Docusign Envelope ID: 05B7DAFA-0F51-45AC-9C87-FE4E59087630

DESIGN DATA: RP 73.667 to 74.623 NB				
Traffic	Average Daily			
Current 2020	Pass: 4,060	Trucks: 225	Total: 4,285	
Forecast 2040	Pass: 5,485	Trucks: 325	Total: 5,810	
Clear Zone Distance: Use Existing		Design Speed: 55		
Minimum Sight Dist. for Stopping: Use Existing		Bridges: N/A		
Sight Dist. for No Passing Zone: Use Existing				
Pavement Design Life (years)				
Design Accumulated One-way ESALs:				

DESIGN DATA: RP 73.667 to 74.623 SB				
Traffic	Average Daily			
Current 2020	Pass: 4,200	Trucks: 225	Total: 4,425	
Forecast 2040	Pass: 5,670	Trucks: 325	Total: 5,995	
Clear Zone Distance: Use Existing		Design Speed: 65		
Minimum Sight Dist. for Stopping: Use Existing		Bridges: N/A		
Sight Dist. for No Passing Zone: Use Existing				
Pavement Design Life (years)				
Design Accumulated One-way ESALs:				

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	23544	1	1

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

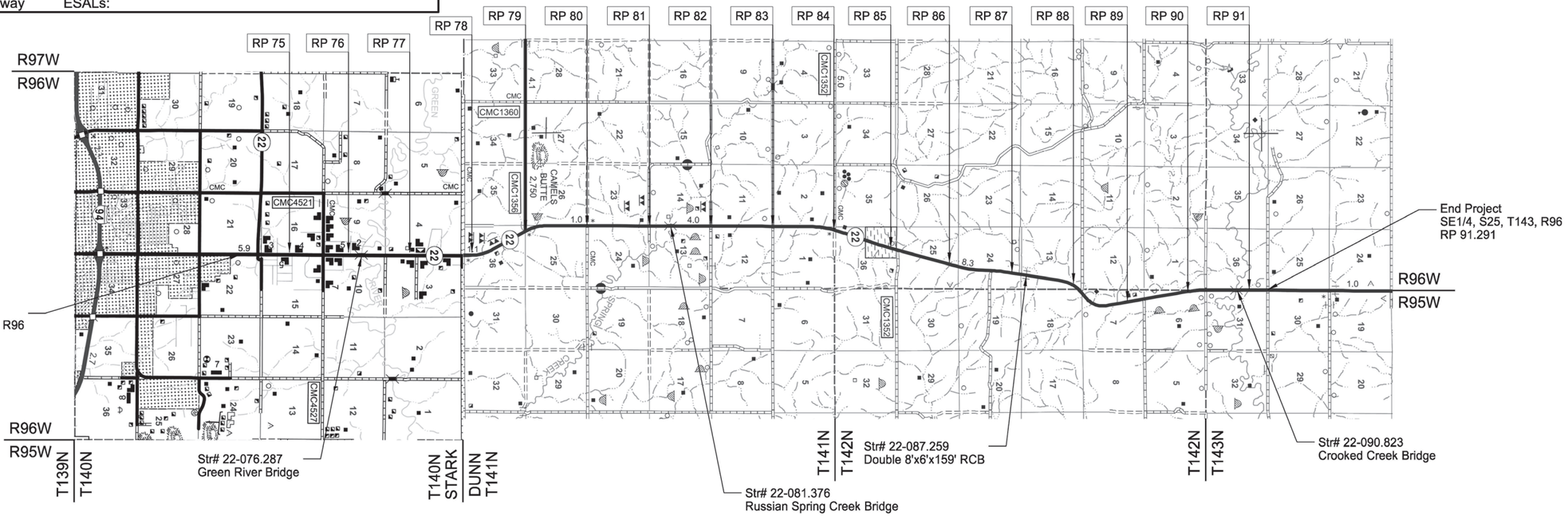
XA-SS-5-022(140)074

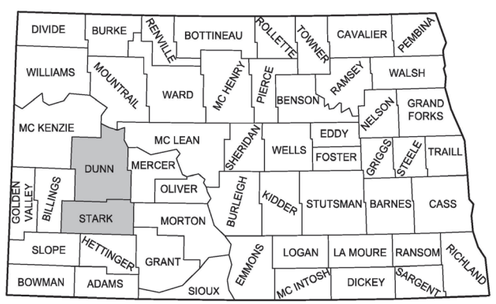
Stark & Dunn Counties
From Dickinson 45th St to 17th St NW

3" HMA Overlay, Structure Repairs, Pavement Markings

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	04/01/2023
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
XA-SS-5-022(140)074	17.125	17.125





STATE COUNTY MAP

DESIGNER
Lucas Doerr, PE

DESIGNER
Ryan Kleppinger

DESIGNER
Paul Holter, EIT

ND DEPARTMENT OF TRANSPORTATION
OFFICE OF PROJECT DEVELOPMENT

Kirk Hoff
11/18/24

BROSZ ENGINEERING, INC.
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 11/14/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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20	1 - 5	General Details
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40	1 - 6	Removals
90	1 - 6	Paving Layouts
100	1 - 26	Work Zone Traffic Control
120	1 - 20	Pavement Marking
170	1 - 2	Bridges and Box Culverts

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SSP 4	Longitudinal Joint Density
PSP 139(23)	Permits and Environmental Considerations
208(23)	E-Ticketing (Mandatory)
209(23)	Flexible Pavement Surface Tolerance

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D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20, 21	Line Styles
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D-101-40	Cross Section Legend
D-704-7	Breakaway Systems For Construction Zone Signs - Perforated Tube
D-704-8	Breakaway Systems For Construction Zone Signs - U-Channel Post
D-704-9	Construction Sign Details - Terminal And Guide Signs
D-704-10	Construction Sign Details - Regulatory Signs
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D-704-14	Construction Sign Punching And Mounting Details
D-704-15	Road Closure Layouts
D-704-20	Terminal And Seal Coat Sign Layouts
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D-704-26	Miscellaneous Sign Layouts
D-704-27	Mobile Operation (Pavement Marking)
D-704-33	Two-Lane Roadway Portable Rumble Strips
D-704-37	Maintaining Traffic Through Area Already Full Depth Reclaimed
D-704-50	Portable Sign Support Assembly
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D-762-1	Pavement Marking Message Details
D-762-4	Pavement Marking
D-762-5	Pavement Marking for Standard 90 Degree Flared Intersection-(No Center Left Turn Lane on Major Road)
D-762-6	Pavement Marking for Standard 90 Degree Flared Intersection - (Center Left Turn Lane on Major Road)
D-762-11	Short-Term Pavement Marking

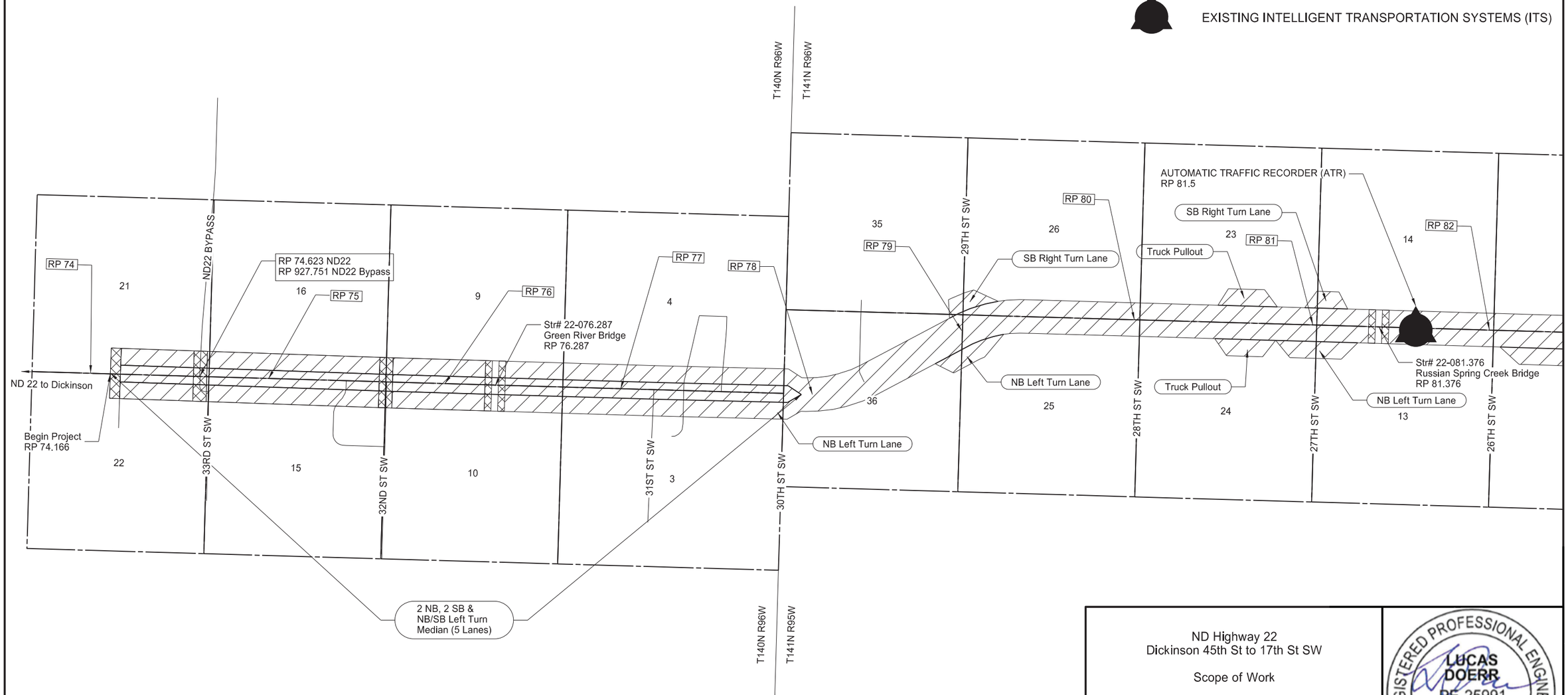
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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LEGEND

MILLING TRANSITION

3" HMA OVERLAY

EXISTING INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

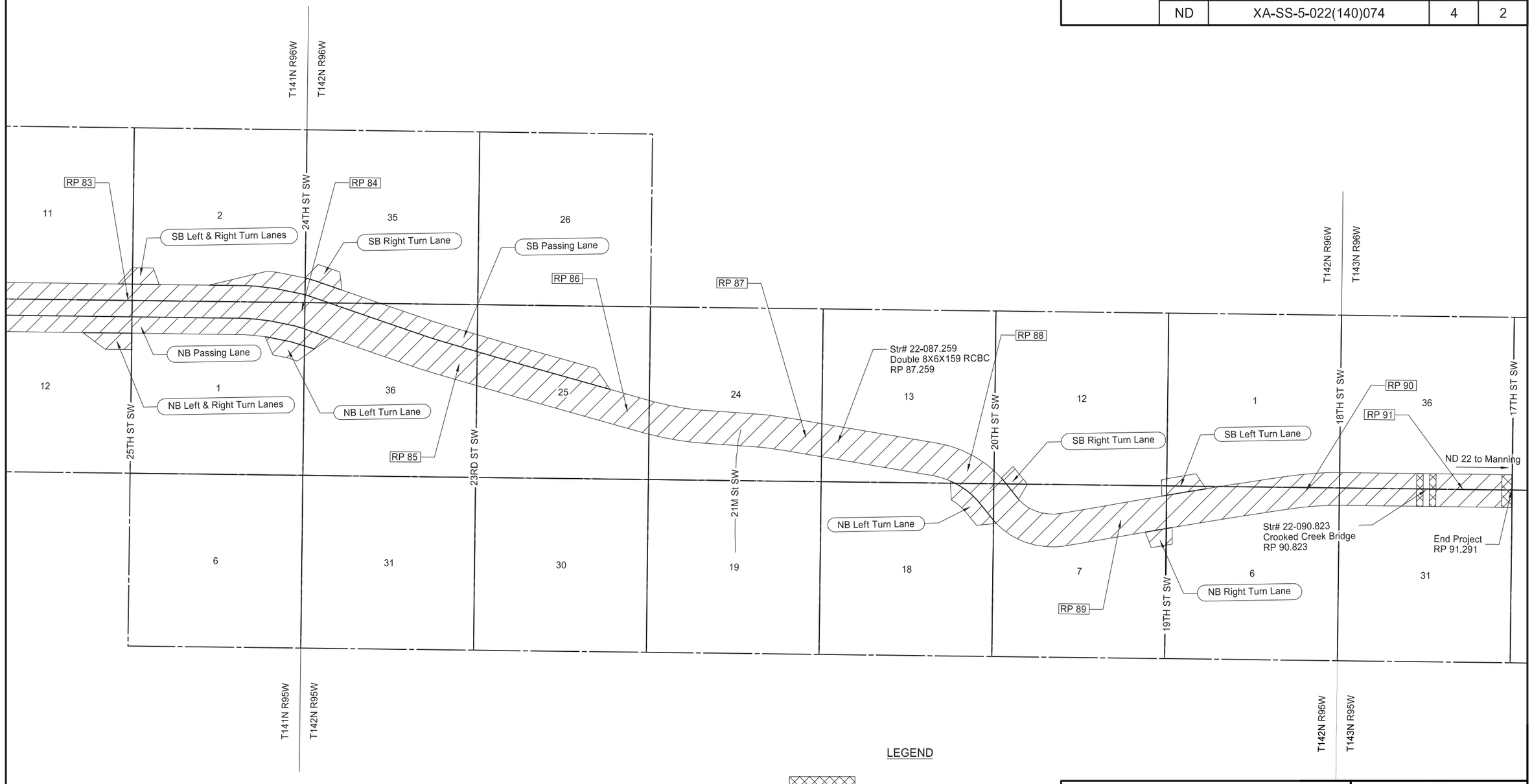


ND Highway 22
Dickinson 45th St to 17th St SW

Scope of Work

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/26/24
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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ND Highway 22
Dickinson 45th St to 17th St SW

Scope of Work

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

100-P01 COORDINATION OF PROJECTS: The following project is under contract for the 2025 construction season and will include construction activities within the vicinity of the work area of this project.

- XA-SS-5-022(141)091 – 17th St SW to JCT ND 200 Killdeer

The work to be performed as part of Project XA-SS-5-022(141)091 will include a 3" HMA Overlay, ADA Curb Ramps, Erosion Repairs, and Structure Repairs on ND Hwy 22 from 17th St SW to the junction of ND 22 and ND 200 – Killdeer.

The Contractor will be responsible for coordinating work activities for this project with the work activities to be performed from project XA-SS-5-022(141)091. All costs for project coordination are incidental to the project.

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 Panels", 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 or earthwork pay items.

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.

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

430-P01 HMA LONGITUDINAL JOINTS: Construct the joints within the final lift of pavement as detailed within this note.

Place a longitudinal joint at the centerline of the roadway.

Unless work zone traffic control phasing dictates otherwise, construct each lane and the adjoining shoulder using a single pass or a hot seam.

A hot seam is defined as follows:

- Constructed using two pavers simultaneously;
- No more than 300 feet between pavers; and
- Roll the seam between paver passes in a manner such that the seam is not visible.

430-P02 BLADE LEVELING: Perform blade leveling on the project. Use approximately ¼" of the 3" HMA for blade leveling prior to paving. Perform blade leveling in a single motor grader pass across the full width of the driving surface in each lane. Compact the material using a pneumatic roller prior to paving. The minimum thickness for the top lift is 1.5". Include all costs to perform blade leveling in the price bid for "Superpave FAA 45".

704-100 TRAFFIC CONTROL SUPERVISOR: Provide a Traffic Control Supervisor.

704-500 PORTABLE RUMBLE STRIPS (PRS): Use PRS made of rubber or engineered polymers.

Install PRS as part of the temporary traffic control when the following signs are also part of the required traffic control set up:

- "Be Prepared to Stop" (W3-4); and
- "Flagger" symbol (W20-7)

Install PRS that meet the following criteria:

- Have no adhesives or fasteners required for placement;
- Have a manufacture's speed rating that meets or exceeds the posted speed limit; and
- Each strip in the array must weigh a minimum of 100 pounds.

Use individual PRS constructed in one of the following manners:

- A single piece; or
- Interlocking segments; or
- Two pieces hinged at the midpoint.

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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NOTES

An installed array of PRS consists of a minimum of 3 individual strips.

Move rumble strips with the flagging operation. Do not place rumble strips on horizontal curves.

The Engineer will count and measure each array as one unit. Include the cost of providing, installing, maintaining, and relocating PRS in the unit price bid for "Portable Rumble Strips".

704-P01 TRAFFIC CONTROL FOR UNEVEN LANES: The contents of this note replace Section 704.04 O.2, “Two Lane Roadways” in the Standard Specifications.

If the pavement in adjacent lanes is uneven at the completion of a day’s work, install traffic control as described in this note. For the purposes of this note, use of a notched wedge during asphalt paving is considered greater than 1 inch and less than 2 inches.

If the difference in elevation between the lanes is less than 1 inch install the following signs:

- “Uneven Lanes” sign (Sign W8-11-48) and a supplementary plaque identifying the length of the uneven pavement (Sign W20-52-54). Place this assembly on the right shoulder, in both directions, in advance of the uneven pavement.

If the difference in elevation between the lanes is greater than 1 inch and less than 2 inches install the following signs:

- “Uneven Lanes” sign (Sign W8-11-48) and a supplementary plaque identifying the length of the uneven pavement (Sign W20-52-54). Place this assembly on the right shoulder, in both directions, in advance of the uneven pavement.

- Between the “Uneven Lanes” sign and the beginning of the uneven pavement, install a “Do Not Pass” sign (Sign R4-1-48) on the right shoulder in both directions.

If the difference in elevation between the lanes is 2 inches or greater install the following traffic control devices:

- “Uneven Lanes” sign (Sign W8-11-48) and a supplementary plaque identifying the length of the uneven pavement (Sign W20-52-54). Place this assembly on the right shoulder, in both directions, in advance of the uneven pavement.

- Between the “Uneven Lanes” sign and the beginning of the uneven pavement, install a “Do Not Pass” sign (Sign R4-1-48) on the right shoulder in both directions.

- Install tubular markers spaced at 2 times the posted speed limit through the uneven lane area.

In all instances install “Uneven Lanes” signs and a supplementary plaque identifying the length of the uneven pavement at the following intersections:

County Major Collectors; 23rd St SW, 24th St SW, 28th St SW, 29th St SW, and 32nd St SW
State Highways; ND22 Bypass

704-P02 TRAFFIC CONTROL FOR BITUMINOUS PAVEMENT: From RP 77.941 to RP 91.439, provide traffic control consisting of a temporary road closure, flagging, and a pilot car.

Traffic control device quantities are estimated based on a 6-mile lane closure and the list below. The Department will pay for all necessary deployed devices, regardless of the length of the lane closure.

1. Standard D-704-12;
2. Standard D-704-33;
3. Standard D-704-20, layout G – signing will be required at junctions at HWY 22: 23rd St SW, 24th St SW, 28th St SW 29th St SW
4. Standard D-704-22, layouts K and L; and
5. Standard D-704-26, layouts CC, EE, and GG
6. Standard D-704-26, layout KK – signing will be required at junctions at HWY 22: 23rd St SW, 24th St SW, 28th St SW 29th St SW when pilot car operations are being utilized.

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

772-P01 ITS EQUIPMENT: Intelligent Transportation Systems (ITS) equipment is located within the project limits.

An Automatic Traffic Recorder (ATR) site is located on ND Highway 22 at RP 81.5. Provide 2 weeks’ notice before work begins in this area. NDDOT district personnel will disconnect the loops in the roadway. Pave through this area as shown in the plans.

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/26/24
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	6	3

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

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

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Estimated Quantities

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline:				TOTAL
103	0100	CONTRACT BOND	L SUM	1				1
109	1000	E-TICKETING	L SUM	1				1
216	0100	WATER	M GAL	65				65
302	0120	AGGREGATE BASE COURSE CL 5	TON	1992				1992
401	0050	TACK COAT	GAL	54315				54315
411	0100	MILLING PAVEMENT SURFACE	TON	5003				5003
411	0110	MILLING PCC PAVEMENT	SY	212				212
430	0045	SUPERPAVE FAA 45	TON	90970				90970
430	1000	CORED SAMPLE	EA	968				968
430	5818	PG 58H-34 ASPHALT CEMENT	TON	5460				5460
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	1961				1961
602	7000	SPECIAL SURFACE FINISH	SF	1802				1802
702	0100	MOBILIZATION	L SUM	1				1
704	0100	FLAGGING	MHR	1936				1936
704	1000	TRAFFIC CONTROL SIGNS	UNIT	3772				3772
704	1048	PORTABLE RUMBLE STRIPS	EA	6				6
704	1052	TYPE III BARRICADE	EA	12				12
704	1060	DELINEATOR DRUMS	EA	44				44
704	1067	TUBULAR MARKERS	EA	494				494
704	1080	STACKABLE VERTICAL PANELS	EA	50				50
704	1185	PILOT CAR	HR	420				420
706	0550	BITUMINOUS LABORATORY	EA	1				1
706	0600	CONTRACTOR'S LABORATORY	EA	1				1
760	0025	SINUSOIDAL RUMBLE STRIP - ASPHALT SHOULDER	MILE	34				34
760	0027	SINUSOIDAL RUMBLE STRIP - ASPHALT CENTERLINE	MILE	17				17
762	0111	EPOXY PVMT MK 12IN LINE	LF	16664				16664
762	0112	EPOXY PVMT MK MESSAGE	SF	1791				1791
762	0114	EPOXY PVMT MK 6IN LINE	LF	361676				361676
762	0117	EPOXY PVMT MK 24IN LINE	LF	333				333
762	0432	SHORT TERM 6IN LINE-TYPE NR	LF	624402				624402
762	0436	SHORT TERM 24IN LINE-TYPE NR	LF	601				601
762	0437	SHORT TERM 12IN LINE-TYPE NR	LF	65370				65370
930	9223	CRACK SEALING	LF	1881				1881
930	9694	GIRDER PATCHING	L SUM	1				1

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Basis of Estimate ND 22	Typical Section 1			Typical Section 2			Typical Section 3			Typical Section 4			Typical Section 5			Typical Section 6			Typical Section 7		
	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP
Surfacing Quantities	74.166 to 77.440		3.274	77.750 to 77.816		0.066	77.864 to 77.918		0.054	78.108 to 78.772		0.664	78.870 to 78.942		0.072	79.017 to 79.074		0.057	80.609 to 80.666		0.057
	83.909 to 83.959		0.050							79.155 to 80.552		1.397	80.880 to 80.951		0.071	81.018 to 81.146		0.128			
										80.723 to 80.825		0.102				88.147 to 88.280		0.133			
										81.271 to 82.078		0.807									
										85.840 to 87.917		2.077									
										88.319 to 89.138		0.819									
										89.535 to 91.291		1.756									
	Total =		3.324	Total =		0.066	Total =		0.054	Total =		7.622	Total =		0.143	Total =		0.318	Total =		0.057

Material	Unit	Width (ft)	Quantity per Mile	Total Per Section	Width (ft)	Quantity per Mile	Total Per Section	Width (ft)	Quantity per Mile	Total Per Section	Width (ft)	Quantity per Mile	Total Per Section	Width (ft)	Quantity per Mile	Total Per Section	Width (ft)	Quantity per Mile	Total Per Section	Width (ft)	Quantity per Mile	Total Per Section
Tack Coat @ 0.05 Gal/SY (1st Lift)	Gal	76.0	2229.3	7,410.30	68.0	1994.7	131.65	76.0	2229.3	120.38	40.0	1173.3	8,943.15	52.0	1525.3	218.12	60.0	1760.0	559.68	80.0	2346.7	133.76
Tack Coat @ 0.05 Gal/SY (2nd Lift)	Gal	76.0	2229.3	7,410.30	68.0	1994.7	131.65	76.0	2229.3	120.38	40.0	1173.3	8,943.15	52.0	1525.3	218.12	60.0	1760.0	559.68	80.0	2346.7	133.76
Superpave FAA 45 (2 Ton/CY)	Ton	73.8	7324.0	24,344.98	65.8	6544.0	431.90	73.8	7327.0	395.66	37.8	3804.0	28,994.09	49.8	4977.0	711.71	57.8	5760.0	1,831.68	78.0	7716.0	439.81
PG 58H-34 Asphalt Cement (6.0%)	Ton	73.8	439.4	1,460.57	65.8	392.6	25.91	73.8	439.6	23.74	44.5	228.2	1,739.34	49.8	298.6	42.70	57.8	345.6	109.90	78.0	463.0	26.39

Basis of Estimate ND 22	Typical Section 8			Typical Section 9			Typical Section 10			Typical Section 11			Typical Section 12			Transition: Typ 1 to 2			Transition: Typ 1 to 10		
	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP
Surfacing Quantities	82.223 to 82.800		0.577	82.909 to 83.148		0.239	84.018 to 84.145		0.127	84.31 to 85.706		1.396	89.199 to 89.284		0.085	77.44 to 77.750		0.310	83.959 to 84.018		0.059
	83.249 to 83.574		0.325																		
	Total =		0.902	Total =		0.239	Total =		0.127	Total =		1.396	Total =		0.085	Total =		0.310	Total =		0.059

Material	Unit	Width (ft)	Quantity per Mile	Total Per Section	Width (ft)	Quantity per Mile	Total Per Section	Width (ft)	Quantity per Mile	Total Per Section	Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section
Tack Coat @ 0.05 Gal/SY (1st Lift)	Gal	48.0	1408.0	1,270.02	72.0	2112.0	504.77	80.0	2346.7	298.03	48.0	1408.0	1,965.57	60.0	1760.0	149.60	72.0	2112.0	654.72	76.0	2288.0	134.99
Tack Coat @ 0.05 Gal/SY (2nd Lift)	Gal	48.0	1408.0	1,270.02	72.0	2112.0	504.77	80.0	2346.7	298.03	48.0	1408.0	1,965.57	60.0	1760.0	149.60	72.0	2112.0	654.72	76.0	2288.0	134.99
Superpave FAA 45 (2 Ton/CY)	Ton	45.8	4587.0	4,137.47	69.8	6936.0	1,657.70	77.8	7718.0	980.19	45.8	4587.0	6,403.45	57.8	5762.0	489.77	69.8	6934.0	2,149.54	73.8	7521.0	443.74
PG 58H-34 Asphalt Cement (6.0%)	Ton	45.8	275.2	248.23	69.8	416.2	99.47	77.8	463.1	58.81	45.8	275.2	384.18	57.8	345.7	29.38	69.8	416.0	128.96	73.8	451.3	26.62

Basis of Estimate ND 22	Transition: Typ 2 to 3			Transition: Typ 3 to 4			Transition: Typ 4 to 5			Transition: Typ 4 to 7 & Typ 7 to 4			Transition: Typ 4 to 8			Transition: Typ 4 to 6 & Typ 6 to 4			Transition: Typ 4 to 12 & Typ 12 to 4		
	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP
Surfacing Quantities	77.816 to 77.864		0.048	77.918 to 78.108		0.190	78.772 to 78.87		0.098	80.552 to 80.609		0.057	82.078 to 82.223		0.145	79.074 to 79.155		0.081	89.138 to 89.199		0.061
							80.825 to 80.88		0.055	80.666 to 80.723		0.057				81.146 to 81.271		0.125	89.284 to 89.535		0.251
																87.917 to 88.147		0.23			
																88.28 to 88.319		0.039			
	Total =		0.048	Total =		0.190	Total =		0.153	Total =		0.114	Total =		0.145	**Total =**		0.475	Total =		0.312

Material	Unit	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section
Tack Coat @ 0.05 Gal/SY (1st Lift)	Gal	58.0	2112.0	101.38	64.0	1701.3	323.25	78.0	1349.3	206.45	78.0	1760.0	200.64	68.0	1290.7	187.15	60	1466.7	696.7	78.0	1466.7	457.60
Tack Coat @ 0.05 Gal/SY (2nd Lift)	Gal	58.0	2112.0	101.38	64.0	1701.3	323.25	78.0	1349.3	206.45	78.0	1760.0	200.64	68.0	1290.7	187.15	60	1466.7	696.7	78.0	1466.7	457.60
Superpave FAA 45 (2 Ton/CY)	Ton	55.8	6935.5	332.90	61.8	5565.5	1,057.44	75.9	4390.5	671.75	75.8	5760.0	656.64	65.8	4195.5	608.35	57.8	4782.0	2271.5	75.9	4783.0	1,492.30
PG 58H-34 Asphalt Cement (6.0%)	Ton	59.2	416.1	19.97	61.8	333.9	63.44	75.9	263.4	40.30	75.8	345.6	39.40	65.8	251.7	36.50	57.8	286.9	136.3	75.9	287.0	89.53

ND Highway 22
Dickinson 45th St to 17th St SW

Basis of Estimate

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/26/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	10	2

Basis of Estimate ND 22		Transition: Typ 5 to 6			Transition: Typ 8 to 9 & Typ 9 to 8			Transition: Typ 8 to 1			Transition: Typ 10 to 11			Transition: Typ 11 to 4		
		RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP	RP		# of RP
Surfacing Quantities		78.942 to 79.017		0.075	82.8 to 82.909		0.109	83.574 to 83.909		0.335	84.145 to 84.31		0.165	85.706 to 85.84		0.134
		80.951 to 81.018		0.067	83.148 to 83.249		0.101									
		Total =		0.142	Total =		0.210	Total =		0.335	Total =		0.165	Total =		0.134
Material	Unit	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section	Average Width (ft)	Quantity per Mile	Total Per Section
Tack Coat @ 0.05 Gal/SY (1st Lift)	Gal	62.0	1642.7	233.26	44.0	1760.0	369.60	54.0	1818.7	609.25	70.0	1877.3	309.76	48.0	1290.7	172.95
Tack Coat @ 0.05 Gal/SY (2nd Lift)	Gal	62.0	1642.7	233.26	44.0	1760.0	369.60	54.0	1818.7	609.25	70.0	1877.3	309.76	48.0	1290.7	172.95
Superpave FAA 45 (2 Ton/CY)	Ton	59.8	5368.5	762.33	41.8	5761.5	1,209.92	51.8	5955.5	1,995.09	67.8	6152.5	1,015.16	45.8	4195.5	562.20
PG 58H-34 Asphalt Cement (6.0%)	Ton	59.8	322.1	45.74	45.2	345.7	72.60	51.8	357.3	119.70	67.8	369.2	60.91	45.8	251.7	33.73

Material - Project Summary	Unit	Section 10 Surfacing Quantities	Section 20 Sheet 1	Section 20 Sheet 3	Section 40 Sheet 1	Section 40 Sheet 2	Section 40 Sheet 3	Section 40 Sheet 4	Section 40 Sheet 5	Section 40 Sheet 6	Section 90 Sheet 1	Section 90 Sheet 2	Section 90 Sheet 3	Section 90 Sheet 4	Section 90 Sheet 5	Section 90 Sheet 6	Total	Unit
Milling Pavement Surface	Ton	---	134	1,080	1,340	1,027	---	---	1,046	376	---	---	---	---	---	---	**5,003**	Ton
Milling PCC Pavement	SY	---	---	---	---	---	137	75	---	---	---	---	---	---	---	---	**212**	SY
Aggregate Base Course CL 5 (1.875 Ton/CY) (Mainline)	Ton	---	1,768	---	---	---	---	---	---	---	---	---	---	---	---	---	**1,768**	Ton
Aggregate Base Course CL 5 (1.875 Ton/CY) (Radius Slough	Ton	---	224	---	---	---	---	---	---	---	---	---	---	---	---	---	**224**	Ton
Tack Coat (0.05 Gal/SY)	Gal	52,726	1,076	---	---	---	---	---	---	---	4	3	8	4	358	136	**54,315**	Gal
Superpave FAA 45 (2 Ton/CY)	Ton	86,047	3,448	---	---	---	---	---	---	---	7	4	22	11	1,055	376	**90,970**	Ton
PG 58H-34 Asphalt Cement (6.0%)	Ton	5,162	207	---	---	---	---	---	---	---	1	1	1	1	64	23	**5,460**	Ton

HBP Cored Samples						
	A	B	C	D		
Specification	Distance (ft)/1000	Lanes	Lifts	Quantity (A x B x C)	Quantity (1 per mile)	Unit
430.04 I.2.b(2), "Pavement Density Cores" Proposed Typicals 4 & 7	44	2	2	176	N/A	EA
430.04 I.2.b(2), "Pavement Density Cores" Proposed Typicals 5, 8 & 11	19	3	2	114	N/A	EA
430.04 I.2.b(2), "Pavement Density Cores" Proposed Typicals 2, 6, & 12	4	4	2	32	N/A	EA
430.04 I.2.b(2), "Pavement Density Cores" Proposed Typicals 1, 3, & 9	23	5	2	230	N/A	EA
430.04 I.2.b(2), "Pavement Density Cores" Proposed Typicals 10	2	6	2	24	N/A	EA

HBP Cored Samples						
	A	B	C	D		
Specification	Distance (ft)/1000	Joints	Lifts	Quantity (A x B x C)	Quantity (1 per mile)	Unit
SSP 4, "Longitudinal Joint Density in HMA Pavement" Proposed Typicals 4 & 7	44	1	2	88	N/A	EA
SSP 4, "Longitudinal Joint Density in HMA Pavement" Proposed Typicals 5, 8, & 11	19	2	2	76	N/A	EA
SSP 4, "Longitudinal Joint Density in HMA Pavement" Proposed Typicals 2, 6, & 12	4	3	2	24	N/A	EA
SSP 4, "Longitudinal Joint Density in HMA Pavement" Proposed Typicals 1, 3, & 9	23	4	2	184	N/A	EA
SSP 4, "Longitudinal Joint Density in HMA Pavement" Proposed Typicals 10	2	5	2	20	N/A	EA
		Total		**968**	**0**	**EA**

Sinusoidal Rumble Strips					
Type	Start RP	End RP	Length (LF)	Basis	Quantity
Asphalt Centerline	74.166	91.291	90,420	1 / Mile	17.1 Miles
Asphalt Shoulder	74.166	91.291	90,420	2 / Mile	34.3 Miles

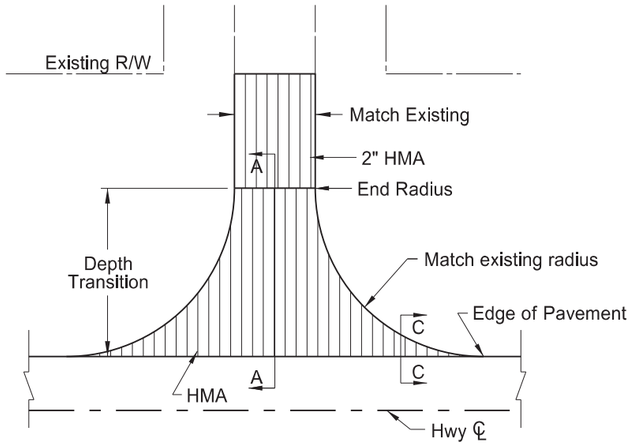
Water	Total
25 MGal for Dust Palliative	25
0.02 MGal/Ton for Aggregates	40
Total (MGAL) =	**65**

ND Highway 22
Dickinson 45th St to 17th St SW

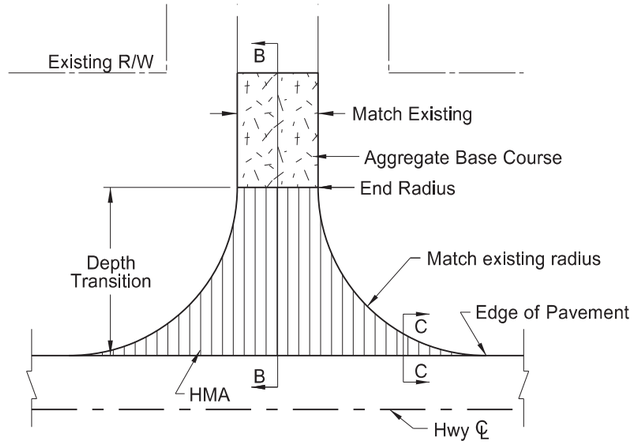
Basis of Estimate

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/26/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	20	1



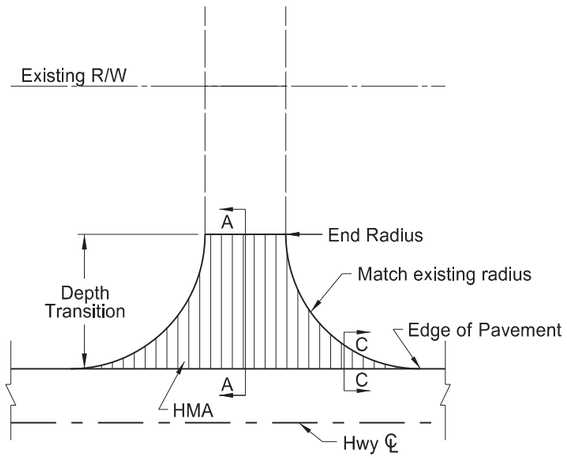
(1) Paved Section Line, County Road, or Street Approach



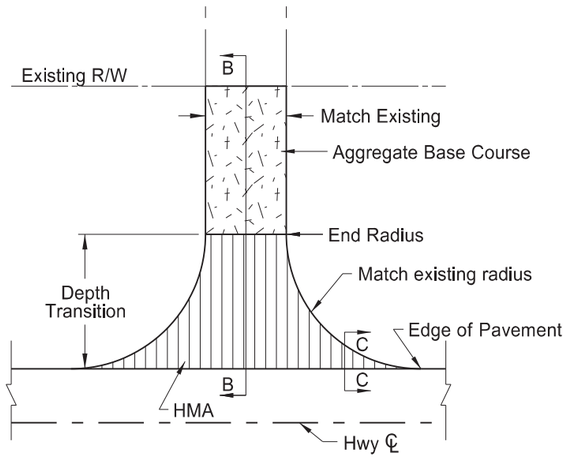
(2) Gravel Section Line, County Road, or Street Approach

Notes:

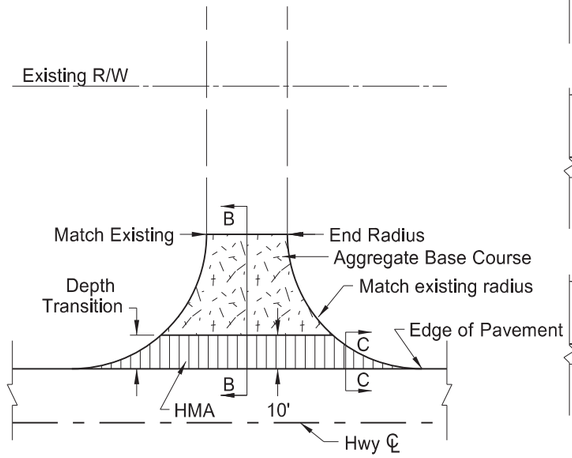
1. Actual HMA paving and aggregate base course locations may vary in the field, as approved by the Engineer.
2. Quantity totals have been included in the bid items of the "Estimate of Quantities" of the plans.
3. Aggregate base course has been provided in the quantities to fill in around the radii. This material will be required when sloughs are steeper than 4:1 (see section C-C)



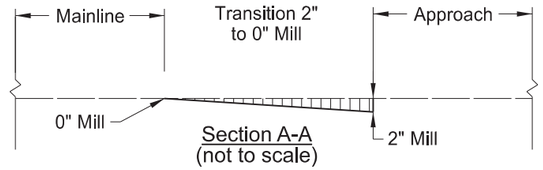
(3) Paved Private Drive Approach



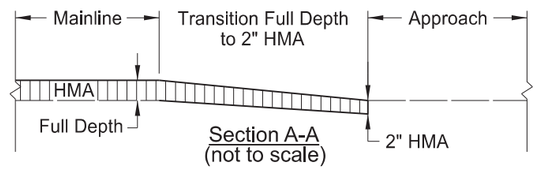
(4) Gravel Private Drive Approach



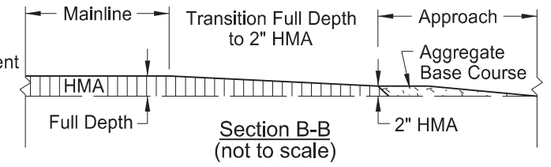
(5) Field Drive Approach



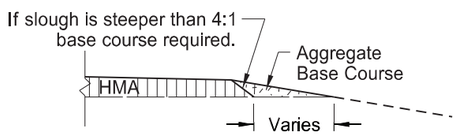
Section A-A
(not to scale)



Section A-A
(not to scale)



Section B-B
(not to scale)



Section C-C
(not to scale)

BASIS OF ESTIMATE		1	2	3	4	5	
		Paved Section Line	Gravel Section Line	Paved Private Drive	Gravel Private Drive	Field Drive	
NUMBER OF APPROACH TYPE		6	22	5	29	44	
Material	UNIT	Quantity Per Location	Quantity Per Location	Quantity Per Location	Quantity Per Location	Quantity Per Location	TOTAL
Tack Coat	GAL	20	18	10	10	5	**1,076.00**
Superpave FAA 45	TON	65	60	33	33	14	**3,448.00**
PG 58H-34 Asphalt Cement	TON	3.9	3.6	2.0	2.0	0.8	**206.88**
Aggregate Base Course CL 5	TON	0	20	0	20	17	**1,768.00**
Aggregate Base Course CL 5 - Radius Slough	TON	4	2	2	2	2	**224.00**
Milling	TON	14	0	10	0	0	**134.00**

ND Highway 22
Dickinson 45th St to 17th St SW

General Details
Approach Paving

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	20	2

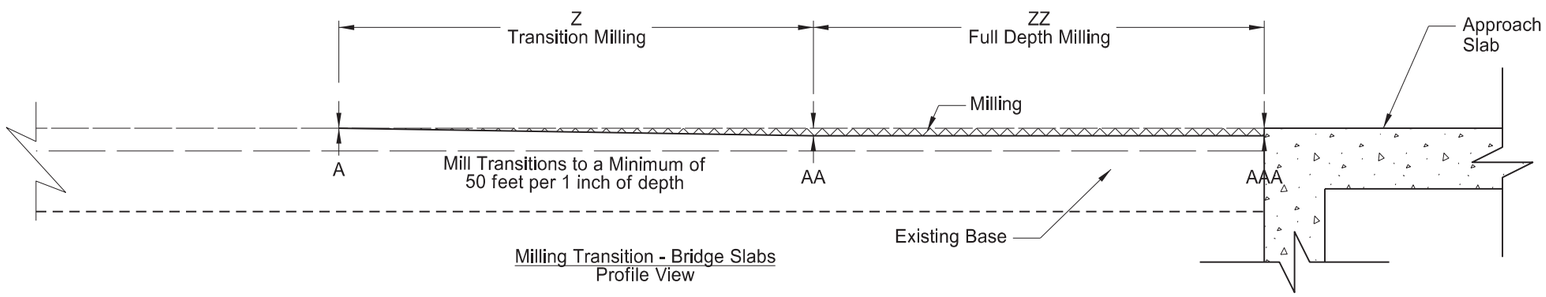
Locations For Apporaches				
1: Paved Section Line	2: Gravel Section Line	3: Paved Private Drive	4: Gravel Private Drive	5: Field Drive
Location	Location	Location	Location	Location
RP 74.63 Lt & Rt	RP 76.68 Lt & Rt	RP 74.94 Rt	RP 74.18 Rt	RP 74.18 Lt
RP 75.68 Lt & Rt	RP 77.17 Lt & Rt	RP 75.45 Lt	RP 75.04 Rt	RP 76.55 Rt
RP 77.90 Rt	RP 77.90 Lt	RP 76.11 Lt	RP 75.79 Rt	RP 78.14 Lt & Rt
RP 79.02 Lt	RP 80.02 Lt & Rt	RP 76.89 Rt	RP 75.95 Rt	RP 78.76 Lt
---	RP 81.03 Lt & Rt	RP 77.11 Lt	RP 76.17 Rt	RP 79.52 Rt
---	RP 82.02 Lt & Rt	---	RP 76.55 Lt	RP 80.52 Rt
---	RP 83.03 Lt & Rt	---	RP 76.63 Lt	RP 80.74 Lt & Rt
---	RP 84.03 Lt	---	RP 77.34 Rt	RP 81.29 Lt
---	RP 85.11 Rt	---	RP 77.54 Rt	RP 81.53 Lt
---	RP 87.13 Lt	---	RP 78.50 Lt & Rt	RP 81.78 Lt & Rt
---	RP 88.17 Lt	---	RP 79.84 Lt	RP 82.94 Rt
---	RP 89.29 Rt	---	RP 80.52 Lt	RP 83.56 Lt & Rt
---	RP 90.29 Lt & Rt	---	RP 80.96 Lt	RP 83.68 Rt
---	RP 91.29 Lt & Rt	---	RP 81.53 Rt	RP 84.03 Rt
---	---	---	RP 82.32 Lt & Rt	RP 84.19 Rt
---	---	---	RP 83.68 Lt	RP 84.59 Rt
---	---	---	RP 84.19 Lt	RP 85.11 Lt
---	---	---	RP 84.65 Lt	RP 85.30 Lt & Rt
---	---	---	RP 86.66 Rt	RP 85.65 Lt
---	---	---	RP 88.30 Lt	RP 85.74 Rt
---	---	---	RP 88.49 Rt	RP 86.11 Lt & Rt
---	---	---	RP 88.98 Lt	RP 86.26 Lt
---	---	---	RP 89.11 Lt	RP 86.42 Lt
---	---	---	RP 89.42 Lt	RP 86.66 Lt
---	---	---	RP 89.49 Lt	RP 86.75 Lt
---	---	---	RP 40.88 Rt	RP 87.13 Rt
---	---	---	RP 91.17 Lt	RP 87.60 Lt & Rt
---	---	---	---	RP 88.30 Rt
---	---	---	---	RP 88.79 Lt & Rt
---	---	---	---	RP 88.98 Rt
---	---	---	---	RP 89.42 Rt
---	---	---	---	RP 89.57 Rt
---	---	---	---	RP 40.68 Lt & Rt
---	---	---	---	RP 40.88 Lt
---	---	---	---	RP 91.18 Rt

ND Highway 22
Dickinson 45th St to 17th St SW

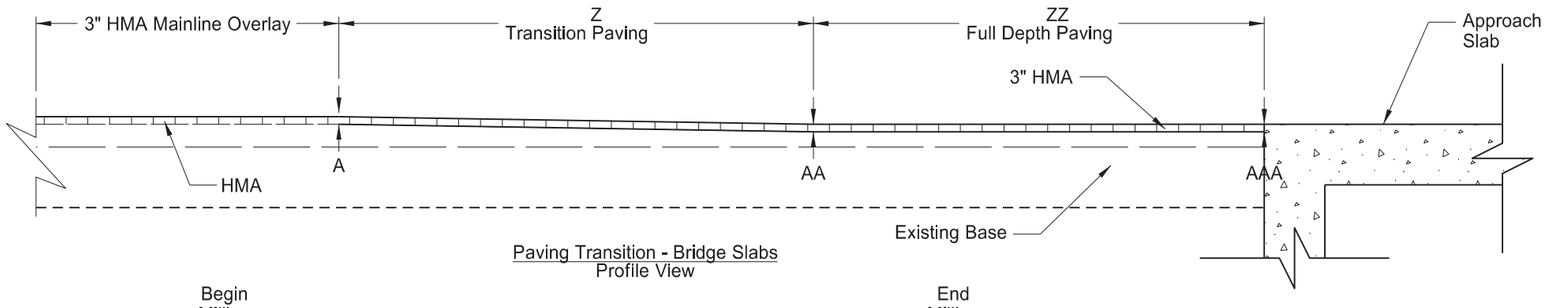
Approach Types and Locations

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

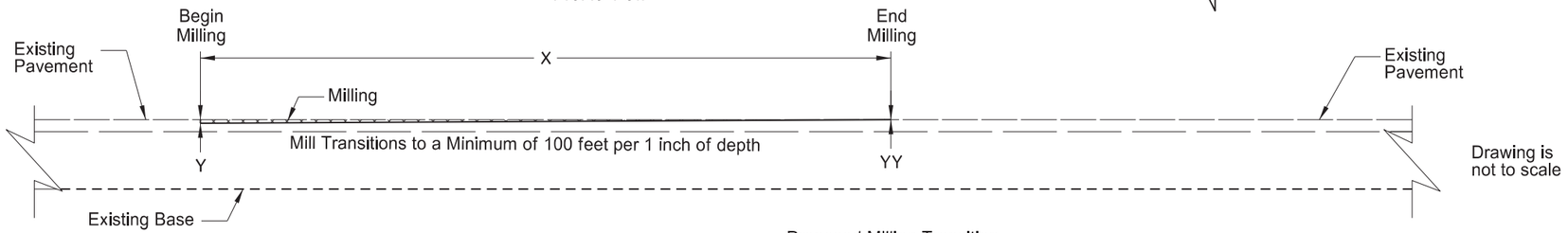
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	20	3



Milling Transition - Bridge Slabs
Profile View

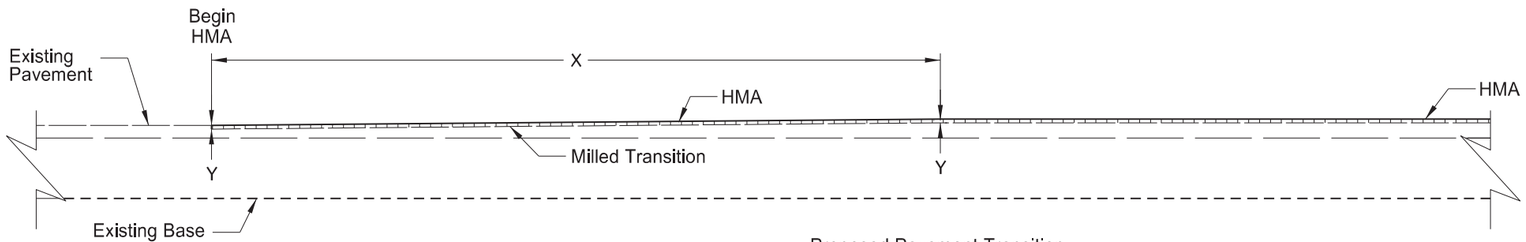


Paving Transition - Bridge Slabs
Profile View



Drawing is not to scale

Proposed Milling Transition



Drawing is not to scale

Proposed Pavement Transition

LOCATION	X (FT)	BEGIN MILLING/PAVING RP/STATION	Y (IN)	YY (IN)	END MILLING/PAVING RP/STATION				MILLING (TON)	Comments
Beginning of Project Overlay	300	74.166	6.0	0.0	74.223				422	Tack Coat, Superpave FAA 45, PG 58H-28 Asphalt Cement Qauntities calculated in section 10
End of Project Overlay	300	91.291	6.0	0.0	91.234				222	
LOCATION	**Z (FT)**	**BEGIN TRANSITION MILLING RP**	**A (IN)**	**AA (IN)**	**END TRANSITION MILLING/BEGIN FULL DETPH MILLING RP**	**ZZ (FT)**	**AAA (IN)**	**END FULL DEPTH MILLING RP**	**MILLING (TON)**	
Green River Bridge (South Tie-In)	150	76.150	0.0	3.0	76.221	250	3.0	76.268	106	Full Depth Milling section quantities are shown in section 40
Green River Bridge (North Tie-In)	150	76.422	0.0	3.0	76.351	250	3.0	76.304	106	
Russian Spring Creek Bridge (South Tie-In)	150	81.255	0.0	3.0	81.326	250	3.0	81.373	56	
Russian Spring Creek Bridge (North Tie-In)	150	81.498	0.0	3.0	81.427	250	3.0	81.380	56	
Crooked Creek Bridge (South Tie-In)	150	90.670	0.0	3.0	90.741	250	3.0	90.788	56	
Crooked Creek Bridge (North Tie-In)	150	90.921	0.0	3.0	90.850	250	3.0	90.803	56	

NOTES:
- Cross-sectional view of bridge tie-in shown on Sec 30 Sheet 5.

