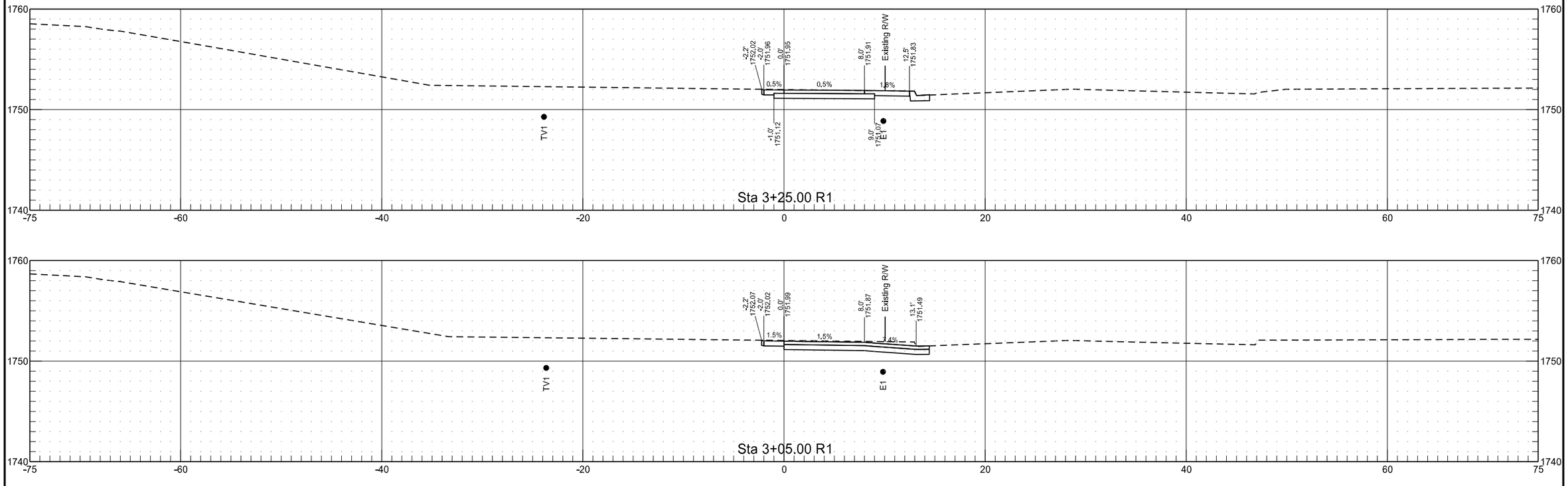
PEDESTRIAN FENCE	53.0 LF

PEDESTRIAN UNDERPASS
HAZEN, ND

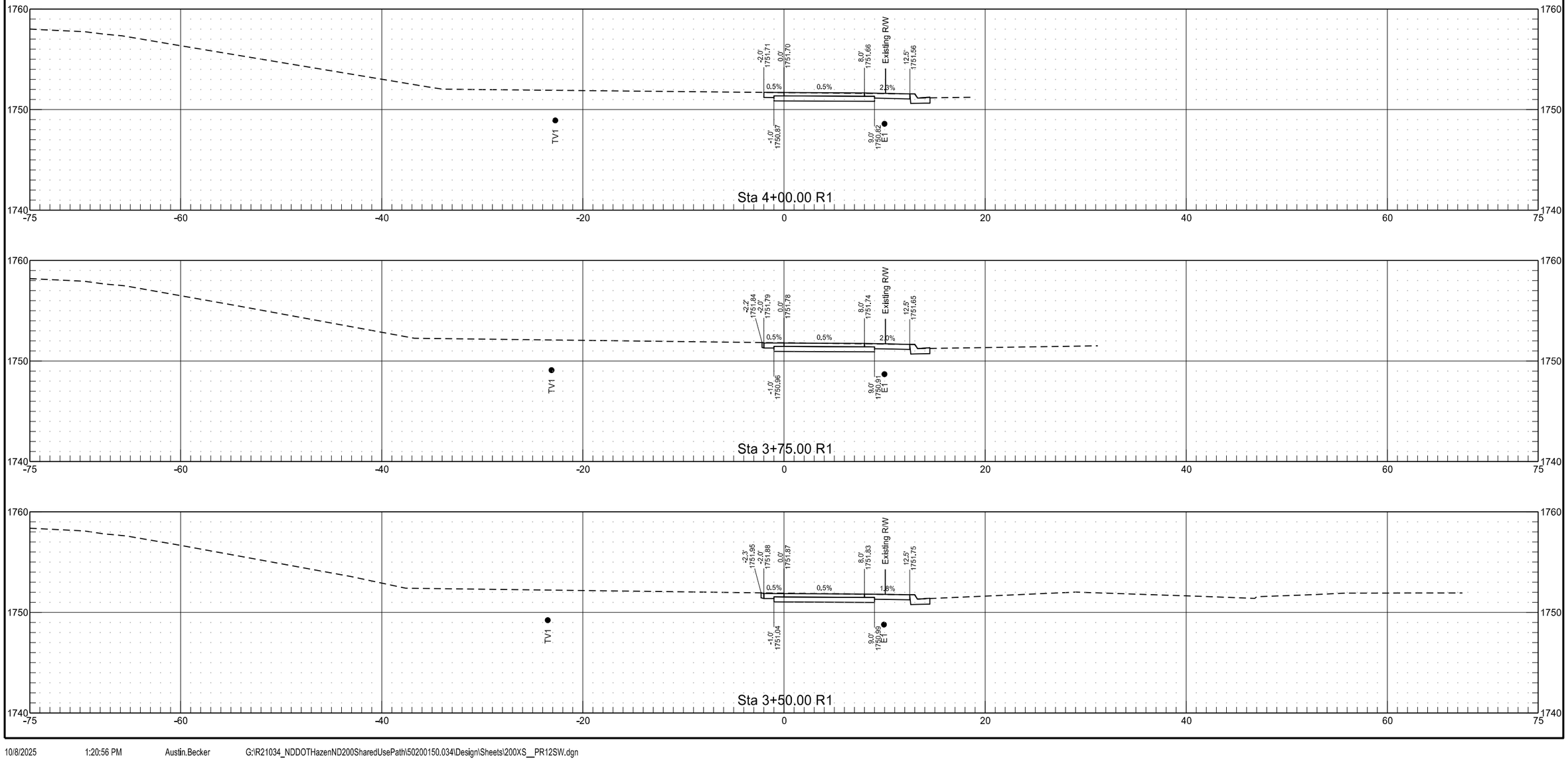
PEDESTRIAN FENCE DETAILS

Shared Use Path - PR12SW

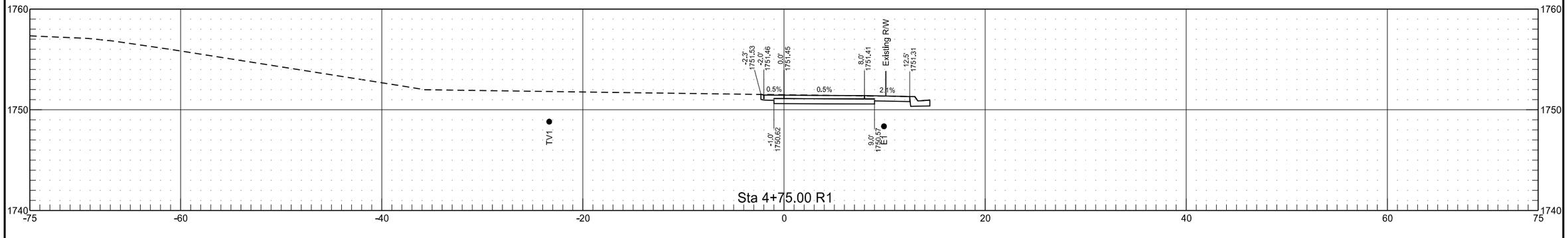
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	ND	NDS-NH-5-200(034)150	200	1

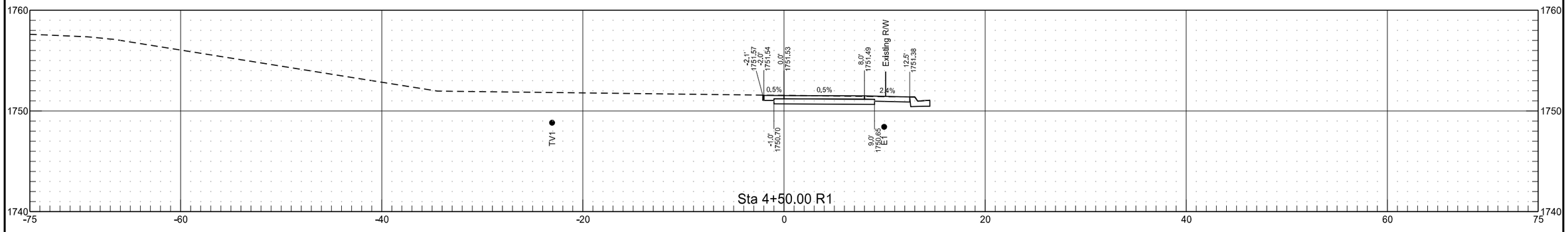


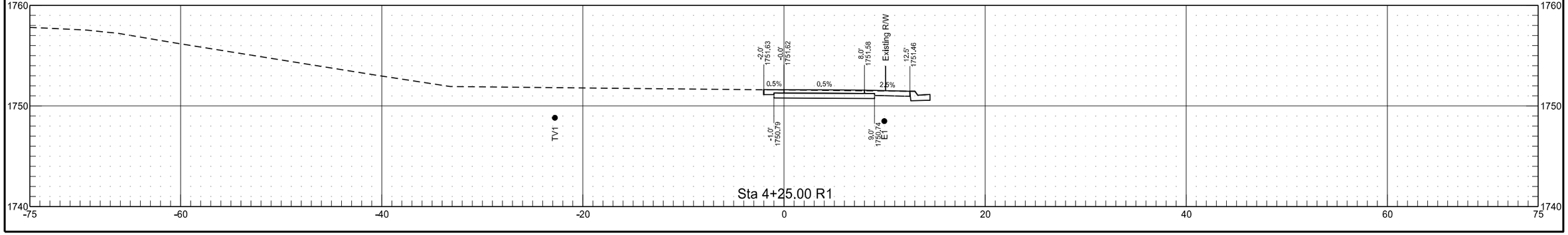
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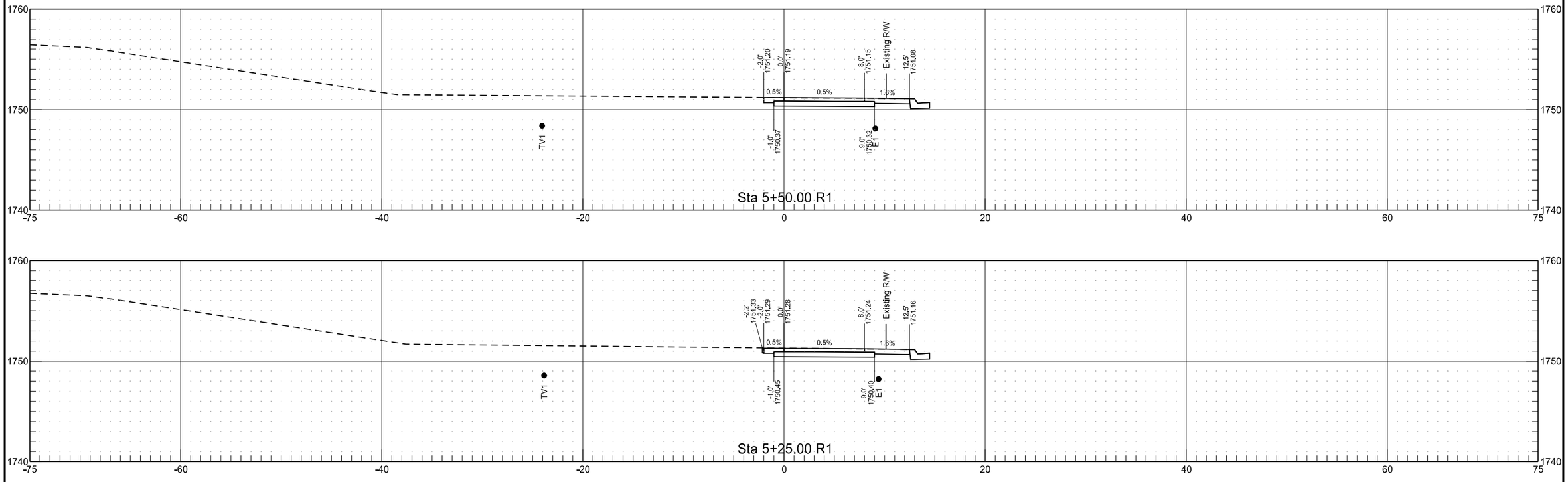




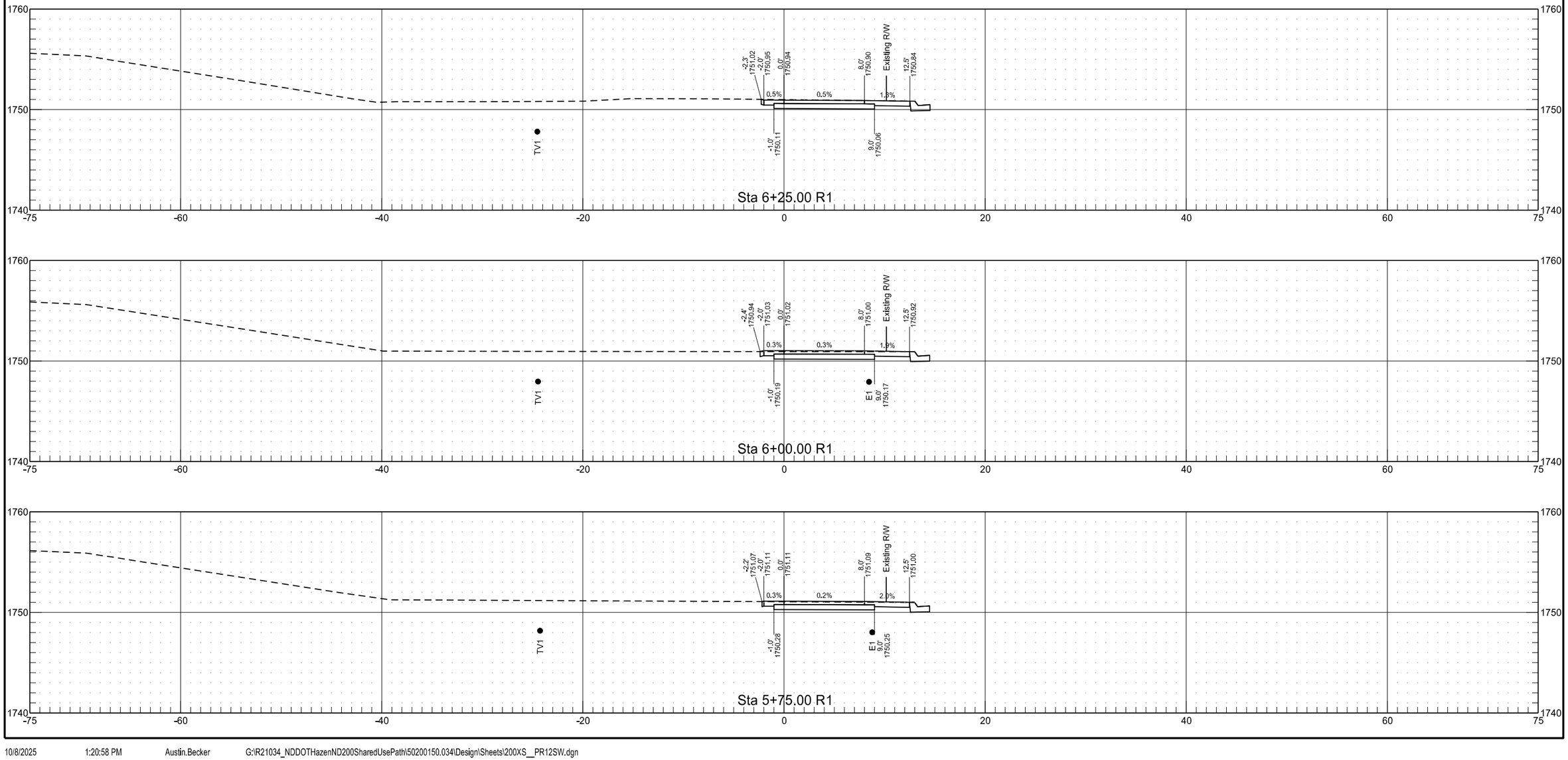


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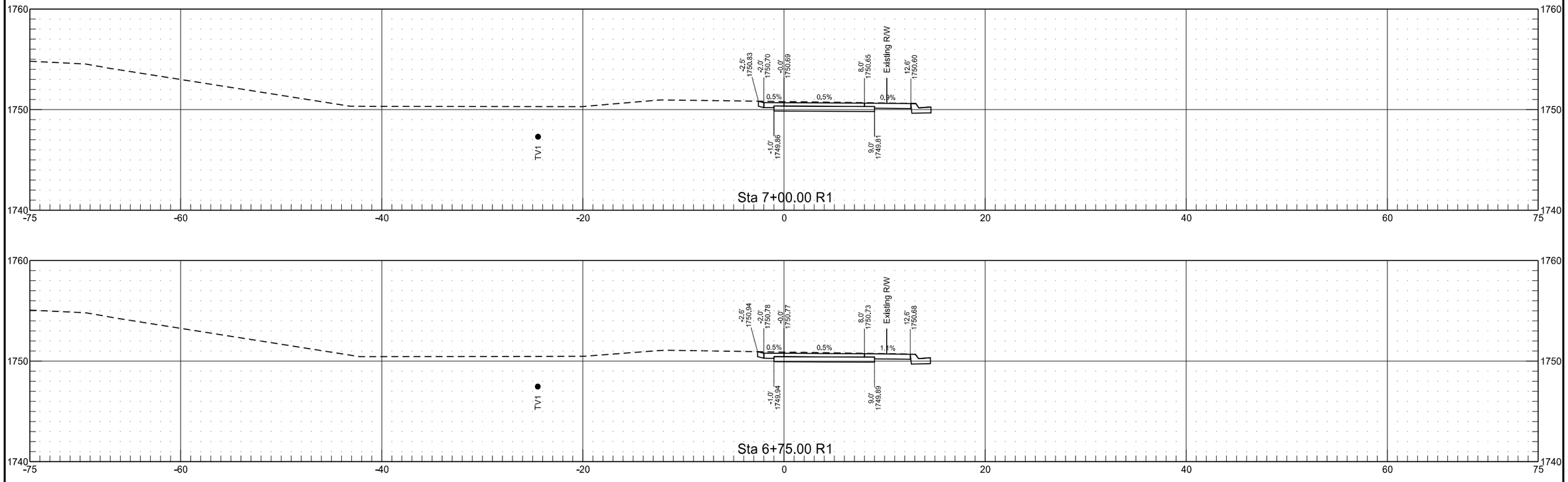


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	ND	NDS-NH-5-200(034)150	200	5



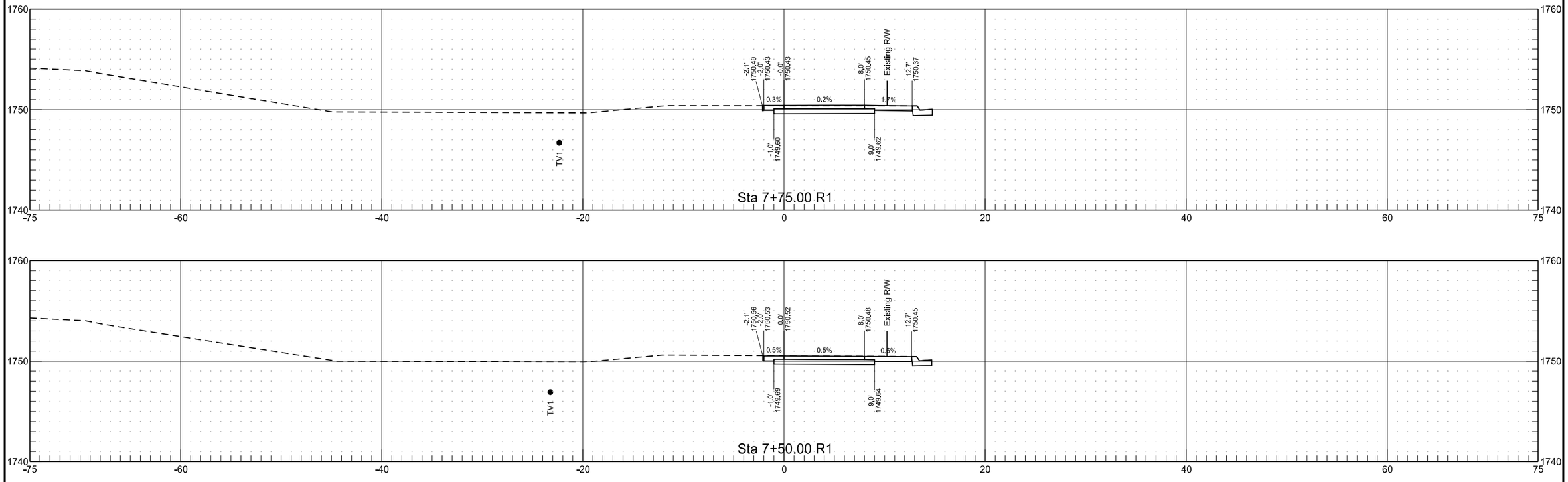
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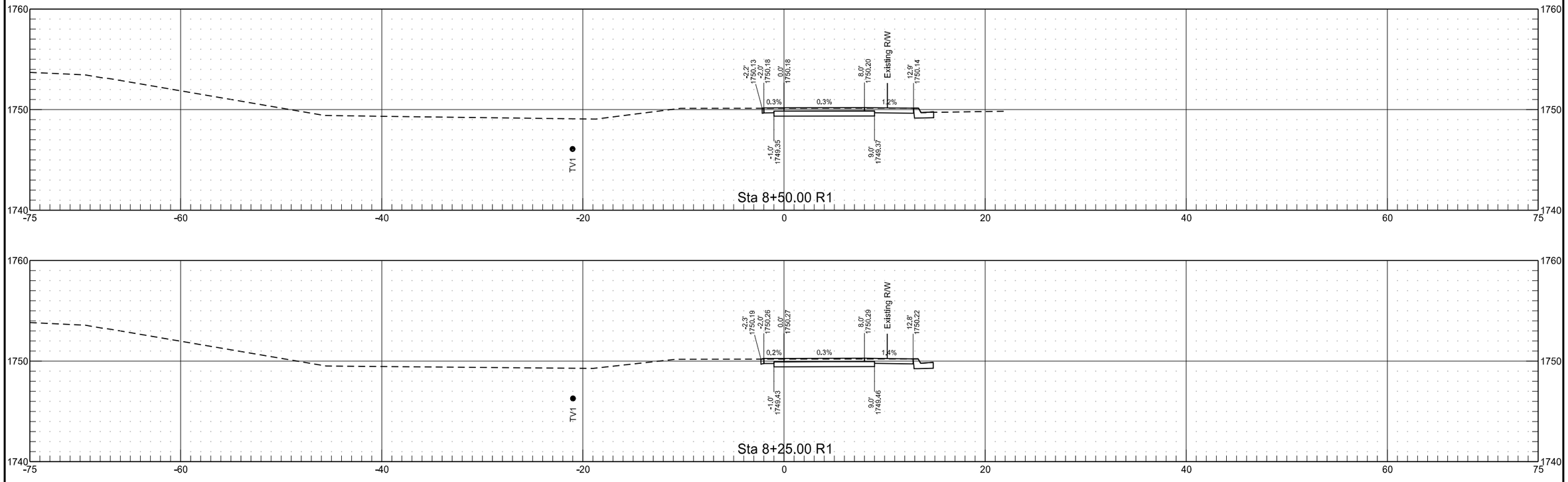
Shared Use Path - PR12SW

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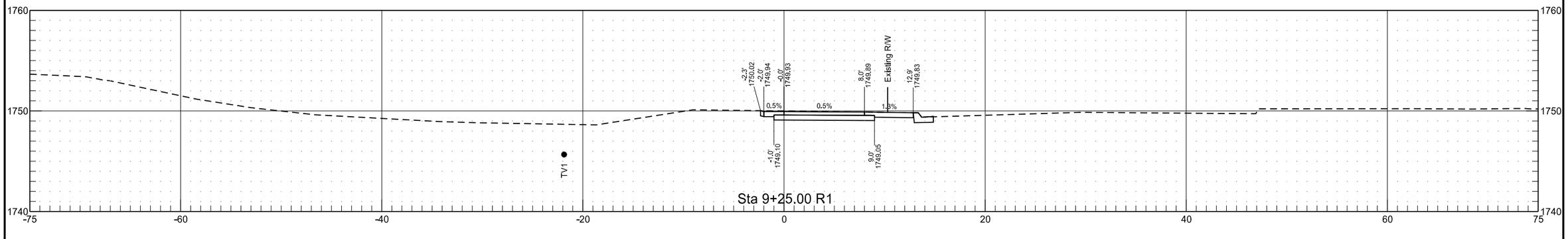


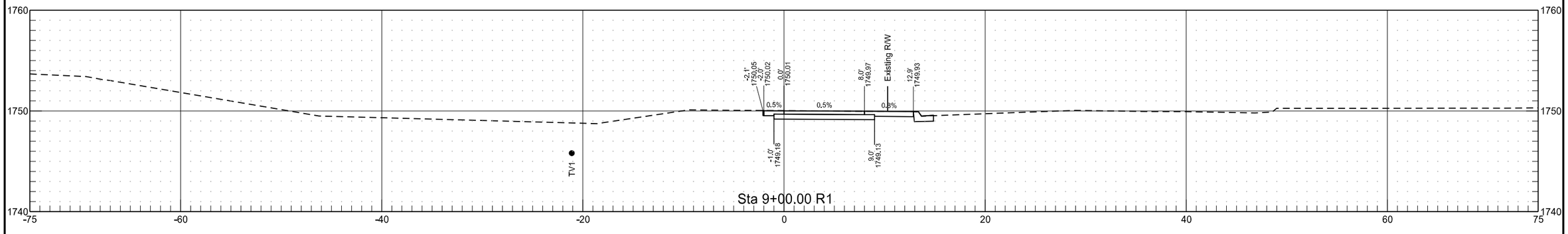
Shared Use Path - PR12SW

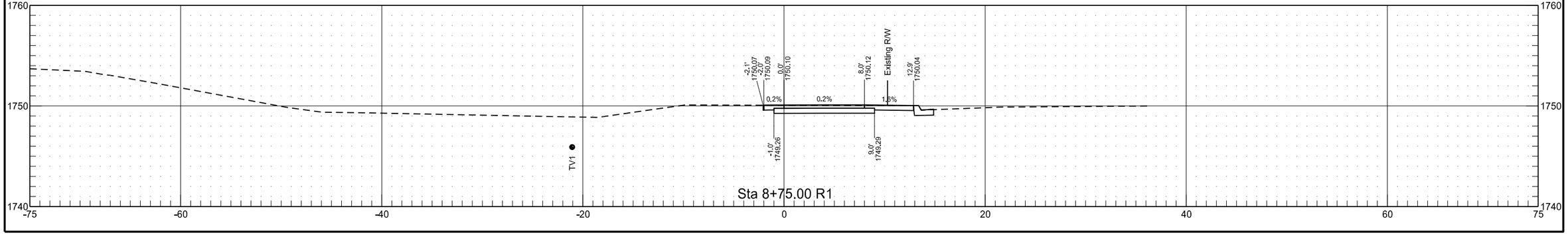
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	ND	NDS-NH-5-200(034)150	200	8



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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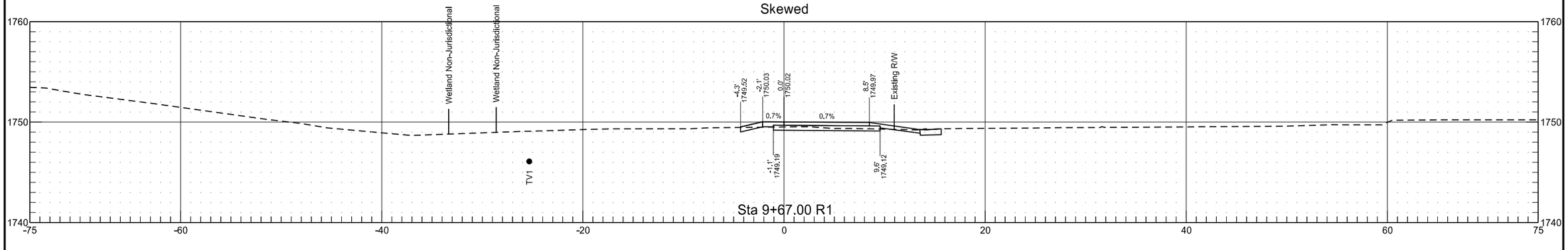


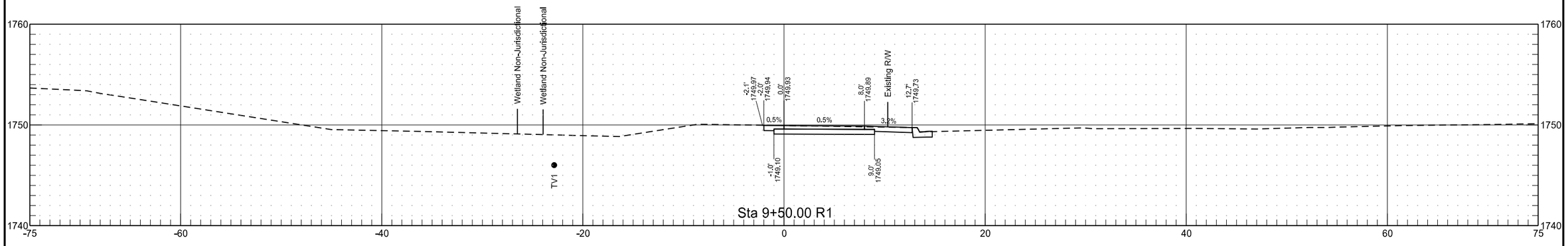


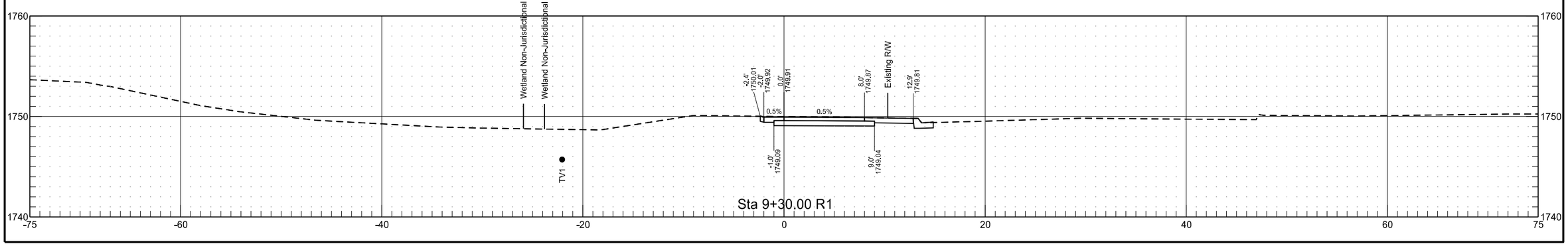


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Skewed

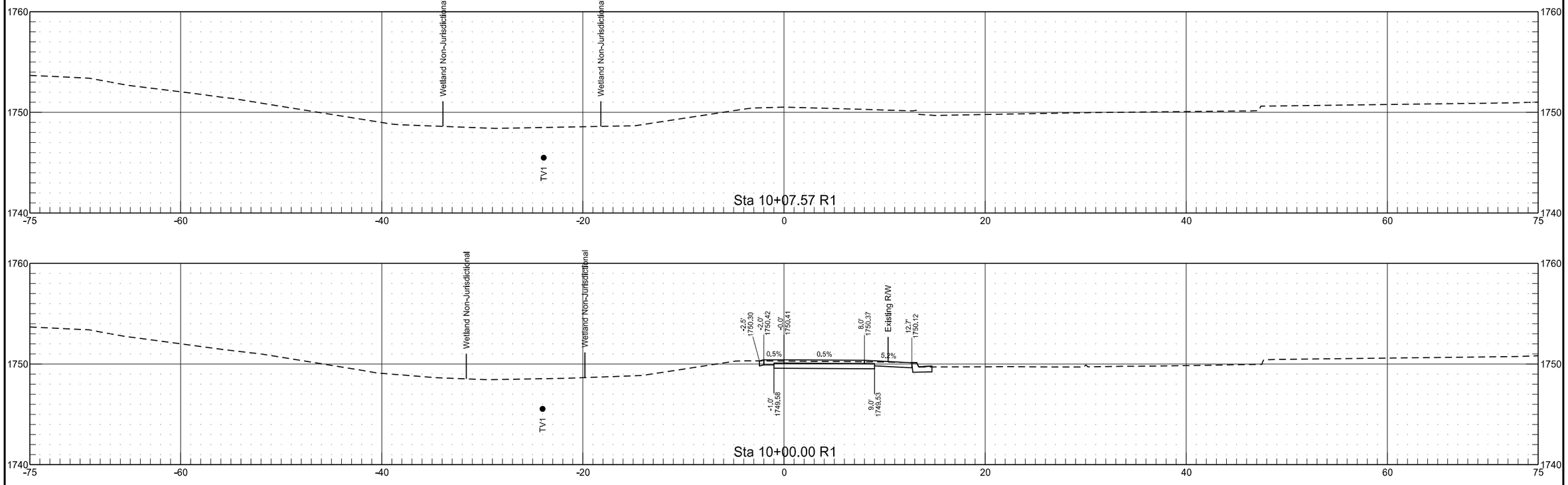




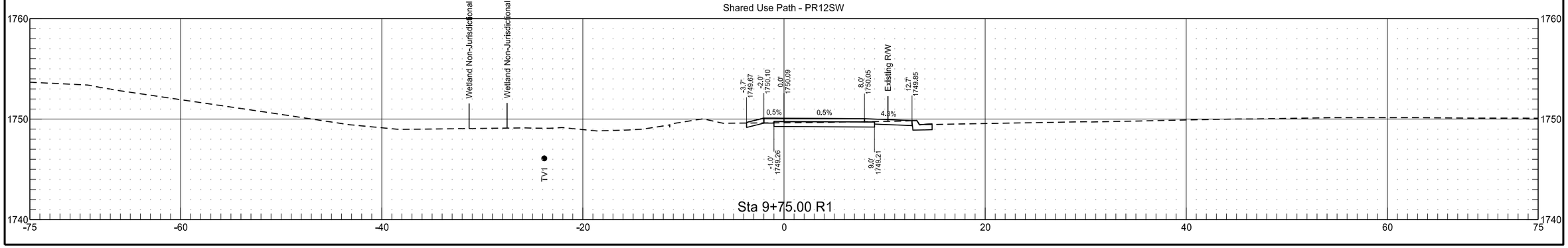


Shared Use Path - PR12SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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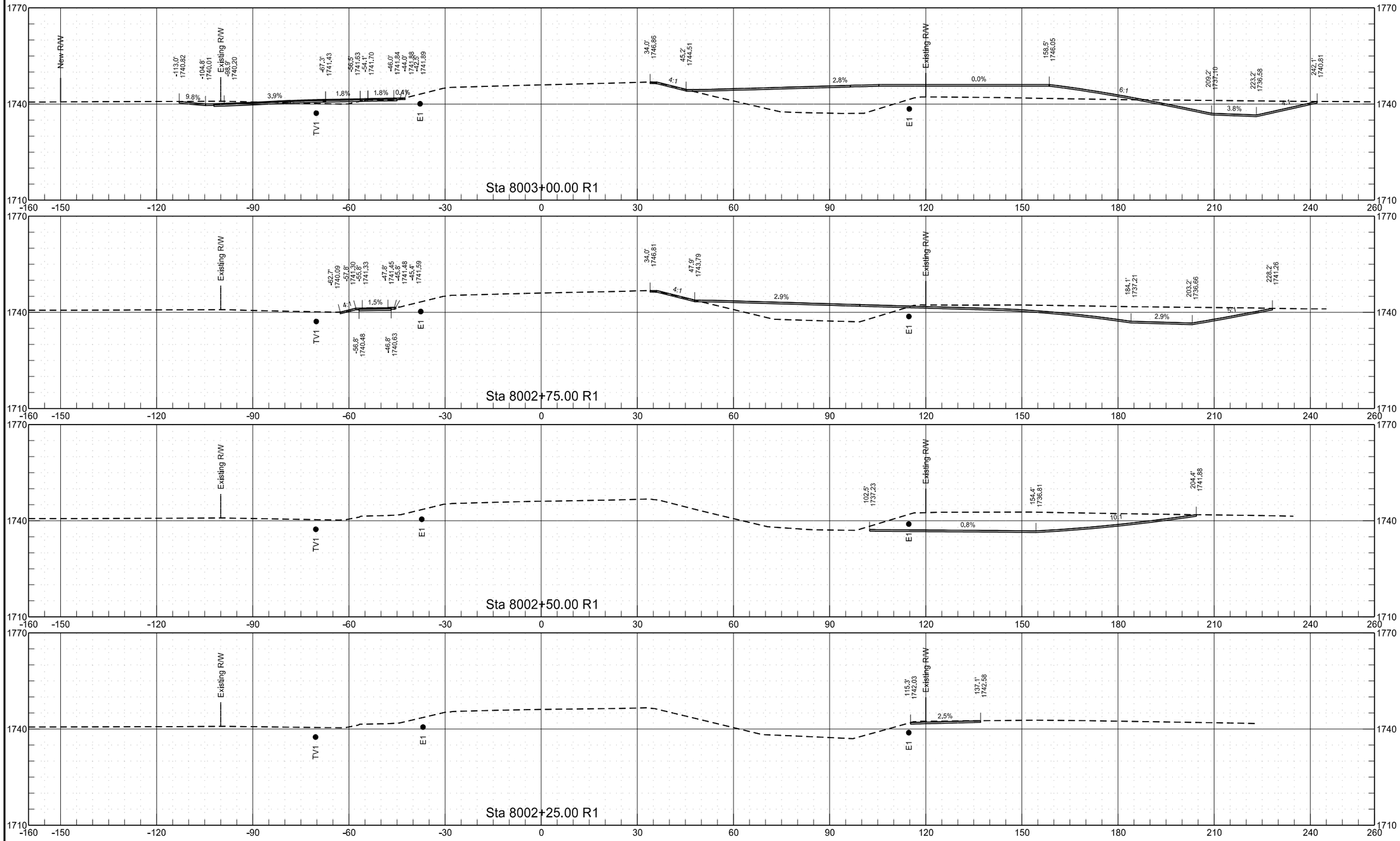


Shared Use Path - PR12SW



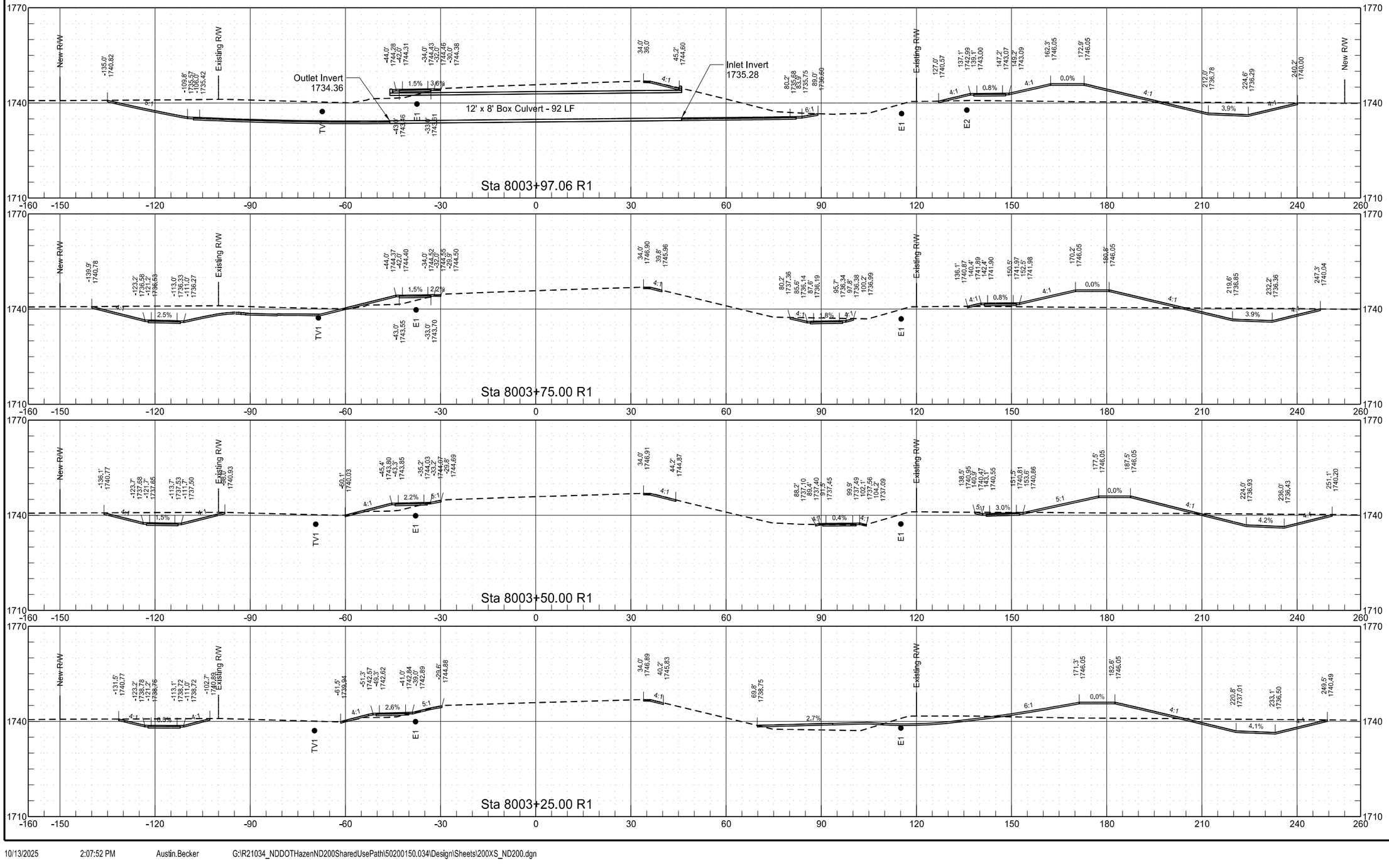
ND 200 - EX200

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	200	12



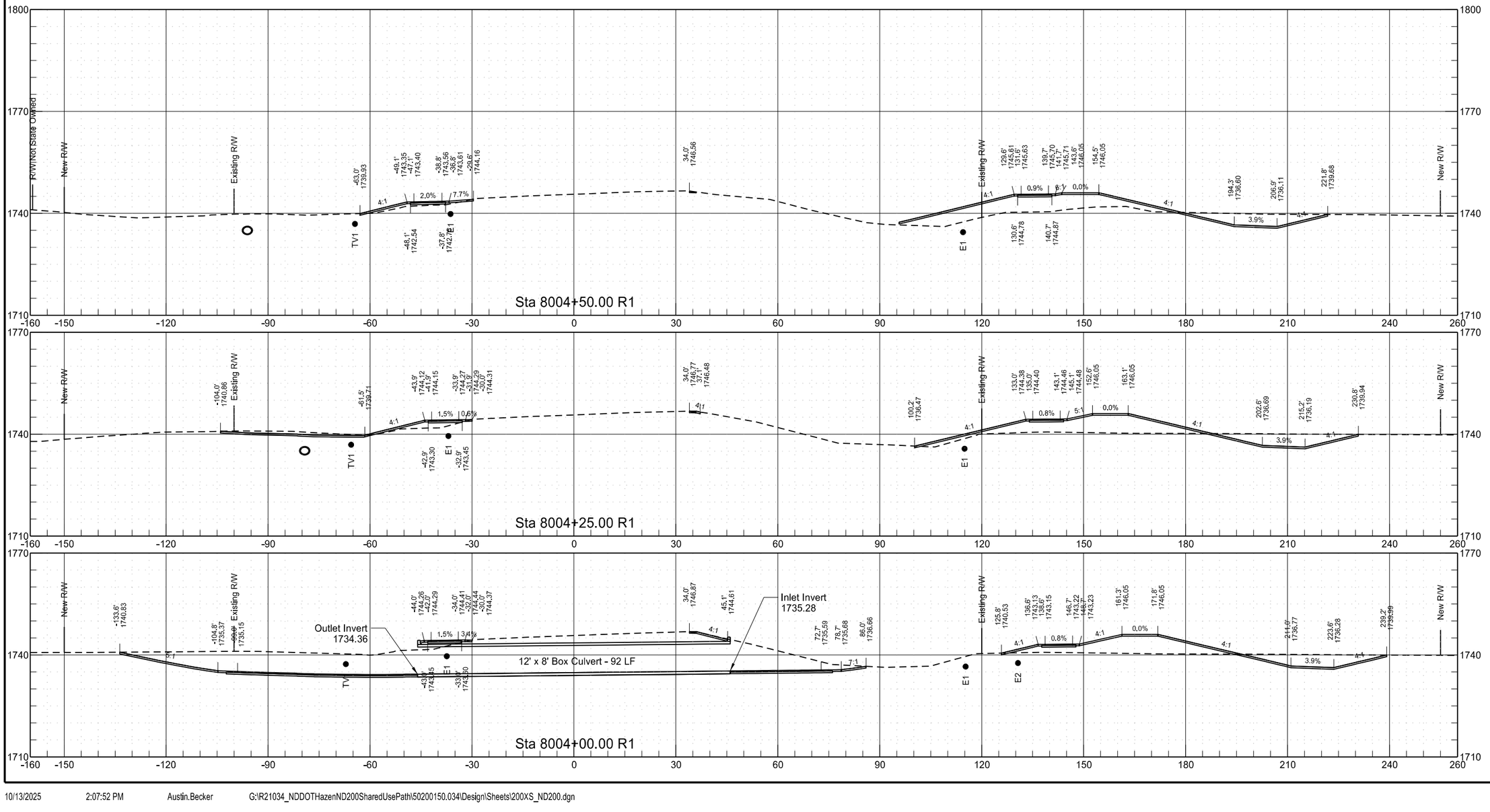
ND 200 - EX200

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	200	13

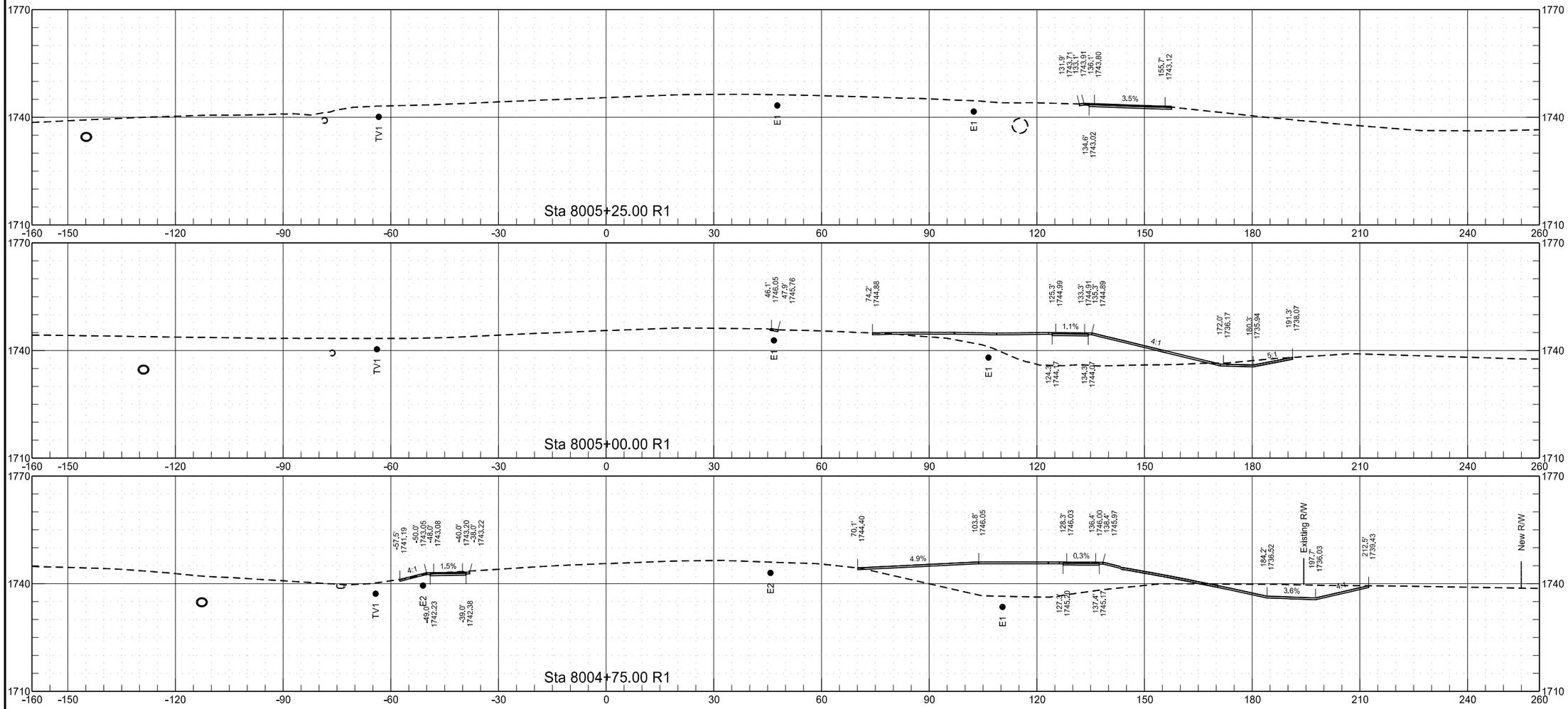


ND 200 - EX200

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	200	14

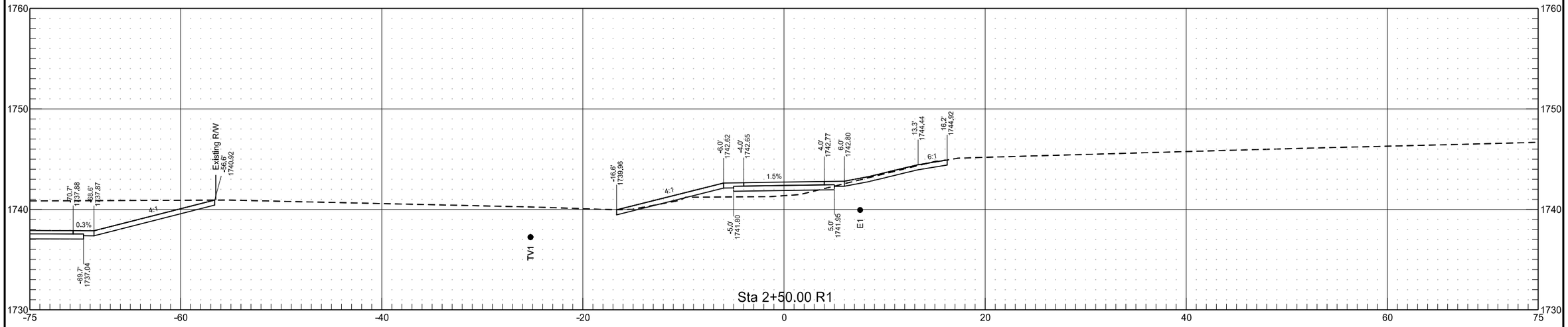


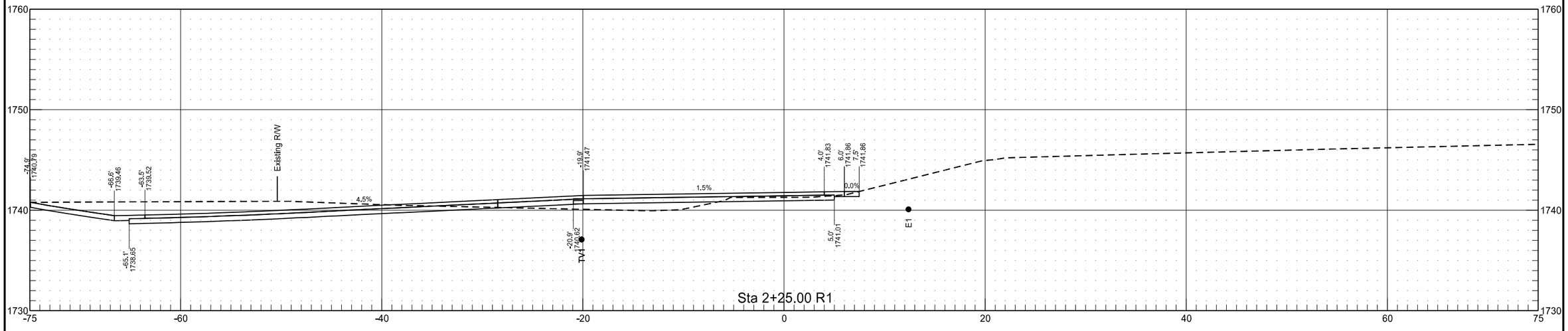
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	ND	NDS-NH-5-200(034)150	200	15

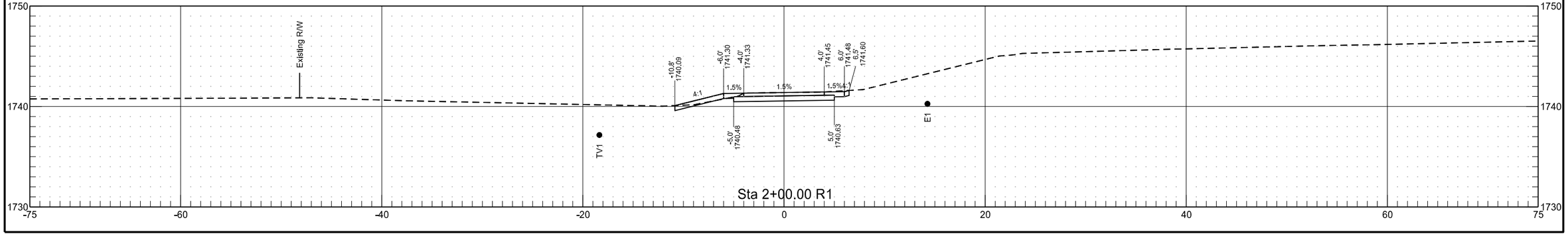


Shared Use Path - PR200SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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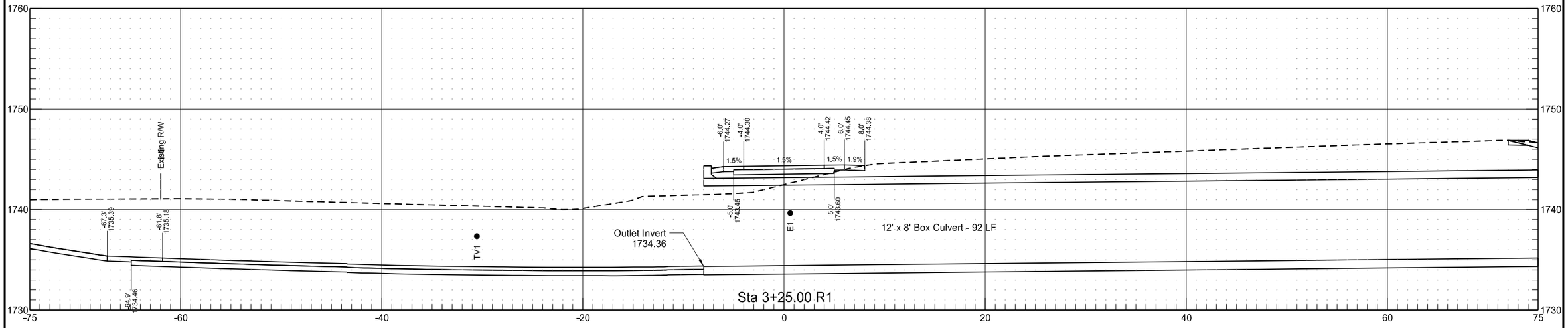


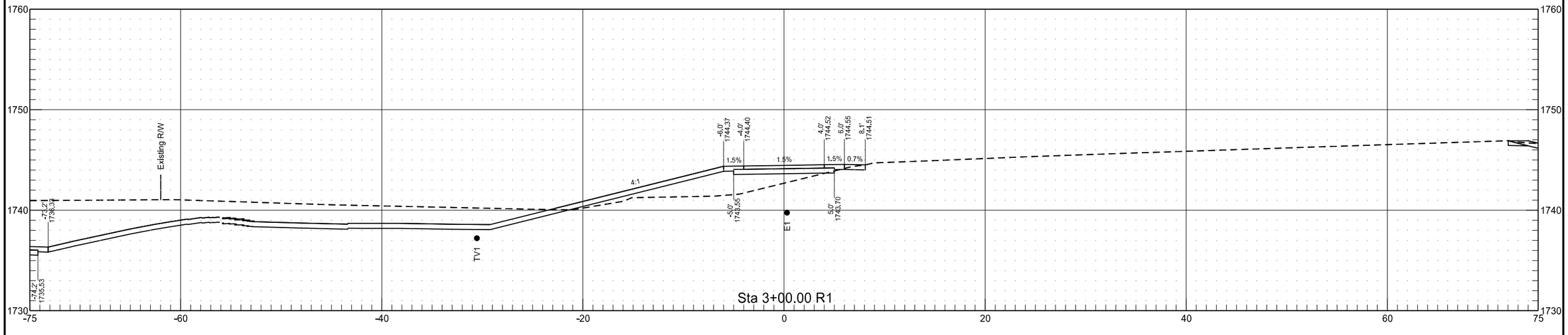


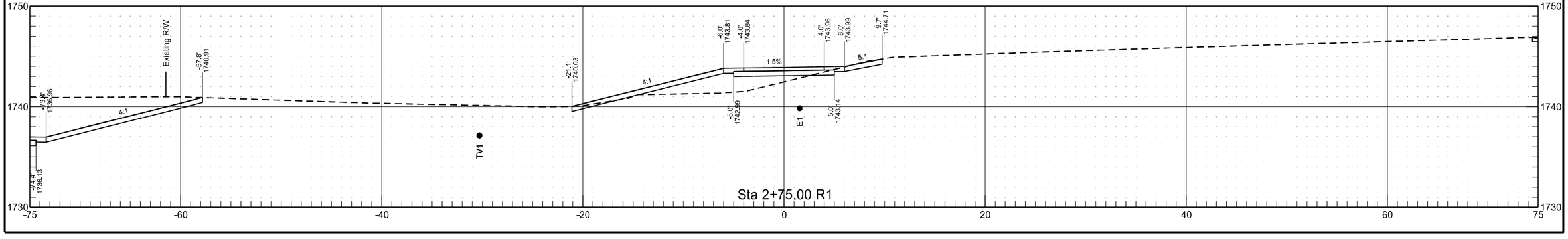


Shared Use Path - PR200SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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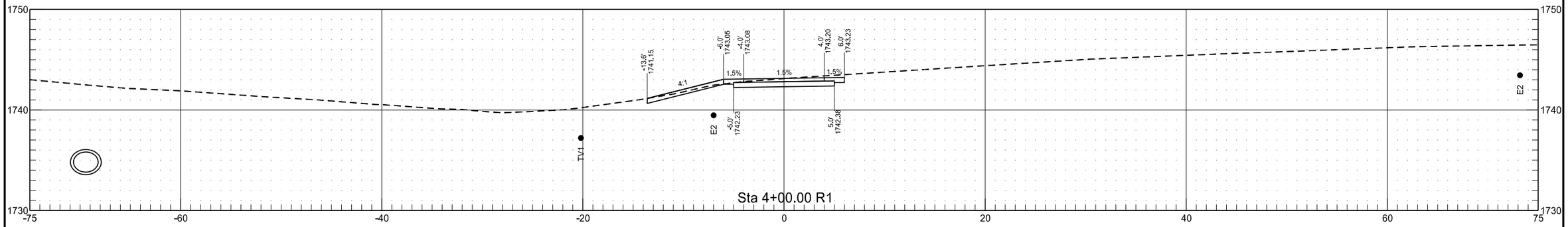


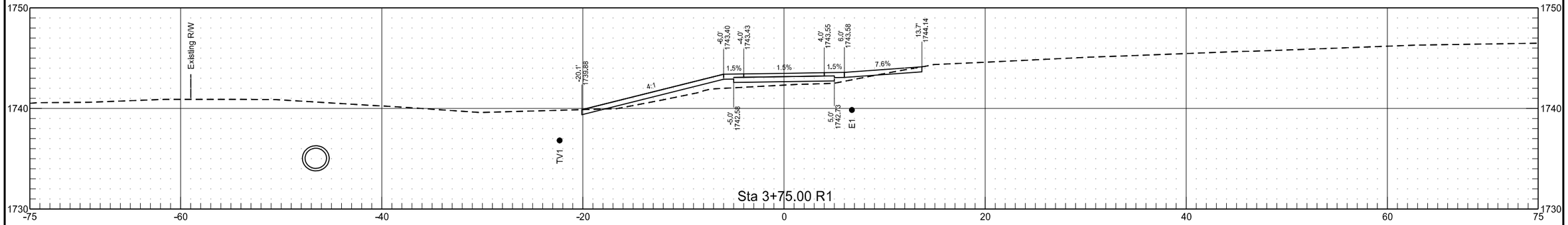


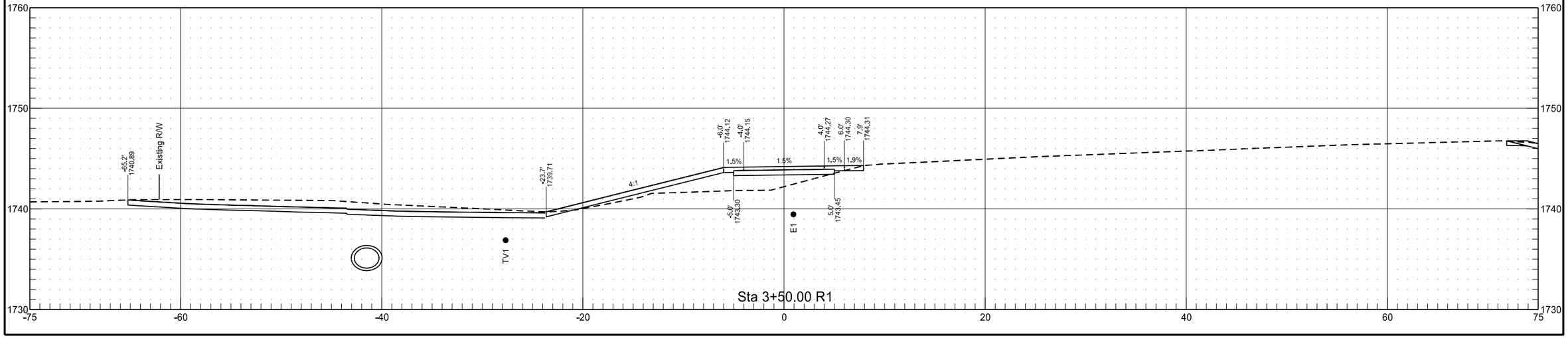


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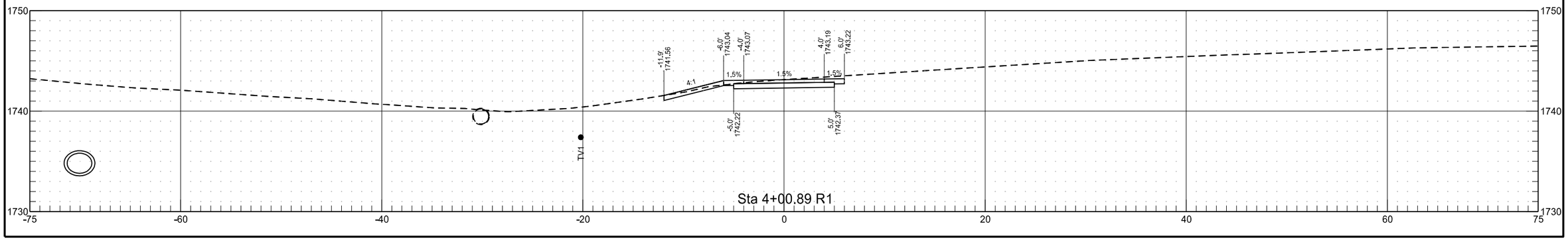






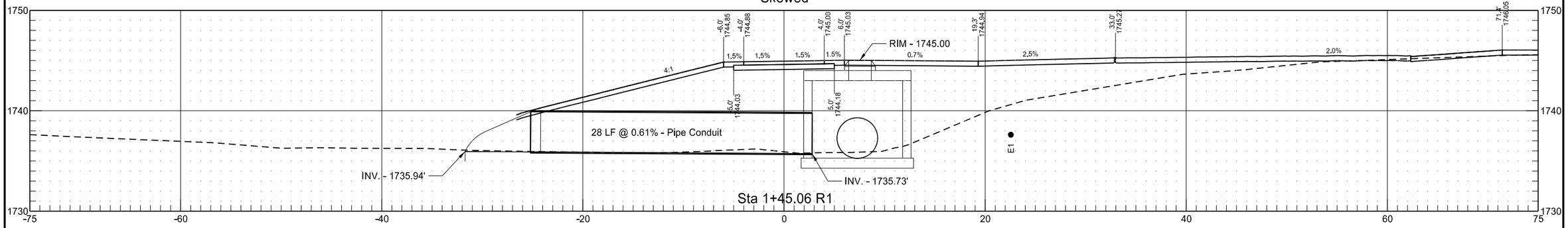
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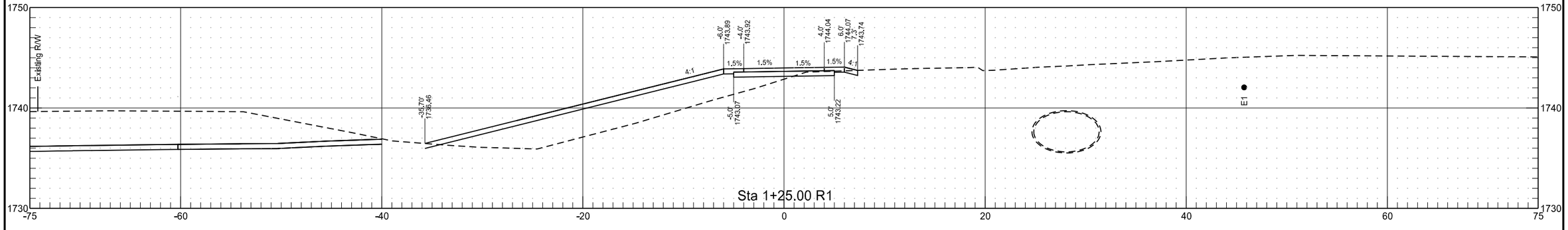
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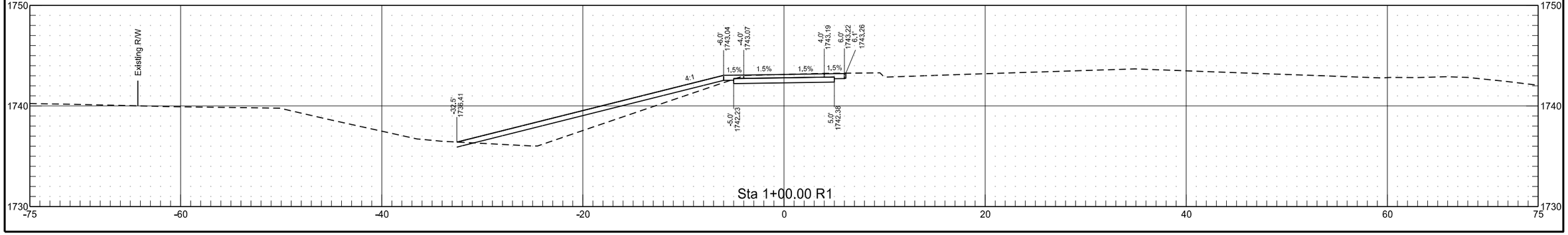


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	200	20

Skewed

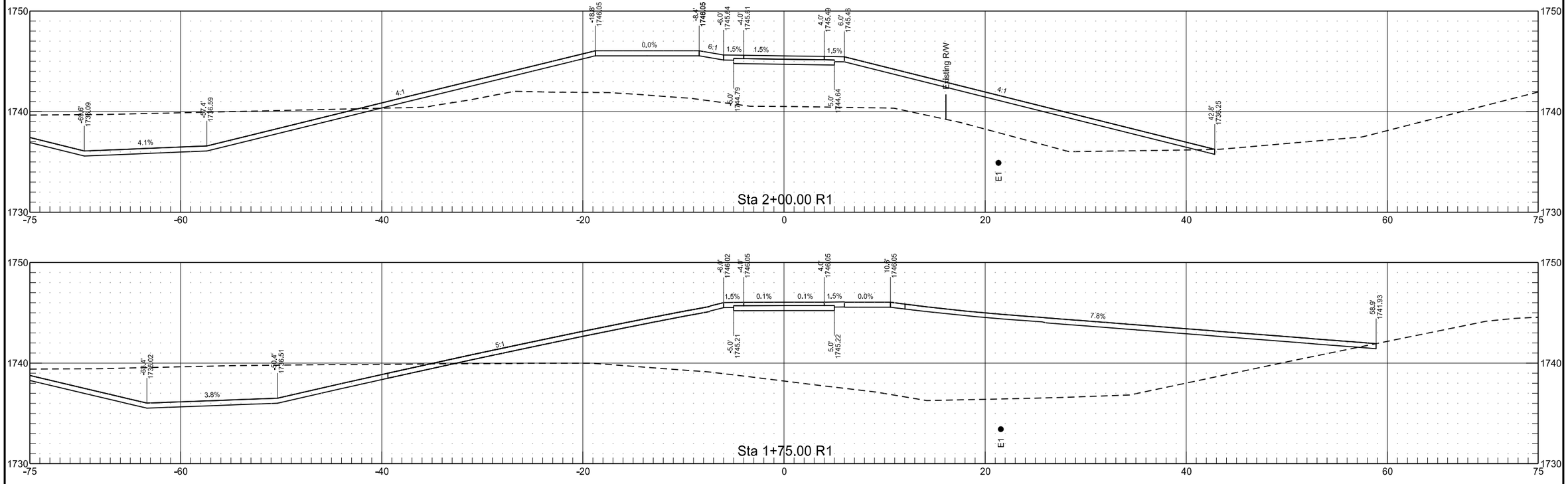






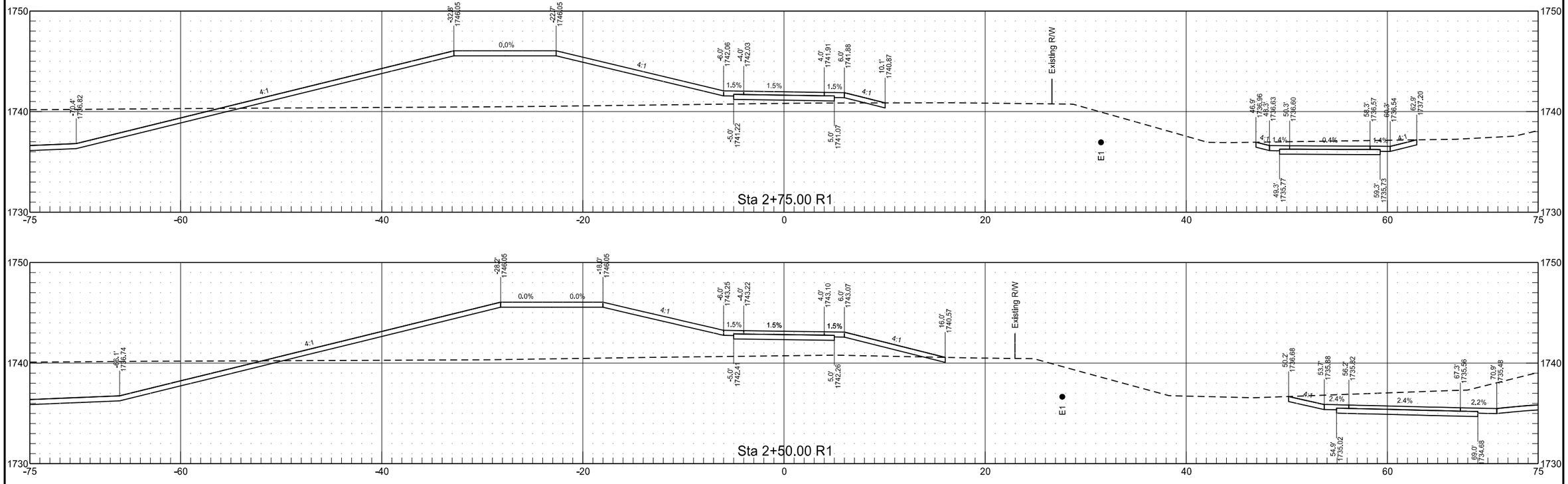
Shared Use Path - PR5SW

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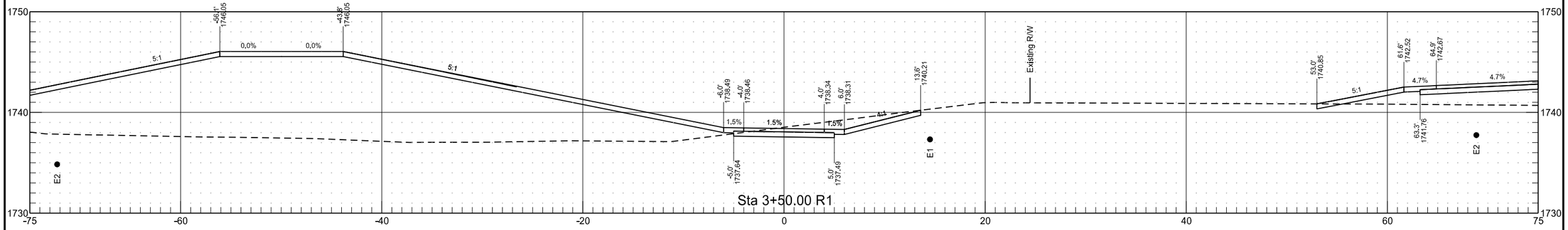
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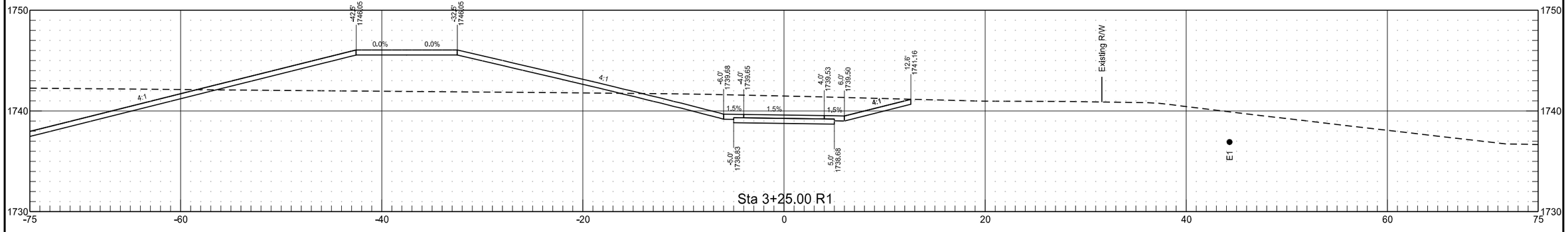
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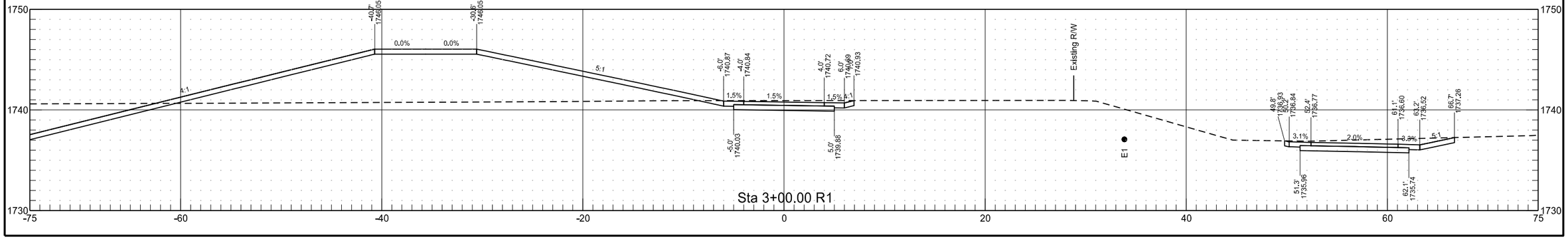


Shared Use Path - PR5SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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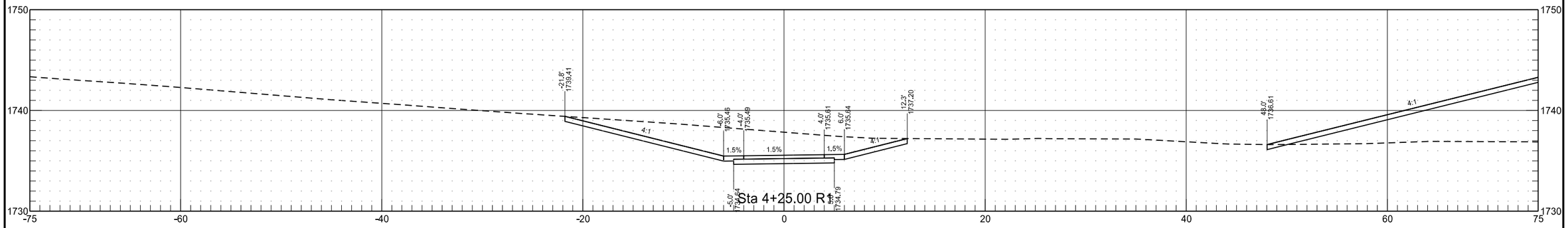


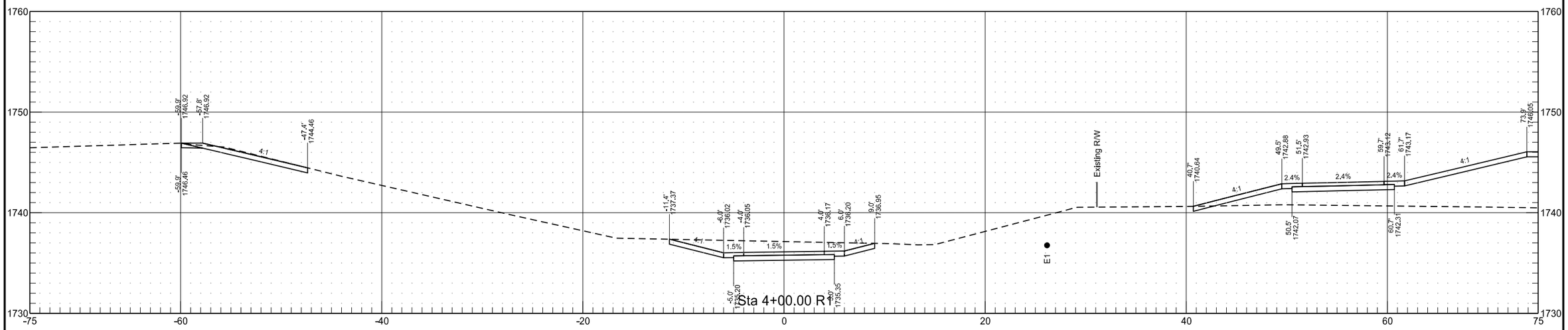


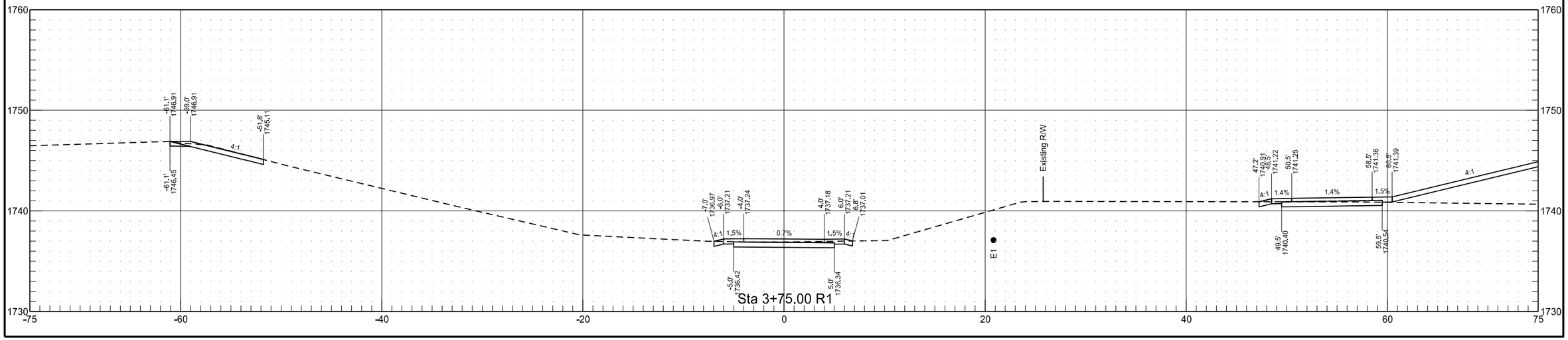


Shared Use Path - PR5SW

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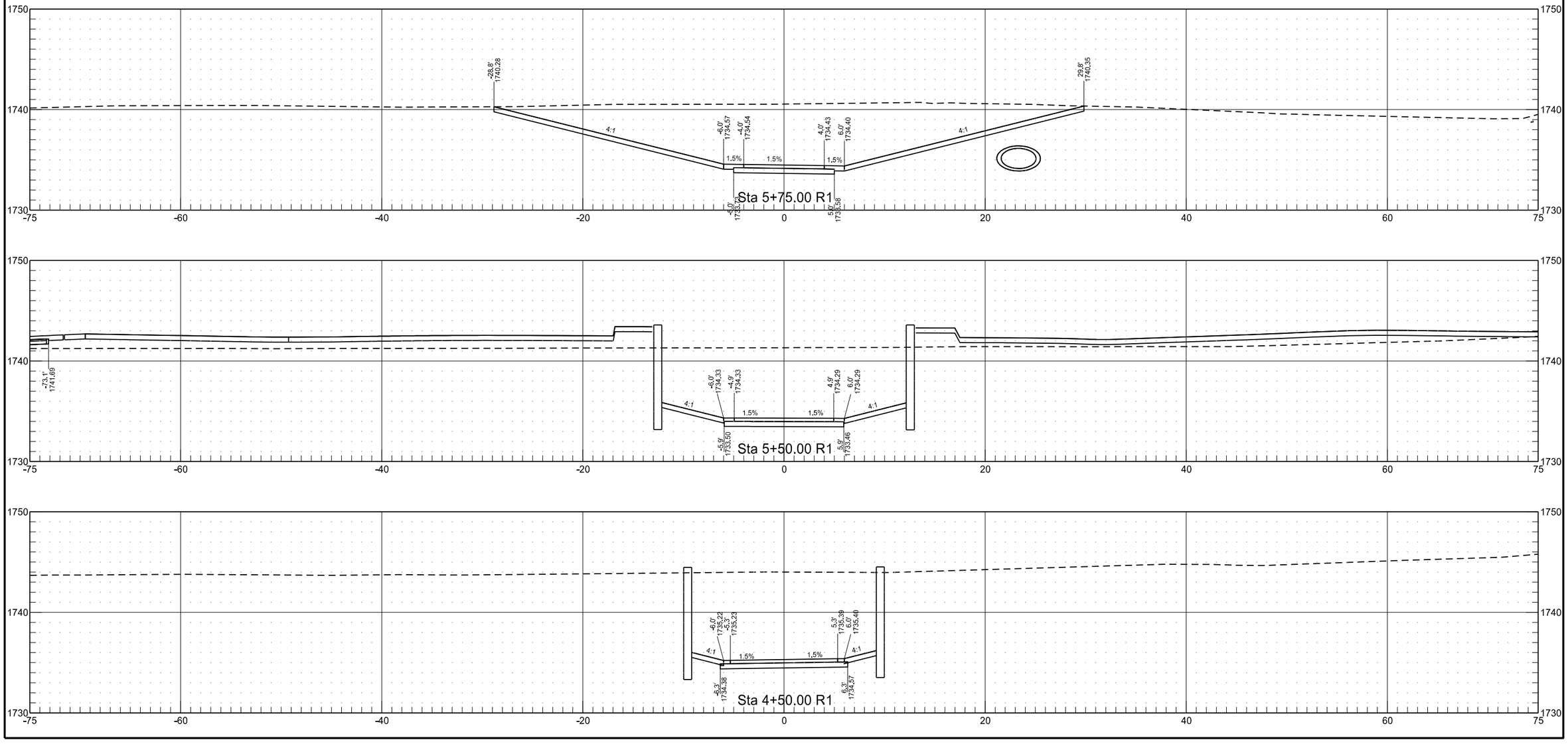






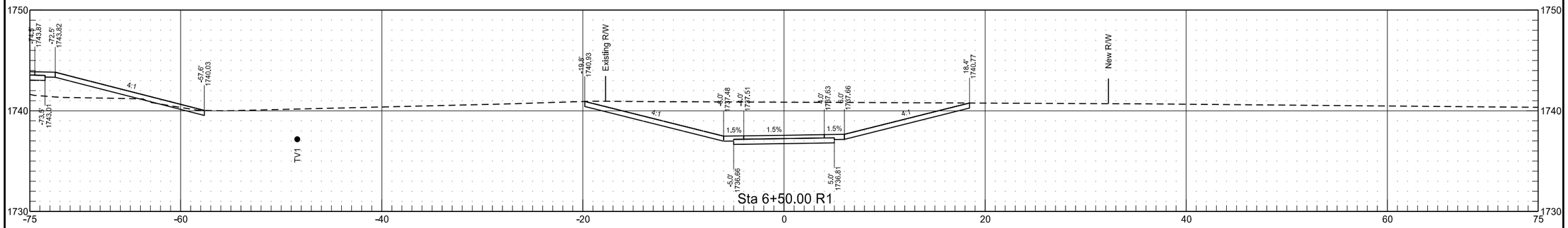
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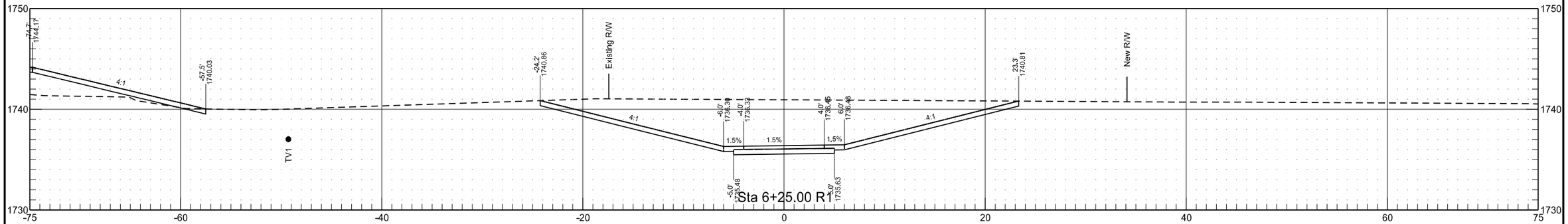
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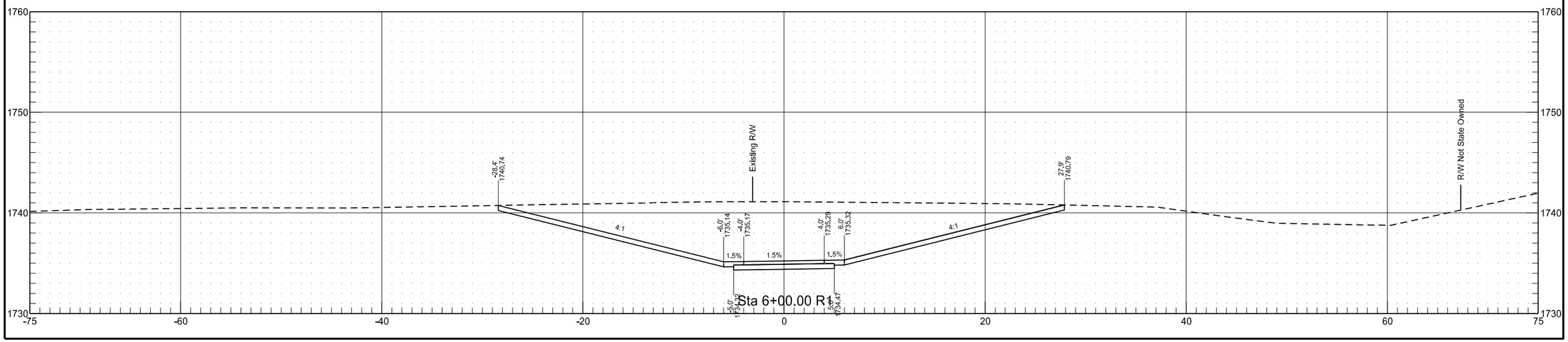


Shared Use Path - PR5SW

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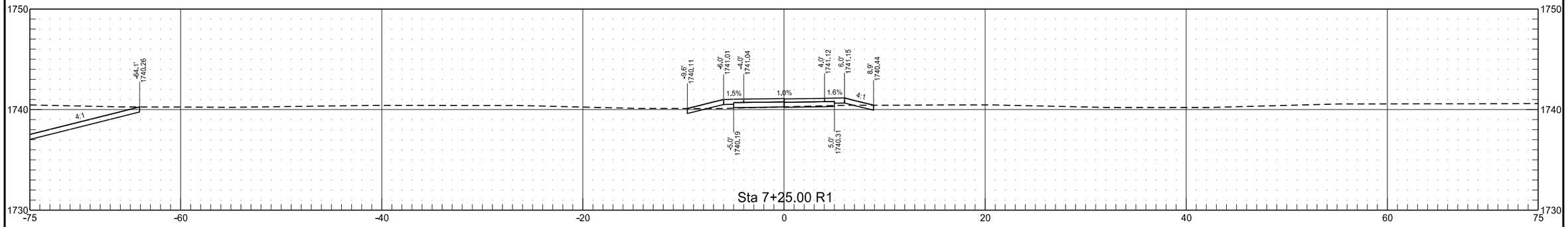


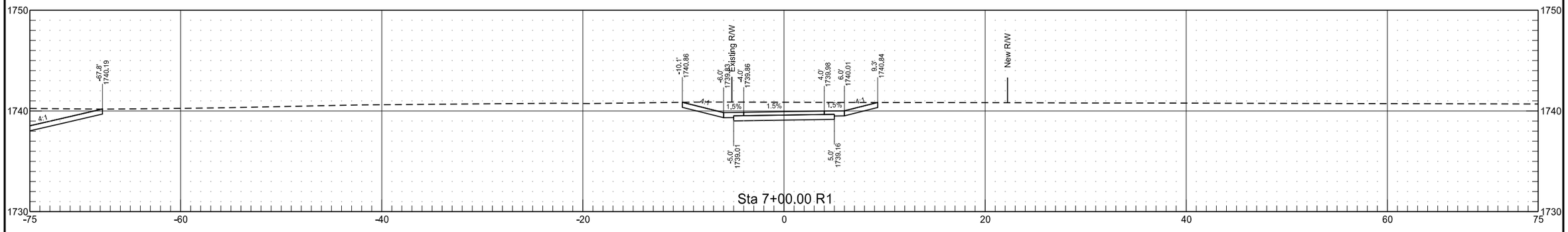


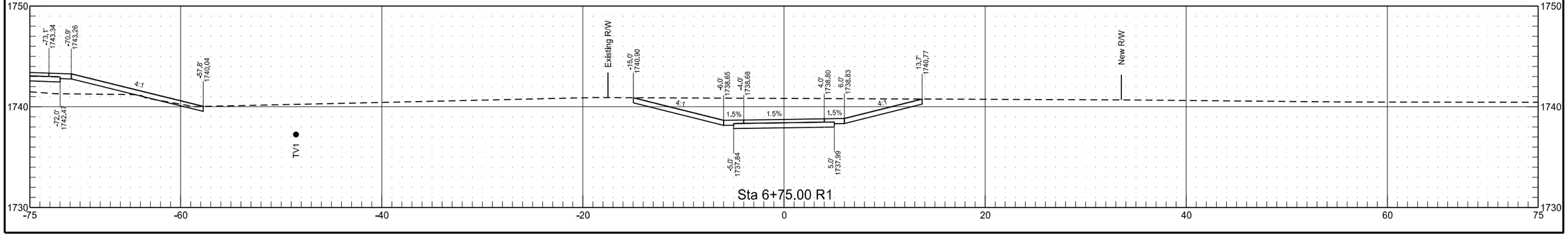


Shared Use Path - PR5SW

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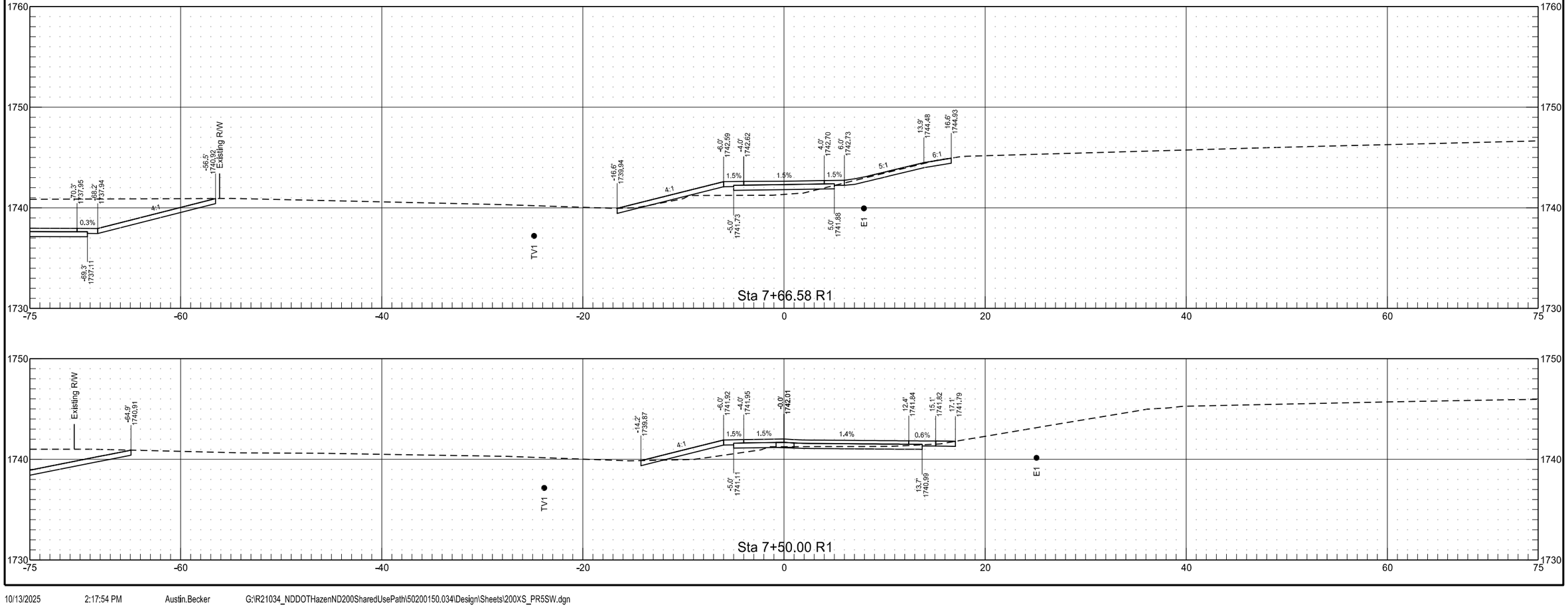






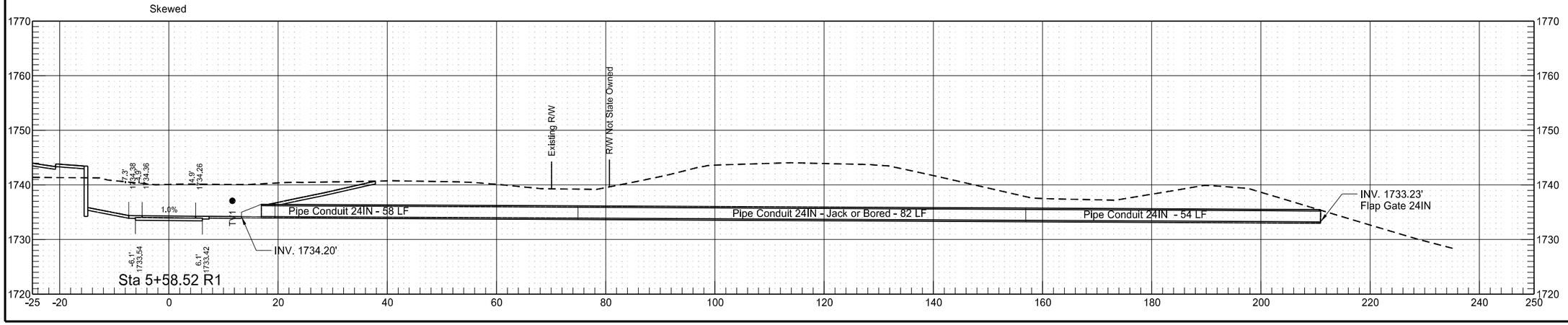
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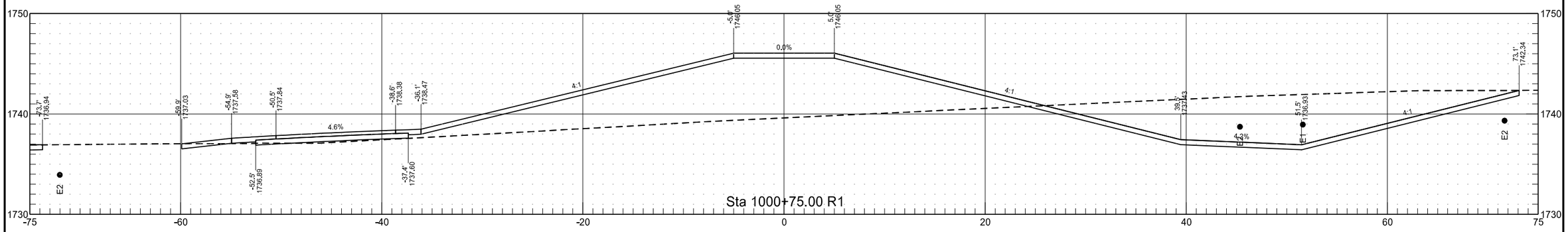
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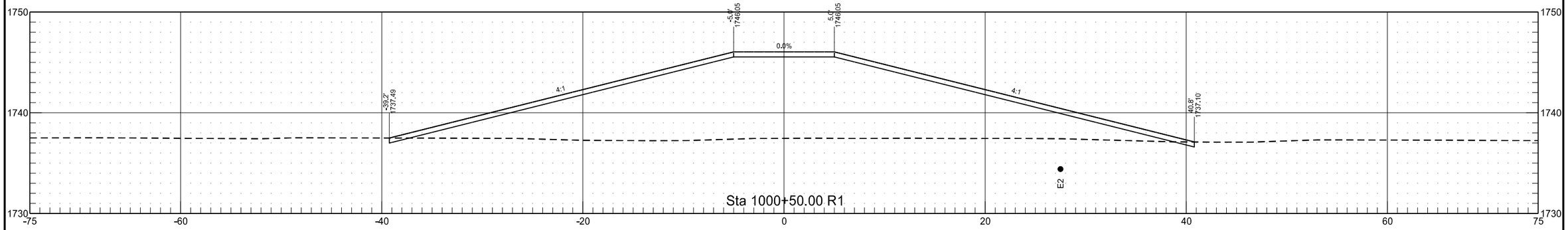
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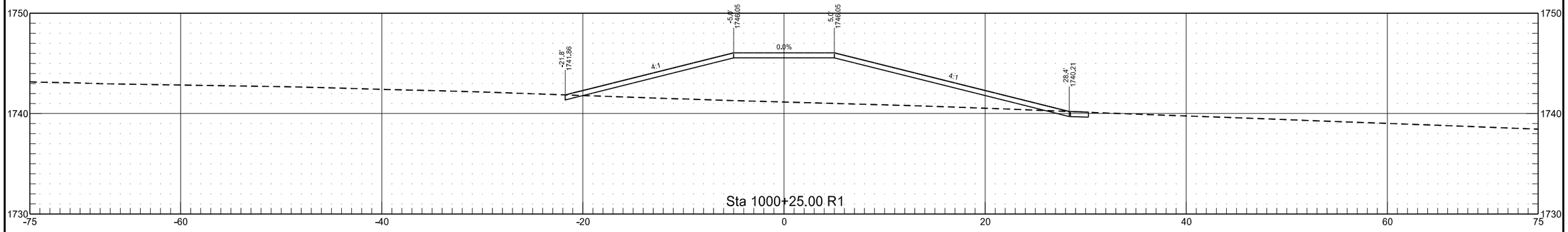


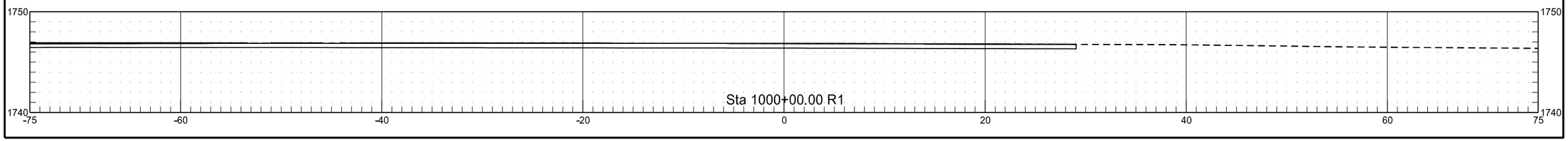
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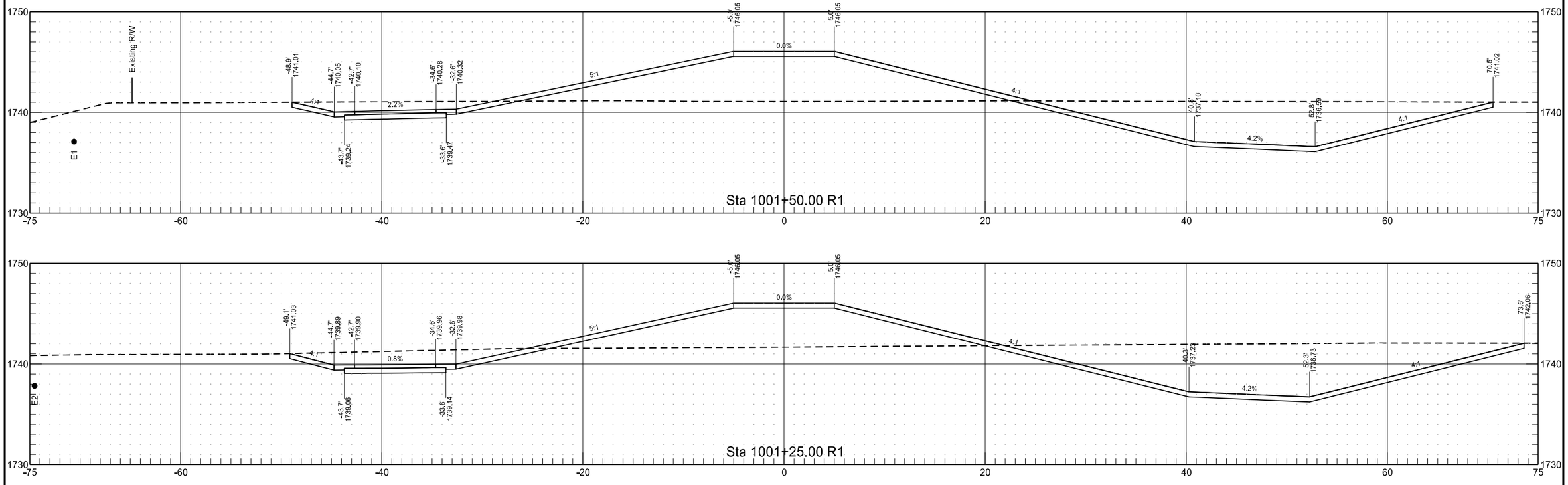






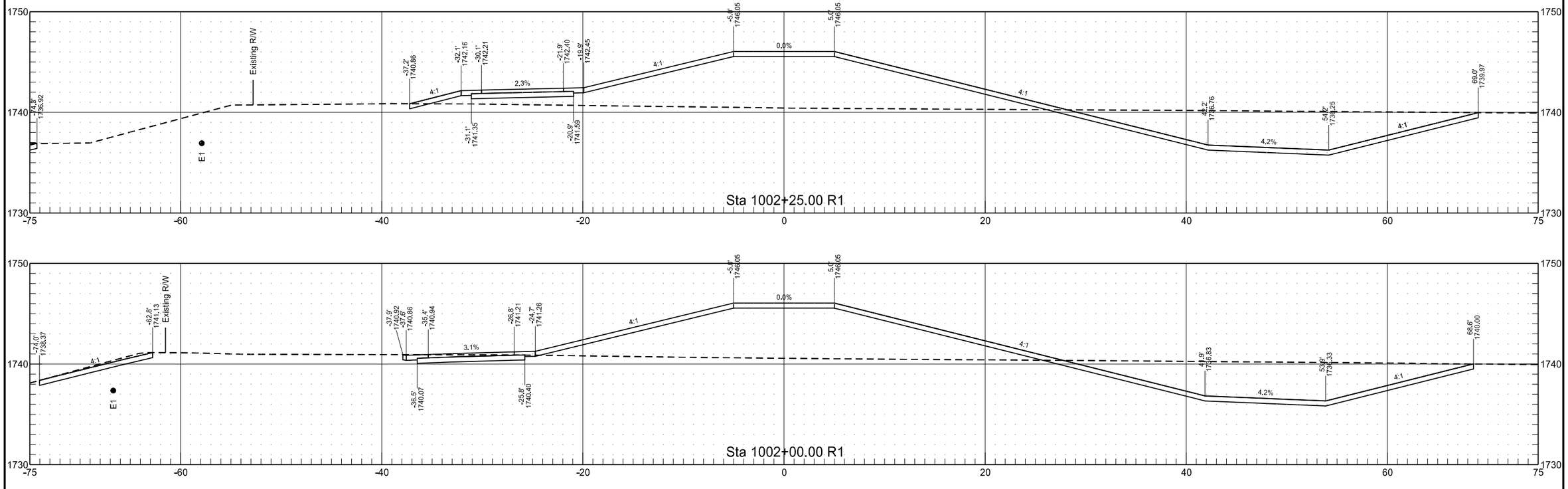
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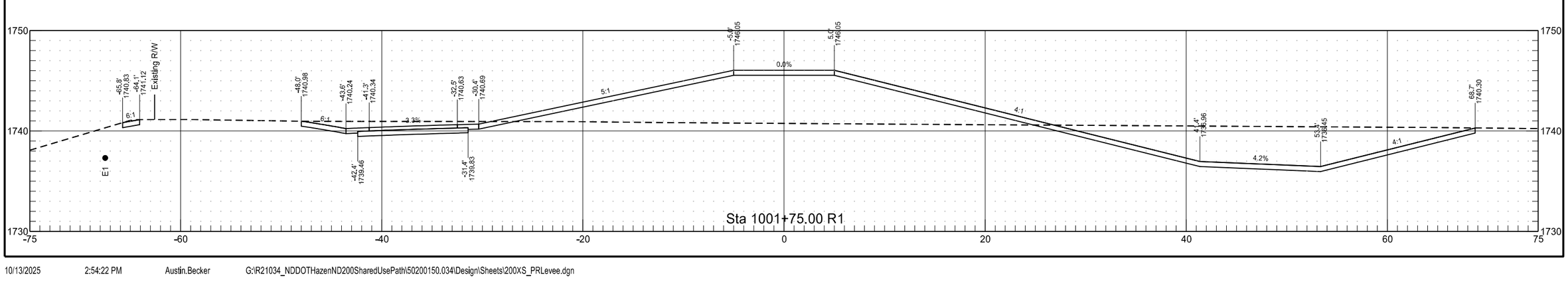
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	200	31



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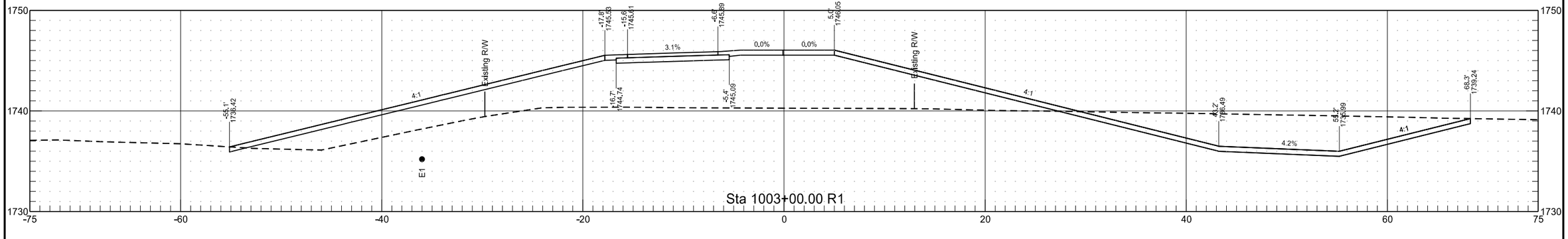
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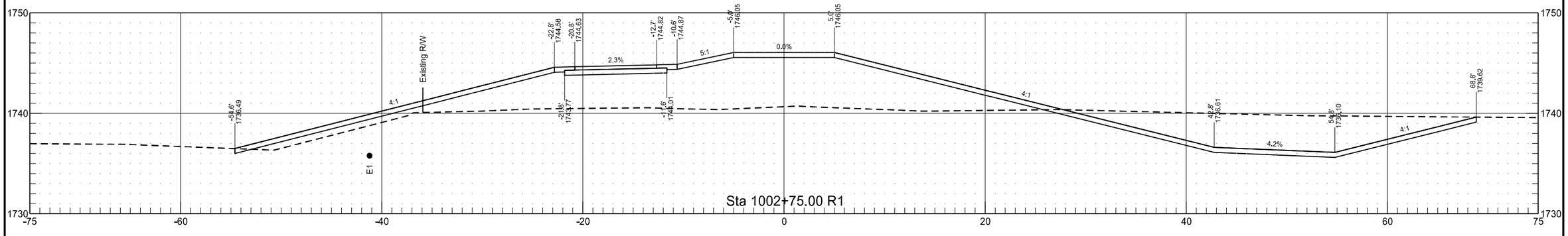


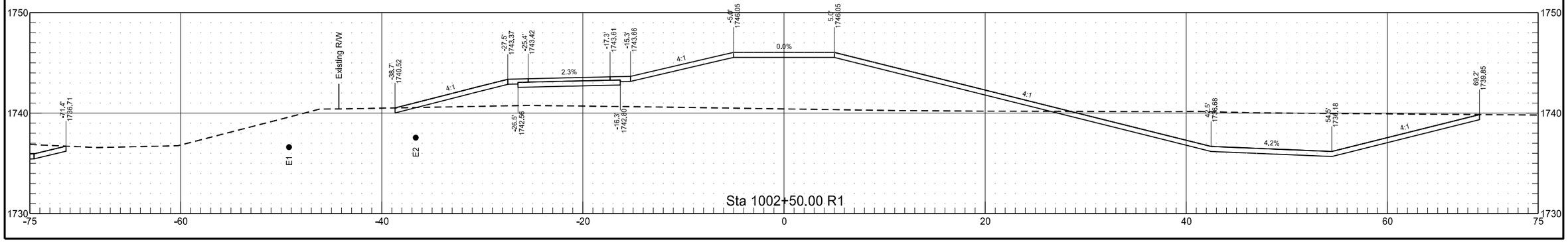


Shared Use Path - PR1LEVEE

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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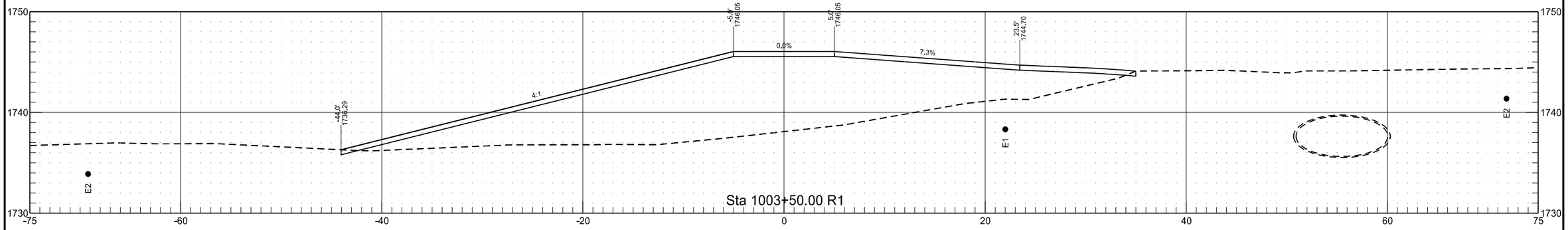


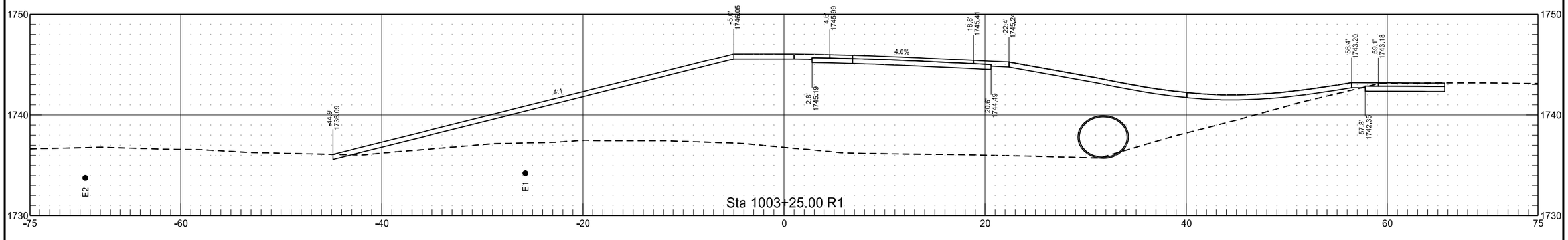


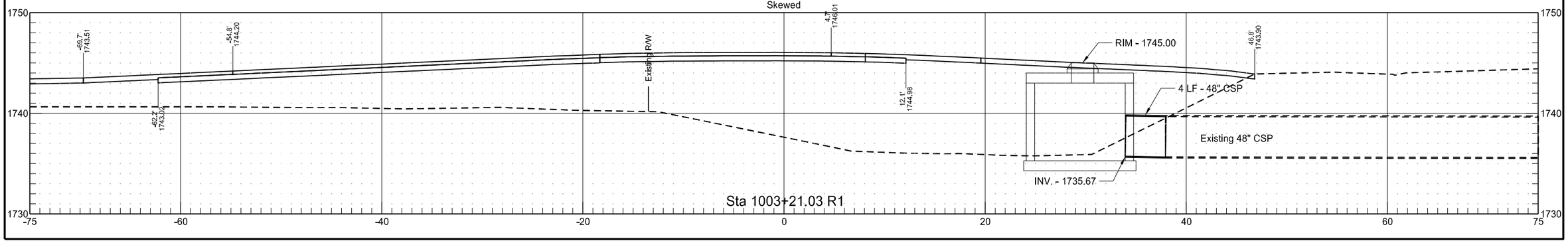


Shared Use Path - PR1LEVEE

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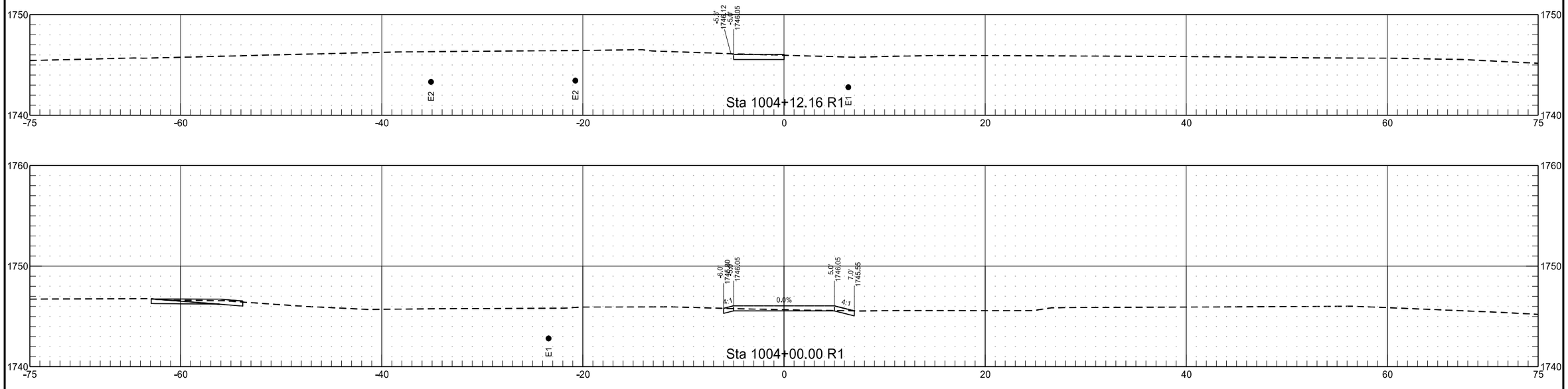






Shared Use Path - PR1LEVEE

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NDS-NH-5-200(034)150	200	35



Docusign Envelope ID: 60E6D5C0-46BC-49CB-8E0F-CBA6AC9DB3C4

NDDOT ABBREVIATIONS

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

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09-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions

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PROFESSIONAL
PE-4683
04/14/25
ENGINEER
NORTH DAKOTA

Docusign Envelope ID: 60E6D5C0-46BC-49CB-8E0F-CBA6AC9DB3C4

NDDOT ABBREVIATIONS

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

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NDDOT ABBREVIATIONS

D-101-3

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

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

NORTH DAKOTA
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NDDOT ABBREVIATIONS