- All bridge tie-ins must be milled out and the bottom lift repaved within the same working day.

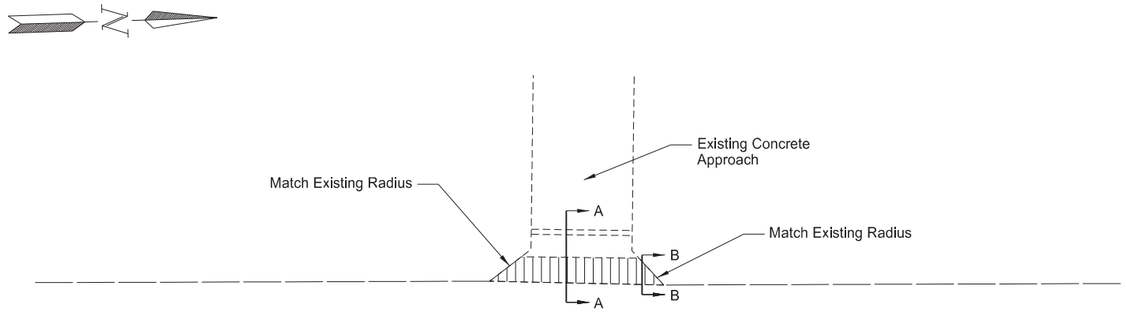
ND Highway 22
Dickinson 45th St to 17th St SW

General Details
Milling and Paving Transitions

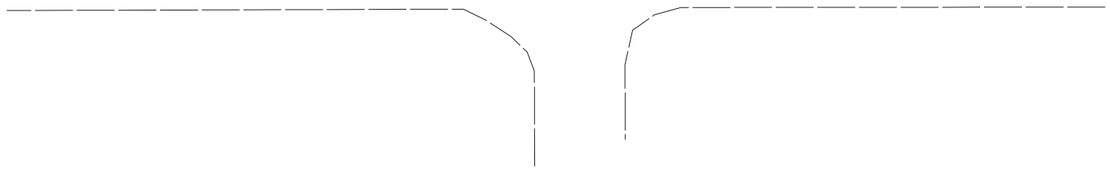
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

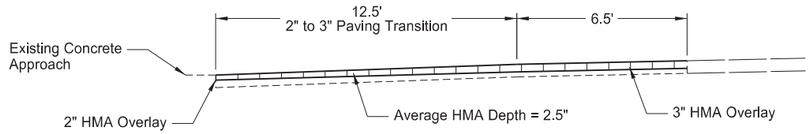
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	20	4

Notes:
1. See Section 40 for Removal/Milling
2. Drawings Not to Scale

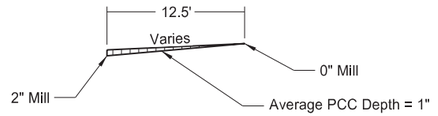


RP 74.926

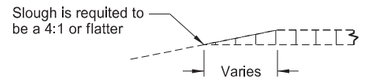




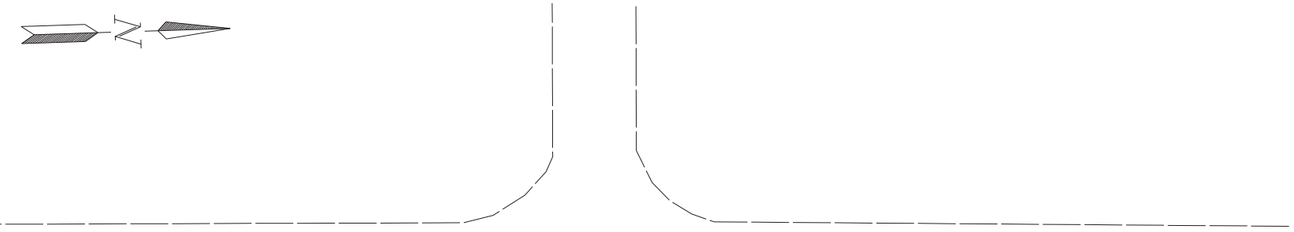
Section A-A Approach Paving



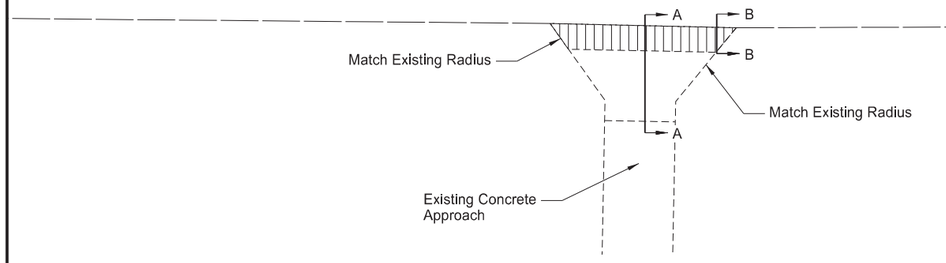
Section A-A Approach Milling

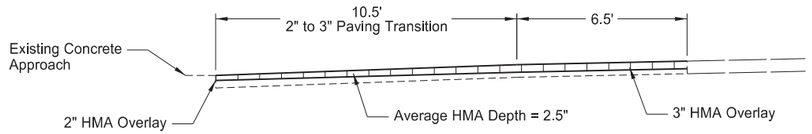


Section B-B

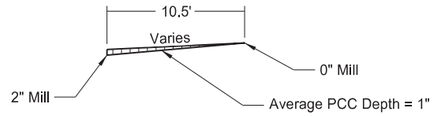


RP 75.442

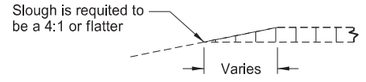




Section A-A Approach Paving



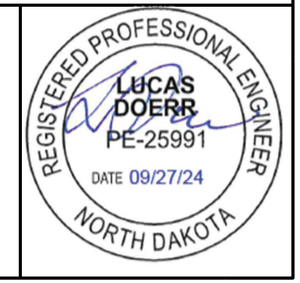
Section A-A Approach Milling



Section B-B

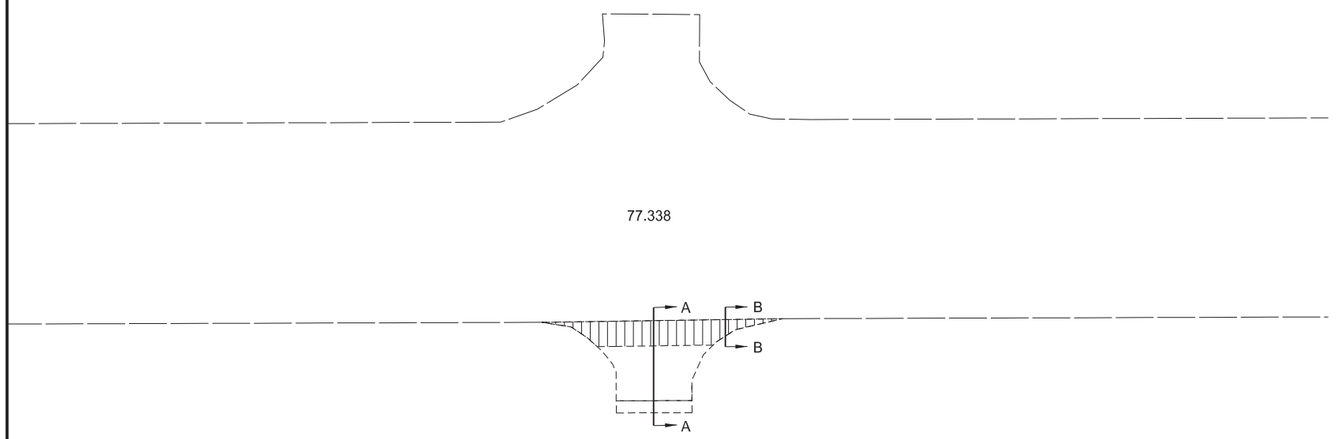
ND Highway 22
Dickinson 45th St to 17th St SW

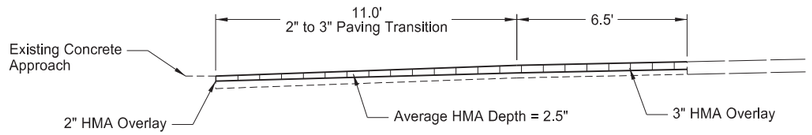
Concrete Approach



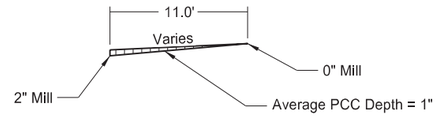
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	20	5

Notes:
1. See Section 40 for Removal/Milling
2. Drawings Not to Scale





Section A-A Approach Paving



Section A-A Approach Milling



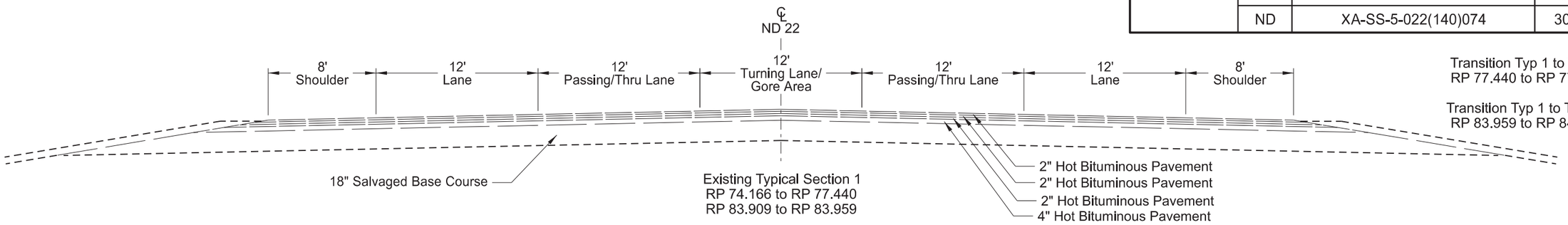
Section B-B

ND Highway 22
Dickinson 45th St to 17th St SW

Concrete Approach

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

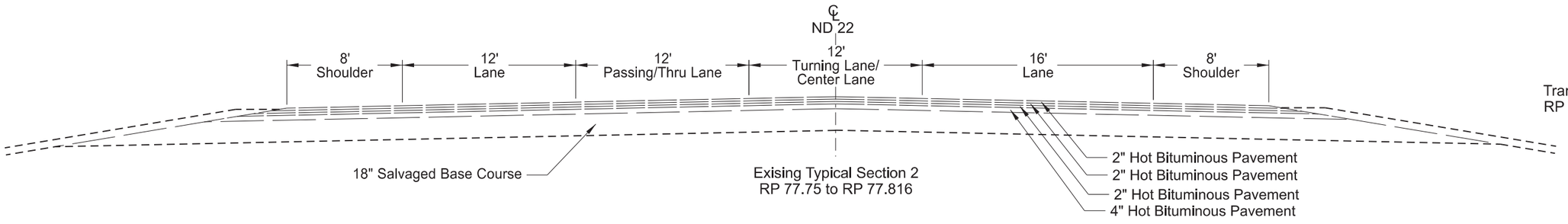
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	30	1



Existing Typical Section 1
RP 74.166 to RP 77.440
RP 83.909 to RP 83.959

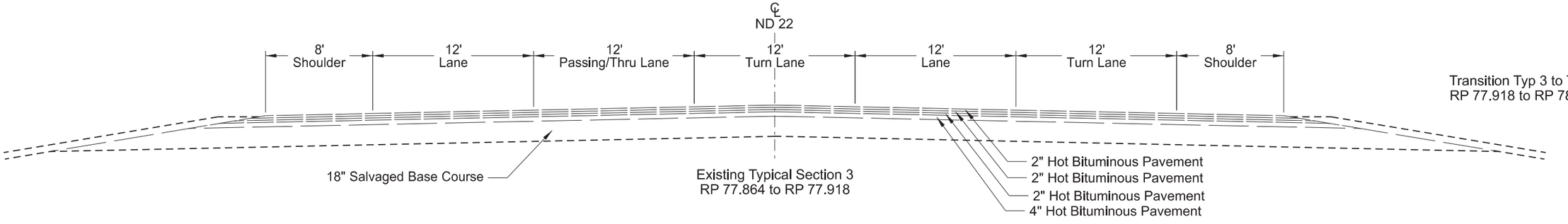
Transition Typ 1 to Typ 2
RP 77.440 to RP 77.750

Transition Typ 1 to Typ 10
RP 83.959 to RP 84.018



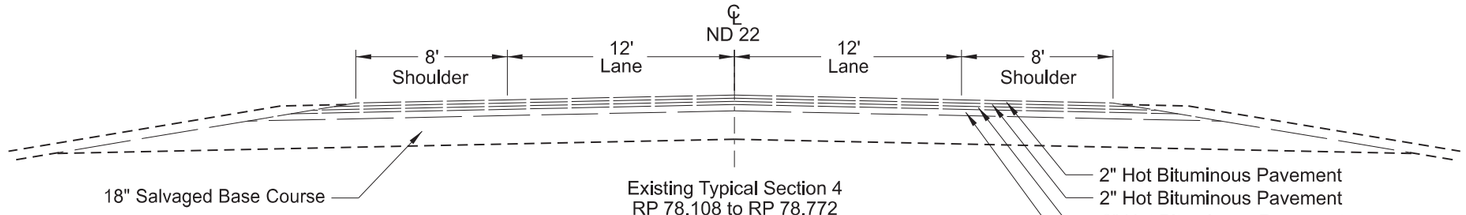
Exising Typical Section 2
RP 77.75 to RP 77.816

Transition Typ 2 to Typ 3
RP 77.816 to RP 77.864



Existing Typical Section 3
RP 77.864 to RP 77.918

Transition Typ 3 to Typ 4
RP 77.918 to RP 78.108



Existing Typical Section 4
RP 78.108 to RP 78.772
RP 79.155 to RP 80.552
RP 80.723 to RP 80.825
RP 81.271 to RP 82.078
RP 85.840 to RP 87.917
RP 88.319 to RP 89.138
RP 89.535 to RP 91.291

Transition Typ 4 to Typ 5
RP 78.772 to RP 78.870
RP 80.825 to RP 80.880

Transition Typ 4 to Typ 7
RP 80.552 to RP 80.609

Transition Typ 4 to Typ 8
RP 82.078 to RP 82.223

Transition Typ 4 to Typ 6
RP 87.917 to RP 88.147

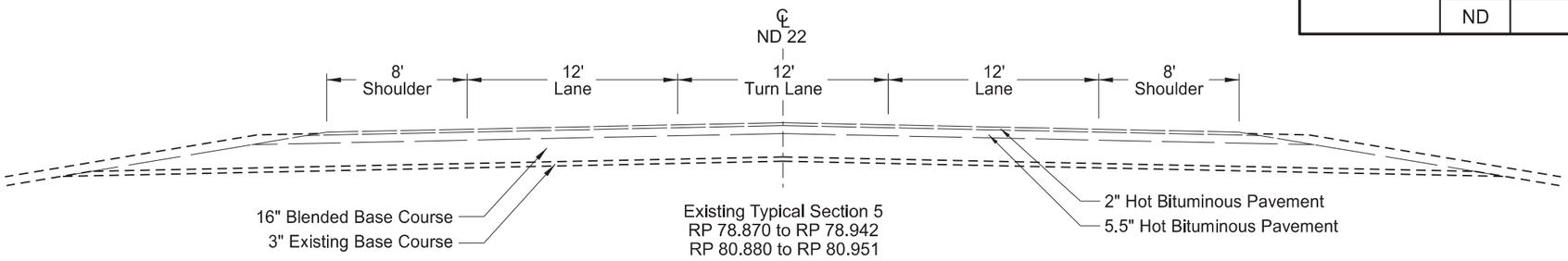
Transition Typ 4 to Typ 12
RP 89.138 to RP 89.199

ND Highway 22
Dickinson 45th St to 17th St SW

Existing Typical Sections

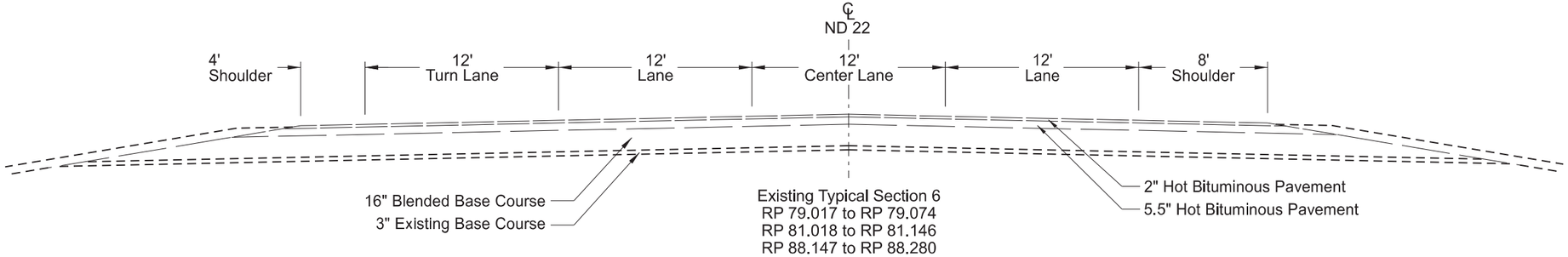
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	30	2



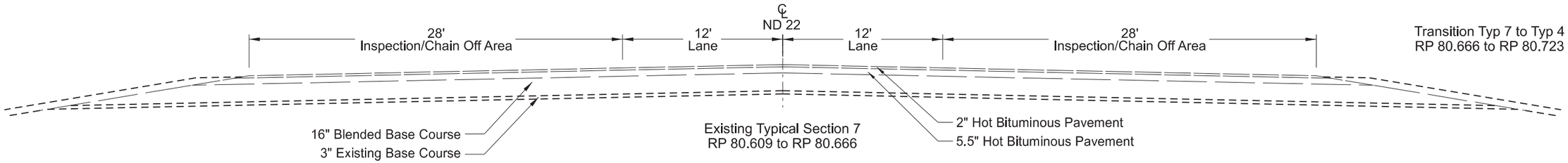
Existing Typical Section 5
RP 78.870 to RP 78.942
RP 80.880 to RP 80.951

Transition Typ 5 to Typ 6
RP 78.942 to RP 79.017
RP 80.951 to RP 81.018



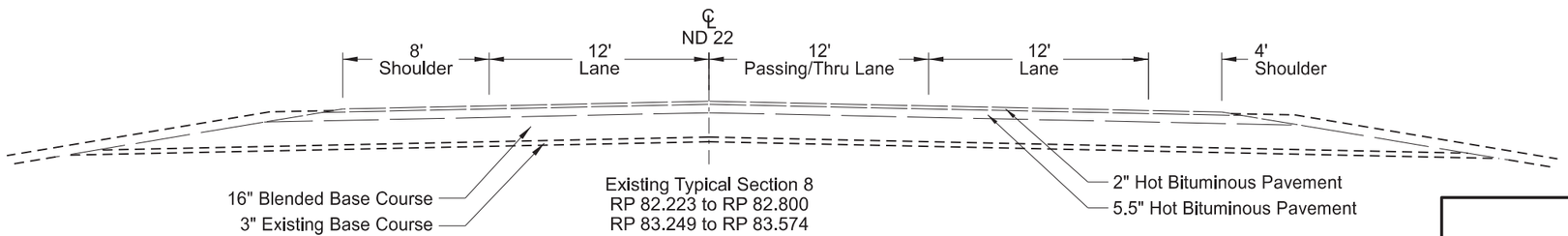
Existing Typical Section 6
RP 79.017 to RP 79.074
RP 81.018 to RP 81.146
RP 88.147 to RP 88.280

Transition Typ 6 to Typ 4
RP 79.074 to RP 79.155
RP 81.146 to RP 81.271
RP 88.280 to RP 88.319



Existing Typical Section 7
RP 80.609 to RP 80.666

Transition Typ 7 to Typ 4
RP 80.666 to RP 80.723



Existing Typical Section 8
RP 82.223 to RP 82.800
RP 83.249 to RP 83.574

Transition Typ 8 to Typ 9
RP 82.800 to RP 82.909

Transition Typ 8 to Typ 1
RP 83.574 to RP 83.909

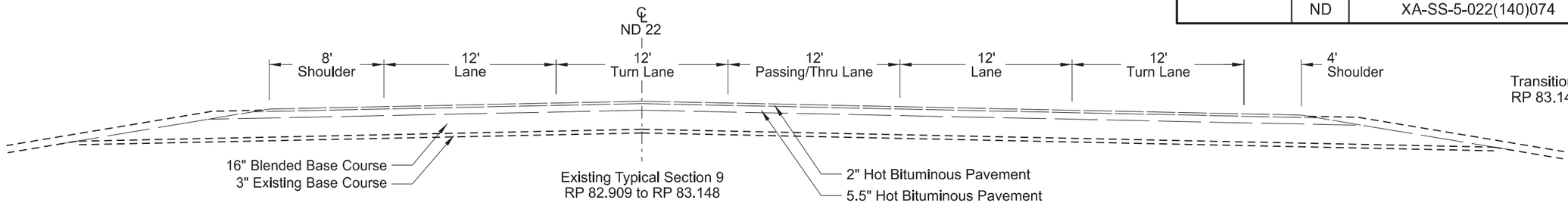
Transition Typ 8 to Typ 4
RP 89.453 to RP 89.535

ND Highway 22
Dickinson 45th St to 17th St SW

Existing Typical Sections

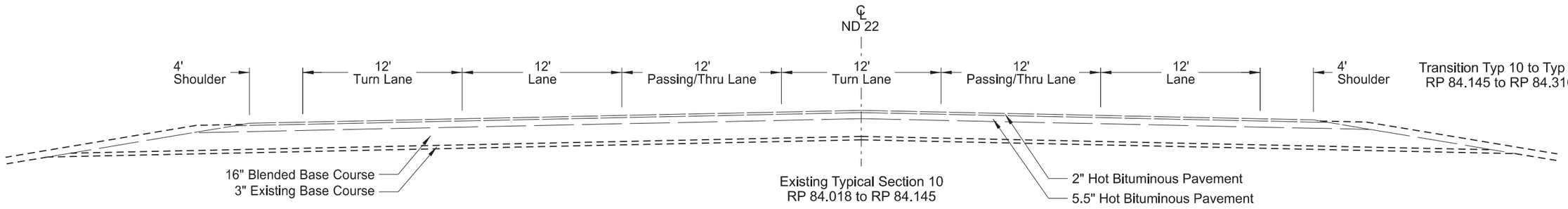
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	30	3



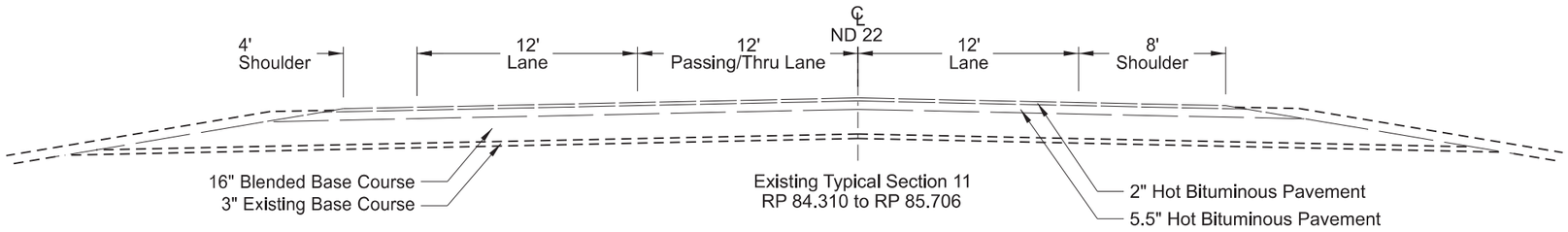
Existing Typical Section 9
RP 82.909 to RP 83.148

Transition Typ 9 to Typ 8
RP 83.148 to RP 83.249



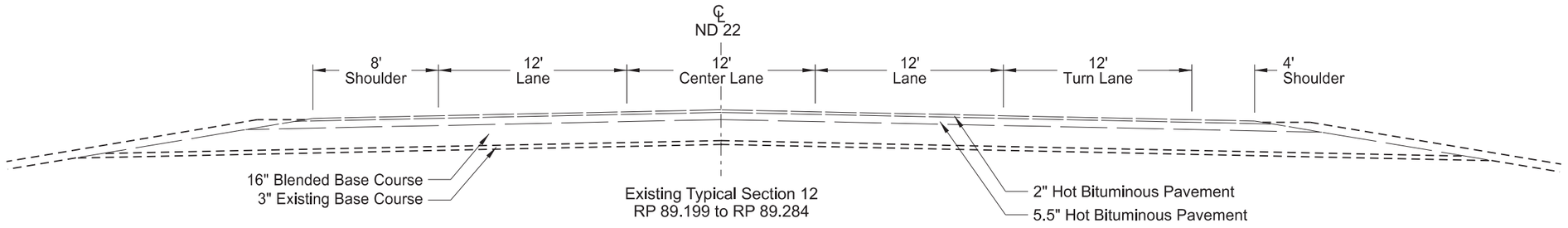
Existing Typical Section 10
RP 84.018 to RP 84.145

Transition Typ 10 to Typ 11
RP 84.145 to RP 84.310



Existing Typical Section 11
RP 84.310 to RP 85.706

Transition Typ 11 to Typ 4
RP 85.706 to RP 85.840



Existing Typical Section 12
RP 89.199 to RP 89.284

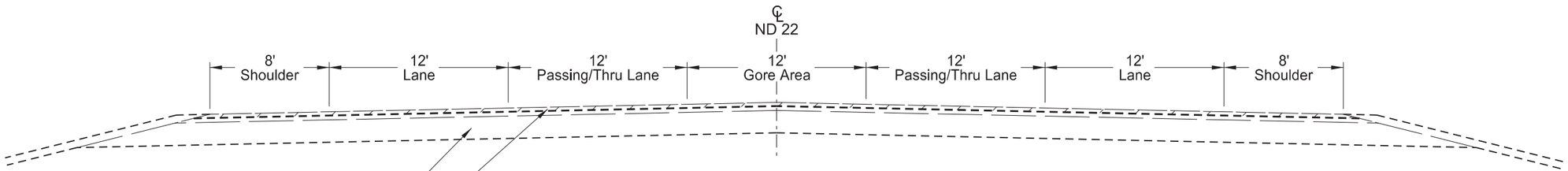
Transition Typ 12 to Typ 4
RP 89.284 to RP 89.535

ND Highway 22
Dickinson 45th St to 17th St SW

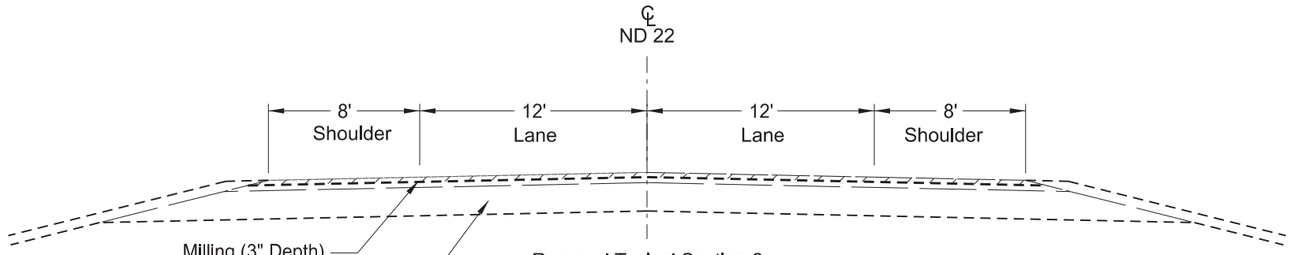
Existing Typical Sections

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	30	4



Removal Typical Section 1
Green River Bridge Tie-In
RP 76.221 to RP 76.268
RP 76.304 to RP 76.351



Removal Typical Section 2
Russian Spring Creek Bridge Tie-In
RP 81.326 to RP 81.373
RP 81.380 to RP 81.427
Crooked Creek Bridge Tie-In
RP 90.741 to RP 90.788
RP 90.803 to RP 90.850

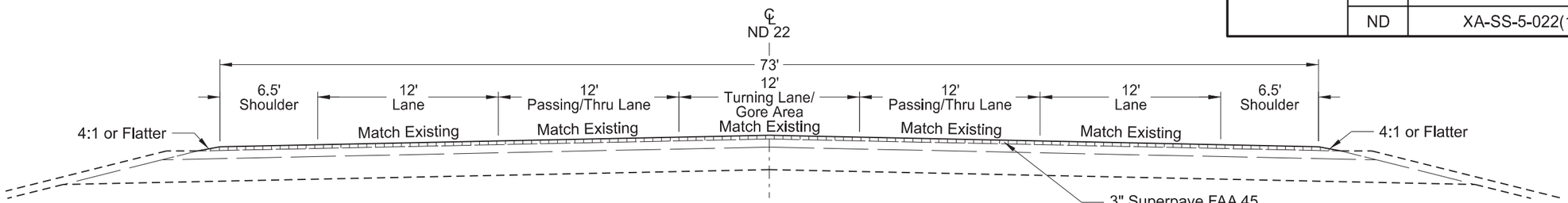
NOTE: Refer to Section 40 Sheets 5-6 for quantities related to these typical-sections

ND Highway 22
Dickinson 45th St to 17th St SW

Removal Typical Sections

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	30	5

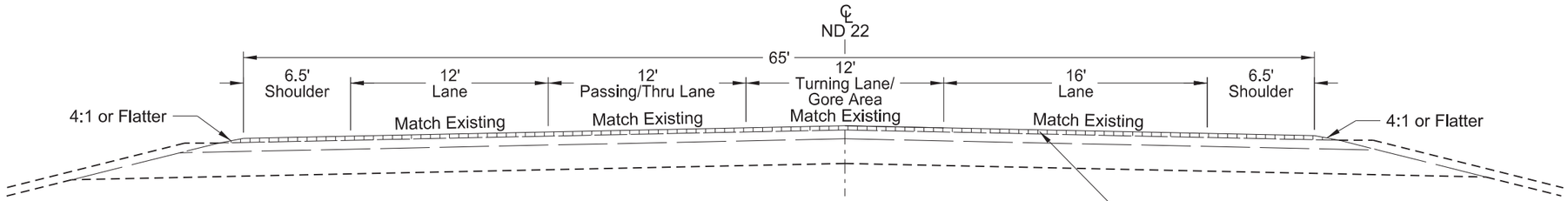


Proposed Typical Section 1
RP 74.166 to RP 77.440
RP 83.909 to RP 83.959

3" Superpave FAA 45
PG 58H-34 Asphalt Cement
Area = 18.7257 SF

Transition Typ 1 to Typ 2
RP 77.440 to RP 77.750

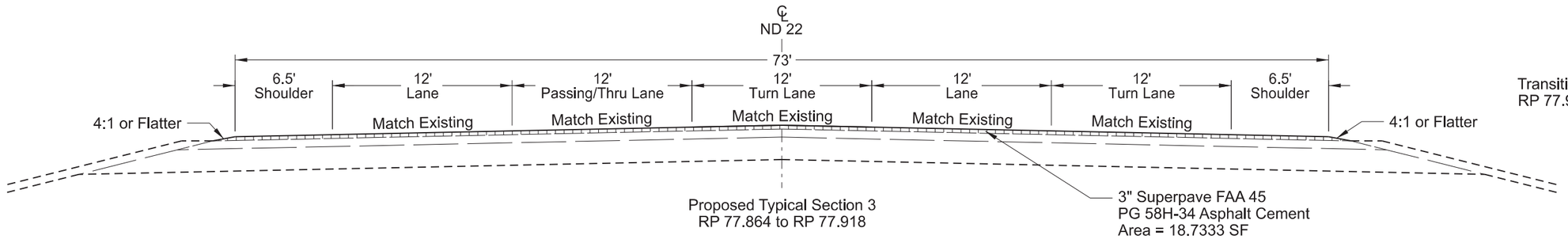
Transition Typ 1 to Typ 10
RP 83.959 to RP 84.018



Proposed Typical Section 2
RP 77.75 to RP 77.816

3" Superpave FAA 45
PG 58H-34 Asphalt Cement
Area = 16.7307 SF

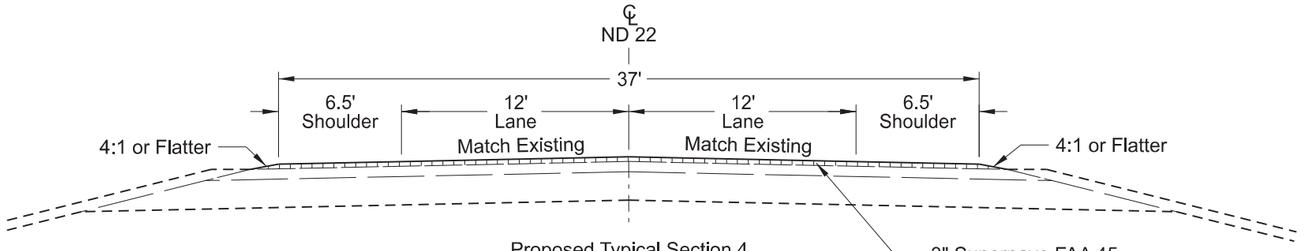
Transition Typ 2 to Typ 3
RP 77.816 to RP 77.864



Proposed Typical Section 3
RP 77.864 to RP 77.918

3" Superpave FAA 45
PG 58H-34 Asphalt Cement
Area = 18.7333 SF

Transition Typ 3 to Typ 4
RP 77.918 to RP 78.108



Proposed Typical Section 4
RP 78.108 to RP 78.772
RP 79.155 to RP 80.552
RP 80.723 to RP 80.825
RP 81.271 to RP 82.078
RP 85.840 to RP 87.917
RP 88.319 to RP 89.138
RP 89.535 to RP 91.291

3" Superpave FAA 45
PG 58H-34 Asphalt Cement
Area = 9.7270 SF

Transition Typ 4 to Typ 5
RP 78.772 to RP 78.870
RP 80.825 to RP 80.880

Transition Typ 4 to Typ 7
RP 80.552 to RP 80.609

Transition Typ 4 to Typ 8
RP 82.078 to RP 82.223

Transition Typ 4 to Typ 6
RP 87.917 to RP 88.147

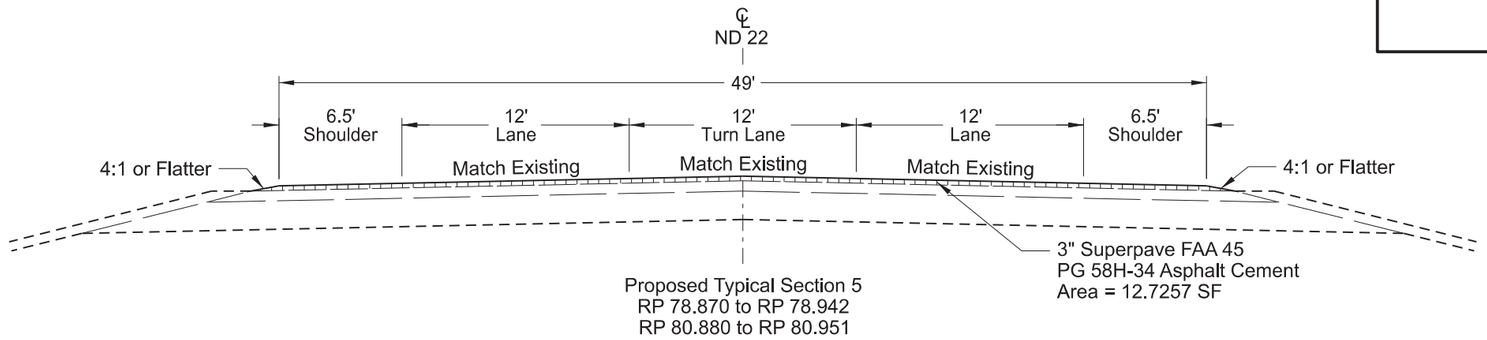
Transition Typ 4 to Typ 12
RP 89.138 to RP 89.199

ND Highway 22
Dickinson 45th St to 17th St SW

Proposed Typical Sections

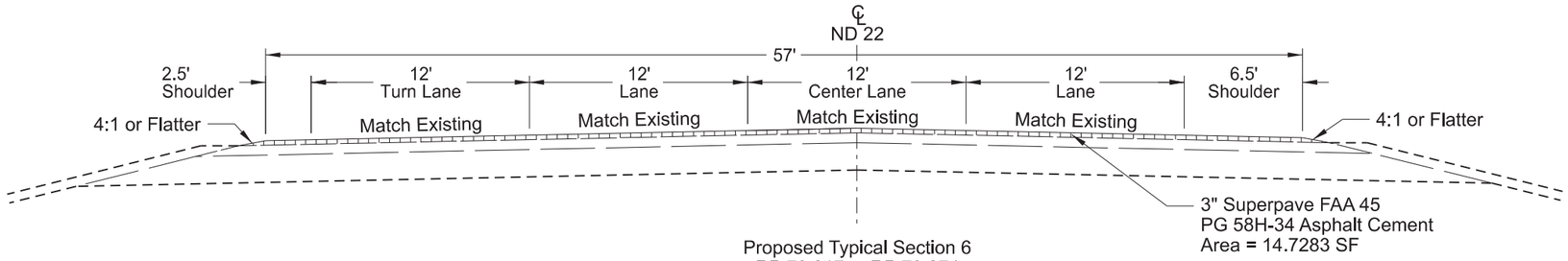
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	30	6



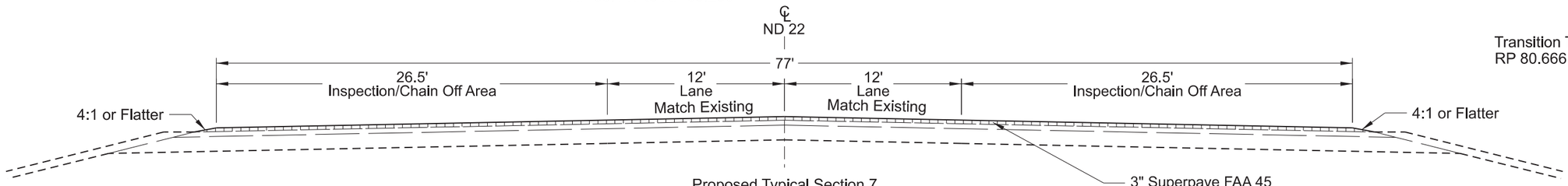
Proposed Typical Section 5
RP 78.870 to RP 78.942
RP 80.880 to RP 80.951

Transition Typ 5 to Typ 6
RP 78.942 to RP 79.017
RP 80.951 to RP 81.018



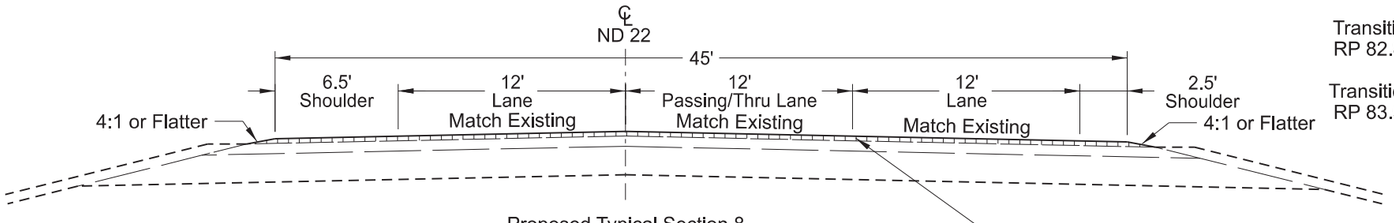
Proposed Typical Section 6
RP 79.017 to RP 79.074
RP 81.018 to RP 81.146
RP 88.147 to RP 88.280

Transition Typ 6 to Typ 4
RP 79.074 to RP 79.155
RP 81.146 to RP 81.271
RP 88.280 to RP 88.319



Proposed Typical Section 7
RP 80.609 to RP 80.666

Transition Typ 7 to Typ 4
RP 80.666 to RP 80.723



Proposed Typical Section 8
RP 82.223 to RP 82.800
RP 83.249 to RP 83.574

Transition Typ 8 to Typ 9
RP 82.800 to RP 82.909

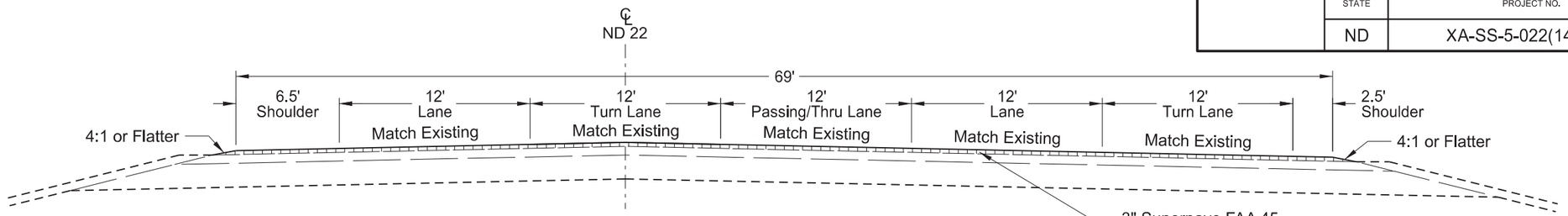
Transition Typ 8 to Type 1
RP 83.574 to RP 83.909

ND Highway 22
Dickinson 45th St to 17th St SW

Proposed Typical Sections

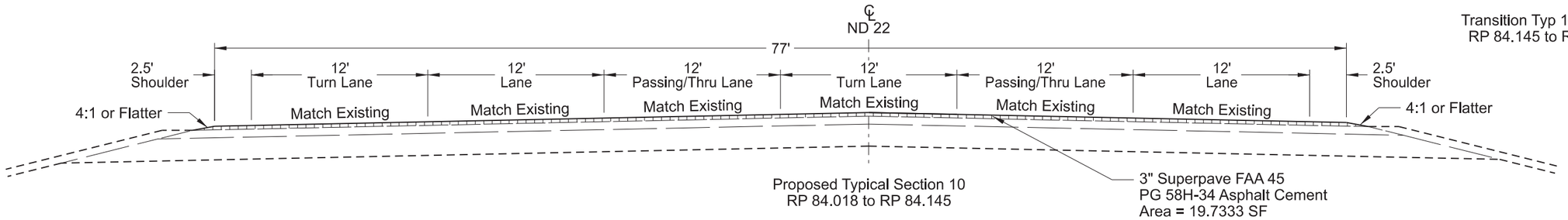
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	30	7



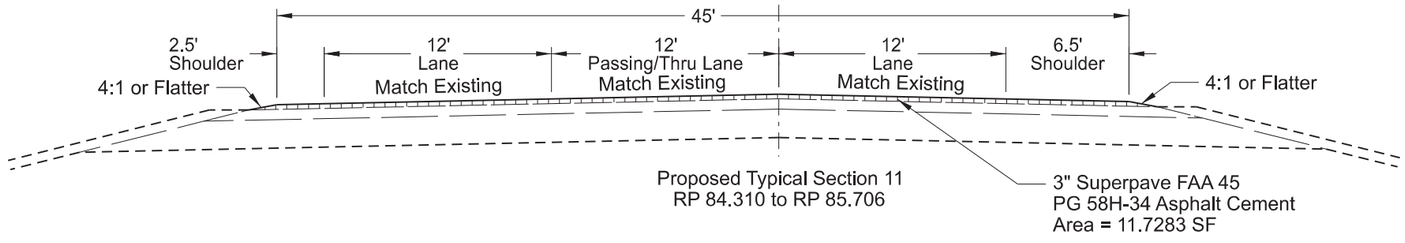
Proposed Typical Section 9
RP 82.909 to RP 83.148

Transition Typ 9 to Typ 8
RP 83.148 to RP 83.249



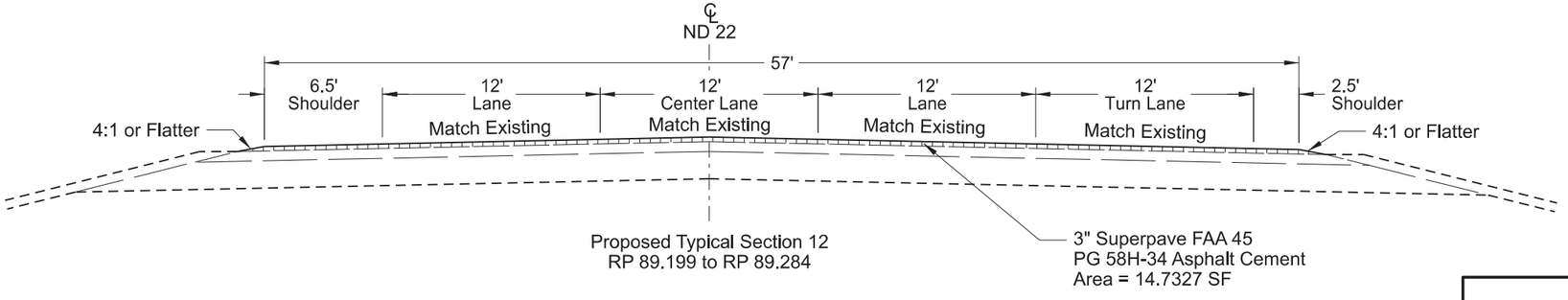
Proposed Typical Section 10
RP 84.018 to RP 84.145

Transition Typ 10 to Typ 11
RP 84.145 to RP 84.310



Proposed Typical Section 11
RP 84.310 to RP 85.706

Transition Typ 11 to Typ 4
RP 85.706 to RP 85.840



Proposed Typical Section 12
RP 89.199 to RP 89.284

Transition Typ 12 to Typ 4
RP 89.284 to RP 89.535

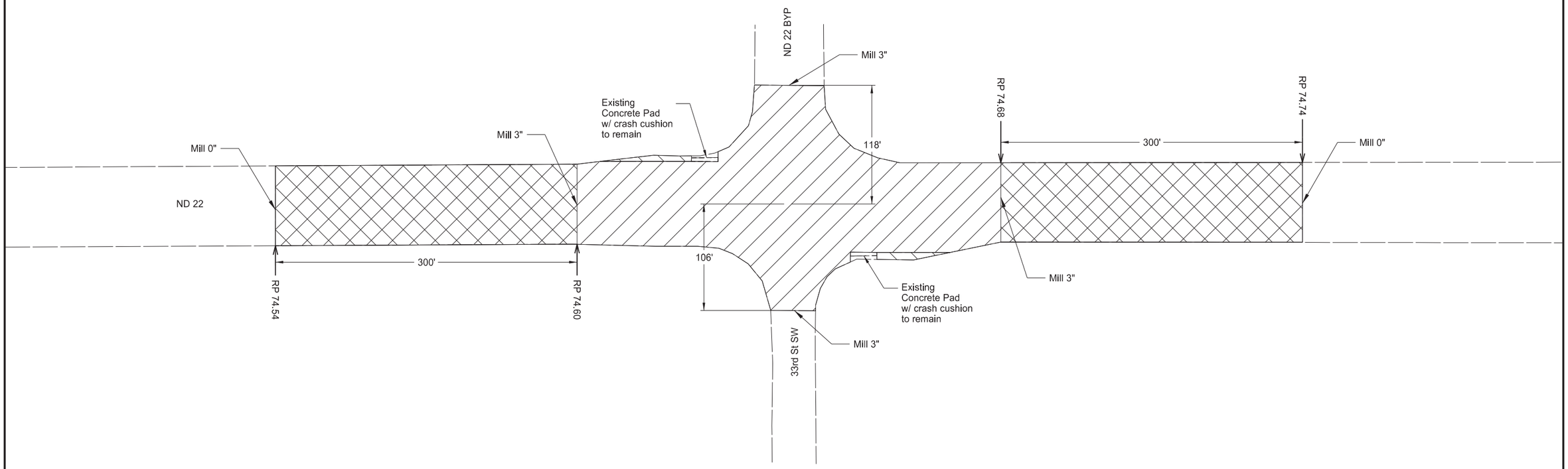
ND Highway 22
Dickinson 45th St to 17th St SW

Proposed Typical Sections

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	40	1

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
411	0100	MILLING PAVEMENT SURFACE RP 74.54 to RP 74.74	1340	TON



LEGEND

3" Mill - 5351 SY

1.5" Mill - 86 SY

Transitional Mill - 5294 SY

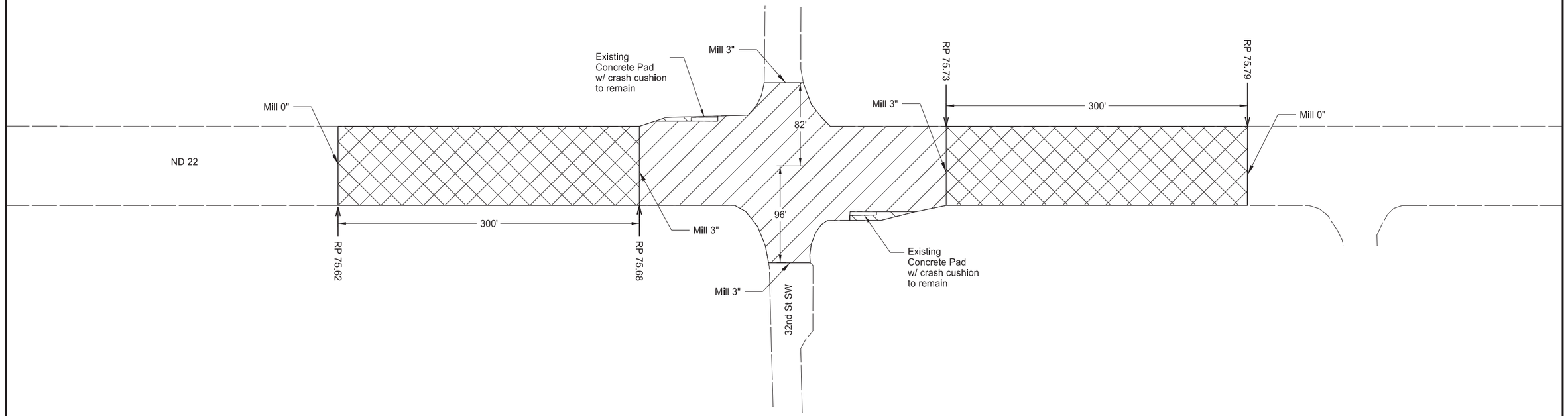
ND Highway 22
Dickinson 45th St to 17th St SW

33rd Street Intersection
Removals

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	40	2

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
411	0100	MILLING PAVEMENT SURFACE RP 75.62 to RP 75.79	1027	TON