MEASUREMENTS

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

SURVEY DESCRIPTIONS

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

SOIL TYPES

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

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

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LINE STYLES

D-101-20

Existing Topography

- Existing Ground Void
- Existing Cemetary Boundary
- Existing Box Culvert Bridge
- Existing Concrete Surface
- Existing Drainage Structure
- Existing Gravel Surface
- Existing Riprap
- Existing Dirt Surface
- Existing Asphalt Surface
- Existing Tie Point Line
- Existing Railroad Centerline
- Existing Guardrail Cable
- Existing Guardrail Metal
- Existing Edge of Water
- Existing Fence
- Existing Railroad
- Existing Field Line
- Exst Flow
- Existing Curb
- Existing Valley Gutter
- Existing Driveway Gutter
- Existing Curb and Gutter
- Existing Mountable Curb and Gutter
- Existing 3-Cable w Posts
- Site Boundary
- Existing Berm, Dike, Pit, or Earth Dam
- Existing Ditch Block
- Existing Tree Boundary
- Existing Brush or Shrub Boundary
- Existing Retaining Wall
- Existing Planter or Wall
- Existing W-Beam Guardrail with Posts
- Existing Railroad Switch
- Gravel Pit - Borrow Area
- Existing Wet Area-Vegetation Break
- Existing High Tension Cable Guardrail
- Existing High Tension Cable Guardrail with Posts

Proposed Topography

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

Existing Utilities

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

Proposed Utilities

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

Traffic Utilities

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

Sign Structures

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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LINE STYLES

D-101-21

Right Of Way

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

Boundary Control

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

Cross Sections and Typicals

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

Geotechnical

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

Countours

- Depression Contours
- Supplemental Contour

Profile

- Subgrade, Subcut or Ditch Grade
- Topsoil Profile

Striping

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

Pavement Joints

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

Bridge Details

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

Erosion Control

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

Environmental

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

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SYMBOLS

D-101-30

North Arrow (Half Scale)

Alignment Data Point

Alignment Monument

Spot Elevation

Existing Miscellaneous Spot

Existing Access Control Arrow

Existing Benchmark

Reset USGS Marker

Iron Monument Found

Iron Pin R/W Monument

Property Corner

Iron Pin Reference Monument

Right of Way Marker (Exst, Ppsd, Reset)

Existing Federal Reference Corner

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

Existing Witness Corner

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

Existing Traverse PI Aerial Panel

Existing Reference Marker Point NGS

Existing EFB Misc

Existing Bush or Shrub

Existing Large Evergreen Tree

Existing Small Evergreen Tree

Existing Large Tree

Existing Small Tree

Existing Tree Trunk

Cairn or Stone Circle

Existing Artifact

Existing Satellite Dish

Existing Weather Station

Existing Windmill or Tower

Reinforced Pavement

CSB Continuous Split Barrel Sample

FA Flight Auger Sample

SB Split Barrel Sample

T Thinwall Tube Sample

N Standard Penetration Test

Incl Inclinometer Tube

Excavation Unit

Existing Ground Water Well Bore Hole

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

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Kirk J Hoff

12 18 2020

SYMBOLS

D-101-31

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

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

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

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12 18 2020

SYMBOLS

D-101-32

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

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

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

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

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12 18 2020

SYMBOLS

D-101-33

Existing Manhole (Electrical, Gas, Telephone)

Water Manhole (Exst, Exst with Valve)

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

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

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

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

Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)

Existing Water Appurtenance

Sprinkler Head (Exst, Ppsd)

Fire Hydrant (Exst, Ppsd)

Cleanout (Exst Sanitary, Underdrain)

Existing Catch Basin Inlet (Round, Square)

Existing Curb Inlet (Round, Square)

Existing Slotted Reinforced Concrete Pipe

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

Inlet Mountable Curb (Type A, Type B)

Inlet Saddle Base (Type 1, Type 2)

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

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

Median Drain

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

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

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

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

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

Pump
Sanitary, Storm Drain, Exst Water

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

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

Existing Utility Marker

Existing Meter

Existing Fuel Dispensers

Existing Fuel Filler Pipes

Existing Fuel Leak Sensors

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

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12 18 2020

Cross Section Legend

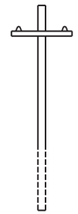
D-101-40

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

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

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

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



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



Anchor

High Tension Cable Guardrail

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



Connection to infer that probably will not be displayed

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



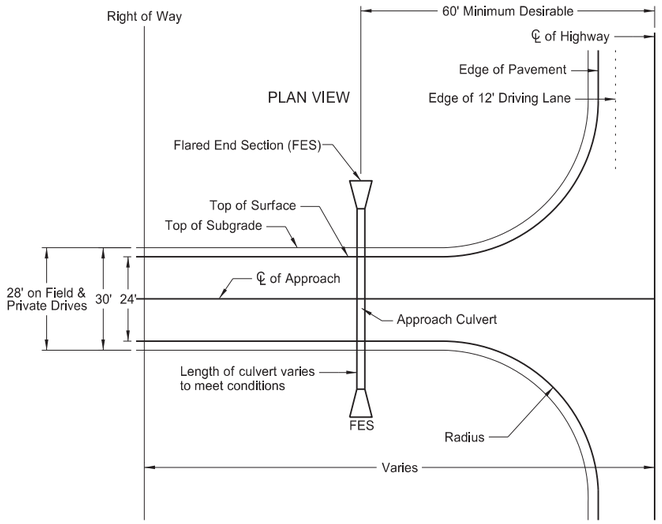
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-20-18	
REVISIONS	
DATE	CHANGE
6/14/2023	CADD Standards Update

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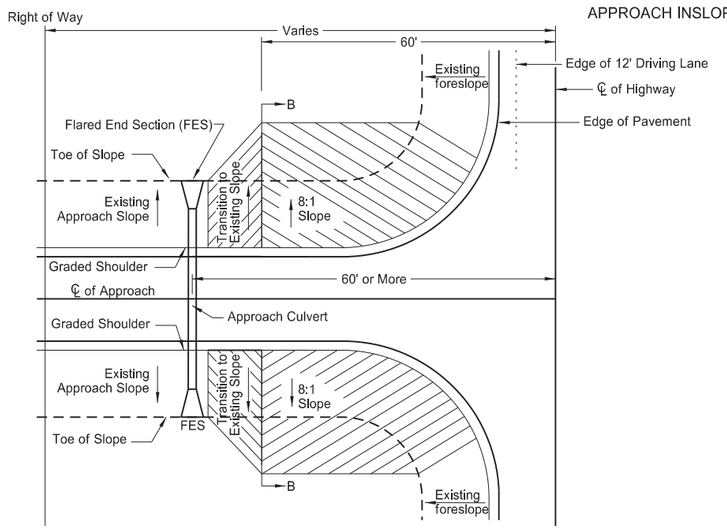
06/14/23

STANDARD RURAL APPROACHES

D-203-8

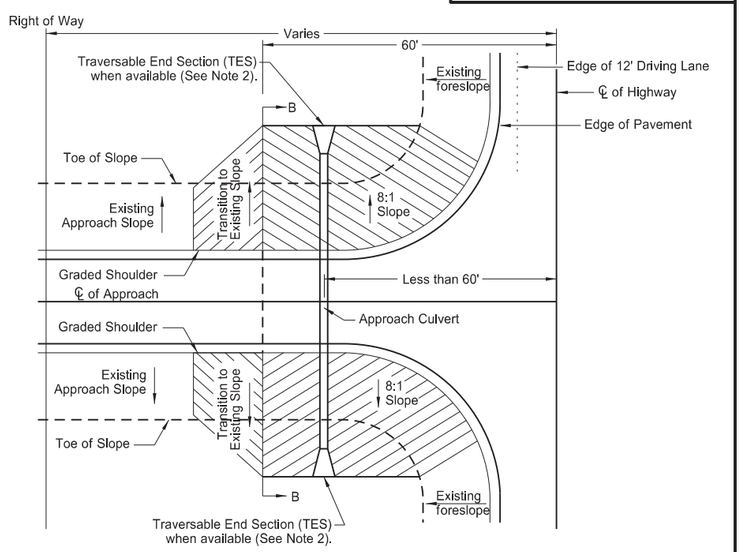


APPROACH INSLOPES



CASE 1

APPROACH PIPE LOCATED
60' OR MORE FROM ℄



CASE 2

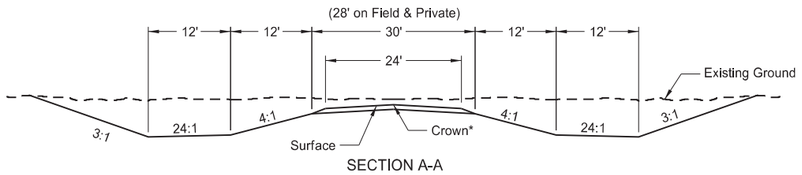
APPROACH PIPE LOCATED
LESS THAN 60' FROM ℄

Approach Pipe Traversable End Sections (TES)

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

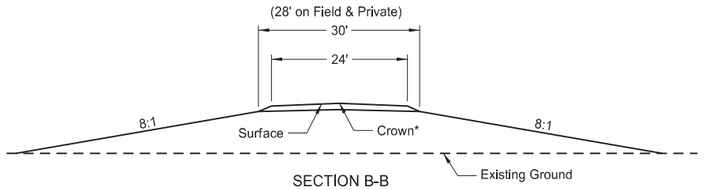
CRITERIA FOR RURAL APPROACH TYPES

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

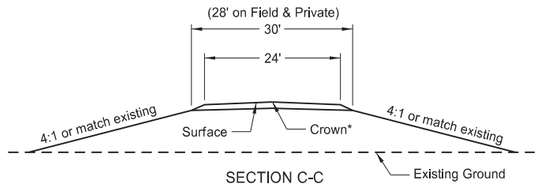


SECTION A-A

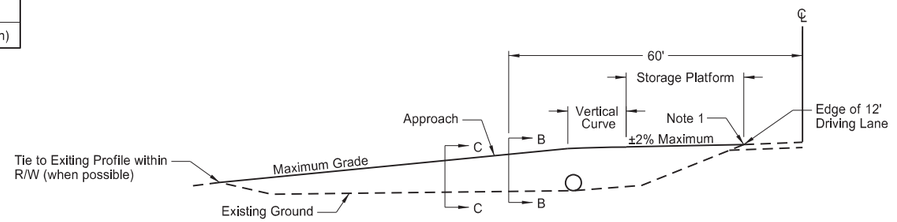
*2.1% crown for paved surface
*3.0% crown for gravel surface



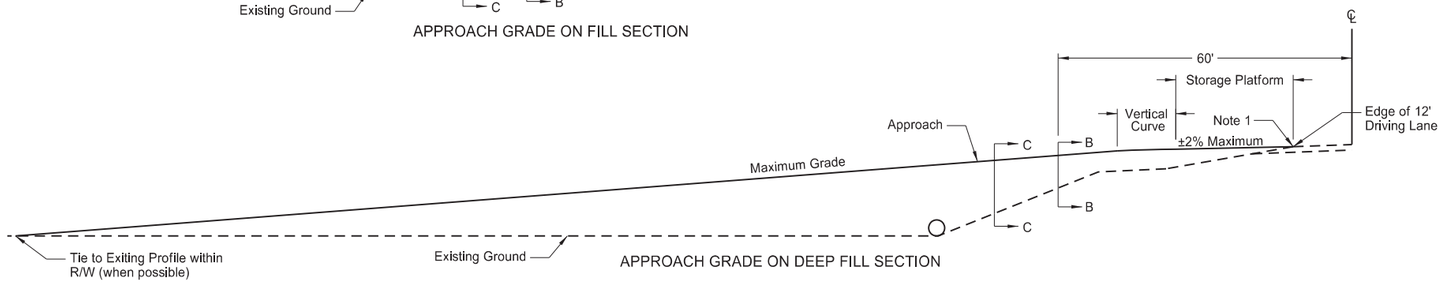
SECTION B-B



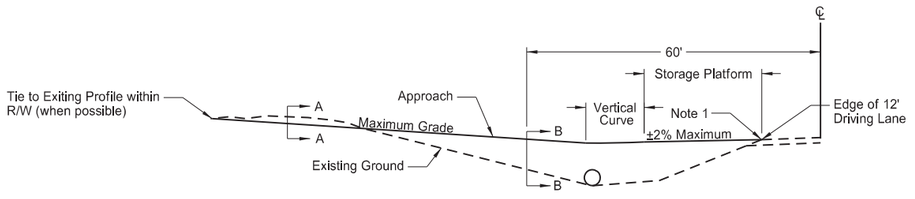
SECTION C-C



APPROACH GRADE ON FILL SECTION



APPROACH GRADE ON DEEP FILL SECTION



APPROACH GRADE ON CUT SECTION

NOTES:

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

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

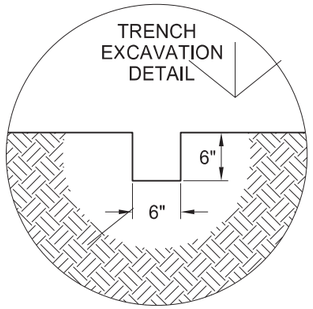
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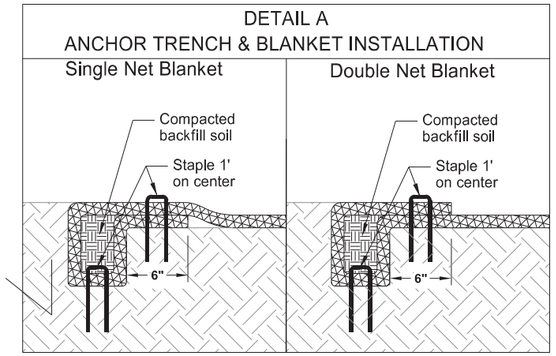
06/29/22

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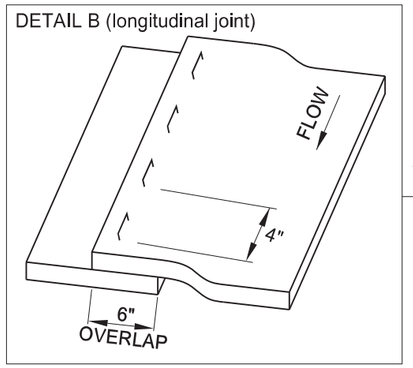
D-255-2

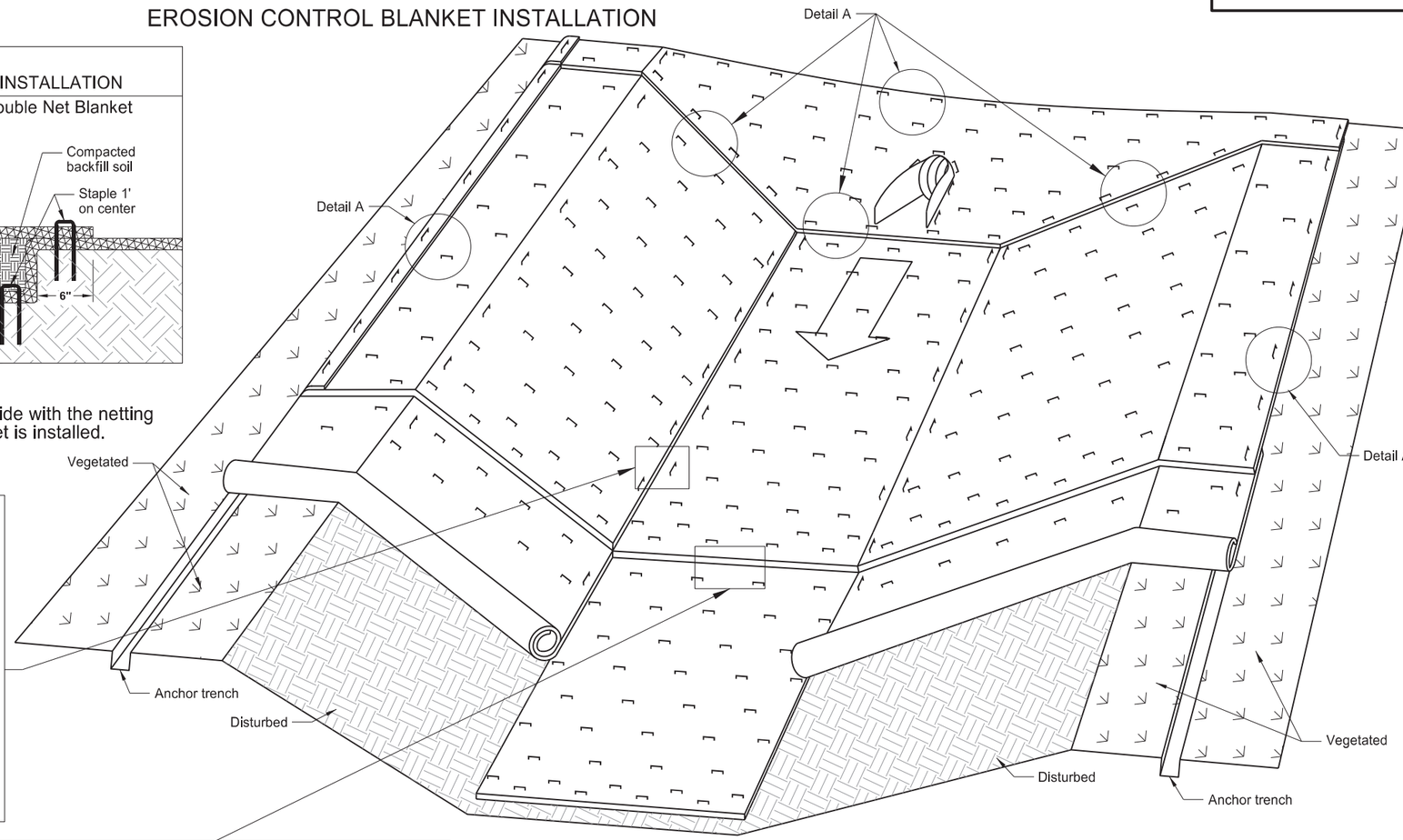
EROSION AND SILTATION CONTROL
EROSION CONTROL BLANKET INSTALLATION



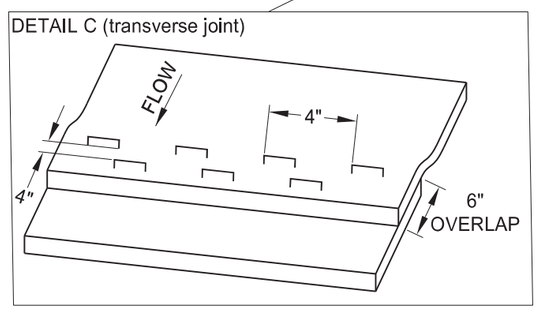


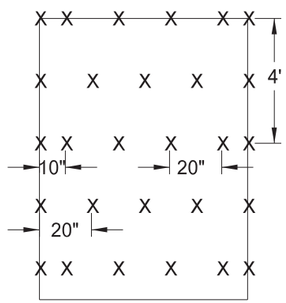
NOTE:
If a Single Net Blanket is used, the side with the netting should be on the top once the blanket is installed.



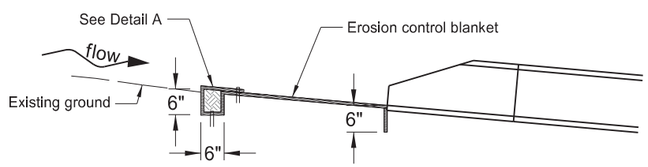


BLANKET LAYOUT
CHANNEL INSTALLATION

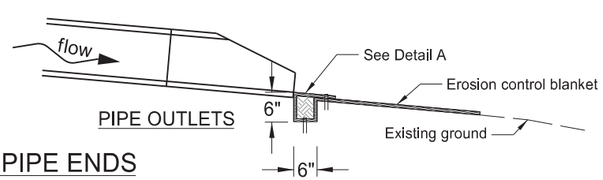




STAPLE PATTERN
(3.8 staples per square yard)



PIPE INLETS



PIPE OUTLETS

INSTALLATION AT PIPE ENDS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
06-26-14	Changed standard drawing number from D-708-6 to D-255-2
07-27-15	Changed Installation details such as trench depth and overlap dimensions
08-27-19	New Design Engineer PE Stamp
08-27-25	Revised minor details for clarity

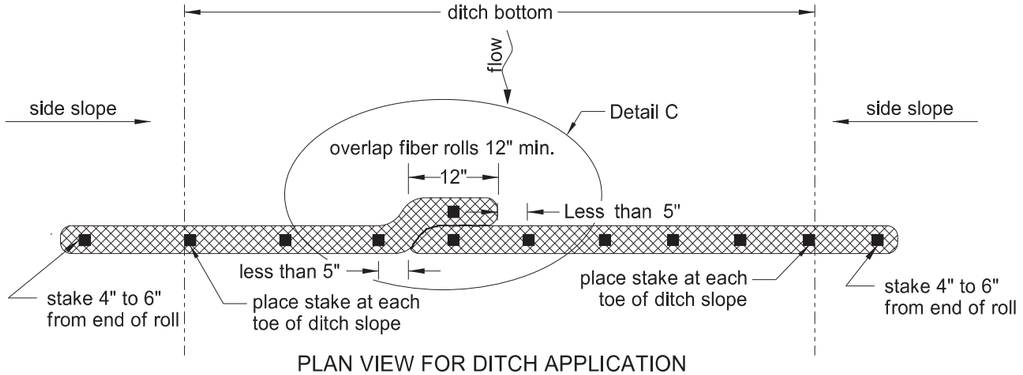
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08/27/25

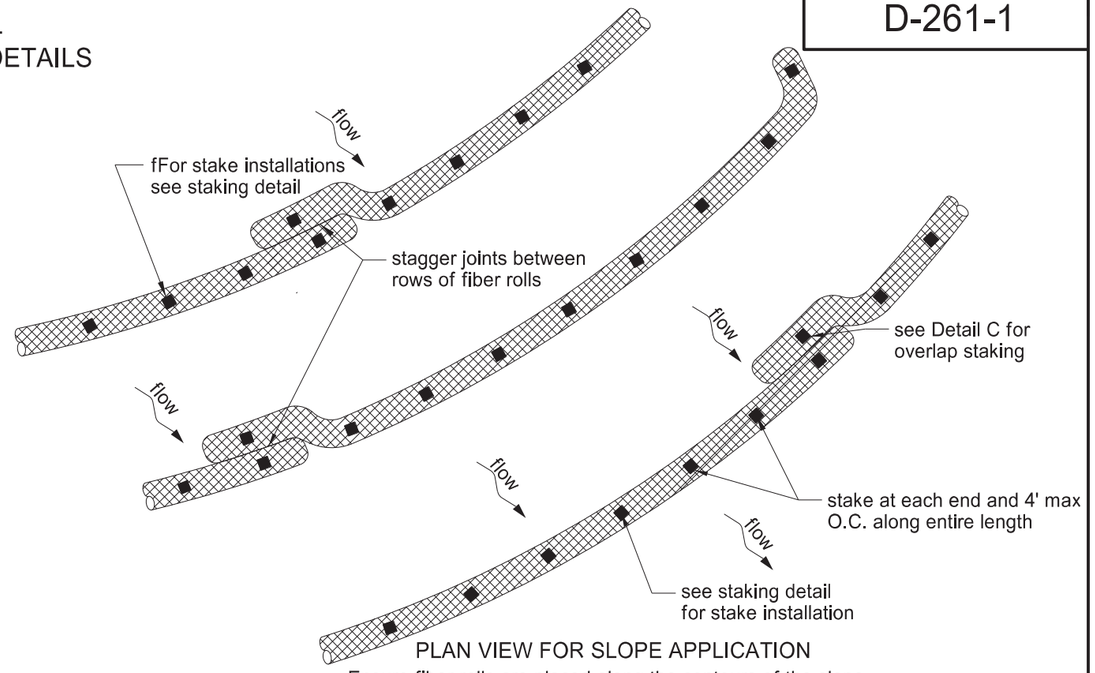
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EROSION CONTROL
FIBER ROLL PLACEMENT DETAILS

D-261-1

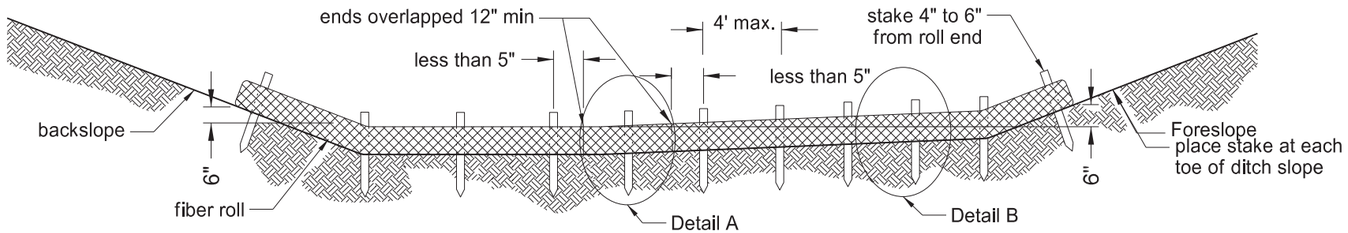


PLAN VIEW FOR DITCH APPLICATION

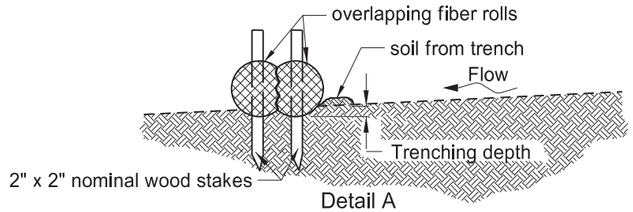


PLAN VIEW FOR SLOPE APPLICATION

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

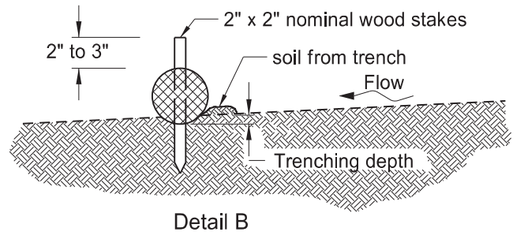


12 OR 20 INCH FIBER ROLL - DITCH BOTTOM



Detail A

FIBER ROLL OVERLAPPING STAKING DETAIL

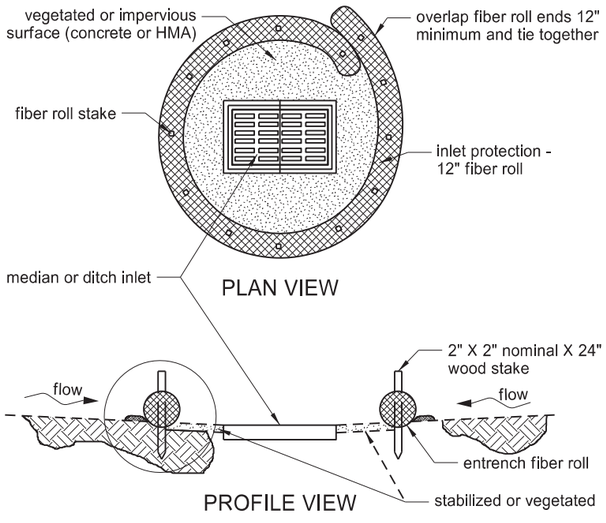


Detail B

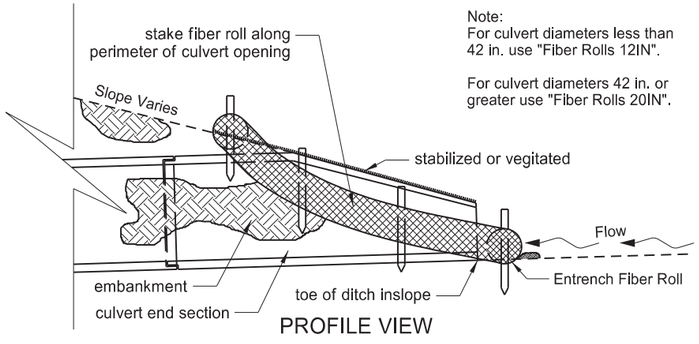
FIBER ROLL STAKING DETAIL

NOTE: Do not allow runoff to run under or around roll.

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

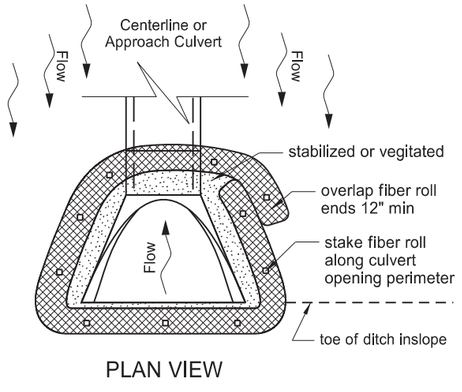


FIBER ROLL PROTECTION (MEDIAN OR DITCH INLET)



Note:
For culvert diameters less than 42 in. use "Fiber Rolls 12IN".

For culvert diameters 42 in. or greater use "Fiber Rolls 20IN".



FIBER ROLL PROTECTION (INLET OF CULVERT)

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

11-18-10

REVISIONS

DATE	CHANGE
06-10-13	Added plan view for ditch and slope application. Added table with values for stake and trench dimensions
10-04-13	Revised fiber roll overlap detail
06-26-14	Changed standard drawing number from D-708-7 to D-261-1
08-27-19	New Design Engineer PE Stamp
04-22-24	Slope Plan View-overlap change
03-13-25	Added D-708-6 Culvert Inlet detail
09-02-25	Added D-708-6 Inlet detail

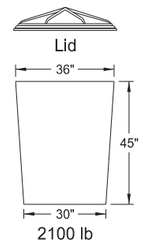
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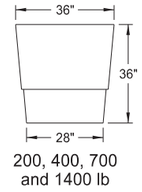
09/02/25

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ATTENUATION DEVICE

D-704-1

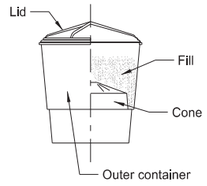




Outer Containers

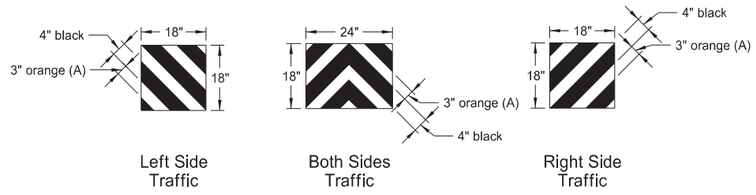


Cones



Typical Assembly

Typical Module
Construction Detail

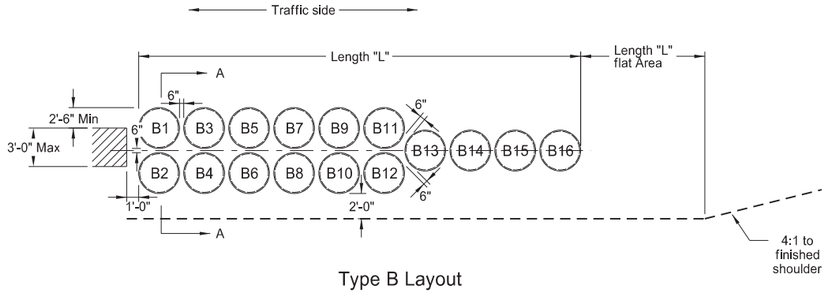


Reflective Sheet Detail

Note:
Apply Type IV reflective sheeting (as specified in the NDDOT Standard Specifications) directly to the outer container of the last attenuation device facing traffic, following the details above. Or apply the sheet to a metallic sheet and attach it to the container with approved fasteners.

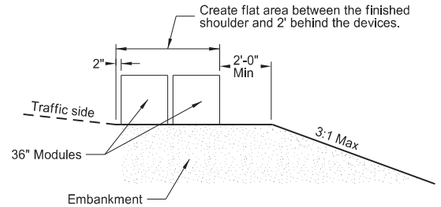
(A) Use 3" orange sheeting for temporary installations, and 3" yellow sheeting for permanent installations.

Fill Chart					
	Module Weights (LBS)				
	200	400	700	1400	2100
Distance from top edge	8½"	5"	4"	3"	0"



Type B Layout

Note:
Angle attenuation devices 10 degrees towards traffic when placed at piers offset from roadway.



Section A-A
(Type B Layout)

Type B Attenuation Device												
Module Number	Dash Number											
	80	75	70	65	60	55	50	45	40	35	30	25
	Module Weights (LBS)											
B1	2100	2100										
B2	2100	2100										
B3	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100		
B4	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100		
B5	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B6	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B7	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B8	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400
B9	700	700	700	700	700	700	700	700	700	700	700	700
B10	700	700	700	700	700	700	700	700	700	700	700	700
B11	700	700	700	700	700	700	700	700	700	700	700	700
B12	700	700	700	700	700	700	700	700	700	700	700	700
B13	700	700	700	700	700	700	700	700	700	700	700	700
B14	400	400	400	400	400	400	400	400	400	400	400	400
B15	400	400	400	400	400	400	400	400	400	400	400	400
B16	200	200	200	200	200	200	200	200	200	200	200	200
Length (L)	34.2'	34.2'	30.7'	30.7'	30.7'	30.7'	30.7'	30.7'	30.7'	30.7'	27.2'	27.2'
Module Weights (LBS)	Replacement Module											
2100	1	1	1	1	1	1	1	1	1	1		
1400	1	1	1	1	1	1	1	1	1	1	1	1
700	2	2	2	2	2	2	2	2	2	2	2	2
400	1	1	1	1	1	1	1	1	1	1	1	1
200	2	2	2	2	1	1	1	1	1	1	1	1

Notes:

1. Materials
   A) Use modules manufactured from frangible polyethylene material which shatters upon impact.
   B) Fill modules with class 43 aggregate meeting NDDOT Standard Specifications aggregate requirements. Use fill with a unit weight of at least 100 pounds per cubic foot. Use fill with a moisture content of 2% or less when left over winter.

2. Modules
   Provide modules in two sizes containing volumes of either 2, 4, 7, 14, or 21 cubic feet minimum.
   A) Provide three components for 2, 4, or 7 cubic foot module containers:
      1) A 14 C.F., yellow outer container.
      2) A black lid securely locking over the top lip of the container.
      3) A variable cone-shaped supporting insert capable of supporting 200, 400, or 700 pounds of sand mass to allow for three sizes of modules. Place cone inserts inside the 14 cubic foot container.
   B) Provide two components for the 14 cubic foot module container:
      1) A 14 C.F., yellow outer container.
      2) A black lid securely locking over the top lip of the container.
   C) Provide two components for the 21 cubic foot module container:
      1) A 36" height X 36" width yellow outer container.
      2) A black lid which locks securely over the top of the container.

3. For temporary installations use Energite or Fitch attenuation barrels manufactured by Energy Absorption Systems of Chicago, IL, TrafFix barrels manufactured by TrafFix Devices, Inc. of San Clemente, CA, or approved equal modules. As an option, place attenuation devices on 3½" maximum thickness pallets to facilitate maintenance.

4. For permanent installations use Barrel Attenuation Device consisting of one-piece outer sand container modules with separate detachable lid. Energite attenuation barrels manufactured by Energy Absorption Systems of Chicago, IL, TrafFix barrels manufactured by TrafFix Devices, Inc. of San Clemente, CA, or approved equal meet these requirements.

5. The Typical Module Construction Detail and Type B Layout are based on the Energite Crash Cushion manufactured by Energy Absorption. Provide any required layouts and details from other sand filled attenuation module manufacturers which differ from those shown here.

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-25-12

REVISIONS

DATE	CHANGE
07-18-14	Revised sheeting in reflective sheet detail
09-27-17	Update to active voice
10-03-19	New Design Engr PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

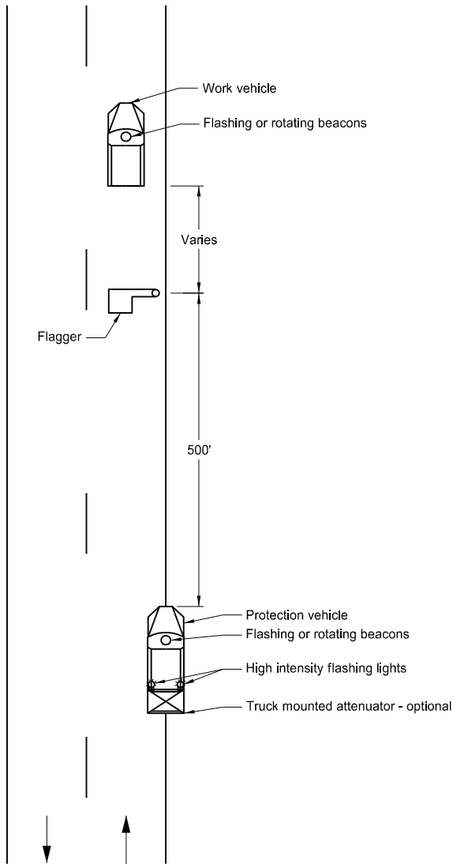
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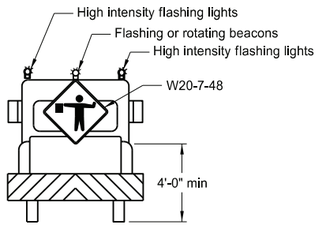
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TRAFFIC CONTROL FOR CORING OF HOT BITUMINOUS PAVEMENT

D-704-2

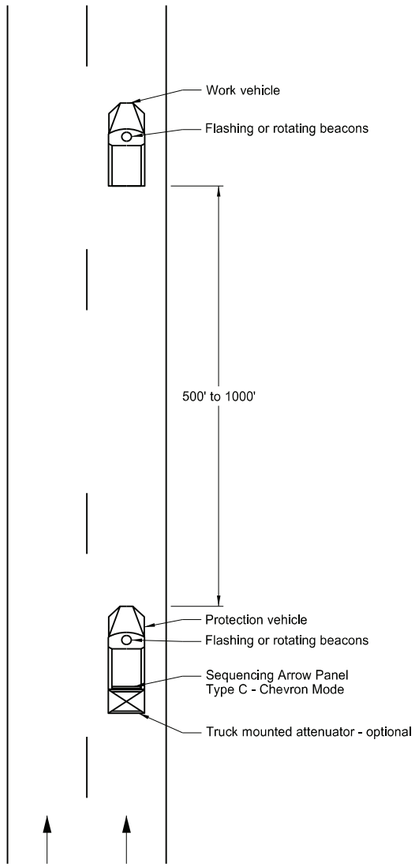
Two Lane, Two Way Roadways

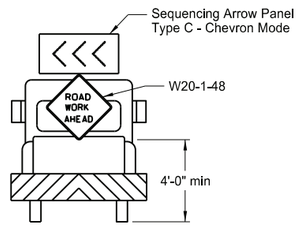




Typical Protection Vehicle

Multilane Roadways





Typical Protection Vehicle

Notes:

1. Display a 360 degree rotating, flashing, oscillating or strobe light on the working vehicle.

2. Display a 360 degree rotating, flashing, oscillating or strobe light on the shadow vehicle. Operate a sequencing arrow panel Type C in chevron mode on the shadow vehicle for Multilane Roadway.

3. Use these layouts during daylight hours and in areas of good visibility only.

4. Use flagger to protect the work area and warn oncoming traffic for two lane, two way roadway.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-25-12	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

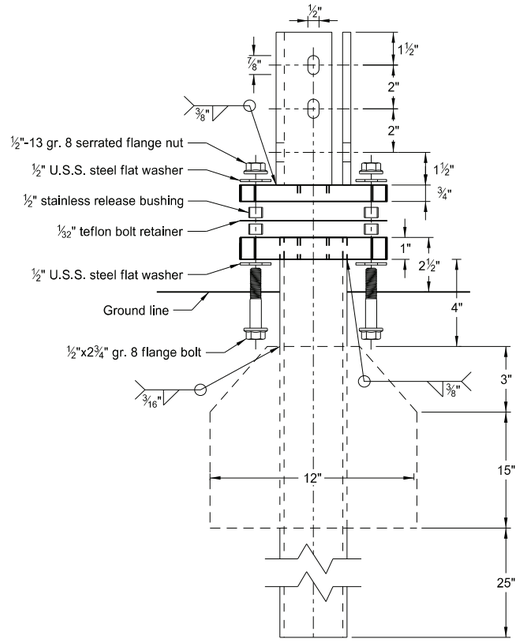
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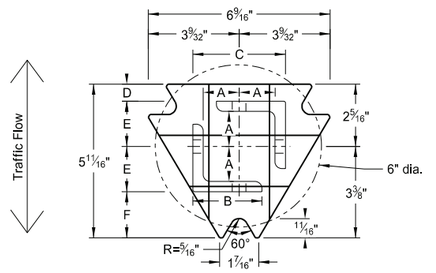
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

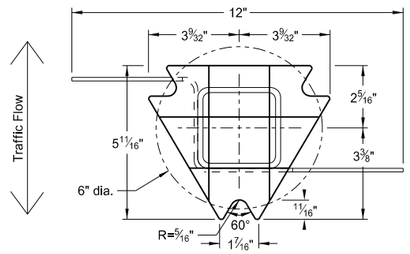


Multi-Directional
Slip Base Assembly

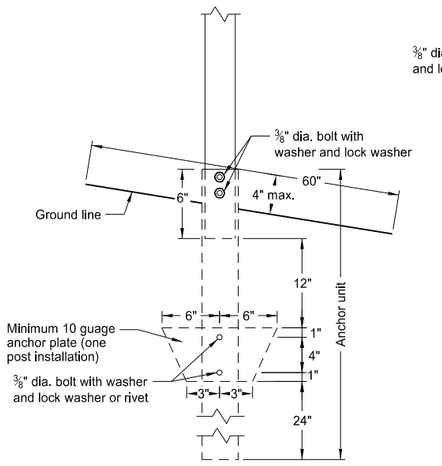
Perforated Tube



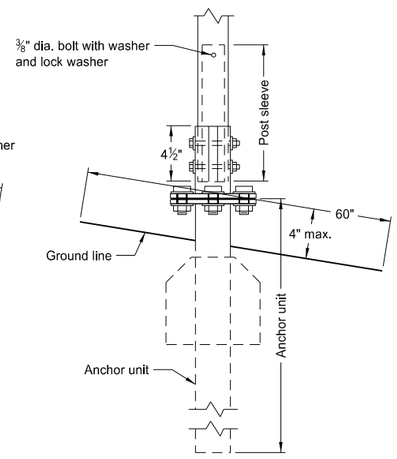
Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2½"x2½"x⅜" ASTM A36 structural angle



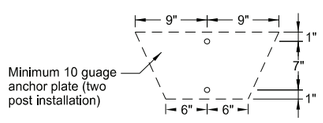
Bottom Soil Stub
Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50

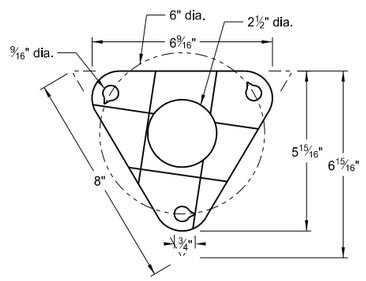


Anchor Unit and Post Assembly



Multi-Directional
Slip Base Anchor Unit
and Post Sleeve Assembly





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

Notes:

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

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

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

Top Post Receiver Data Table						
Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 9/64"	2½"	3 1/32"	25/32"	1 33/64"	1 7/8"
2½"x10 ga.	1 9/32"	2½"	3 5/16"	⅝"	1 21/32"	1¾"

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

(B) For additional wind load, insert the 2 3/16"x10 ga. into 2½"x10 ga.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

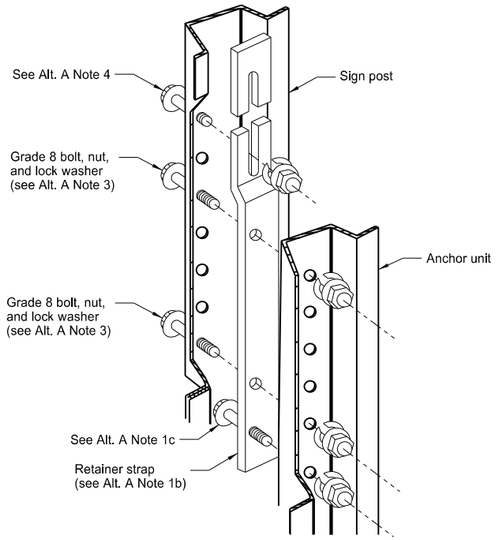
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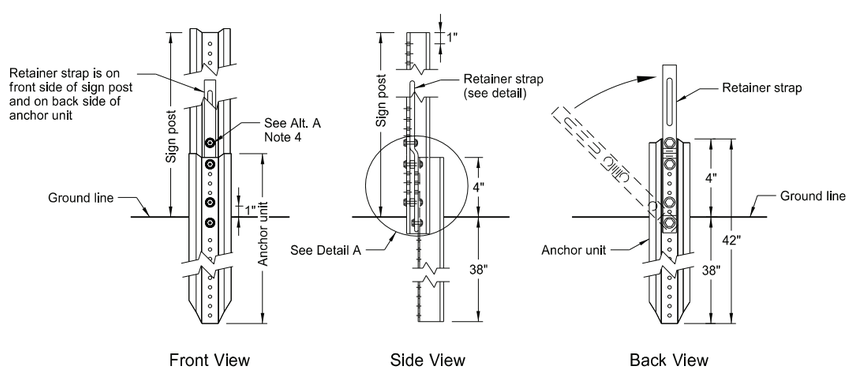
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post



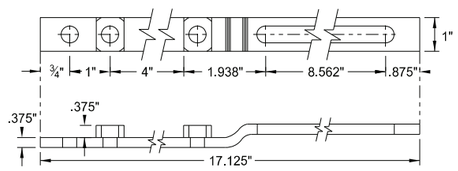
Detail A



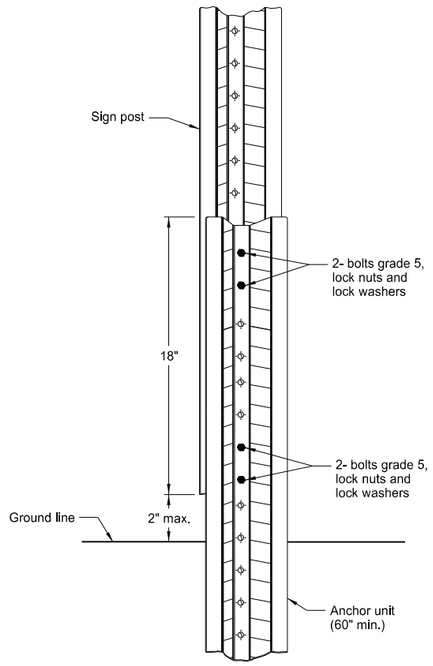
Front View | Side View | Back View

Breakaway U-Channel Detail Alternate A

Install a maximum of 2 posts within 7'.

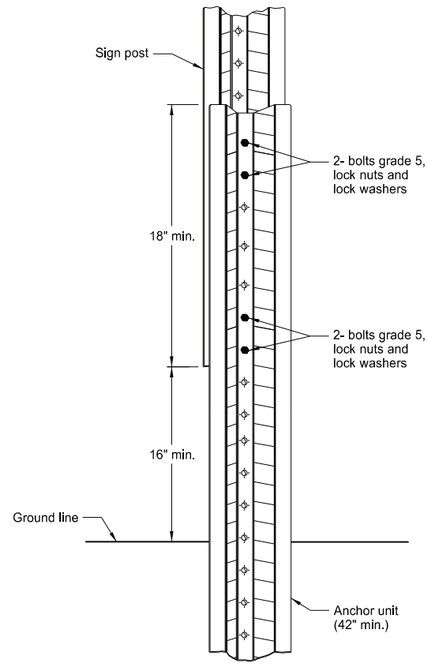


Retainer Strap Detail



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

Install a maximum of 3 posts within 7'.



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

Install a maximum of 3 posts within 7'.

Alternate A Steps of Installation:

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature

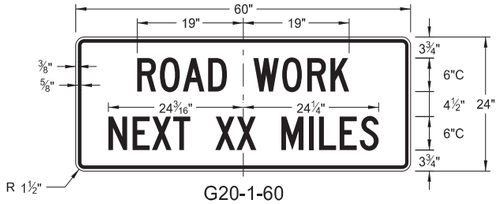
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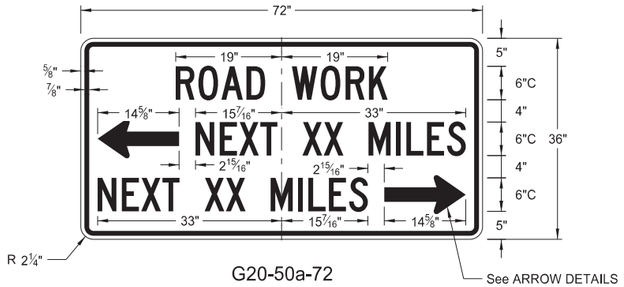
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CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS

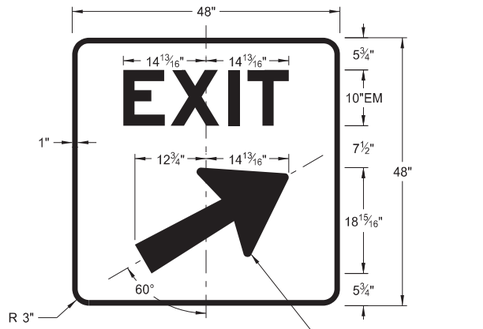
D-704-9



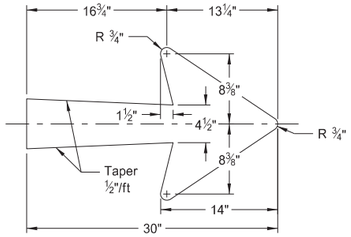
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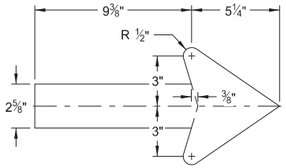
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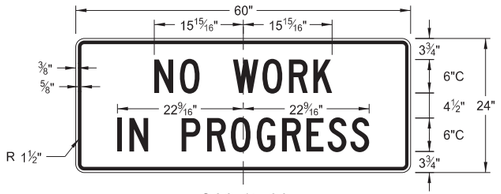
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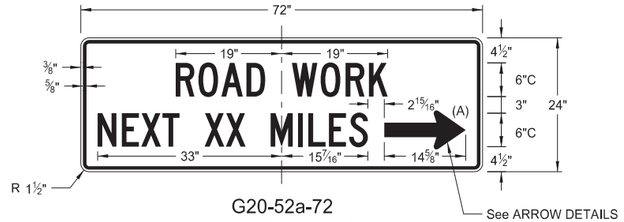
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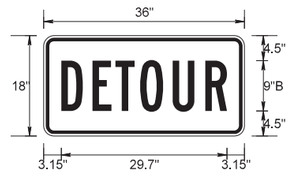
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G20-52a-72



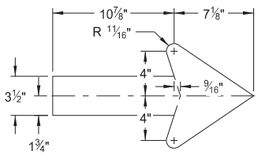
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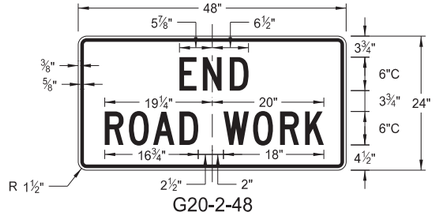
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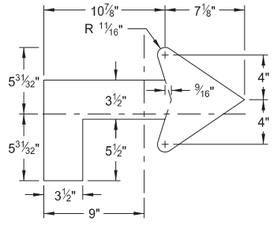
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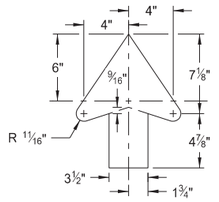
M4-9(L or R)-30
Right or Left



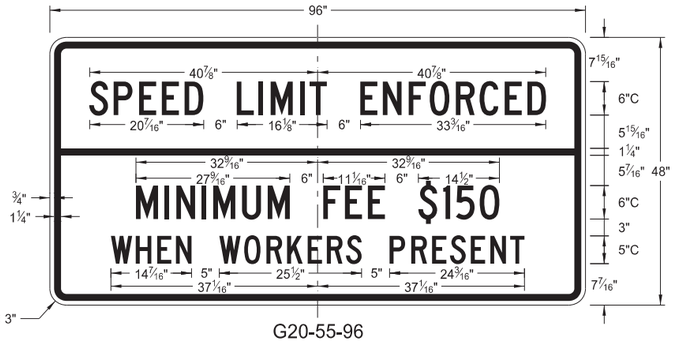
G20-2-48
Legend: black (non-refl)
Background: orange



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



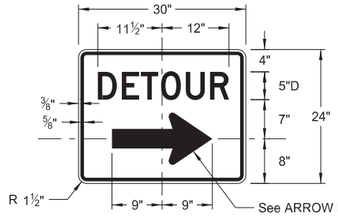
M4-9-30
Straight



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



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



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

ARROW DETAILS

NOTES:

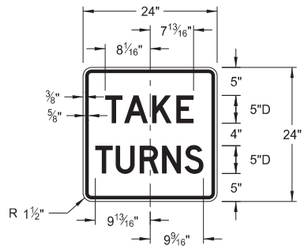
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Added sign & background color
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

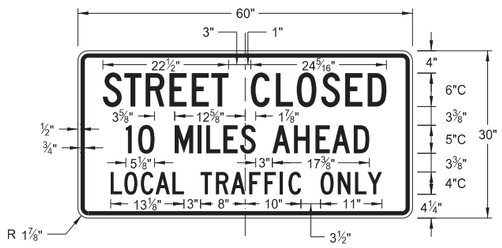
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PROFESSIONAL
PE-4683
06/30/25
ENGINEER
NORTH DAKOTA

Docusign Envelope ID: 2F5C9714-A0E1-42BB-B36B-42204844BFCB

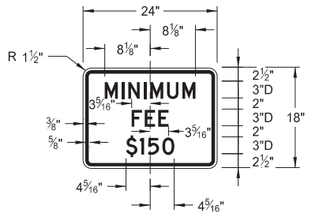
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



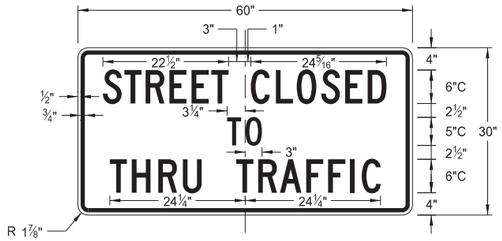
R1-50P-24
Legend: black (non-refl)
Background: white



R11-3c-60
Legend: black (non-refl)
Background: white



R2-1aP-24
Legend: black (non-refl)
Background: white



R11-4a-60
Legend: black (non-refl)
Background: white



R11-2a-48
Legend: black (non-refl)
Background: white

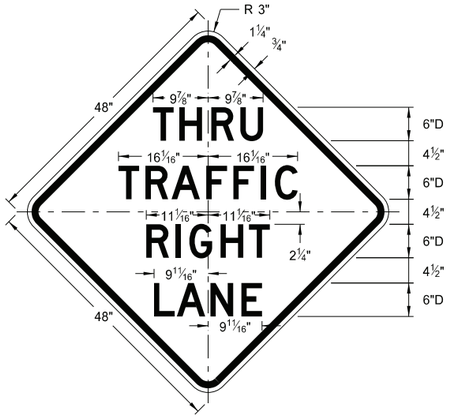
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

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06/30/25
ENGINEER
NORTH DAKOTA

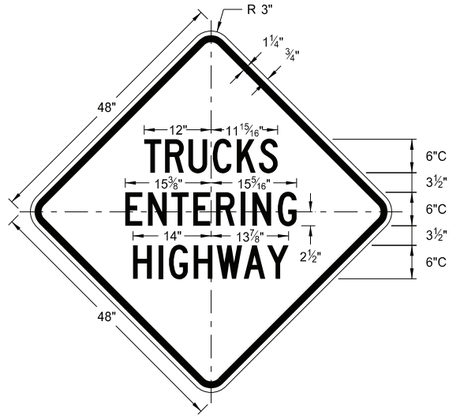
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CONSTRUCTION SIGN DETAILS
WARNING SIGNS

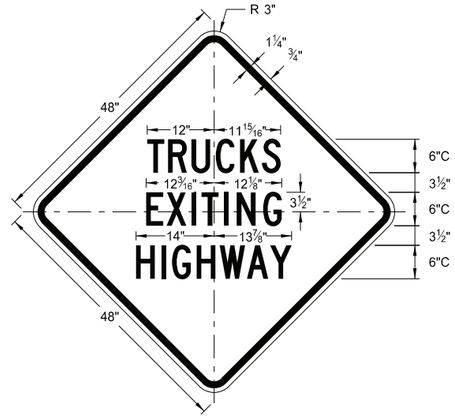
D-704-11



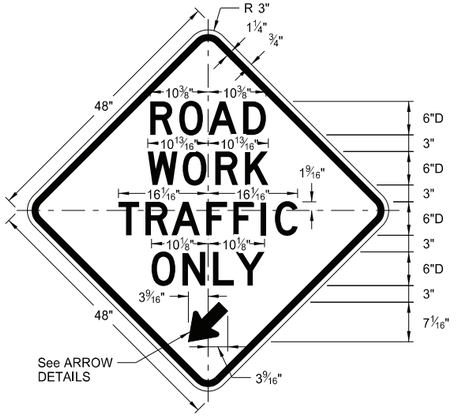
W5-8-48
Legend: black (non-refl)
Background: orange



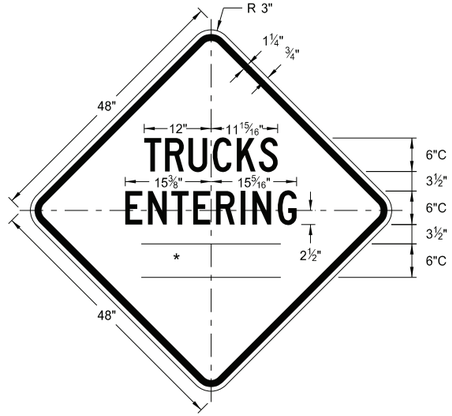
W8-53-48
Legend: black (non-refl)
Background: orange



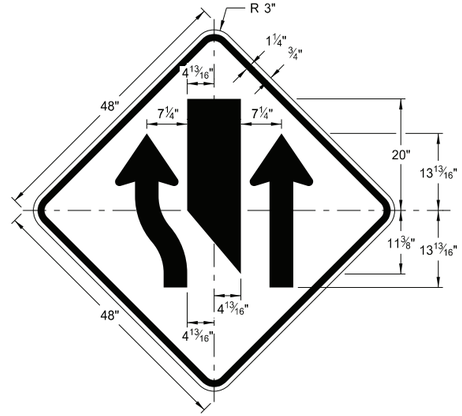
W8-56-48
Legend: black (non-refl)
Background: orange



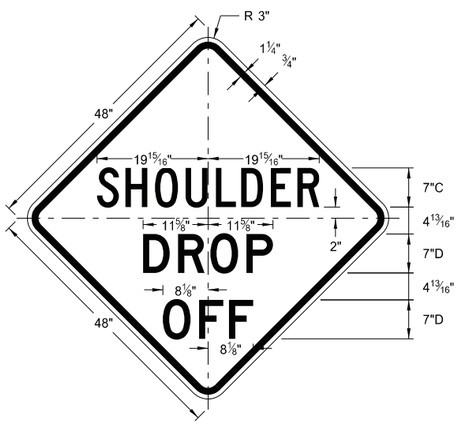
W5-9-48
Legend; black (non-refl)
Background: orange



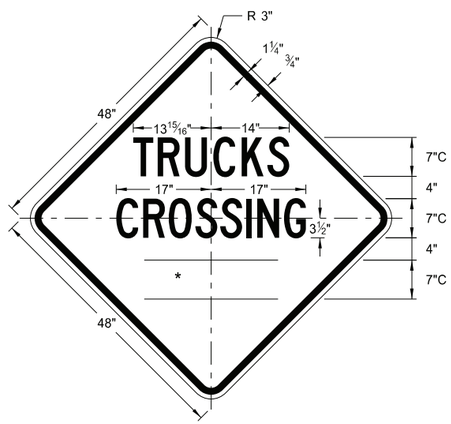
W8-54-48
Legend; black (non-refl)
Background: orange



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



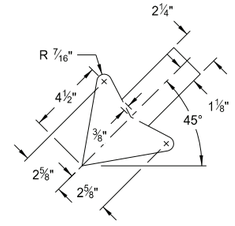
W8-9a-48
Legend: black (non-refl)
Background: orange



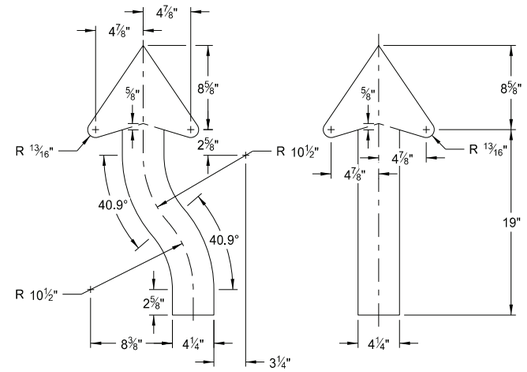
W8-55-48
Legend: black (non-refl)
Background: orange

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

* DISTANCE MESSAGES



W5-9-48



W9-3a-48

ARROW DETAILS

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp
8-01-24	Electronic Stamp/Signature

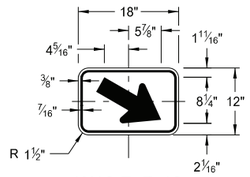
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PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/01/24

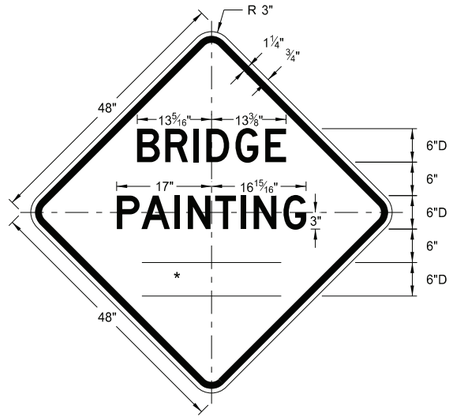
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CONSTRUCTION SIGN DETAILS
WARNING SIGNS

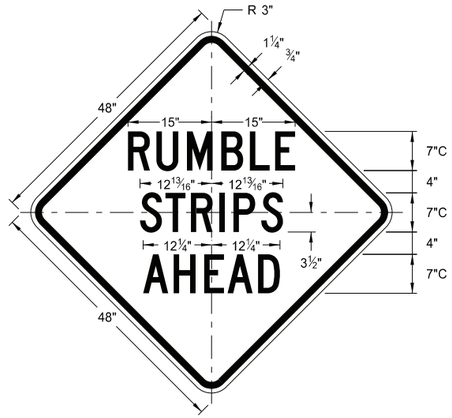
D-704-11A



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



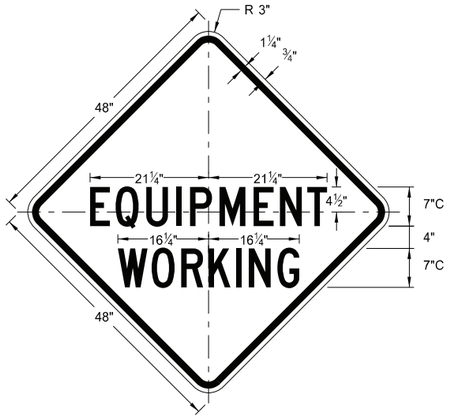
W21-50-48
Legend: black (non-refl)
Background: orange



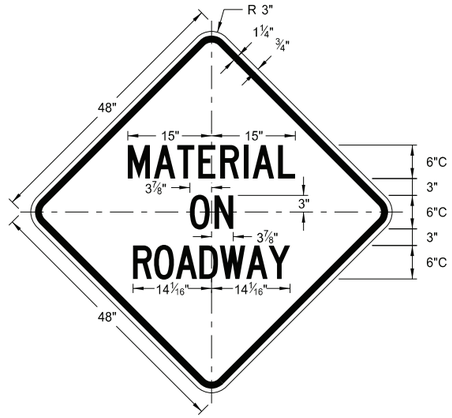
W21-53-48
Legend: black (non-refl)
Background: orange

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

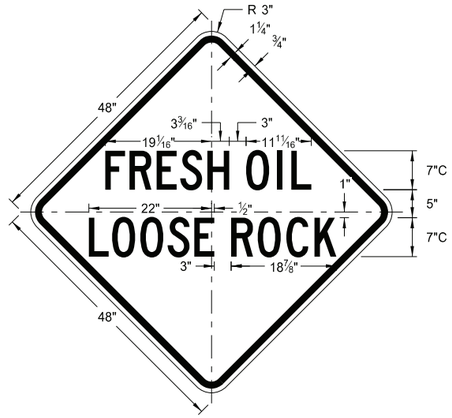
* DISTANCE MESSAGES



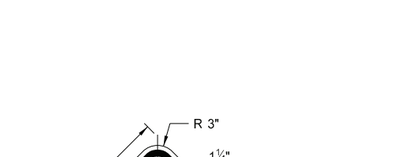
W20-51-48
Legend: black (non-refl)
Background: orange



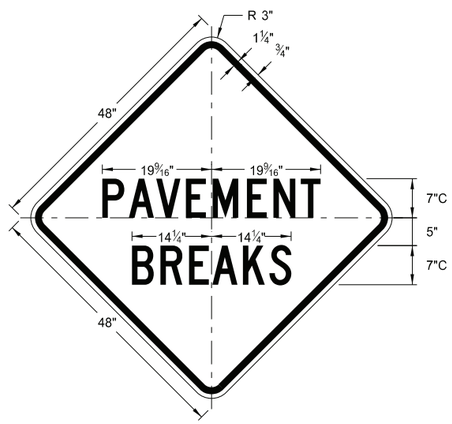
W21-51-48
Legend: black (non-refl)
Background: orange



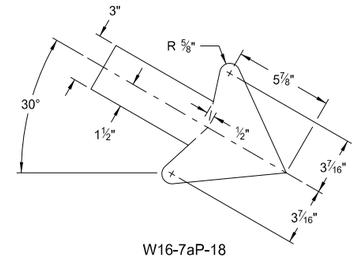
W22-8-48
Legend: black (non-refl)
Background: orange



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



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



W16-7aP-18

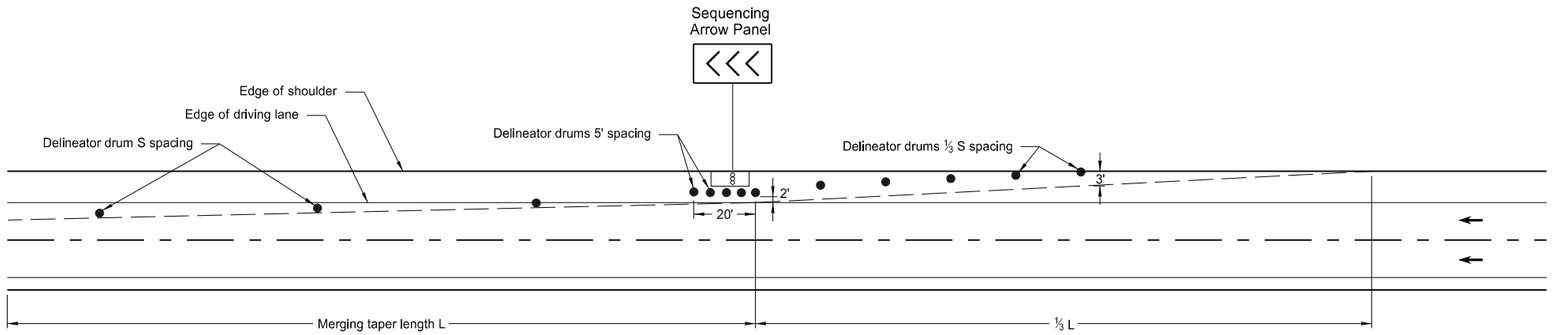
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.
8-01-24	Electronic Stamp/Signature.

KIRK J. HOFF
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PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

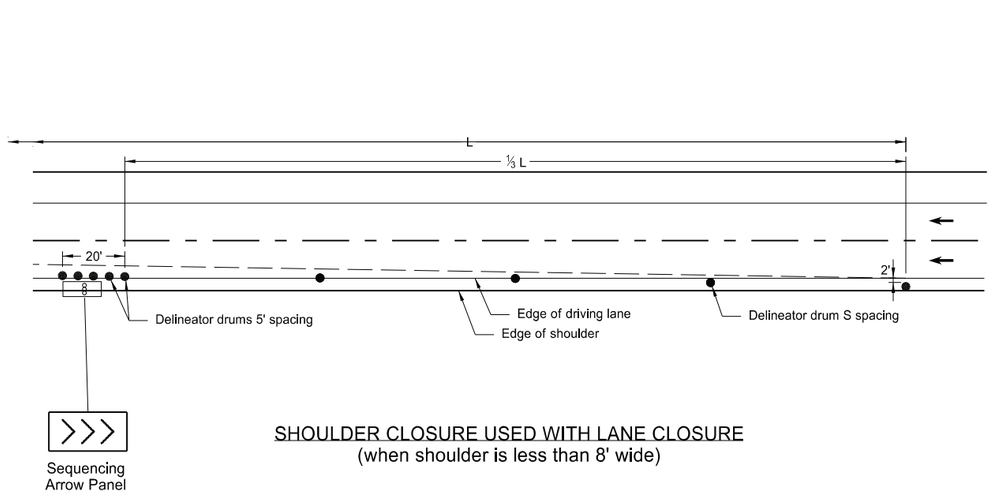
08/01/24

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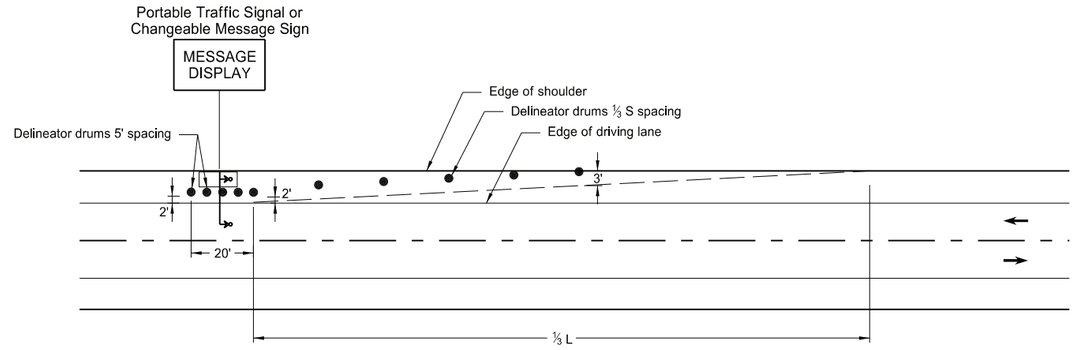
SHOULDER CLOSURE TAPERS



SHOULDER CLOSURE WITH LANE CLOSURE
(when shoulder is 8' or wider)



SHOULDER CLOSURE USED WITH LANE CLOSURE
(when shoulder is less than 8' wide)



PORTABLE TRAFFIC SIGNAL OR CHANGEABLE MESSAGE SIGN ON SHOULDER

KEY

● Delineator Drum	∞ Sequencing Arrow Panel
° Message Display	Portable Traffic Signal

Notes:

1. S = Posted Speed Limit in mph
   W = Width of offset in feet
   L = Taper length in feet
   $L = WS^2/60$ (40mph or less)
   L = WS (45mph or more)

2. If a shoulder taper is used, use a length of approximately ⅓L. If a shoulder is used as a travel lane, use a normal merging or shifting taper.

3. When paved shoulders of 8 foot width or more are closed, use channelizing devices to close shoulder in advance, to delineate beginning of work space, and to direct vehicular traffic to remain within the traveled way.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active volce
10-25-19	Added L dimension to detail
8-01-24	Electronic Stamp/Signature

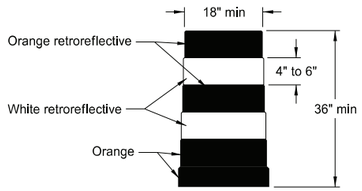
KIRK J. HOFF
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PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/01/24

DocuSign Envelope ID: B6D1C72A-6E5E-4E5C-A02F-4D3D1C582775

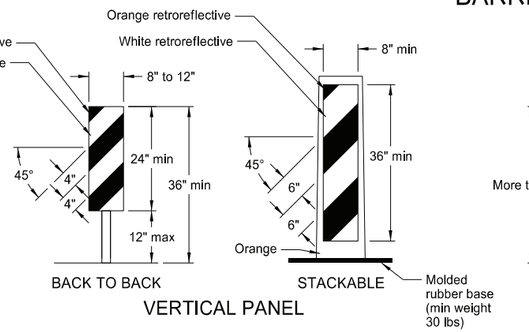
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



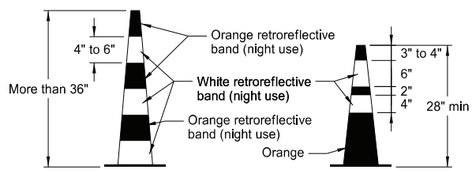
DELINEATOR DRUM

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



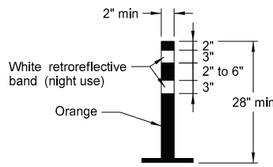
VERTICAL PANEL

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



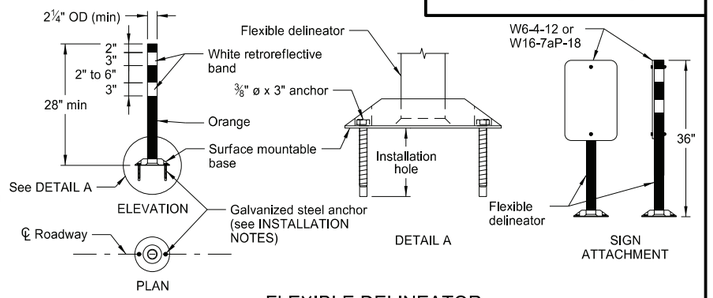
TRAFFIC CONE

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



TUBULAR MARKER

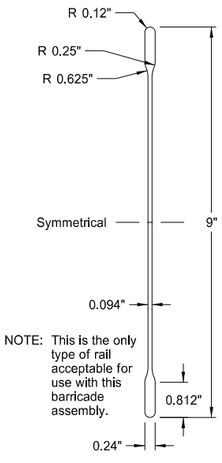
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



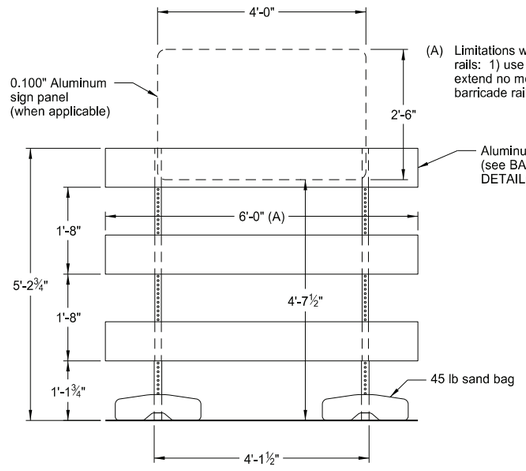
FLEXIBLE DELINEATOR

INSTALLATION NOTES:

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

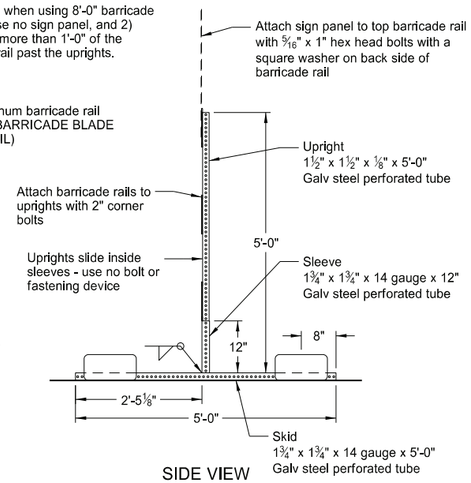


BARRICADE BLADE DETAIL



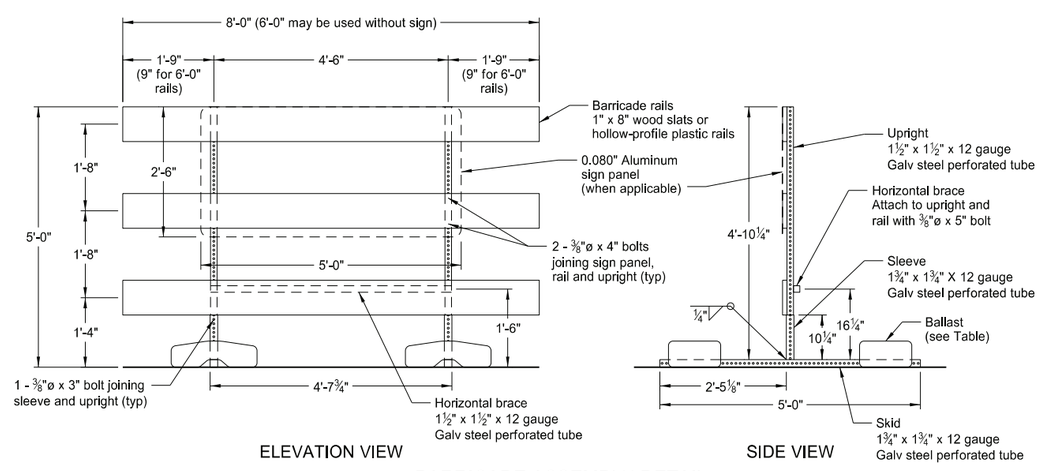
ELEVATION VIEW

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



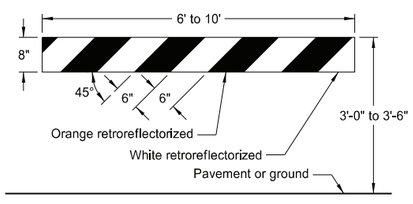
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

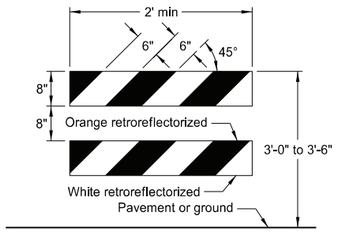


BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

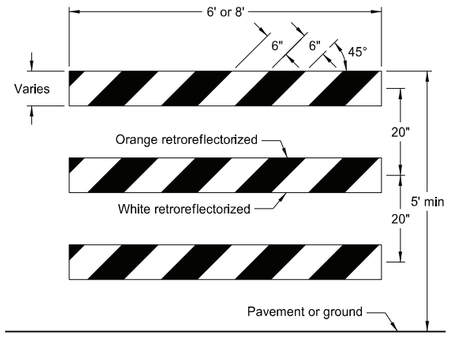
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the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



TYPE I BARRICADE

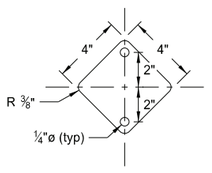


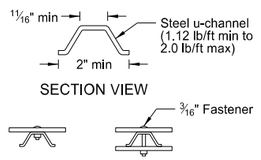
TYPE II BARRICADE

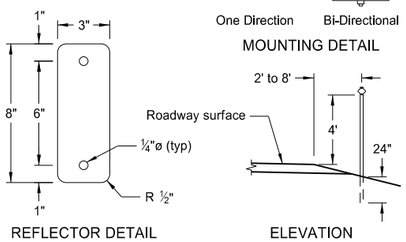


TYPE III BARRICADE

BARRICADE RAIL DETAILS







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	Updated to active voice
11-01-19	Revised details for Flexible Delineator
8-01-24	Electronic Stamp/Signature

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

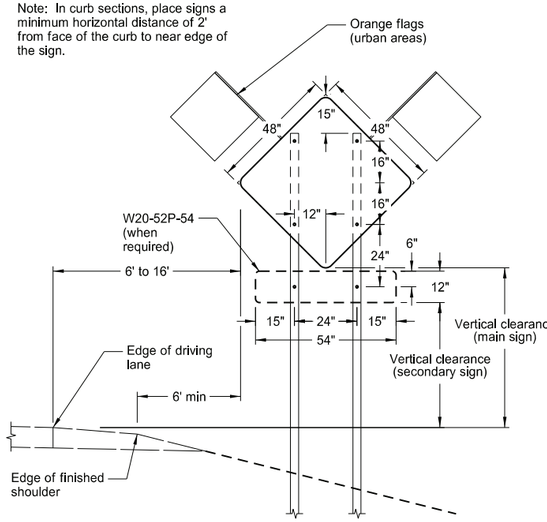
08/01/24

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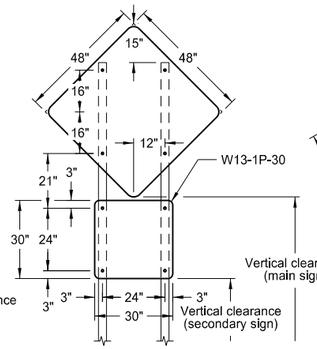
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

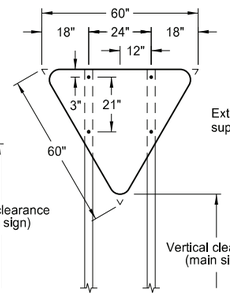
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



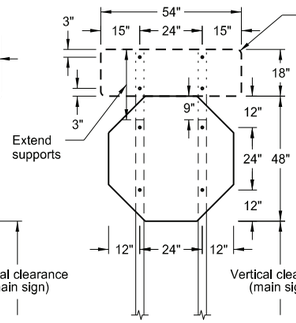
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



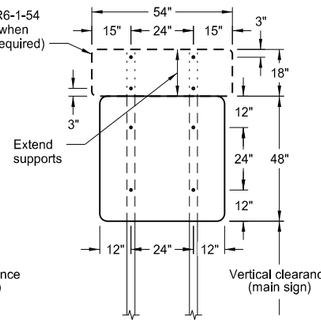
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



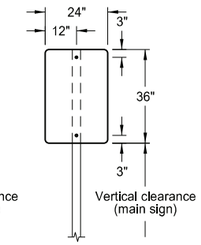
R1-2-60 - YIELD SIGN



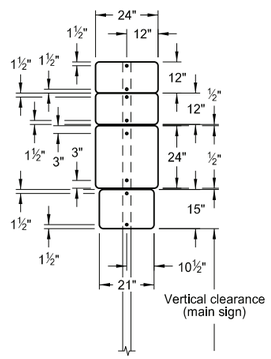
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



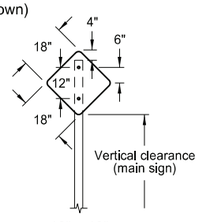
48" x 48" SIGN
(with R6-1-54 sign as required)



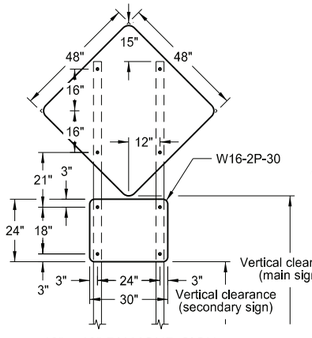
24" x 36" SIGN



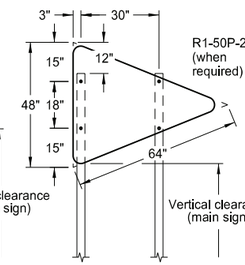
24" x 24"
ROUTE MARKER
ASSEMBLY



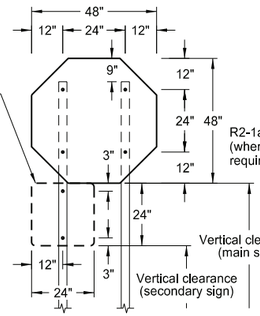
18" x 18"
DIAMOND SIGN



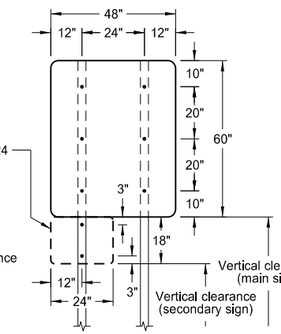
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



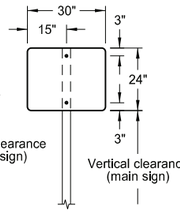
W14-3-64 - PENNANT SIGN



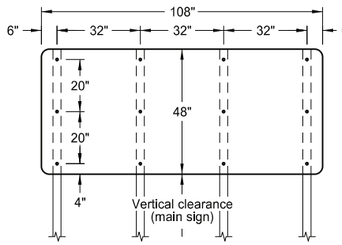
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



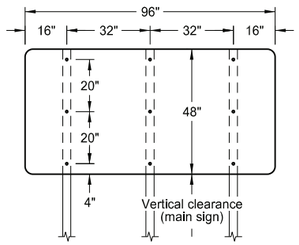
48" x 48" SIGN
(with R2-1aP-24 sign as required)



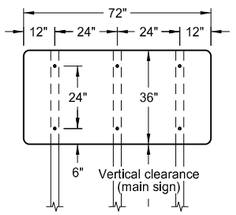
30" x 24" SIGN



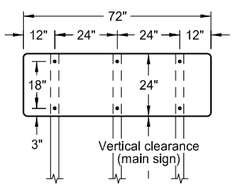
108" x 48" SIGN



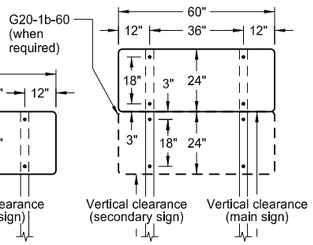
96" x 48" SIGN



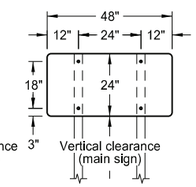
72" x 36" SIGN



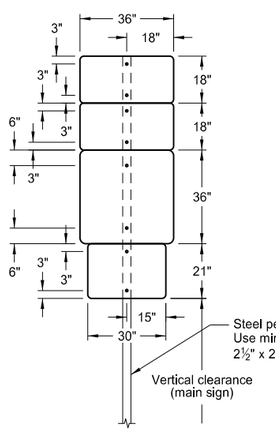
72" x 24" SIGN



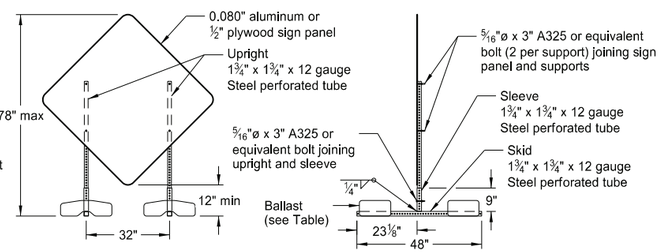
60" x 24" SIGN



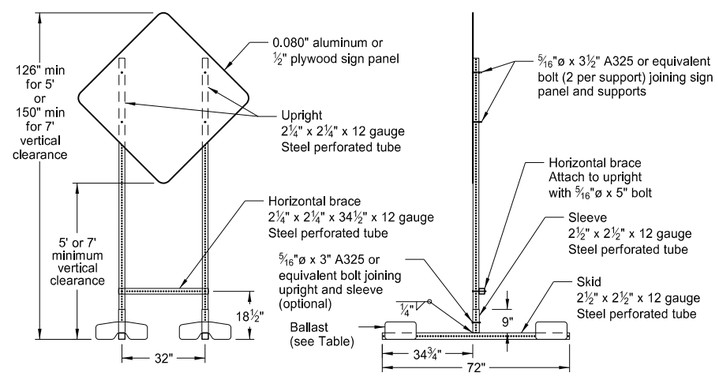
48" x 24" SIGN



36" x 36"
ROUTE MARKER
ASSEMBLY



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

MINIMUM BALLAST
(For each side of sign support base)

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

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

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

10-4-13

REVISIONS

DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail
8-01-24	Electronic Stamp/Signature

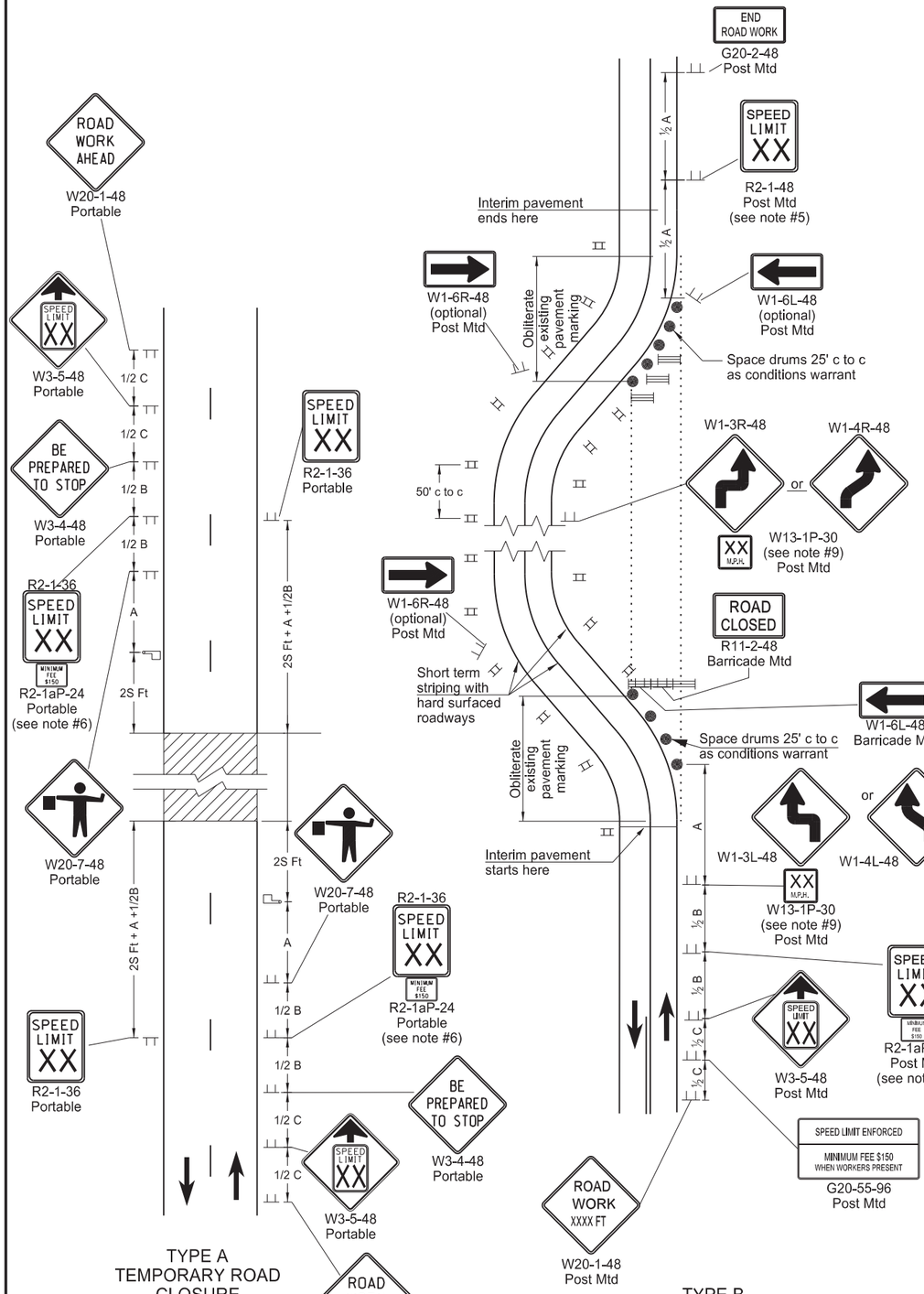
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/01/24

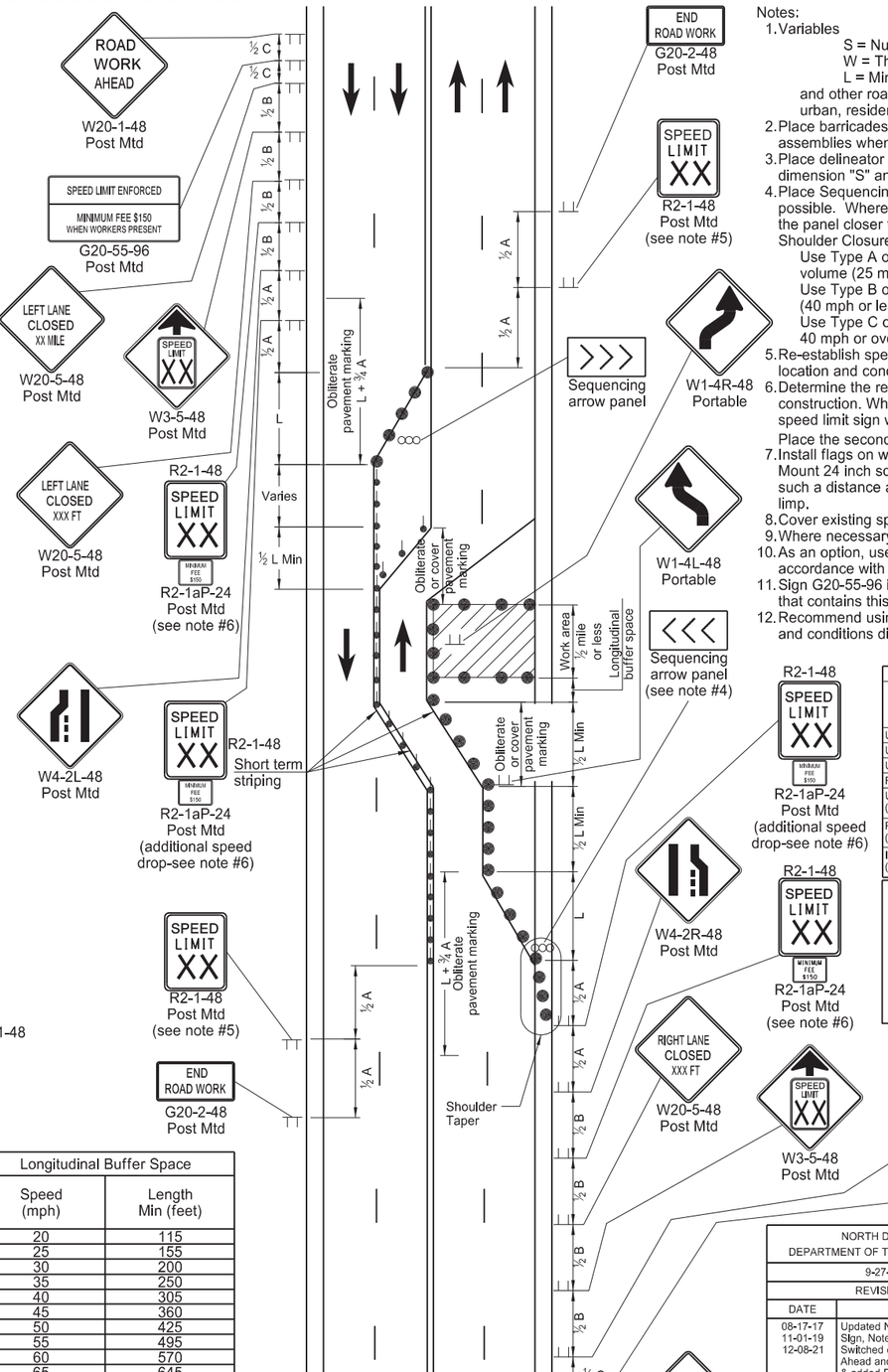
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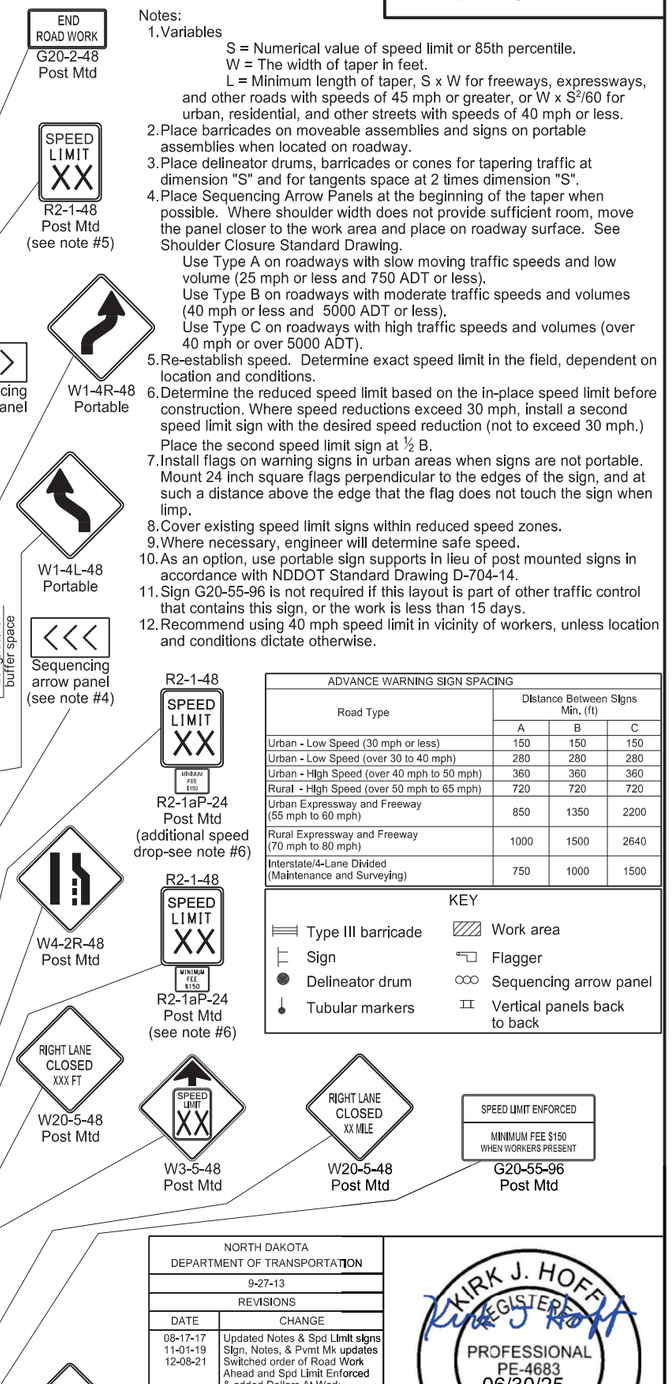
ROAD CLOSURE LAYOUTS

D-704-15



Longitudinal Buffer Space	
Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910





Notes:

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

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

KEY

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

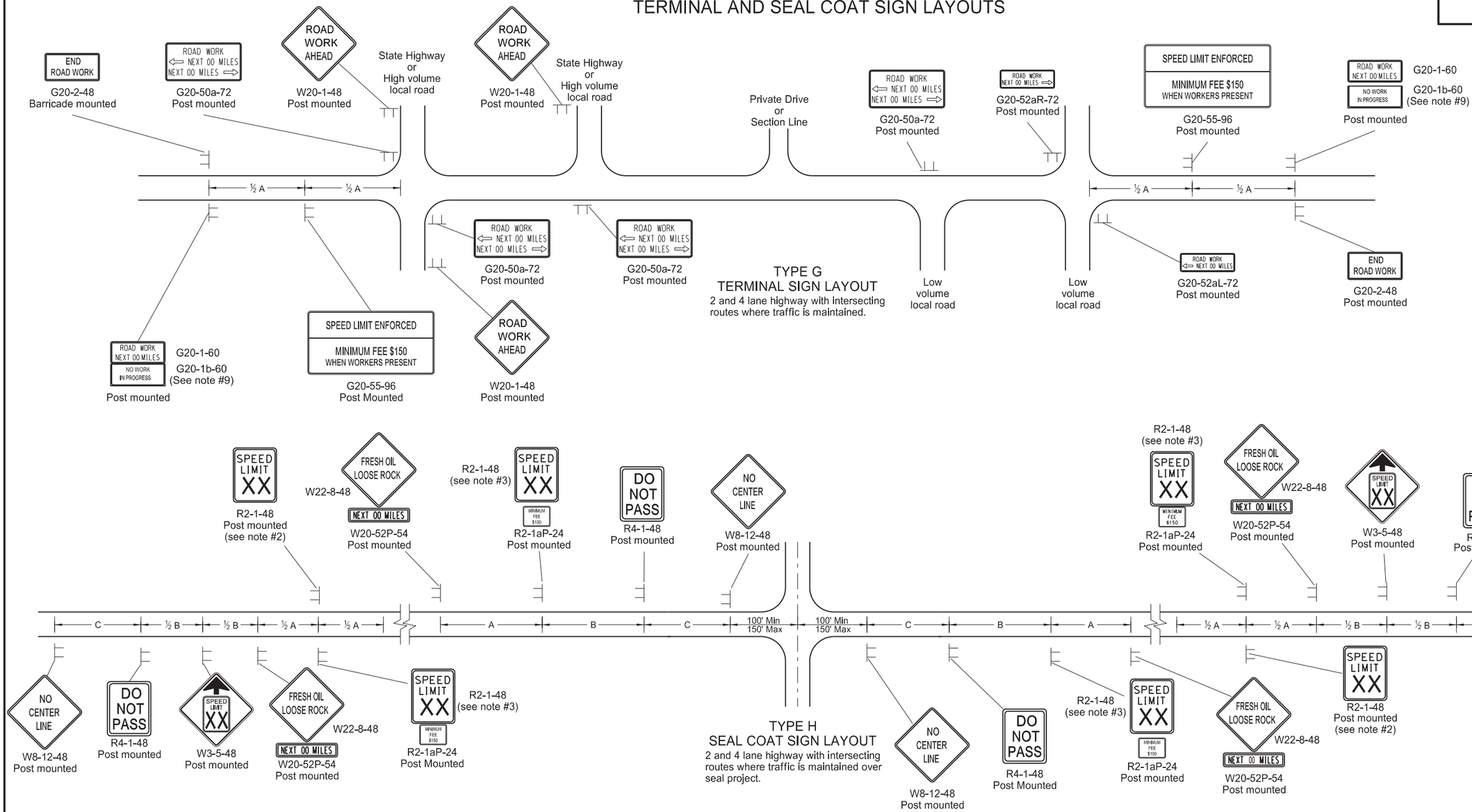
DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pvmt Mk updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 06/30/25 ENGINEER NORTH DAKOTA

Docusign Envelope ID: 2F5C9714-A0E1-42BB-B36B-42204844BFCB

TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



Notes:

1. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
2. Determine the exact speed limit in the field, based on location and conditions.
3. Determine the reduced speed limit based on the in place speed limit before construction. Where speed limit reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 MPH.) Place the second speed limit sign at ½ B.
4. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
5. Cover existing speed limit signs within a reduced speed zone.
6. On seal coat projects, place signs R2-1-48, R2-1aP-24, R4-1-48, W22-8-48 and W20-52P-54 after all important intersections and at five mile intervals. Place sign W8-12-48 after all important intersections and at 2 mile intervals until short term center line pavement marking is placed.
7. As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Drawing D-704-14.
8. Cover or remove speed limit signs from layout Type H when loose aggregate is removed.
9. Install sign G20-1b-60 when work is suspended for winter.
10. Use other traffic control layouts in immediate work areas. Place sign R2-1aP-24 below speed limit signs in reduced speed limit work areas.
11. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.
12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Updated notes & sign numbers
11-01-19	Updated note & sign
12-08-21	Switched order of Road Work and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

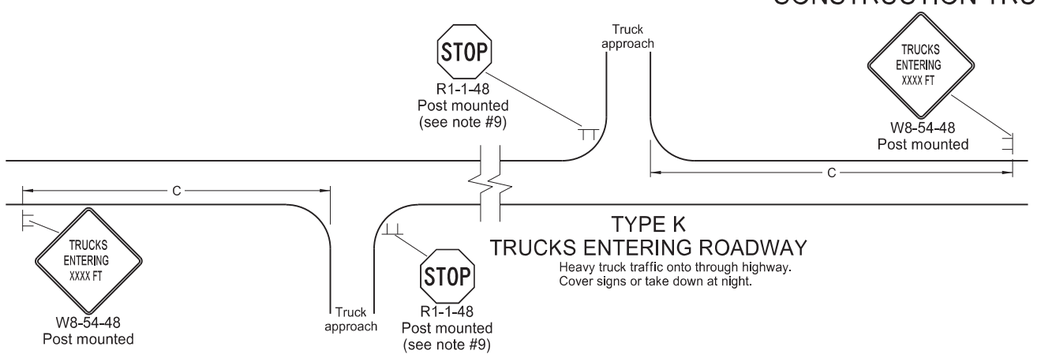
KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 06/30/25 ENGINEER NORTH DAKOTA

Docusign Envelope ID: 2F5C9714-A0E1-42BB-B36B-42204844BFCB

CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

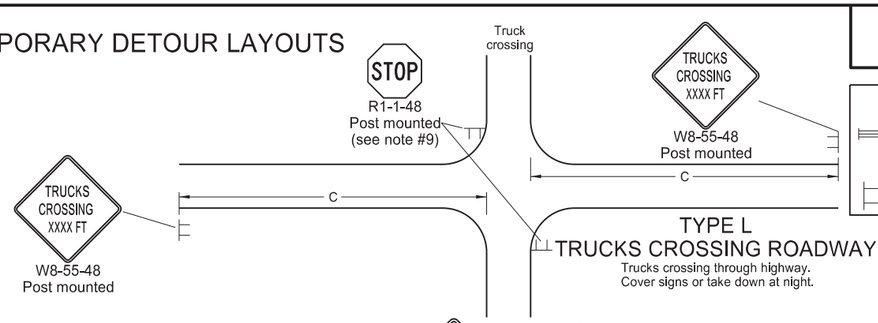
D-704-22

KEY: Type III barricade; Work area; Sign; Flagger



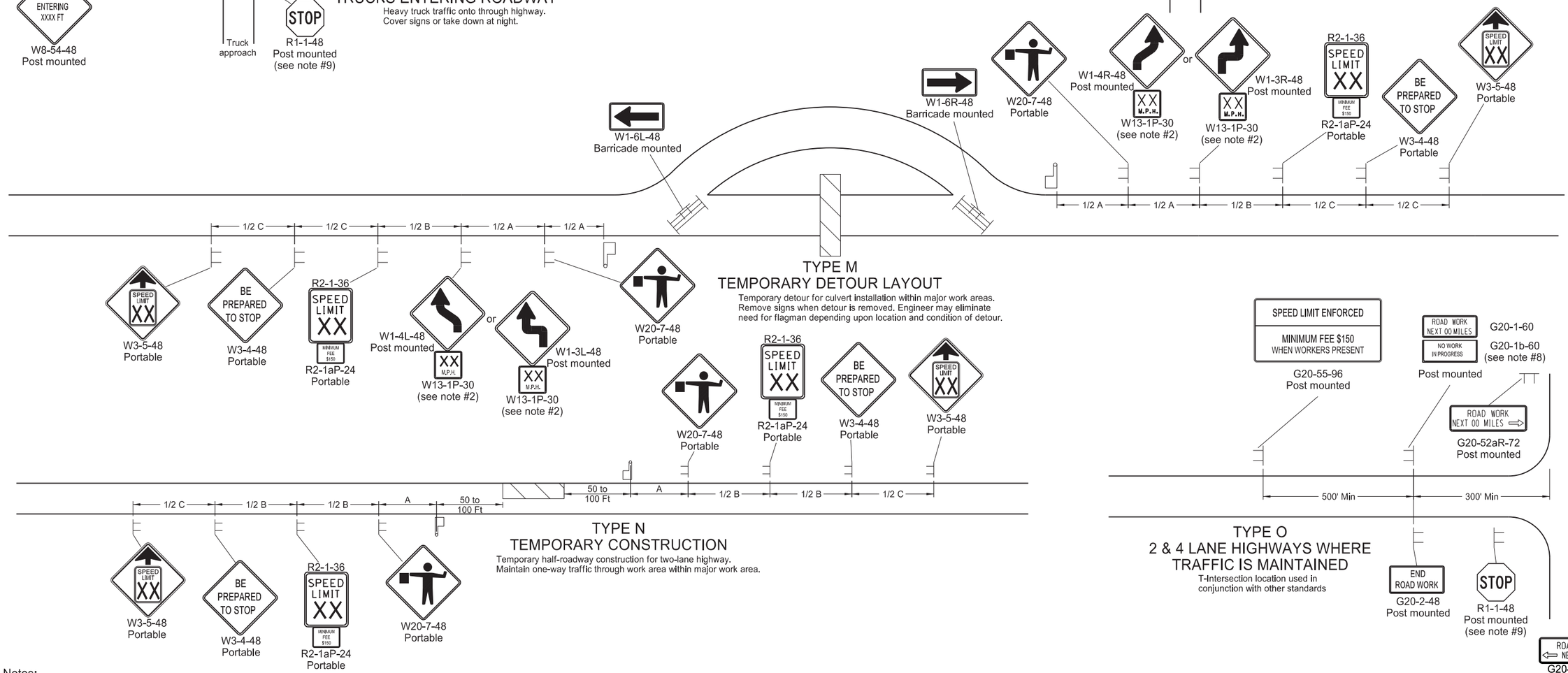
TYPE K
TRUCKS ENTERING ROADWAY

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



TYPE L
TRUCKS CROSSING ROADWAY

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



TYPE M
TEMPORARY DETOUR LAYOUT

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

TYPE N
TEMPORARY CONSTRUCTION

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

TYPE O
2 & 4 LANE HIGHWAYS WHERE TRAFFIC IS MAINTAINED

T-Intersection location used in conjunction with other standards

Notes:

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

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft) A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

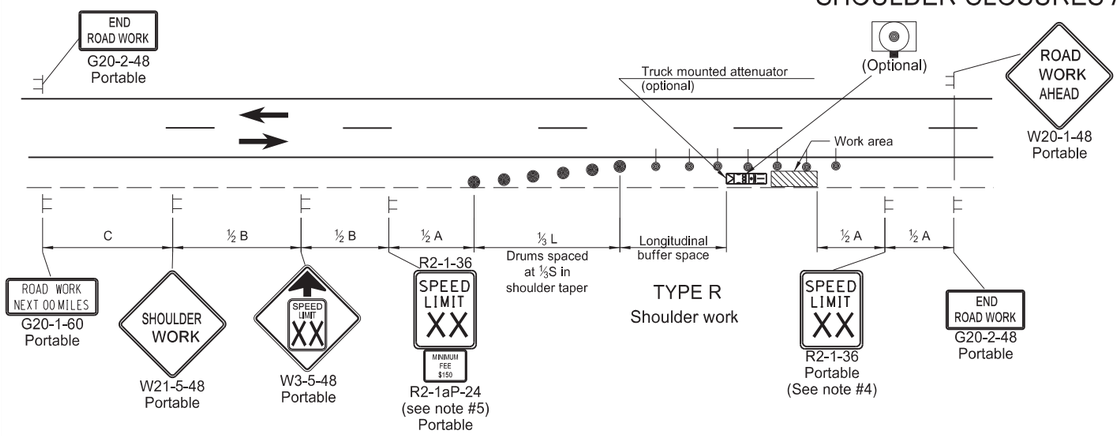
DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

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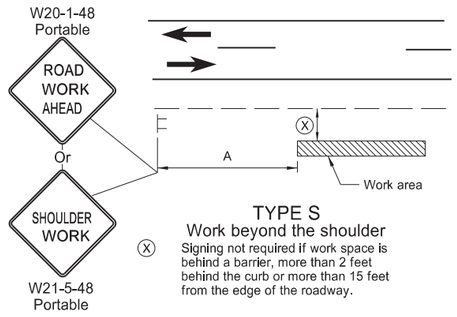
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SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS

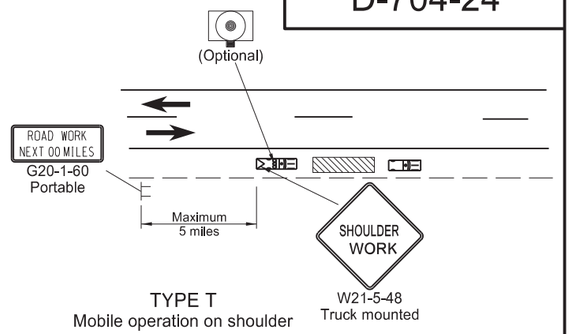
D-704-24



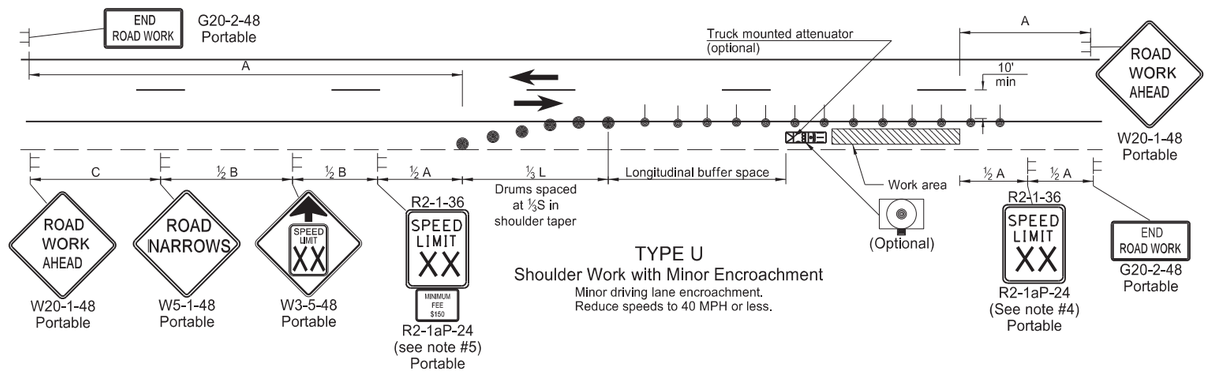
TYPE R
Shoulder work



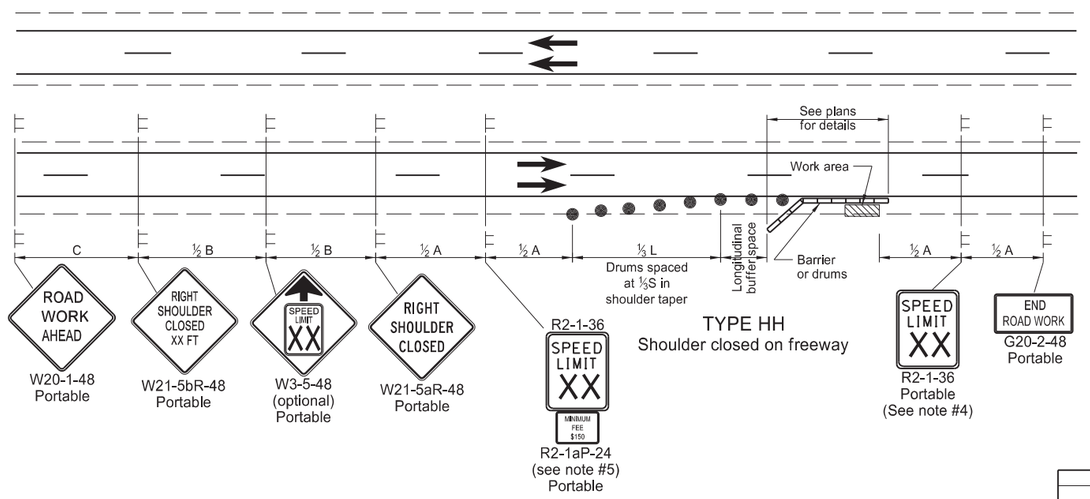
TYPE S
Work beyond the shoulder
Signing not required if work space is behind a barrier, more than 2 feet behind the curb or more than 15 feet from the edge of the roadway.



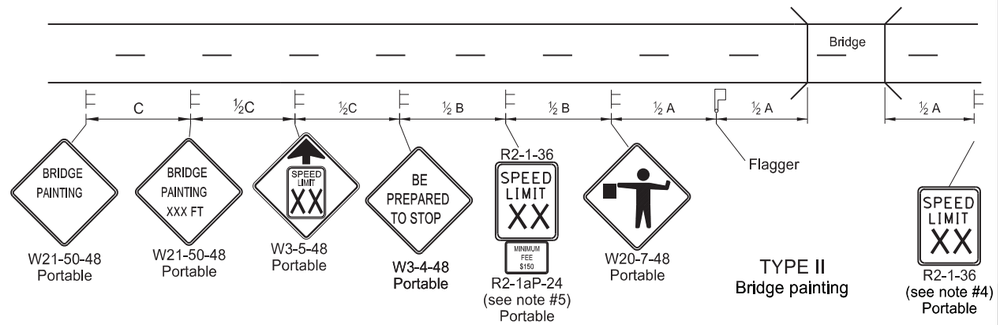
TYPE T
Mobile operation on shoulder



TYPE U
Shoulder Work with Minor Encroachment
Minor driving lane encroachment.
Reduce speeds to 40 MPH or less.



TYPE HH
Shoulder closed on freeway



TYPE II
Bridge painting

Notes
1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of the taper in feet.
   L = Minimum length of taper, S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or W x S^2 /60 for urban, residential, and other streets with speeds of 40 mph or less.
2. Space delineator drums for tapering traffic at dimension "S". Space delineator drums or tubular markers for tangents at 2 times "S".
3. Sequencing Arrow Panels
   Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
   UseType B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
   Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
4. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
5. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at ½B.
6. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
7. Cover existing speed limit signs within a reduced speed zone.
8. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
9. Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

KEY

Sign	Work area
Delineator Drum	Tubular Marker
Sequencing Arrow Panel (Caution Mode)	

ADVANCE WARNING SIGN SPACING

Road Type	Distance Between Signs Min. (ft) A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

Longitudinal Buffer Space

Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

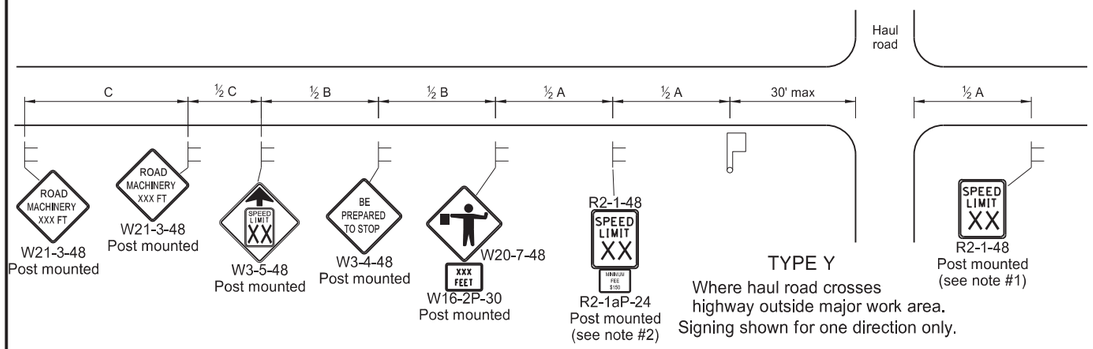
DATE	CHANGE
08-17-17	Updated notes & revised signs
11-01-19	Revised drum spacing & signs nos
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

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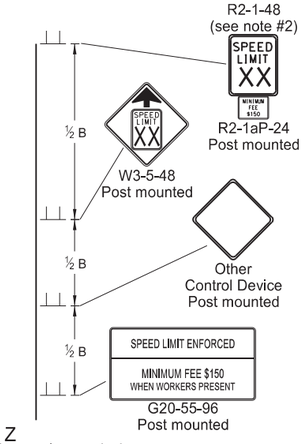
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MISCELLANEOUS SIGN LAYOUTS

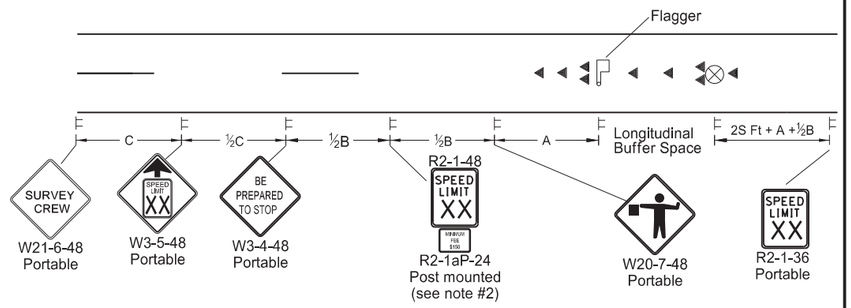
D-704-26



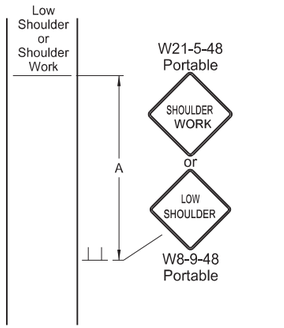
TYPE Y
Where haul road crosses highway outside major work area.
Signing shown for one direction only.