LEGEND

3" Mill - 3501 SY

1.5" Mill - 51 SY

Transitional Mill - 5267 SY

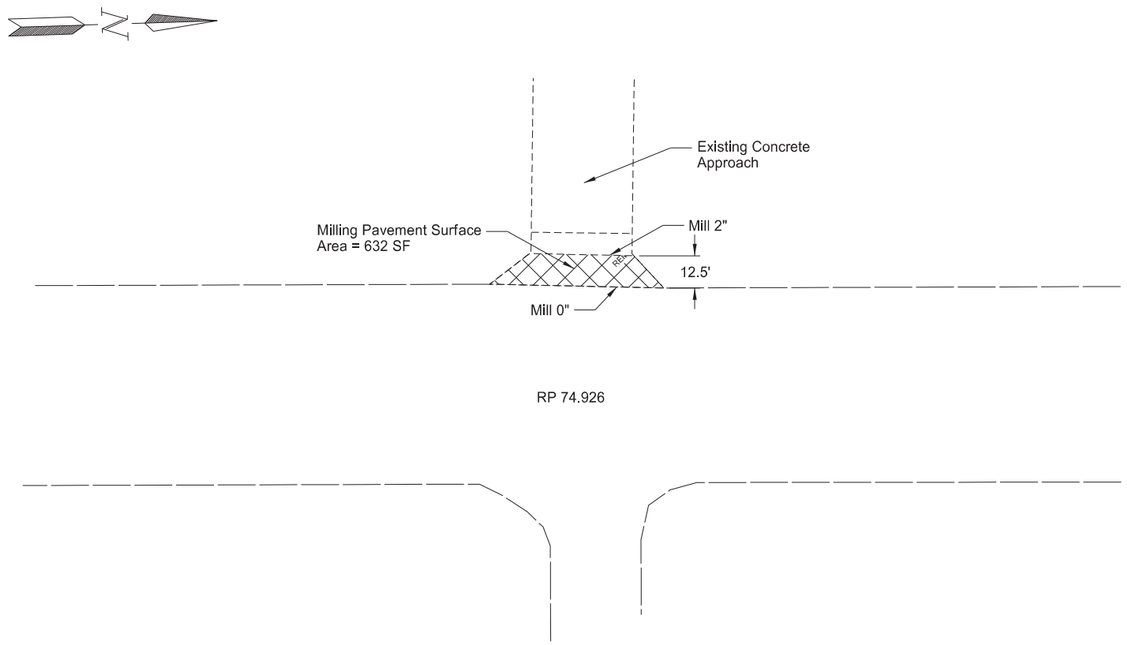
ND Highway 22
Dickinson 45th St to 17th St SW

32nd Street Intersection
Removals

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	40	3

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
411	0110	MILLING PCC PAVEMENT		
		RP 74.926	70	SY
		RP 75.442	67	SY



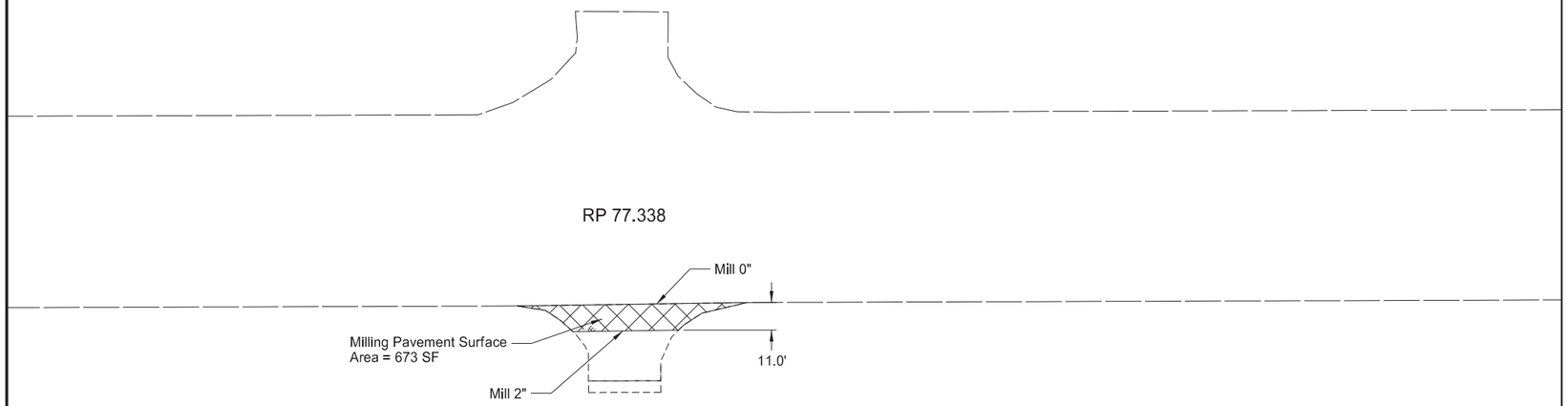
LEGEND

PCC Pavement Grinding

ND Highway 22
Dickinson 45th St to 17th St SW

Removals

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	40	4

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
411	0110	MILLING PCC PAVEMENT		
		RP 77.338	75	SY

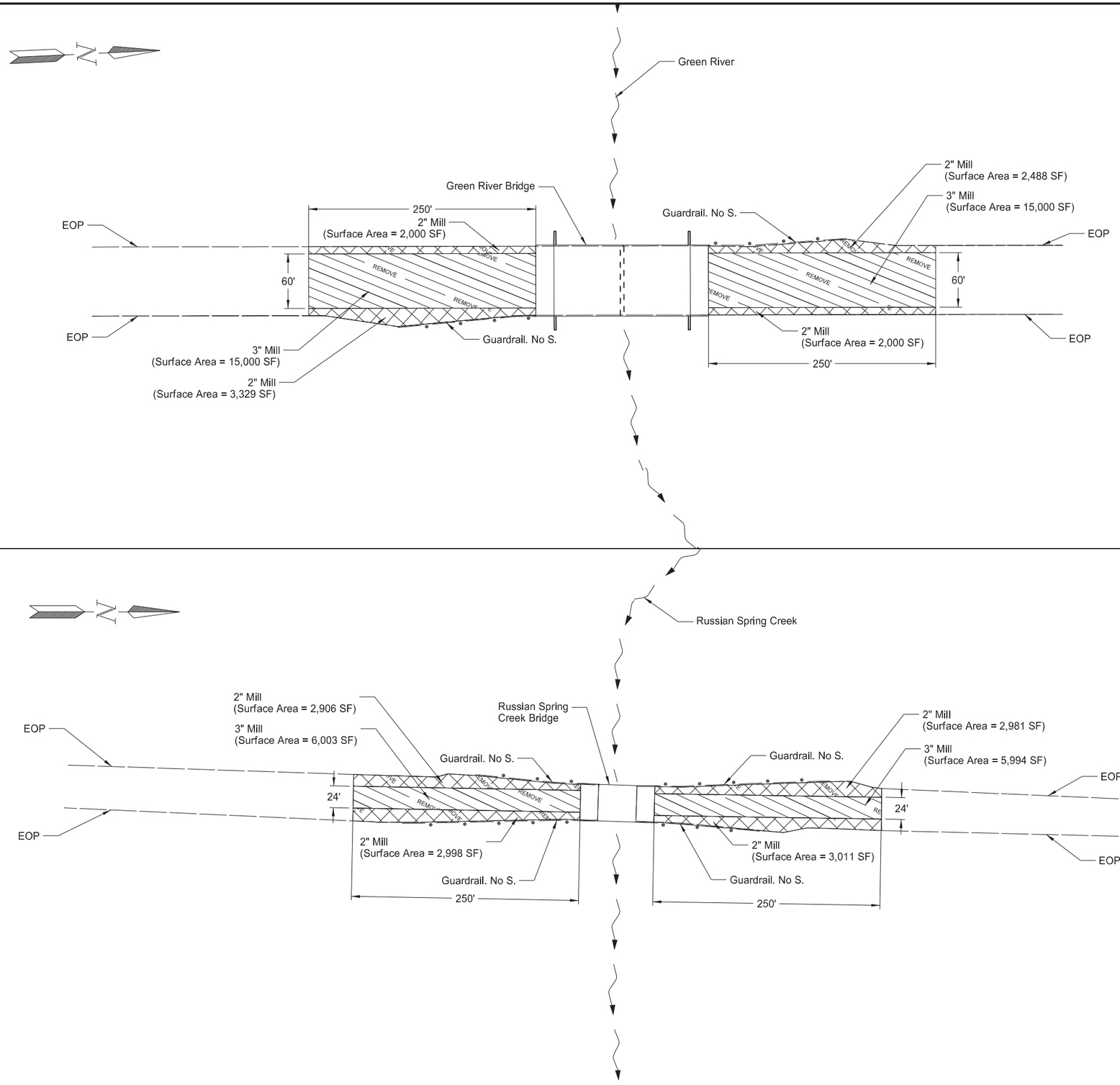
LEGEND

MOVE — PCC Pavement Grinding

ND Highway 22
Dickinson 45th St to 17th St SW

Removals

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	40	5

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
		Green River - Str #22-076.287	677	TON
		Russian Spring Creek - Str #22-081.376	369	TON

Legend

3" Depth Mill

2" Depth Mill

Note: Refer to Section 20 Sheet 3 and
Section 30 Sheet 5 for more information.

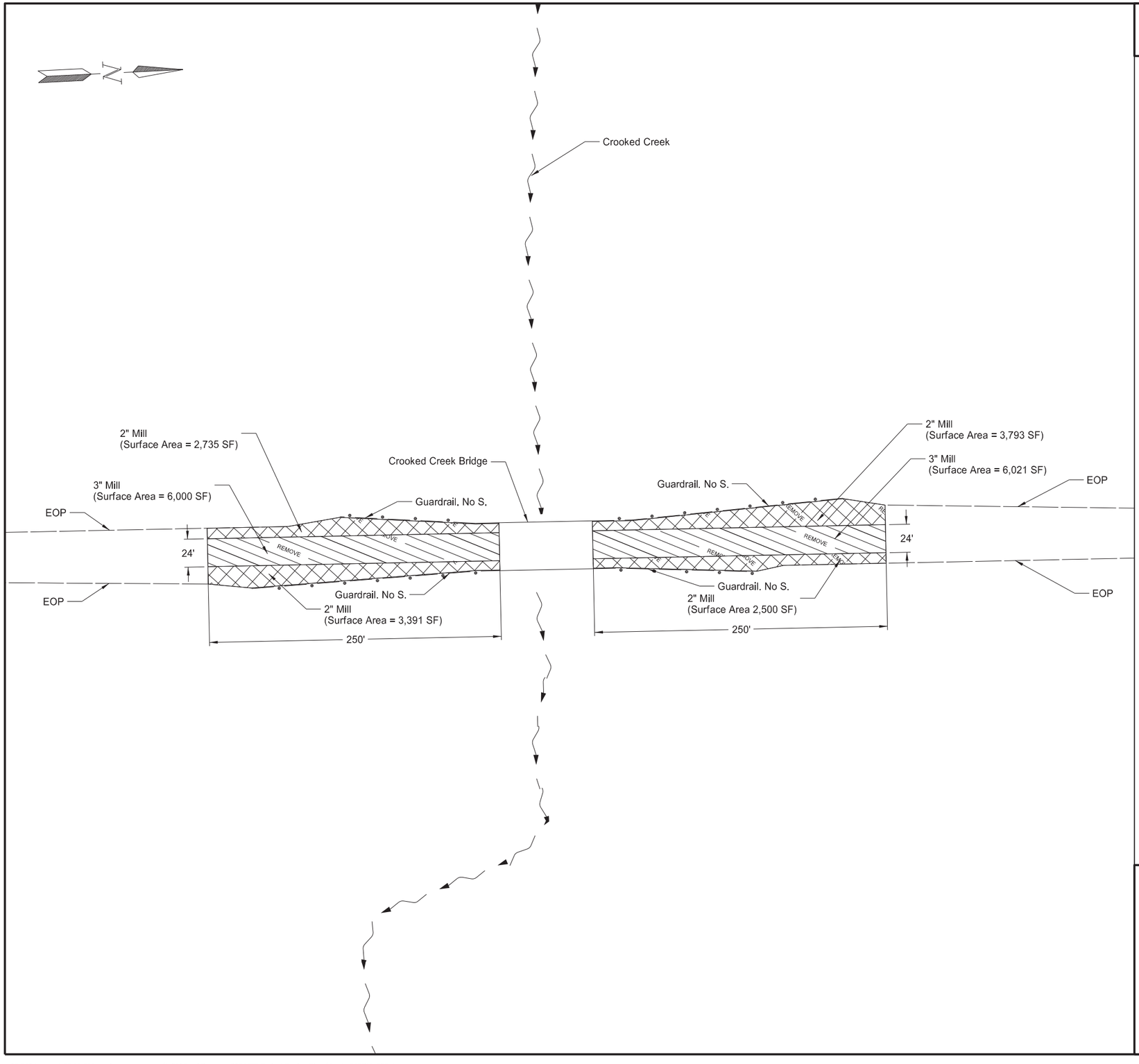
ND Highway 22
Dickinson 45th St to 17th St SW

Removals

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	40	6

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
411	0100	MILLING PAVEMENT SURFACE		
		Crooked Creek Bridge - Str #22-090.823	376	TON



Legend

3" Depth Mill

2" Depth Mill

Note: Refer to Section 20 Sheet 3 and
Section 30 Sheet 5 for more information.

ND Highway 22
Dickinson 45th St to 17th St SW

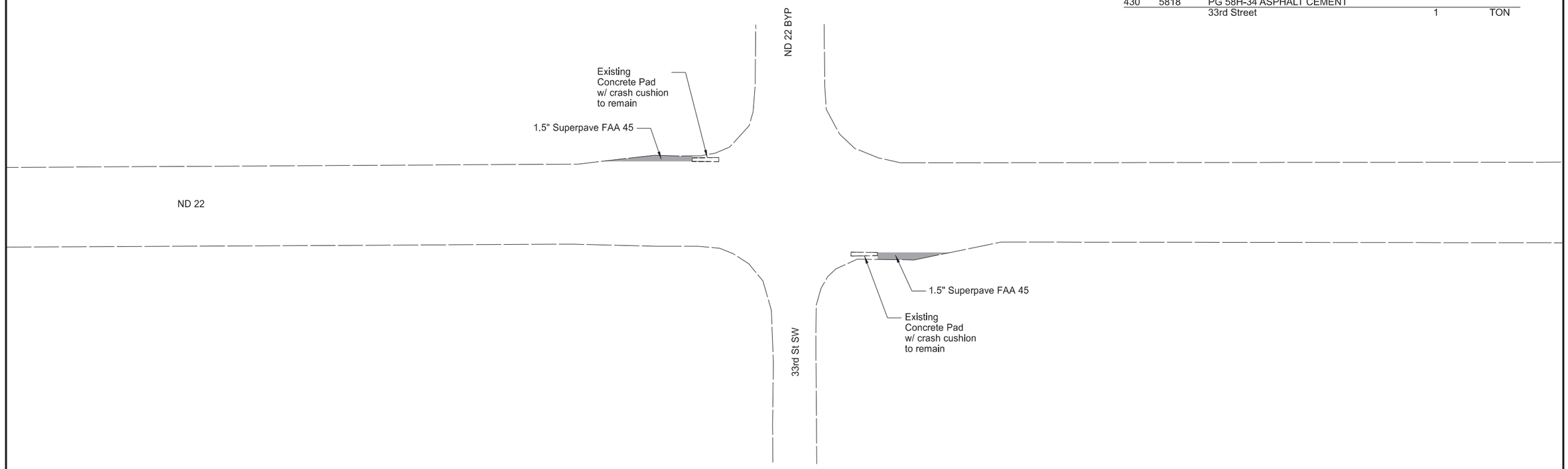
Removals

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	90	1

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
401	0050	TACK COAT		
		33rd Street	4	GAL
430	0045	SUPERPAVE FAA 45		
		33rd Street	7	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
		33rd Street	1	TON



LEGEND

1.5" Superpave FAA 45, PG 58H-34 Asphalt Cement - 86 SY

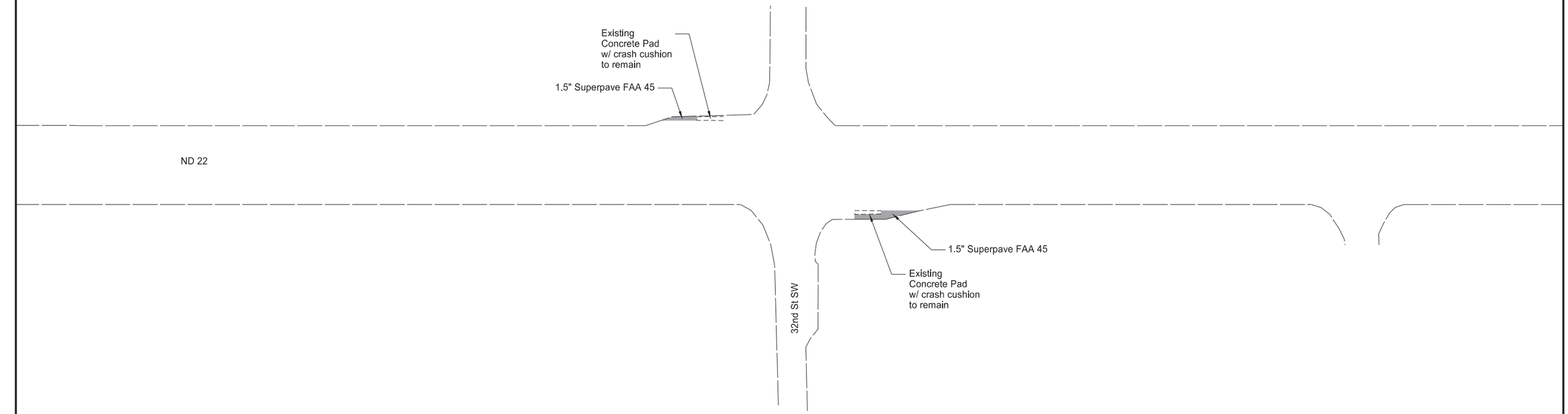
ND Highway 22
Dickinson 45th St to 17th St SW

33rd Street Intersection
Pavement Layout

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	90	2

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
401	0050	TACK COAT		
		32nd Street	3	GAL
430	0045	SUPERPAVE FAA 45		
		32nd Street	4	TON
430	5818	PG 58H-34 ASPHALT CEMENT		
		32nd Street	1	TON



LEGEND

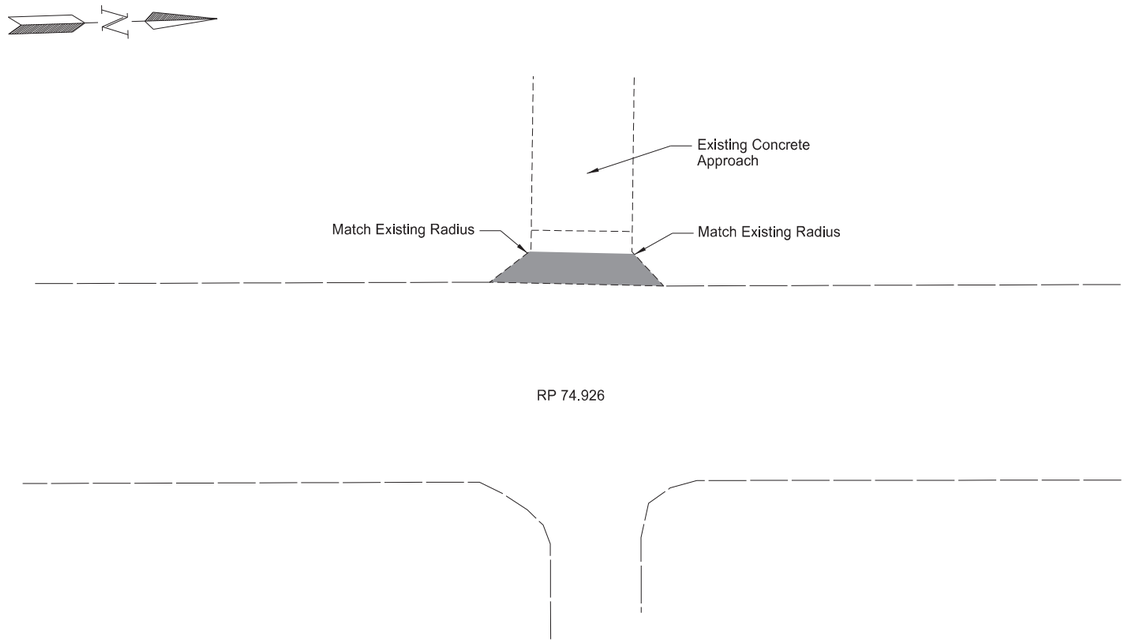
1.5" Superpave FAA 45, PG 58H-34 Asphalt Cement - 49 SY

ND Highway 22
Dickinson 45th St to 17th St SW

32nd Street Intersection
Pavement Layout

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	90	3

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
401	0050	TACK COAT		
		RP 74.926 Lt	4	GAL
		RP 75.442 Rt	4	GAL
430	0045	SUPERPAVE FAA 45		
		RP 74.926 Lt	11	TON
		RP 75.442 Rt	11	TON
430	5803	PG 58H-34 ASPHALT CEMENT		
		RP 74.926 Lt	0.6	TON
		RP 75.442 Rt	0.6	TON

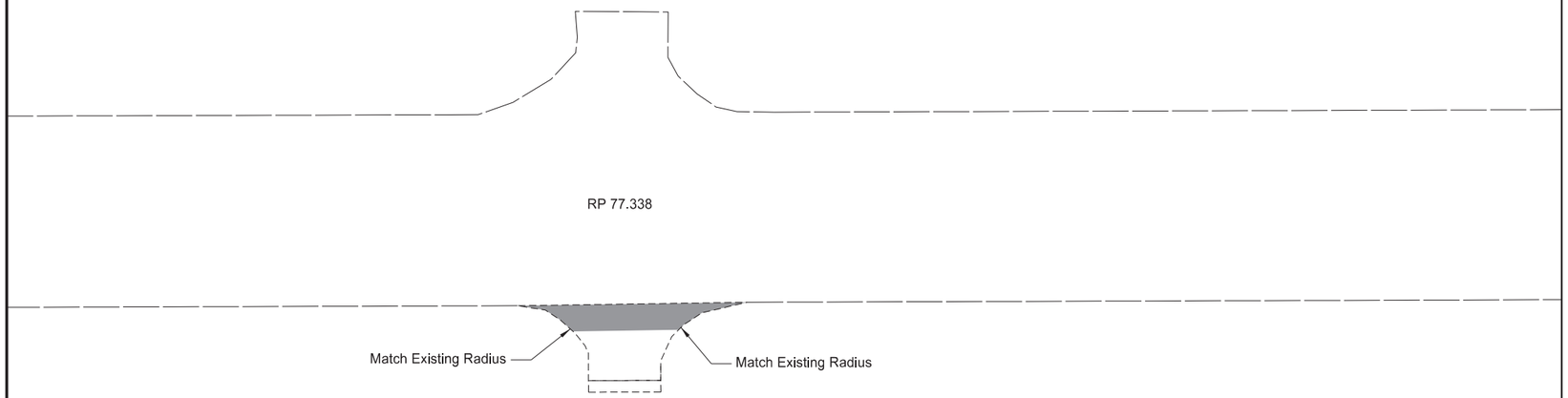
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Superpave FAA 45, PG 58H-34 Asphalt Cement

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Layout

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
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DATE 09/27/24
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	90	4

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
401	0050	TACK COAT		
		RP 75.442 Rt	4	GAL
430	0045	SUPERPAVE FAA 45		
		RP 75.442 Rt	11	TON
430	5803	PG 58H-34 ASPHALT CEMENT		
		RP 75.442 Rt	0.6	TON

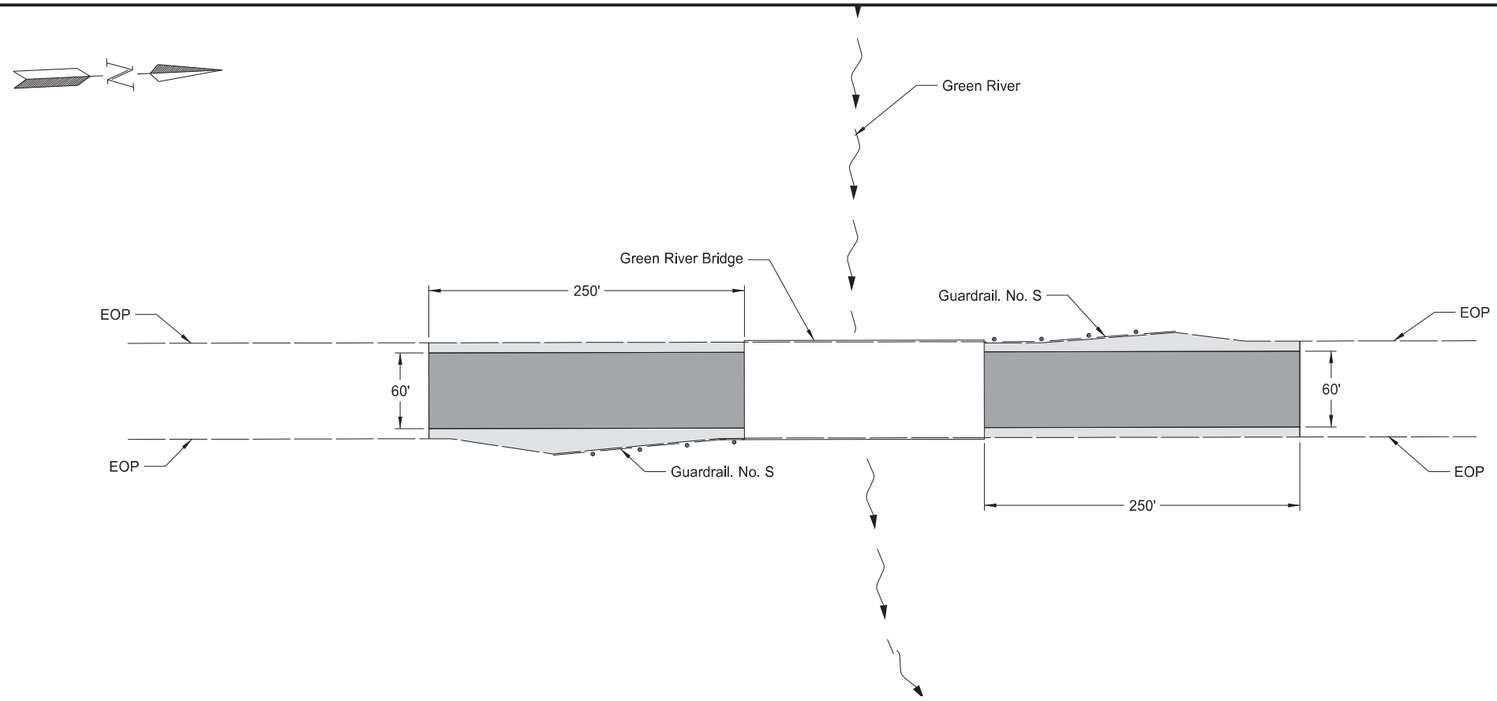
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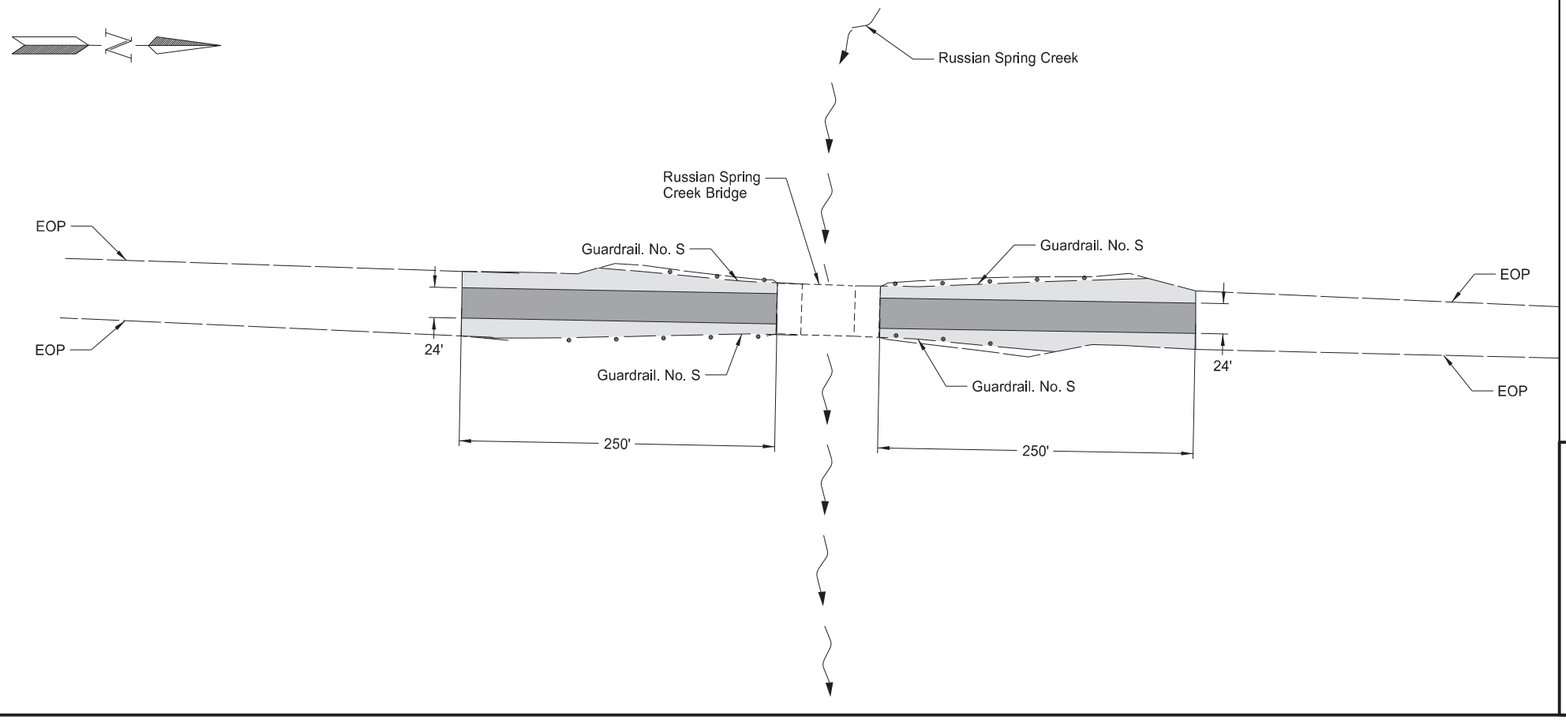
Superpave FAA 45, PG 58H-34 Asphalt Cement

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Layout

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	90	5

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
401	0050	TACK COAT		
		Green River - Str #22-076.287	221	GAL
		Russian Spring Creek - Str #22-081.376	137	GAL
430	0045	SUPERPAVE FAA 45		
		Green River - Str #22-076.287	677	TON
		Russian Spring Creek - Str #22-081.376	378	TON
430	5803	PG 58H-34 ASPHALT CEMENT		
		Green River - Str #22-076.287	41	TON
		Russian Spring Creek - Str #22-081.376	23	TON

Legend

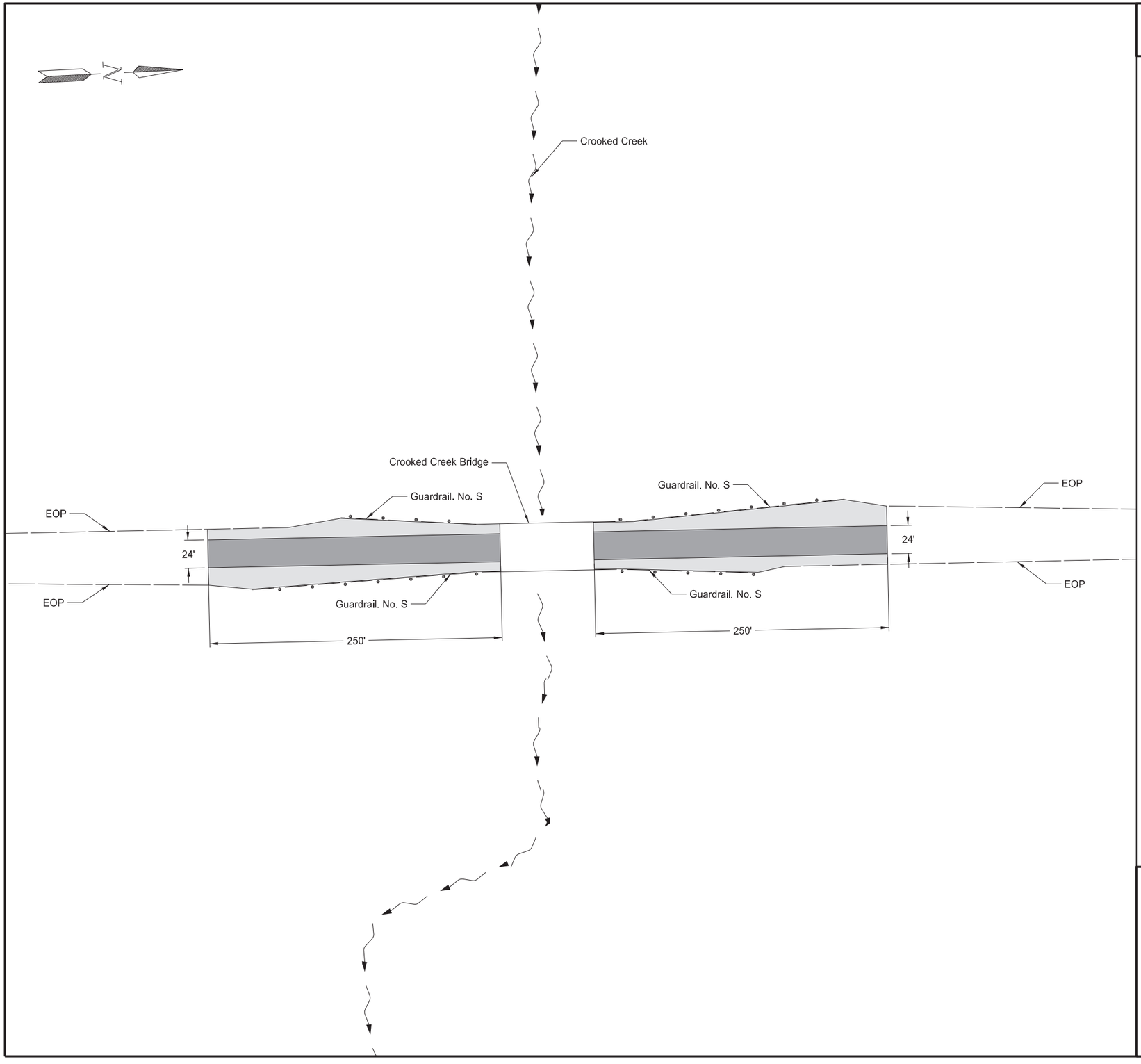
2" Superpave FAA 45, PG 58H-34 Asphalt Cement

3" Superpave FAA 45, PG 58H-34 Asphalt Cement

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Layout

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DATE 09/27/24
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	90	6

SPEC	CODE	ITEM DESCRIPTION	QUANTITY	UNIT
401	0050	TACK COAT		
		Crooked Creek Bridge - Str #22-090.823	136	GAL
430	0045	SUPERPAVE FAA 45		
		Crooked Creek Bridge - Str #22-090.823	376	TON
430	5803	PG 58H-34 ASPHALT CEMENT		
		Crooked Creek Bridge - Str #22-090.823	23	TON

Legend

2" Superpave FAA 45, PG 58H-34 Asphalt Cement

3" Superpave FAA 45, PG 58H-34 Asphalt Cement

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Layout

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	100	1

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE		35	
G20-1-60	**60"x24"**	**ROAD WORK NEXT __ MILES**	**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**	**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**	**6**	**18**	**108**
G20-50a-72	**72"x36"**	**ROAD WORK NEXT __ MILES RT & LT ARROWS**	**27**	**43**	**1161**
G20-52a-72	**72"x24"**	**ROAD WORK NEXT __ MILES RT or LT ARROW**	**3**	**36**	**108**
G20-55-96	**96"x48"**	**SPEED LIMIT ENFORCED - MINIMUM FEE $150 WHEN WORKERS PRESENT**	**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		32	
R1-2-60	60"x60"	YIELD		29	
R2-1-36	**36"x48"**	**SPEED LIMIT __ (Portable only)**	**4**	**30**	**120**
R2-1-48	**48"x60"**	**SPEED LIMIT __**	**4**	**39**	**156**
R2-1aP-24	**24"x18"**	**MINIMUM FEE $150 (Mounted on Speed Limit post)**	**4**	**10**	**40**
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-48	48"x60"	DO NOT PASS		39	
R4-7-48	48"x60"	KEEP RIGHT		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)		14	
R7-1-12	12"x18"	NO PARKING ANY TIME		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)		12	
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)		12	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)		15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT		35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT		35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT		35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD		35	
W3-3-48	48"x48"	SIGNAL AHEAD		35	
W3-4-48	**48"x48"**	**BE PREPARED TO STOP**	**4**	**35**	**140**
W3-5-48	**48"x48"**	**SPEED REDUCTION AHEAD**	**4**	**35**	**140**
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT		35	
W5-1-48	**48"x48"**	**ROAD NARROWS**	**4**	**35**	**140**
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC		35	
W8-1-48	**48"x48"**	**BUMP**	**4**	**35**	**140**
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-11-48	**48"x48"**	**UNEVEN LANES**	**10**	**35**	**350**
W8-12-48	**48"x48"**	**NO CENTER LINE**	**4**	**35**	**140**
W8-17-48	**48"x48"**	**SHOULDER DROP-OFF SYMBOL**	**4**	**35**	**140**
W8-53-48	**48"x48"**	**TRUCKS ENTERING HIGHWAY**	**4**	**35**	**140**
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT or _ MILE		35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT or _ MILE		35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)		14	
W14-3-64	64"x48"	NO PASSING ZONE		28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)		10	
W20-1-48	**48"x48"**	**ROAD WORK AHEAD or _FT or _ MILE**	**5**	**35**	**175**
W20-2-48	48"x48"	DETOUR AHEAD or __ FT or _ MILE		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or _ MILE		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or _ MILE		35	
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE		35	
W20-7-48	**48"x48"**	**FLAGGER**	**4**	**35**	**140**
W20-8-18	**18"x18"**	**STOP - SLOW PADDLE Back to Back**	**4**	**5**	**20**
W20-52P-54	**54"x12"**	**NEXT __ MILES (Mounted on warning sign post)**	**4**	**12**	**48**
W21-1-48	48"x48"	WORKERS		35	
W21-2-48	48"x48"	FRESH OIL		35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or _ MILE		35	
W21-5-48	48"x48"	SHOULDER WORK		35	
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED		35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT or _ MILE		35	

SIGN NUMBER	SIGN SIZE	DESCRIPTION	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		35	
W21-53-48	**48"x48"**	**RUMBLE STRIPS AHEAD**	**4**	**35**	**140**
W22-8-48	48"x48"	FRESH OIL LOOSE ROCK		35	
W24-1-48	48"x48"	DOUBLE REVERSE CURVE		35	

SPECIAL SIGNS

SPEC & CODE

704-1000	**TRAFFIC CONTROL SIGNS**	**TOTAL UNITS**	**3772**

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	**FLAGGING**	**MHR**	**1936**
704-1048	**PORTABLE RUMBLE STRIPS**	**EACH**	**6**
704-1050	TYPE I BARRICADES	EACH	
704-1052	**TYPE III BARRICADES**	**EACH**	**12**
704-1060	**DELINEATOR DRUMS**	**EACH**	**44**
704-1065	TRAFFIC CONES	EACH	
704-1067	**TUBULAR MARKERS**	**EACH**	**494**
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1080	**STACKABLE VERTICAL PANELS**	**EACH**	**50**
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	
704-1185	**PILOT CAR**	**HR**	**420**
704-1500	OBLITERATION OF PVMT MK	SF	
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
762-0200	RAISED PAVEMENT MARKERS	EACH	
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	

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

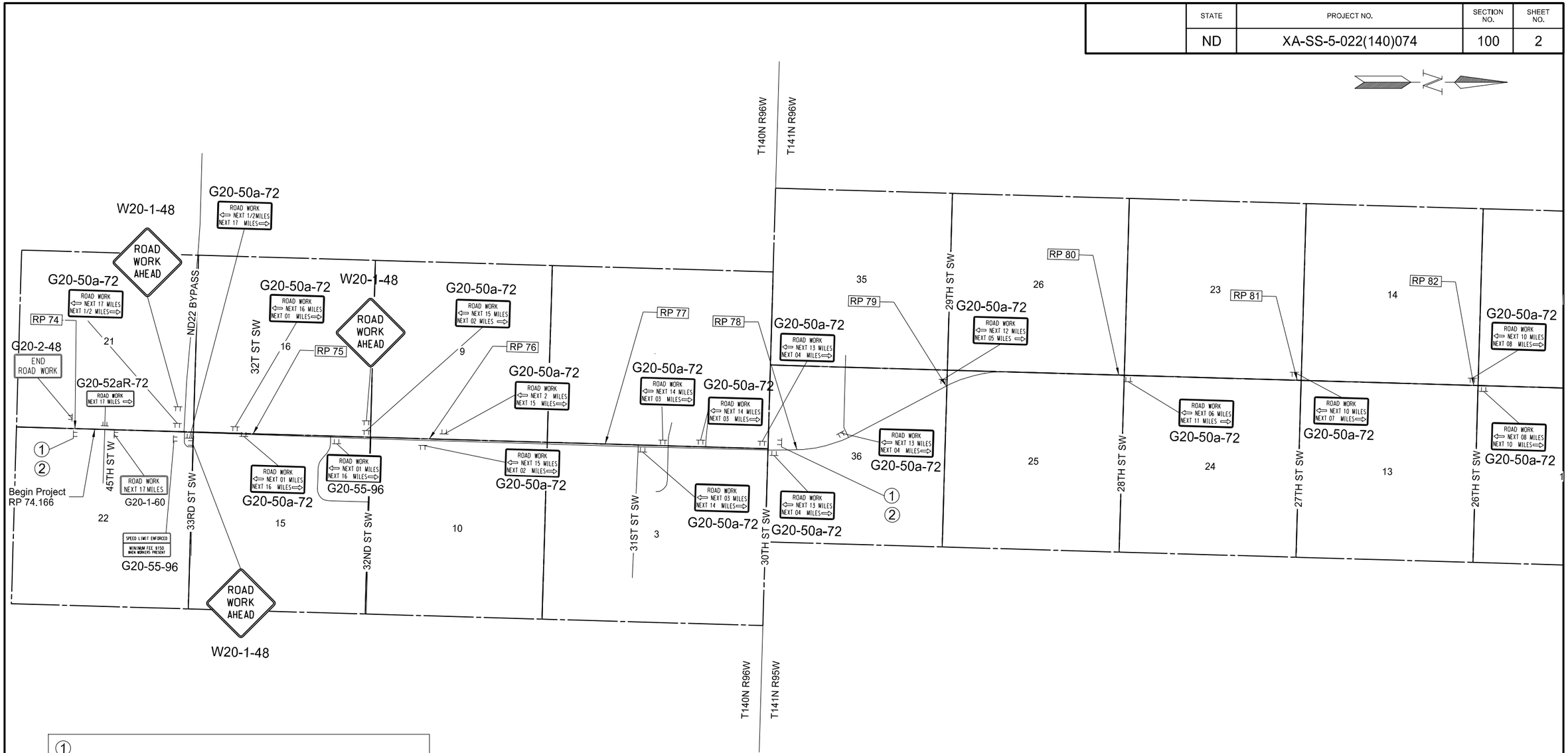
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

Traffic Control Devices List

ND Highway 22

Dickinson 45th St to 7th St SW

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	2

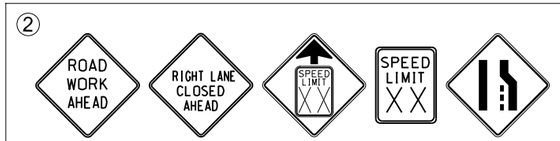


①



Skid Mounted

②



Skid Mounted

ND Highway 22
Dickinson 45th St to 17th St NW

Work Zone Traffic Control

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	3

T141N R96W
T142N R96W
24TH ST SW
25TH ST SW
23RD ST SW
21M St SW
20TH ST SW
19TH ST SW
17TH ST SW
T142N R96W
T143N R96W
T141N R95W
T142N R95W
T142N R95W
T143N R95W

RP 84
RP 85
RP 86
RP 87
RP 88
RP 89
RP 90
RP 91

G20-50a-72
ROAD WORK
⇦ NEXT 08 MILES
NEXT 09 MILES ⇨

G20-50a-72
ROAD WORK
⇦ NEXT 07 MILES
NEXT 10 MILES ⇨

G20-50a-72
ROAD WORK
⇦ NEXT 09 MILES
NEXT 08 MILES ⇨

G20-50a-72
ROAD WORK
⇦ NEXT 11 MILES
NEXT 06 MILES ⇨

G20-50a-72
ROAD WORK
⇦ NEXT 13 MILES
NEXT 04 MILES ⇨

G20-50a-72
ROAD WORK
⇦ NEXT 14 MILES
NEXT 03 MILES ⇨

G20-50a-72
ROAD WORK
⇦ NEXT 15 MILES
NEXT 02 MILES ⇨

G20-52aR-72
ROAD WORK
NEXT 17 MILES ⇨

G20-55-96
SPEED LIMIT ENFORCED
MINIMUM FEE $150
WHEN WORKERS PRESENT

G20-1-60
ROAD WORK
NEXT 17 MILES

G20-52aL-72
ROAD WORK
⇦ NEXT 17 MILES

G20-2-48
END
ROAD WORK

End Project
RP 91.291

1 2 6 25 26 30 31 35 36

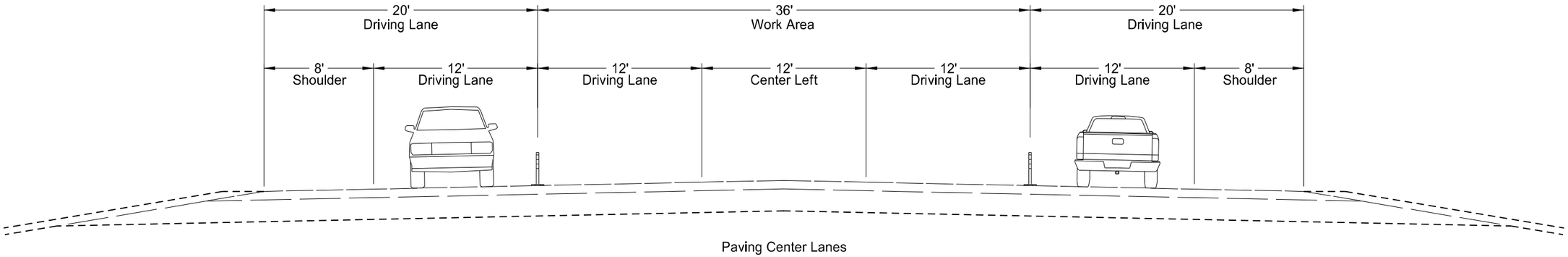
ND Highway 22
Dickinson 45th St to 17th St NW

Work Zone Traffic Control

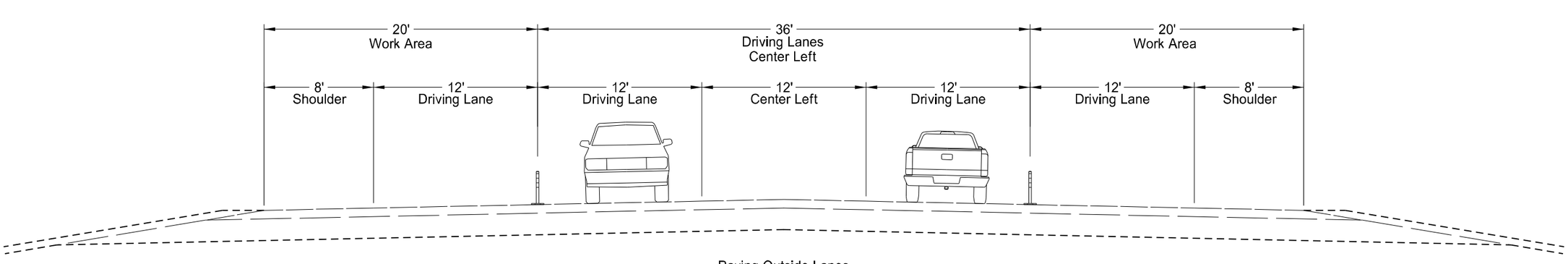
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	4



Paving Center Lanes



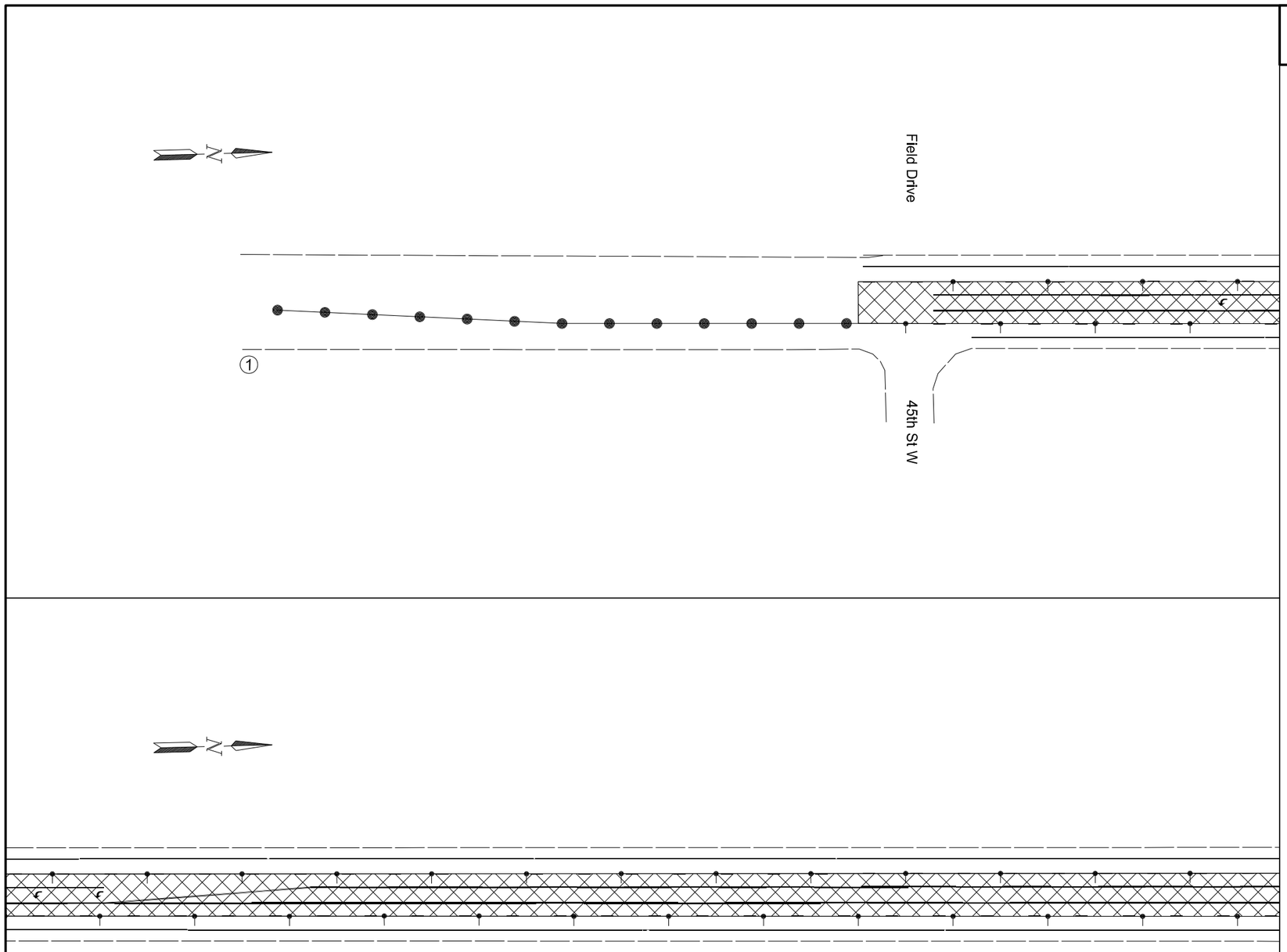
Paving Outside Lanes

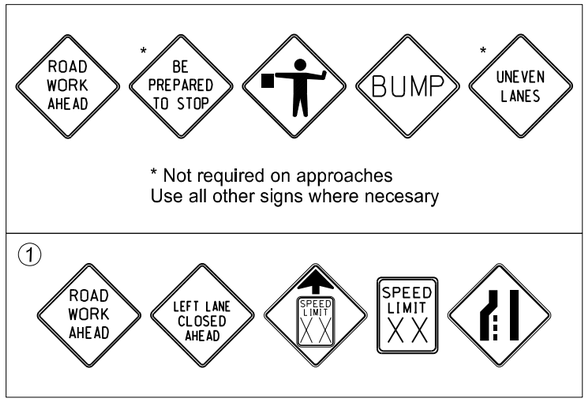
ND Highway 22
Dickinson 45th St to 17th St NW

RP 74.166 to Urban Limit

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	5





Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

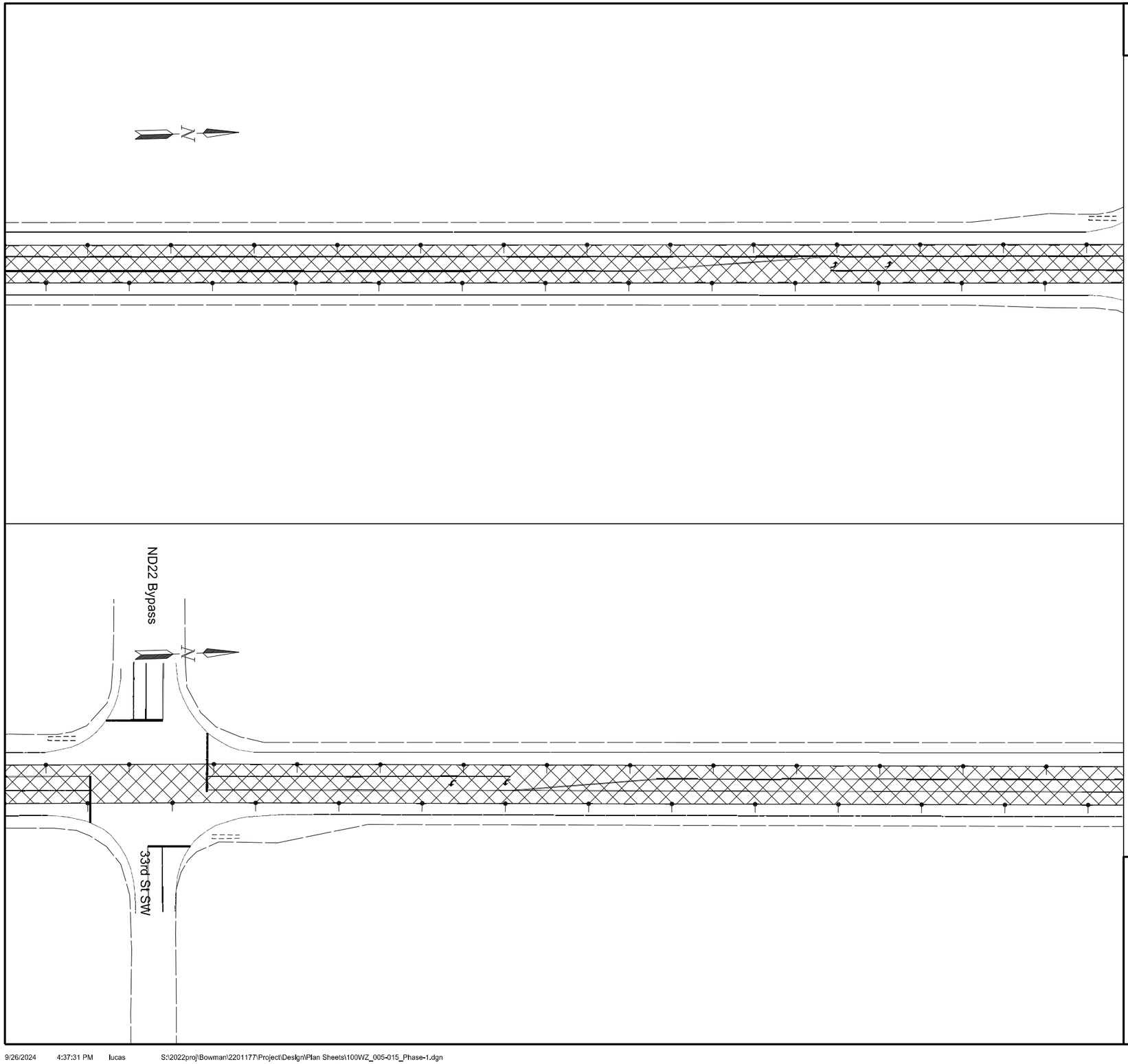
Traffic Control Sign Layout

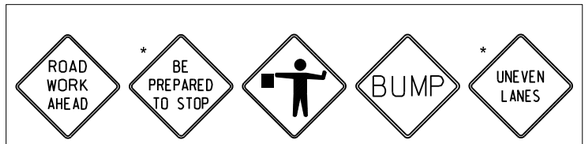
Phase 1

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	6





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

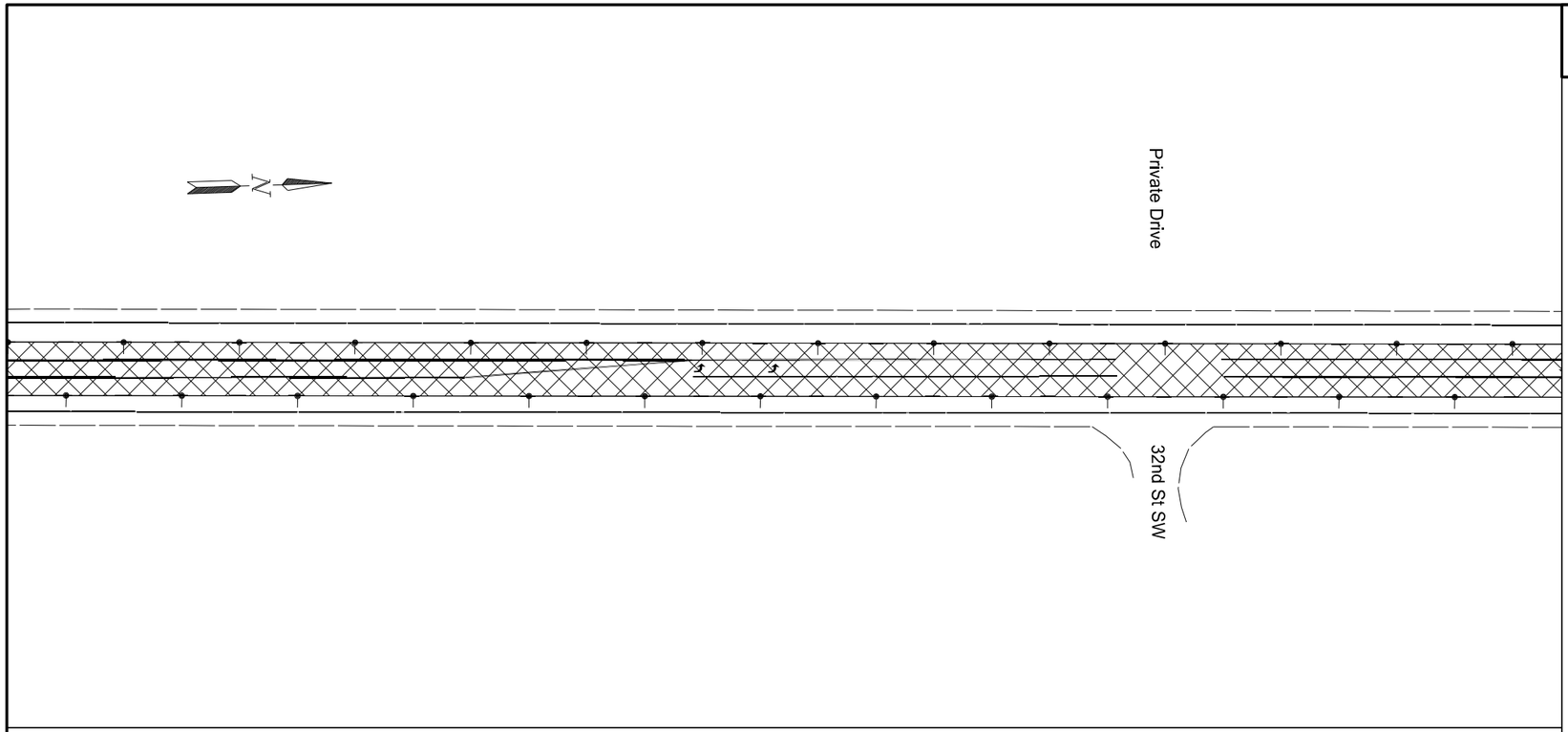
ND Highway 22
Dickinson 45th St to 17th St SW

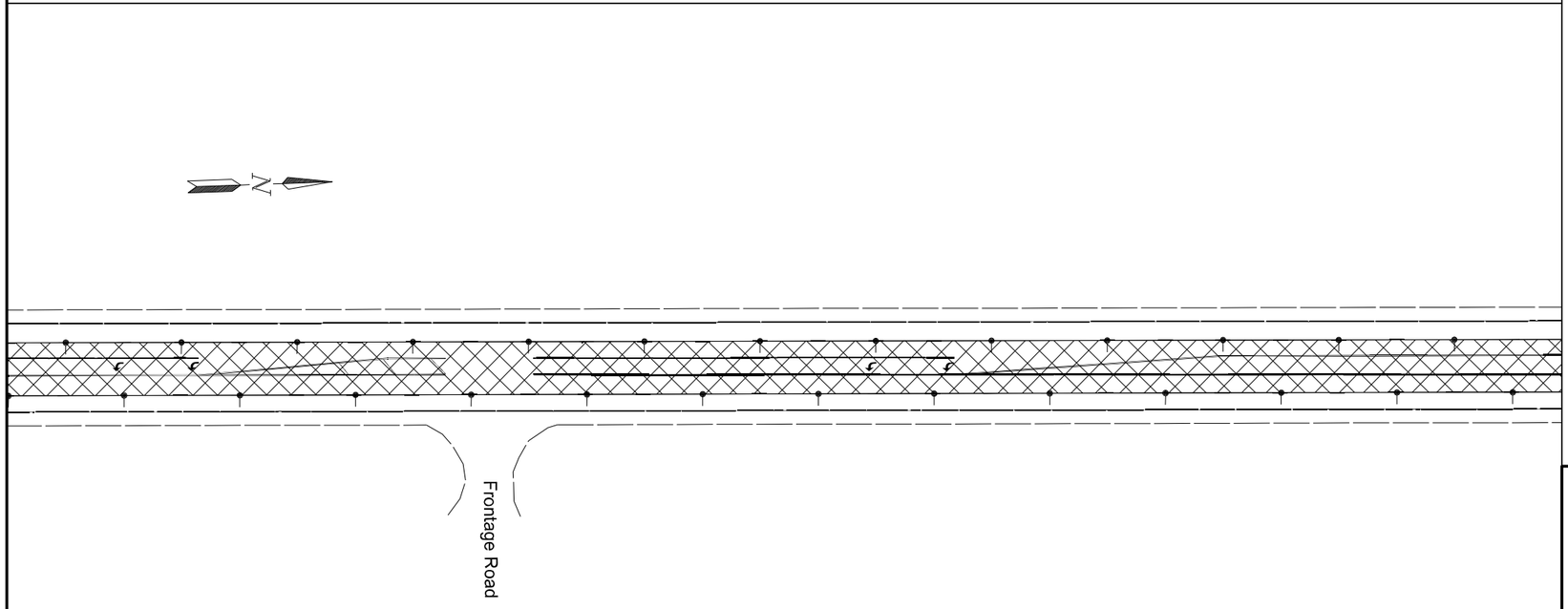
Traffic Control Sign Layout

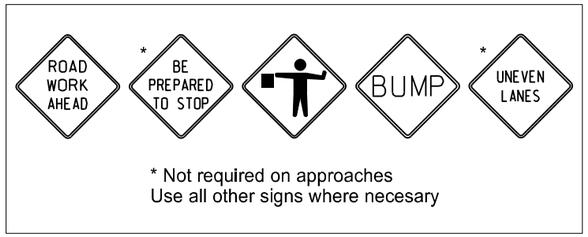
Phase 1

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	7







* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

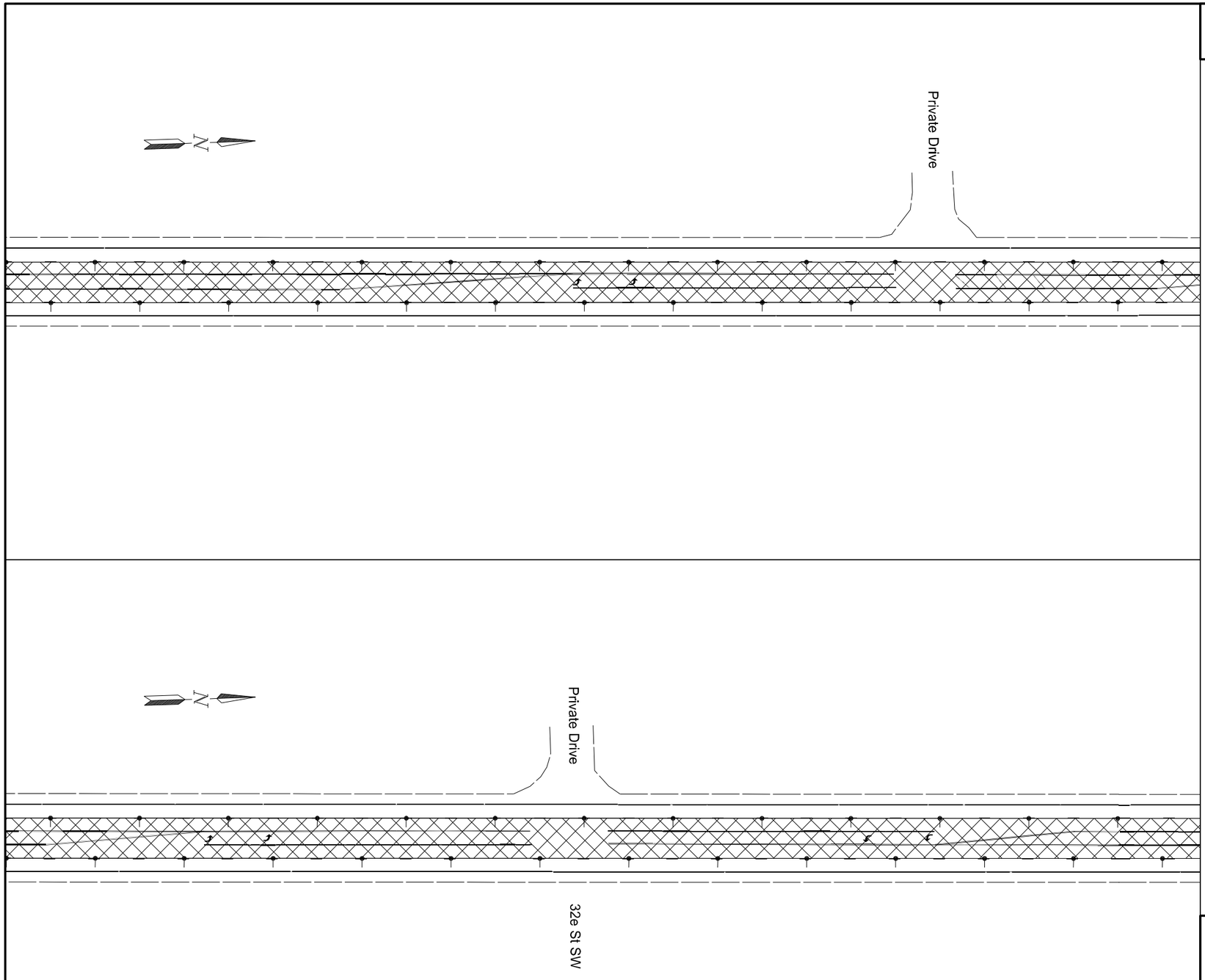
Traffic Control Sign Layout

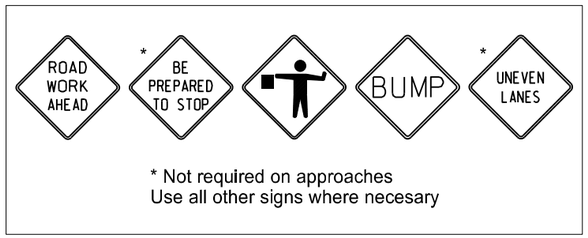
Phase 1

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	100	8





Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

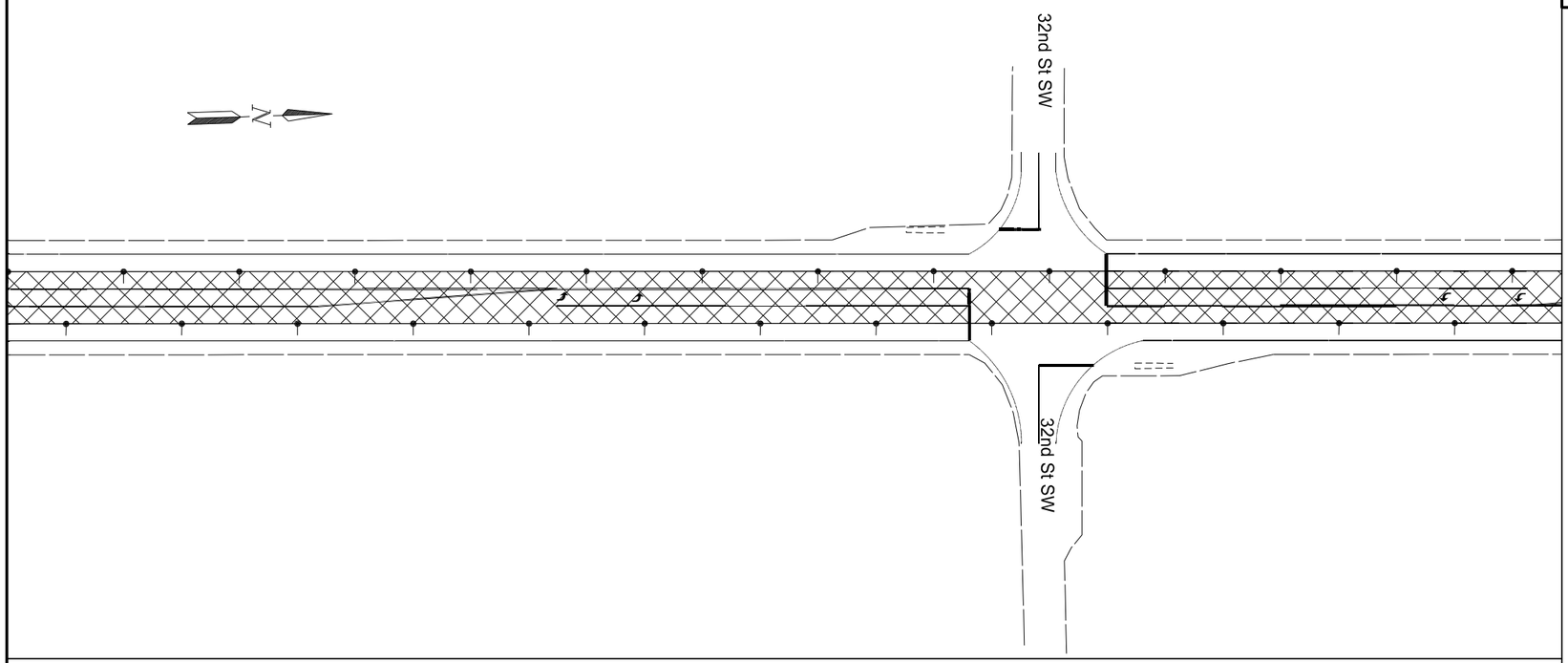
Traffic Control Sign Layout

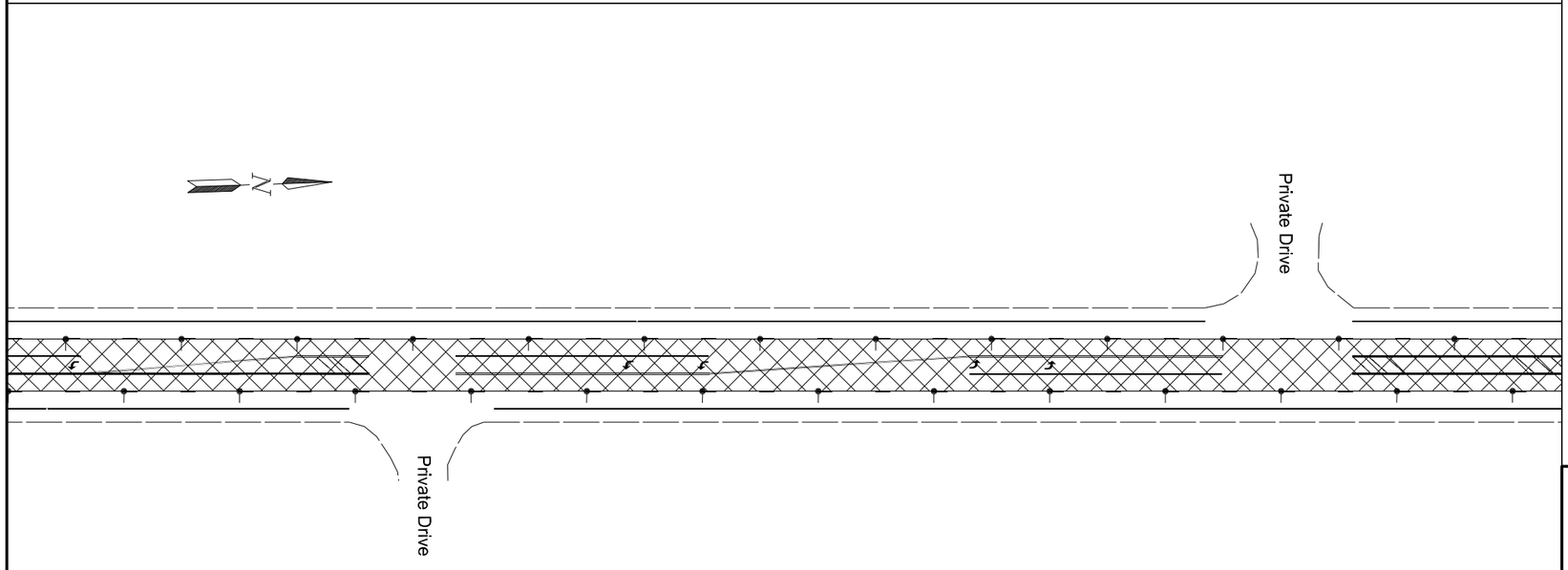
Phase 1

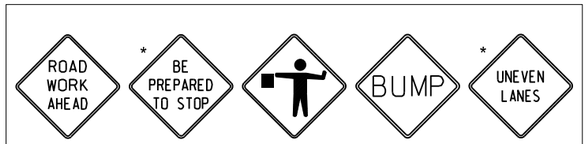
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	100	9







* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

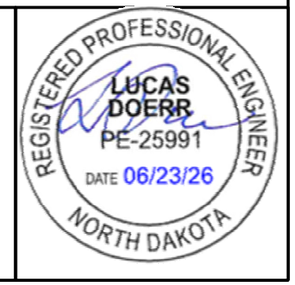
Legend

- Work Zone
- Work Zone
- Work Zone

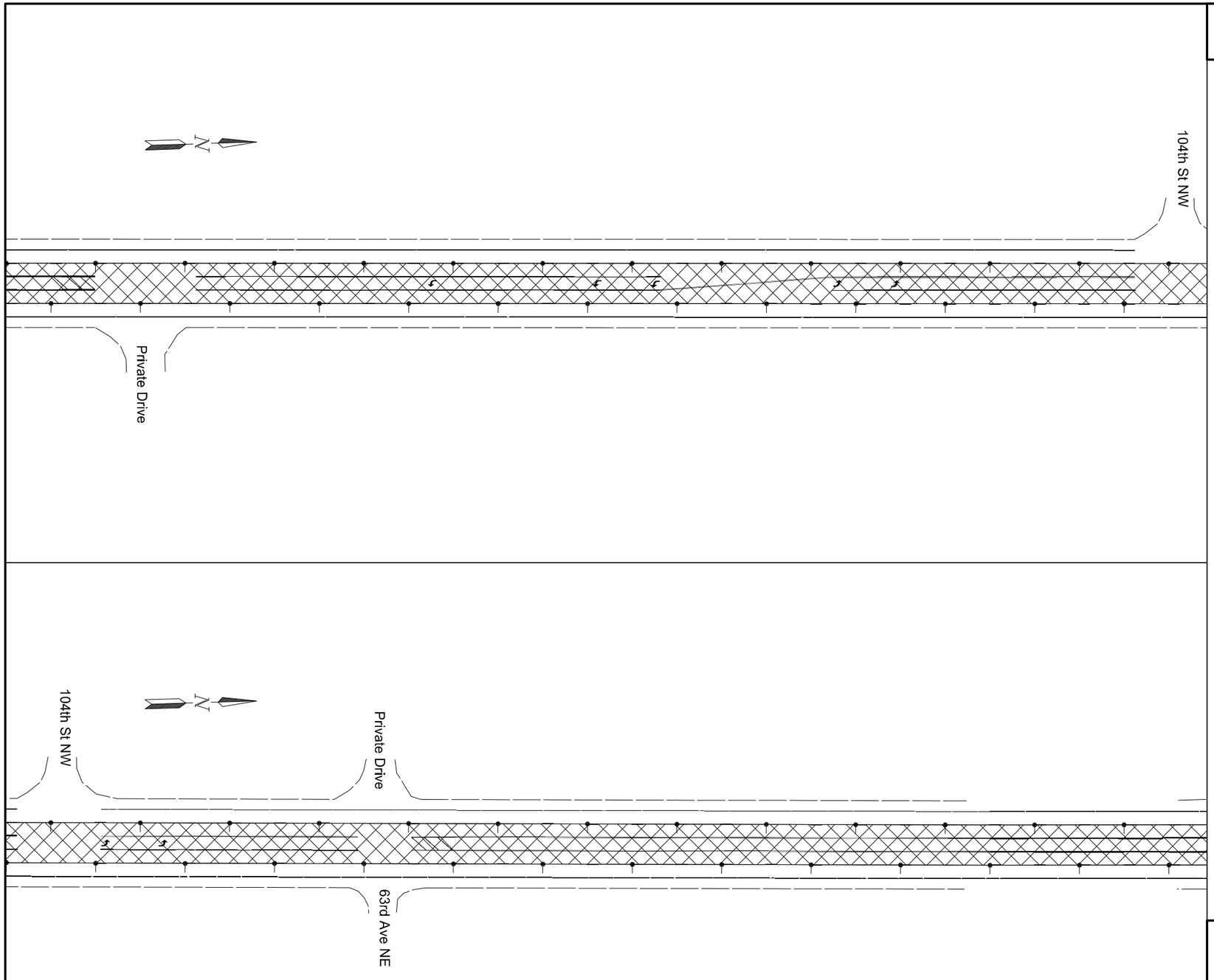
ND Highway 22
Dickinson 45th St to 17th St SW

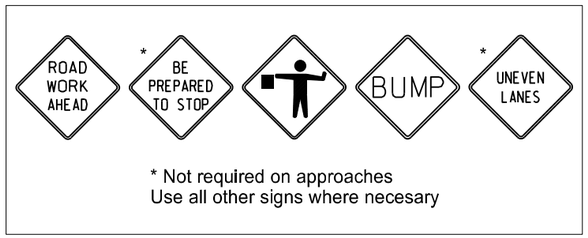
Traffic Control Sign Layout

Phase 1



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	10





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

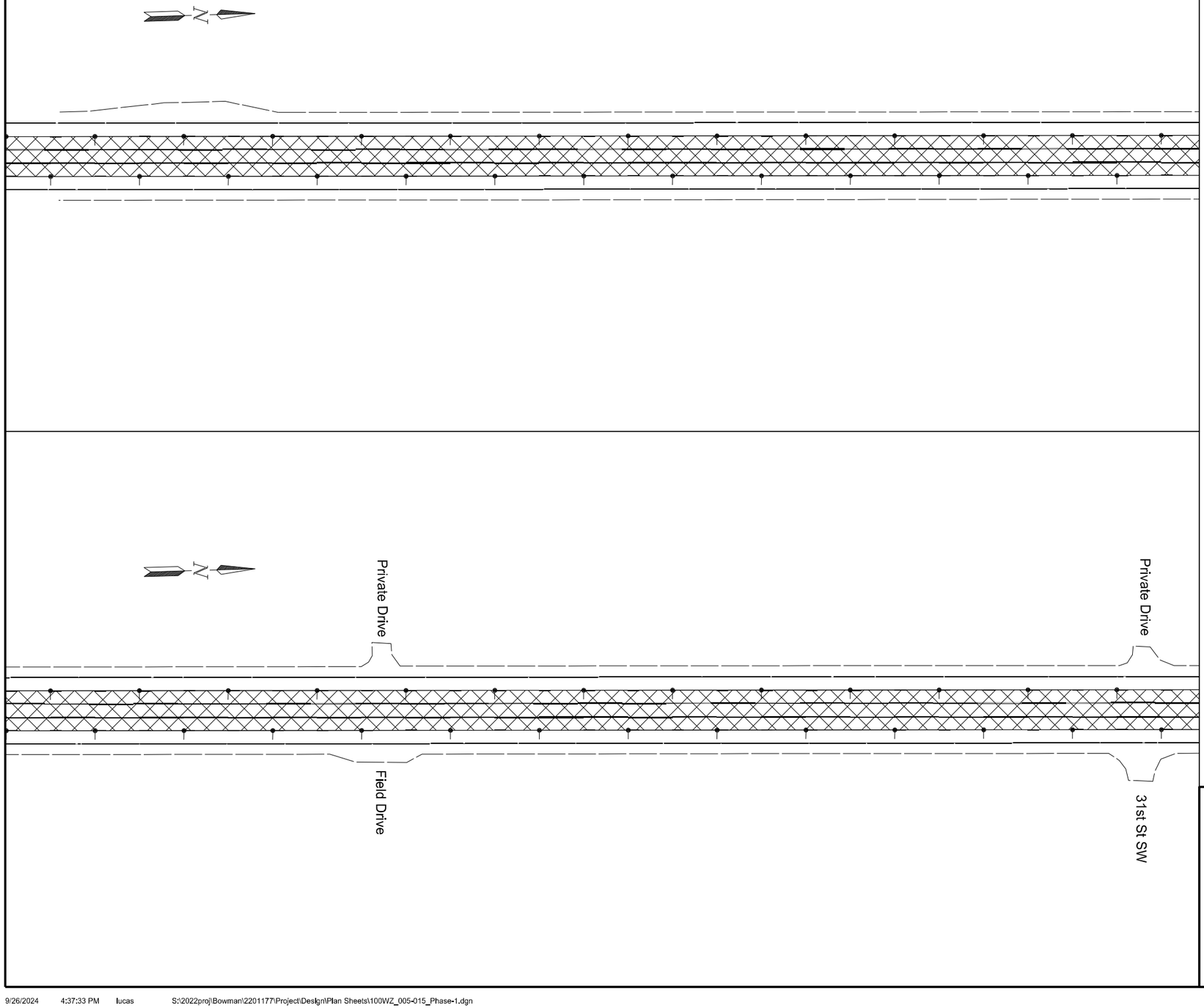
Traffic Control Sign Layout

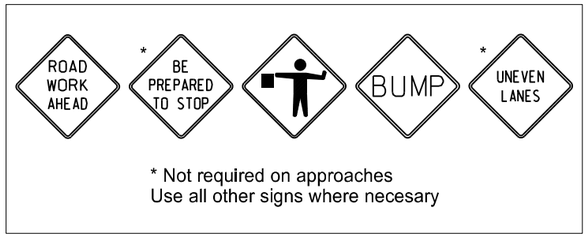
Phase 1

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	11





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

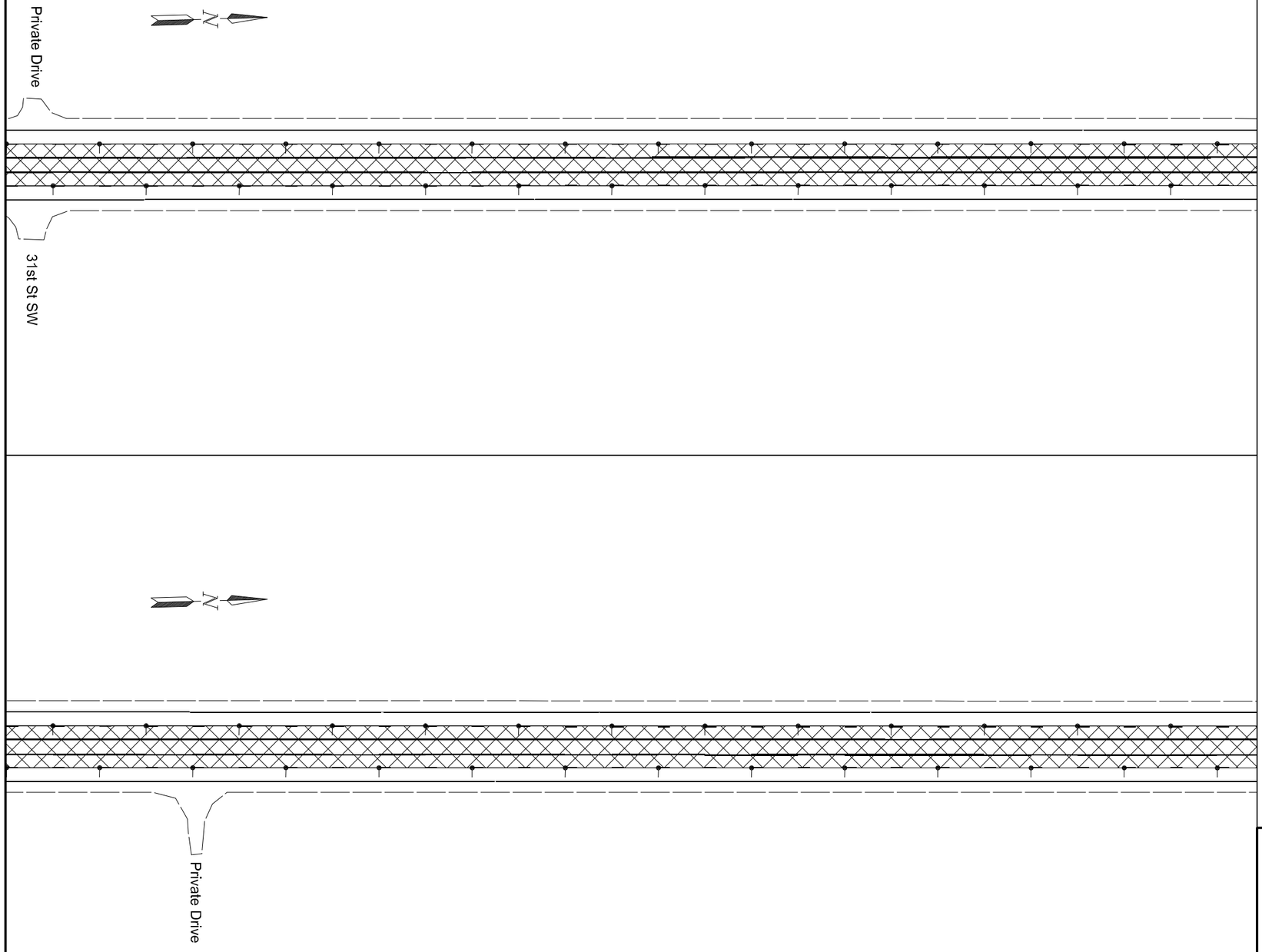
Traffic Control Sign Layout

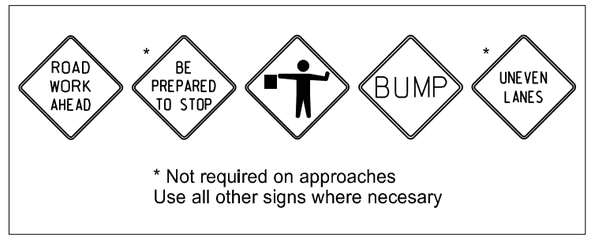
Phase 1

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	12





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

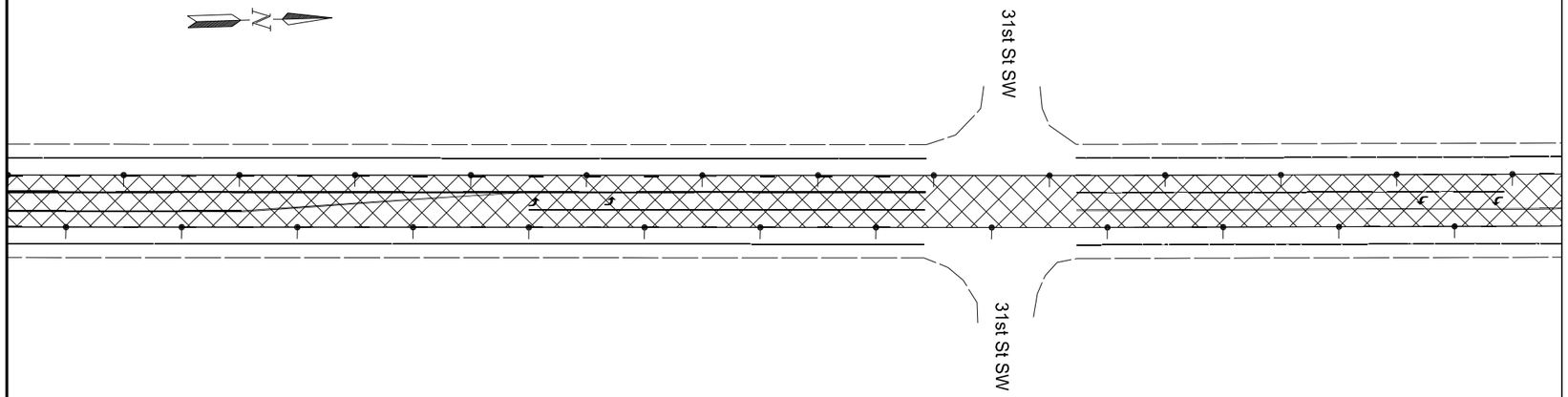
Traffic Control Sign Layout

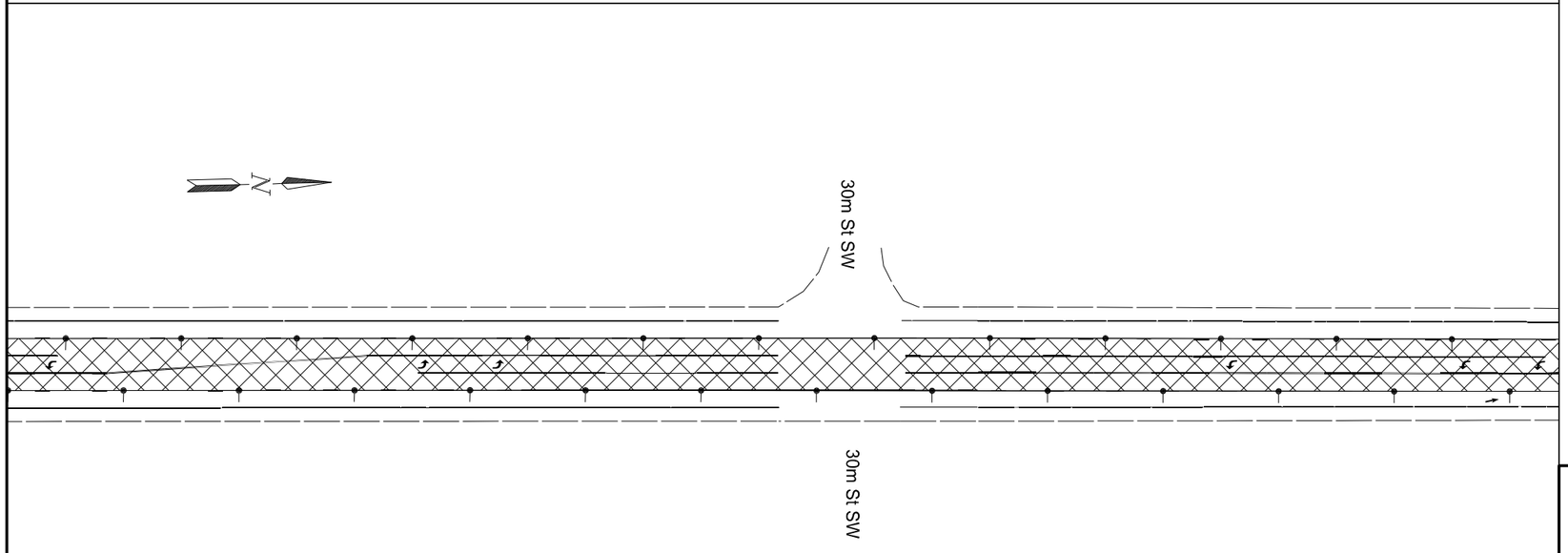
Phase 1

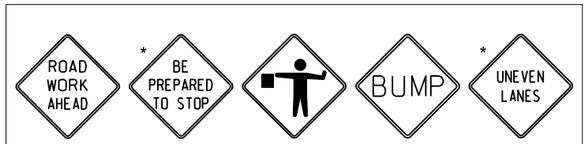
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	13







* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

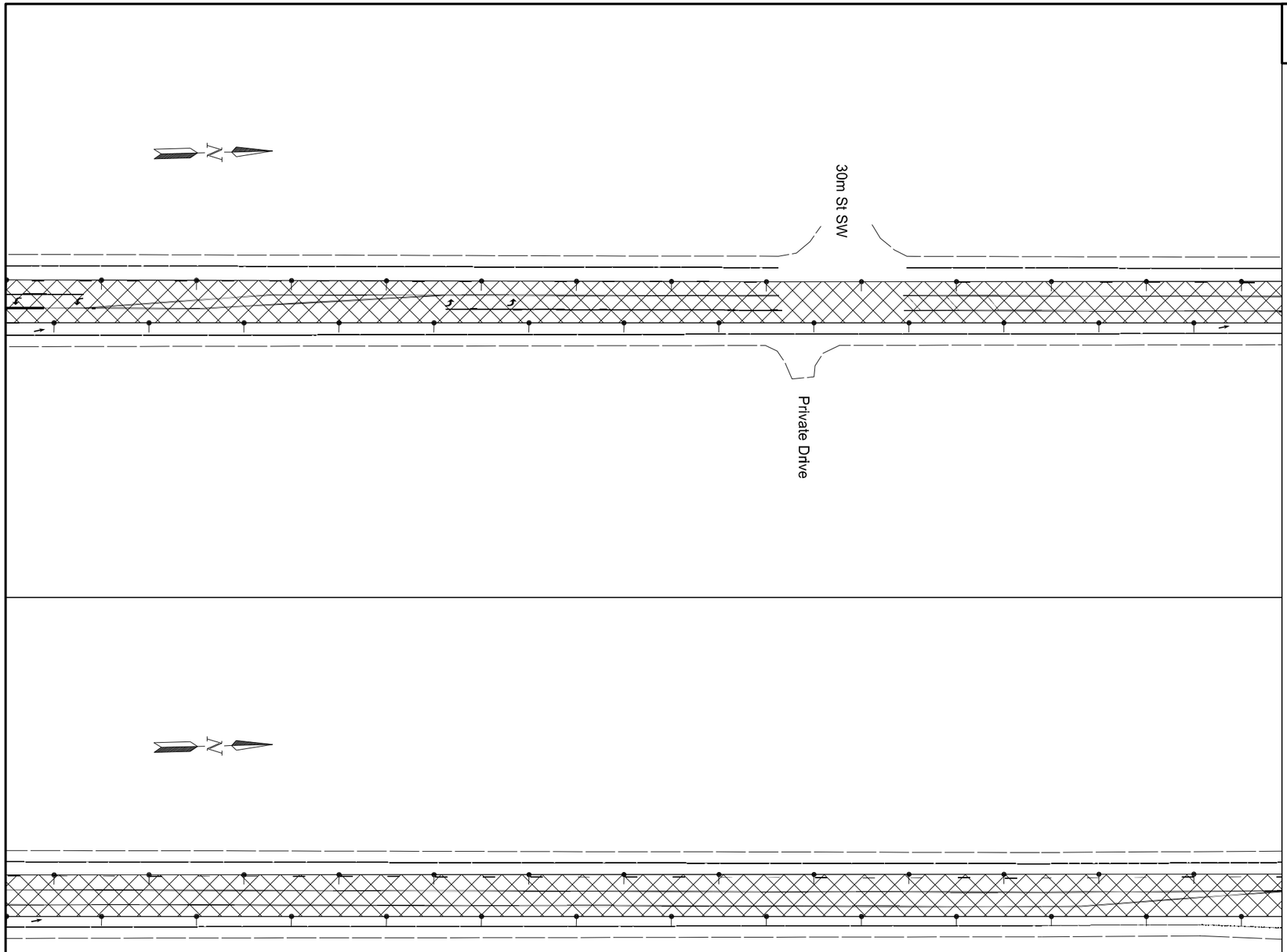
ND Highway 22
Dickinson 45th St to 17th St SW

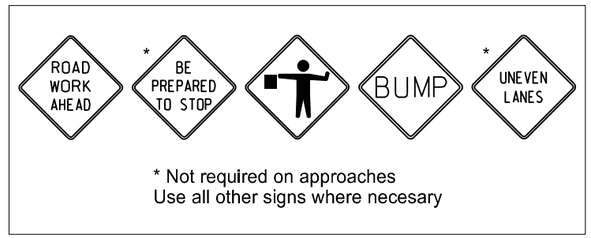
Traffic Control Sign Layout

Phase 1

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	14





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

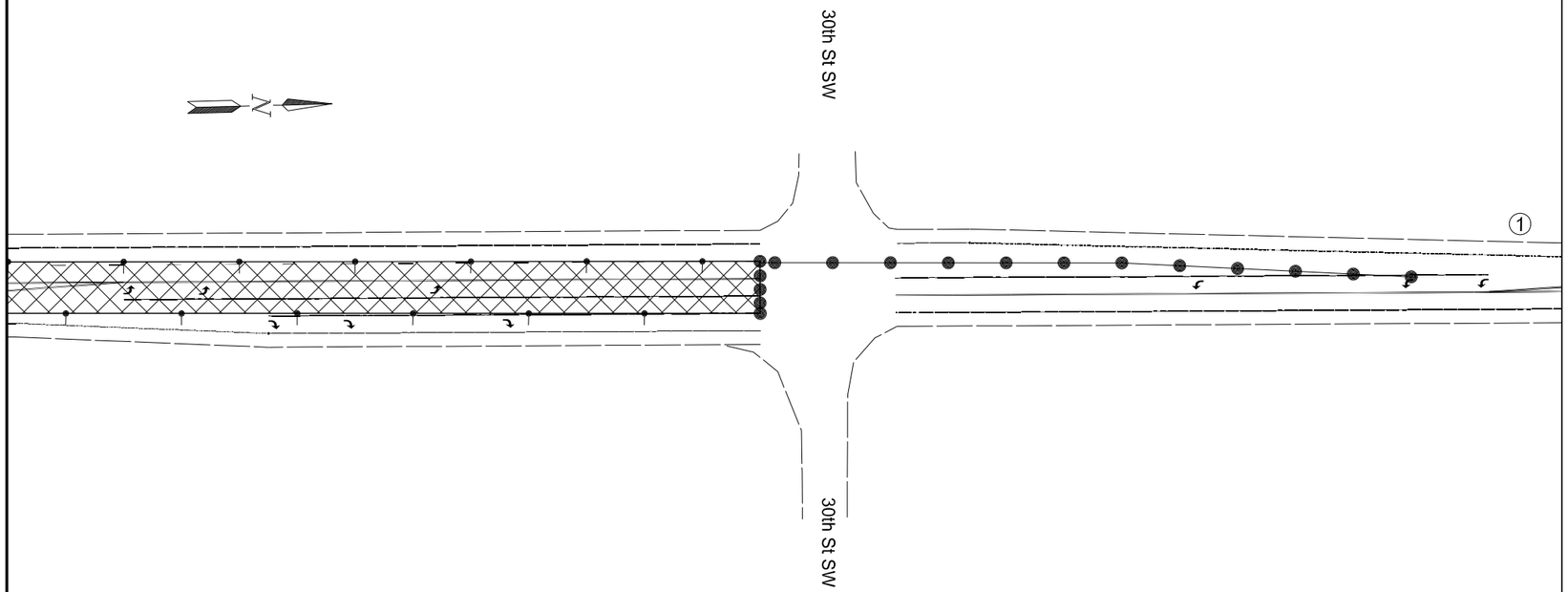
ND Highway 22
Dickinson 45th St to 17th St SW

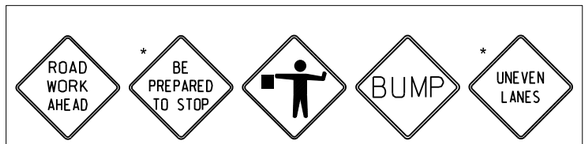
Traffic Control Sign Layout

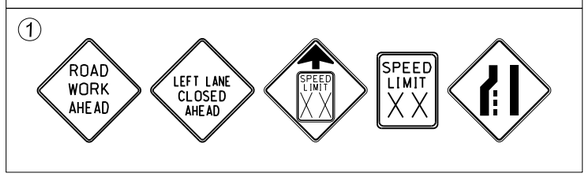
Phase 1

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	15







Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

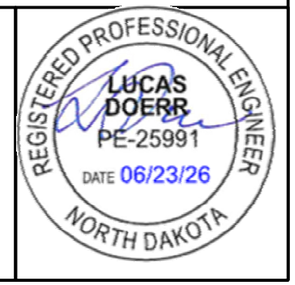
- Work Zone

- Work Zone

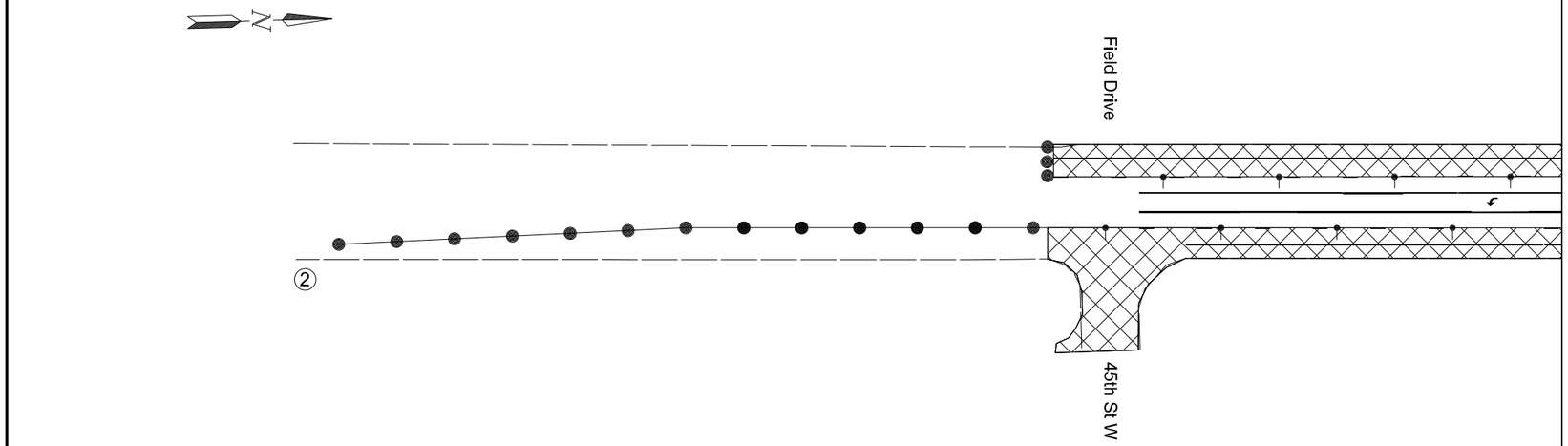
ND Highway 22
Dickinson 45th St to 17th St SW