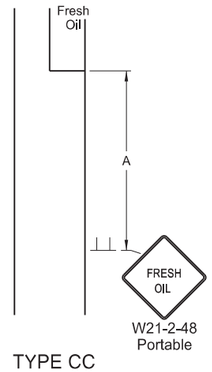
TYPE Z
Where speed zone is needed
Signing shown for one direction only.



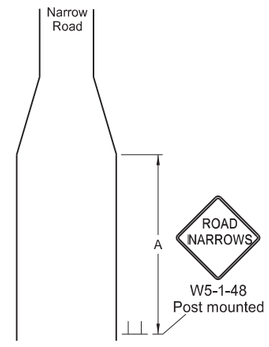
TYPE AA
Where survey crew is used
Signing shown for one direction only.



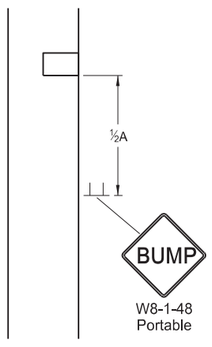
TYPE BB
Within major work area where sign conditions exist



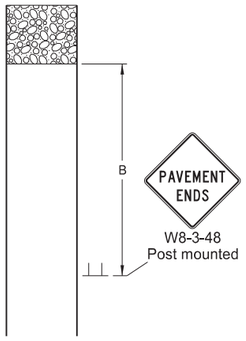
TYPE CC
Where sign conditions exist



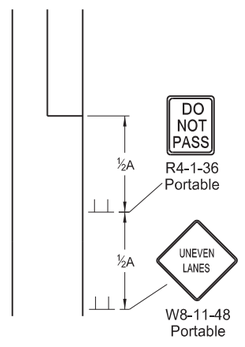
TYPE DD
Where sign conditions exist



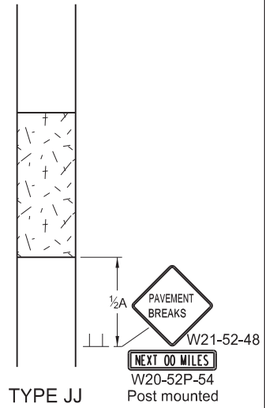
TYPE EE
Where sign conditions exist



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

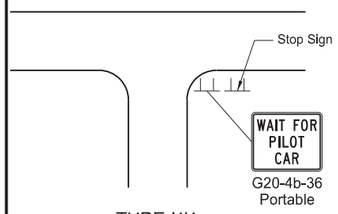


TYPE GG
Where elevation difference exists between lanes



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

KEY
Flagger
Sign
Cones
Survey Equipment
S = Numerical value of speed limit or 85th percentile.



TYPE KK
At major intersections within pilot car control area

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

ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 80 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

Longitudinal Buffer Space	
*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

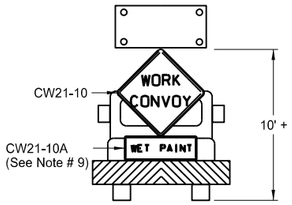
DATE	CHANGE
08-17-17	Added speed limit signs. Updated notes & sign numbers
11-01-19	Revised note 5 & sign numbers
02-23-23	Revised distance & removed signs
06-30-25	Legislative Changes

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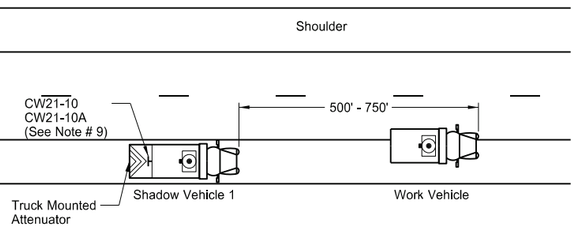
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MOBILE OPERATION
(PAVEMENT MARKING)

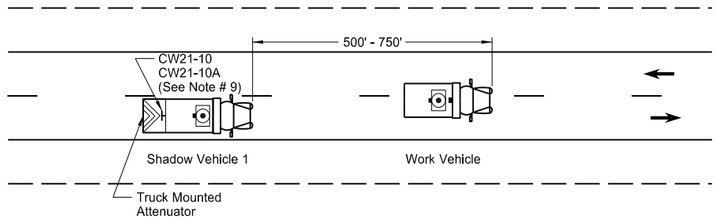
D-704-27



Typical Shadow Vehicle 1
Two-Way Roaday

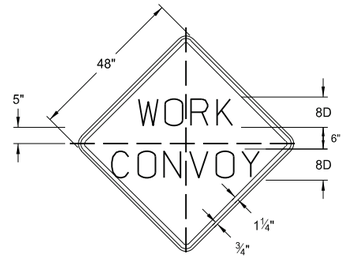


Two-Way Roadway with Paved Shoulders

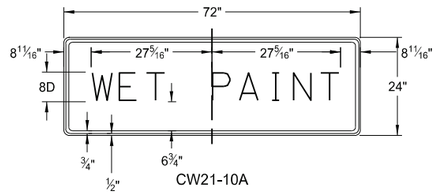


Two-Way Roadway without Paved Shoulders

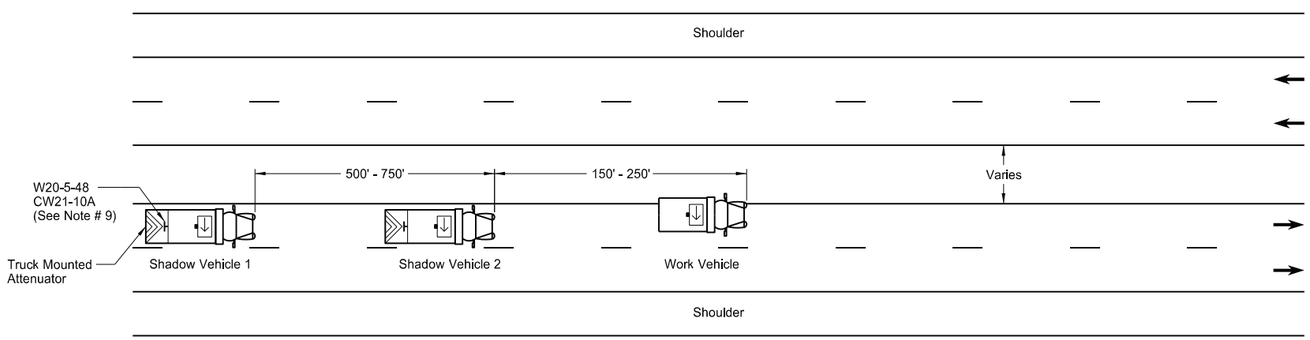
Sign Details



CW21-10

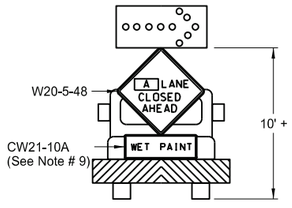


CW21-10A



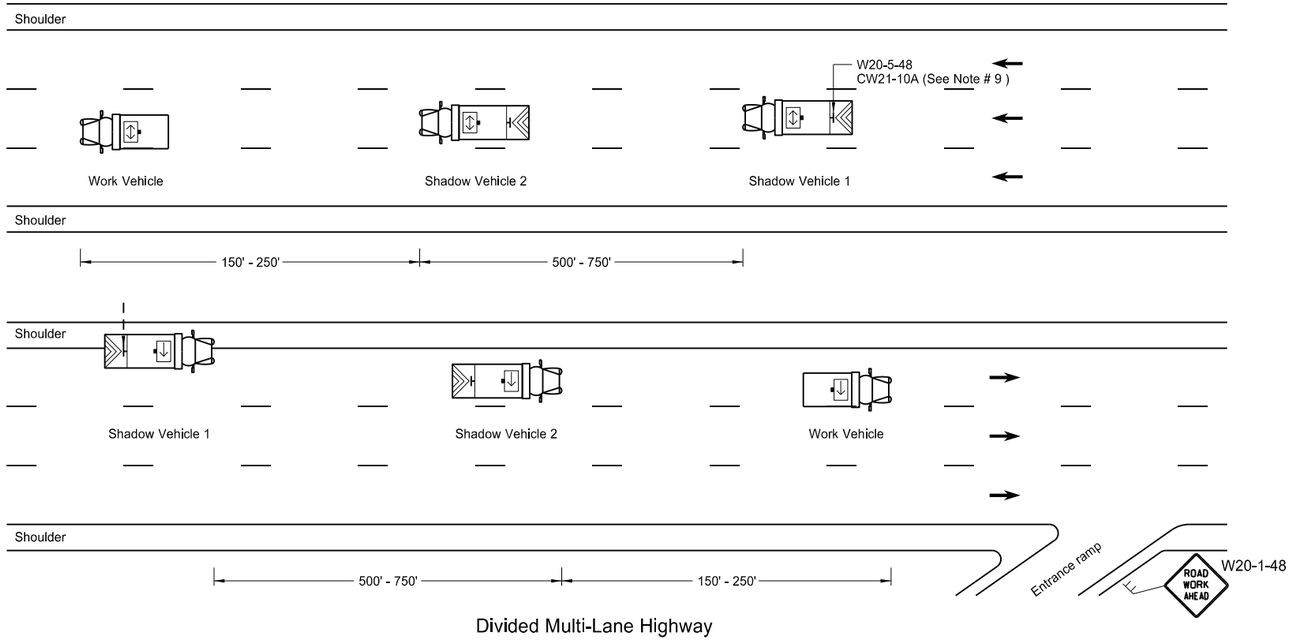
Undivided Multi-Lane Roadway

Notes
1. Use additional vehicles you choose to be in the convoy with truck mounted attenuators, at your own expense.
2. Display yellow rotating beacons or stobe lights on shadow and work vehicles, unless otherwise stated in the plans.
3. Use Type B or Type C flashing arrow panels controlled from inside the vehicle.
4. Provide each vehicle with two-way electronic communication capability.
5. Move shadow vehicle 1 first to shadow other convoy vehicles when convoy changes lane.
6. Vary vehicle spacing between shadow vehicle 1 and shadow vehicle 2 based on sight distance restrictions. Motorists approaching the work convoy need to see trail vehicle in time to slow down and/or change lanes as they approach shadow vehicle.
7. Sign Colors
   Letters = Black
   Border = Black
   Background = Orange
8. As an option, use shadow vehicle 2 the paint tender vehicle.
9. Use sign CW21-10A only during painting operation.
10. Pull over work and shadow vehicles periodically to allow motor vehicle traffic to pass on two lane - two way roadways.



Typical Shadow Vehicle 1 & 2
Multi-Lane Highways

A = Left Right Center



Divided Multi-Lane Highway

KEY

- Sign
- Truck mounted attenuator
- Flashing arrow panels:
  - Right directional
  - Left directional
  - Double arrow directional
  - Caution Mode

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

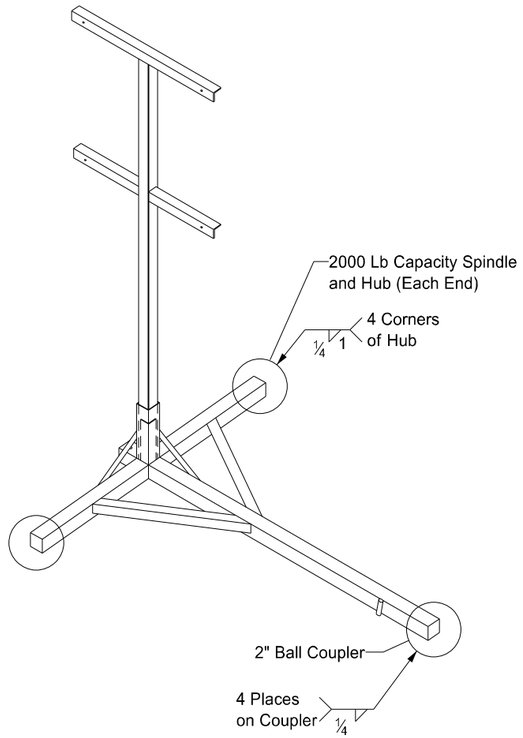
DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways
9-27-17	Updated to active voice
11-08-19	Changed Standard Heading
8-02-24	Electronic Stamp/Signature.

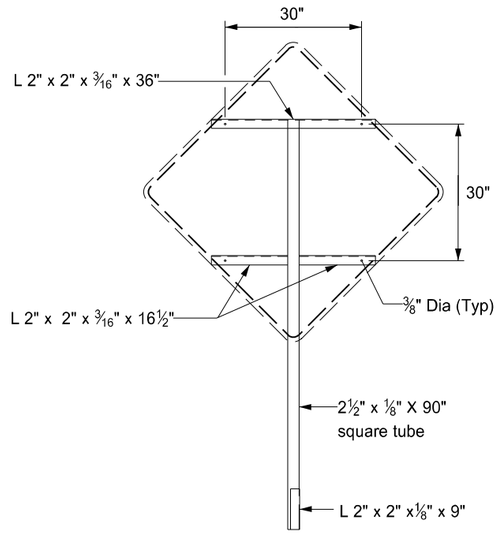
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08/02/24

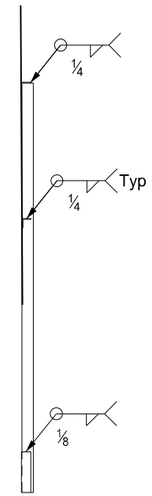
PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50





FRONT

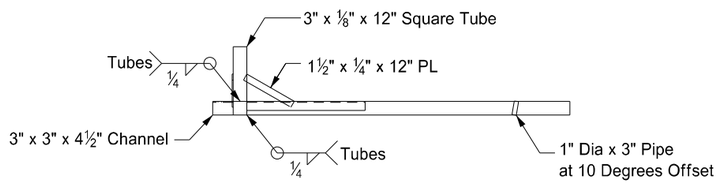


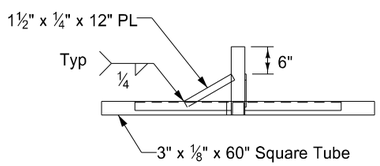
RIGHT

SIGN SUPPORT

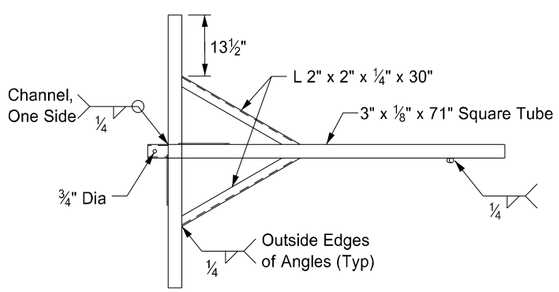
Notes:

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





RIGHT



TOP

TRAILER

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

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12 02 2020

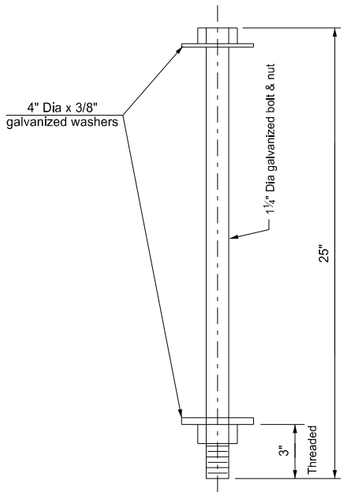
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CONCRETE MEDIAN BARRIER
(TEMPORARY USAGE)

D-704-51

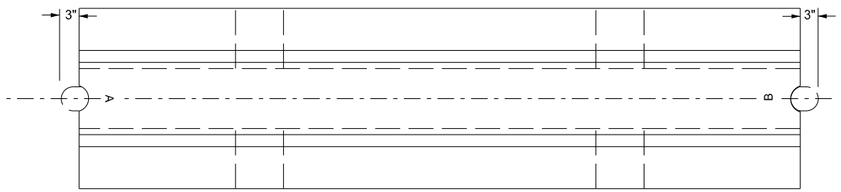
Notes:

1. Barrier ends imprinted with 4 inch letters A and B. Field match A end with B end.
2. Place barrier markers at the center of the barrier at 20' centers.
3. Connect barrier sections with 1 ¼" Dia A-307 double hex connecting bolt. Maintain bottom nut and washer connection for duration of barrier installation.
4. Place barrier to minimize openings between individual sections.

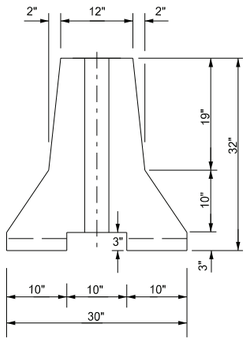


Connecting Bolt Detail

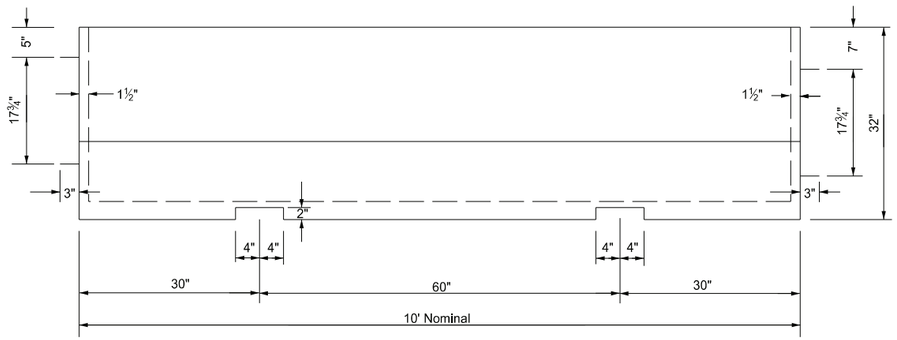
(One per 10 Ft section)



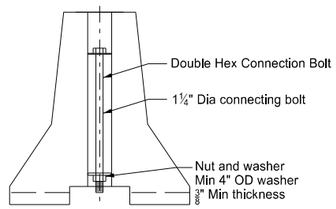
Plan View



End View



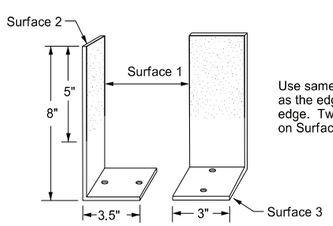
Side View



Bolt Connection Detail

Marker Body
Use high impact,weatherable engineering thermo-plastic material conforming to the following:

Property	Result	ASTM Test Method
Thickness (min)	.090"	——
Tensile strength (min psi) @ yield	5,500	D638
Impact strength @ -20°F (ft-lbs/in of notch)	3.2	D256 Method A
Impact strength @ 73°F (ft-lbs/in of notch)	14.0	D256 Method A
Flexural strength, PSI ¼" @ 73°F	8,000	D790
Flexural modulus, PSI ¼" @ 73°F	300,000	D790
Elongation @ yield	30%	D638



Use same color reflective faces as the edge line along barrier edge. Two way reflective on Surface 1 & 2.

Barrier Marker Detail

Reflective Tape
Use retroreflective, acrylic microprism material with acrylic backing, 3" wide, providing the following minimum optical performance with an observation angle of 0.1° measured in candlepower for the reflector:

Entrance Angle	Specific Intensity
Yellow - 4"	136
White - 4"	200

Adhesive
Use factory applied solid butyl rubber ⅛" thick, 2" wide on 2¼" wide release paper on surface 3 to temporarily mount markers to portable concrete barrier.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-20-12	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
11-01-19	New Design Engr PE Stamp
8-21-24	Removed Fabrication Info

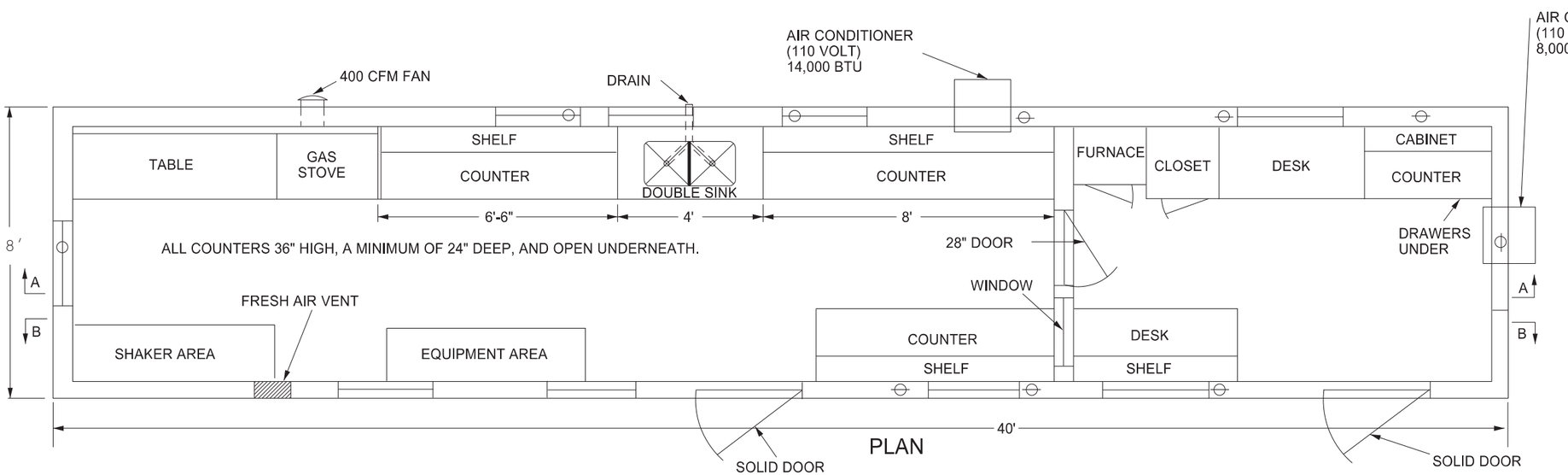
KIRK J. HOFF
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PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

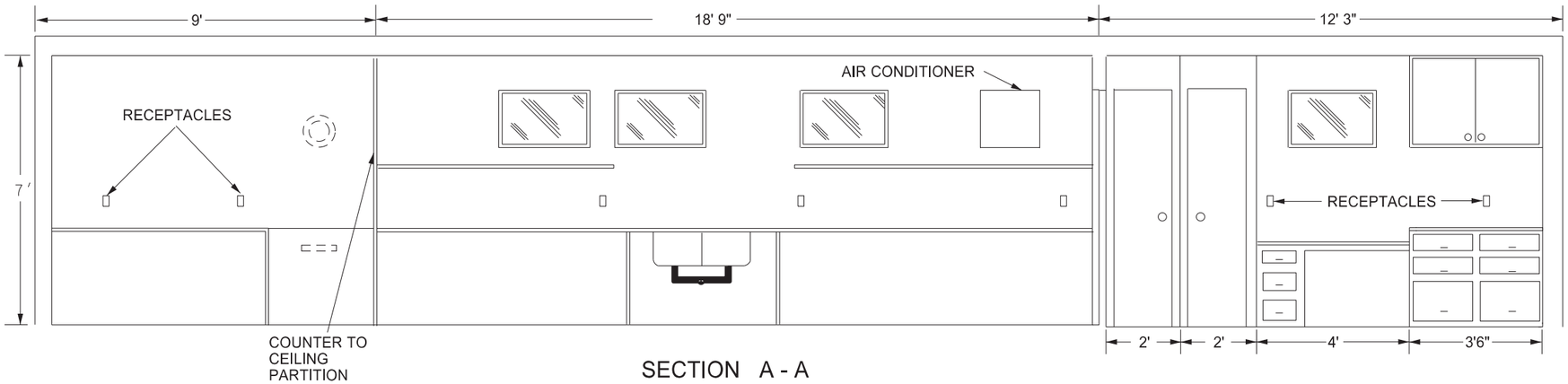
08/21/24

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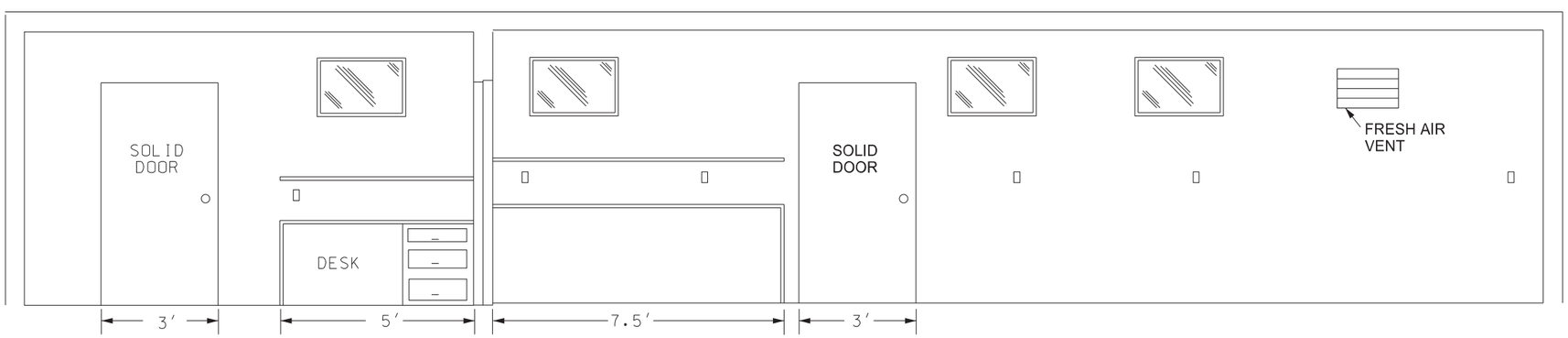
BITUMINOUS LABORATORY

D-706-1





SECTION A - A



SECTION B - B

Provide a laboratory with the following:

1. A 1'x1' shelf at 36" above the regular countertop.
2. Double compartment stainless steel sink, with each compartment a minimum of 16"x14"x10" deep. Provide water service lines made of copper or plastic and a diameter of ½ inch.
3. An exhaust fan capable of removing inside air at a rate of 400 CFM.
4. Fresh air vent hinged to open or close manually.
5. 24" x 48" table capable of holding a 200 lb masonry saw with a minimum clearance of 36" above the table.
6. A water supply tank with a capacity of 500 gallons and a 20 gallon capacity pressure tank on the pump.
7. Heavy duty type locks, latches, and hinges for doors made to withstand the intense use in service.
8. A wall between the office and the work area properly insulated to prevent the transmission of heat and noise.
9. The steel cable tie downs and ground anchors at each corner of the lab.
10. Electrical service entrance wired for 100 amps and separate circuits for air conditioners. Space convenience outlets in counter areas a minimum of four feet apart.

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

10-03-13

REVISIONS

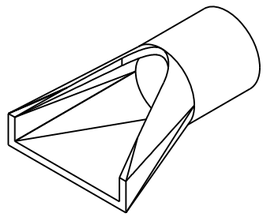
DATE	CHANGE
07-30-14	Changed standard's title and revised notes.
01-11-16	Revised notes.
08-27-19	New Design Engineer PE Stamp
08-09-24	Electronic Stamp/Signature.

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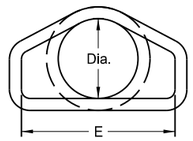
08/09/24

REINFORCED CONCRETE PIPE CULVERTS AND END SECTIONS
(Round Pipe)

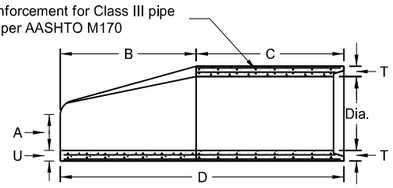
FLARED END SECTION						
TERMINAL DIMENSIONS						
DIA	A	B	C	D	E	U
12	0'-4"	2'-0"	4'-0⅞"	6'-0⅞"	2'-0"	2"
15	0'-6"	2'-3"	3'-10"	6'-1"	2'-6"	2¼"
18	0'-9"	2'-3"	3'-10"	6'-1"	3'-0"	2½"
21	0'-9"	3'-0"	3'-1"	6'-1"	3'-6"	2¾"
24	0'-9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3"
27	0'-10½"	4'-0"	2'-1½"	6'-1½"	4'-6"	3¼"
30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



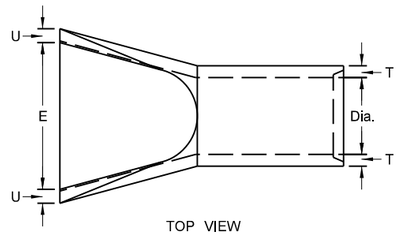
PERSPECTIVE



END VIEW



SIDE VIEW



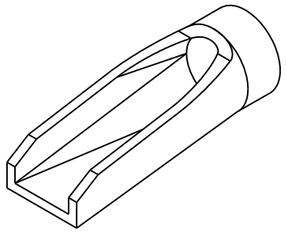
TOP VIEW

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

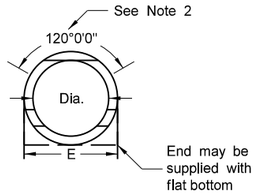
NOTES:

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

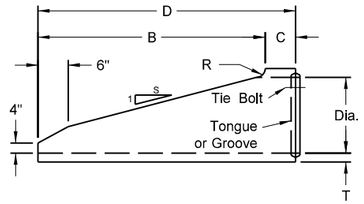
TRAVERSABLE END SECTION						
DIA	B	C	D	E	R	S
15"	4'	9"	4'-9"	1'-7½"	3"	6
18"	5'-9"	9"	6'-6"	1'-11"	3"	6
24"	6'	1'	7'	2'-6"	3"	4
30"	7'-6"	1'	8'-6"	3'-1"	3½"	4
36"	7'-3"	15"	8'-6"	3'-8"	3"	4



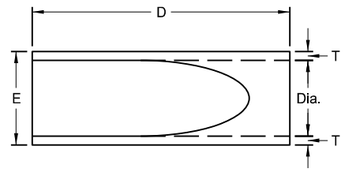
PERSPECTIVE



END VIEW



SIDE VIEW



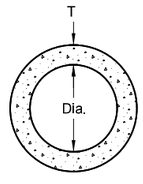
TOP VIEW

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

NOTES (Traversable End Section):

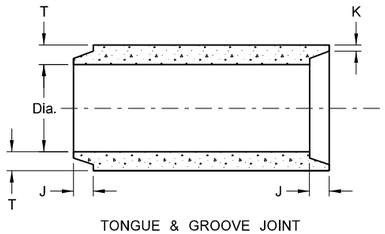
1. Manufactured in accordance with applicable portions of ASTM C76/AASHTO M170.
2. Reinforcement per Class III RCP with double reinforcement in the upper 120° of the full barrel portion.

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

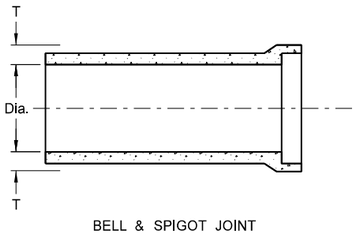


END VIEW

CIRCULAR PIPE

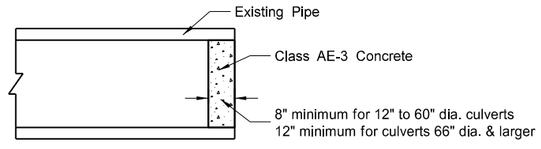


TONGUE & GROOVE JOINT



BELL & SPIGOT JOINT

JOINTS FOR REINFORCED CONCRETE PIPE



CONCRETE PIPE PLUG

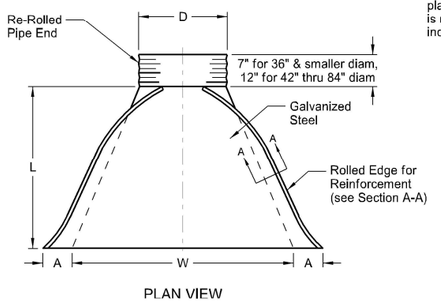
SEE STANDARD DRAWING D-714-22 FOR DETAILS OF CONCRETE PIPE TIES (TIE BOLTS).

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

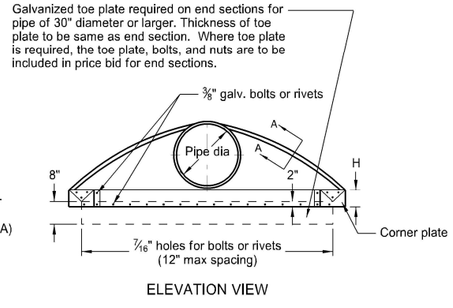
This document was originally issued and sealed by Jon Ketterling Registration Number PE-4684, on 9/18/19 and the original document is stored at the North Dakota Department of Transportation

ROUND CORRUGATED STEEL PIPE CULVERTS AND END SECTIONS

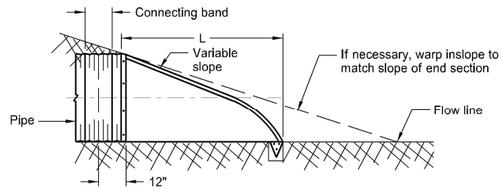
D-714-4



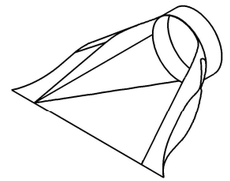
PLAN VIEW



ELEVATION VIEW



TYPICAL CROSS SECTION
(showing connector section)



PERSPECTIVE VIEW

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

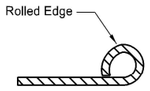
* These sizes have 0.109" sides and 0.138" center panels.

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

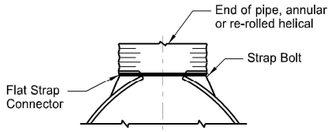
Manufacturers tolerances of above dimensions will be allowed.

Splices to be the lap riveted type.

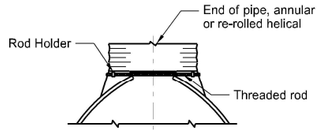
Multiple panel bodies shall have lap seams which are to be tightly joined with ⅜" dia. galv. bolts or rivets. Nuts to be torqued to 25 foot-lbs ±.



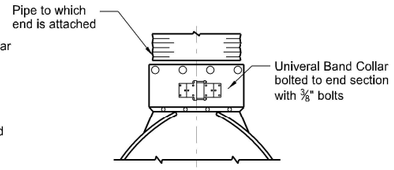
SECTION A-A



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



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

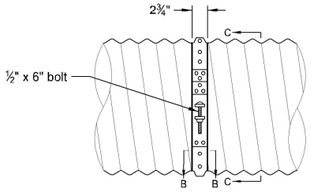


TYPE #3
For all pipe sizes

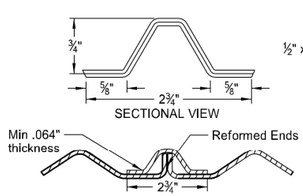
COUPLING BAND DIMENSIONS				
COUPLING TYPE	CORRUGATION PITCH x DEPTH	PIPE SIZE	COUPLING BAND LENGTH	MIN. BAND THICKNESS
Hat Band	2⅔" x ½"	12" - 48"	2¾"	.064"
Annular Band	2⅔" x ½"	12" - 72"	12"	.052"
		78" - 84"	12"	.079"
	3" x 1"	48" - 120"	14"	.052"
Hugger Band	2⅔" x ½" Rerolled End	12" - 72"	10½"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

NOTES:

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



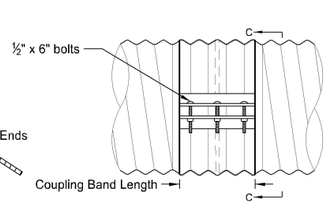
SIDE VIEW



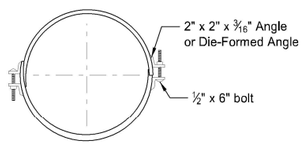
SECTIONAL VIEW

SECTION B-B

HAT BAND FOR FLANGED END PIPE

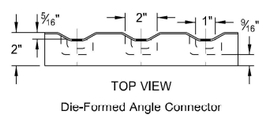


SIDE VIEW

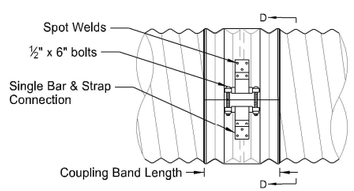


SECTION C-C
Angle Connection

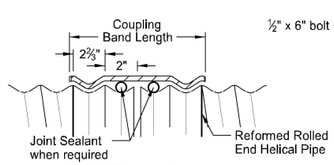
ANNULAR BAND



TOP VIEW
Die-Formed Angle Connector

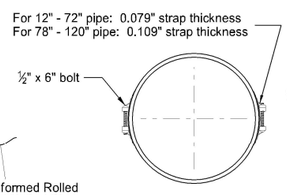


SIDE VIEW

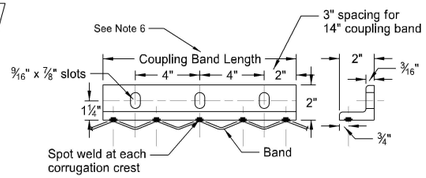


SECTIONAL VIEW

HUGGER COUPLING BAND



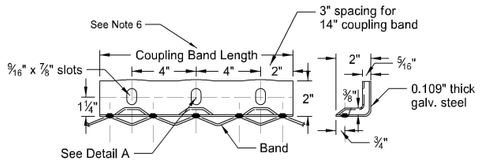
SECTION D-D
Bar & Strap Connection



SIDE VIEW

END VIEW

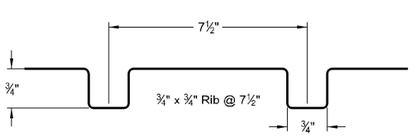
2" x 2" x 3/16" Angle Connector

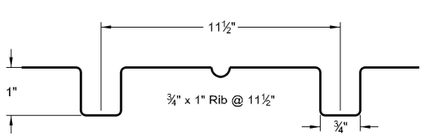


SIDE VIEW

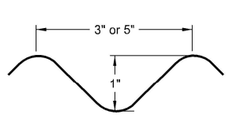
END VIEW

Die-Formed Angle Connector

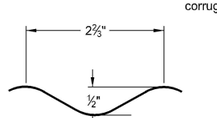




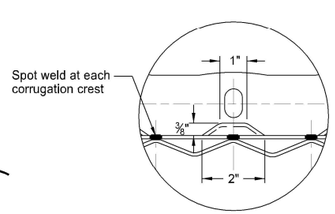
SPIRAL RIB CORRUGATIONS



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



2⅔" x ½" CORRUGATIONS



Detail A

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

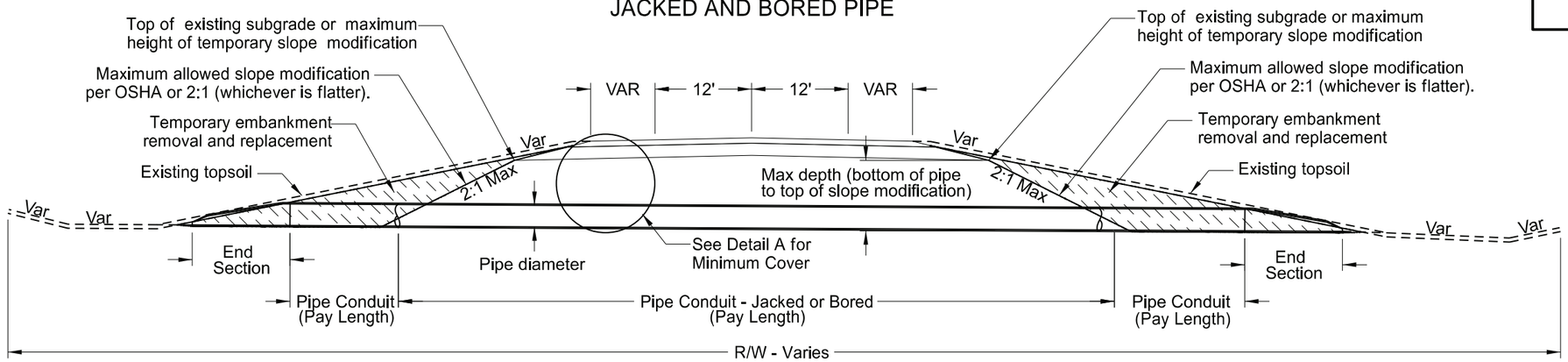
JONATHAN D KETTERLING
REGISTERED
PROFESSIONAL
PE-4684
ENGINEER
NORTH DAKOTA

09/23/22

DocuSign

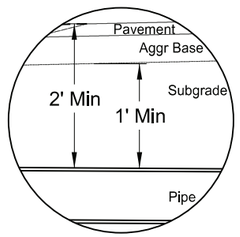
D-714-16

JACKED AND BORED PIPE

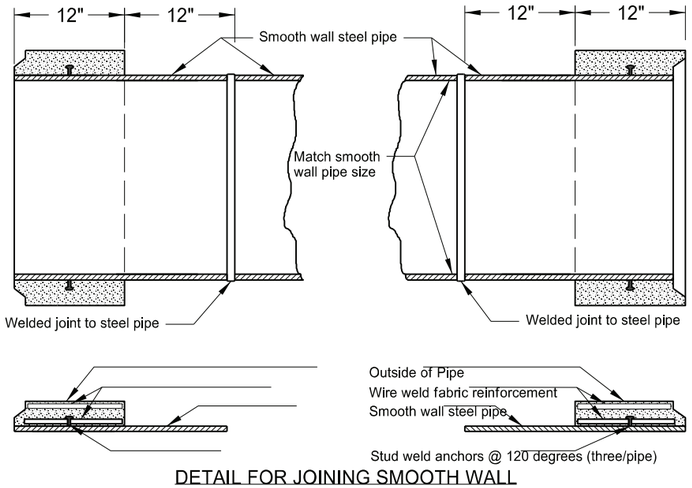


JACKED AND BORED PAY LENGTH

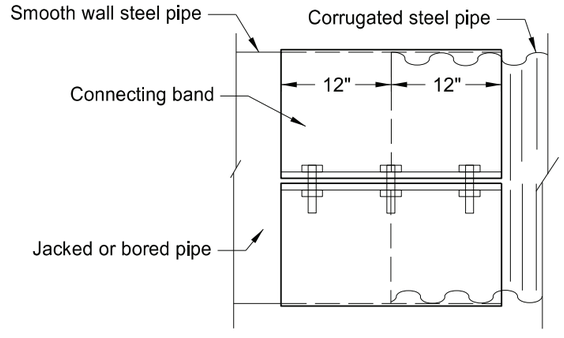
NOTE: This Detail applies to jacked and bored pipe under a roadway embankment. Additional coordination and design are needed for railroad embankments.



Detail A - Minimum Cover
2' Top of Pavement to Top of Pipe, and 1' Top of Subgrade to Top of Pipe



DETAIL FOR JOINING SMOOTH WALL STEEL PIPE TO REINFORCED CONCRETE PIPE



CONNECTING BAND FOR JOINING SMOOTH WALL STEEL PIPE TO CORRUGATED PIPE

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-15-2022	
REVISIONS	
DATE	CHANGE
08-31-2023	Corrected spelling of corrugated.

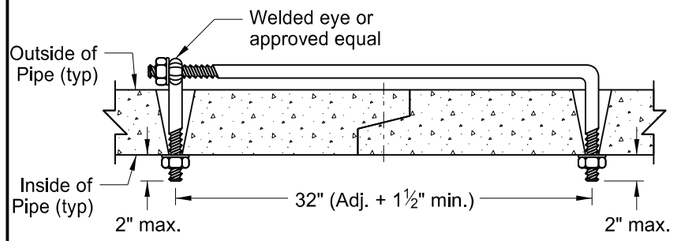
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/31/23

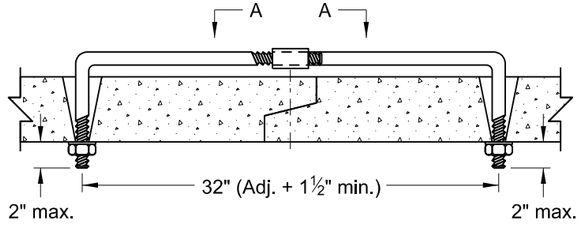
Docusign Envelope ID: 183A3561-9FCE-4D1A-975A-207779A0B2A0

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

D-714-22

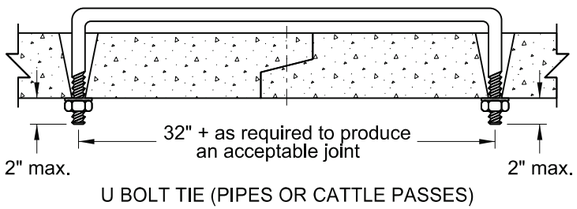


EYE BOLT TIE (PIPES ONLY)

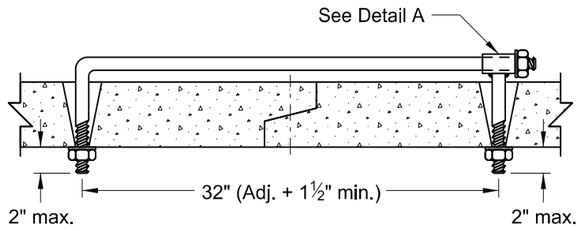


ADJUSTABLE TIE (PIPES ONLY)

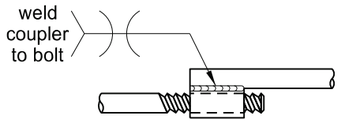
REQUIRED SIZE OF TIE BOLTS		
PIPE SIZE	THREAD ø	XXS PIPE SLEEVE INNER ø
18" - 24"	⅝" SEE NOTE 3	¾"
30" - 66"	¾"	1"
72" - 120"	1"	1¼"
RCB/CATTLE PASS		



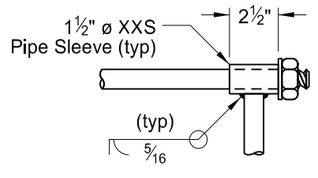
U BOLT TIE (PIPES OR CATTLE PASSES)



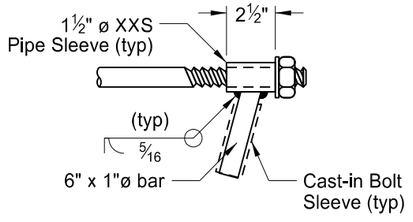
WELDED TIE (PIPES ONLY)



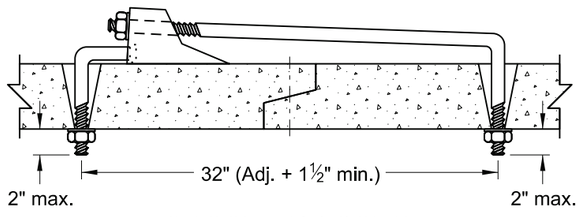
SECTION A-A



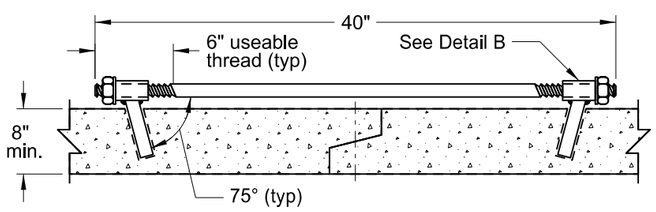
DETAIL A



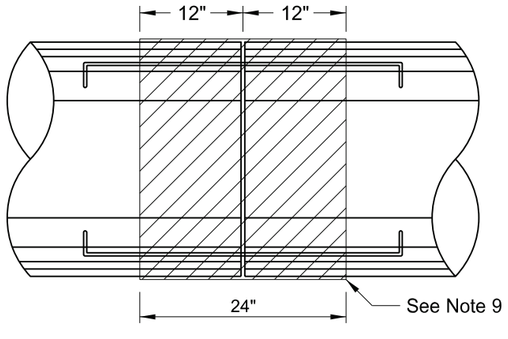
DETAIL B



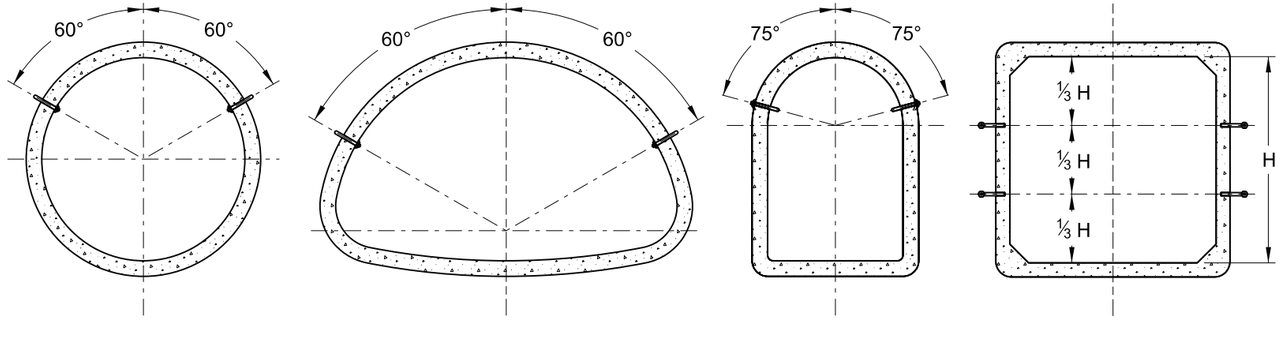
CANOPY TIE (PIPES ONLY)



HIDDEN TIE (RCB ONLY)



PLAN VIEW (PIPES ONLY)



END VIEW

NOTES:

1. The pipe size listed is the inside diameter of round pipe or the equivalent diameter of pipe arch.
2. Insert pipe ties from the inside of the pipes and grout into place for Cattle Pass and Jacked and Bored pipes. Jacked and bored pipes with a diameter of 24" or less do not require pipe ties.
3. Nuts and washers are not required on Jacked and Bored pipes or pipes with a 24" diameter or less. Insert and grout tie bars into place where nuts and washers are not used.
4. Do not use pipe ties to pull the pipe or RCB sections tight. The ties are only for holding sections together.
5. Use only tie bolt assemblies that have been hot dip galvanized in accordance with ASTM A 153.
6. Holes in pipes to accommodate tie bolts will be precast. Tapered holes are permitted. Use holes that have a diameter ¼" larger than the diameter of the thread. In precast RCB's, use holes that contain cast-in bolt sleeves with an inside diameter of 1¼".
7. Include the cost of precasting the required holes and furnishing and installing the tie bolts in the price bid for the appropriate conduit or RCB pay item.
8. Tie all centerline and approach RCP culvert joints. Tie all joints including the end sections of all free ends of storm drain systems. Free ends are defined as any storm drain end which does not terminate at an inlet or manhole. Outfall culverts with end sections which drain adjacent ditches are examples of free ends.
9. Place joint wrap prior to installing ties. Firmly secure the wrap around the full perimeter. For concrete pipes, use Type S2 geotextile fabric and overlap the joint by 12" in both directions. For box culverts, use a waterproof membrane that meets ASTM C990. Provide a membrane that is a minimum of 12" wide and center it at the joint. Provide a minimum overlap of 2.5" at the seams.
10. Use tie bolts that conform to ASTM A 36. Use heavy hex nuts that conform to ASTM A 563. Use washers that conform to ASTM F 436, Type 1. Use welded pipe sleeves and cast-in bolt sleeves that conform to ASTM A 53, Grade B.
11. Provide lock washers or burr threads of concrete box ties after installation and tightening to prevent nut rotation.
12. Tie RCB's as noted in the plans.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

3-18-14

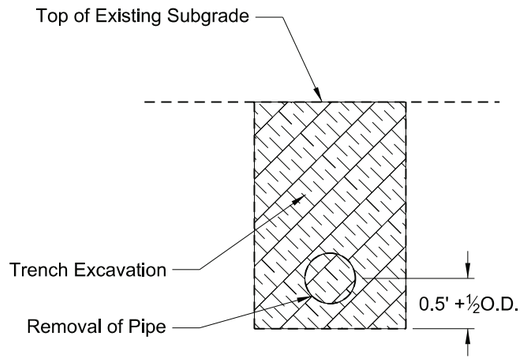
REVISIONS

DATE	CHANGE
7-21-15	Note 8
6-6-17	Notes 2-11 Table, Title, Labels
8-11-21	Notes 2-12 Table, Label
01-17-25	Notes 9-13 Table, Labels Section A-A, End View

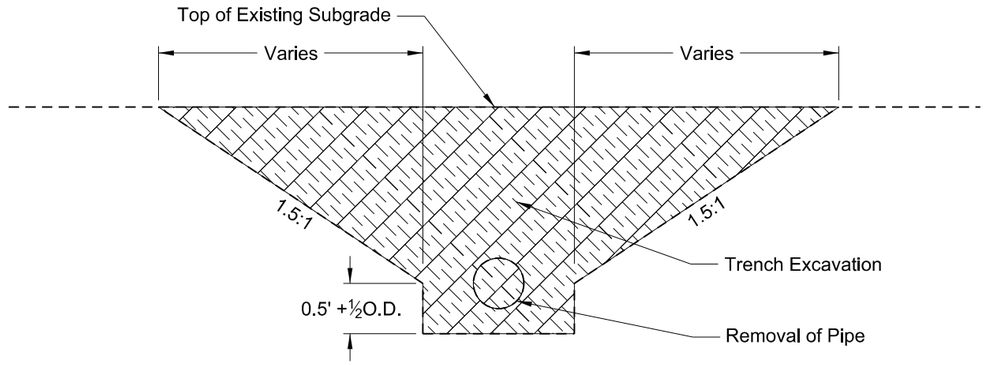
REGISTERED PROFESSIONAL ENGINEER
JASON R. THORENSON
PE - 5048
DATE 01/17/25
NORTH DAKOTA

PIPE INSTALLATION DETAIL FOR LONGITUDINAL MAINLINE PIPE OR PIPE NOT UNDER THE ROADWAY

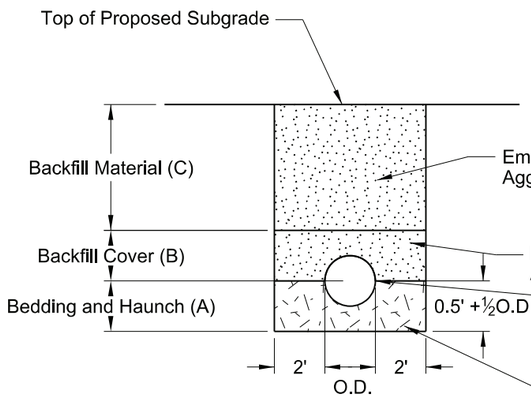
D-714-27



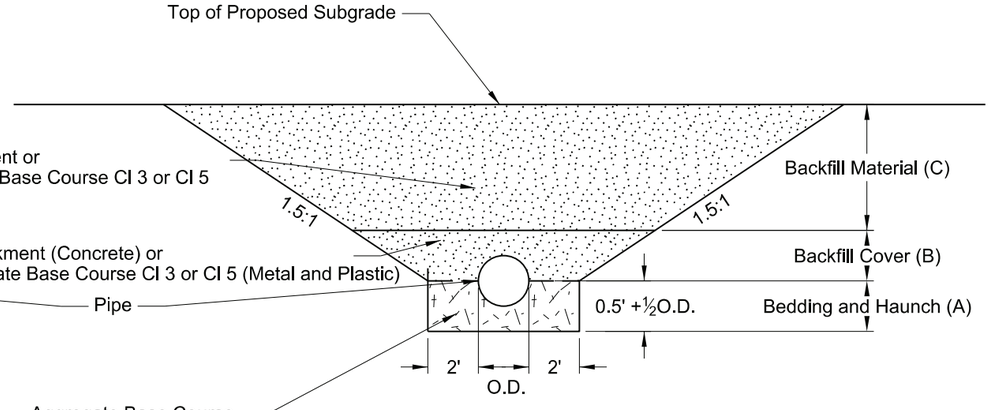
EXCAVATION DETAIL A



EXCAVATION DETAIL B



BACKFILL DETAIL A



BACKFILL DETAIL B

Pay Items
1) Pipe*
2) Removal of Pipe (if required)

*Included in Pipe Pay Item
1) Pipe
2) Trench excavation
3) Aggregate base course CI 3 or CI 5
4) Embankment

NOTES:
1) This drawing does not apply to pipes in approaches.
2) It is the contactor's option to select Detail A or B.
3) Embankment may be either Borrow Excavation or Common Excavation - Type A

Bedding and Haunch (A)
Pipes Not Under Roadway = 0.5 O.D. + 0.5 Feet
Pipes Under the Roadway = 0.5 O.D. + 0.5 Feet
Backfill Cover (B)
Concrete Pipe = 0.5 O.D.
Metal and Plastic = 0.5 O.D. + 1 Foot
Backfill Material (C)
Top of Pipe 4 Feet or Less Below the Top of Proposed Subgrade = Aggregate Base Course CI3 or CI 5
Top of Pipe Greater than 4 Feet Below the Top of Proposed Subgrade = Common Excavation - Type A
Pipe Not Under Roadway = Common Excavation - Type B

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

7-26-13

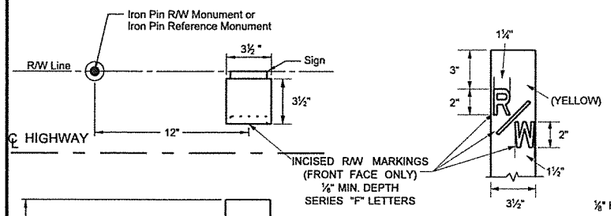
REVISIONS

DATE	CHANGE
10-15-13	Label Formatting
1-21-15	Nomenclature
12-10-15	Added Plastic Pipe
5-27-20	Changed bedding depth and updated table

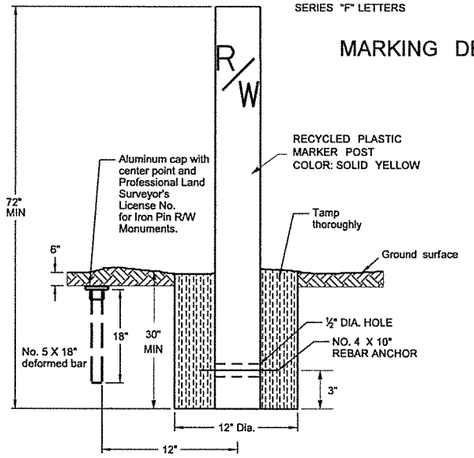
REGISTERED PROFESSIONAL ENGINEER
MATTHEW C KURLE
PE-8777
DATE
05/27/20
NORTH DAKOTA
DocuSign

STANDARD MONUMENTS AND RIGHT OF WAY MARKERS

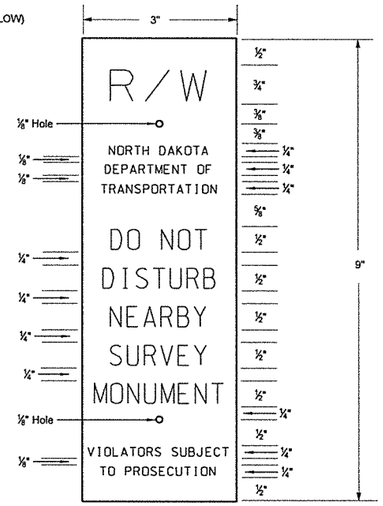
D-720-1



MARKING DETAIL



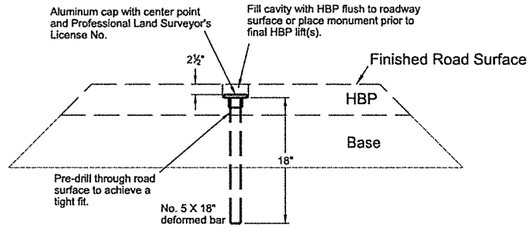
RECYCLED PLASTIC RIGHT OF WAY MARKER (WITNESS POST) DETAILS & IRON PIN REFERENCE AND R/W MONUMENT DETAILS



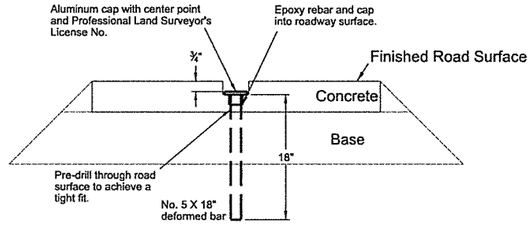
SIGN DETAIL

Black letters on orange high intensity background sheeting meeting ASTM D-4956 Type III or higher on 80 gauge 5052-H38 aluminum. Silk screen graphics. One color print. Attach sign by drilling two holes in the face of the post (side facing the private owner, away from the Department of Transportation right of way). Put inserts into the holes and mount the sign with #4 vandal proof screws. Install sign 2" from top of post.

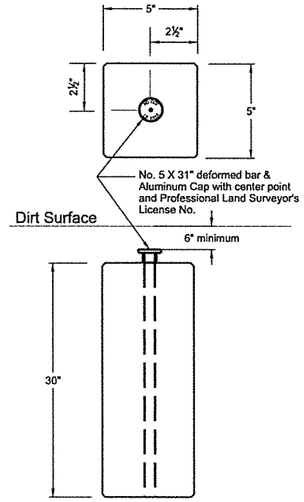
ALIGNMENT MONUMENT DETAILS



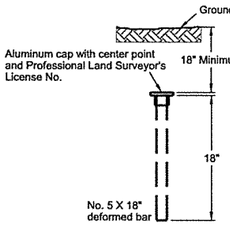
IRON PIN
(Within Finished Roadway Surface)



IRON PIN
(Within Finished Roadway Surface)



PRECAST CONCRETE
(Outside Finished Roadway Surface)
(Inside R/W Limits)



IRON PIN
(Outside Finished Roadway Surface)
(Outside R/W Limits)

NOTES:

Construct and install Alignment Monuments, Iron Pin Reference Monuments, Iron Pin R/W Monuments, and Right of Way Markers (witness posts) according to Section 720 of the Standard Specifications.

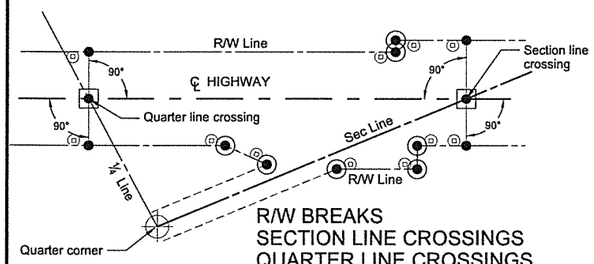
ALIGNMENT MONUMENTS: Place Iron Pin or Precast Concrete Alignment Monuments with aluminum caps on the centerline alignment PI's, section corners, quarter corners, section line crossings, quarter line crossings, and at curve points (PC's, PT's, TS's, and ST's) on the centerline.

IRON PIN R/W MONUMENT: Place Iron Pns with aluminum caps (No. 5 X 18") at breaks on the Right of Way line, and at curve points (PC's, PT's, TS's and ST's) on the Right of Way line.

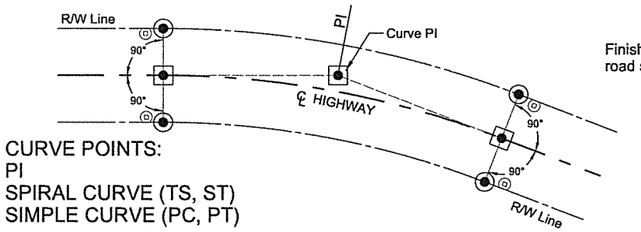
IRON PIN REFERENCE MONUMENT: Place Iron Pins without aluminum caps (No. 5 X 18") as reference monuments on the Right of Way line at section corners, quarter corners, section line crossings, and quarter line crossings.

R/W MARKERS (WITNESS POST) WITHIN DRIVEWAYS: If a single iron Pin R/W or Reference Monument is within a driveway, place right of way marker (witness post) 50 feet back, in stationing, from the Iron Pin Monument along the R/W line. If R/W break is within a driveway, place right of way markers (witness posts) 50 feet back, or ahead from respective Iron Pin R/W Monuments along the R/W lines. Maintain Iron Pin R/W or Reference Monument original position within driveway.

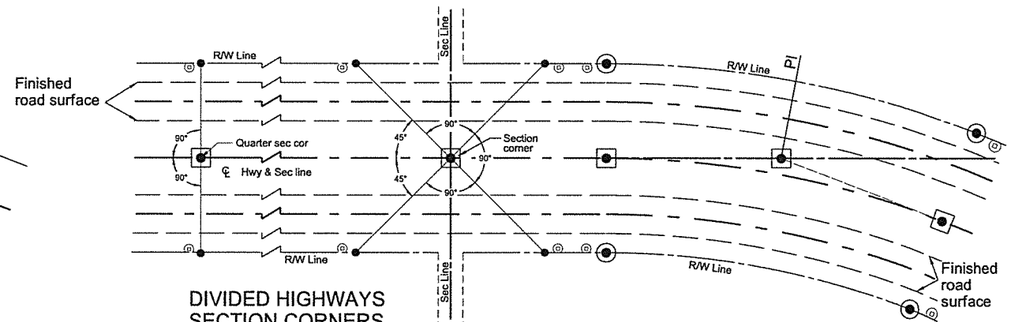
VARIOUS MONUMENT AND MARKER PLACEMENTS



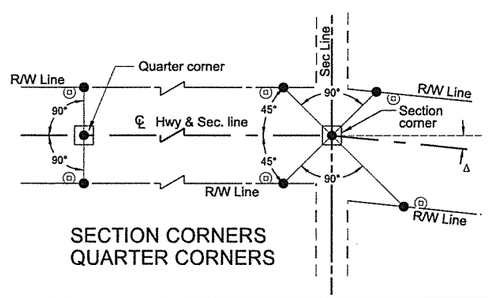
R/W BREAKS
SECTION LINE CROSSINGS
QUARTER LINE CROSSINGS



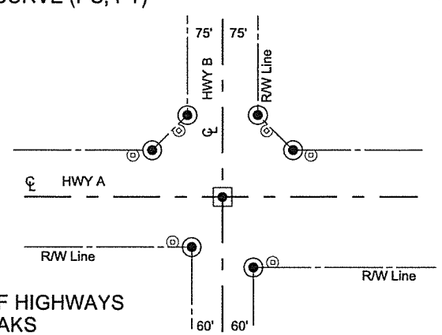
CURVE POINTS:
PI
SPIRAL CURVE (TS, ST)
SIMPLE CURVE (PC, PT)



DIVIDED HIGHWAYS
SECTION CORNERS
QUARTER CORNERS



SECTION CORNERS
QUARTER CORNERS



INTERSECTION OF HIGHWAYS
FLARED R/W BREAKS

LEGEND
Iron Pin Reference Monument
R/W Marker (witness post)
Alignment Monument
Iron Pin R/W Monument

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

10-3-2013

REVISIONS

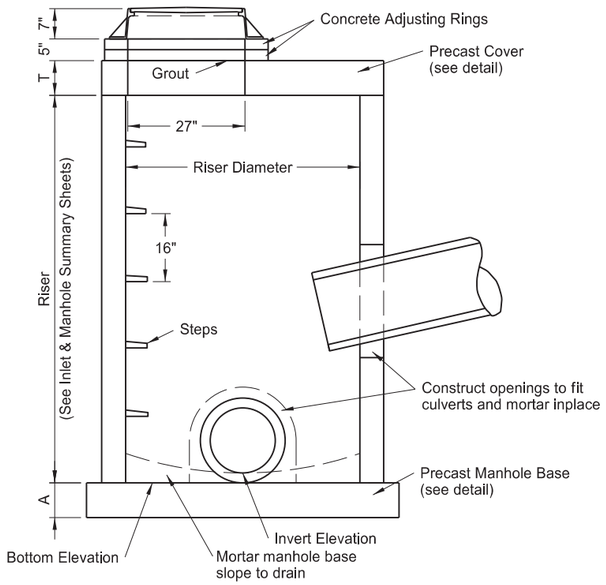
DATE	CHANGE
11/12/13	Note for SIGN DETAIL modified to meet ASTM D-4956 Type III or higher on 80 gauge 5052-H38
10/17/17	Updated to active voice.
08/27/19	New Design Engr PE Stamp.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE 4583
ENGINEER
NORTH DAKOTA
8/27/19

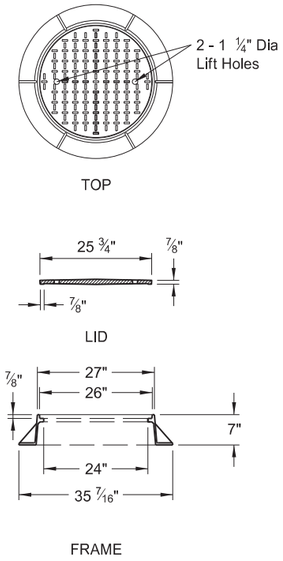
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MANHOLE DETAILS

D-722-5



ELEVATION



MANHOLE CAST IRON RING & COVER

PRECAST MANHOLE COVERS

RISER DIAMETER	COVER DIAMETER	WEIGHT OF SECTION	T	K	L	BOTTOM * BARS	TOP * BARS
48"	58"	1,080 Lb	6"	6"	8"	#4 at 6"	----
54"	65"	1,910 Lb	8"	6"	8"	#4 at 6"	----
60"	72"	2,430 Lb	8"	7"	9"	#4 at 6"	#4 at 11"
66"	79"	3,010 Lb	8"	7"	9"	#4 at 6"	#4 at 11"
72"	86"	3,640 Lb	8"	8"	10"	#4 at 6"	#4 at 11"
84"	100"	5,060 Lb	8"	9"	11"	#5 at 6"	#5 at 11"
96"	114"	6,695 Lb	8"	9"	11"	#5 at 6"	#5 at 11"
108"	128"	12,810 Lb	12"	10"	12"	#5 at 6"	#5 at 11"
120"	142"	15,900 Lb	12"	11"	13"	#5 at 6"	#5 at 11"

* - Place reinforcement listed in each direction.

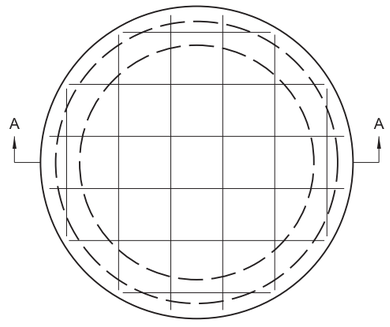
MANHOLE BASES

RISER DIAMETER	BASE DIAMETER	WEIGHT OF SECTION	A	BARS *
48"	66"	1,785 Lb	6"	#4 at 12"
54"	72"	2,830 Lb	8"	#4 at 12"
60"	78"	3,320 Lb	8"	#4 at 12"
66"	86"	4,035 Lb	8"	#4 at 12"
72"	92"	4,620 Lb	8"	#4 at 12"
84"	107"	6,245 Lb	8"	#4 at 12"
96"	120"	7,855 Lb	8"	#4 at 12"
108"	132"	14,255 Lb	12"	#4 at 8"
120"	148"	17,925 Lb	12"	#4 at 8"

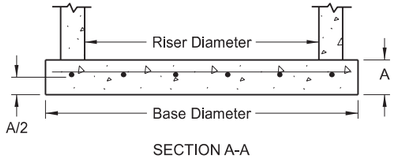
* - Place reinforcement listed in each direction.

NOTES:

1. Use class AE concrete precast or cast-in-place bases constructed in accordance with NDDOT Standard Specifications. Use aggregate size approved by the engineer.
2. Use precast concrete manholes, risers and steps conforming to AASHTO M199.
3. Reinforce precast concrete bases and covers as shown in the table for the corresponding riser diameter.
4. Use Grade 60 reinforcing steel.
5. Cut or Precast manhole riser bottoms square to fit the manhole base. Grout joint between base and riser with cement mortar.
6. The manhole riser length listed in the plans is based on a 7" manhole casting, plus 2 concrete adjusting rings (5"), plus the "T" dimension shown in the Precast Manhole Covers table.
7. Use corrosion resistant manhole steps with a minimum 800 pound vertical load resistance and a minimum 400 pound horizontal pull-out resistance. Use configuration of steps approved by the Engineer.
8. Precast concrete manhole covers shown are designed for an HS-20 wheel load and maximum fill height of 15'-0". Special design is required for heavier wheel loads and/or greater fill heights.
9. Use of other castings, similar in dimension, is allowed if the casting conforms to the manhole cover and has a lid style specified in the plans. Modifications to the manhole cover to facilitate similar castings are only allowed with written approval from the Engineer.
10. Use castings manufactured in accordance with AASHTO M306-09. Use metal conforming to AASHTO M105 Class 35B in the manufacture of castings.
11. Pipe shall be installed to extend a minimum of 2 inches beyond the inside face of the structure wall at each end. Payment will be based on the actual installed length of pipe between structures, measured end-to-end and rounded to the nearest whole foot.

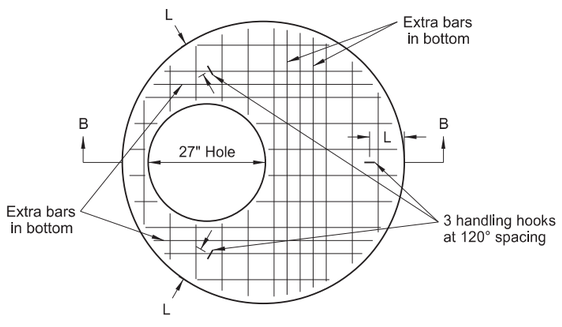


TOP VIEW

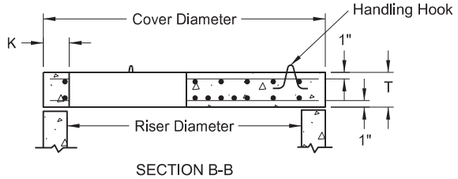


SECTION A-A

PRECAST MANHOLE BASE

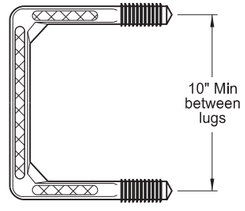


TOP VIEW

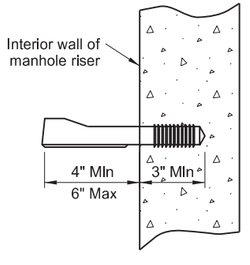


SECTION B-B

PRECAST COVER



TOP VIEW



STEP DETAIL

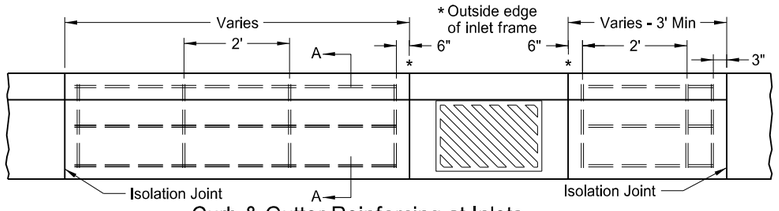
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
05-14-2013	
REVISIONS	
DATE	CHANGE
6-24-14	Revised notes 1 & 6, added dimensions to Elev. drawing.
10-17-17	Updated to active voice.
12-02-20	Updated PE stamp and signature.
07-24-25	Note Revisions

REGISTERED PROFESSIONAL ENGINEER
JASON R. THORENSON
PE - 5048
DATE 07/24/25
NORTH DAKOTA

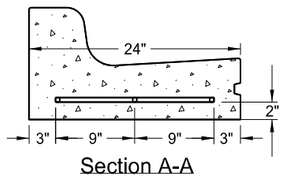
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Curb & Gutter and Valley Gutter

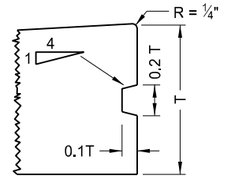
D-748-1



Curb & Gutter Reinforcing at Inlets



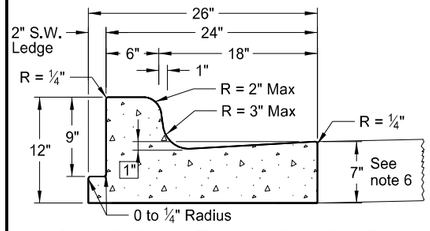
Section A-A



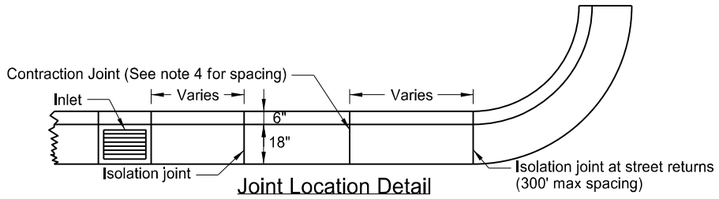
Keyway Detail for Curb & Gutter

(To be used with PCC Pavement and Drives)

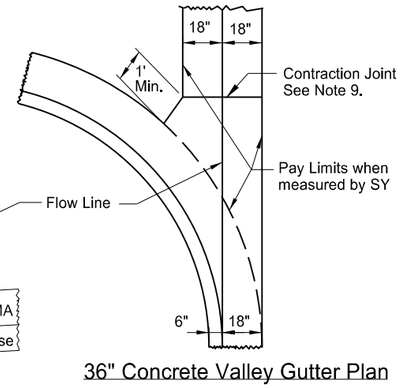
T= Thickness of pavement unless otherwise noted on plans.



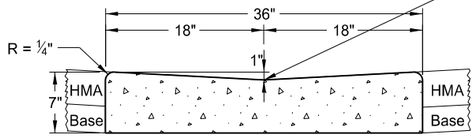
Curb & Gutter Type 1 (Sec. A & B)
Adjacent to Concrete Sidewalk, Median, or Parking Lot. (Sec. A shown. See Sec B for additional details.)



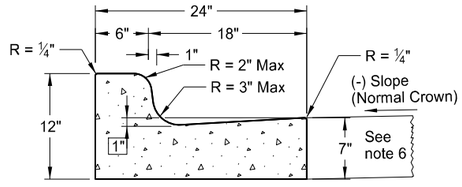
Joint Location Detail



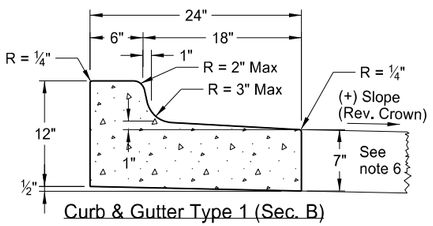
36" Concrete Valley Gutter Plan



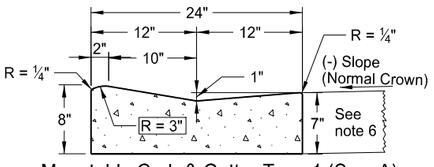
36" Concrete Valley Gutter Detail



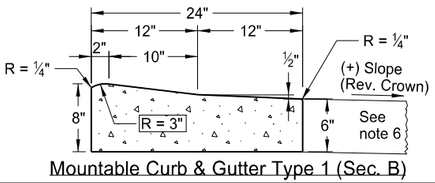
Curb & Gutter Type 1 (Sec. A)



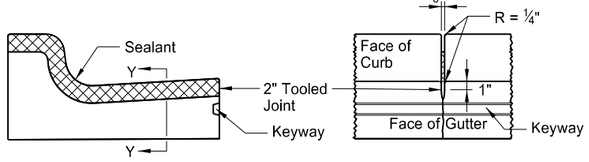
Curb & Gutter Type 1 (Sec. B)



Mountable Curb & Gutter Type 1 (Sec. A)



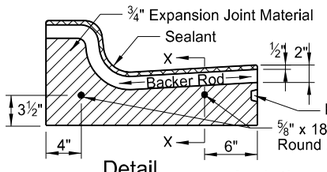
Mountable Curb & Gutter Type 1 (Sec. B)



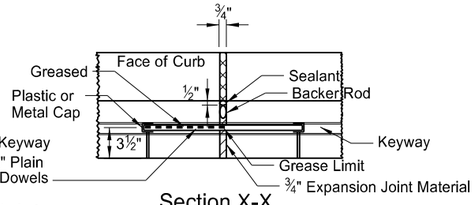
Detail
(10' Max Spacing)

Section Y-Y

Contraction Joint

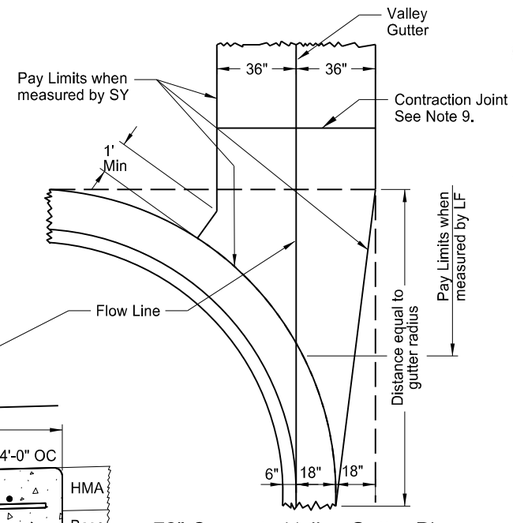


Detail

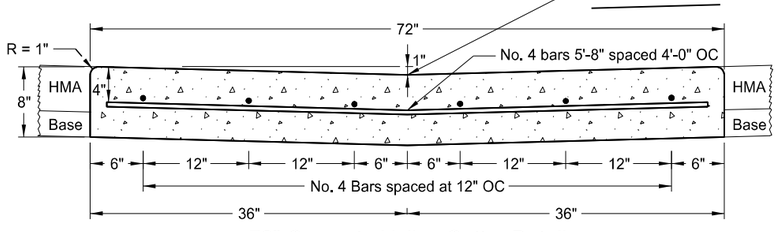


Section X-X

Isolation Joint



72" Concrete Valley Gutter Plan



72" Concrete Valley Gutter Detail

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 material for isolation joints. 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 mix asphalt 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: For contraction joint, use joint sealant 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. Curb & Gutter-Pavement Interface: For hot mix asphalt pavement use gutter depth shown. For PCC pavements, either match gutter depth to adjacent pavement depth or construct gutter depth shown.
7. Tie curb and gutter to abutting PCC pavement with No. 4 bars, 2'-0" in length, spaced at 3'-9" centers for 15' joint spacing (maximum spacing of 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) with an 18" plain round 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.
10. Reinforcing at Inlets: Use #4 deformed reinforcing bars without splices. Include all costs for reinforcing bars at inlets (even inlets located on radii) in the price bid for "Curb & Gutter - Type 1" or "Curb & Gutter Mountable - Type 1." Extend reinforcement to the second joint (with rebar placed through the first joint) in cases where the 3' minimum panel length can't be obtained.

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.
10-30-24	Revised bar size & notes.

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

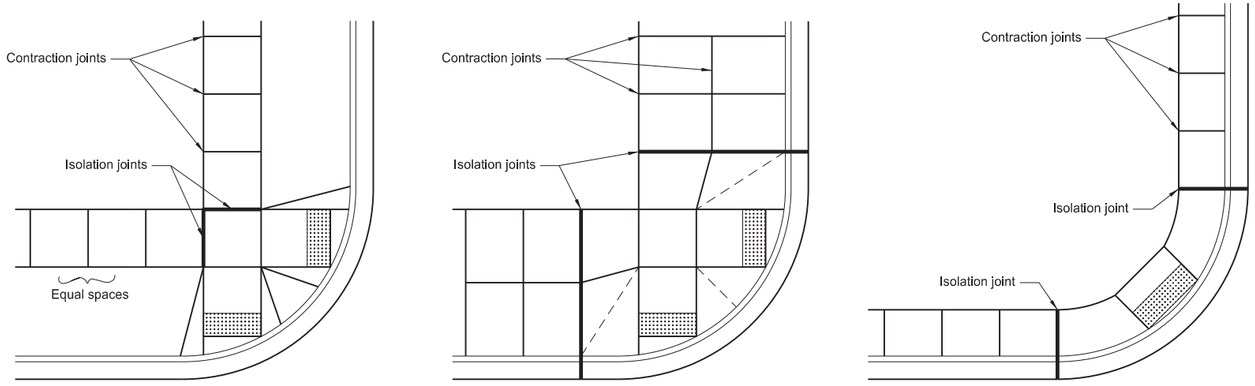
Kirk J Hoff

10/30/24

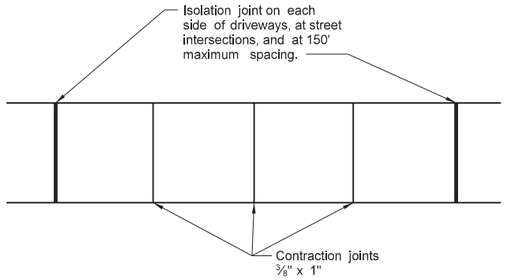
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SIDEWALK

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.

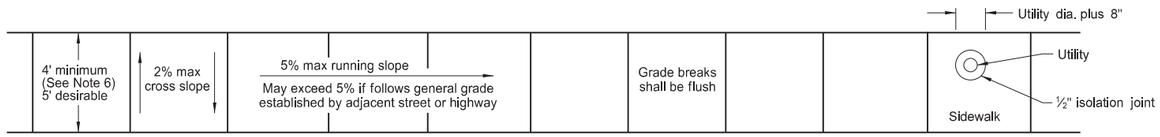
   Saw or groove contraction joints to a minimum depth of 1/3 the depth of the concrete.

   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."

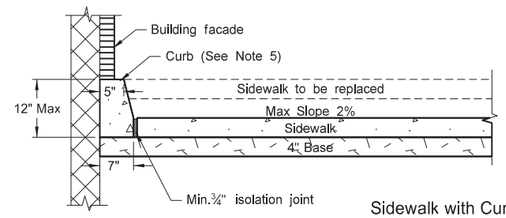
   Modify existing ground slope with landscaping as needed. If not possible, such as adjacent buildings, use a vertical curb as shown in the detail below. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Sidewalk Width & Grade: Provide a continuous 4' min clear 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'.

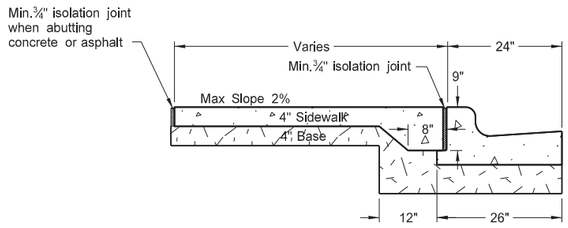


Sidewalk Width and Grade

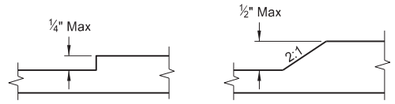
Utility Blockout



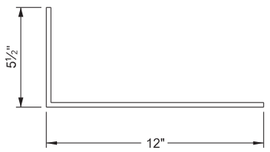
Sidewalk with Curb Detail
(Building face application)



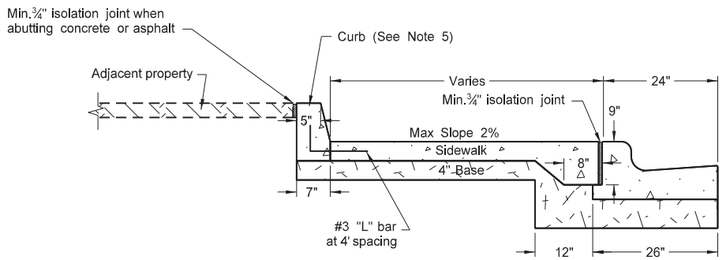
Sidewalk Detail
(Installed adjacent to curb and gutter)



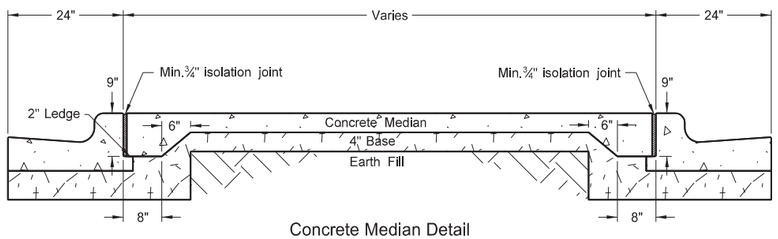
Vertical Discontinuities
(As needed for utility covers, vaults, grating, etc..)



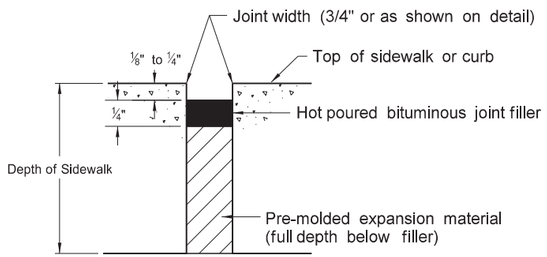
"L"Bar Detail
#3 Bar



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 & grade & passing lane requirements.
08-27-19	New Design Engineer PE Stamp.
08-09-24	Electronic Stamp/Signature.

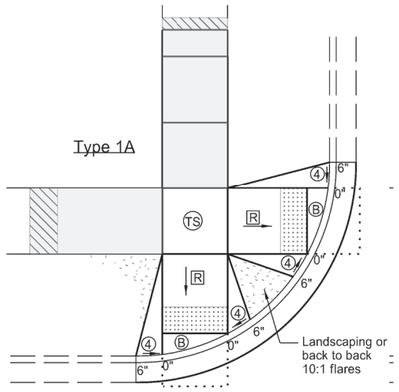
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/09/24

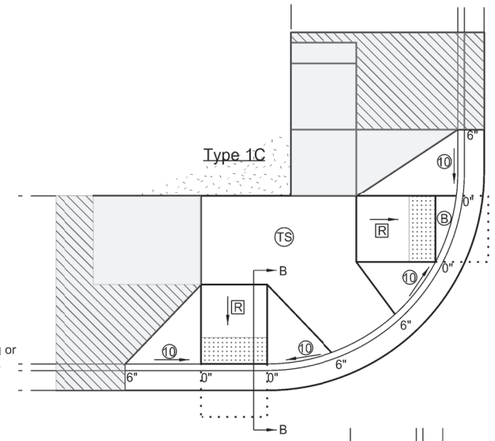
CURB RAMP RETROFIT DETAILS

D-750-3

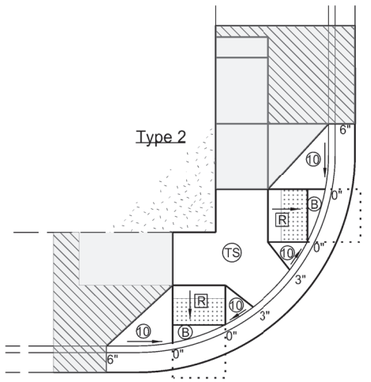
Type 1A



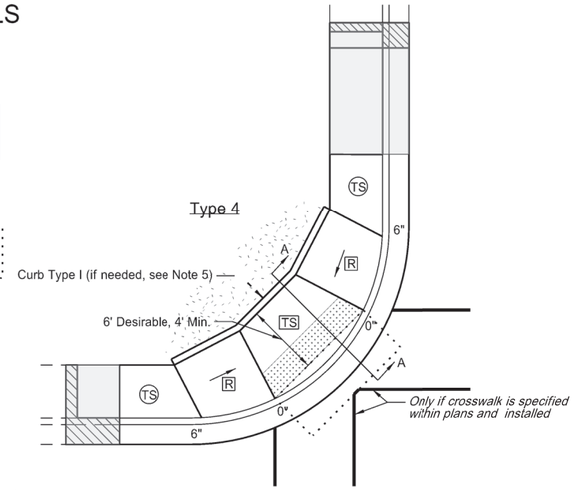
Type 1C



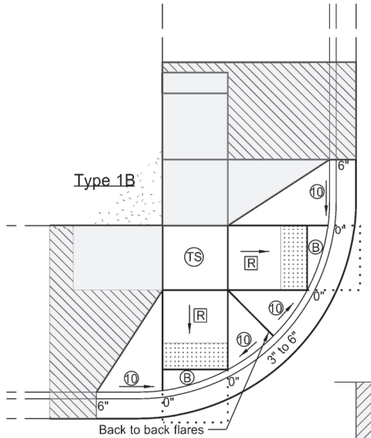
Type 2



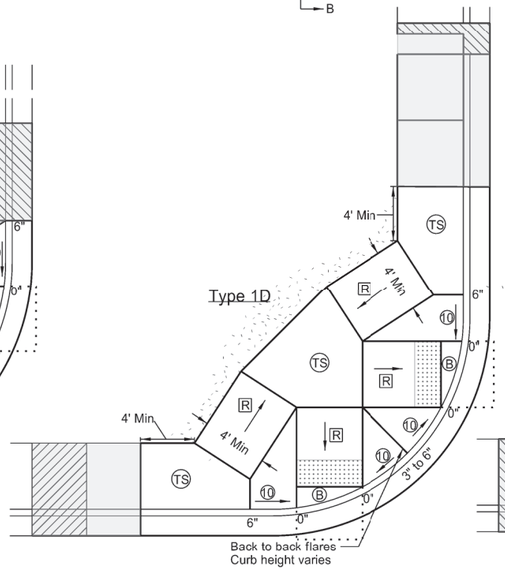
Type 4



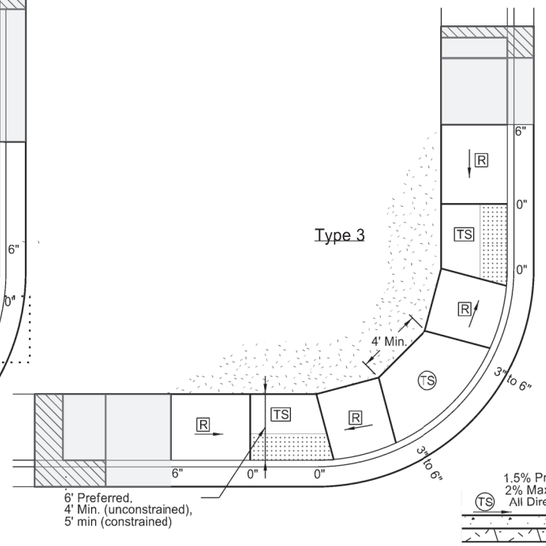
Type 1B



Type 1D



Type 3



5½"
12"
#3 "L" Bar

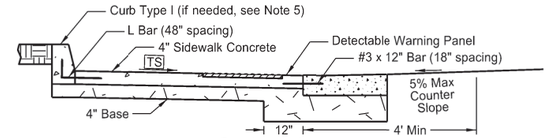
NOTES:

1. Ramp width is the useable portion of the ramp, excluding flares. Match curb ramp width to Existing Pedestrian Facility (EPF) width (4' minimum or 5' for island ramps.) Match ramp width to existing shared use path width. Maximum ramp length is 15'.
2. Provide turning space with desirable 5' x 5' size or larger and minimum 4' x 4' unconstrained size, for any change of direction. Provide landing 5' long x width of path at the bottom and top of parallel ramps and at the top of perpendicular ramps. Turning spaces and Landings may overlap.
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 EPF with 1.5% preferred cross slope and max 2% constructed cross slope.
5. Modify existing ground slope with landscaping, as needed. If not possible, use a vertical curb as detailed on Standard D-750-2. The Engineer will measure curb at the unit price bid for "Curb - Type I" per lineal foot.
6. Islands: If the profile of the island curb ramp is 2% or less, provide a minimum distance of 2' between warning panels. If the profile of the island curb ramp is steeper than 2%, provide a turning space between the ramps.
7. Provide generally planar vertical alignments. Provide grade breaks, perpendicular to the direction of the pedestrian travel, at the top and bottom of curb ramps (1.5% preferred, 2% max constructed cross slope).
8. See Curb Ramp Retrofit Transition Details Standard D-750-4 for additional information. Also See PROWAG for full compliance in the curb ramp area.
9. Grade transitions shall be flush.

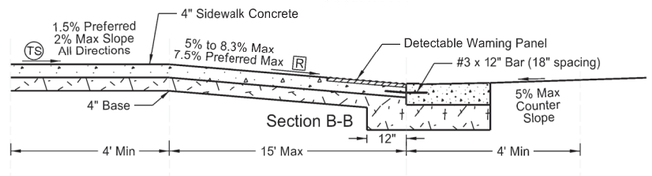
LEGEND:

- : Detectable Warning Panel.
- : Landscaping.
- : Transitional tie-in to nearest joint, if needed.
- : Curb Ramp Retrofit Transitional Area (See Standard Drawing D750-4)
- : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% preferred running and counter slope 5% maximum running and counter slope
- TS : Turning Space Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions.
- R : Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2%.
- B : 1.5% preferred cross slope 2% maximum constructed cross slope running slope consistent with the EPF 4.7% preferred max counter slope 5.0% max constructed counter slope
- 10 : 10:1 maximum constructed slope.
- 4 : 4:1 maximum constructed slope.

0", 3", or 6" : Curb Height.

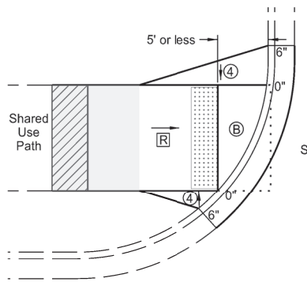


Section A-A



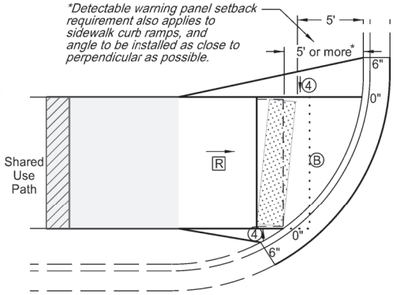
Section B-B

5' or less

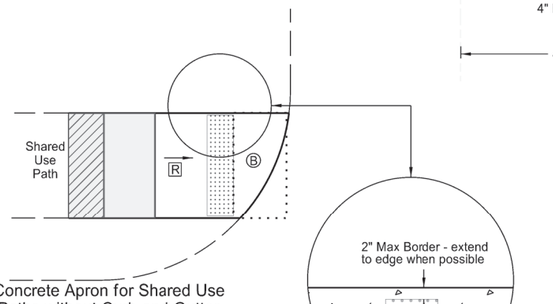


*Detectable warning panel setback requirement also applies to sidewalk curb ramps, and angle to be installed as close to perpendicular as possible.

5' or more*

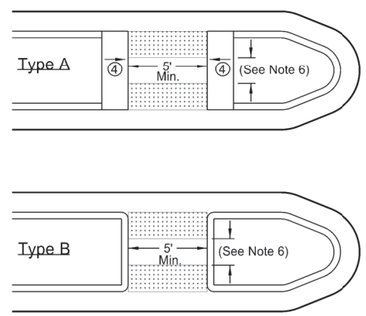


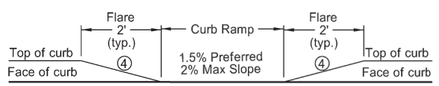
Concrete Apron for Shared Use Paths with Curb and Gutter



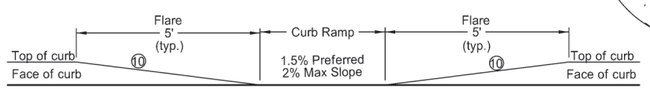
Concrete Apron for Shared Use Paths without Curb and Gutter

Median Refuge Islands (Cut-Through)





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



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

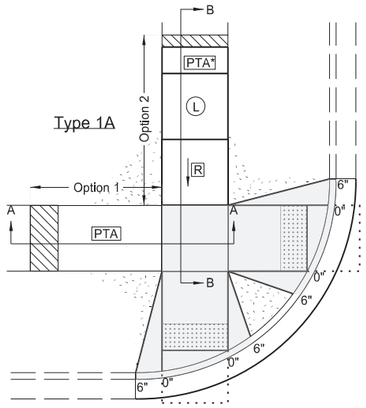
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-26-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
09-05-18	Revised Notes, Revision for Turning Space, Added Passing Space Requirements, Turned Detectable Warning Panel
03-15-21	Slope & other clarifications.
05-19-21	Separate Curb Ramp Transition Area from Curb Ramp area

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NORTH DAKOTA
05 19 2021

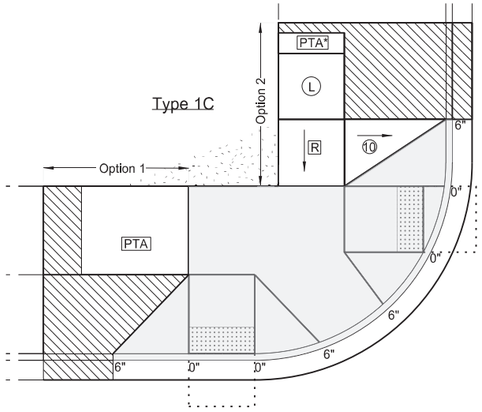
CURB RAMP RETROFIT TRANSITIONAL AREA DETAILS

D-750-4

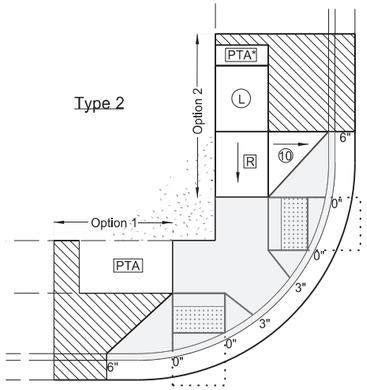
Type 1A



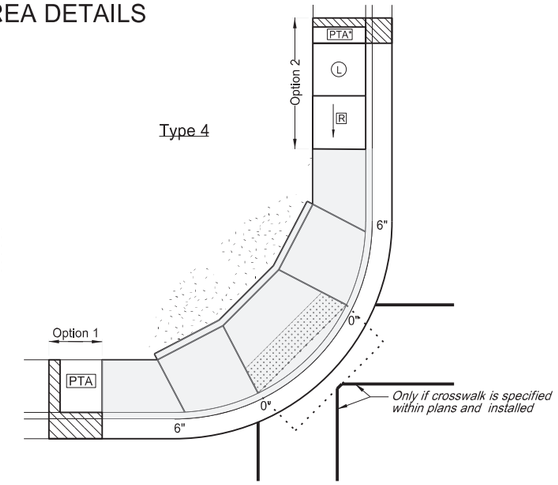
Type 1C



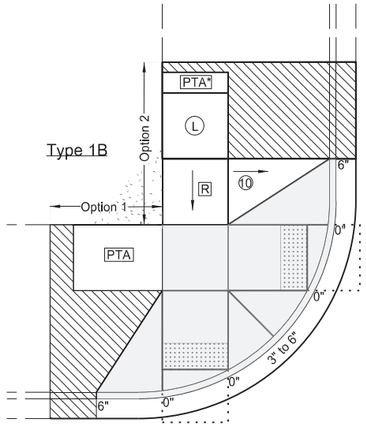
Type 2



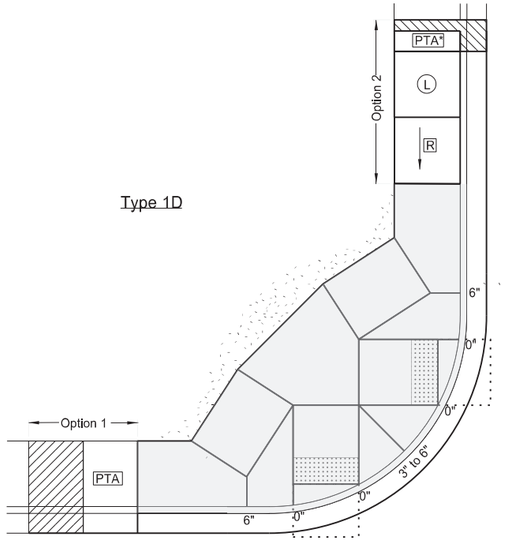
Type 4



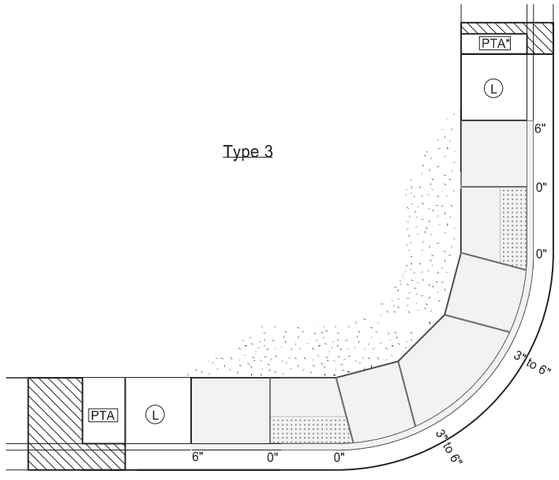
Type 1B

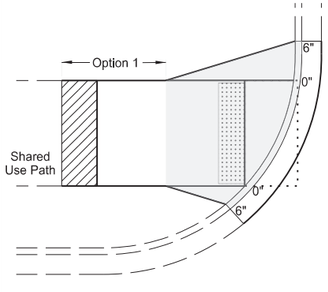


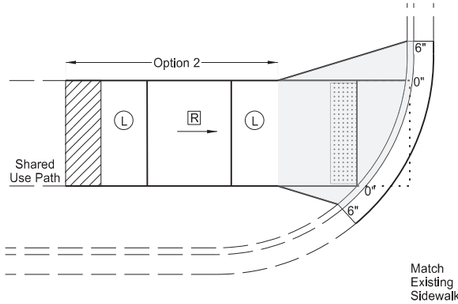
Type 1D



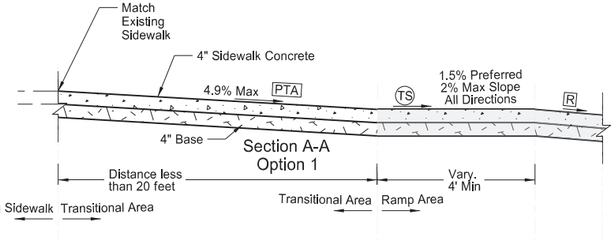
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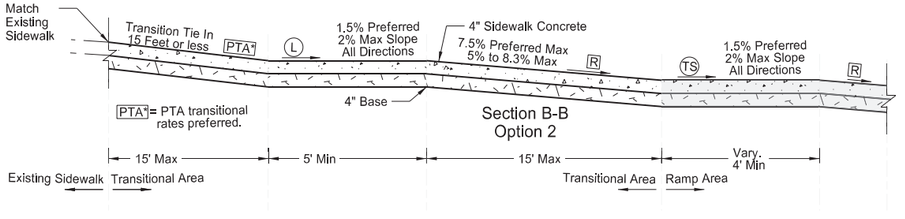






Transition Areas for Shared Use Paths





NOTES:

1. Curb Ramp Transitional Areas are to transition from the Curb Ramp area into the Existing Pedestrian Facility (EPF). Each layout shows example transitions. Use any combination for transitions from the Ramp Area into the EPF that allows for similar or gentler slopes to that of the existing condition, yet transitions in the shortest distance possible. In some cases, if grades allow, the Ramp area can immediately transition into the EPF and no transitional area is needed.
2. Option 1: Use this transition when existing running slope grades are less than 5%. Transition from the ramp area to the EPF using the Pedestrian Access Transition Area (PTA) transition rates and in less than 20 feet.
3. Option 2: Use this transition when existing running slopes are greater than 5% and option 1 is not able to be met.

   Add a ramp and a landing immediately after the ramp area. Then transition from the compliant landing into the EPF using the PTA rates (preferred), or in less than 15 feet (which ever is shorter).
4. Transitional Areas for Shared Use Paths can be concrete or asphalt.
5. See Curb Ramp Retrofit Details Standard D-750-3 for additional information.

LEGEND:

- : Detectable Warning Panel.
- : Landscaping.
- : Transitional tie-in to nearest joint, if needed.
- : Curb Ramp Retrofit Area (See Standard Drawing D750-3)
- : 4' long x width of EPF or 4' minimum Clear space outside traffic lanes of travel. 1.5% preferred cross slope 2% maximum cross slope 4.7% preferred running slope 5% maximum running slope
- PTA : Pedestrian Access Transition Area Running Slope less than 4.9%. Transition Cross Section at 1/2 percent per foot from the from Ramp Area to EPF.
- (L) (TS) : Turning Space/Landing Use at top of ramp or when changing directions. 1.5% preferred slope (2% maximum) all directions.
- R :Preferred Ramp Grade = 5% to 7.5%. Maximum Constructed Grade = 8.3%. Preferred Cross Slope = 1.5%. Maximum Constructed Cross Slope = 2% Maximum Length = 15 feet
- (10) : 10:1 maximum constructed slope.
- (4) : 4:1 maximum constructed slope.

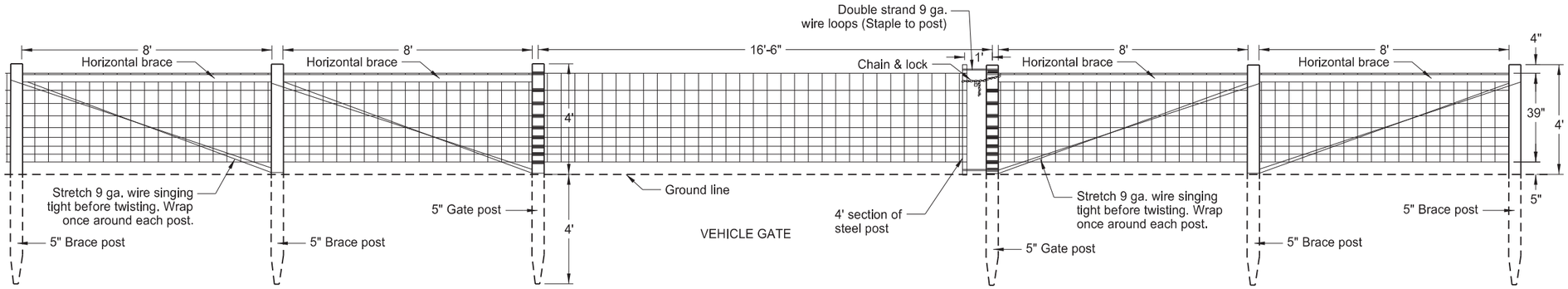
0", 3", or 6" : Curb Height.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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DATE	CHANGE

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ENGINEER
NORTH DAKOTA
05 19 2021

STANDARD WOVEN WIRE FENCE

D-752-3



VEHICLE GATE

NOTES

1. No deduction in measured pay length of woven wire fence for gates, corner assemblies, double brace assemblies or fence terminals.

2. Install double brace assembly at locations shown on the plans or established by the Engineer. Space adjacent fence terminals, corner assemblies or double brace assemblies a maximum of 1320 feet.

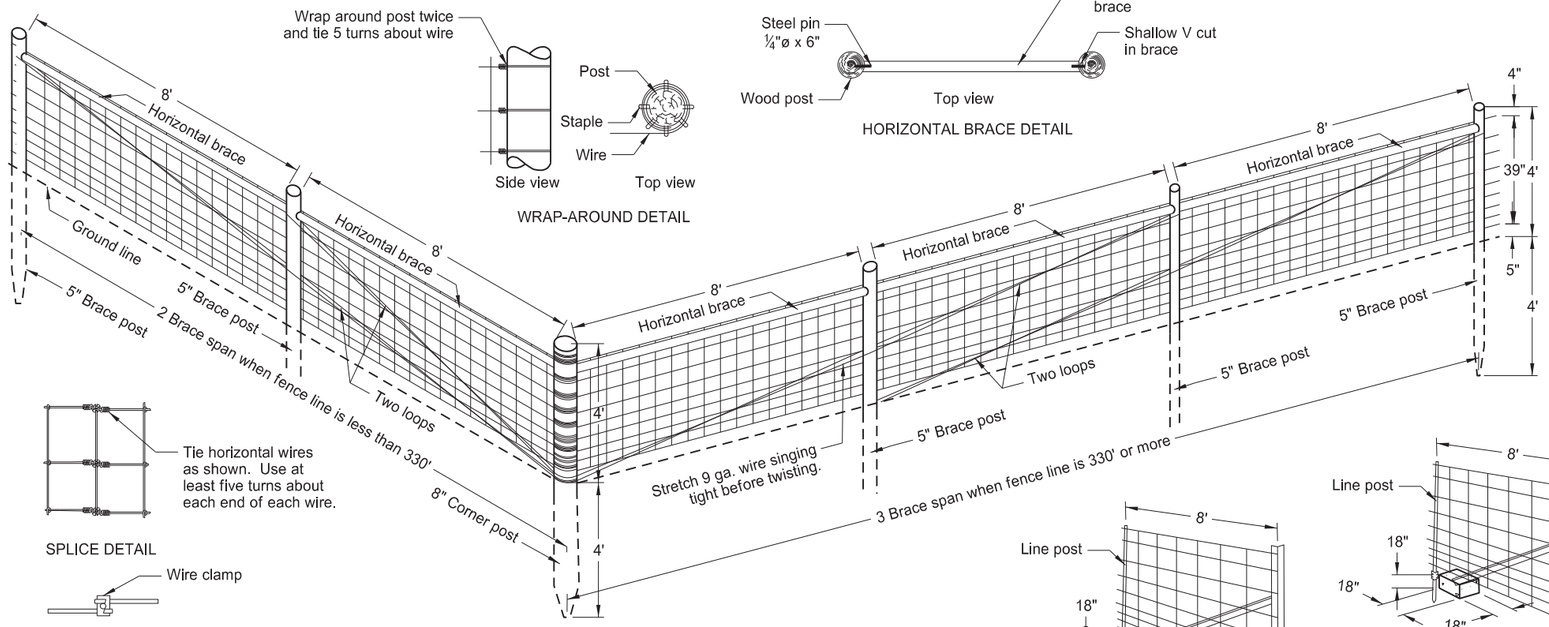
3. Staple the top wire of woven wire fence separately. Staple intermediate wires a maximum spacing of 10" apart. Staple bottom wire.

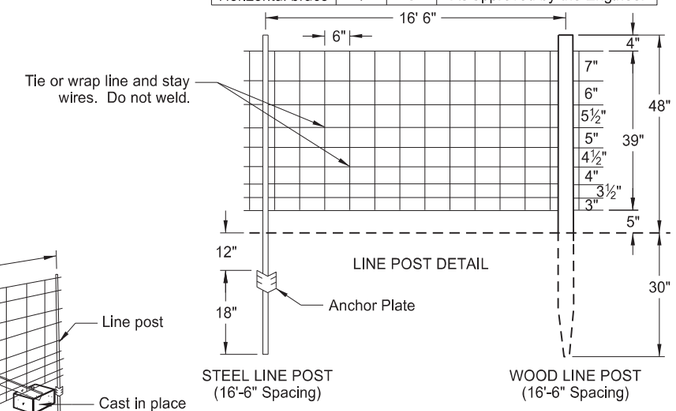
4. If in the opinion of the Engineer the change in grade is so sharp that woven wire will not conform to the grade, install a double brace.

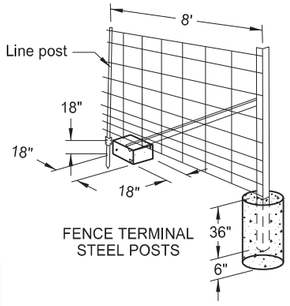
5. Determine post type used, either wood or steel, unless otherwise specified in the plans.

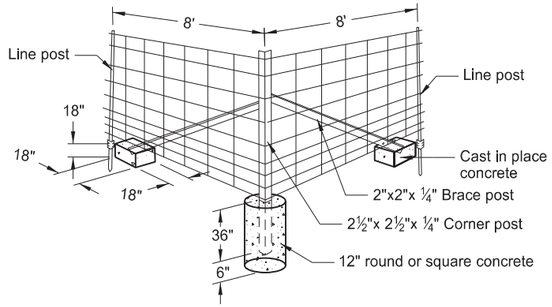
6. Include the cost of bracing at vehicle gates in the price bid for "Vehicle Gate."

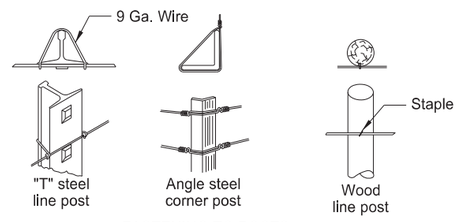
POST SIZES					
USE OF POST	Treated wood		Steel		
	Post dia.	Post length	Post length	Post wt. Lbs/Ft	Anchor wt. Lbs
Line post	3½"	6'-6"	6'-6"	1.33	0.67
Corner post	8"	8'	7'	4.10	(Conc.)
End post	5"	8'			
Brace post	5"	8'	7'	3.19	(Conc.)
Gate post	5"	8'			
Horizontal brace	4"	8'	As approved by the Engineer		

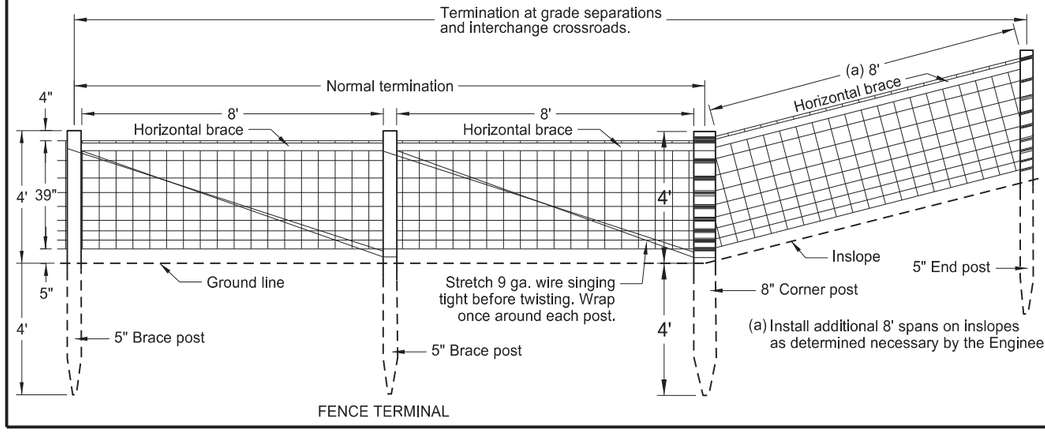


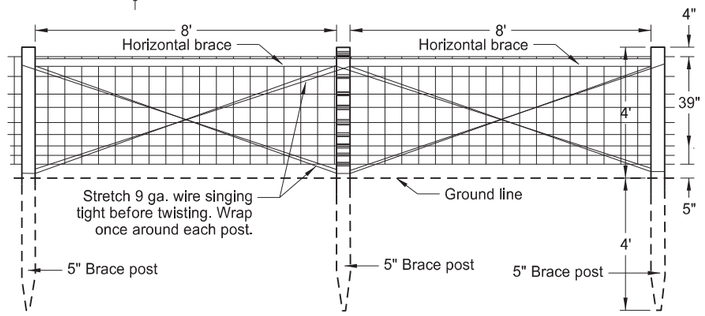












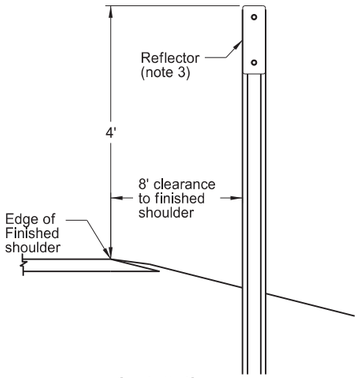
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-02-12	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
02-09-23	Revised post spacing & brace size

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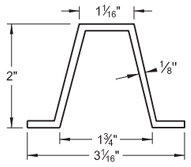
02/09/23

REFLECTORIZED DELINEATORS - TWO-LANE TWO-WAY HIGHWAY

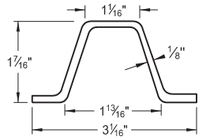
D-754-21B



Installation
(Type A and C)



Aluminum Post Detail
Approx. 0.88 lbs/ft



Steel Post Detail
Approx. 2.0 lbs/ft

Delineator Details

Type A and C

Installation: Install posts along the right shoulder line, in the direction of travel, unless shown otherwise on the plans.