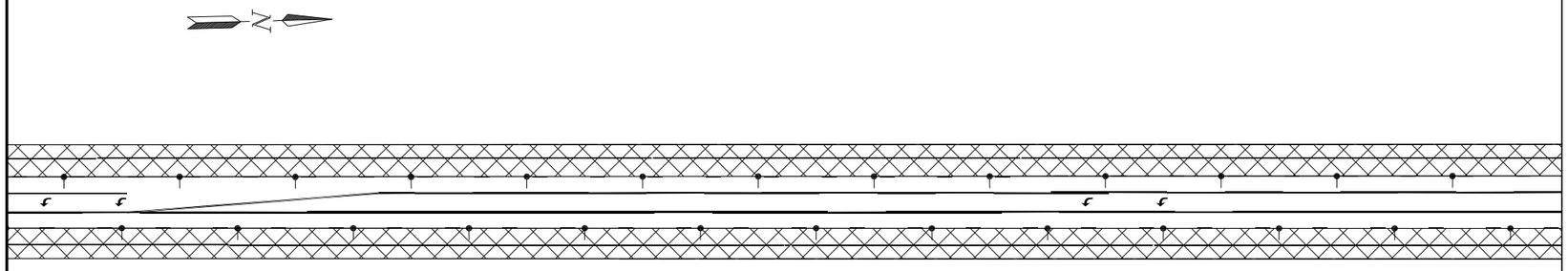
Traffic Control Sign Layout

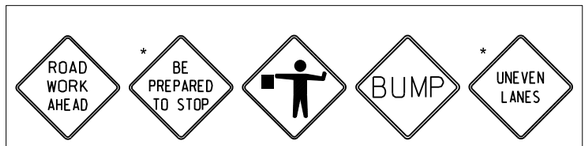
Phase 1

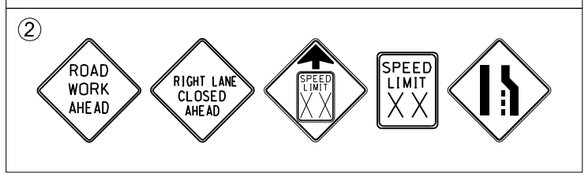


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	16









Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

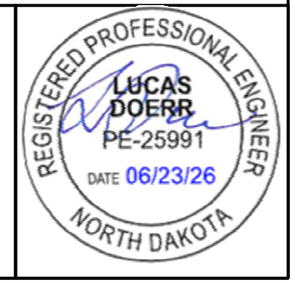
- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

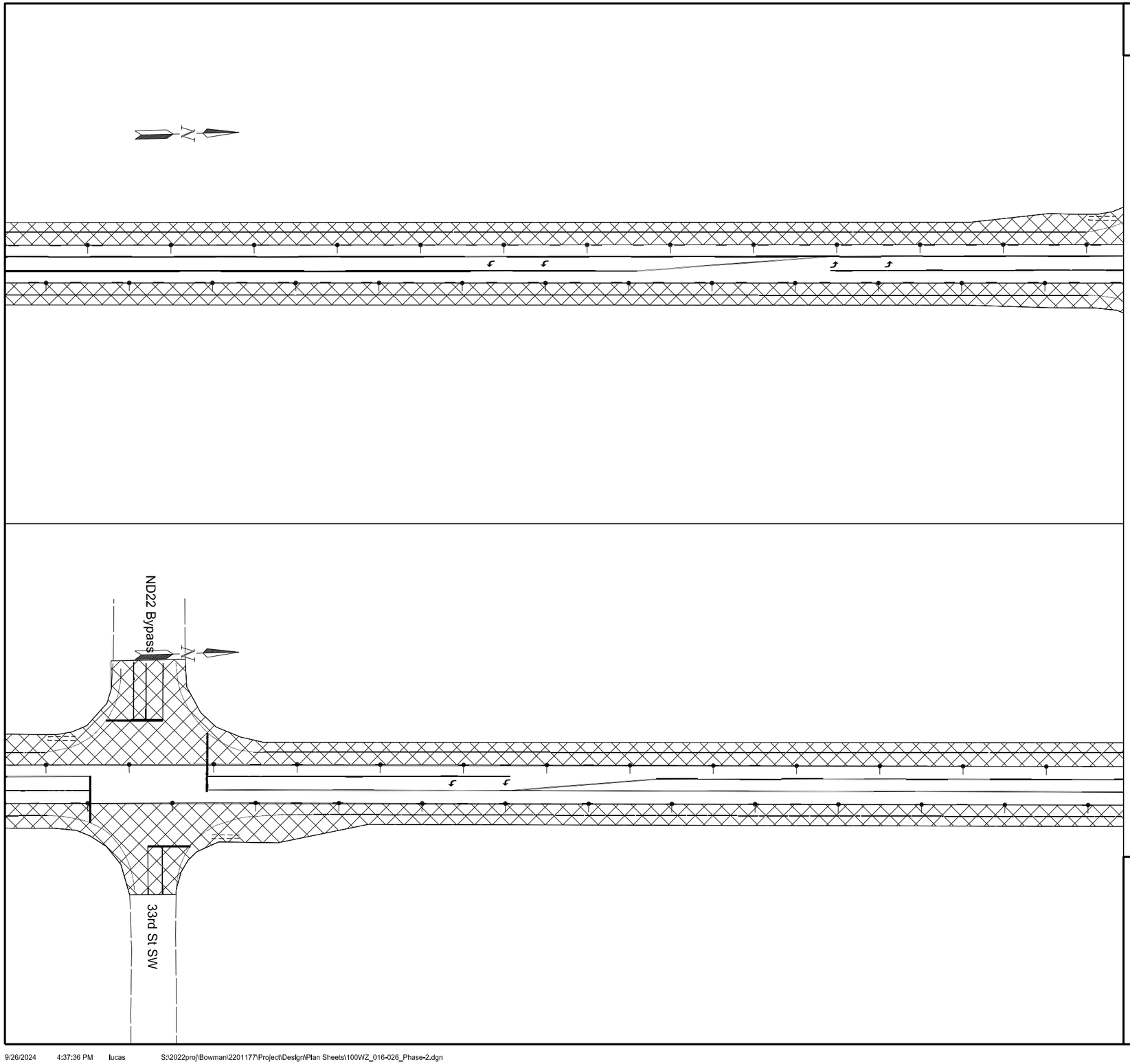
Traffic Control Sign Layout

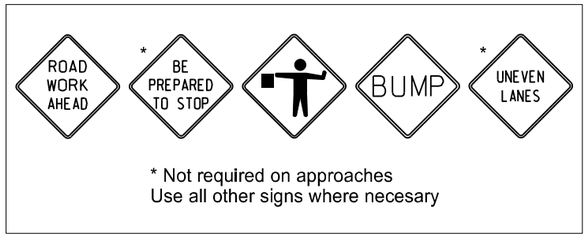
Phase 2



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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	17





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone
- Work Zone
- Work Zone

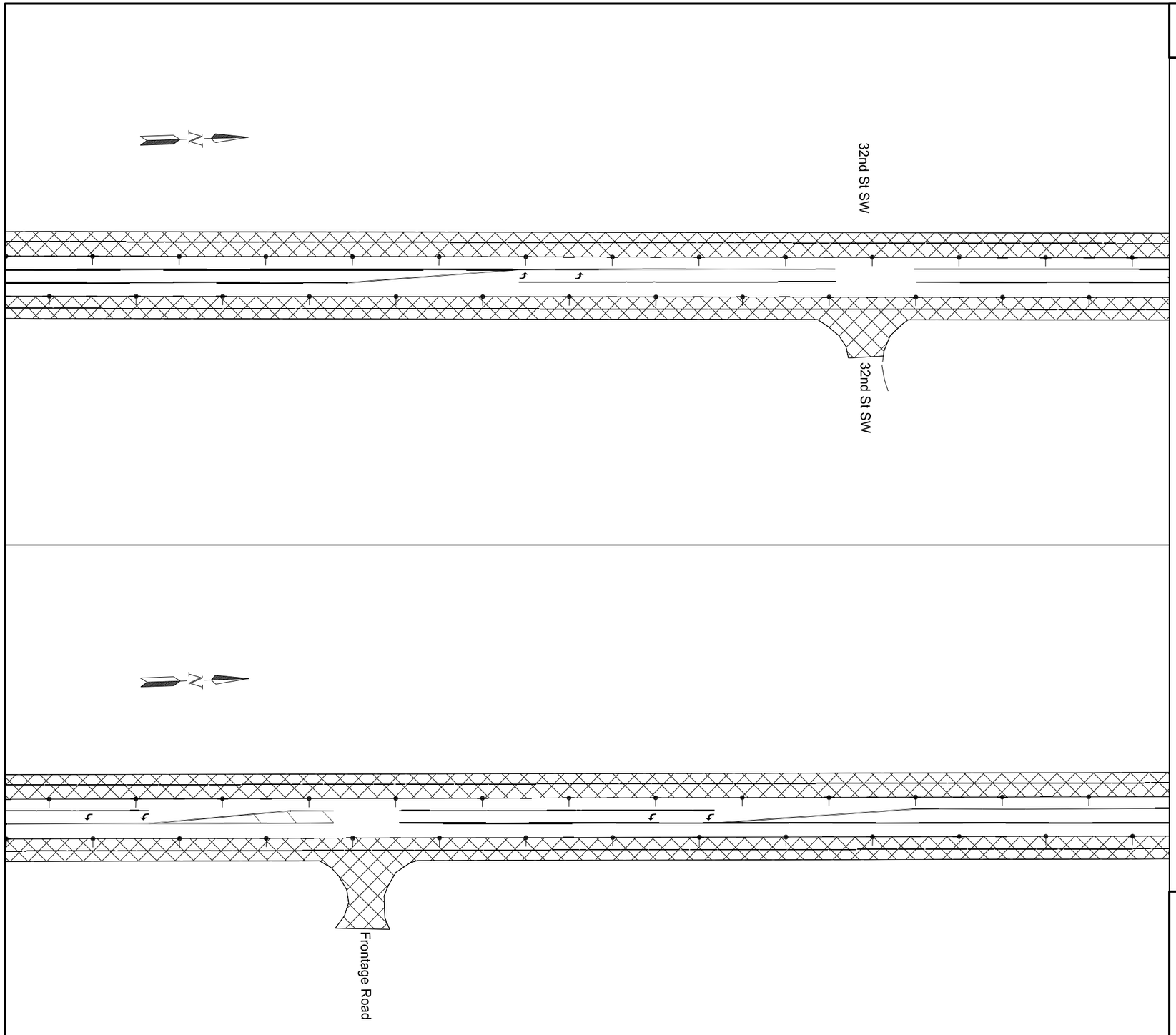
ND Highway 22
Dickinson 45th St to 17th St SW

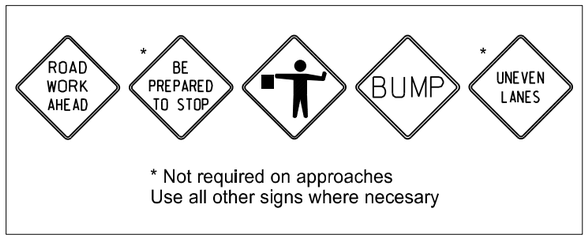
Traffic Control Sign Layout

Phase 2

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	18





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

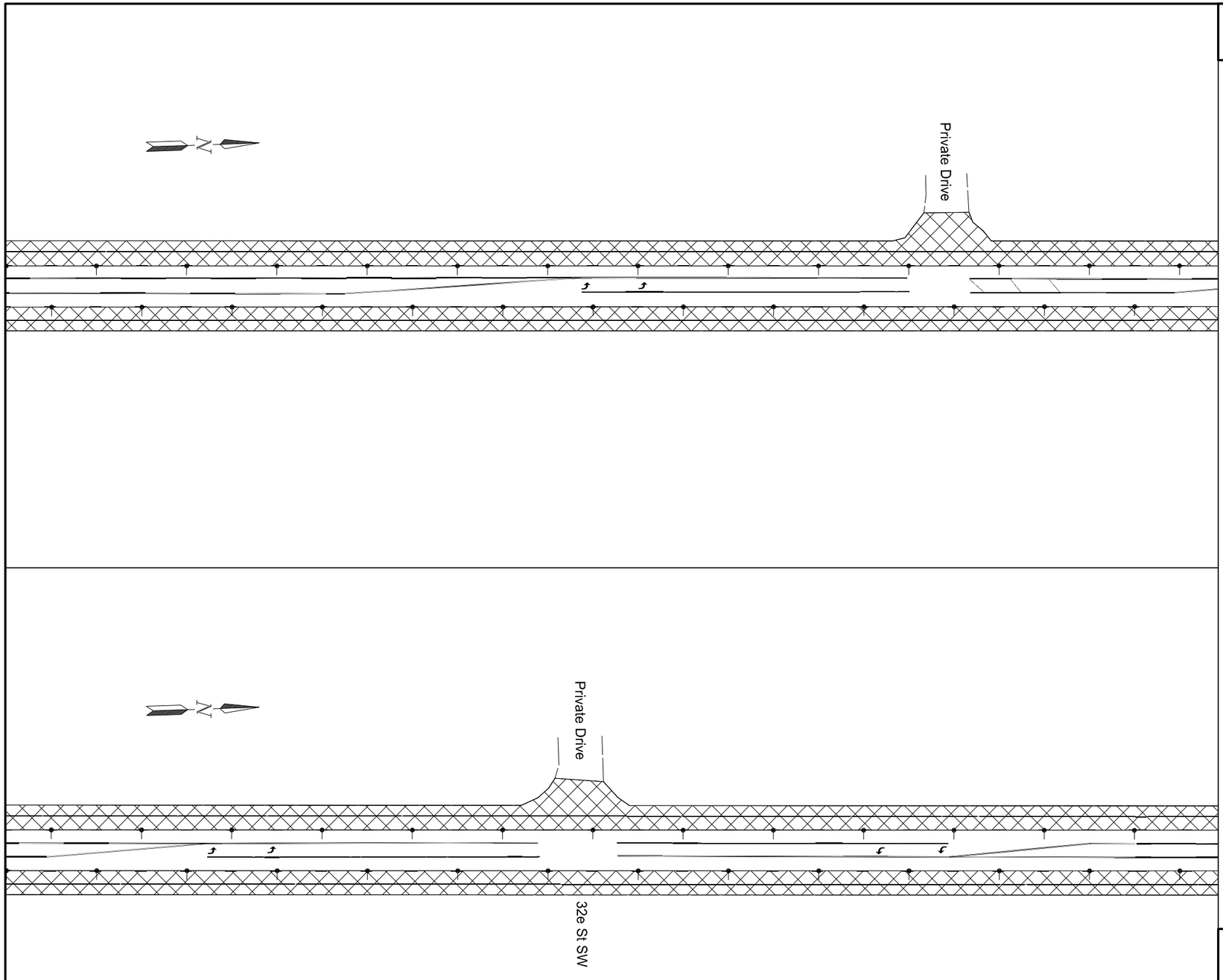
ND Highway 22
Dickinson 45th St to 17th St SW

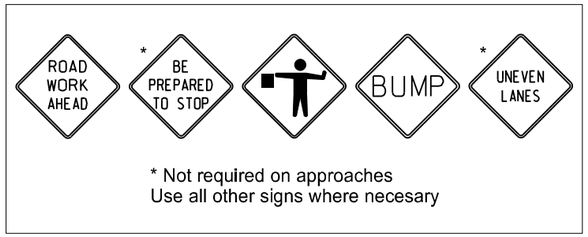
Traffic Control Sign Layout

Phase 2

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	19





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

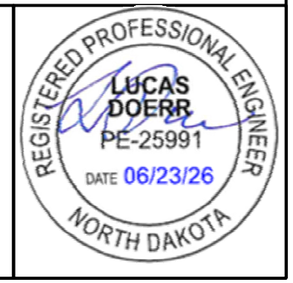
Legend

- Work Zone
- Work Zone
- Work Zone

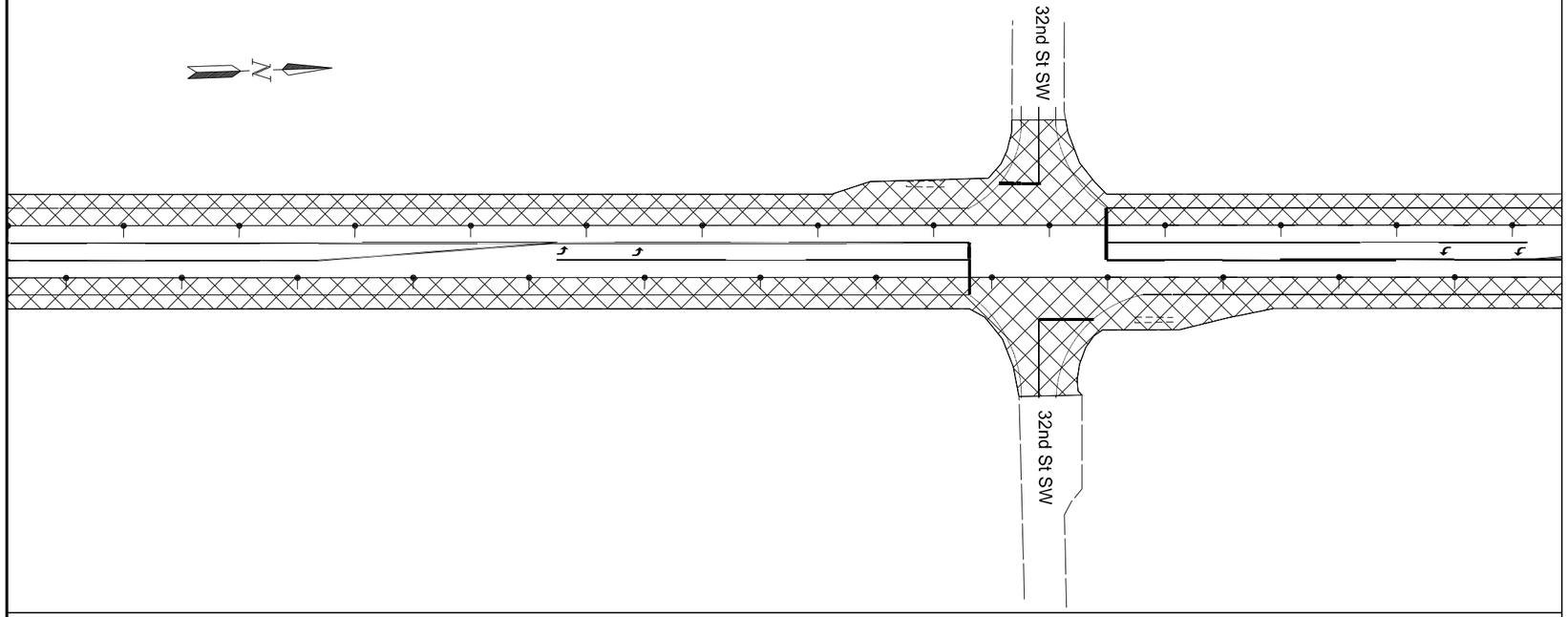
ND Highway 22
Dickinson 45th St to 17th St SW

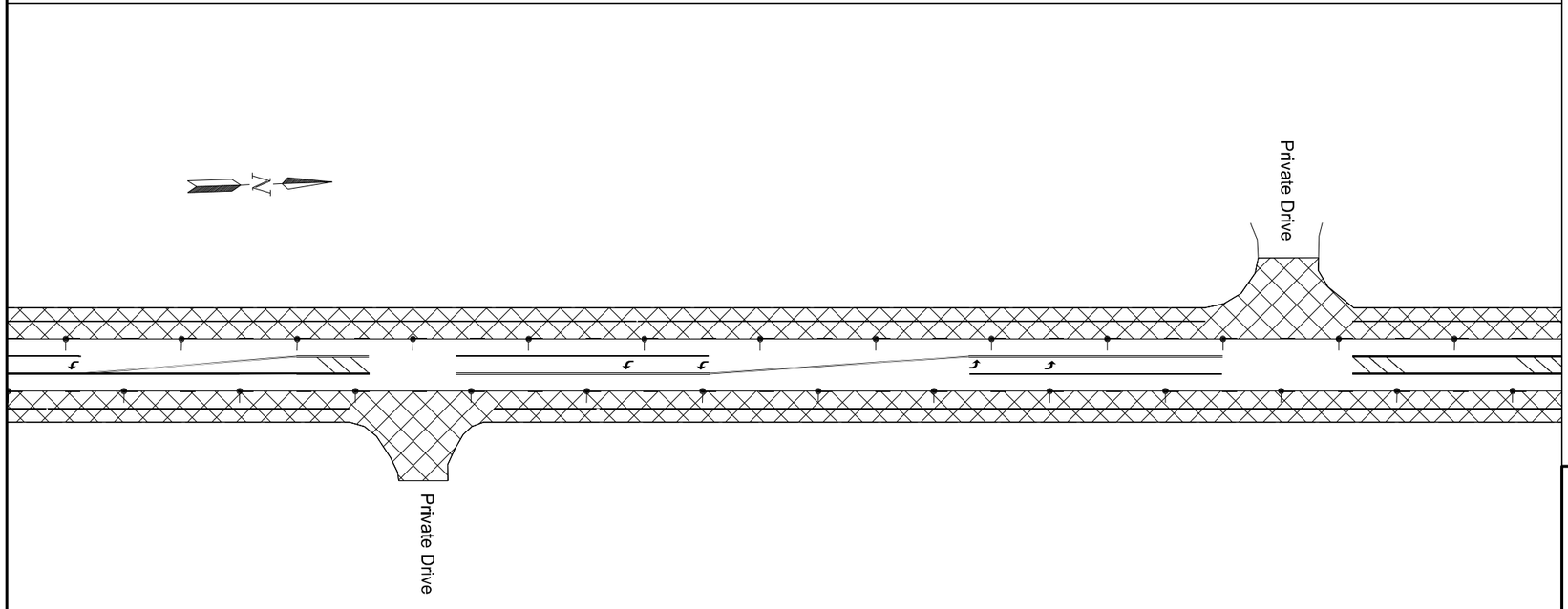
Traffic Control Sign Layout

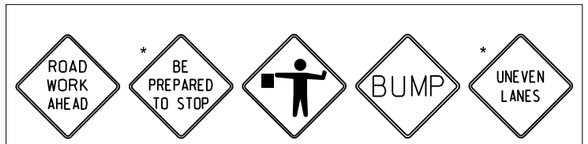
Phase 2



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	100	20







* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

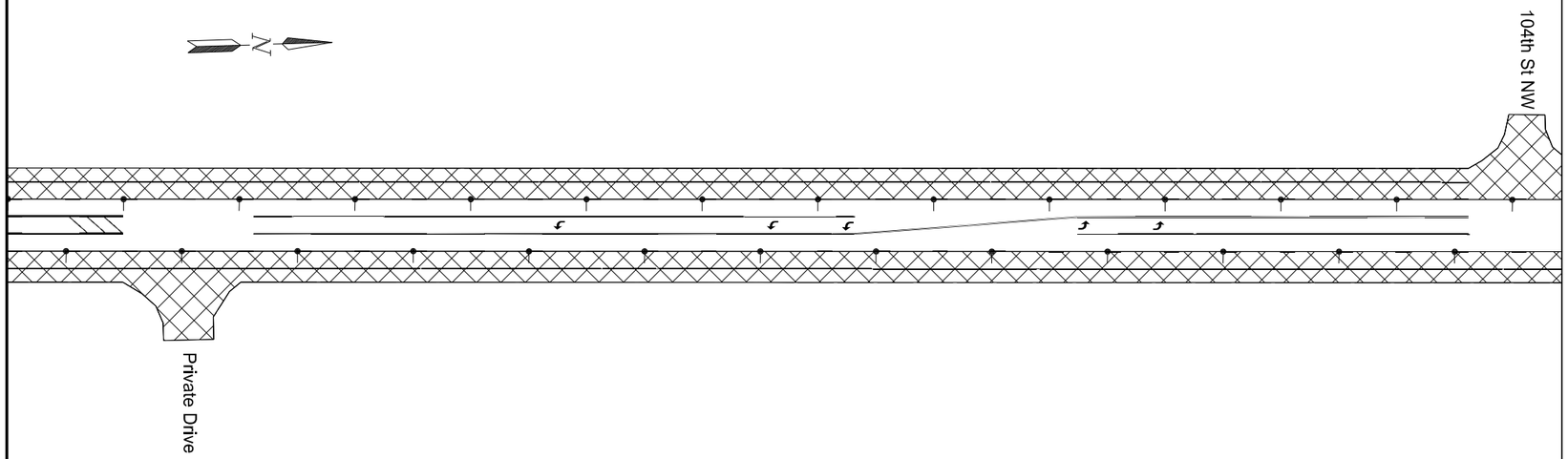
ND Highway 22
Dickinson 45th St to 17th St SW

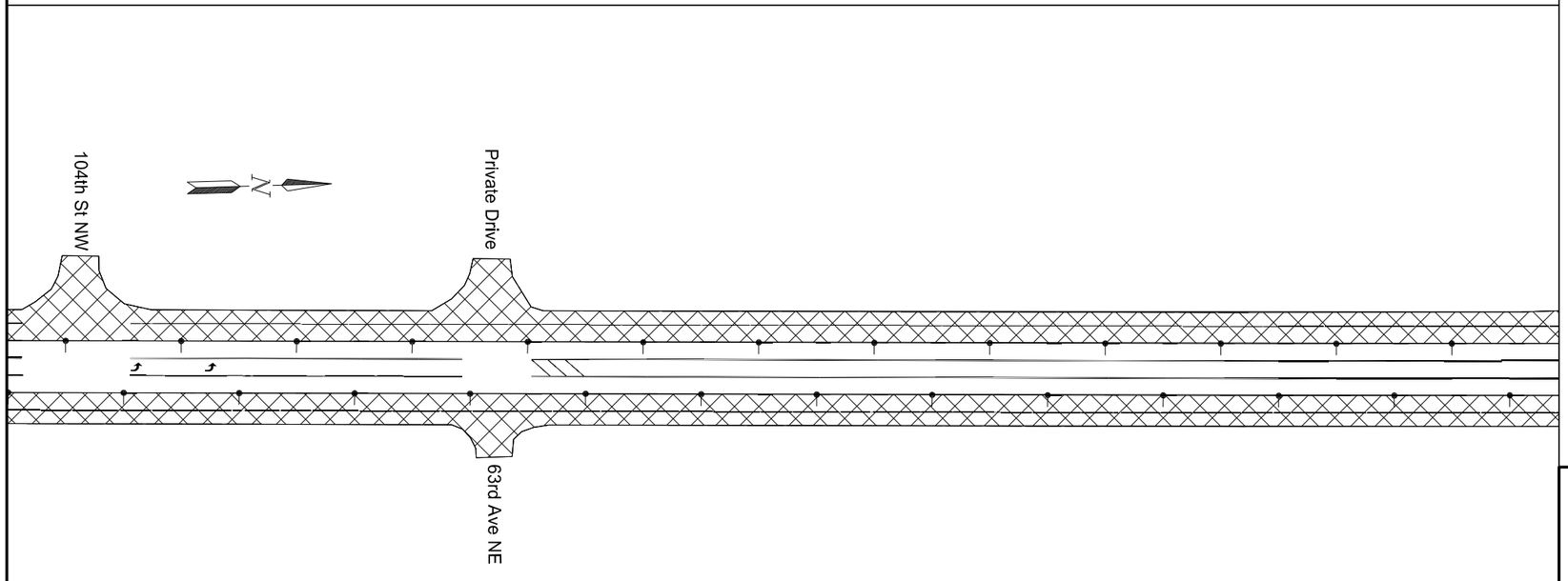
Traffic Control Sign Layout

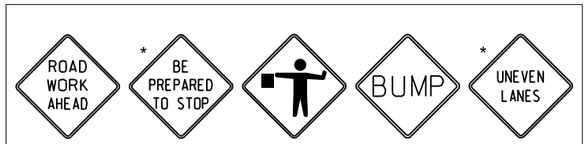
Phase 2

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	21







* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

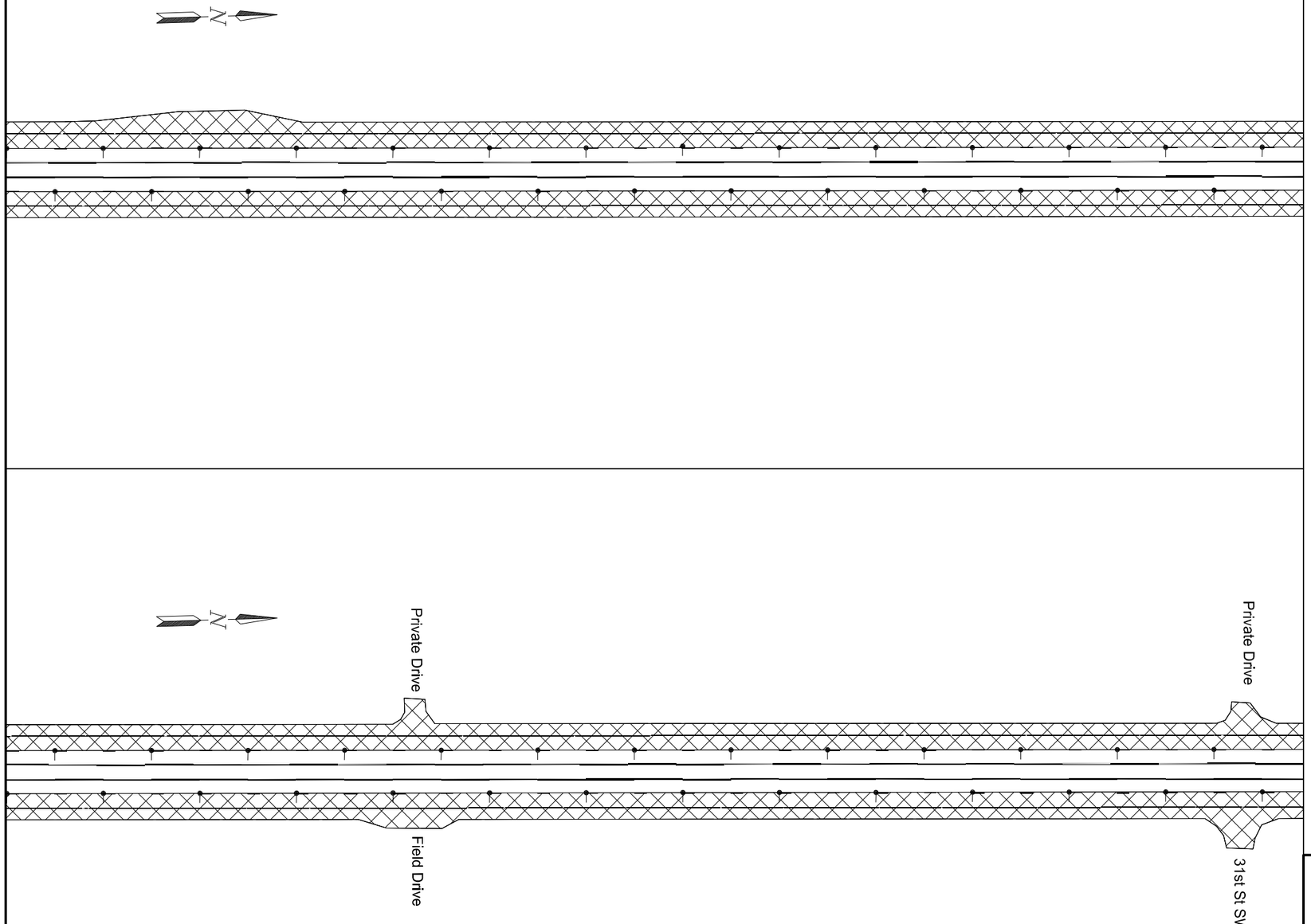
Traffic Control Sign Layout

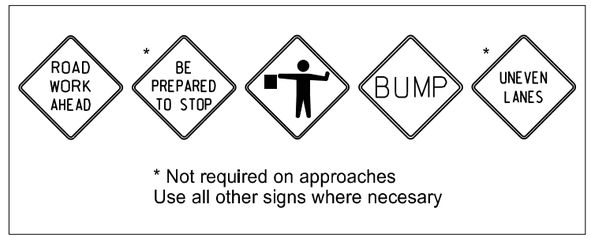
Phase 2

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	100	22





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone
- Work Zone
- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

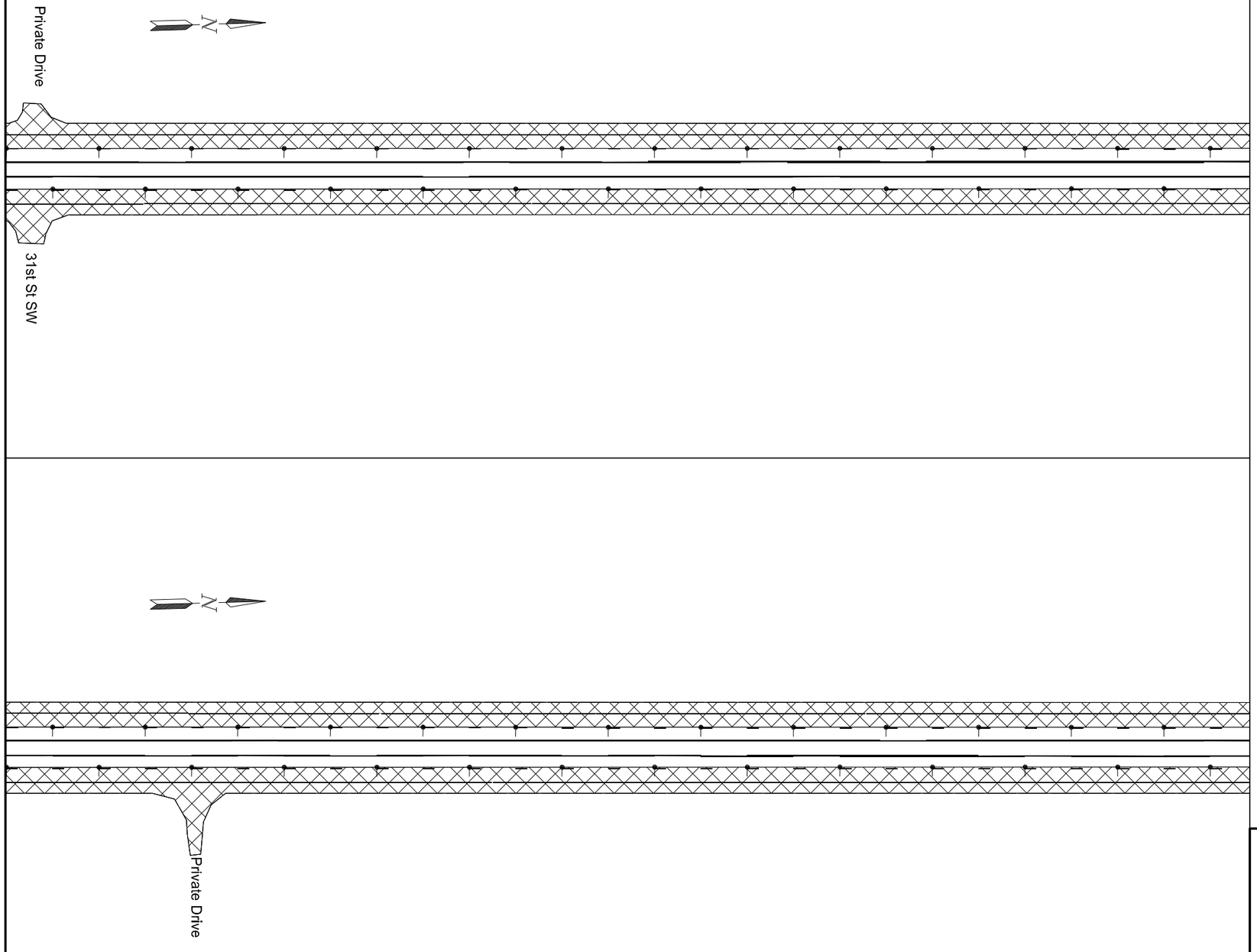
Traffic Control Sign Layout

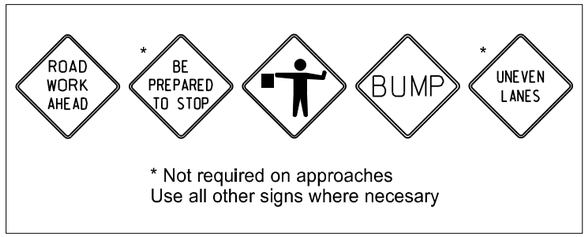
Phase 2

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	100	23





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

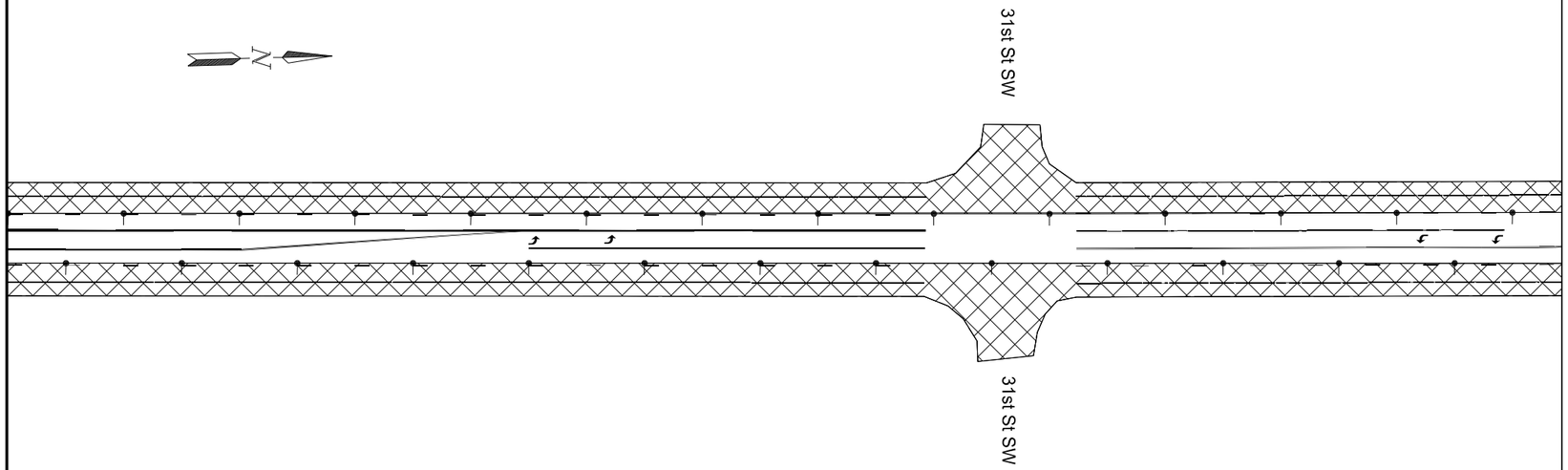
Traffic Control Sign Layout

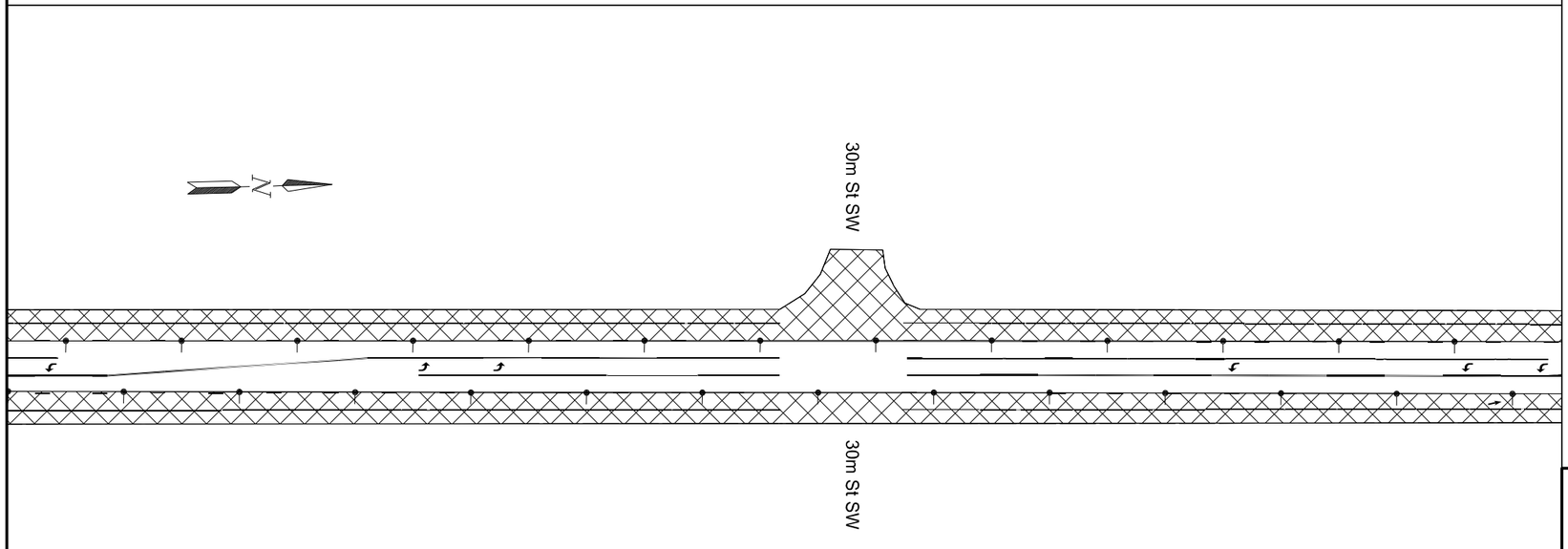
Phase 2

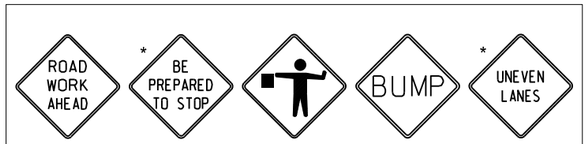
REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	24







* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

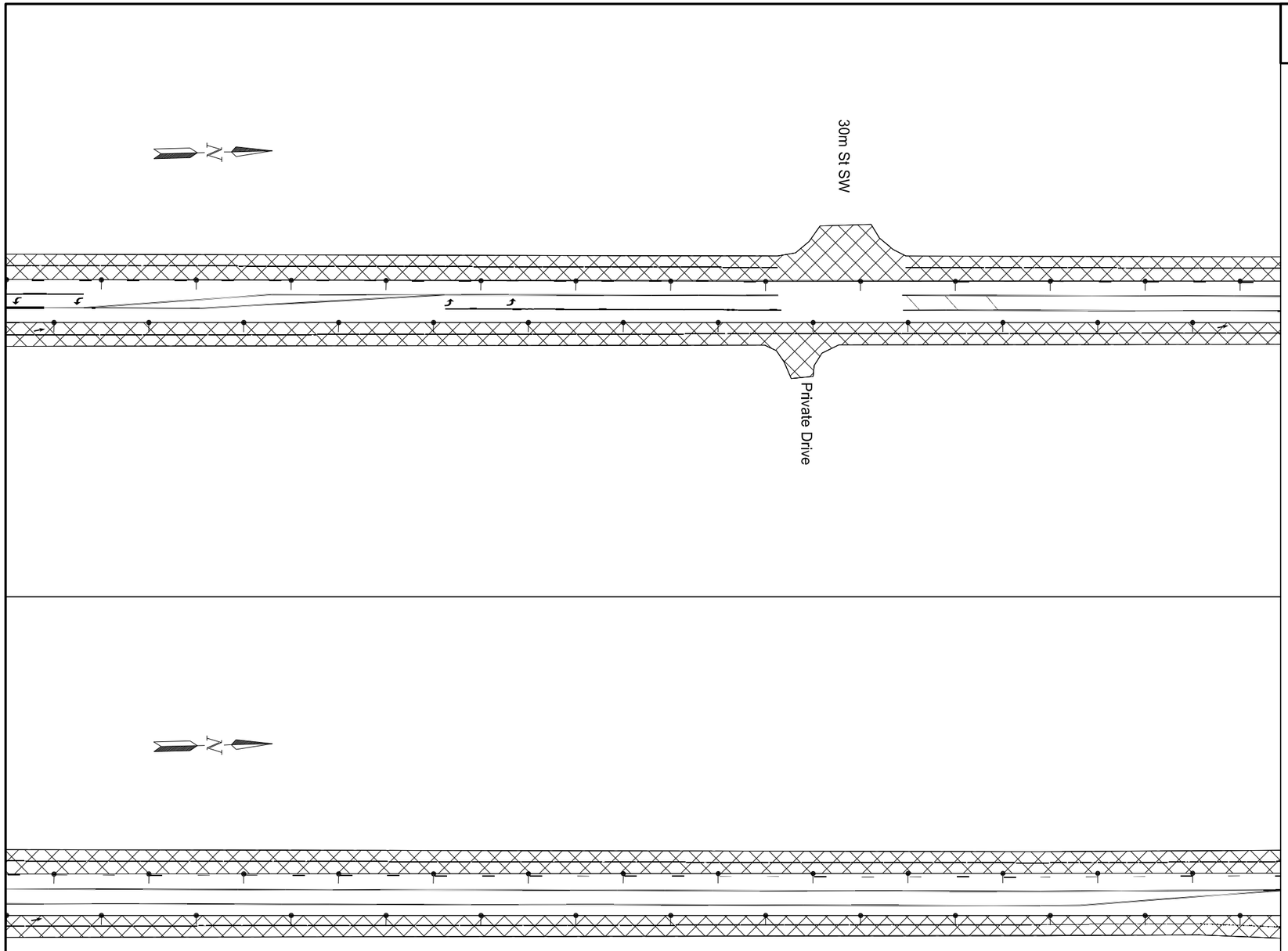
Traffic Control Sign Layout

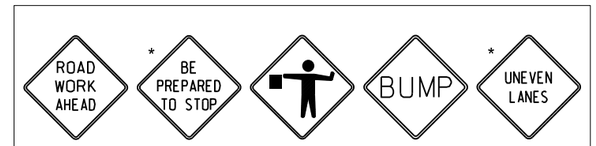
Phase 2

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	25





* Not required on approaches
Use all other signs where necesary

Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

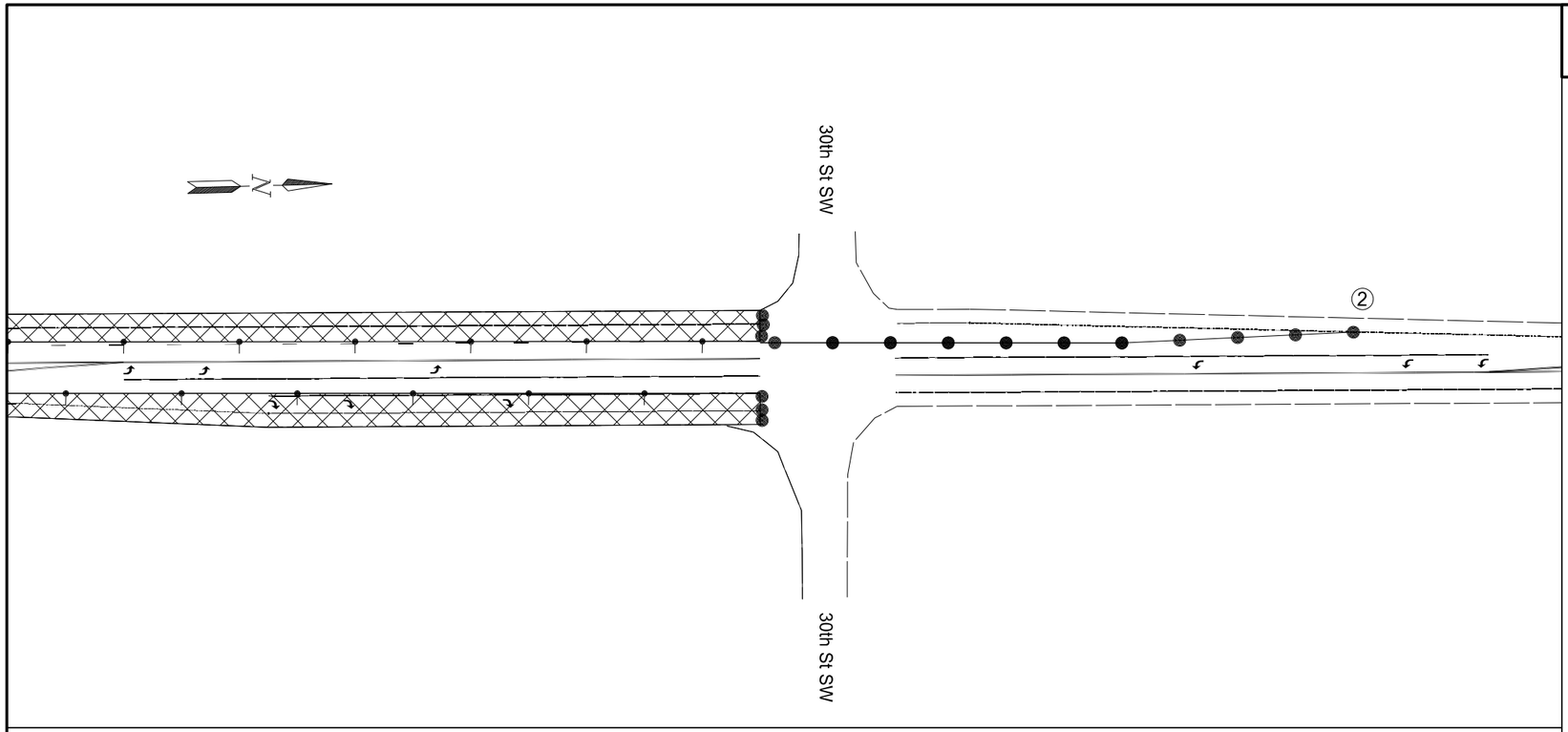
ND Highway 22
Dickinson 45th St to 17th St SW

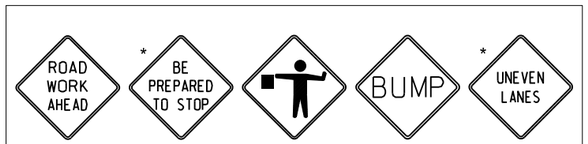
Traffic Control Sign Layout

Phase 2

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	100	26





* Not required on approaches
Use all other signs where necesary

②



Note:
Use D-704-20 for Sign Spacing

Legend

- Work Zone

- Work Zone

- Work Zone

ND Highway 22
Dickinson 45th St to 17th St SW

Traffic Control Sign Layout

Phase 2

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 06/23/26
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	1