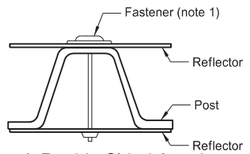
Reflectors: Use reflector of the same color as the adjacent pavement marking with a 0.080 inch minimum thickness sign backing material.

(1) Use fasteners that are a minimum ¼" diameter. Use double headed rivet or other non-rust vandal resistant fastener.

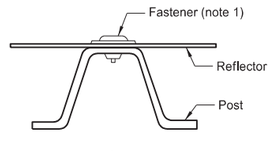
(2) Drill only those holes required to attach the number of reflectors on that post, or drill all the posts the same so that any number of reflectors may be added.

(3) Mount reflector facing traffic at an angle of 90° away from oncoming traffic.

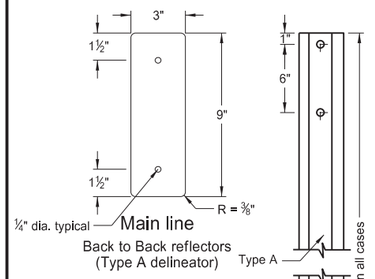
(4) Include all costs for materials, labor, and equipment to install double sided type A delineators in the unit price bid for "Delineators-Type A-Double Sided." Include all costs for materials, labor, and equipment to install type C delineators in the unit price bid for "Delineators-Type C."



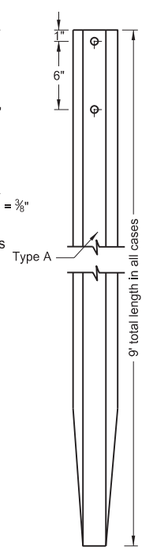
Delineators-Type A-Double Sided Attachment Detail



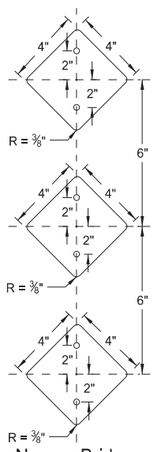
Delineators-Type C Attachment Detail



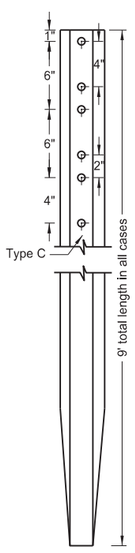
Back to Back reflectors
(Type A delineator)



U-type Post
(Delineators-Type A-Double Sided)



Narrow Bridges
Three reflectors
(Type C delineator)



U-type Post
(Delineators-Type C)

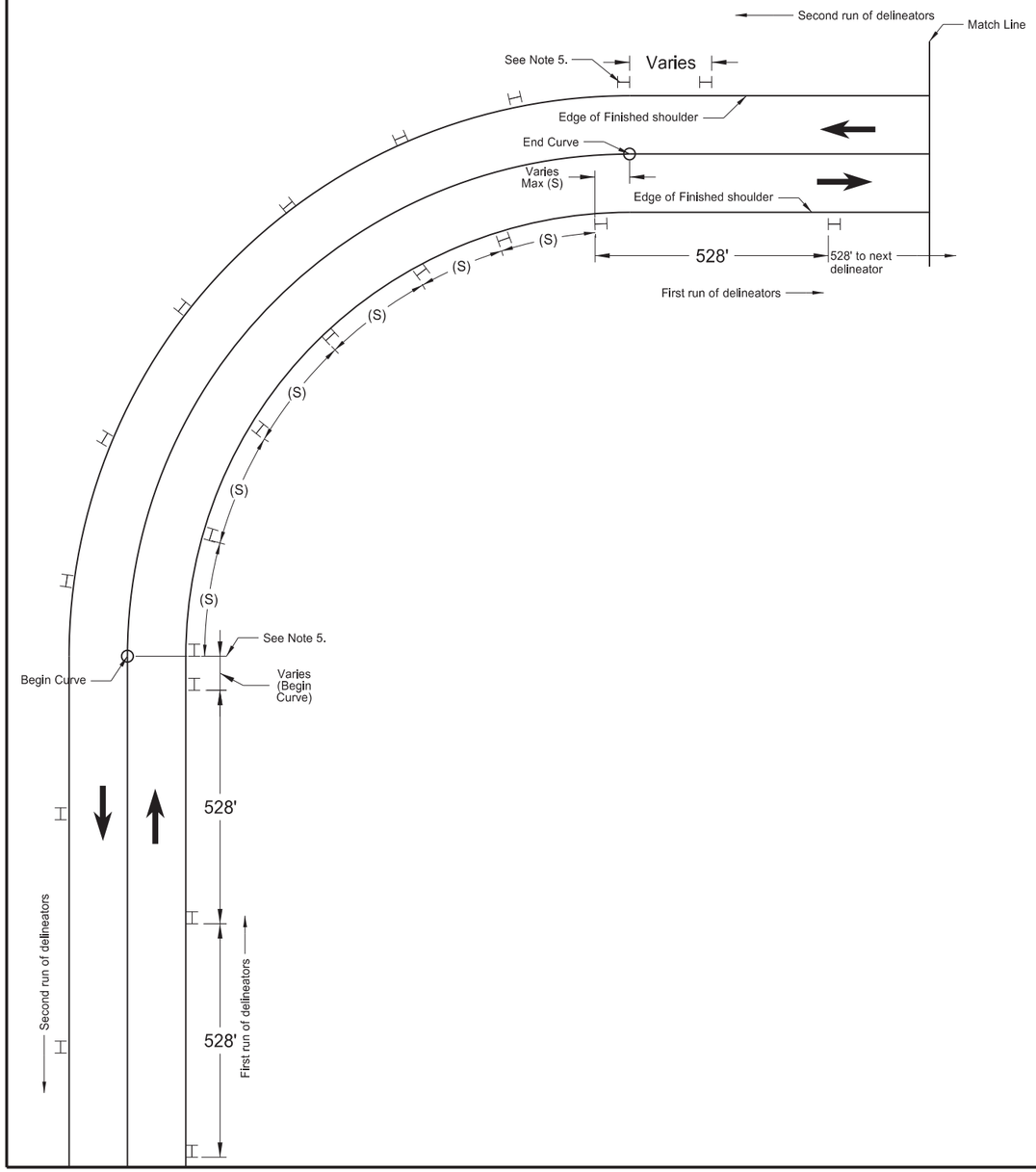
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12/16/22	
REVISIONS	
DATE	CHANGE

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PE-4683
ENGINEER
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12/16/22

TYPE A REFLECTORIZED DELINEATOR SPACING - TWO-LANE TWO-WAY HIGHWAY

D-754-21C



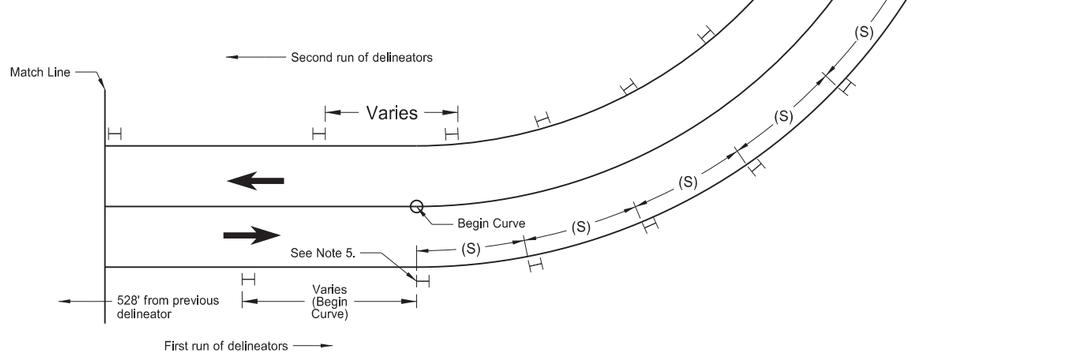
Spacing:

Curve Radius	Spacing (S) on Center
R > 11,500'	528'
11,500' ≥ R > 1,200'	264'
1,200' ≥ R	See table below

Radius (R) of Curve	Approx. Spacing (S) on Curve
1,200' ≥ R > 1,000'	90'
1,000' ≥ R > 800'	80'
800' ≥ R > 500'	65'
500' ≥ R > 300'	50'
300' ≥ R > 180'	35'
180' ≥ R > 50'	20'

Notes:

1. Do not place delineators within 100' of a railroad crossing. Shift delineators in either direction to minimize impact to uniform spacing. Reestablish uniform spacing based on the last delineator location.
2. For delineators that land within approaches, shift delineators in either direction a distance not exceeding ¼ of the uniform spacing. Eliminate delineators that still fall within approaches.
3. Eliminate delineators landing within guardrail. Reestablish uniform spacing based on last delineator.
4. Do not place delineators within ¼ of the uniform spacing of a reference point marker. Adjust the delineators on the opposite side to maintain an even spacing between opposing sides.
5. Install Type A delineators at the start of each curve in the adjacent lane's direction of travel.
6. Place the second run of delineators on the opposite side of the road midpoint between delineators placed during the first run.
7. Discontinue delineators on outside of curve where chevrons exist. Place delineators on inside of curve, at those locations, as provided on basis of estimate.



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-16-22	
REVISIONS	
DATE	CHANGE

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

12/16/22

DocuSign Envelope ID: 3BB6949C-35F3-4834-B8EF-90A4185B6E25

PERFORATED TUBE ASSEMBLY DETAILS

D-754-23

Notes:

1. Curbed Roadways: Use a 3' clearance from face of the curb except where right of way or sidewalk width is limited; Use a minimum 2' clearance. Increase the horizontal clearance if required to maintain a minimum sidewalk clear width of 4' from the sign support, not including any attached curb.

2. Minimum vertical clearance: Provide at least 5' measured from the bottom of the sign to the edge of the driving lane or auxiliary lane at the side of the road in rural districts. Provide at least 7' clearance to the bottom of the sign, where parking or pedestrian movements occur.

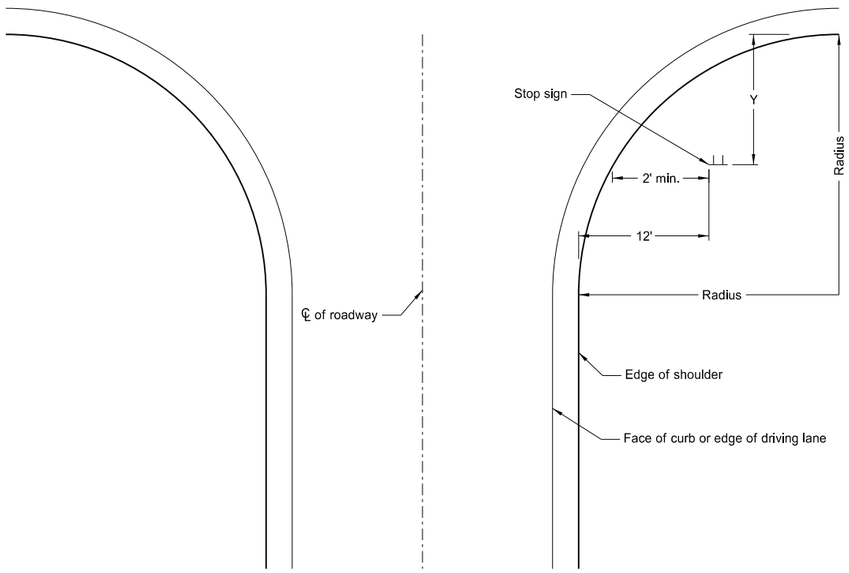
   Install signs on expressways a minimum height of 7'.

   Install adopt-a-highway signs on Freeways at least 7' above the edge of the driving lane.

   Maximum vertical clearance is 6" greater than the minimum vertical clearance.

3. Offset signs: Use a vertical clearance of 5' above the edge of the driving lane for signs placed 30 feet or more from the edge of the traveled way.

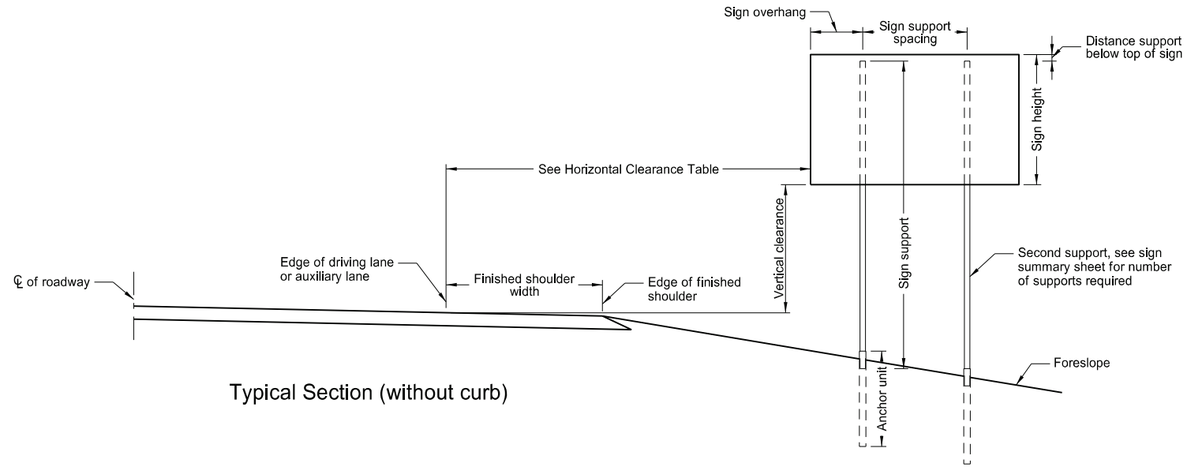
4. Provide a horizontal clearance from edge of shared use path to edge of sign of 3', except where width is limited. Provide a minimum clearance of 2'.



Stop Sign Location
Wide Throat Intersection

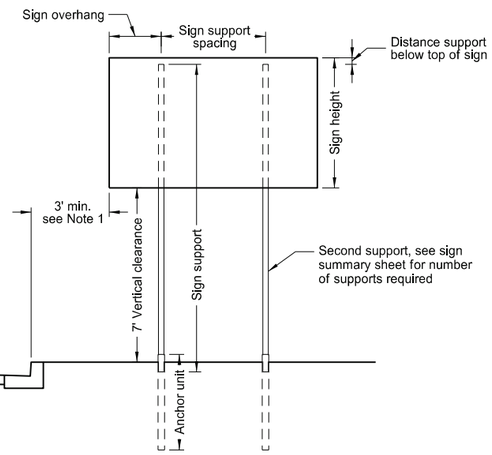
Use layout for the placement of "Stop" signs.

Radius ft.	Y-max. ft.	Y-min. ft.
40	50	15
45	50	18
50	50	21
55	50	25
60	50	28
65	50	32
70	50	35
75	50	39
80	50	43



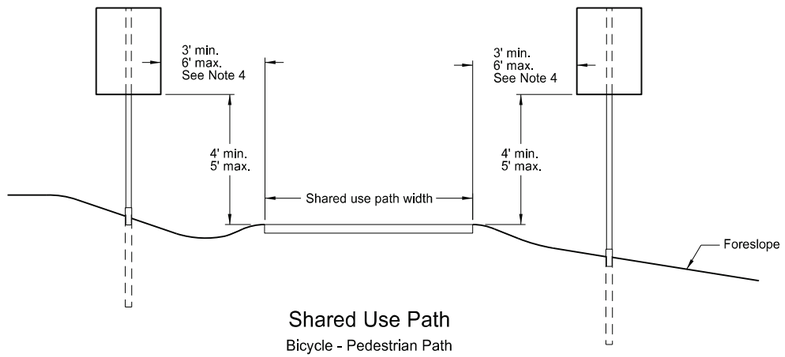
Typical Section (without curb)

Horizontal Clearance Table	
Shoulder Width ft	Offset ft
0 to 2	16
>2 to 4	18
>4 to 6	20
>6 to 8	22
>8 to 10	24



Typical Section (with curb)

Residential or Business District



Shared Use Path

Bicycle - Pedestrian Path

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
7-8-14	Revised note 2, added note 4.
8-30-18	Updated notes to active voice.
8-29-19	New Design Engineer PE Stamp.
8-05-24	Electronic Stamp/Signature.

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

Kirk J. Hoff

08/05/24

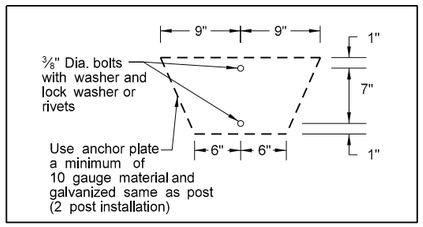
DocuSign Envelope ID: 3BB6949C-35F3-4834-B8EF-90A4185B6E25

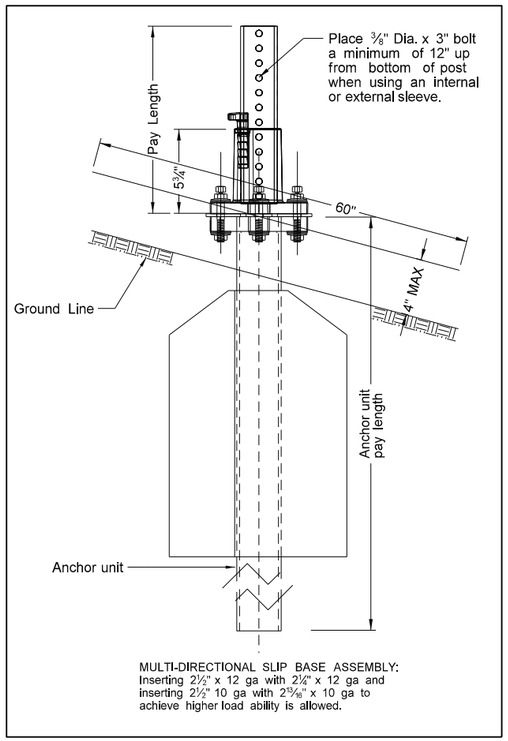
Mounting Details Perforated Tube

D-754-24

Number of Posts	Telescoping Perforated Tube: Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thick-ness Gauge
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2½(D)	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2½(D)	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2½(D)	12	Yes		7
3 & 4	2½	10	2 3/16	10	Yes		7

(B) - Provide a shim as specified by the manufacturer when placing 2½", 12 gauge posts in standard soils without breakaway bases. Provide breakaway base when placing the support in weak soils. The Engineer will determine if the soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
(C) - 3" anchor unit
(D) - 2½" x 12 ga. x 18" minimum length external sleeve required.

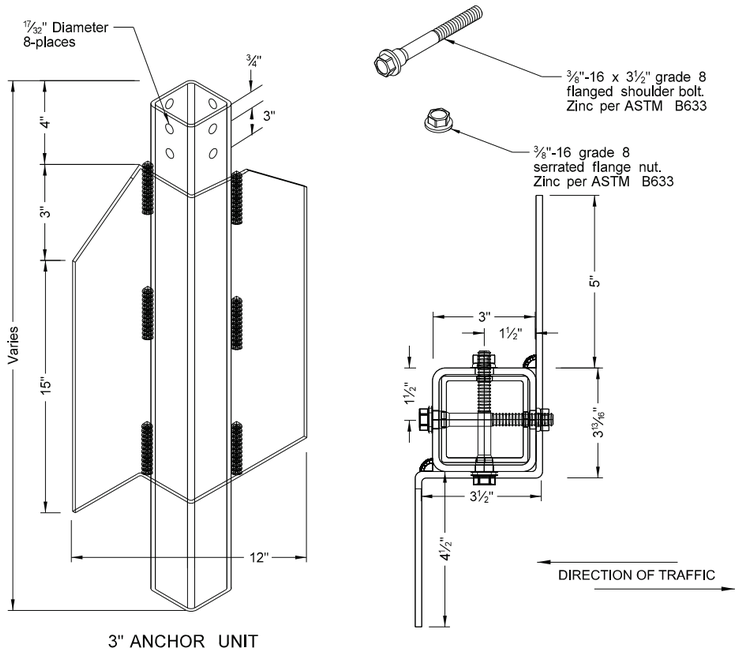




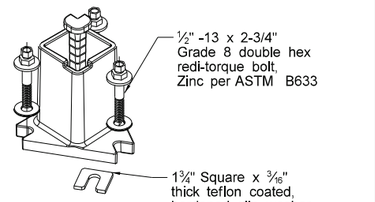
MULTI-DIRECTIONAL SLIP BASE ASSEMBLY:
Inserting 2½" x 12 ga with 2¼" x 12 ga and inserting 2½" 10 ga with 2 15/16" x 10 ga to achieve higher load ability is allowed.

SHOULDER BOLT

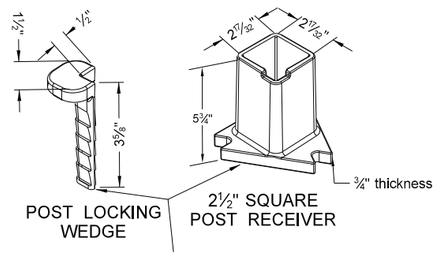
Shimming agent to reduce tolerance between 3" anchor unit and 2½" post.
(use standard ⅜" diameter grade 8 bolt with proper shim)

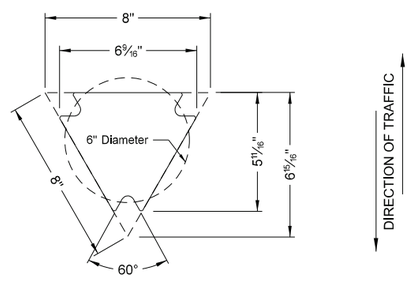


3" ANCHOR UNIT



SLIP BASE FOR 2½" POST





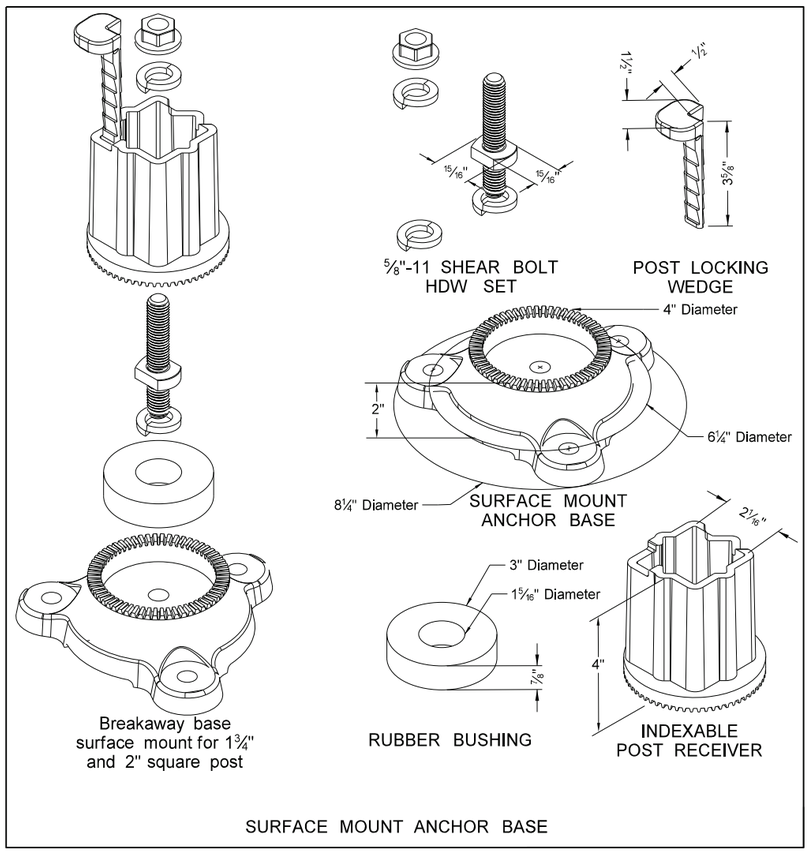
SLIP BASE DETAIL

Properties of Telescoping Perforated Tubes: Tube Size In.	Wall Thickness in.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia In.⁴	Cross Sect. Area In.²	Section Modulud In.³
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.783

The 2 3/16" size 10 gauge is shown as 2.19" size on the plans; The 2½" size is shown as 2.51" size on the plans.

NOTE:

1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.
2. Provide 7 guage HRPO commmercial quality ASTM A569 and 3" x 3" x 7" guage ASTM A500 grade B anchor material with 43.9 KSI yield strength and 59.3 KSI tensile strength. Hot dip galvanize anchor per ASTM A123/153. Tolerances on anchor unit and slip base bottom assembly are +/- 0.005" unless otherwise noted.
3. Eliminate wings when anchor is used in concrete sidewalk.
4. Provide a minimum 8' distance between the first and fourth post on four post signs.
5. Install in accordance with manufacturers recommendation.
6. Use a minimum ½" diameter x 4" grade 8 concrete fastener for surface mount breakaway base.



SURFACE MOUNT ANCHOR BASE

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

8-6-09

REVISIONS

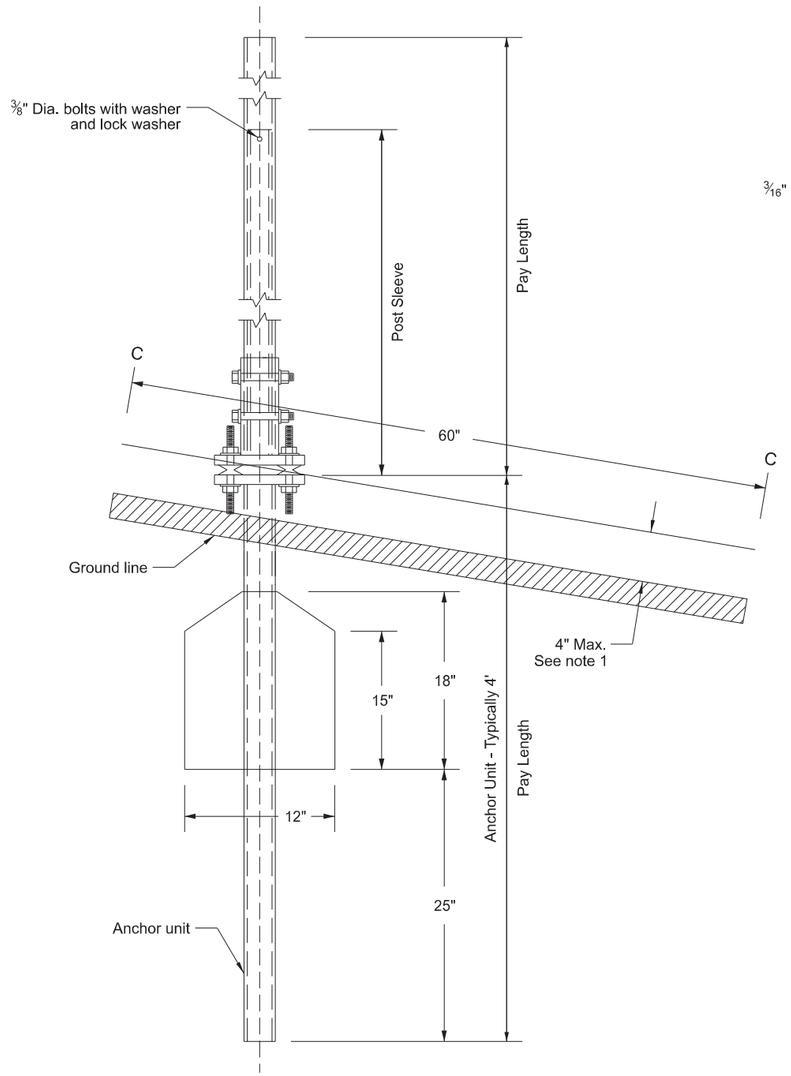
DATE	CHANGE
8-30-18	Updated notes to active voice & corrected max height of base.
8-29-19	New Design Engineer PE Stamp.
8-05-24	Electronic Stamp/Signature.

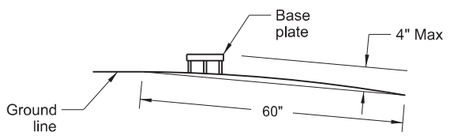
KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 ENGINEER NORTH DAKOTA

08/05/24

Docusign Envelope ID: B2017174-2071-4D82-BD09-F2B4B86DFDCB

D-754-24A

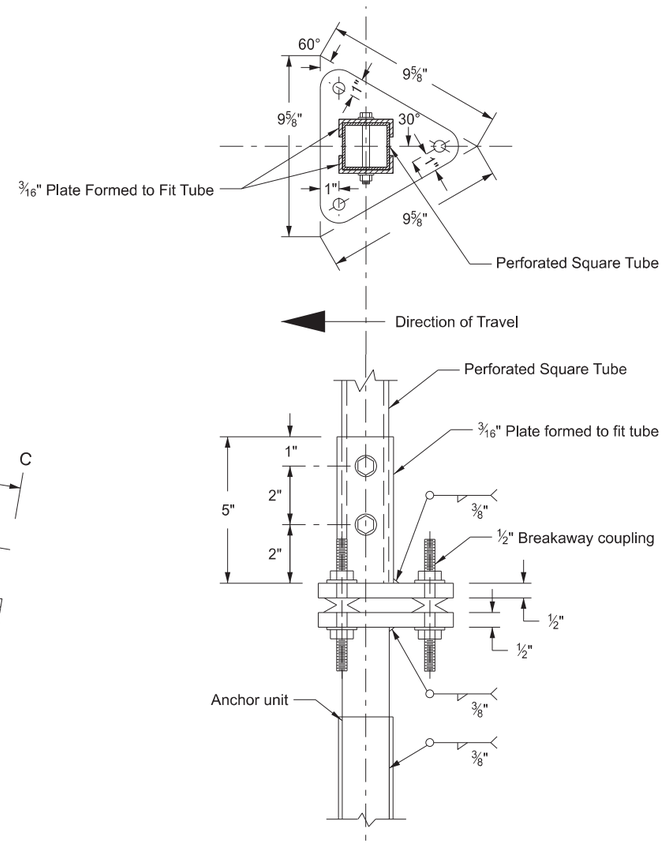




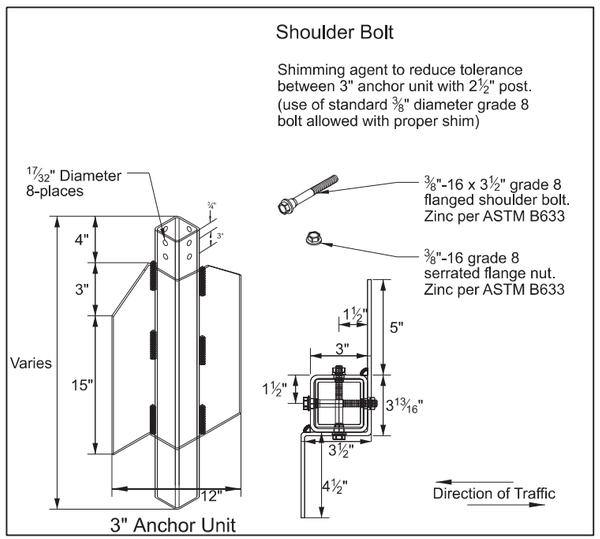
Section C-C

Max projection of the stub post is 4" above a 60" chord aligned radially to the center line of the highway and connecting any point, within the length of the chord, on the ground surface on one side of the support to a point in the ground surface on the other side.

Breakaway Coupler System for Perforated Tubes



Base Plate with Breakaway Coupler



3" Anchor Unit

Notes:

1. 4" Vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.
2. Use anchor unit of the same size and specification as the post.
3. Provide a minimum 8' distance between the first and fourth post on four post signs.
4. Use the breakaway base system on standard D-754-24 or the breakaway coupling system manufactured from material meeting the requirements of ASTM A325 fasteners with the special requirements specified by DENT BREAKAWAY IND., INC. which meets the test requirements of NCHRP Report 350.

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thickness Guage
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2	12	Yes		7
3 & 4	2½	10	2 3/16	10	Yes		7

(B) - 2½" 12 gauge posts do not need breakaway bases unless support is placed in boggy, wet, or loose soil areas.

(C) - 3" anchor unit

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

10-3-2013

REVISIONS

DATE	CHANGE
08-30-18	Updated notes to active voice.
08-30-19	New Design Engr PE Stamp.
08-05-24	Electronic Stamp/Signature.
07-22-25	Corrected "typo" in C-C note.

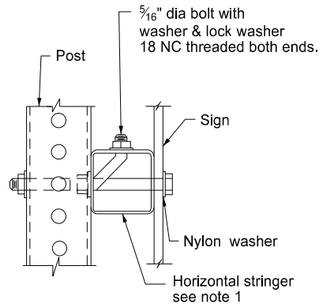
KIRK J. HOFFT REGISTERED PROFESSIONAL PE-4683 ENGINEER NORTH DAKOTA

07/22/25

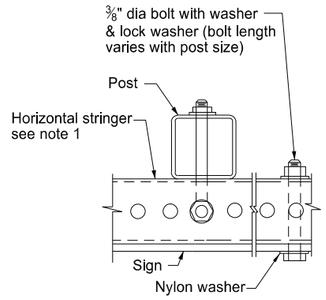
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Mounting Details Perforated Tube

D-754-25

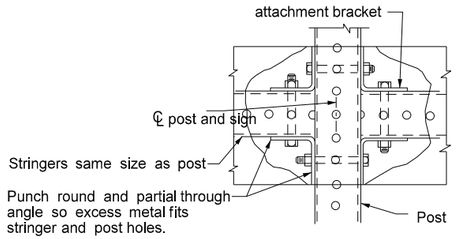


Side View



Top View

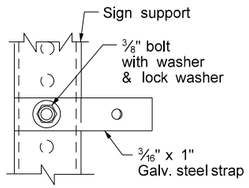
STRINGER MOUNTING
(WITH STRINGER IN FRONT OF POST)



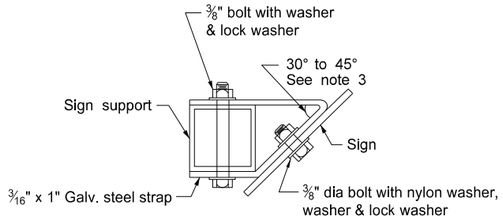
STREET NAME SIGNS AND ONE WAY SIGNS
SINGLE POST ASSEMBLY
ONE STRINGER OR BACK TO BACK MOUNTING

Note:

1. Horizontal stringers - Use perforated tubes or 1¾" x 3/16" thick, 1.08 lbs./ft aluminum or 3.16 lbs./ft steel z bar stringers.
2. Use minimum outside diameter 15/16" ±1/16" and 10 gauge thick metal washers on sign face.
3. Place No Parking signs with directional arrows at a 30 to 45 degree angle with the line of traffic flow. Turning the support to the correct angle for No Parking signs requiring the above angles is allowed. If the No Parking sign is placed with another sign that requires placement at a 90 degree angle with the line of traffic flow, use the detailed angle strap to mount the No Parking sign. Use flat washers and lock washers with all nylon washers.
4. Punching the sign backing and placing the bolt through the sign, the stringer and the post is allowed in lieu of using the bent bolt to attach the post to the stringer.
5. 4" vertical clearance of anchor or breakaway base. The 4" x 60" measurement is above and below post location and also back and ahead of post.

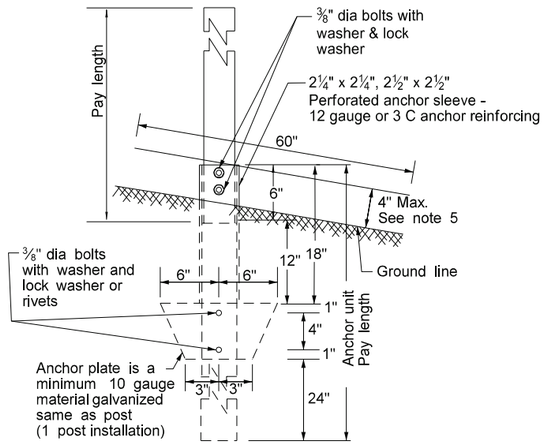


Side View



Top View

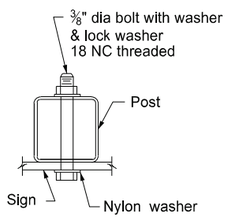
STRAP DETAIL



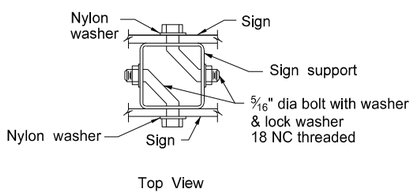
ANCHOR UNIT AND POST ASSEMBLY

Number of Posts	Telescoping Perforated Tube						
	Post Size In.	Wall Thick-ness Gauge	Sleeve Size In.	Wall Thick-ness Gauge	Slip Base	Anchor Size Without Slip Base In.	Anchor Wall Thick-ness Gauge
1	2	12			No	2¼	12
1	2¼	12			No	2½	12
1	2½	12			(B)	3(C)	7
1	2½	10			Yes		7
1	2¼	12	2½(D)	12	Yes		7
1	2½	12	2¼	12	Yes		7
2	2½	10			Yes		7
2	2¼	12	2½(D)	12	Yes		7
2	2½	12	2¼	12	Yes		7
3 & 4	2½	12			Yes		7
3 & 4	2½	10			Yes		7
3 & 4	2½	12	2¼	12	Yes		7
3 & 4	2¼	12	2½(D)	12	Yes		7
3 & 4	2½	10	2 3/16	10	Yes		7

(B) - When placing 2½", 12 gauge posts in standard soils without breakaway bases, provide a shim as specified by the manufacturer. Provide breakaway base when placing the support in weak soils. Engineer will determine if soils are weak. Weak soils are classified as boggy, wet, or loose soil areas.
(C) - 3" anchor unit
(D) - 2½" x 12 ga. x 18" minimum length external sleeve required.

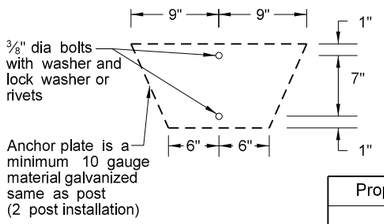


BOLT MOUNTING



Top View

BACK TO BACK MOUNTING



Properties of Telescoping Perforated Tubes							
Tube Size In.	Wall Thickness In.	U.S. Standard Gauge	Weight Per Foot Lbs.	Moment of Inertia $In.^4$	Cross Sect. area $In.^2$	Section Modulus $In.^3$
1½ x 1½	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2¼ x 2¼	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2½ x 2½	0.105	12	3.141	0.804	0.803	0.643
2½ x 2½	0.135	10	4.006	0.979	1.010	0.783

The 2 3/16" size 10 gauge is shown as 2.19" size on the plans.
The 2½" size is shown as 2.51" size on the plans.

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

8-6-09

REVISIONS

DATE	CHANGE
7-8-14	Revised Note 3.
8-30-18	Updated notes to active voice.
8-30-19	New Design Engr PE Stamp.
8-05-24	Electronic Stamp/Signature.

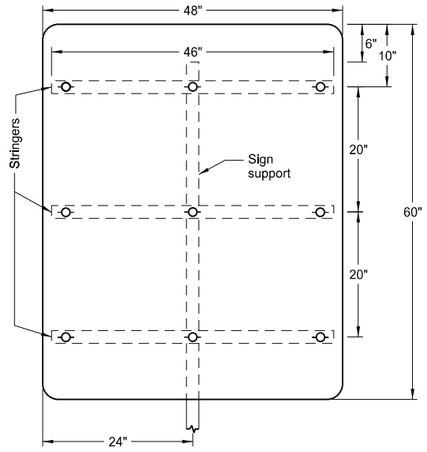
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/05/24

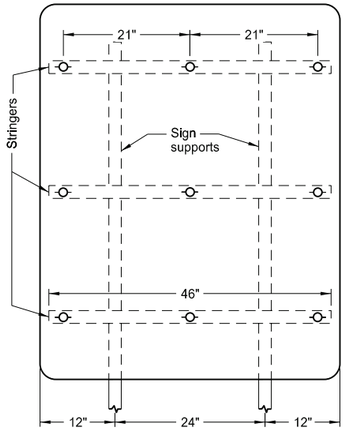
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS REGULATORY, WARNING AND GUIDE SIGNS

D-754-28

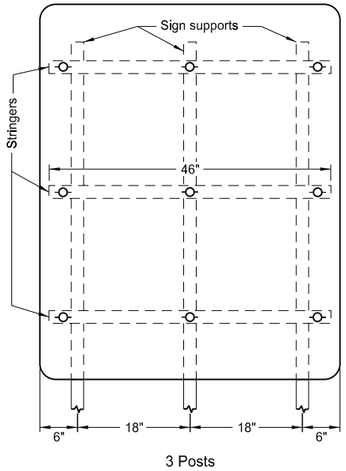


1 Post

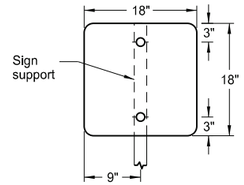


2 Posts

Assembly No. 12

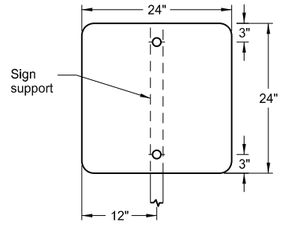


3 Posts

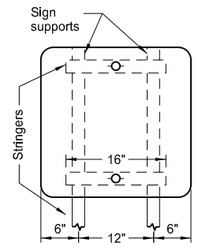


1 Post

Assembly No. 13

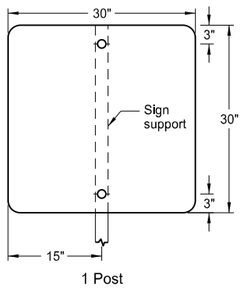


1 Post

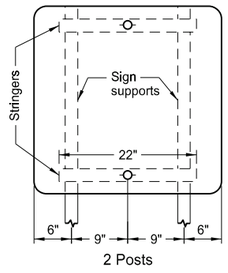


2 Posts

Assembly No. 14

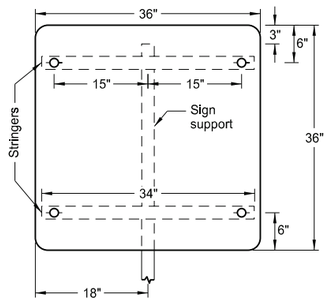


1 Post

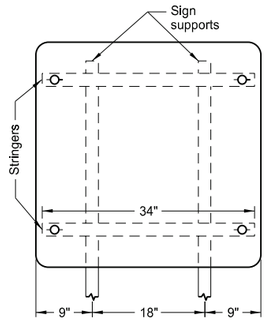


2 Posts

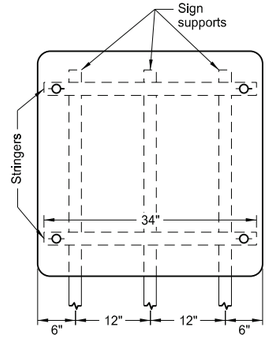
Assembly No. 15



1 Post

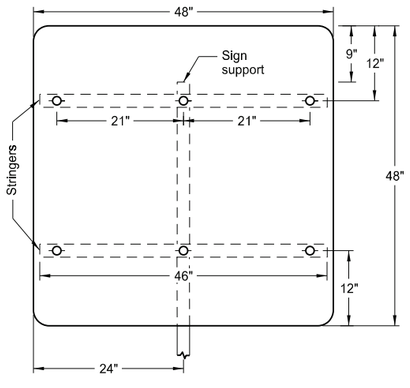


2 Posts

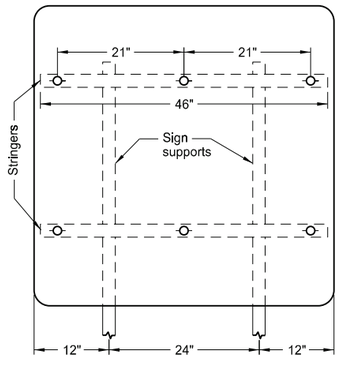


3 Posts

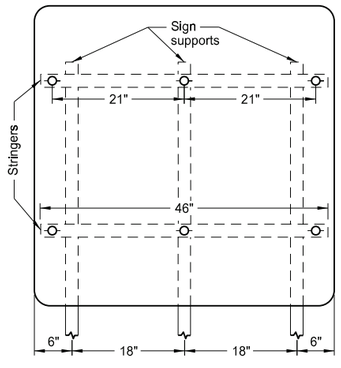
Assembly No. 16



1 Post



2 Posts



3 Posts

Assembly No. 17

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18	Updated to active voice & changed Assembly 16 post spacing.
8-30-19	New Design Engineer PE Stamp.
8-06-24	Electronic Stamp/Signature.

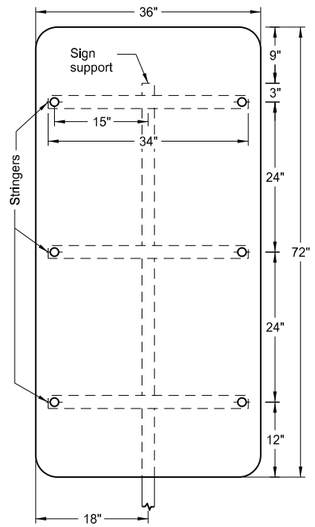
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/06/24

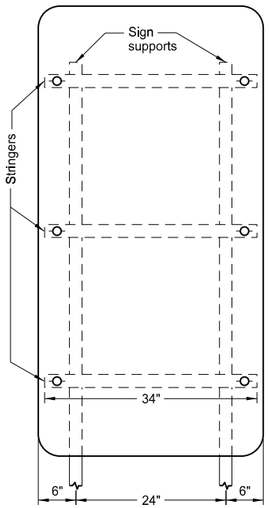
DocuSign Envelope ID: 245AF61F-5CB3-4068-9ABB-3DD8A55F5268

SIGN PUNCHING, STRINGER AND SUPPORT LOCATION
DETAILS REGULATORY, WARNING AND GUIDE SIGNS

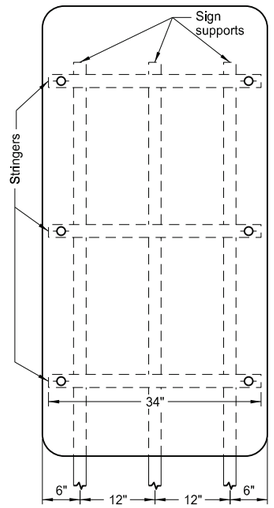
D-754-31



1 Post

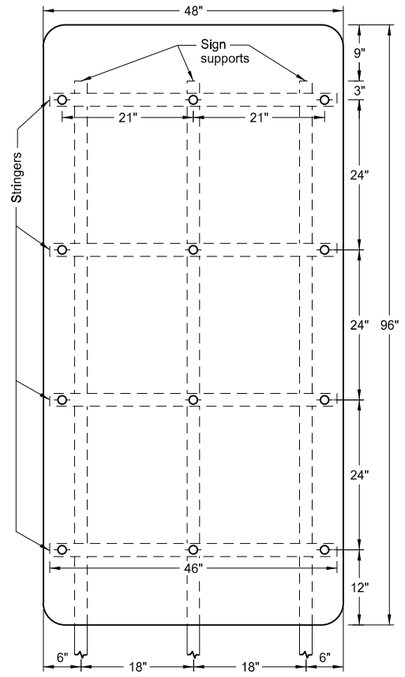


2 Posts



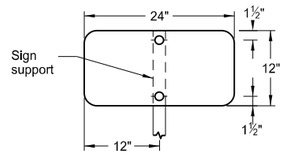
3 Posts

Assembly No. 24



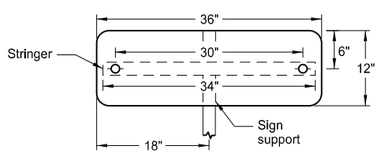
3 Posts

Assembly No. 25



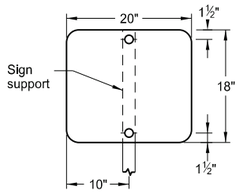
1 Post

Assembly No. 26



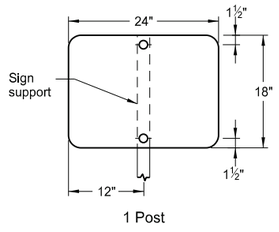
1 Post

Assembly No. 27



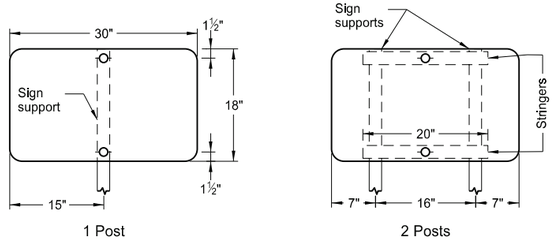
1 Post

Assembly No. 28



1 Post

Assembly No. 29



1 Post 2 Posts

Assembly No. 30

Notes:

1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½" x 1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
8-30-19	New Design Engineer PE Stamp.
8-06-24	Electonic Stamp/Signature.

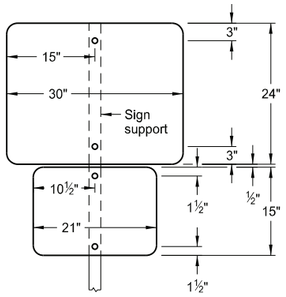
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

08/06/24

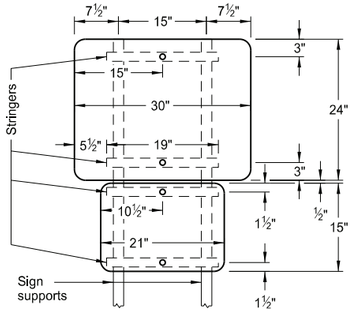
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SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS - ROUTE MARKER SIGNS

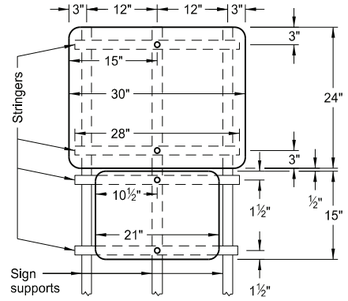
D-754-59



1 Post



2 Posts

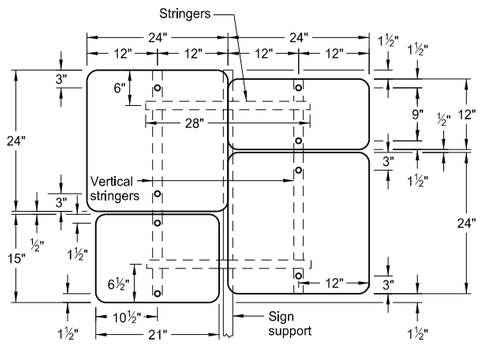


3 Posts

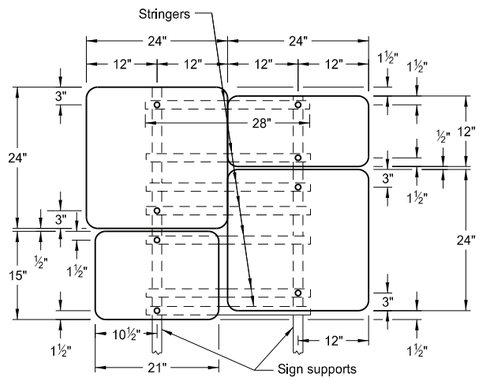
ASSEMBLY NO. 400

Notes:

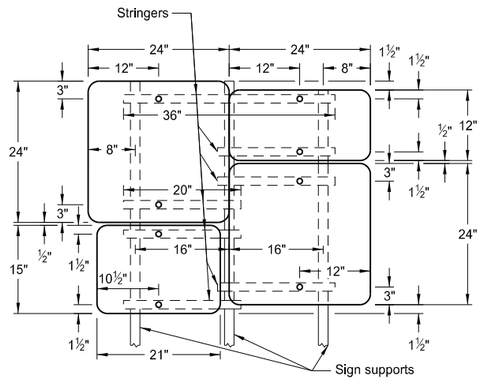
1. Use 0.100 inch minimum thickness sign backing material.
2. Use 1½"x1½" perforated square tube stringers.
3. Punch holes round for ⅜" bolt.



1 Post

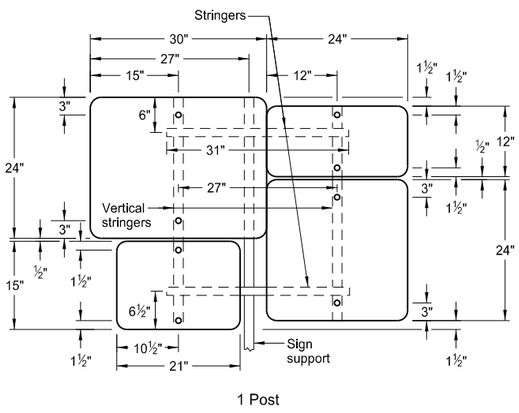


2 Posts

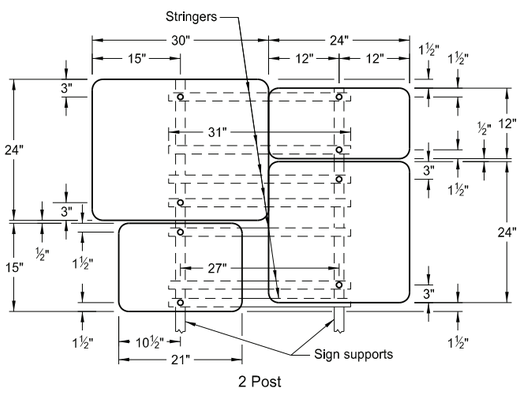


3 Posts

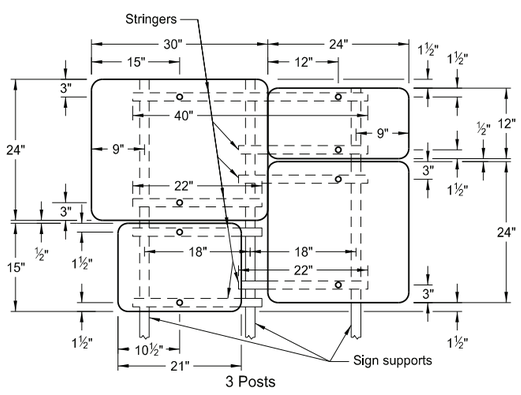
ASSEMBLY NO. 401



1 Post



2 Post



3 Posts

ASSEMBLY NO. 402

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-22-12	
REVISIONS	
DATE	CHANGE
8-30-18	Updated notes to active voice.
9-04-19	New Design Engineer PE Stamp.
8-07-24	Electronic Stamp/Signature.

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

Kirk J Hoff

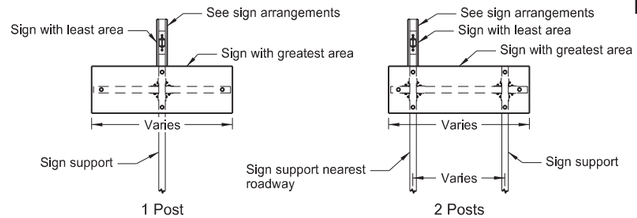
08/07/24

DocuSign Envelope ID: C3490446-F65D-4226-AC76-79FBB84E9BA5

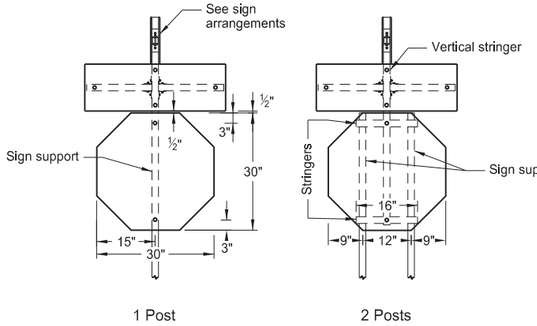
SIGN PUNCHING, STRINGER AND SUPPORT LOCATION DETAILS FOR STREET NAME SIGNS AND 911 SIGNS

D-754-87

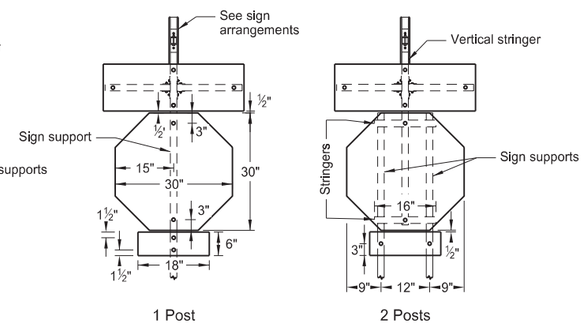
A - Single sign
B - Single sign back to back
C - Single sign each direction
D - Single sign one direction, back to back other direction
E - Back to back both directions



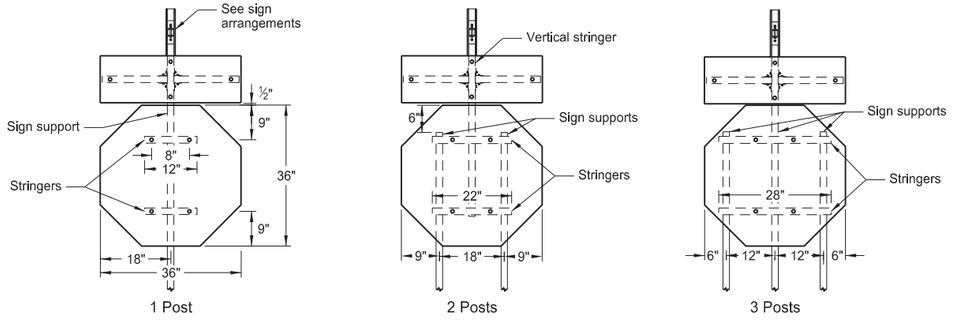
Special Assembly 1 (A, B, C, D or E)



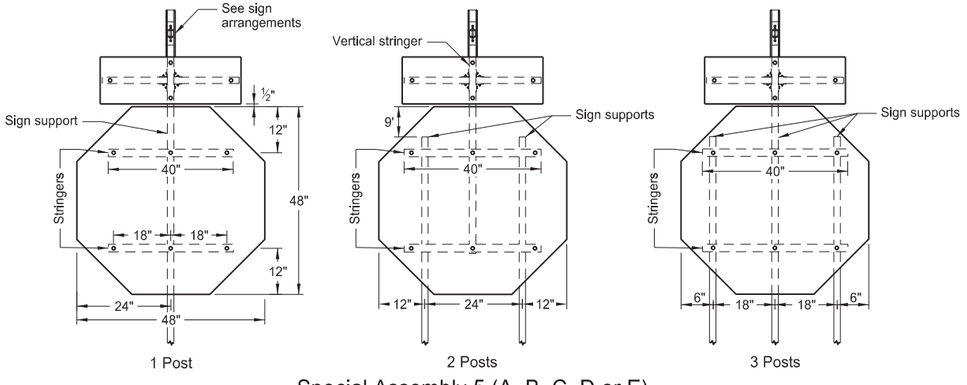
Special Assembly 2 (A, B, C, D or E)



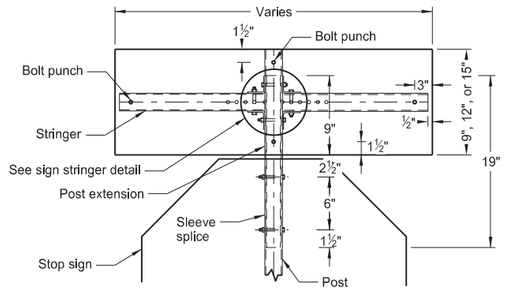
Special Assembly 3 (A, B, C, D or E)



Special Assembly 4 (A, B, C, D or E)

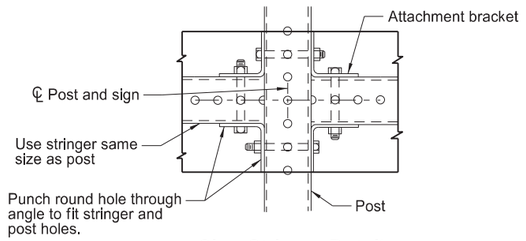


Special Assembly 5 (A, B, C, D or E)



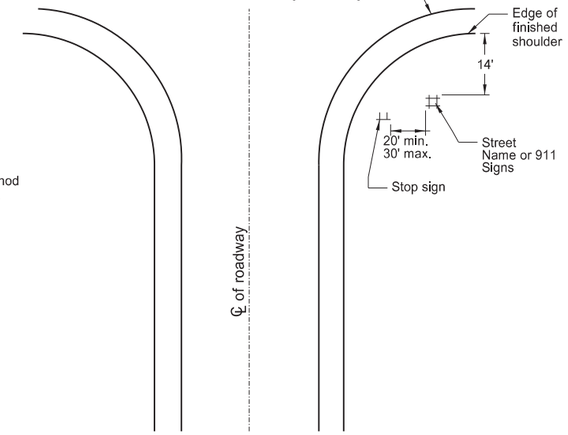
Sleeve Splice Detail

Note: Only use splice method with approval of engineer.