HIGHWAY 22

NO PASSING RIGHT (RP)			NO PASSING LEFT (RP)				SKIPS (RP)			DOUBLE BARRIER(RP)		
START	END	LENGTH (FT)	START	END	LENGTH (FT)	Comment	START	END	LENGTH (FT)	START	END	LENGTH (FT)
-	-	-	78.100	78.293	1019.040		-	-	-	-	-	-
-	-	-	-	-	-		78.293	78.767	2502.720	-	-	-
78.767	79.245	2523.840	78.767	79.245	2523.840		-	-	-	78.767	79.245	2523.840
79.245	79.716	2486.880	-	-	-		-	-	-	-	-	-
79.716	79.793	406.560	79.716	79.793	406.560		-	-	-	79.716	79.793	406.560
-	-	-	79.793	80.000	1092.960		-	-	-	-	-	-
-	-	-	-	-	-		80.000	80.472	2492.160	-	-	-
80.472	81.247	4092.000	80.472	81.247	4092.000		-	-	-	80.472	81.247	4092.000
-	-	-	-	-	-		81.247	81.935	3632.640	-	-	-
81.935	81.959	126.720	-	-	-		-	-	-	-	-	-
81.959	85.987	21267.840	81.959	85.987	21267.840		-	-	-	81.959	85.957	21109.440
85.987	86.076	469.920	-	-	-		-	-	-	-	-	-
86.076	86.168	485.760	86.076	86.168	485.760		-	-	-	86.076	86.186	580.800
-	-	-	86.168	86.398	1214.400		-	-	-	-	-	-
-	-	-	-	-	-		86.398	87.359	5074.080	-	-	-
87.359	87.604	1293.600	-	-	-		-	-	-	-	-	-
-	-	-	87.604	87.807	1071.840		-	-	-	-	-	-
87.807	87.919	591.360										
87.919	88.473	2925.120	87.919	88.473	2925.120		-	-	-	87.919	88.473	2925.120
-	-	-	-	-	-		88.473	88.993	2745.600	-	-	-
88.993	89.053	316.800	-	-	-		-	-	-	-	-	-
-	-	-	-	-	-		89.053	89.120	353.760	-	-	-
89.120	89.526	2143.680	89.120	89.526	2143.680		-	-	-	89.120	89.526	2143.680
-	-	-	-	-	-		89.526	89.867	1800.480	-	-	-
89.867	90.008	744.480	-	-	-		-	-	-	-	-	-
-	-	-	-	-	-		90.008	90.078	369.600	-	-	-
-	-	-	90.078	90.239	850.080		-	-	-	-	-	-
-	-	-	-	-	-		90.239	91.291	5554.560	-	-	-
-	-	-	-	-	-		-	-	-	-	-	-
TOTAL LENGTH =		**39,875**	**TOTAL LENGTH =**		**39,093**		**TOTAL LENGTH =**		**24,526**	**TOTAL LENGTH =**		**33,781**

HIGHWAY 22 TEMPORARY PAVEMENT MARKINGS			
6" LINES		**# OF APPLICATIONS**	
Yellow Centerline	87,950.00	3	263,850.00
Yellow Non-Centerline	78,111.00	1	78,111.00
White Skips	14,724.00	2	29,448.00
TOTAL (LF)			**371,409.00**
12" LINES		**# OF APPLICATIONS**	
Lane Lines	16,021.00	2	32,042.00
Yellow Gore	593.00	1	593.00
TOTAL (LF)			**32,635.00**
24" LINES		**# OF APPLICATIONS**	
Stop Bar	268.00	1	268.00
TOTAL (LF)			**268.00**

PAINTED LENGTH CALCULATIONS		
(A) NO PASSING ZONE =	78,968	FT
(B)DOUBLE BARRIER =	33,781	FT
(C) SKIPS =	24,526	FT
(D) = (A) - 2(B) = SINGLE BARRIER W/ SKIP =	11,405	FT
PAINTED LENGTH = 2(B) +0.25(C) +1.25(D) =	**87,950**	**FT**

6IN WHITE EDGE LINE CALCULATIONS				
	START	END	LENGTH	
White Edge Line Left=	74.166	91.291	90,420	FT
White Edge Line Right=	74.166	91.291	90,420	FT
TOTAL PAINTED WHITE EDGE LINE LENGTH =			**180,840**	**FT**

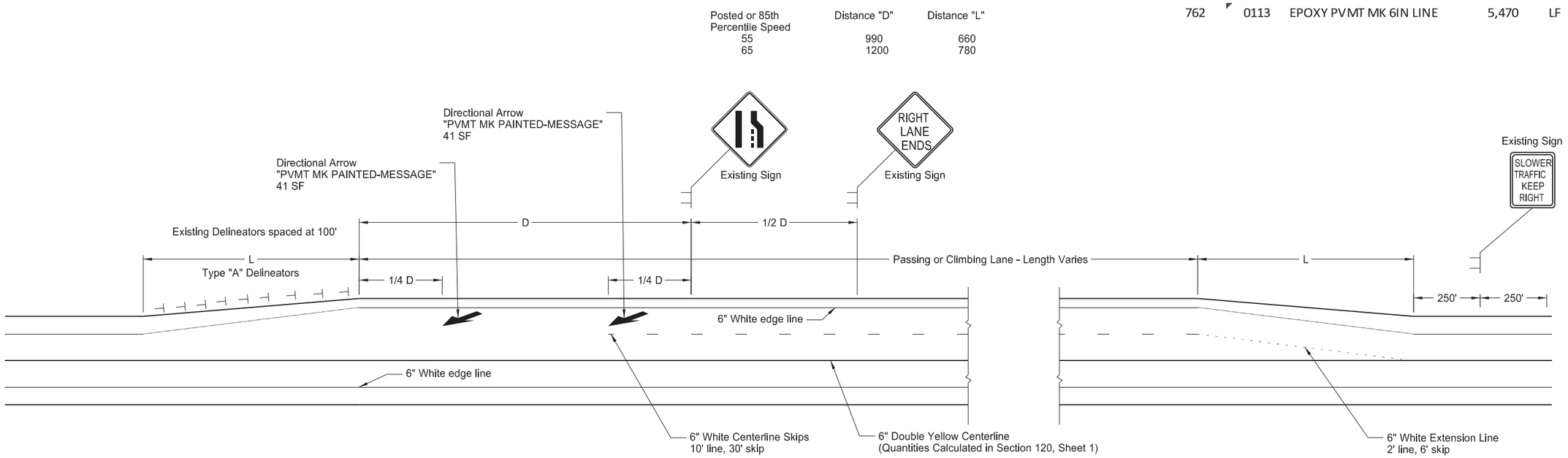
ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	2

SPEC	CODE	ITEM DESCRPTION	QUANTITY	UNIT
762	0112	EPOXY PVMT MK MESSAGE	164	SF
762	0113	EPOXY PVMT MK 6IN LINE	5,470	LF

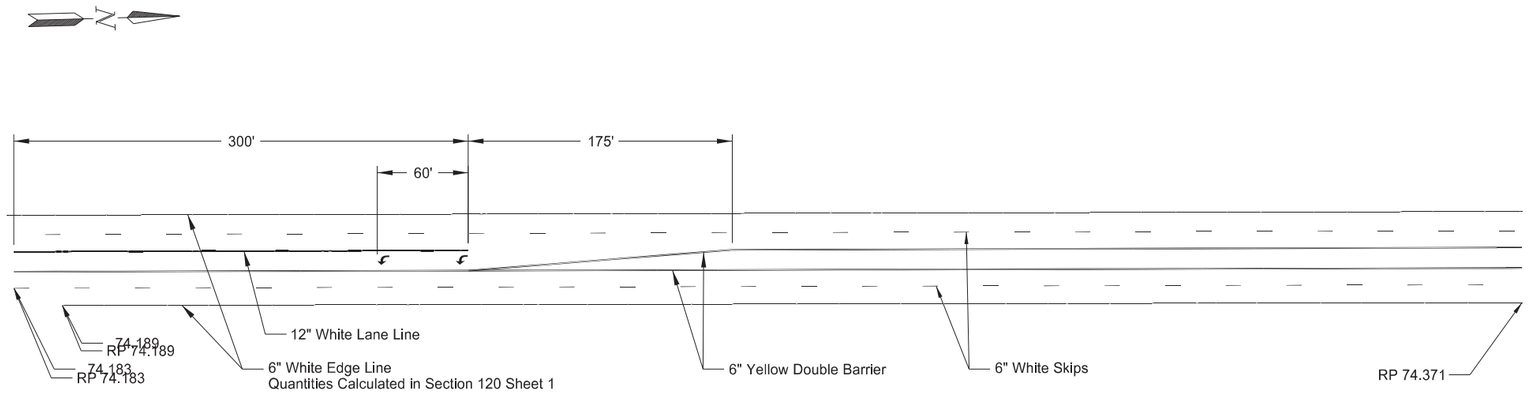


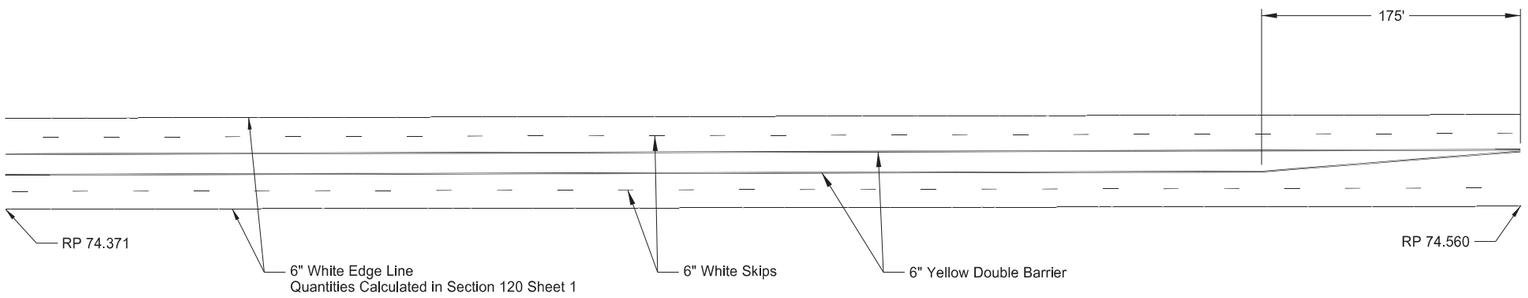
PASSING / CLIMBING LANE LOCATIONS							6" WHITE CL SKIPS LENGTH (FT)	6" WHITE CL SKIPS PAY LENGTH (FT)	6" WHITE SHORT SKIPS LEGNTH (FT)	6" WHITE SHORT SKIPS PAY LENGTH (FT)	DIRECTIONAL ARROW MESSAGE
	(RP)		FULL WIDTH		(RP)						
DIRECTION	BEGIN TAPER	END TAPER	BEGIN	END	BEGIN TAPER	END TAPER					
NB	82.073	82.223	82.223	84.103	84.103	84.427	9,926	2,482	780	195	2
SB	83.490	83.795	83.795	85.763	85.763	85.911	10,391	2,598	780	195	2

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA





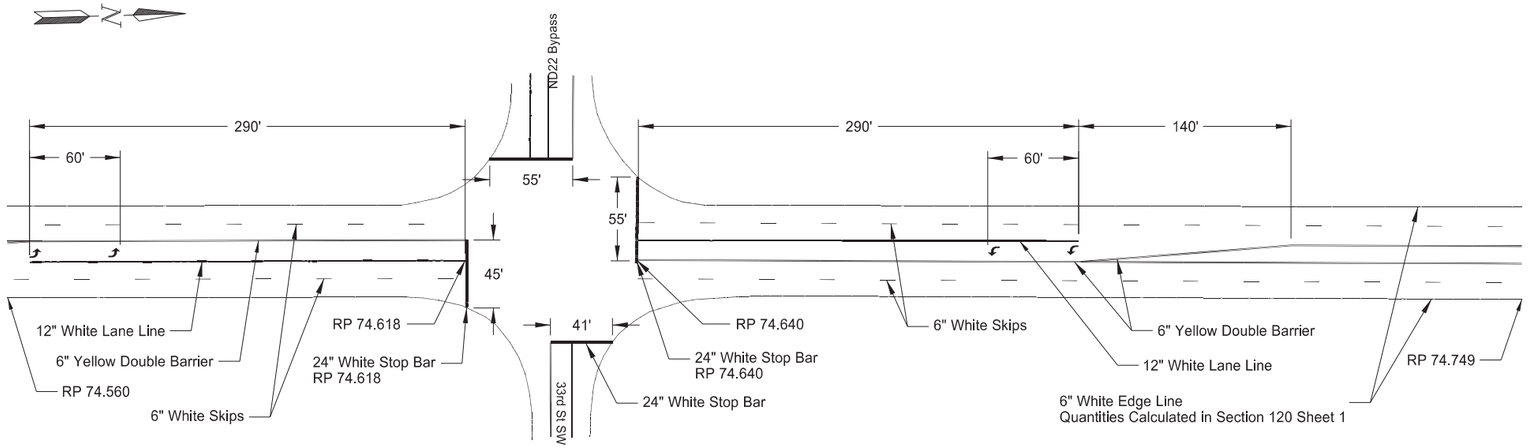
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	3

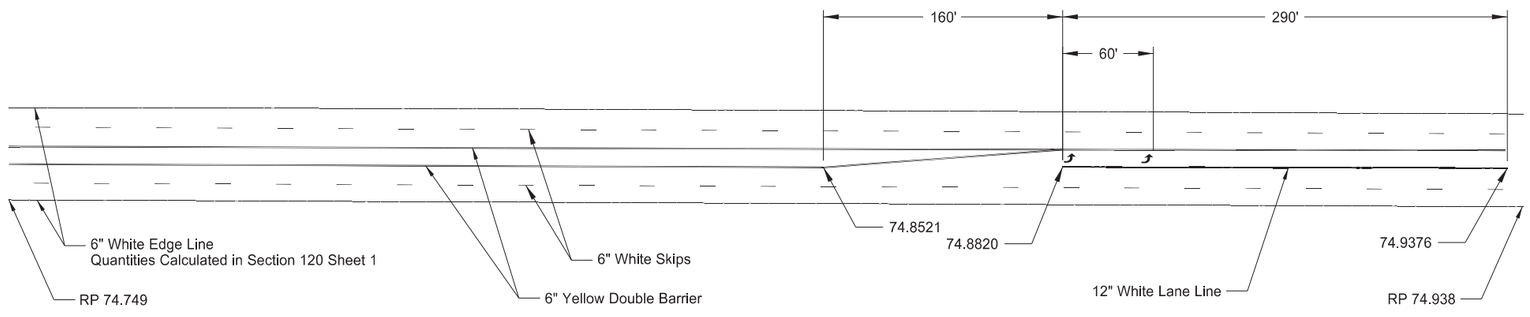
SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	0111	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line	300	LF
762	0112	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (2)	32	SF
762	0114	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 74.183 to RP: 74.560	7385	LF
		White Skips		
		RP: 74.183 to RP: 74.560	998	LF
762	0432	**SHORT TERM 6IN LINE-TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 74.183 to RP: 74.560	22155	LF
		White Skips (2 Applications)		
		RP: 74.183 to RP: 74.560	1996	LF
762	0437	**SHORT TERM 12IN LINE-TYPE NR**		
		White Lane Line (2 Applications)	600	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
RP 74.182 to RP 74.560

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA





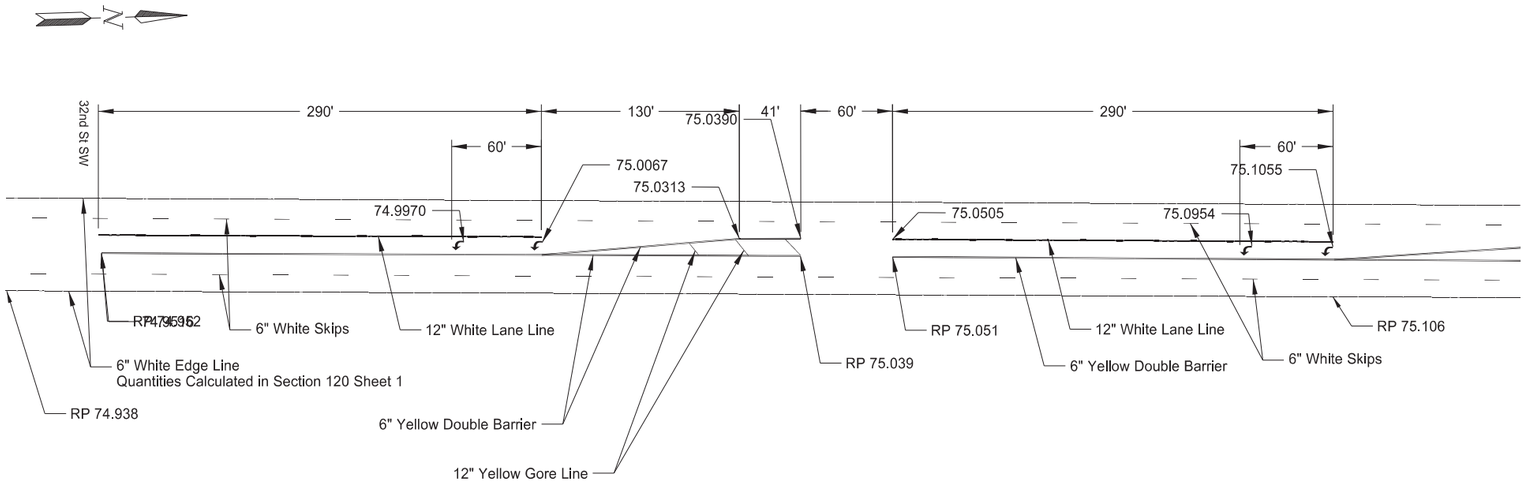
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	4

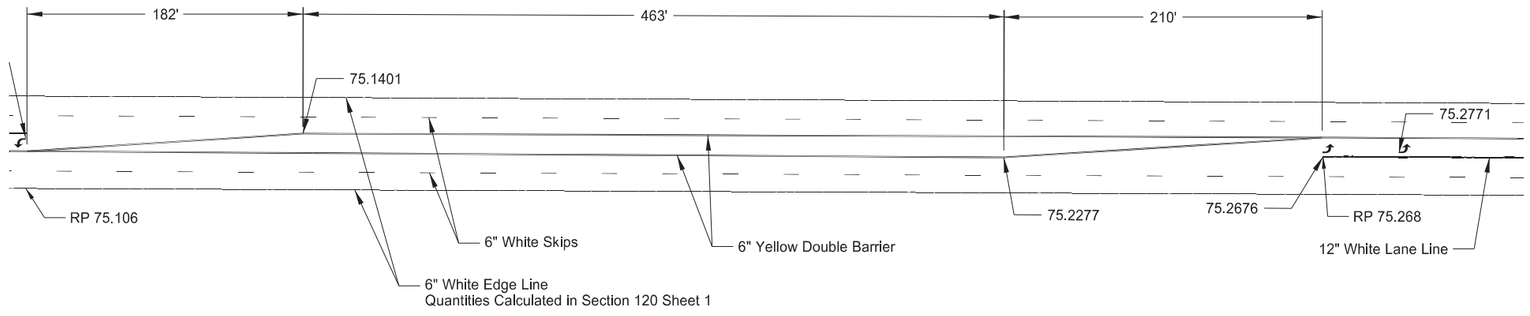
SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	**0111**	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (3)	870	LF
		33rd St SW	150	LF
762	**0112**	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (7)	112	SF
762	**0114**	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 74.560 to RP: 74.618	600	LF
		RP: 74.646 to RP: 74.938	5118	LF
		33rd St SW	250	LF
		White Skips		
		RP: 74.560 to RP: 74.618	150	LF
		RP: 74.646 to RP: 74.938	792	LF
762	**0117**	**EPOXY PVMT MK 24IN LINE**		
		White Stop Bar (4)	196	LF
762	**0432**	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 74.560 to RP: 74.618	1800	LF
		RP: 74.646 to RP: 74.938	15354	LF
		33rd St SW	750	LF
		White Skips (2 Applications)		
		RP: 74.560 to RP: 74.618	300	LF
		RP: 74.646 to RP: 74.938	1584	LF
762	**0436**	**SHORT TERM 24IN LINE-TYPE NR**		
		White Stop Bar (4)	196	LF
762	**0437**	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (3 @ 2 Applications)	1740	LF
		33rd St SW	300	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
RP 74.560 to RP 74.938

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA





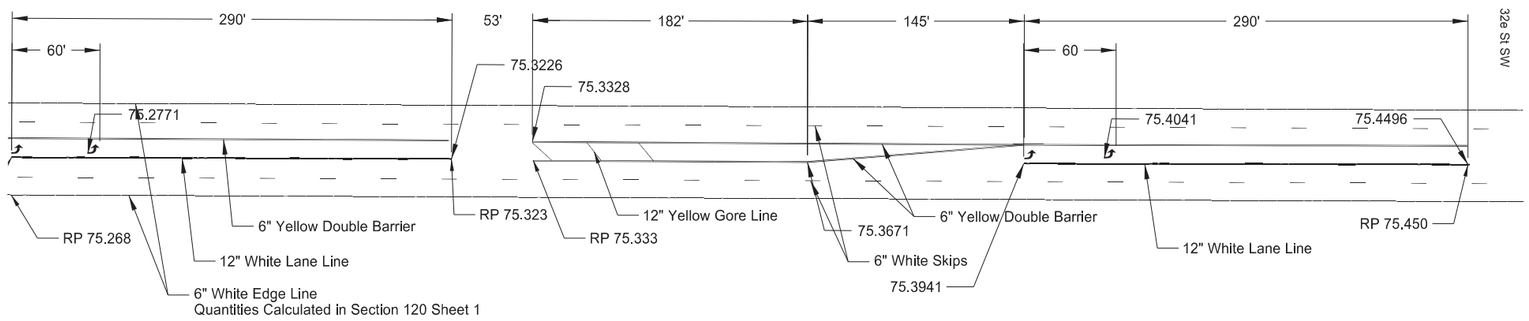
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	5

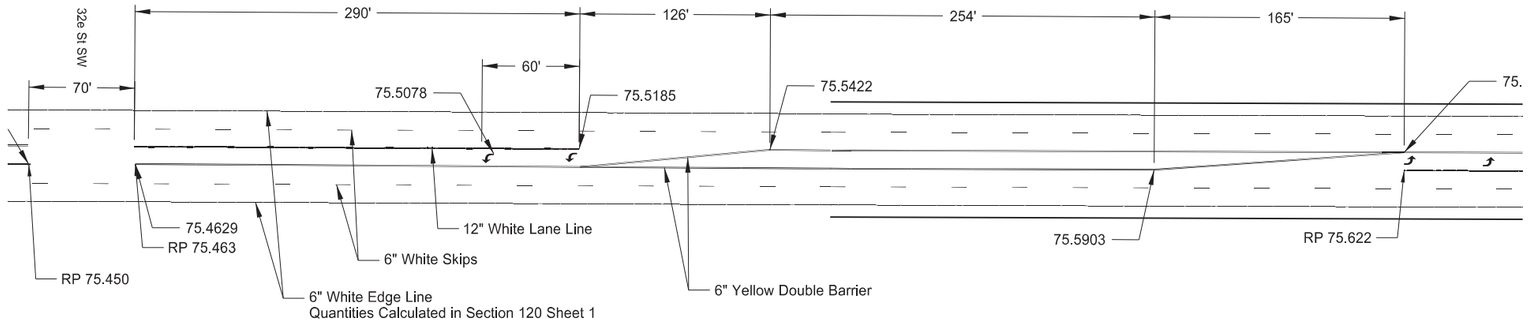
SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	0111	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (2)	580	LF
		Yellow Gore Line (3)	38	LF
762	0112	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (4)	64	SF
762	0114	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 74.952 to RP 75.039	1268	LF
		RP: 75.051 to RP: 75.268	4000	LF
		White Skips		
		RP: 74.938 to RP: 75.268	865	LF
762	0432	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 74.952 to RP 75.039	3804	LF
		RP: 75.051 to RP: 75.268	12000	LF
		White Skips (2 Applications)		
		RP: 74.938 to RP: 75.268	1730	LF
762	0437	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (2 Applications)	1160	LF
		Yellow Gore Line (3 @ 1Application)	38	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
RP 74.938 to RP 75.316

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA





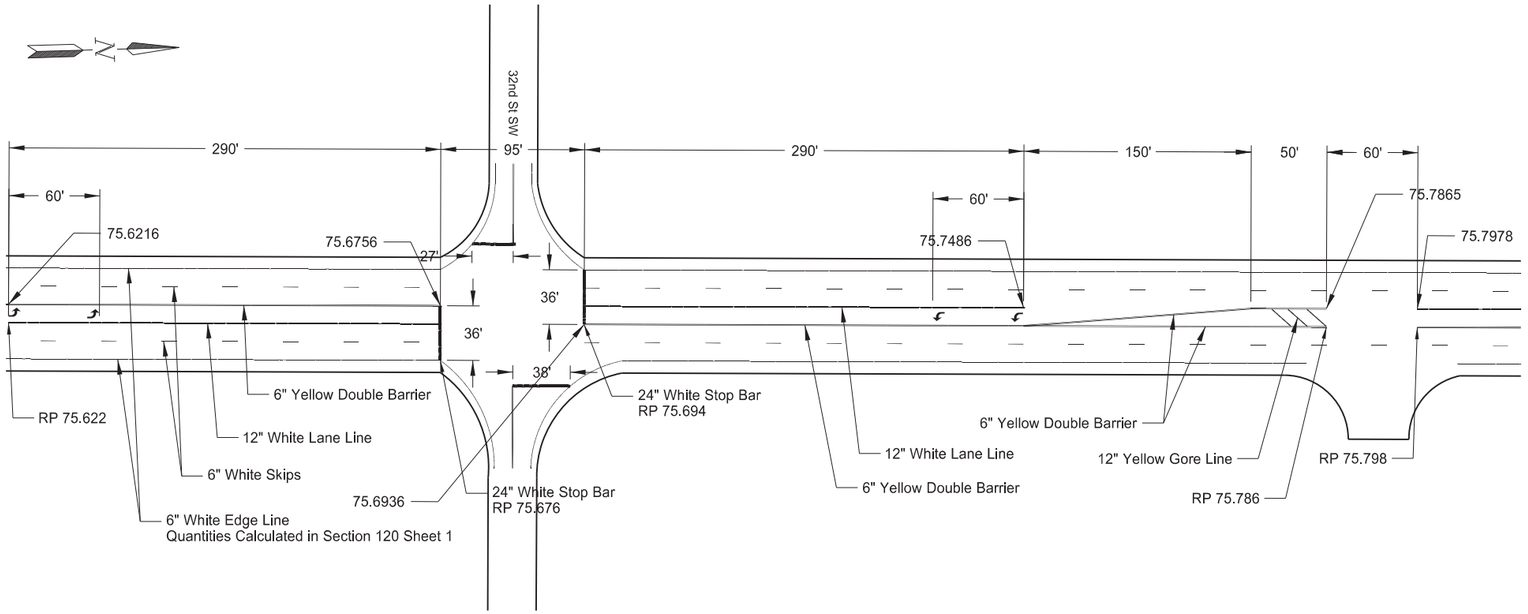
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	6

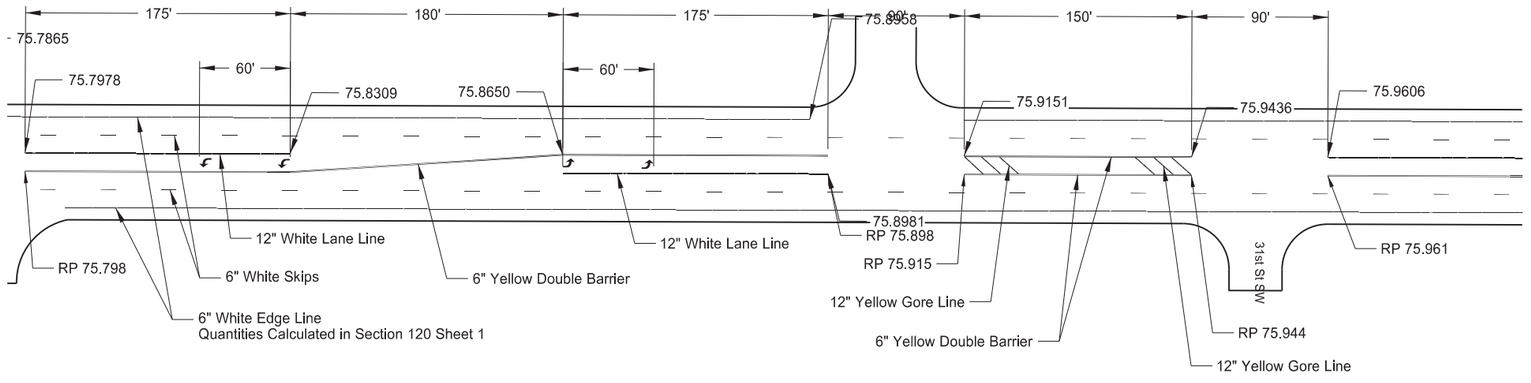
SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	0111	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (3)	870	LF
		Yellow Gore Line (3)	48	LF
762	0112	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (6)	96	SF
762	0114	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 75.268 to RP 75.323	580	LF
		RP: 75.333 to RP: 75.450	1882	LF
		RP: 75.463 to RP 75.622	2766	LF
		White Skips		
		RP: 75.268 to RP: 75.622	934	LF
762	0432	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 75.268 to RP 75.323	1740	LF
		RP: 75.333 to RP: 75.450	5646	LF
		RP: 75.463 to RP 75.622	8298	LF
		White Skips (2 Applications)		
		RP: 75.268 to RP: 75.622	1868	LF
762	0437	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (3 @ 2 Applications)	1740	LF
		Yellow Gore Line (3)	48	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
RP 75.316 to RP 75.694

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA





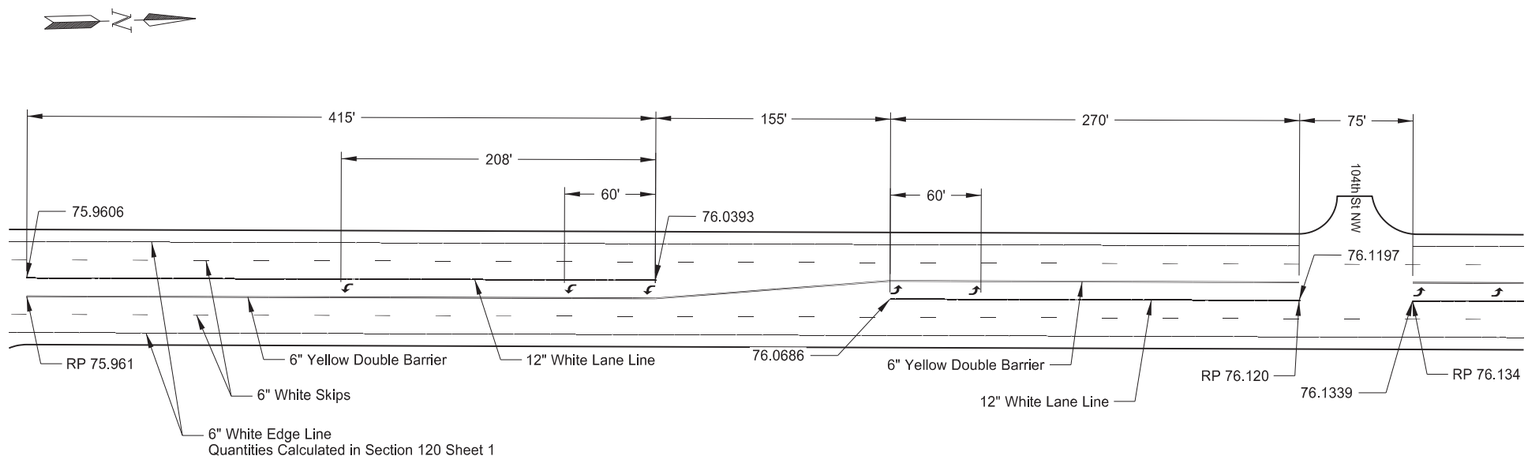
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	7

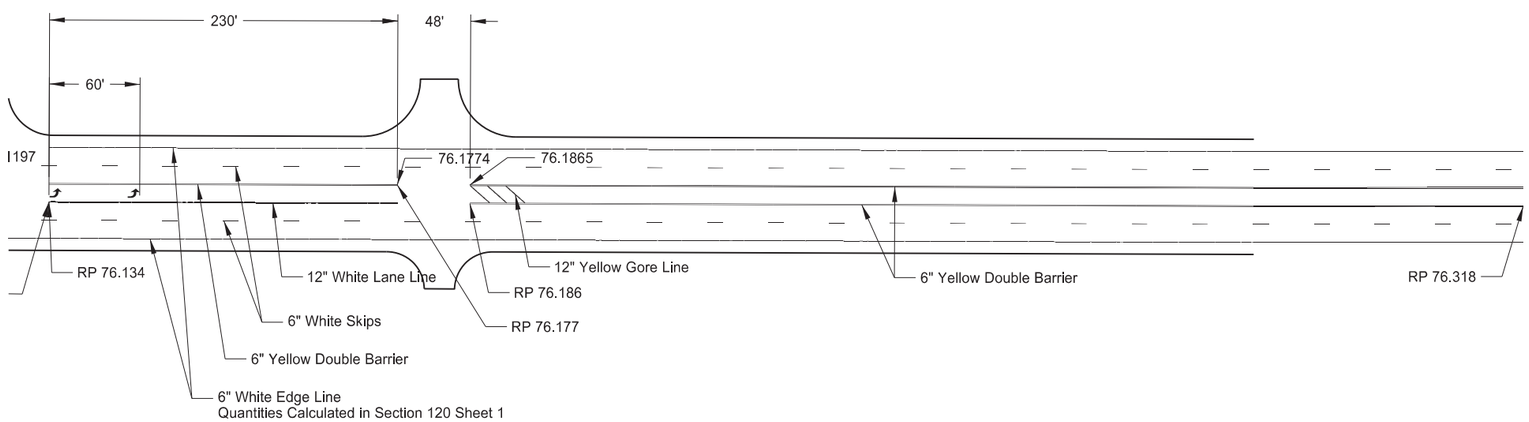
SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	0111	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (4)	930	LF
		Yellow Gore Line (9)	153	LF
762	0112	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (8)	128	SF
762	0114	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 75.622 to RP: 75.676	580	LF
		RP: 75.694 to RP: 75.786	1380	LF
		RP: 75.798 to RP: 75.898	1060	LF
		RP: 75.915 to RP: 75.944	600	LF
		White Skips		
		RP: 75.622 to RP: 75.676	145	LF
		RP: 75.694 to RP: 75.961	705	LF
762	0117	**EPOXY PVMT MK 24IN LINE**		
		White Stop Bar (4)	137	LF
762	0432	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 75.622 to RP: 75.676	1740	LF
		RP: 75.694 to RP: 75.786	4140	LF
		RP: 75.798 to RP: 75.898	3180	LF
		RP: 75.915 to RP: 75.944	1800	LF
		White Skips (2 Applications)		
		RP: 75.622 to RP: 75.676	290	LF
		RP: 75.694 to RP: 75.961	1410	LF
762	0436	**SHORT TERM 24IN LINE-TYPE NR**		
		White Stop Bar (4)	137	LF
762	0437	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (4 @ 2 Applications)	1860	LF
		Yellow Gore Line (9)	153	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavment Markings
RP 75.694 to RP 76.072

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PE-25991
DATE 09/27/24
NORTH DAKOTA





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	8

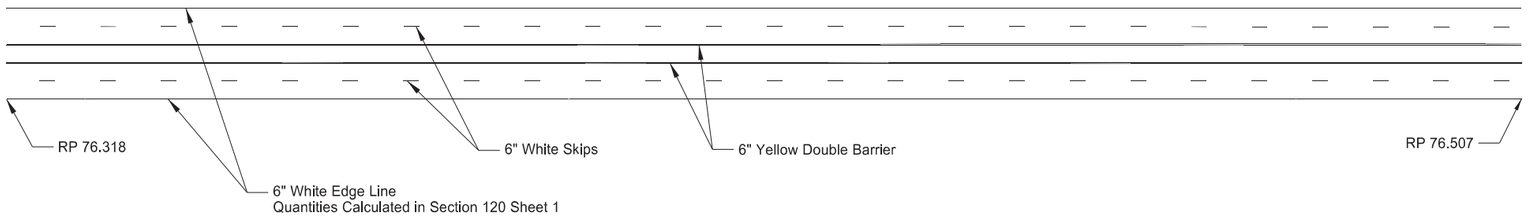
SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	**0111**	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (3)	915	LF
		Yellow Gore Line (3)	51	LF
762	**0112**	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (7)	112	SF
762	**0114**	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 75.961 to RP 76.120	1680	LF
		RP: 76.134 to RP: 76.177	460	LF
		RP: 76.186 to RP 76.318	2780	LF
		White Skips		
		RP: 75.961 to RP: 76.318	944	LF
762	**0432**	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 75.961 to RP 76.120	5040	LF
		RP: 76.134 to RP: 76.177	1380	LF
		RP: 76.186 to RP 76.318	8340	LF
		White Skips (2 Applications)		
		RP: 75.961 to RP: 76.318	1888	LF
762	**0437**	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (3 @ 2 Applications)	1830	LF
		Yellow Gore Line (3)	51	LF

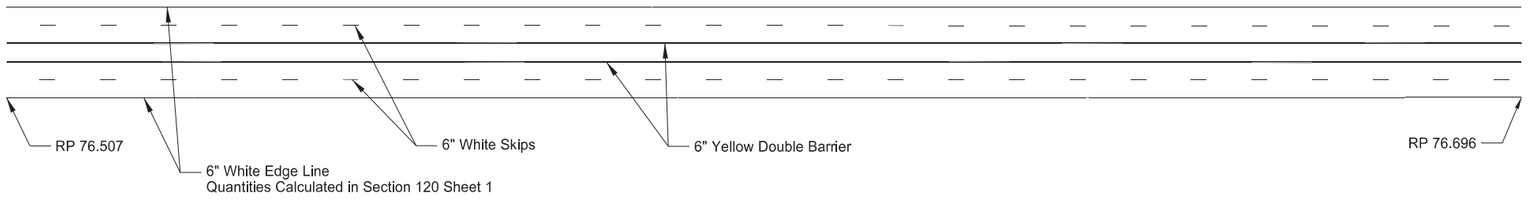
ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
RP 76.072 to RP 76.450

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LUCAS DOERR
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DATE 09/27/24
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	120	9





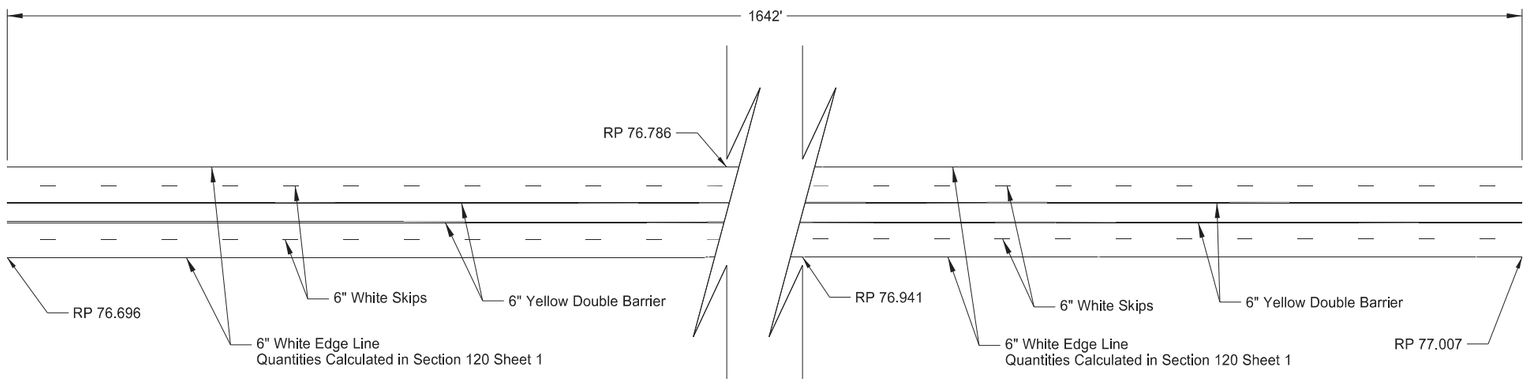
SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	0114	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 76.318 to RP 76.696	8000	LF
		White Skips		
		RP: 76.318 to RP: 76.696	1000	LF
762	0432	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 76.318 to RP 76.696	24000	LF
		White Skips (2 Applications)		
		RP: 76.318 to RP: 76.696	2000	LF

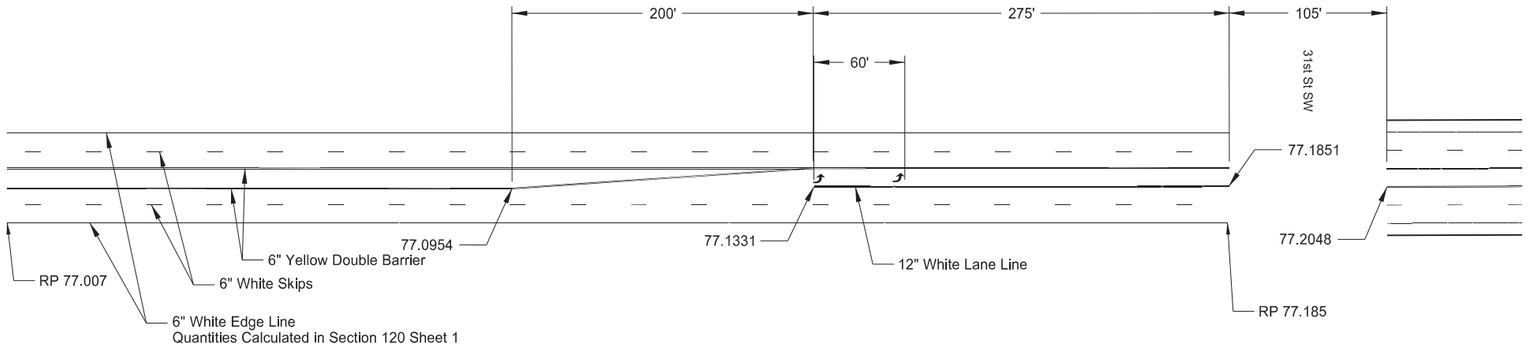
ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
RP 76.450 to RP 76.828

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	120	10



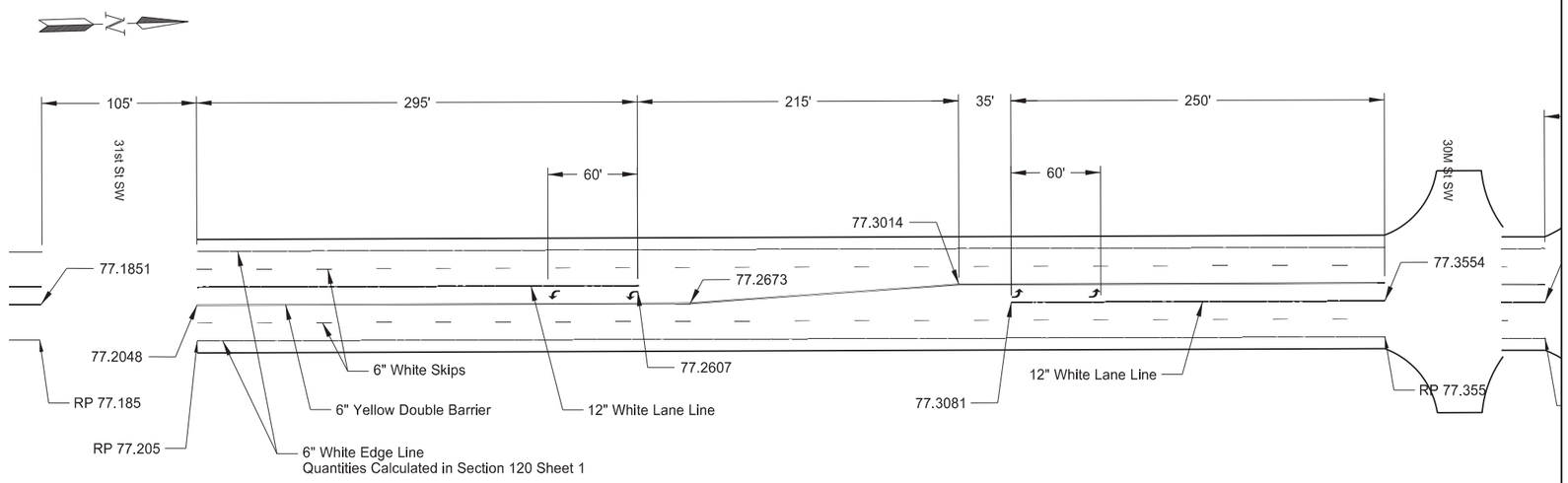


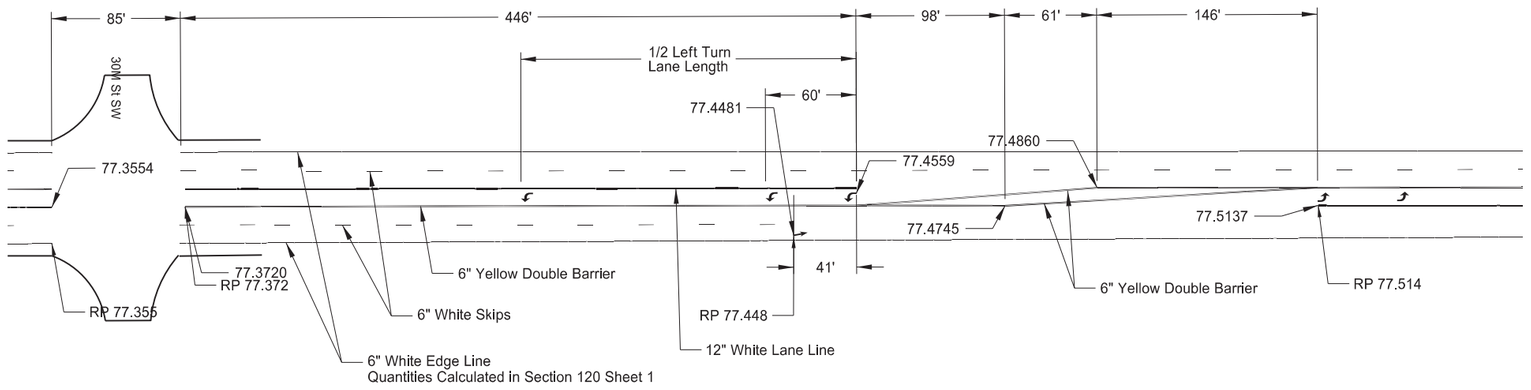
SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	0111	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (1)	275	LF
762	0112	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (2)	32	SF
762	0114	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 76.696 to RP: 77.185	9248	LF
		White Skips		
		RP: 76.696 to RP: 77.185	1224	LF
762	0432	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 76.696 to RP: 77.185	27744	LF
		White Skips (2 Applications)		
		RP: 76.696 to RP: 77.185	2448	LF
762	0437	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (1 @ 2 Applications)	550	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
RP 76.828 to RP 77.206

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
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NORTH DAKOTA





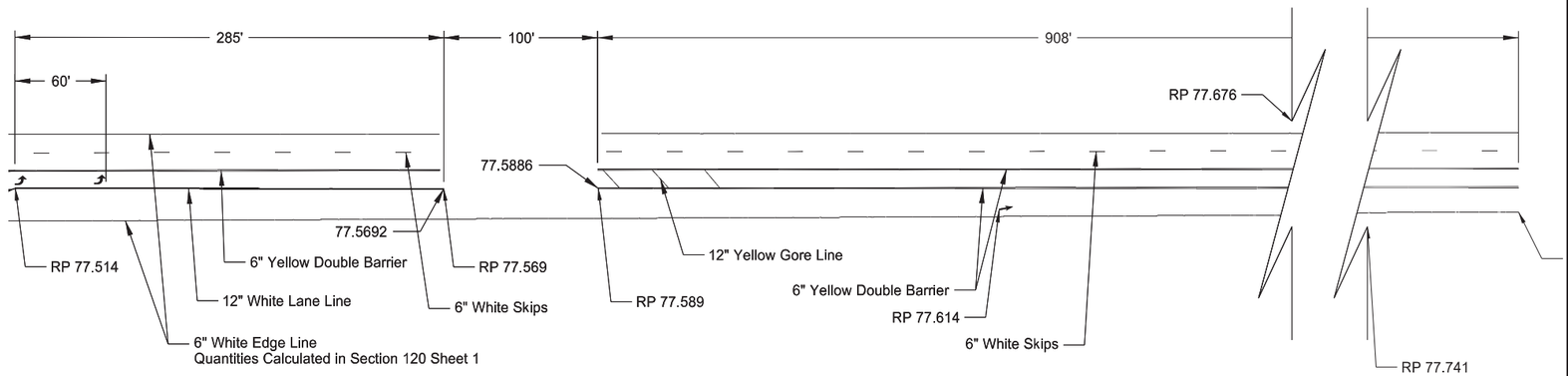
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	ND	XA-SS-5-022(140)074	120	11

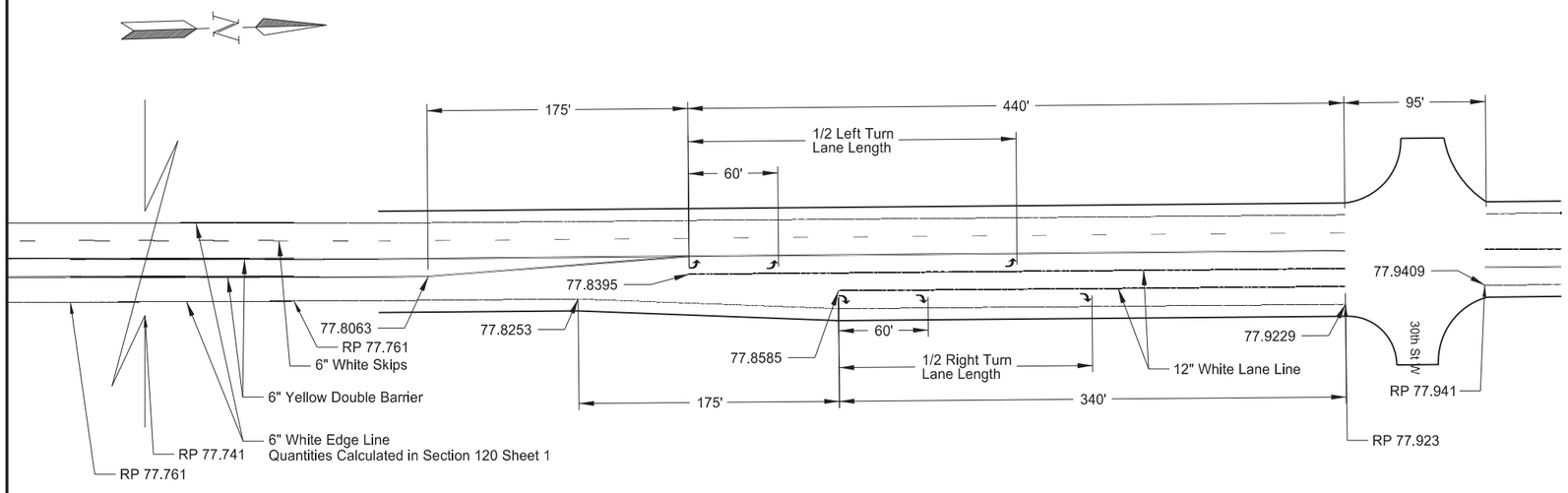
SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	0111	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (3)	991	LF
762	0112	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (7)	112	SF
		Directional Arrow	41	SF
762	0114	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 77.205 to RP: 77.355	1590	LF
		RP: 77.372 to RP: 77.514	2104	LF
		White Skips		
		RP: 77.205 to RP: 77.355	398	LF
		RP: 77.372 to RP: 77.514	287	LF
762	0432	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 77.205 to RP: 77.355	4770	LF
		RP: 77.372 to RP: 77.514	6312	LF
		White Skips (2 Applications)		
		RP: 77.205 to RP: 77.355	796	LF
		RP: 77.372 to RP: 77.514	574	LF
762	0437	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (3 @ 2 Applications)	1982	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
RP 77.206 to RP 77.584