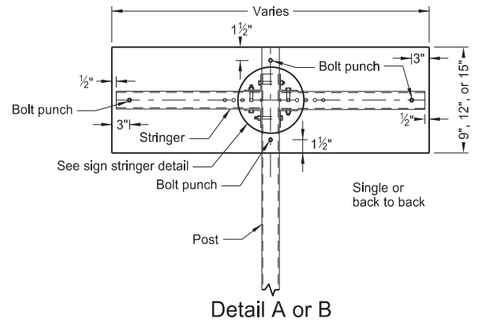
Sign Stringer Detail

Note: See Standard Drawing D-754-86 for 911 support information and sign layout details.

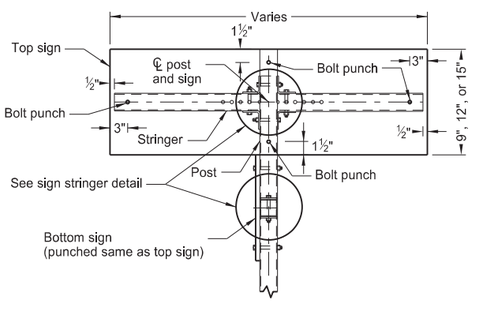


Intersection Layout

Note: Use layout for street name signs or 911 signs with Special Assembly 1 .

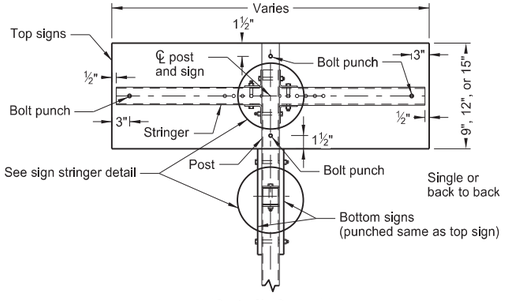


Detail A or B



Detail C

Sign Arrangements



Detail D or E

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
8-30-18	Added 2 post layout for SA1 and Updated notes to active voice.
9-05-19	New Design Engineer PE Stamp.
8-08-24	Electronic Stamp/Signature.

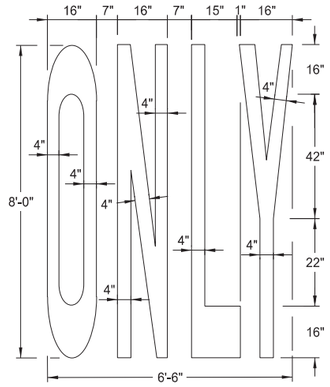
KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 ENGINEER NORTH DAKOTA

08/08/24

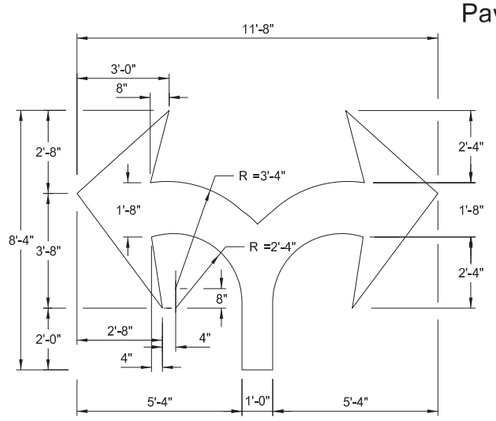
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Pavement Marking Message Details

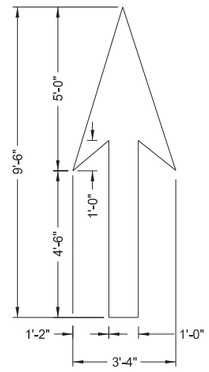
D-762-1



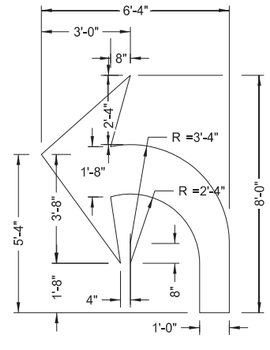
22 S. F.



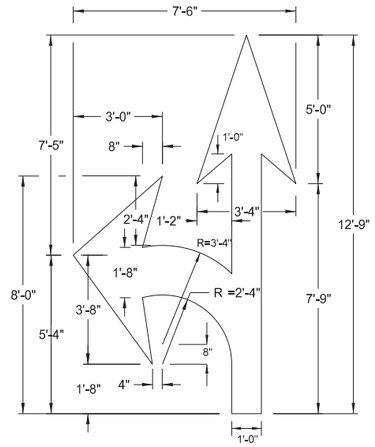
29 S. F.



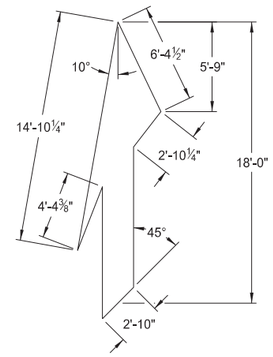
12 S. F.



16 S. F.

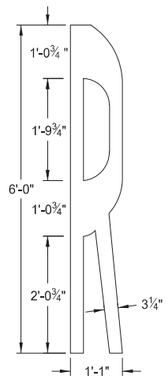


27 S. F.

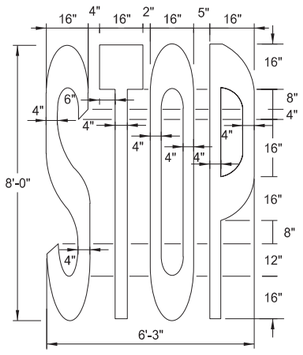


41 S. F.

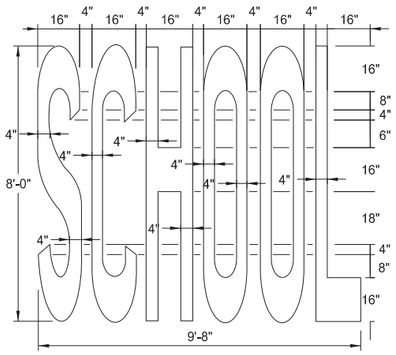
Note: Rotate merge arrow 20° from edge of roadway.



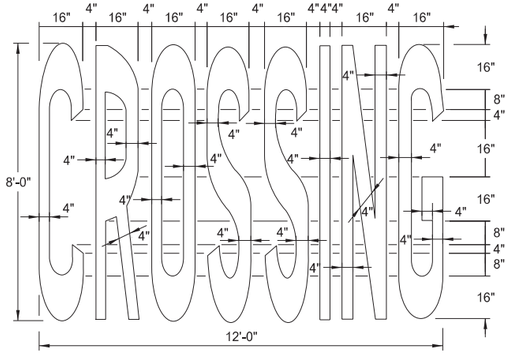
4 S. F.



22 S. F.



34.5 S. F.

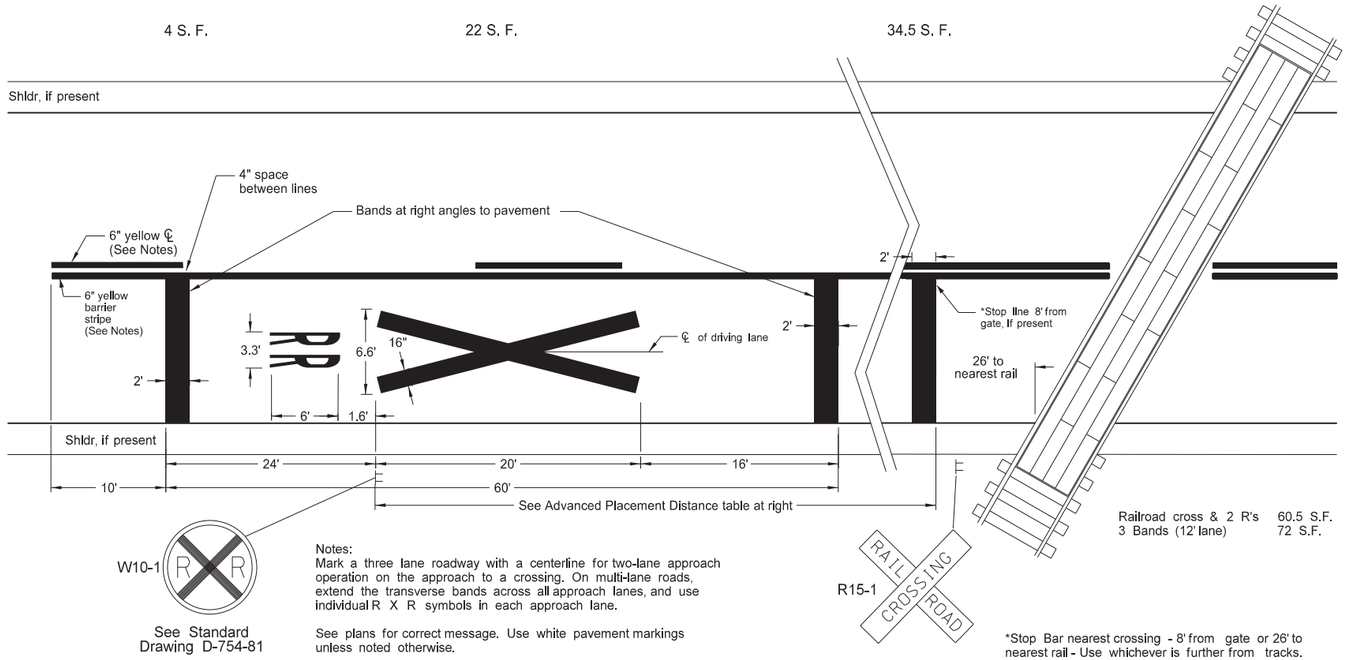


46 S. F.

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



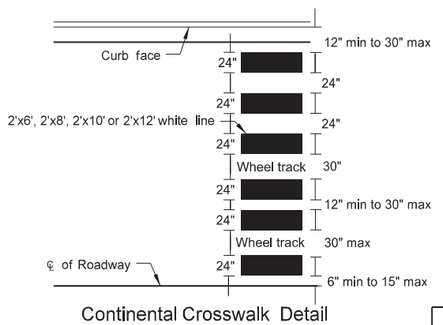
Notes:
Mark a three lane roadway with a centerline for two-lane approach operation on the approach to a crossing. On multi-lane roads, extend the transverse bands across all approach lanes, and use individual R X R symbols in each approach lane.

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

Railroad cross & 2 R's 60.5 S.F.
3 Bands (12' lane) 72 S.F.

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

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



Continental Crosswalk Detail

NOTES:

1. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
2. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

12-6-11

REVISIONS

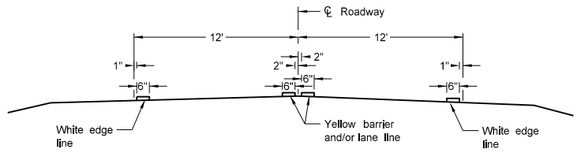
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
01-28-2020	Revised min Stop Bar distance to rail.
11-22-2023	Revised pavement marking widths.

KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 11/22/23 ENGINEER NORTH DAKOTA

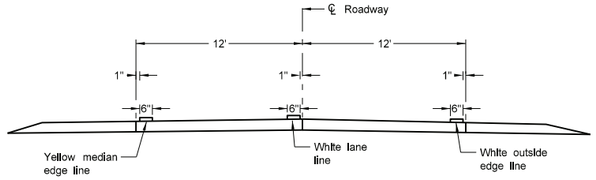
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PAVEMENT MARKING

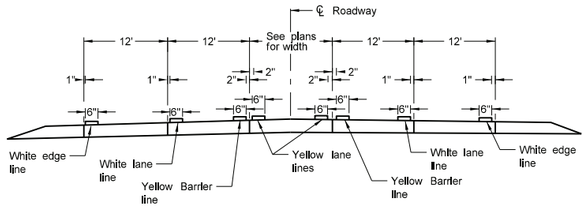
D-762-4



Two Lane Two Way
RURAL ROADWAY



Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



RURAL FIVE LANE ROADWAY
Concrete Section

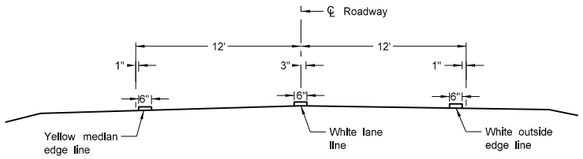
NOTES:

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

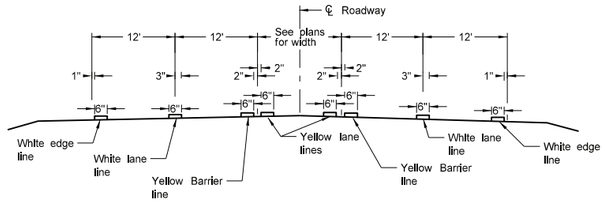
   For section lines, county roads, and street approaches, stripe the radii and edge lines of the paved surface within the right of way except where curb and gutter is present.

2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph,

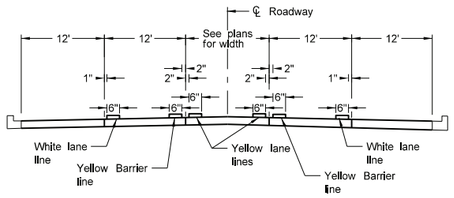
3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits < 40 mph.



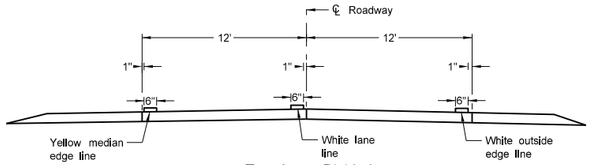
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



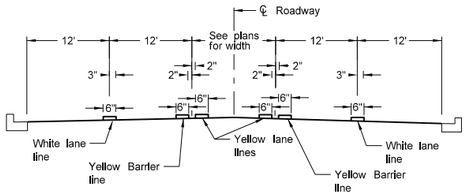
RURAL FIVE LANE ROADWAY
Asphalt Section



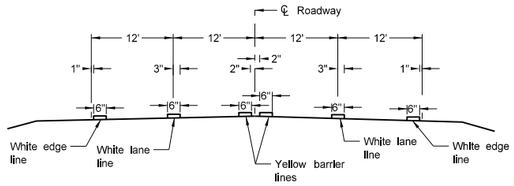
URBAN FIVE LANE SECTION
Concrete Section



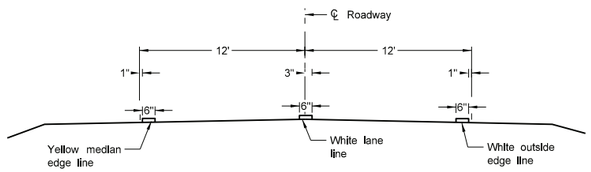
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Concrete Section



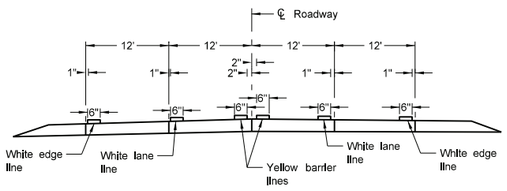
URBAN FIVE LANE SECTION
Asphalt Section



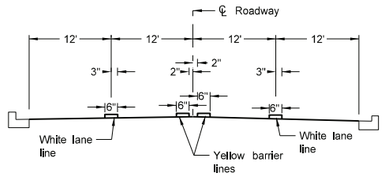
RURAL FOUR LANE ROADWAY
Asphalt Section



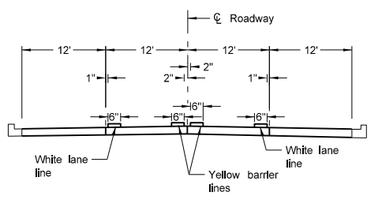
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



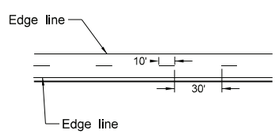
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



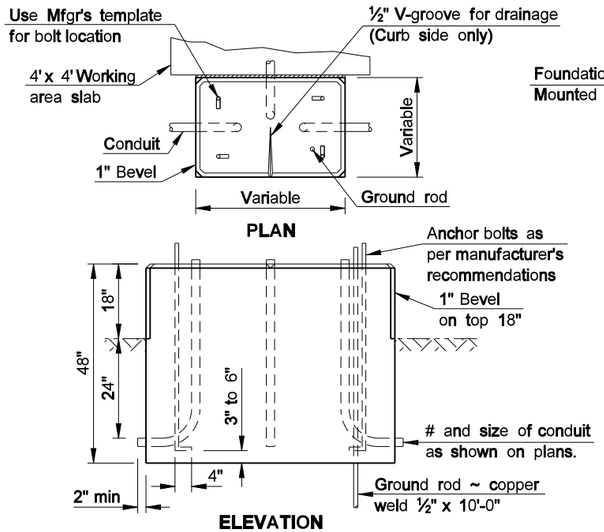
CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
07-09-24	Modified Note 1.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
07/09/24
ENGINEER
NORTH DAKOTA

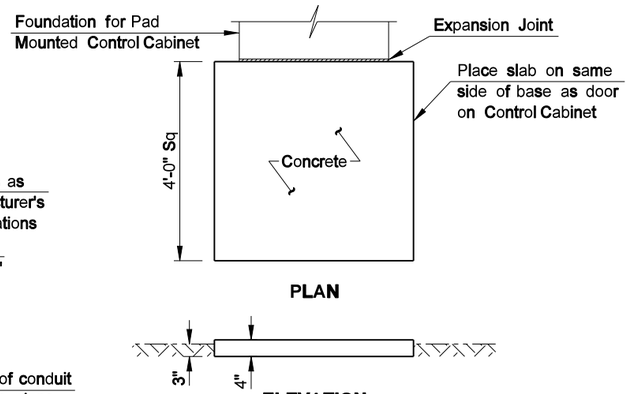
CONCRETE FOUNDATIONS
(TRAFFIC SIGNALS & HIGHWAY LIGHTING)

D-770-1



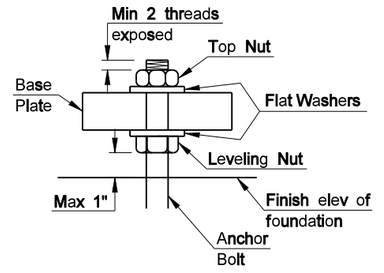
CONTROLLER CABINET FOUNDATION PAD MOUNT

The Controller Cabinet Foundation shall be bid as Concrete Foundation - Traffic Signals.

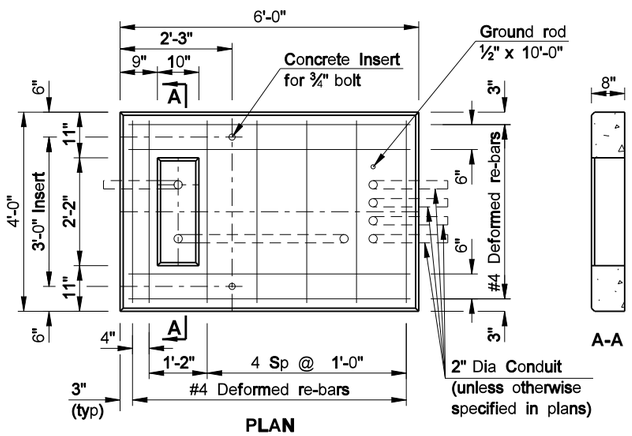


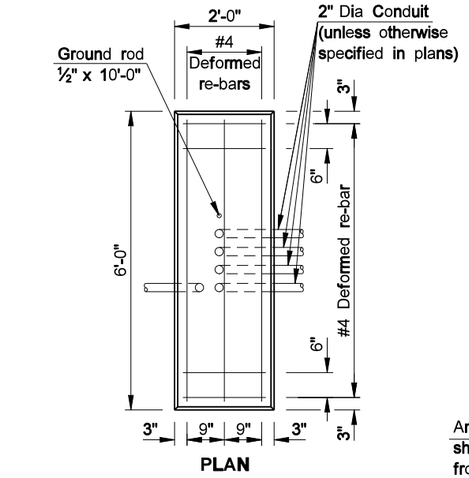
WORKING AREA SLAB

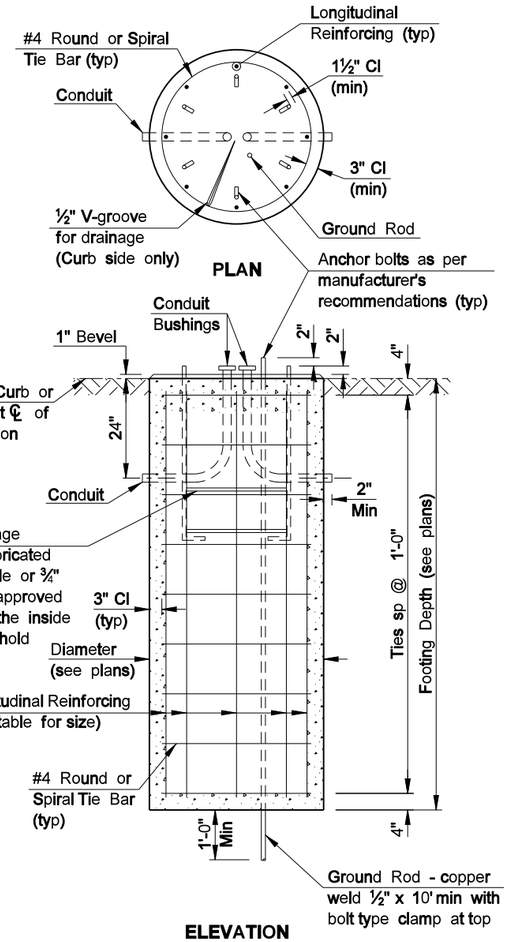
The Working Area Slab shall be installed where shown on the plans and shall not be bid separately but shall be included in the price bid for Concrete Foundation - Traffic Signals.



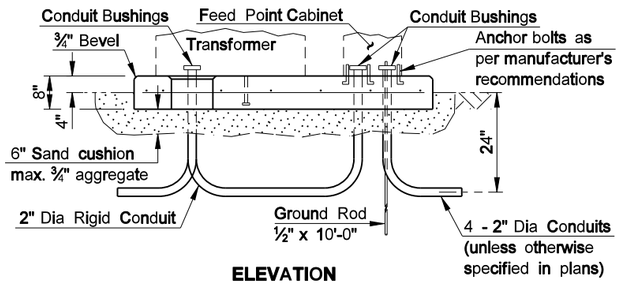
ANCHOR BOLT DETAIL





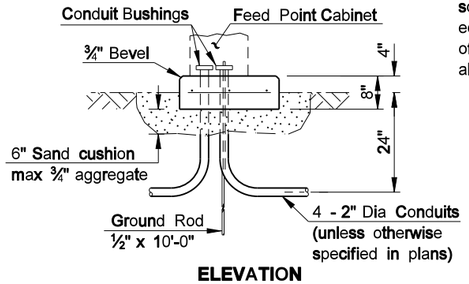


LIGHT & SIGNAL STANDARD FOUNDATION



TRANSFORMER & FEED POINT CABINET FOUNDATION PAD MOUNT

The Transformer & Feed Point Cabinet Foundation Pad Mount shall be bid as Concrete Foundation ~ Feed Point ~ Type A.



FEED POINT CABINET FOUNDATION PAD MOUNT

The Feed Point Cabinet Foundation Pad Mount shall be bid as Concrete Foundation ~ Feed Point ~ Type B.

NOTES:

LIGHT & SIGNAL STANDARD FOUNDATIONS: See plans for conduit size, number of bends and correct position for each foundation. When conduit does not continue beyond the foundation, conduit with a 105° bend and bushings on both ends may be substituted for the 90° bends shown. See plans for correct size & location of foundations. The grade and exact location shall be established by the Engineer in the field. All reinforcing shall be Grade 60. Tie bars shall have a minimum of a 12" lap. Reinforcing may be omitted for Type I, II, V, VI & VII signal standard foundations if the anchor bolts extend to within 3" to 6" above the bottom of the foundation. A minimum of 6 anchor bolts shall be used for cantilevered structures.

CONTROLLER CABINET FOUNDATION PAD MOUNT FOUNDATION: See plans for the number of 90° bends per foundation and correct positioning. The foundation for Pad Mounted Controller Cabinet shall be of sufficient size so that there is a minimum of 3" of clearance from the outside edge of cabinet to the outside edge of the foundation on any side. The contractor shall ensure a water-tight seal between the controler cabinet and the foundation by caulking, except for V-groove.

WORKING AREA SLAB: The materials and preparation of this slab shall be as approved by the Engineer in the field.

TRANSFORMER & FEED POINT CABINET FOUNDATION PAD MOUNTED: The foundation shall have a wood float finish. All conduits shown shall be installed. Conduit that is not used at this time shall be plugged with an expandable plug.

FEED POINT CABINET FOUNDATION PAD MOUNTED: The foundation shall have a wood float finish. All conduits shown shall be installed. Conduit that is not used at this time shall be plugged with an expandable plug.

LIGHT & SIGNAL FOUNDATION TABLE	
FOOTING DEPTH (ft)	LONGITUDINAL REINFORCING
≤ 12	8 - #5
13 - 14	8 - #6
15 - 16	8 - #7
17 - 19	8 - #8

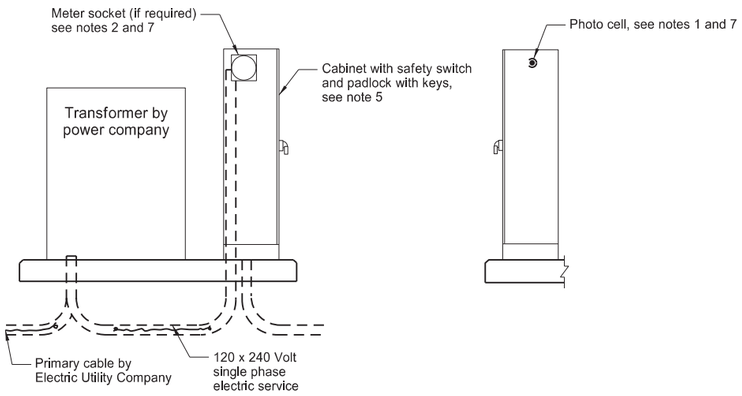
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
6-15-10	
REVISIONS	
DATE	CHANGE

This document was originally issued and sealed by Terrence R. Udland Registration Number PE- 2674 , on 6/15/10 and the original document is stored at the North Dakota Department of Transportation

Docusign Envelope ID: 98D18526-2204-423D-9746-A270B873E215

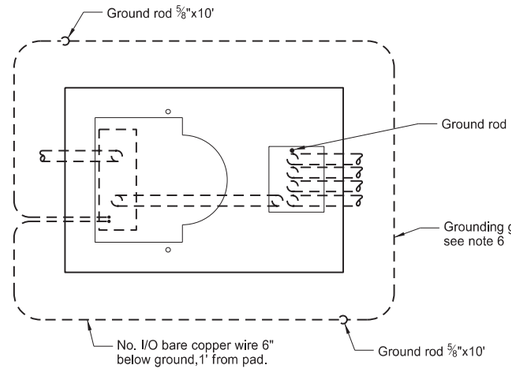
FEED POINTS
(ROADWAY LIGHTING)

D-770-2



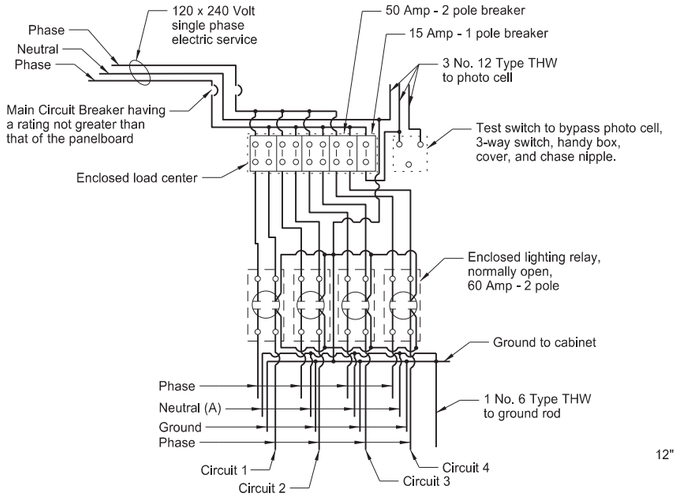
Elevation

Photo Cell
Mounting Detail



Plan

Transformer and Feed Point Cabinet Pad Mounted



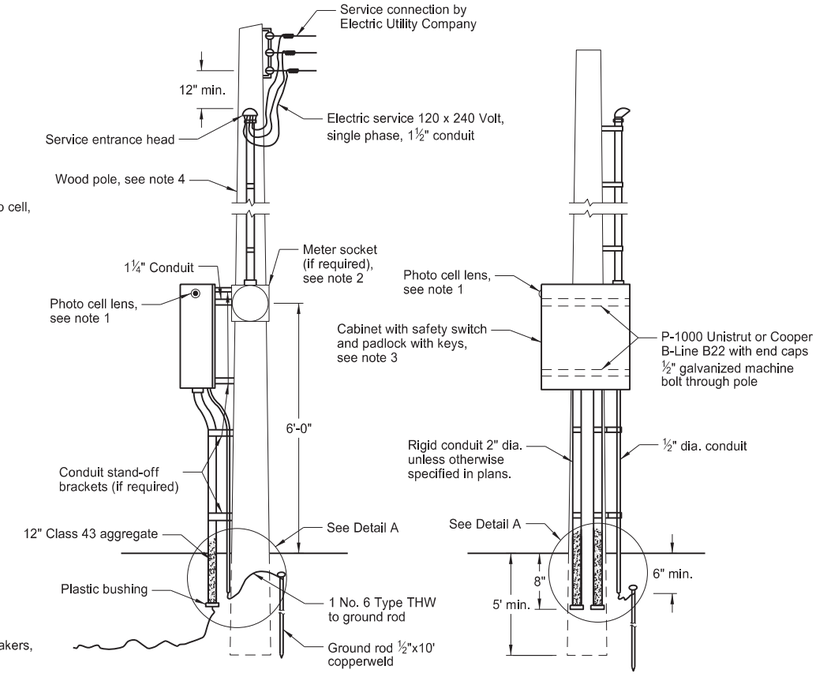
Feed Point Type IV

Provide Type I feed point similar to Type IV, except with one electrical circuit, one 50 Amp - 2 pole breakers, and one lighting relay, normally open.

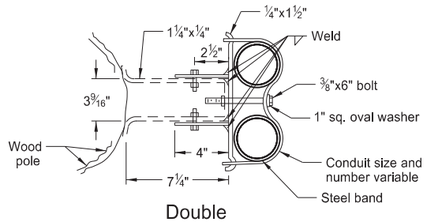
Provide Type II feed point similar to Type IV, except with two electrical circuit, two 50 Amp - 2 pole breakers, and two lighting relays, normally open.

Provide Type III feed point similar to Type IV, except with three electrical circuits, three 50 Amp - 2 pole breakers, and three lighting relays, normally open.

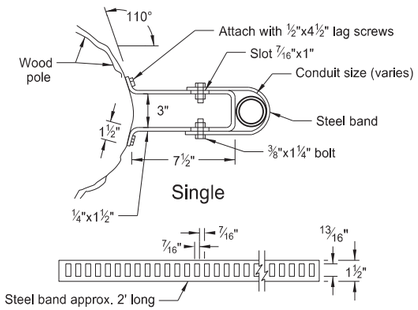
(A) Install when festoon circuit is required.



Feed Point Pole Mounted

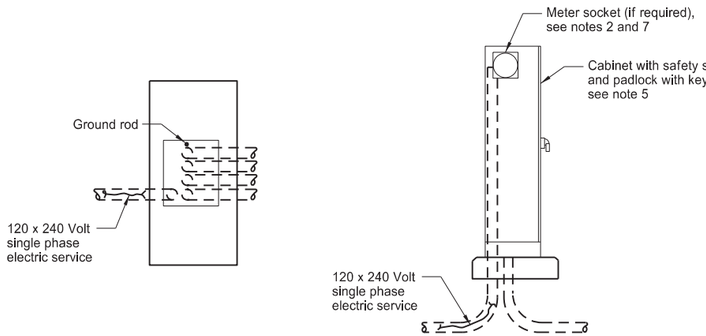


Double



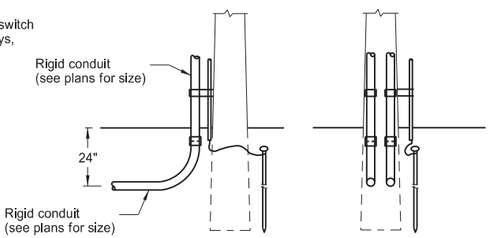
Conduit Standoff Bracket

Omission of conduit standoff brackets allowed when not required by local utility company.



Plan Elevation

Feed Point Cabinet Pad Mounted



Detail A

Use this detail for a continuous run of conduit from the feed point to the first light standard.

Notes:

1. Photo Cell: Furnish and install the photoelectric cell. Face photo lens north.
2. Meter Socket: Install meter socket and trim if the meter is required by local Utility Company. Meter furnished and installed by Utility Company.
3. Pole Mounted Cabinet: Provide cabinet with lock drip shield, factory installed steel backing, stainless steel hardware, and side hinge door. Shop coat cabinet with one coat of primer and two coats of exterior gray enamel.

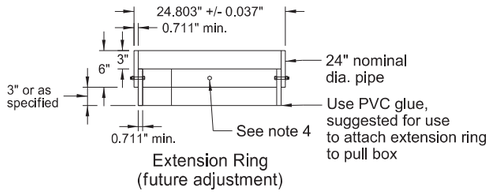
   Provide 30" high x 24" wide x 8" deep Type I and II feed points. Provide 30" high x 42" wide x 10" deep or 36" high x 36" wide x 10" deep Type III and IV feed points.
4. Wood Pole: Provide minimum 20' Class VII full length penta pressure treated wood pole. (if required, see layout sheets)
5. Pad Mounted Cabinet: Provide 56" high x 26" wide x 14" deep weatherproof cabinet. Minimum 12 gauge steel or aluminum with provisions for padlock.
6. Grounding Grid: Provide grounding grid with a maximum ground resistance of 25 ohms, using one or more 5/8"x10' copperweld ground rods in parallel or series at two corners. Provide a minimum distance between ground unit assemblies of 6'0".
7. Meter Location: Do not mount the meter (if required) on the same side of the cabinet as the photo cell.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-8-13	
REVISIONS	
DATE	CHANGE
07-08-14	Revised note 3
10-17-17	Updated to active voice
08-28-19	New Design Engineer PE Stamp
11-01-24	Revised note 5
09-12-25	Revised date to match

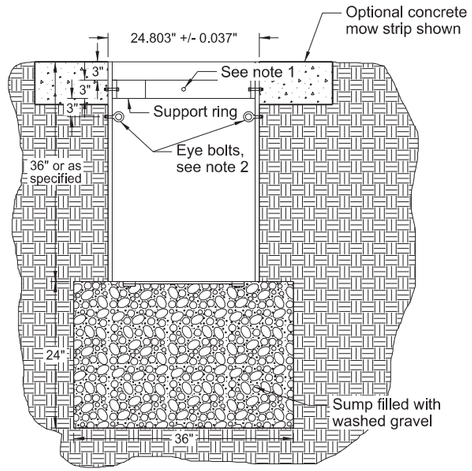
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
09/12/25
ENGINEER
NORTH DAKOTA

Docusign Envelope ID: 98D18526-2204-423D-9746-A270B873E215

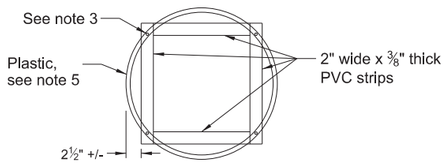
PULL BOX & TRENCHING DETAILS



Extension Ring
(future adjustment)

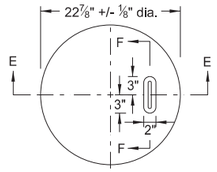


Elevation

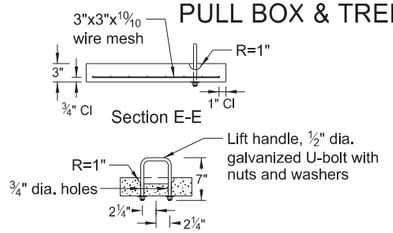


Bottom View

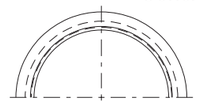
PVC Pull Box



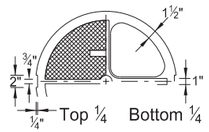
Top View

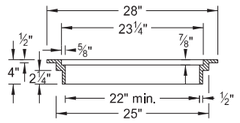


Concrete Cover

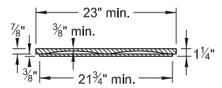


Half Top View



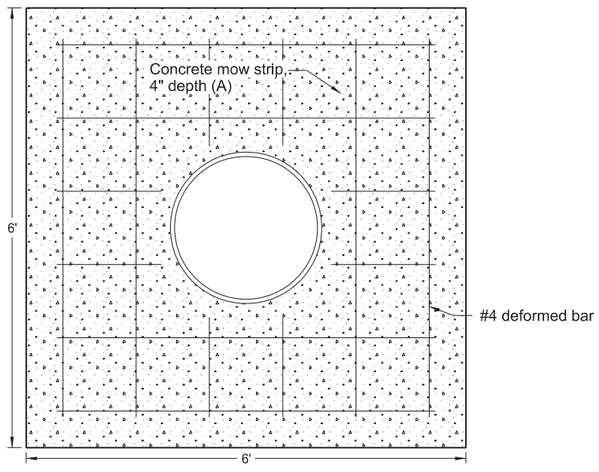


Section Frame



Section Cover

Cast Iron Frame and Cover



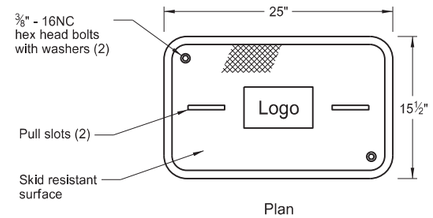
Top View
with optional concrete mow strip

PVC Pull Box Notes:

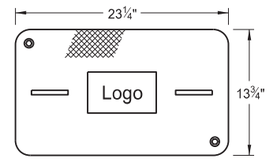
1. Attach split 24" nominal diameter PVC cover support ring with four ⅜" dia. x 2" long stainless steel hex head bolts with nuts at 90 degrees apart.
2. Two type 2 shoulder eye bolts, ⅜" dia. x 1¼" shank length with hex nuts 180 degrees apart (for lifting pull box and supporting electric cable).
3. Four ¼" x 1¼" long galvanized lag screws. Screw assembly together.
4. Attach split 24" nominal diameter PVC cover support extension ring with four ⅜" dia. x 2" long stainless steel hex head bolts with nuts at 90 degrees apart.
5. Bolt assembly together.
6. Size conduit holes located in barrel section no more than 1" larger than size of conduit being used.
7. After pull box and conduit installation, install water tight seal for inside walls and cover.
8. PVC pipe to meet requirements of ASTM F679 or equal.
9. Provide Austenitic Stainless Steel Hex Head bolts and nuts. Other fasteners to be galvanized as per ASTM A153.
10. Install an epoxy coating on the top and sides of the concrete cover. Provide an epoxy protective coating that is light gray, clear, or neutral in color and apply as recommended by the pull box manufacturer. Before application, clean with a wire brush and dry the surfaces of the concrete to which the epoxy protective coating is applied.
11. If a Cast Iron cover is provided, use grey iron as per AASHTO M 306.

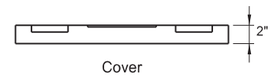
General Pull Box Notes:

1. Duct seal all conduits entering and exiting pull boxes.
2. Ensure all pull boxes are UL listed.

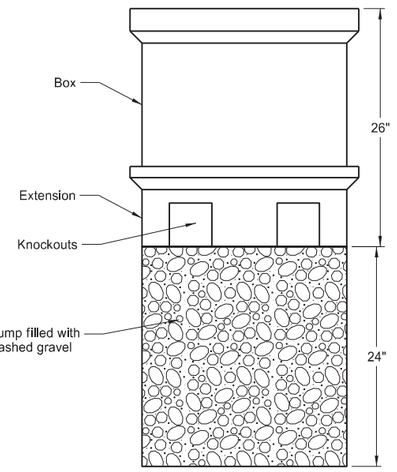


Plan





Cover



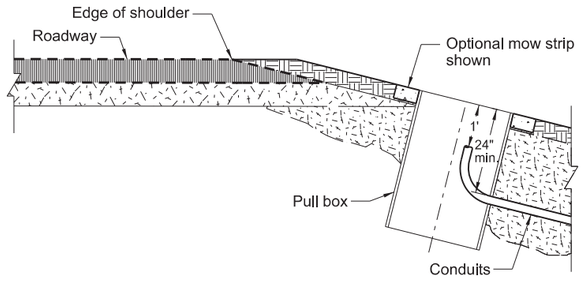
Elevation



Polymer Concrete Pull Box Notes:

1. Place top of pull box flush with surfaced area and approximately one inch above earth or sodded areas on level surfaces.
2. Provide at least one knockout per side in pull box.
3. Provide Polymer Concrete pull box meeting Tier 22 as per ANSI / SCTE 77.
4. Ensure the pull box constructed of polymer concrete reinforced by a heavy weave fiberglass.

Polymer Concrete Pull Box



Pull Box Installation Details

Note: The location of pull box will vary, refer to layout sheets for actual location.

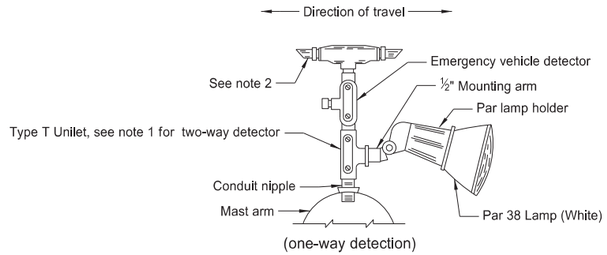
When required, install a mow strip around the pull box. Place expansion material between the foundation and the mow strip. Ensure the mow strip is 4" depth and 2' width from the foundation. Use #4 deformed bars in the mow strip. Space the bars 6" from the outside edge. Place the bars in a grid pattern at 1' apart.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-8-13	
REVISIONS	
DATE	CHANGE
11-01-24	Updated PVC pull box, trenching
09-12-25	Revised date to match

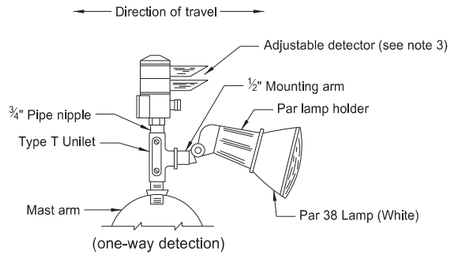
KIRK J. HOFF
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PROFESSIONAL
PE-4683
09/12/25
ENGINEER
NORTH DAKOTA

Docusign Envelope ID: 98D18526-2204-423D-9746-A270B873E215

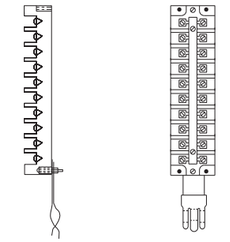
LIGHTING AND SIGNAL DETAILS



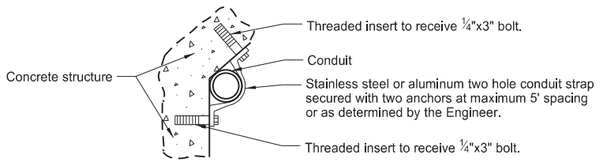
Emergency Vehicle Detector Detail



Alternate Emergency Vehicle Detector Detail (adjustable)

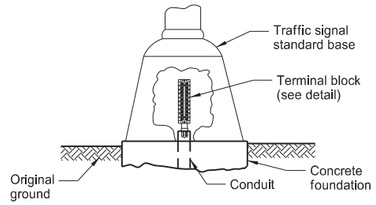


Terminal Block Detail

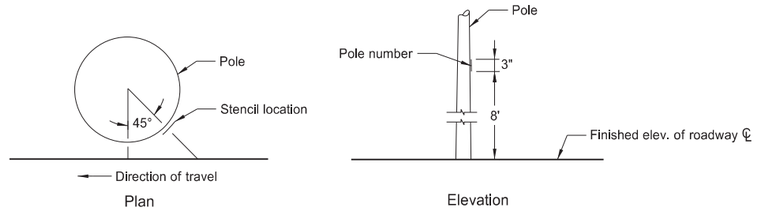


Bridge Mounted Conduit Hanger

Notes:
1. Use Type X Unilet with two Par lamp holders and lamps for Two-way Detectors. (one in each direction).
2. Plug unused end of One-way Detector with metal pipe plug.
3. Rotate detector lens to face direction of travel on Two-way Detectors.

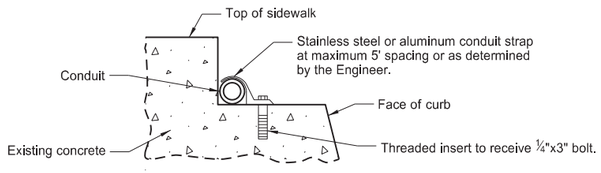


Terminal Block
(rigid mounted)

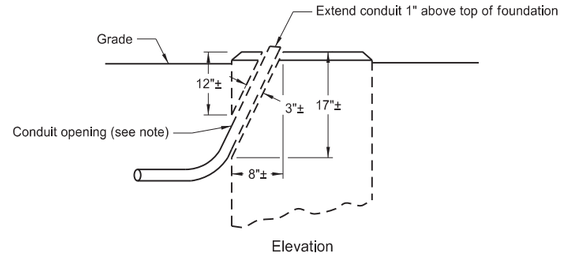


Light Standard Numbering

Note: On the roadway side of each light standard, stencil the pole number using contrasting color paint or an adhesive coated plastic such as Scotchcal by 3M or as approved by the Engineer. See layout sheets for pole numbers.

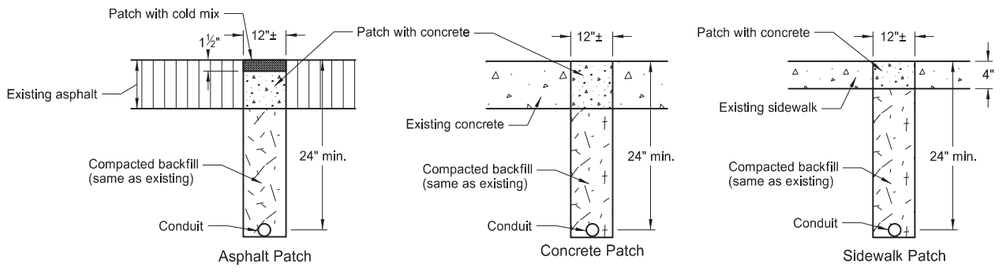


Bridge Curb Mounted Conduit



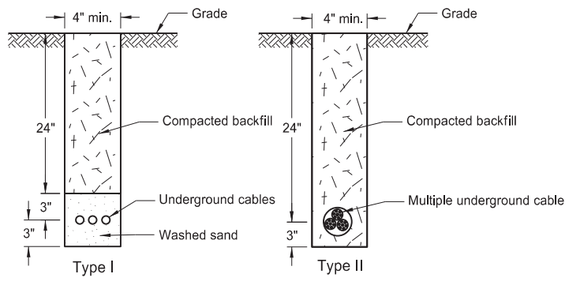
Revise Concrete Foundation

Note: Jackhammer or drill to remove material and provide a location for conduit. Make opening no larger than necessary. Place conduit, fill with concrete and finish foundation to original appearance.



Surface Patch Details

Note: Saw cut trenches. Use PCC pavement for replacement concrete with the coarse aggregate gradation, maximum size and method of curing as approved by the Engineer. Immediately prior to pouring replacement concrete, paint all surfaces with an approved epoxy compound.



Cable Trench

Note: Seed entire area disturbed by trenching.

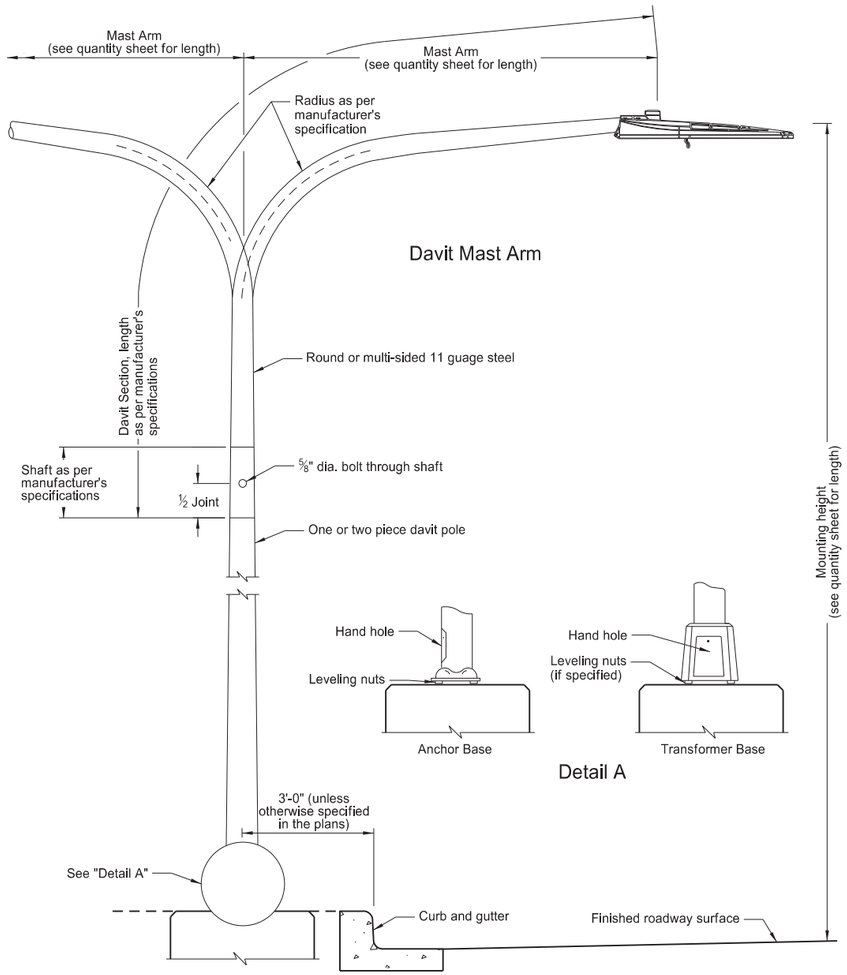
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-8-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice
10-25-19	Removed conduit under RR detail
11-01-24	Updated bridge hanger detail
09-12-25	Revised date to match

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ENGINEER
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Docusign Envelope ID: 98D18526-2204-423D-9746-A270B873E215

LIGHT STANDARD DETAILS

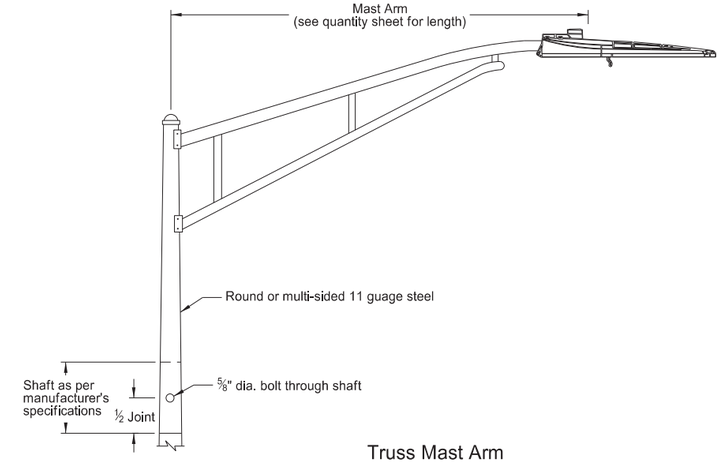
D-770-5



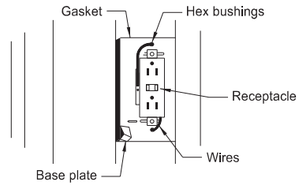
Davit Mast Arm

Detail A

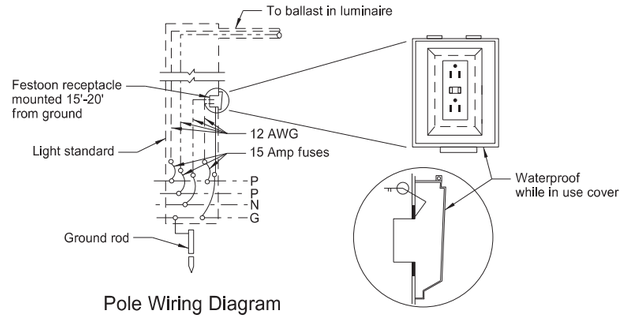
Light Standard Details



Truss Mast Arm



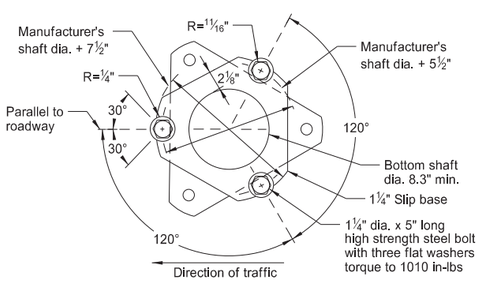
Optional: Festoon receptacle
mounted on multi-sided pole.



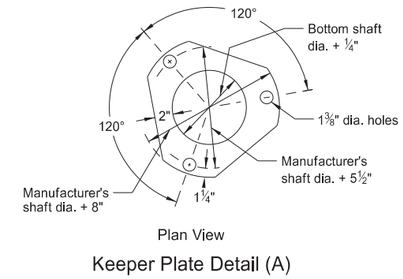
Pole Wiring Diagram

Receptacle Mounting Detail (B)

(B) Mount receptacle on side of pole that faces the street.
Install Festoon Receptacle only when specified in the plans.



Top View



Plan View

Keeper Plate Detail (A)

(A) ASTM A446 Grade "A" 28 gauge keeper plate on top of middle flat washer. Galvanize Keeper plate after fabrication.

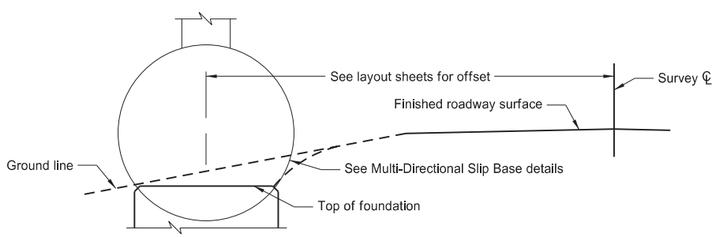
Notes:

Light Standard Locations: The minimum offset distance from the curb face is 3 feet. Offset light standards at least 3 feet in urban areas and where speeds are less than 30 mph. Where speeds are 30 mph or more, place light standards at least 16 feet from the driving lane.

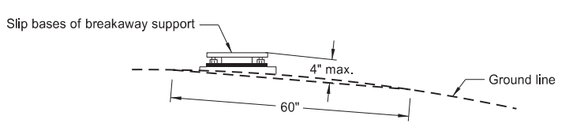
Steel Standards: Touch up marred or scratched areas after erection.

Luminaire: Use internal ballast-constant wattage 120x240 voltage. See layout sheets for type of luminaire, wattage, I.E.S. distribution, and operating system.

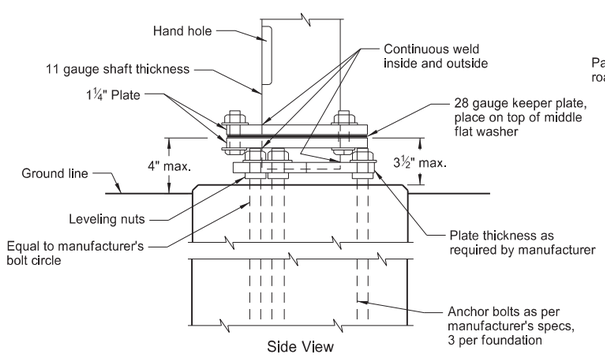
Fusing: Fusing in base, see specifications.



Concrete Foundation Location

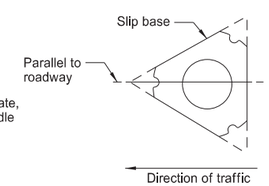


Breakaway Support Stub Clearance Diagram

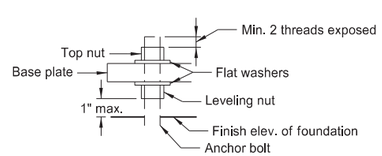


Side View

Steel Base Detail



Slip Base Placement Detail



Anchor Bolt Detail

Multi-Directional Slip Base

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-8-13	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice
08-28-19	New Design Engineer PE Stamp
11-01-24	Revised luminaire details/notes
09-12-25	Revised date to match

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