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
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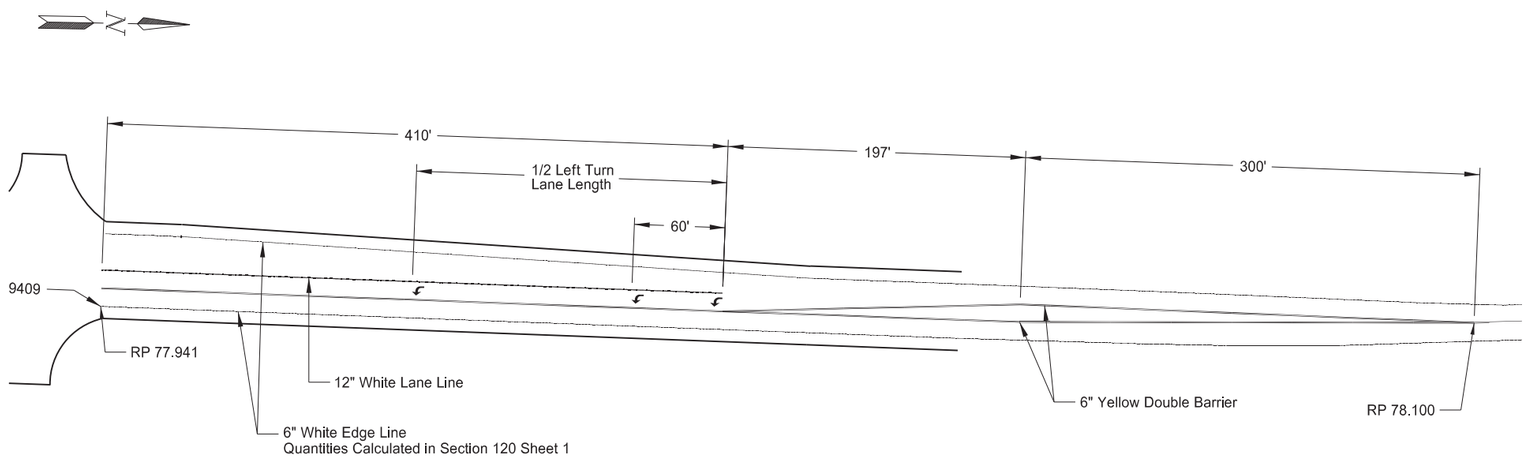
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	12

SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	**0111**	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (3)	1065	LF
		Yellow Gore Line (3)	48	LF
762	**0112**	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (3)	48	SF
		Right Turn Arrows (3)	48	SF
		Directional Arrow	41	SF
762	**0114**	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 77.514 to RP: 77.569	570	LF
		RP: 77.589 to RP: 77.923	4356	LF
		White Skips		
		RP: 77.514 to RP: 77.569	72	LF
		RP: 77.589 to RP: 77.923	441	LF
762	**0432**	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 77.514 to RP: 77.569	1710	LF
		RP: 77.589 to RP: 77.923	13068	LF
		White Skips (2 Applications)		
		RP: 77.514 to RP: 77.569	144	LF
		RP: 77.589 to RP: 77.923	882	LF
762	**0437**	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (3 @ 2 Applications)	2130	LF
		Yellow Gore Line (3)	48	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
RP 77.584 to RP 77.962

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA



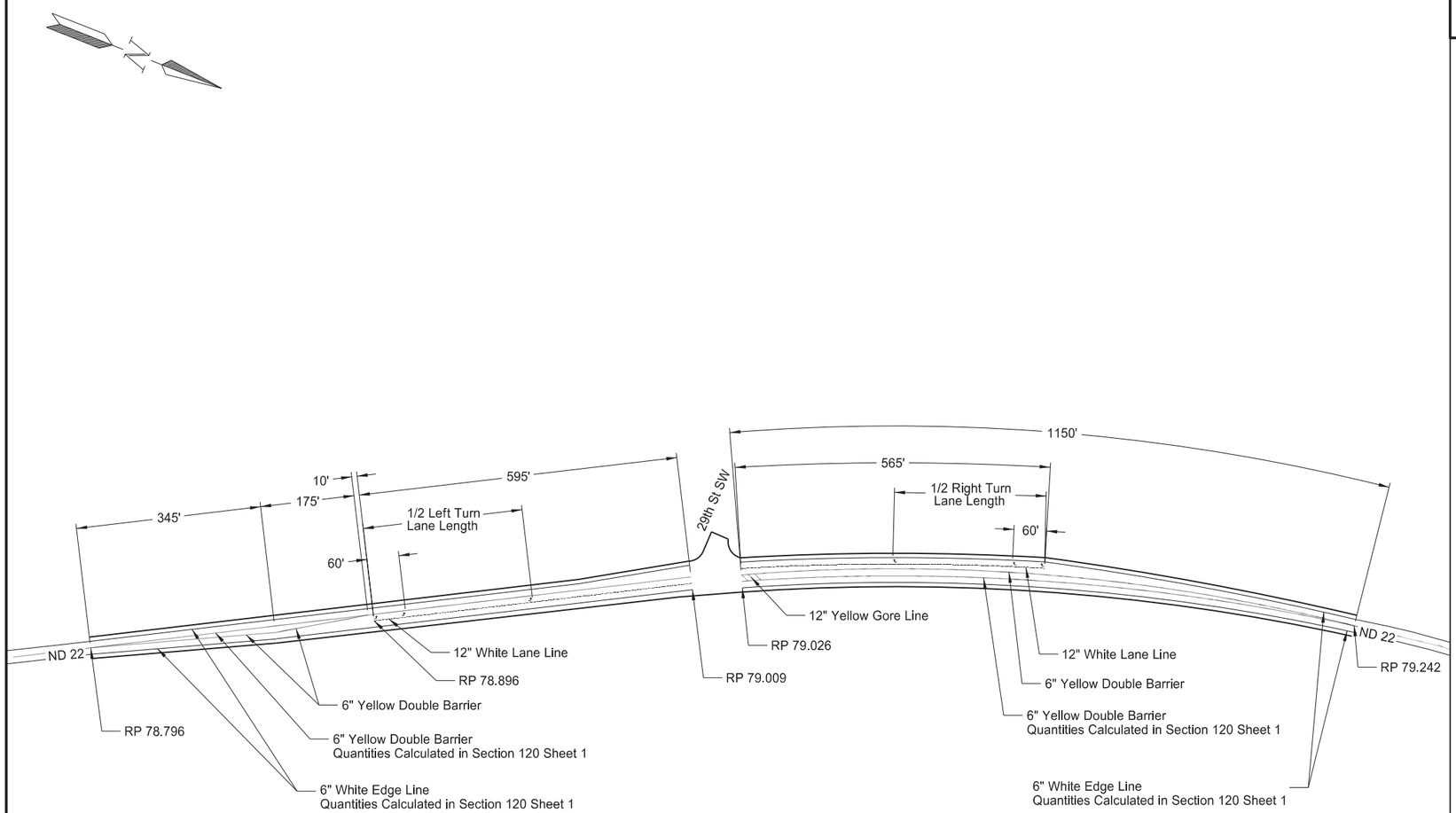
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	13

SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	0111	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line	410	LF
762	0112	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (3)	48	SF
762	0114	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 77.941 to RP: 78.100	2804	LF
762	0432	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 77.941 to RP: 78.100	8412	LF
762	0437	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (2 Applications)	820	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
RP 77.962 to RP 78.151

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DATE 09/27/24
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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	14

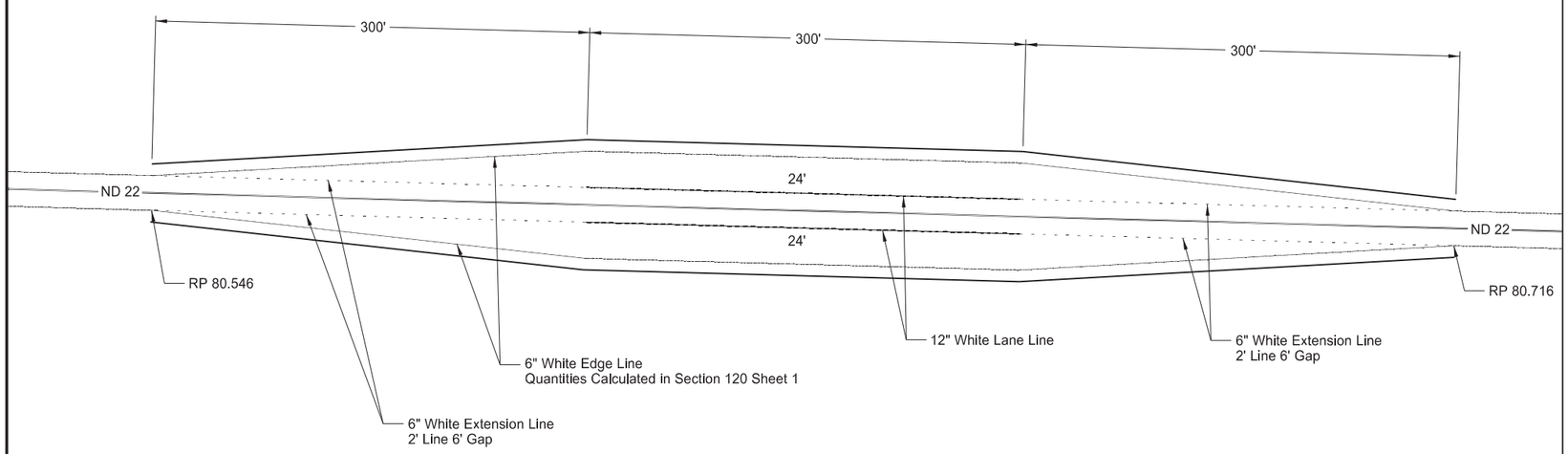
SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	**0111**	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (2)	1160	LF
		Yellow Gore Line (3)	51	LF
762	**0112**	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (6)	96	SF
762	**0114**	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 78.796 to RP: 78.896	1040	LF
		RP: 79.026 to RP 79.242	2300	LF
762	**0432**	**SHORT TERM 6IN LINE-TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 78.796 to RP: 78.896	3120	LF
		RP: 79.026 to RP 79.242	6900	LF
762	**0437**	**SHORT TERM 12IN LINE-TYPE NR**		
		White Lane Line (2 @ 2 Applications)	2320	LF
		Yellow Gore Line (3)	51	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
29th St SW

REGISTERED PROFESSIONAL ENGINEER
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DATE 09/27/24
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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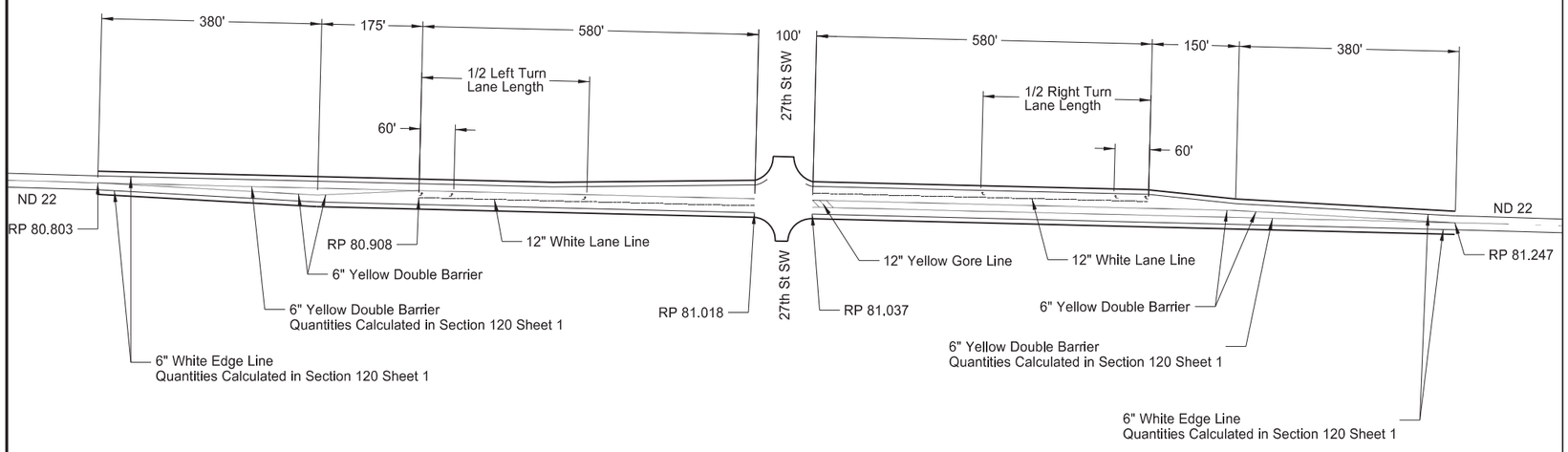


SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	0111	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (2)	600	LF
762	0114	**EPOXY PVMT MK 6IN LINE**		
		White Extension Line (4)	300	LF
762	0432	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (4 @ 2 Applications)	600	LF
762	0437	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (2 Applications)	1200	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
Truck Inspection

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA



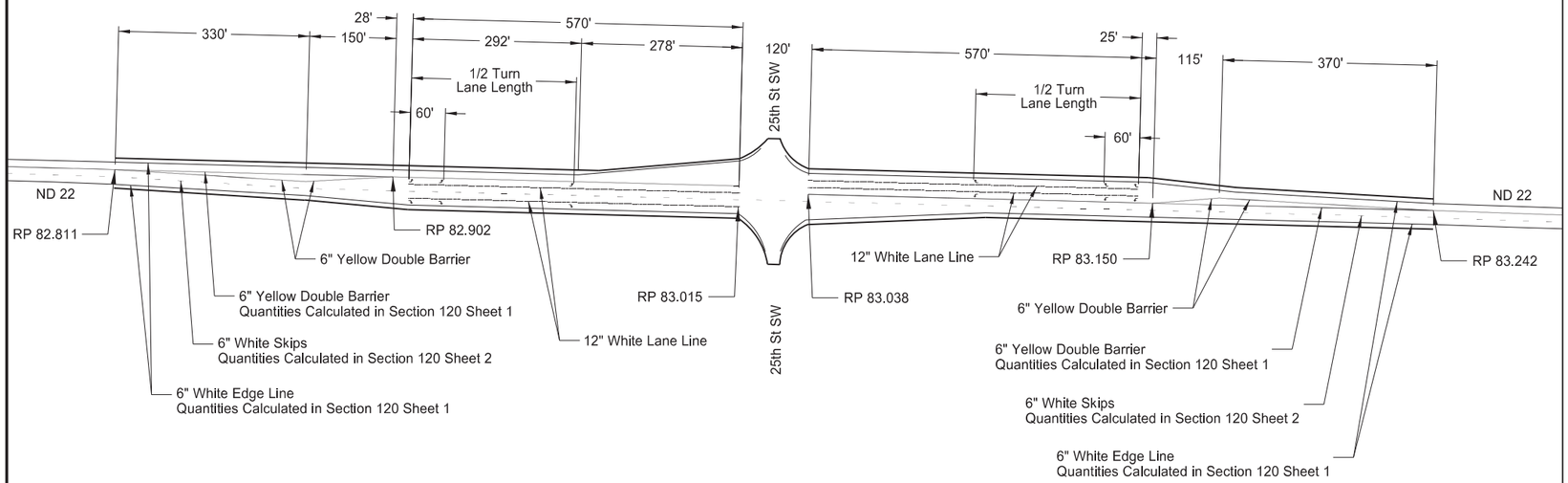
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	16

SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	**0111**	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (2)	1160	LF
		Yellow Gore Line (3)	51	LF
762	**0112**	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (3)	48	SF
		Right Turn Arrows (3)	48	SF
762	**0114**	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 80.803 to RP: 80.908	1110	LF
		RP: 81.037 to RP 81.247	2220	LF
762	**0432**	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 80.803 to RP: 80.908	3330	LF
		RP: 81.037 to RP: 81.247	6660	LF
762	**0437**	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (2 Applications)	2320	LF
		Yellow Gore Line (3)	51	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
27th St SW

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
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DATE 09/27/24
NORTH DAKOTA



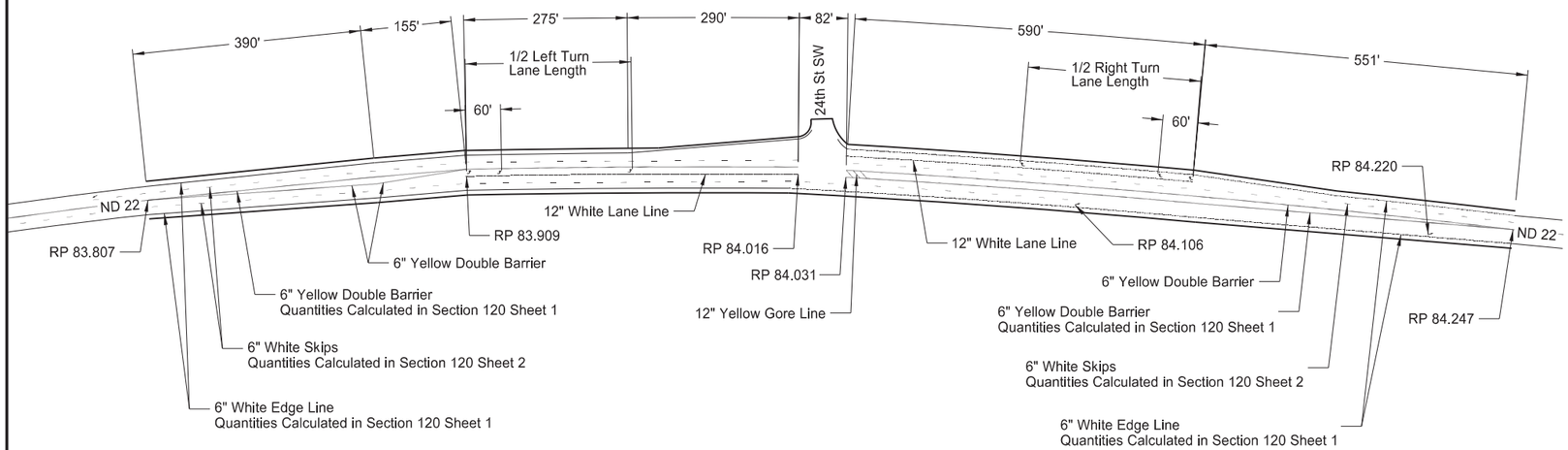
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	17

SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	**0111**	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (4)	2280	LF
762	**0112**	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (6)	96	SF
		Right Turn Arrows (6)	96	SF
762	**0114**	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 82.811 to RP 82.902	960	LF
		RP: 83.150 to RP: 83.242	970	LF
762	**0432**	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 82.811 to RP 82.902	2880	LF
		RP: 83.150 to RP: 83.242	2910	LF
762	**0437**	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (2 Applications)	4560	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
25th St SW

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DATE 09/27/24
NORTH DAKOTA



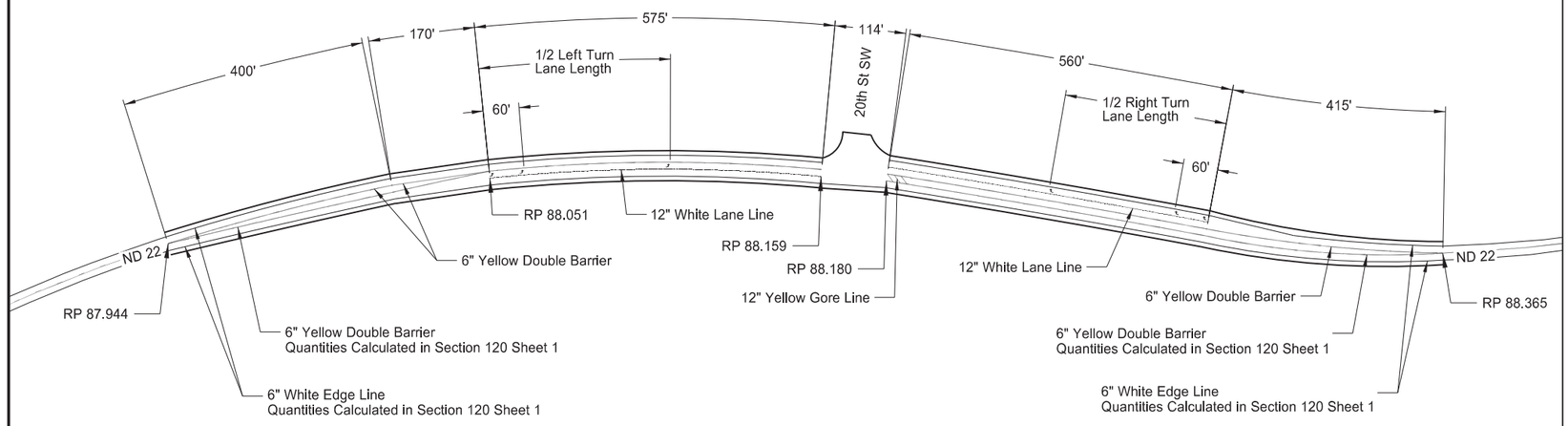
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	18

SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	**0111**	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (2)	1155	LF
		Yellow Gore Line (3)	51	LF
762	**0112**	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (3)	48	SF
		Right Turn Arrows (3)	48	SF
762	**0114**	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 83.807 to RP: 83.909	1090	LF
		RP: 84.031 to RP: 84.247	2280	LF
762	**0432**	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 83.807 to RP: 83.909	3270	LF
		RP: 84.031 to RP: 84.247	6840	LF
762	**0437**	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (2 Applications)	2310	LF
		Yellow Gore Line (3)	51	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
24th St SW

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
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DATE 09/27/24
NORTH DAKOTA



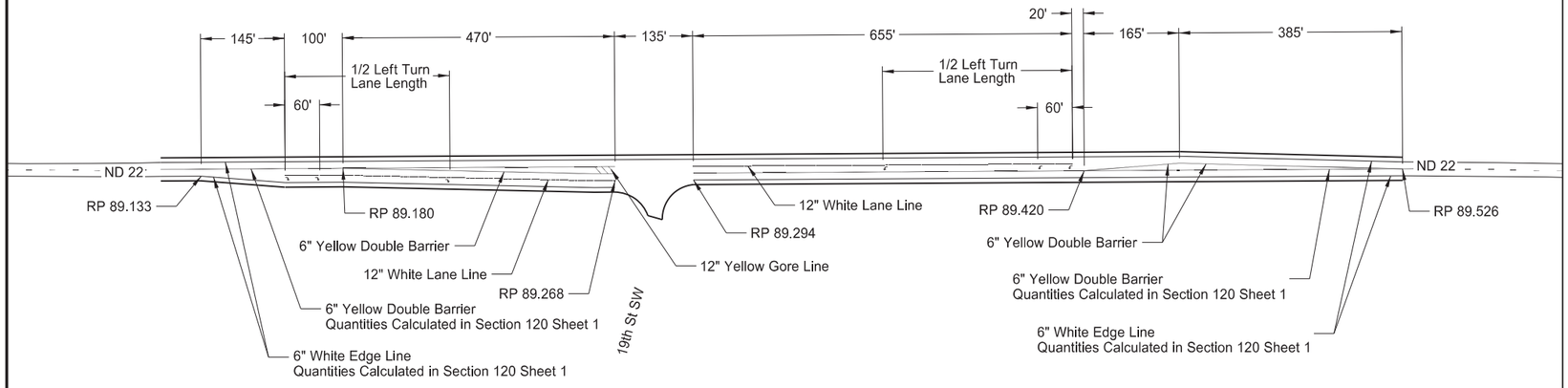
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	19

SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	0111	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (2)	1135	LF
		Yellow Gore Line (3)	51	LF
762	0112	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (3)	48	SF
		Right Turn Arrows (3)	48	SF
762	0114	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 87.944 to RP: 88.051	1140	LF
		RP: 88.180 to RP: 88.365	1950	LF
762	0432	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 87.944 to RP: 88.051	3420	LF
		RP: 88.180 to RP: 88.365	5850	LF
762	0437	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (2 Applications)	2270	LF
		Yellow Gore Line (3)	51	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
20th St SW

REGISTERED PROFESSIONAL ENGINEER
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DATE 09/27/24
NORTH DAKOTA



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	XA-SS-5-022(140)074	120	20

SPEC	CODE	BID ITEM	QUANTITY	UNIT
762	**0111**	**EPOXY PVMT MK 12IN LINE**		
		White Lane Line (2)	1225	LF
		Yellow Gore Line (3)	51	LF
762	**0112**	**EPOXY PVMT MK MESSAGE**		
		Left Turn Arrows (3)	48	SF
		Right Turn Arrows (3)	48	SF
762	**0114**	**EPOXY PVMT MK 6IN LINE**		
		Yellow Double Barrier		
		RP: 89.180 to RP: 89.268	940	LF
		RP: 89.420 to RP: 89.526	1100	LF
762	**0432**	**SHORT TERM 6IN LINE - TYPE NR**		
		Yellow Double Barrier (3 Applications)		
		RP: 89.180 to RP: 89.268	2820	LF
		RP: 89.420 to RP: 89.526	3300	LF
762	**0437**	**SHORT TERM 12IN LINE - TYPE NR**		
		White Lane Line (2 Applications)	2450	LF
		Yellow Gore Line (3)	51	LF

ND Highway 22
Dickinson 45th St to 17th St SW

Pavement Markings
19th St SW

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 09/27/24
NORTH DAKOTA

Docusign Envelope ID: 10286CFA-2046-8241-82E2-FABD7E4EBCC6

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

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	170	1

NOTES:

100 SCOPE OF WORK: Work at this site consists of crack sealing, penetrating water repellent, special surface finish and repairing a spall on the west exterior beam on the south span.

602 PENETRATING WATER REPELLENT TREATMENT: Apply the penetrating water repellent solution to the top of the bridge deck, and top of approach slabs. Apply penetrating water repellent solution prior to sealing any bridge deck or approach slab. Do not allow traffic until the solution has completely penetrated and the entire driving surface is dry.

Collect all roadway debris while cleaning; do not discharge sand, gravel, or other debris into bridge drains. if water washing equipment is used for cleaning, provide either a water pressure washer with 160°F water at 1,800 psi minimum nozzle pressure or a cold water pressure at 3,000 psi minimum nozzle pressure.

602 CRACK SEALING: After the penetrating water repellent has been applied and is dry, the Engineer will perform a visual inspection of the bridge deck and approach slabs to determine the need for crack sealing. Mark and repair all visable cracks appearing on the top surface 0.012" or greater in width at its widest segment or is directed by the Engineer.

Immediately before applying the sealer, clean the cracks by removing all dust and debris with compressed air. Seal the cracks with a two-part epoxy in accordance with the manufacturer's recommendations. Chase crack with the sealant application to limits of crack, including those portions that are narrower than 0.012" wide. Use Paulco TE-2501 (Viking Paint, Inc), Dural 50 LM (Euclid Chemical Co.), TK-9000 or TK-2110 (TK Products), or an approved epoxy sealer. Include all work and materials associated with the deck and approach slab crack sealing in bid item "Crack Sealing".

602 SPECIAL SURFACE FINISH: Clean the surfaces that are to receive the Tex-Cote surface finish using sandblasting, shot blasting, or water-washing equipment to remove all dirt, grease, oil, efflorescence, and laitance. Ensure any curing compounds and release agents have been completely removed from the surfaces to receive the Tex-Cote surface finish.

Apply Tex-Cote XL 70 Bridge Cote with Silane to the inside and top surfaces of the existing barriers. Apply the surface finish in accordance with the manufacturer's recommended application procedures to attain a dry film thickness of 15 mils.

Finish the surface with a uniform texture, color, and appearance free from fins, projections, cavities, and porous areas. Use a "sand" textured finish. Use gray surface finish color number 36424 meeting AMS-STD-595.

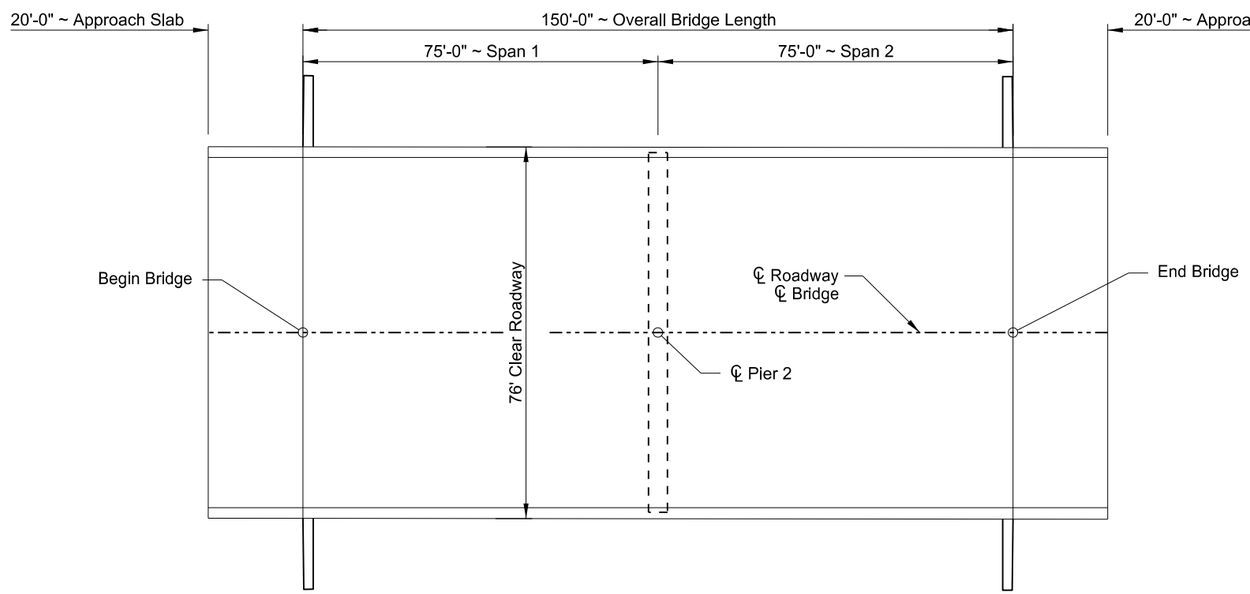
704 TRAFFIC CONTROL: An additional 16 hours of falgging has been included for the repairs to this structure. Utilize the provided traffic control devices.

930 GIRDER PATCHING: The west exterior beam in Span 1 has a surface spall. Remove unsound concrete and coat the spall with a Type VIII neat (no sand) epoxy compound meeting ASTM C 881 Type I or IV. Prepare the concrete surface and mix the epoxy in accordance with manufacturers recommendations. Brush, roll or scrub the epoxy material into the prepared substrate to ensure that all small voids are filled. Cover the entire damaged area with at least 20 mils of neat epoxy compound. Include all work and materials associated with the girder patching in the bid item "Girder Patching."

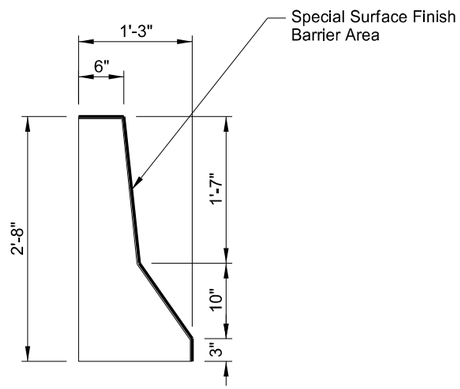
GIRDER PATCHING		
PICTURE	LOCATION	TOTAL (SF)
#1	West Exterior Beam South Span	1.0

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
602	1250	PENETRATING WATER REPLLENT TREATEMENT	SY	1605
602	7000	SPECIAL SURFACE FINISH	SF	1275
930	9223	CRACK SEALING	LF	1358
930	9694	GIRDER PATCHING	LSUM	1



PLAN



SPECIAL SURFACE FINISH DETAIL

NOTE: - Drawing not to scale

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE 08/19/26
NORTH DAKOTA

GREEN RIVER
DICKINSON 45TH ST TO 17TH ST NW

BRIDGE LAYOUT

ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

Jason Thorenson
08/21/26

Docusign Envelope ID: 10286CFA-2046-8241-82E2-FABD7E4EBCC6

NOTES:

100 SCOPE OF WORK: Work at this site consists of crack sealing, penetrating water repellent, and special surface finish.

602 PENETRATING WATER REPELLENT TREATMENT: Apply the penetrating water repellent solution to the top of the bridge deck, and top of approach slabs. Apply penetrating water repellent solution prior to sealing any bridge deck or approach slab. Do not allow traffic until the solution has completely penetrated and the entire driving surface is dry.

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602 CRACK SEALING: After the penetrating water repellent has been applied and is dry, the Engineer will perform a visual inspection of the bridge deck and approach slabs to determine the need for crack sealing. Mark and repair all visable cracks appearing on the top surface 0.012" or greater in width at its widest segment or is directed by the Engineer.

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602 SPECIAL SURFACE FINISH: Clean the surfaces that are to receive the Tex-Cote surface finish using sandblasting, shot blasting, or water-washing equipment to remove all dirt, grease, oil, efflorescence, and laitance. Ensure any curing compounds and release agents have been completely removed from the surfaces to receive the Tex-Cote surface finish.

Apply Tex-Cote XL 70 Bridge Cote with Silane to the inside and top surfaces of the existing barriers. Apply the surface finish in accordance with the manufacturer's recommended application procedures to attain a dry film thickness of 15 mils.

Finish the surface with a uniform texture, color, and appearance free from fins, projections, cavities, and porous areas. Use a "sand" textured finish. Use gray surface finish color number 36424 meeting AMS-STD-595.

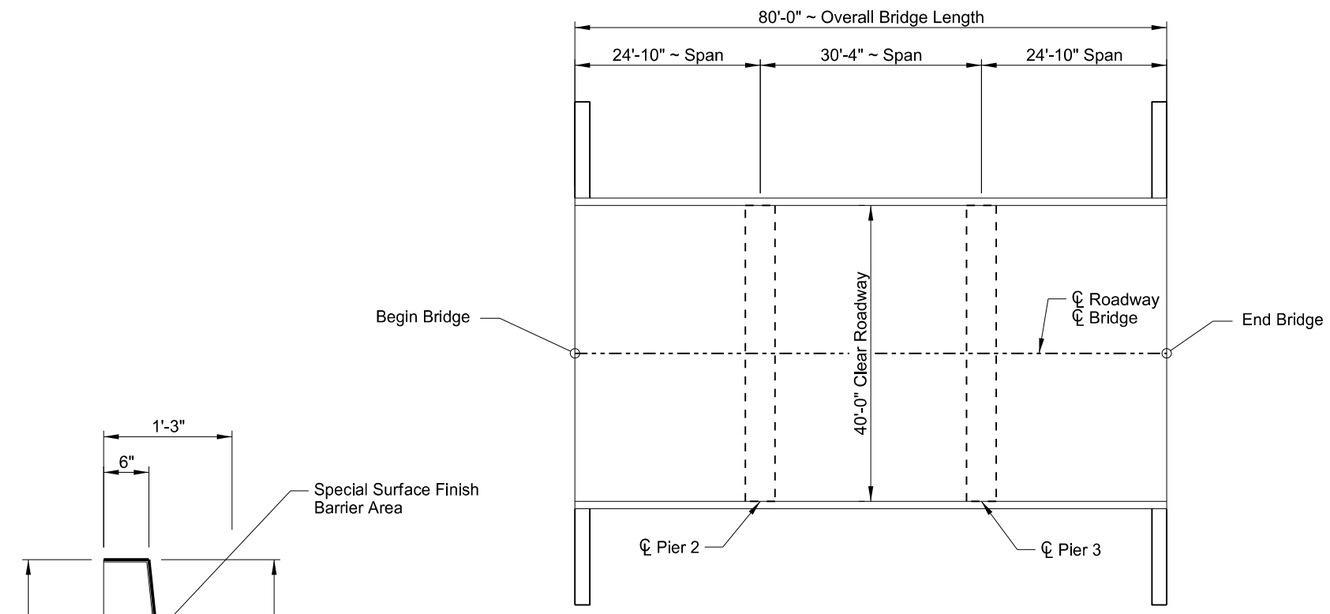
704 TRAFFIC CONTROL: An additional 16 hours of falgging has been included for the repairs to this structure. Utilize the provided traffic control devices.

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

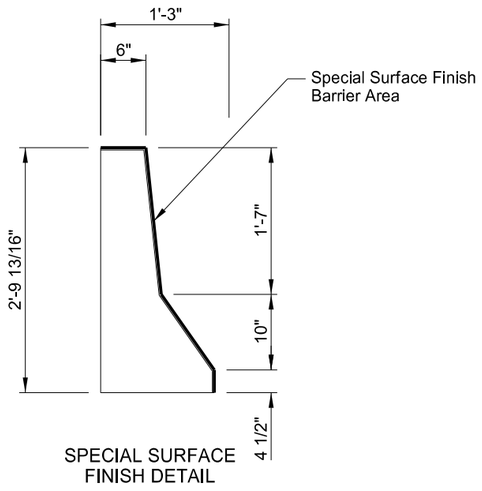
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	XA-SS-5-022(140)074	170	2

BRIDGE BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	356
602	7000	SPECIAL SURFACE FINISH	SF	527
930	9223	CRACK SEALING	LF	523



PLAN



SPECIAL SURFACE
FINISH DETAIL

NOTE: - Drawing not to scale

REGISTERED PROFESSIONAL ENGINEER
LUCAS DOERR
PE-25991
DATE
08/19/26
NORTH DAKOTA

CROOKED CREEK
DICKINSON 45TH ST TO 17TH ST NW

BRIDGE LAYOUT

ND DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

Jason Thorenson
08/21/26

NDDOT ABBREVIATIONS

D-101-1

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
09-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
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NORTH DAKOTA
08/16/22

NDDOT ABBREVIATIONS

D-101-2

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

07-01-14

REVISIONS

DATE	CHANGE
08-03-15	General Revisions
04-23-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions

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

08/16/22

NDDOT ABBREVIATIONS

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
08-03-15	General Revisions
04-23-18	General Revisions
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08-16-22	General Revisions

KIRK J. HOFF
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PE-4683
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NORTH DAKOTA

08/16/22

NDDOT ABBREVIATIONS

MEASUREMENTS

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

SURVEY DESCRIPTIONS

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

SOIL TYPES

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
12-18-20	Sheet Added - Continued from D-101-3

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
12 18 2020

NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
09-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions

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08/16/22

LINE STYLES

D-101-20

Existing Topography

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

Proposed Topography

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

Existing Utilities

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

Proposed Utilities

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

Traffic Utilities

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

Sign Structures

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

07-01-14

REVISIONS

DATE	CHANGE
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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12 18 2020

LINE STYLES

D-101-21

Right Of Way

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

Boundary Control

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

Cross Sections and Typicals

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

Geotechnical

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions

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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	
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12-18-20	General Revisions

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12 18 2020

SYMBOLS

D-101-31

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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DATE	CHANGE
12-18-20	General Revisions

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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	
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DATE	CHANGE
12-18-20	General Revisions

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SYMBOLS

D-101-33

Existing Manhole (Electrical, Gas, Telephone)

Water Manhole (Exst, Exst with Valve)

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

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

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

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

Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)

Existing Water Appurtenance

Sprinkler Head (Exst, Ppsd)

Fire Hydrant (Exst, Ppsd)

Cleanout (Exst Sanitary, Underdrain)

Existing Catch Basin Inlet (Round, Square)

Existing Curb Inlet (Round, Square)

Existing Slotted Reinforced Concrete Pipe

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

Inlet Mountable Curb (Type A, Type B)

Inlet Saddle Base (Type 1, Type 2)

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

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

Median Drain

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

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

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

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

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

Pump
Sanitary, Storm Drain, Exst Water

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

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

Existing Utility Marker

Existing Meter

Existing Fuel Dispensers

Existing Fuel Filler Pipes

Existing Fuel Leak Sensors

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

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12 18 2020

Cross Section Legend

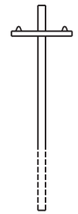
D-101-40

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

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

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

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



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



Anchor

High Tension Cable Guardrail

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



Connection to infer that probably will not be displayed

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



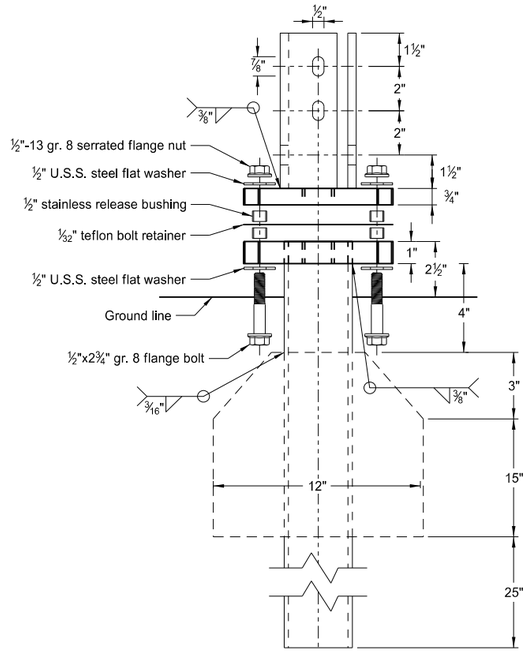
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-20-18	
REVISIONS	
DATE	CHANGE
6/14/2023	CADD Standards Update

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06/14/23

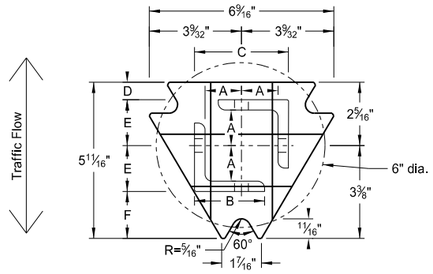
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7

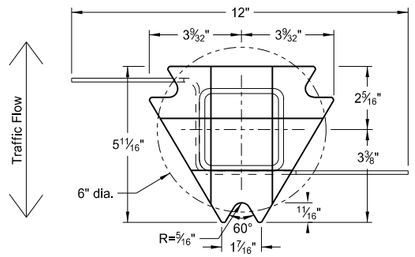


Multi-Directional
Slip Base Assembly

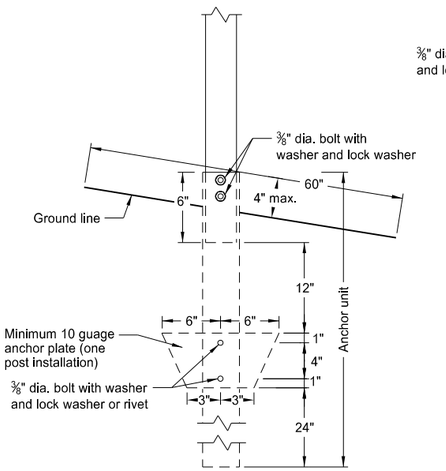
Perforated Tube



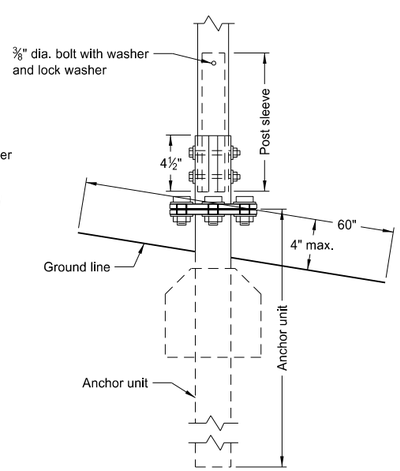
Top Post Receiver
Plate - ASTM A572 grade 50
Angle Receiver - 2½"x2½"x⅜" ASTM A36 structural angle



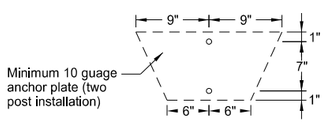
Bottom Soil Stub
Tube - 3"x3"x7 gauge ASTM A500 grade B tube
Stabilizing Wing - 7 gauge H.R.P.O. ASTM A1011
Plate - ASTM A572 grade 50

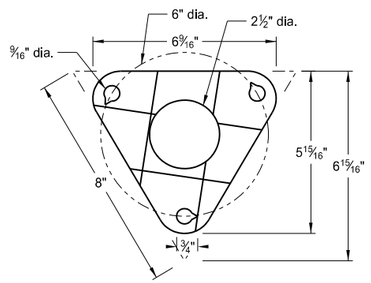


Anchor Unit and Post Assembly



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	2³/16	10	Yes	

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

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

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

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

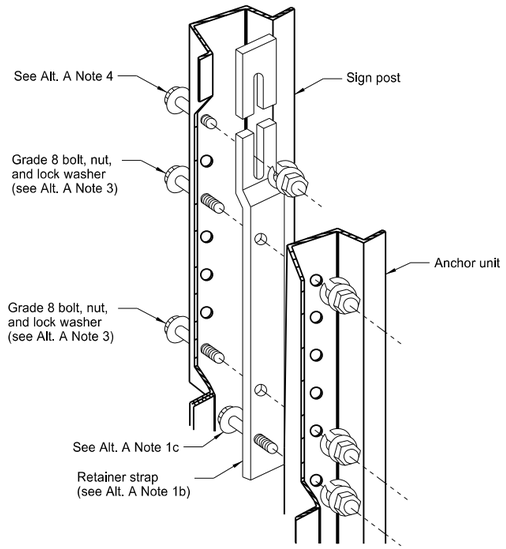
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp

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

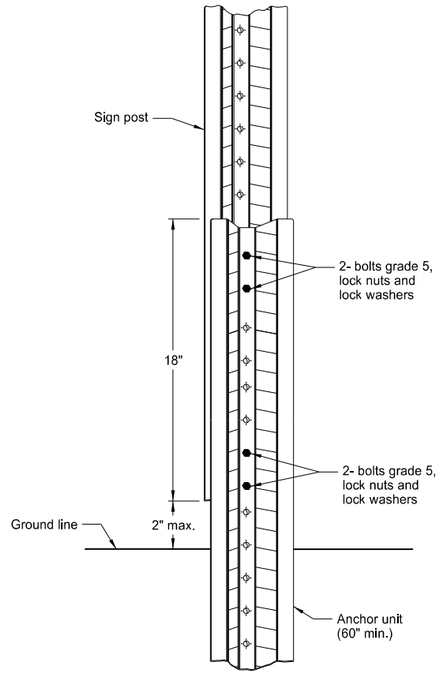
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post

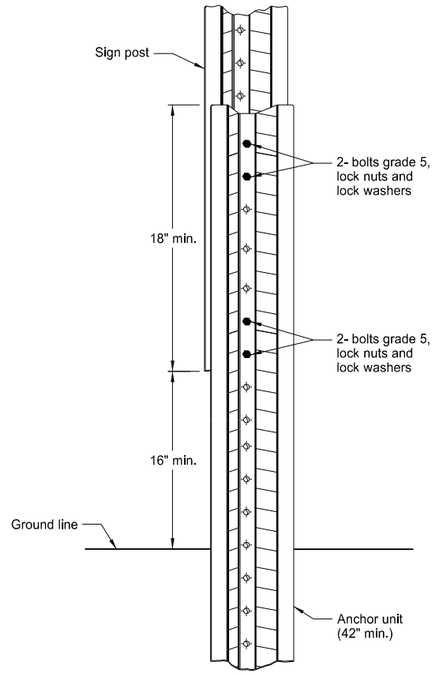


Detail A



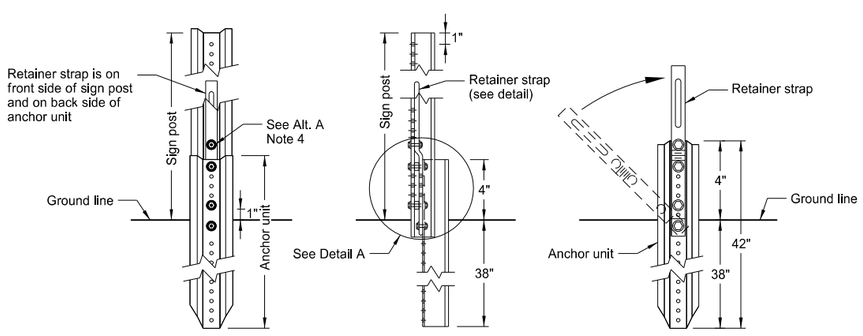
Breakaway U-Channel Splice Detail
Alternate B
(2.5 and 3 lb/ft)

Install a maximum of 3 posts within 7'.



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

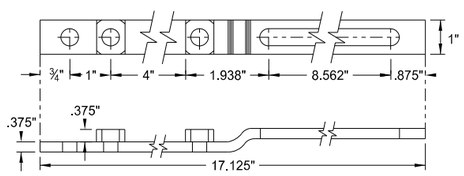
Install a maximum of 3 posts within 7'.



Front View Side View Back View

Breakaway U-Channel Detail
Alternate A

Install a maximum of 2 posts within 7'.



Retainer Strap Detail

Alternate A Steps of Installation:

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

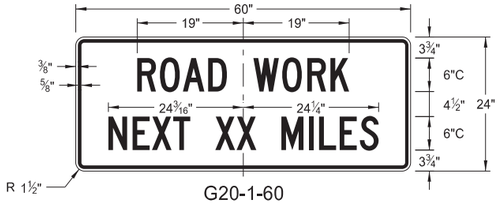
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp

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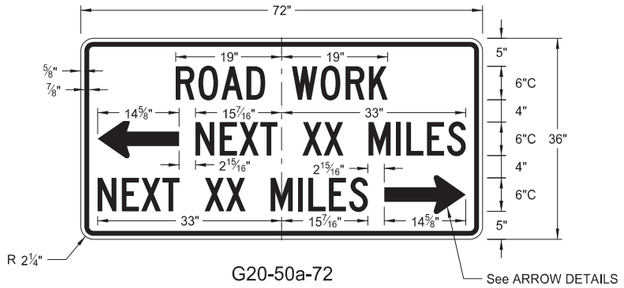
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CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS

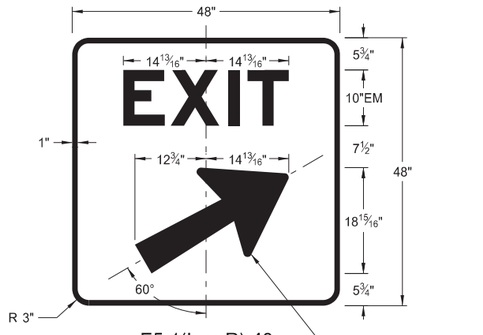
D-704-9



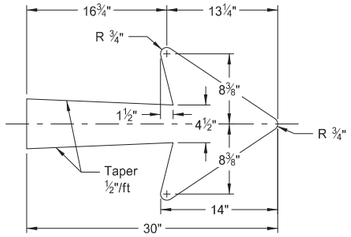
G20-1-60
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Background: orange



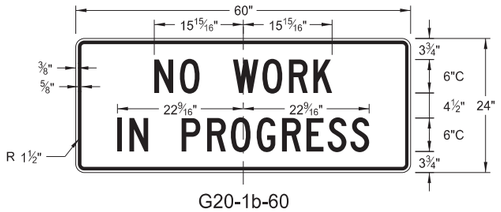
G20-50a-72
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Background: orange



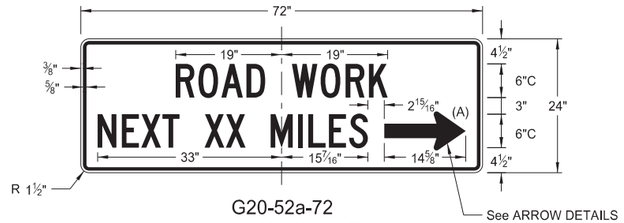
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



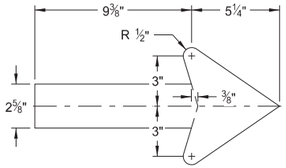
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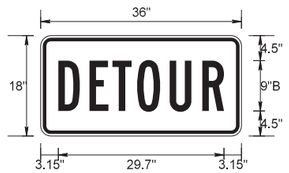
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Background: orange



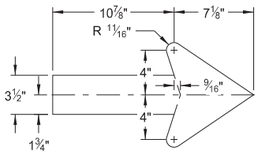
G20-52a-72
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Background: orange



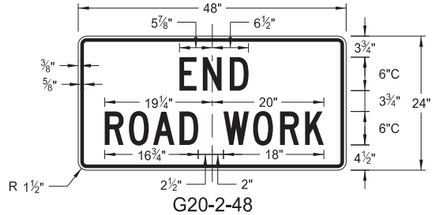
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G20-52a-72



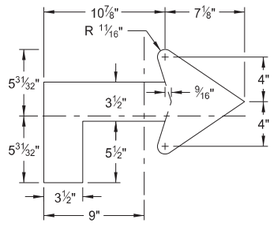
M4-8-36
Legend: black (non-refl)
Background: orange



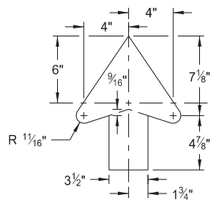
M4-9(L or R)-30
Right or Left



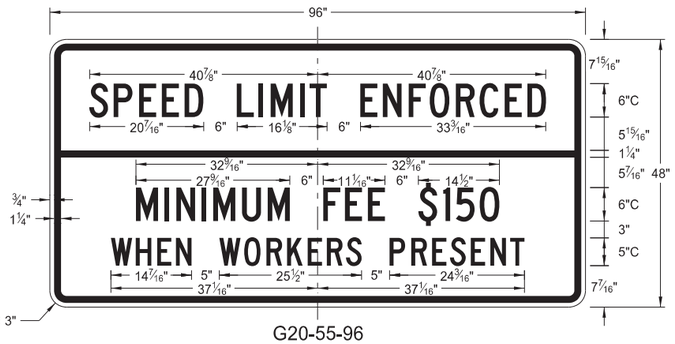
G20-2-48
Legend: black (non-refl)
Background: orange



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



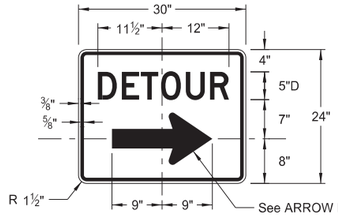
M4-9-30
Straight



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:

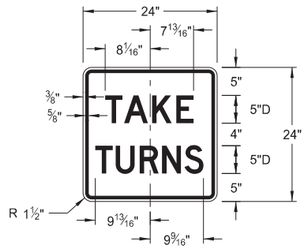
(A) Arrow may be right or left of the legend to Indicate construction to the right or left.

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

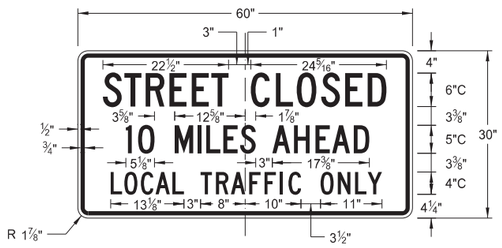
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
06/30/25
ENGINEER
NORTH DAKOTA

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

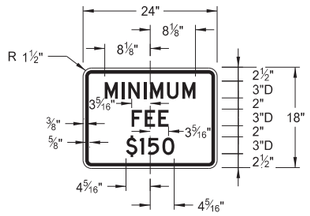
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



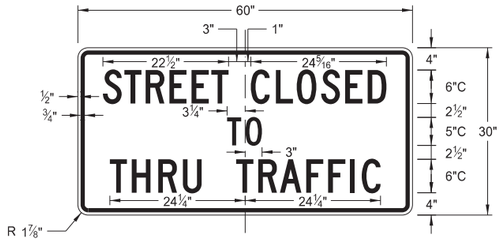
R1-50P-24
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Background: white



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

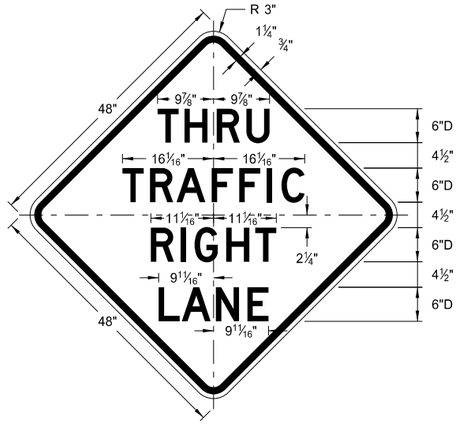


R11-2a-48
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Background: white

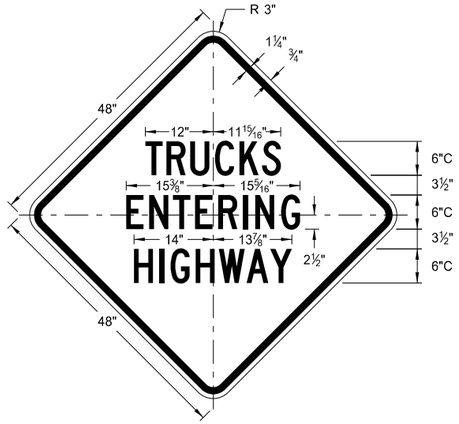
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

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PE-4683
06/30/25
ENGINEER
NORTH DAKOTA

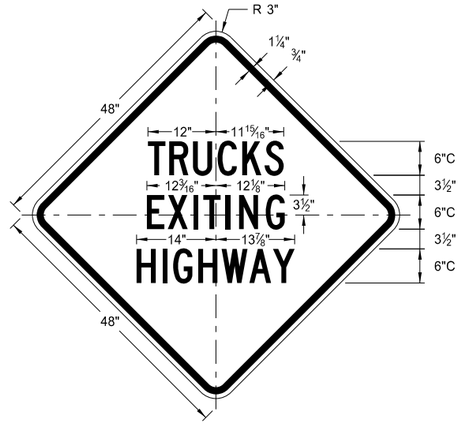
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



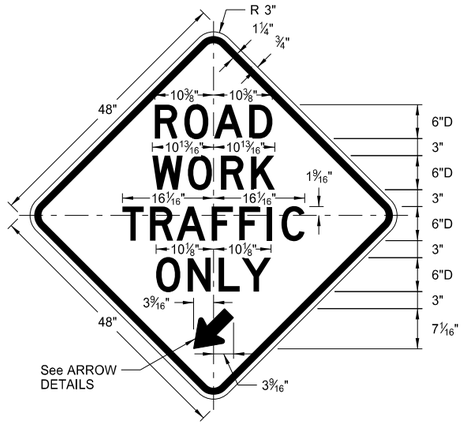
W5-8-48
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Background: orange



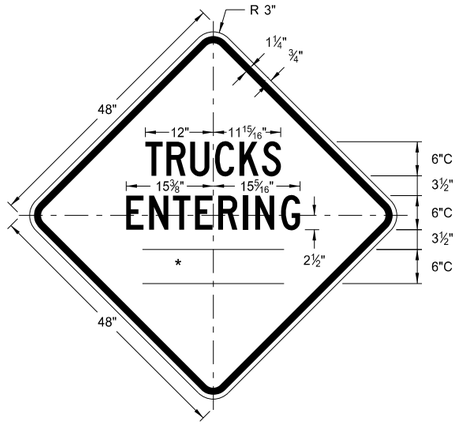
W8-53-48
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Background: orange



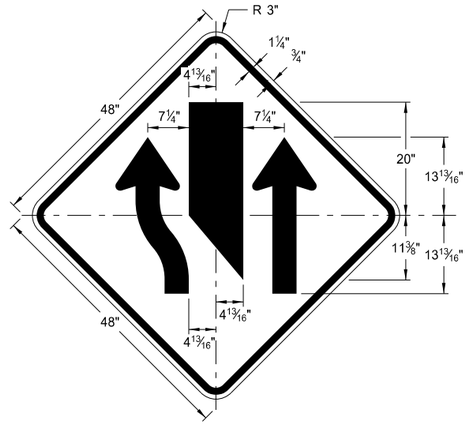
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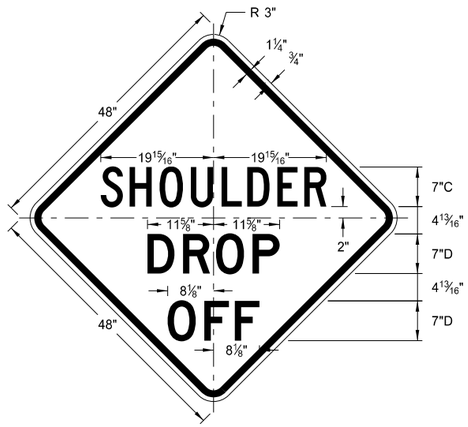
W5-9-48
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Background: orange



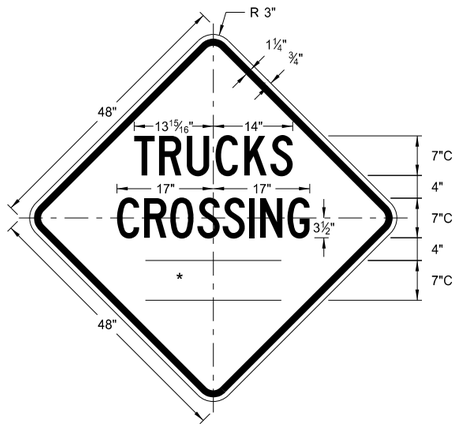
W8-54-48
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Background: orange



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



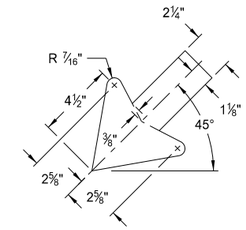
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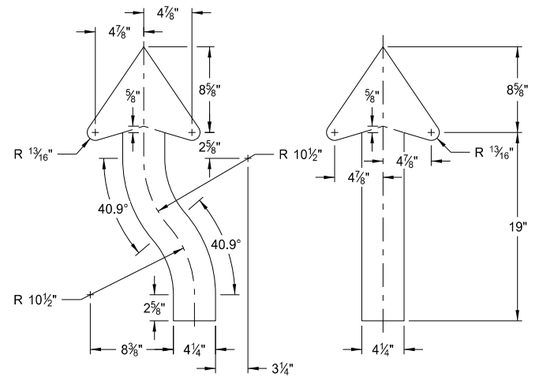
W8-55-48
Legend: black (non-refl)
Background: orange

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

* DISTANCE MESSAGES



W5-9-48



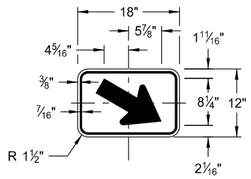
W9-3a-48

ARROW DETAILS

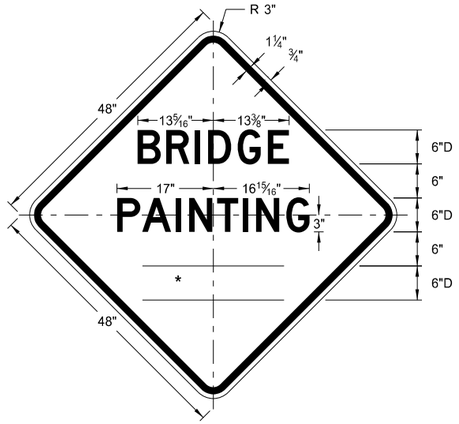
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number
5-31-18	Revised sign and arrow details
10-03-19	New Design Engineer PE Stamp

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

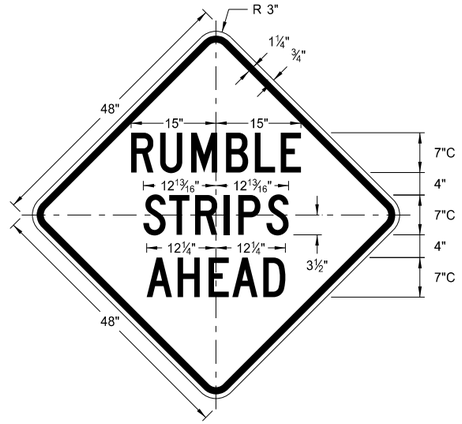
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



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



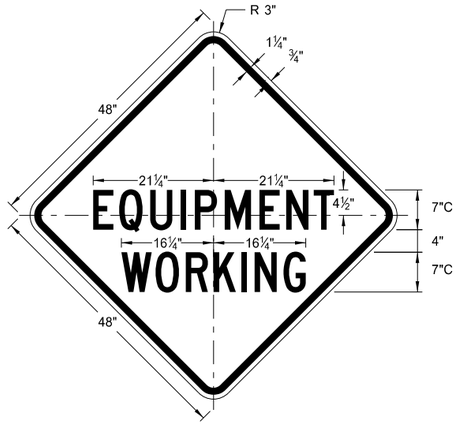
W21-50-48
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Background: orange



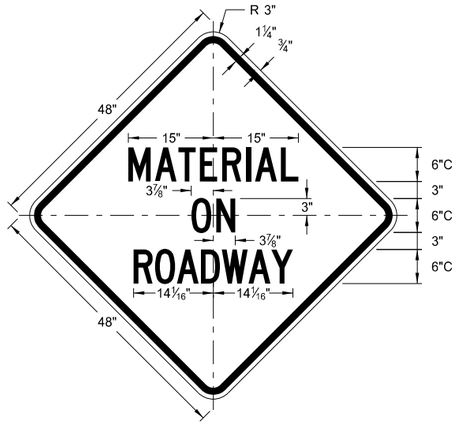
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Legend: black (non-refl)
Background: orange

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

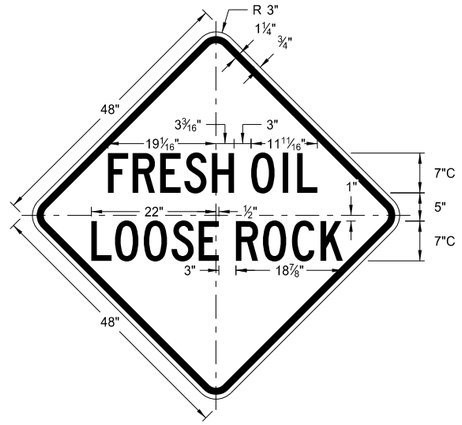
* DISTANCE MESSAGES



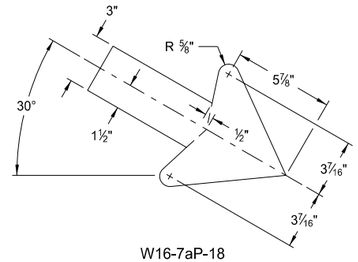
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Legend: black (non-refl)
Background: orange



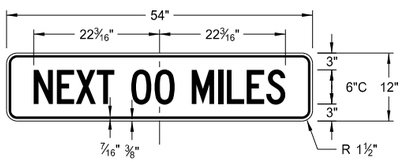
W21-51-48
Legend: black (non-refl)
Background: orange



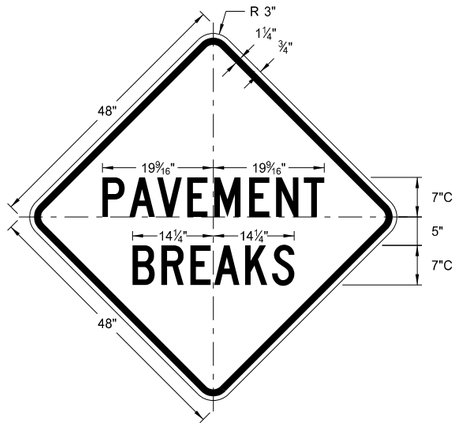
W22-8-48
Legend: black (non-refl)
Background: orange



W16-7aP-18



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



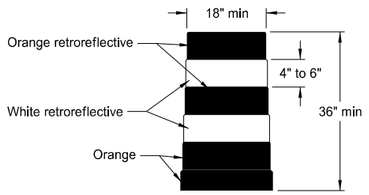
W21-52-48
Legend: black (non-refl)
Background: orange

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

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

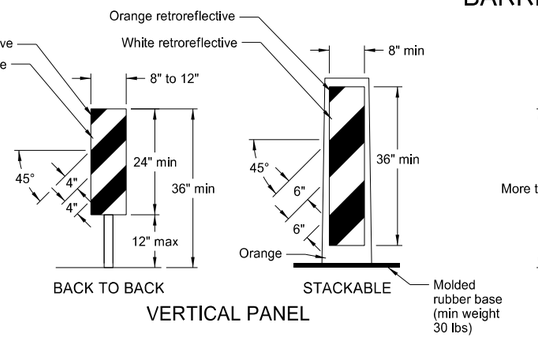
BARRICADE AND CHANNELIZING DEVICE DETAILS

D-704-13



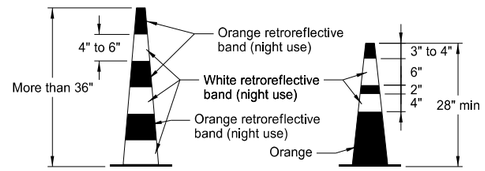
DELINEATOR DRUM

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



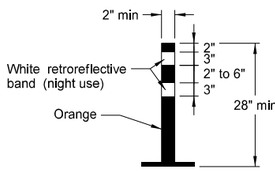
VERTICAL PANEL

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



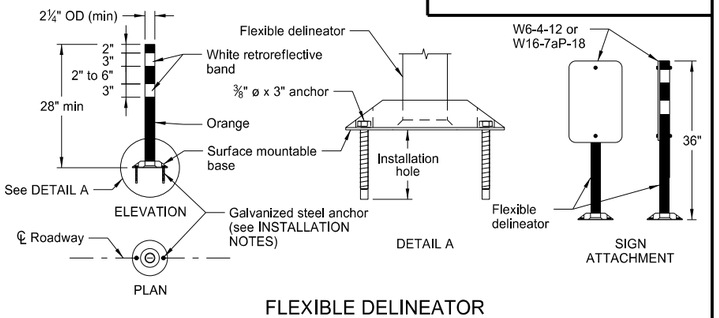
TRAFFIC CONE

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



TUBULAR MARKER

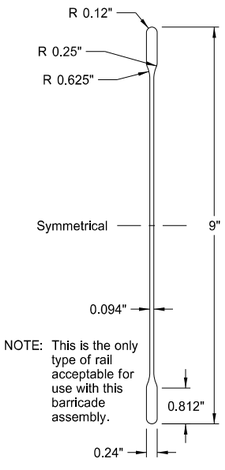
Provide retroreflectorization of tubular markers more than 42" in height by alternating four 4" to 6" wide orange and white stripes with the top stripe being orange.



FLEXIBLE DELINEATOR

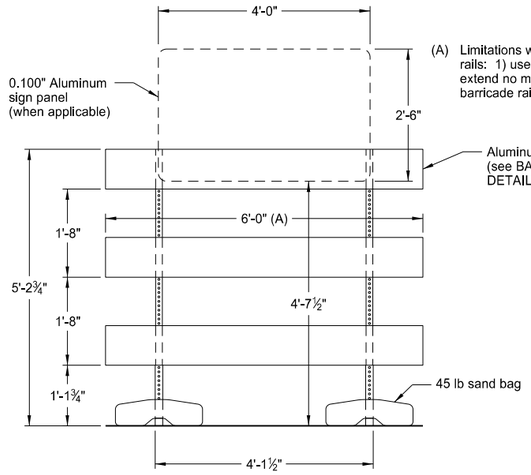
INSTALLATION NOTES:

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



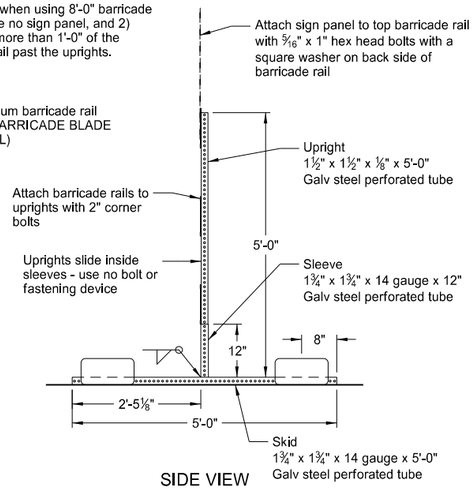
NOTE: This is the only type of rail acceptable for use with this barricade assembly.

BARRICADE BLADE DETAIL



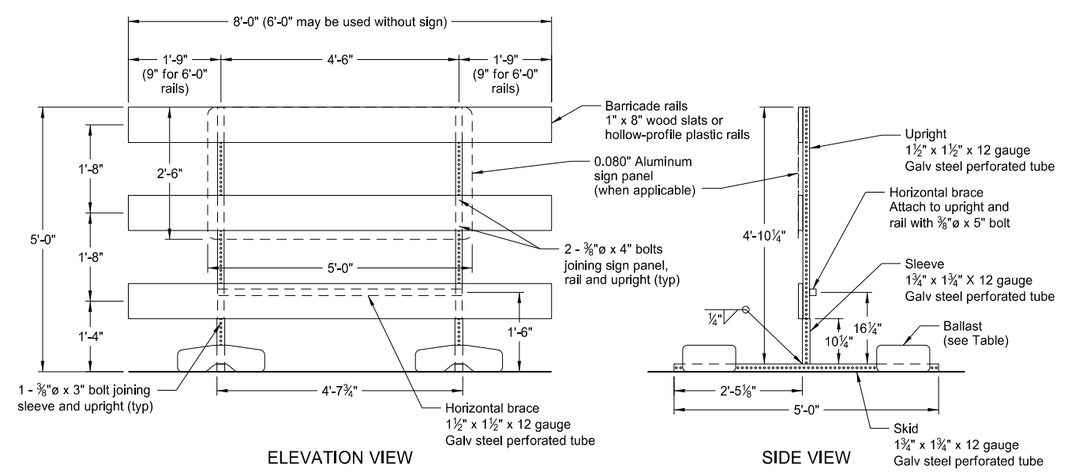
(A) Limitations when using 8'-0" barricade rails: 1) use no sign panel, and 2) extend no more than 1'-0" of the barricade rail past the uprights.

ELEVATION VIEW



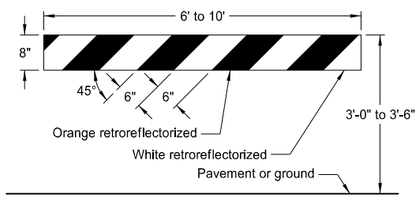
SIDE VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

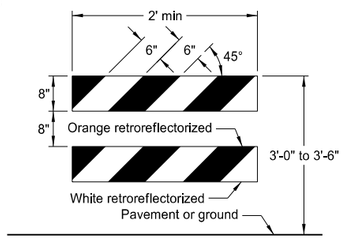


BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

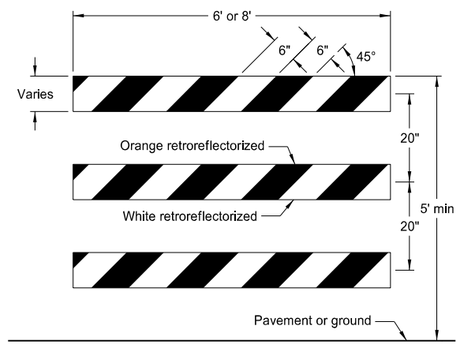
NOTE: For barricade markings use alternating orange and white retroreflective stripes, sloping downward in the direction traffic is to pass. Place retroreflective sheeting on both sides of the rails with a minimum of 270 square inches of visible retroreflective area facing vehicular traffic. When the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



TYPE I BARRICADE

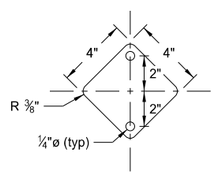


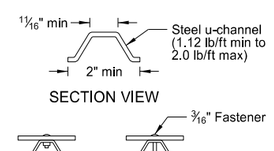
TYPE II BARRICADE

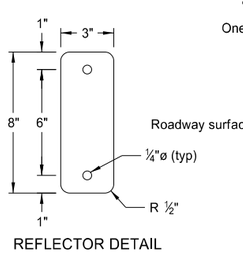


TYPE III BARRICADE

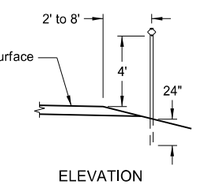
BARRICADE RAIL DETAILS







REFLECTOR DETAIL



ELEVATION

DELINEATORS

MINIMUM BALLAST
(For each side of barricade support)

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

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

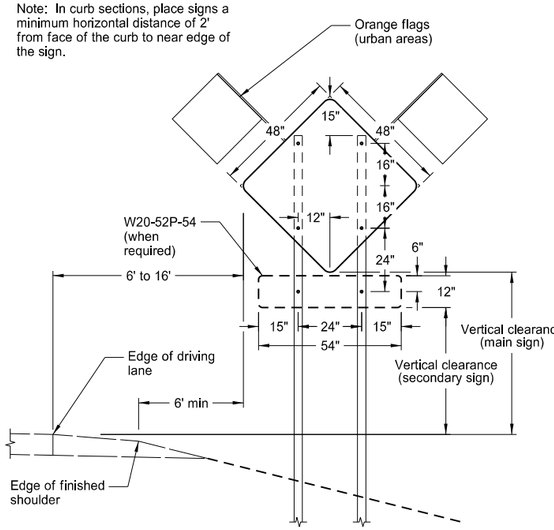
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17 11-01-19	Updated to active voice Revised details for Flexible Delineator

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

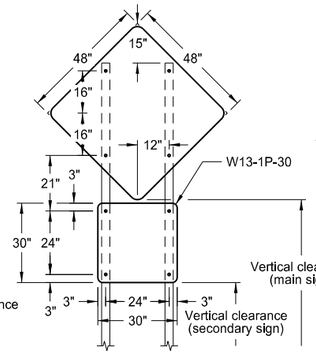
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

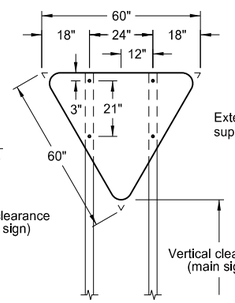
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



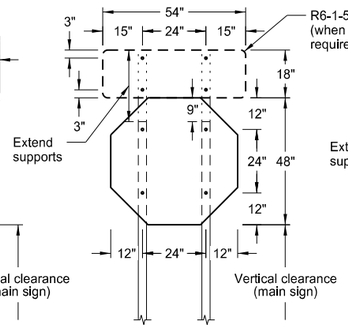
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



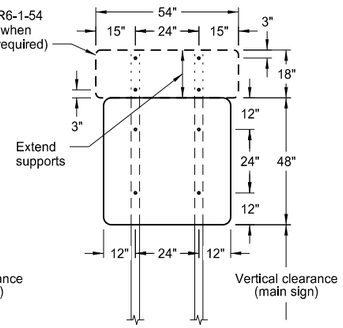
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



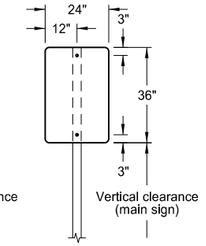
R1-2-60 - YIELD SIGN



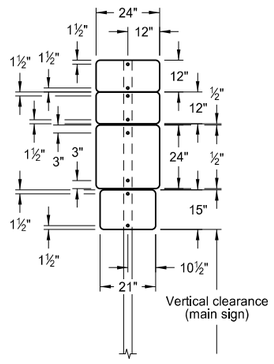
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



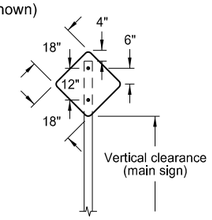
48" x 48" SIGN
(with R6-1-54 sign as required)



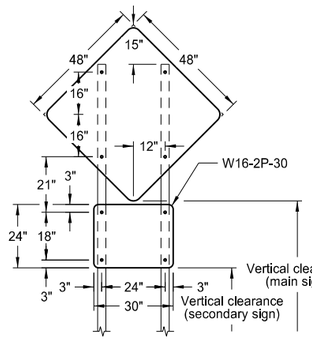
24" x 36" SIGN



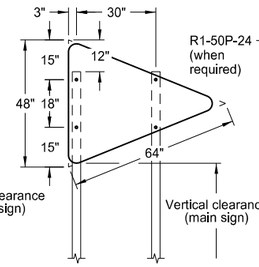
24" x 24"
ROUTE MARKER
ASSEMBLY



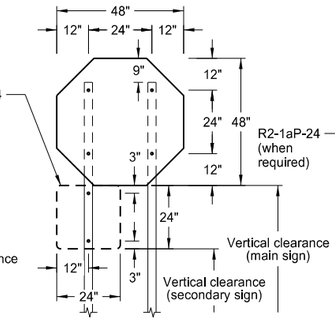
18" x 18"
DIAMOND SIGN



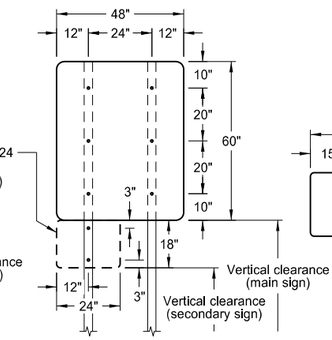
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



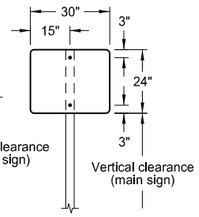
W14-3-64 - PENNANT SIGN



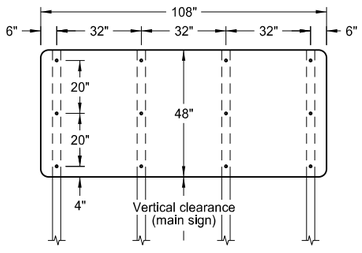
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



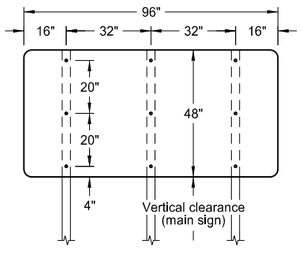
48" x 48" SIGN
(with R2-1aP-24 sign as required)



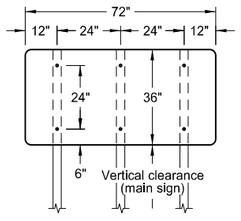
30" x 24" SIGN



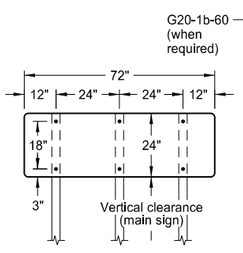
108" x 48" SIGN



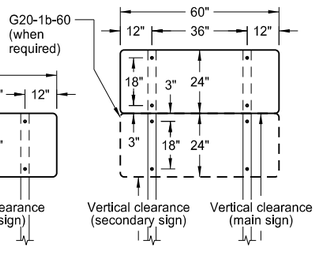
96" x 48" SIGN



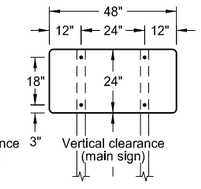
72" x 36" SIGN



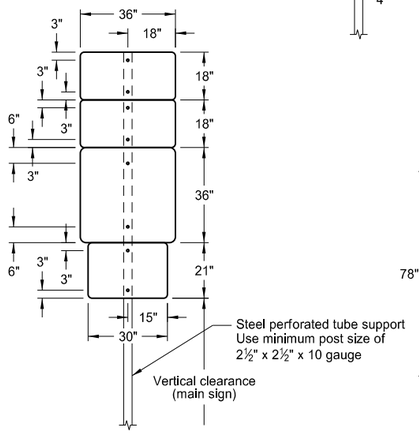
72" x 24" SIGN



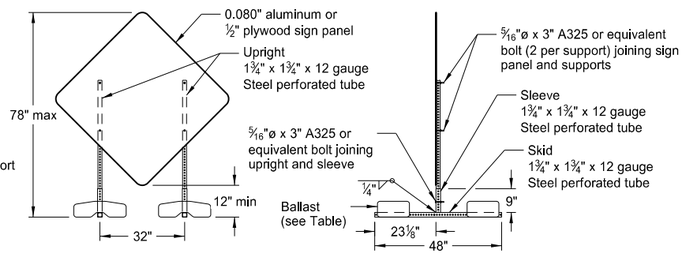
60" x 24" SIGN



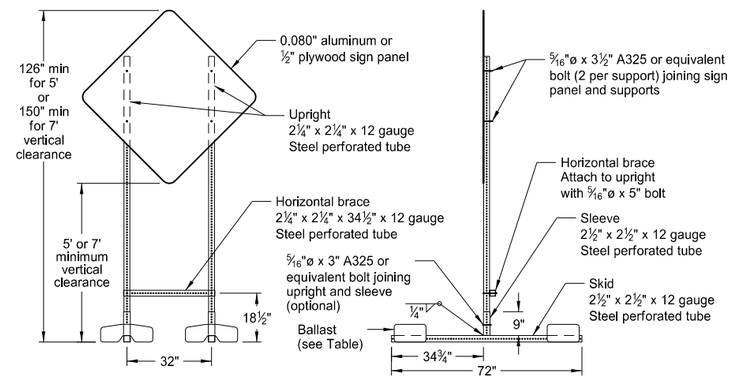
48" x 24" SIGN



36" x 36"
ROUTE MARKER
ASSEMBLY



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

MINIMUM BALLAST
(For each side of sign support base)

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

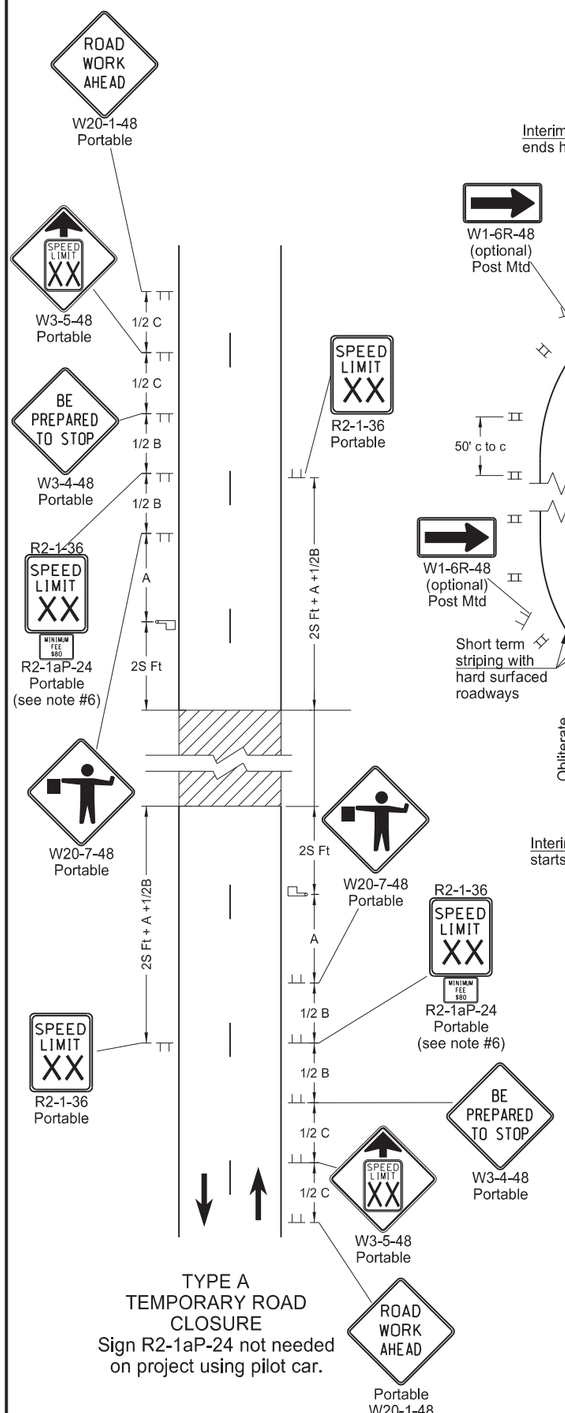
Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of skids.

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

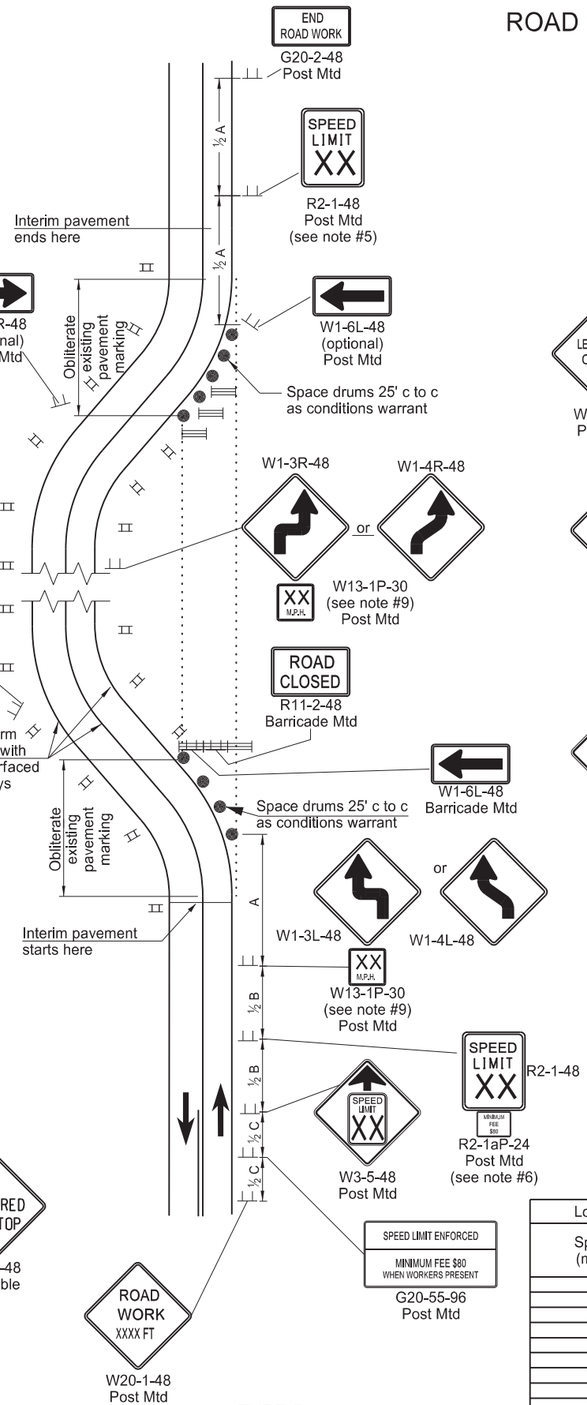
This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/1/19 and the original document is stored at the North Dakota Department of Transportation

ROAD CLOSURE LAYOUTS

D-704-15

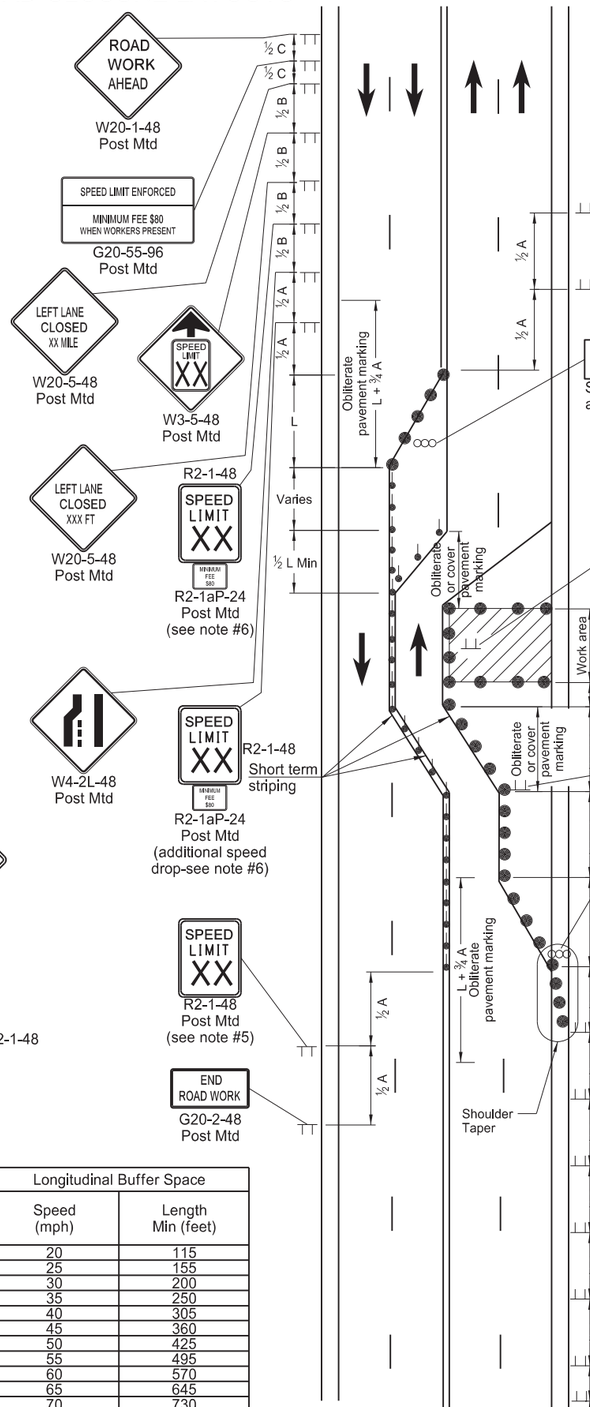


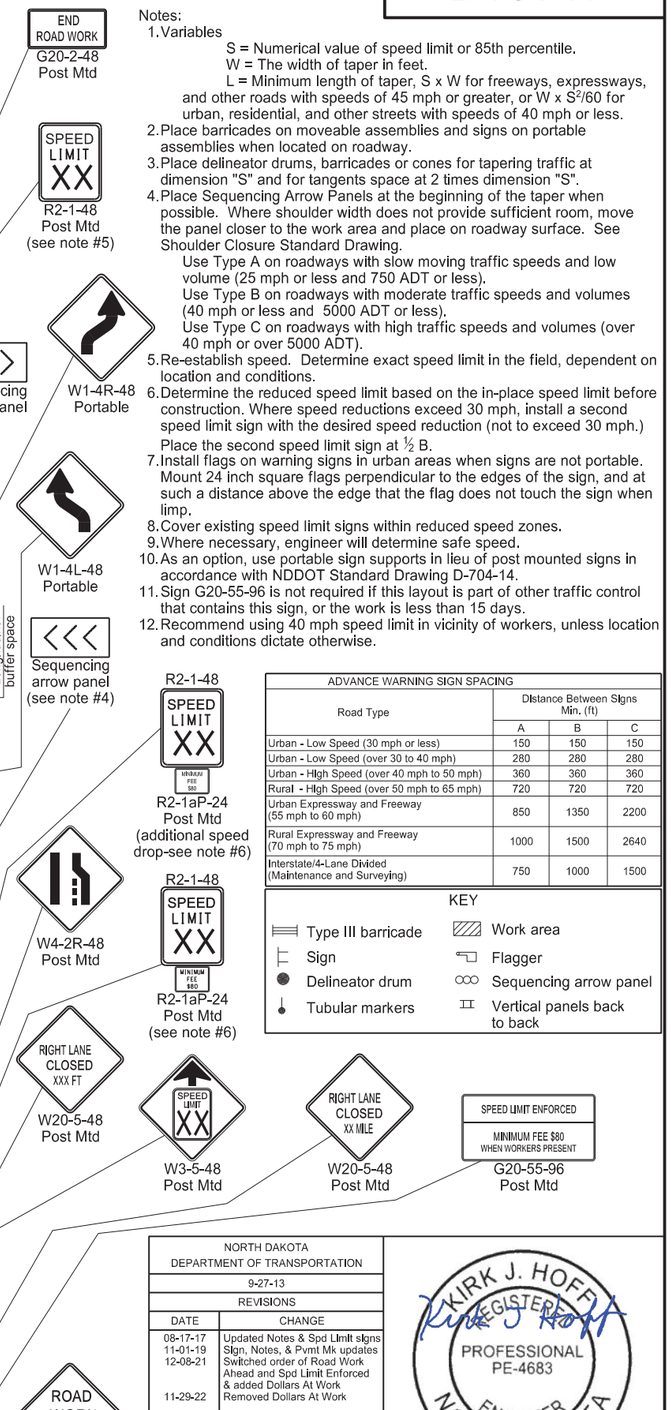
TYPE A
TEMPORARY ROAD CLOSURE
Sign R2-1aP-24 not needed on project using pilot car.



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

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





TYPE C
HALF ROAD CLOSURE ON A MULTI-LANE, HIGH SPEED HIGHWAY
4 lane undivided highway with half the roadway closed.

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

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

KEY

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

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

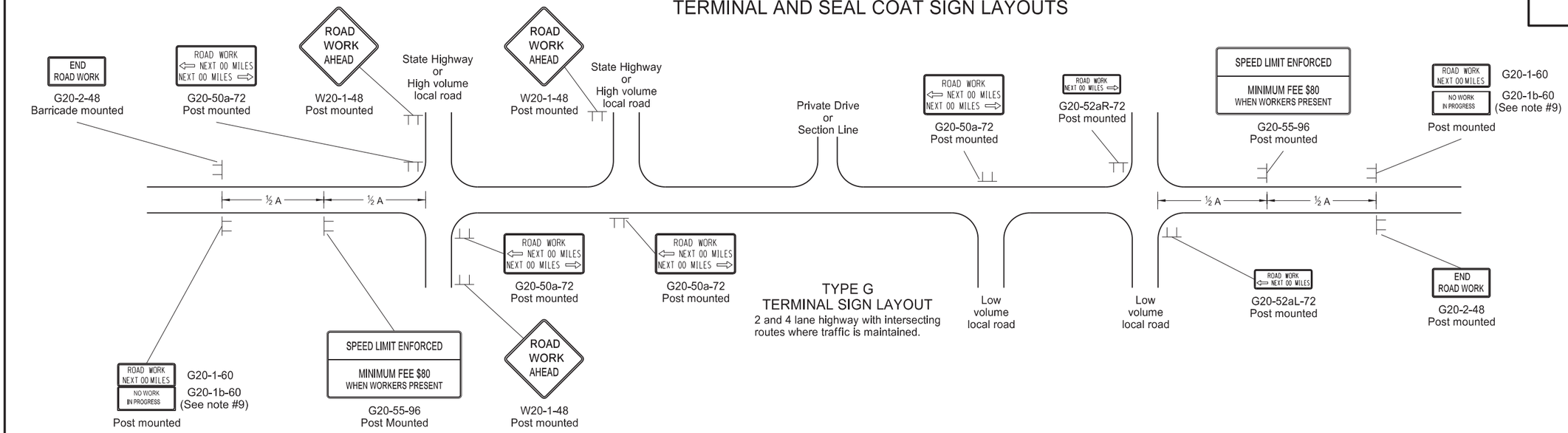
DATE	CHANGE
08-17-17	Updated Notes & Spd Limit signs
11-01-19	Sign, Notes, & Pvmt Mk updates
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work

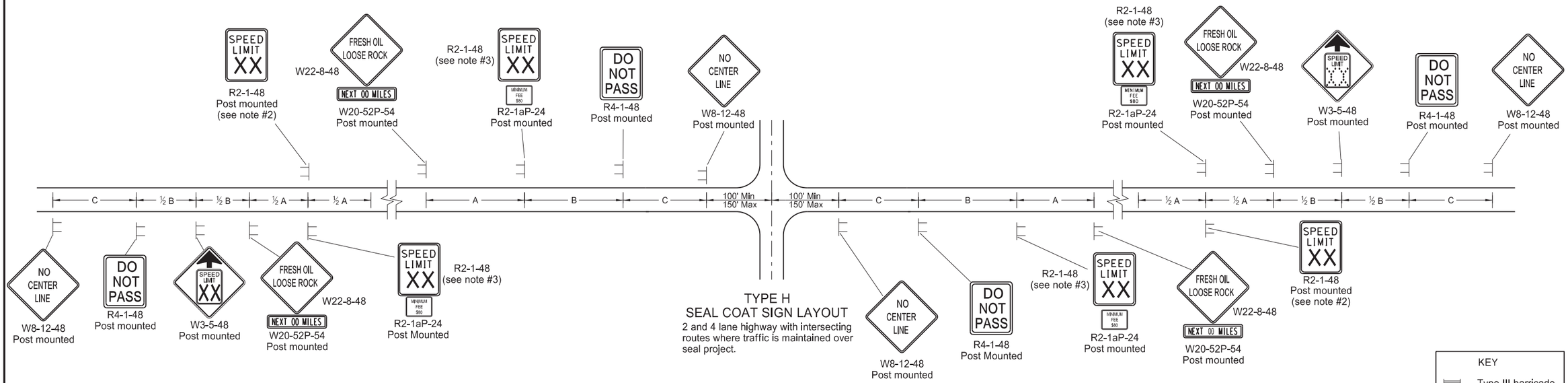
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA

11/29/22

TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20





KEY
- Type III barricade
- Sign

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 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	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

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

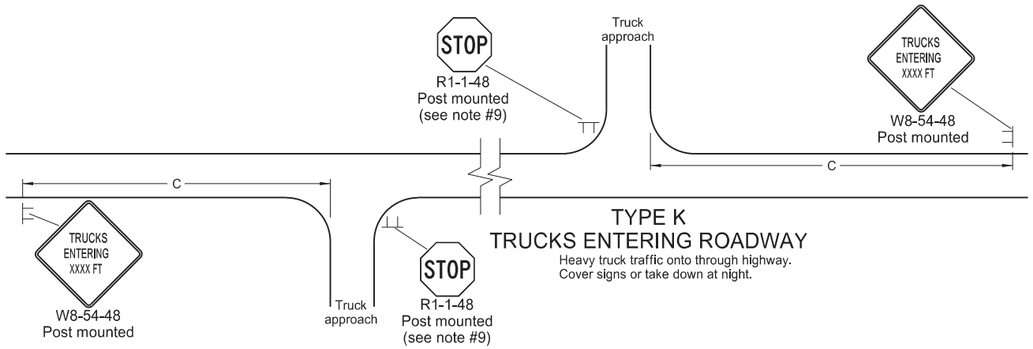
Kirk J. Hoff

11/29/22

CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

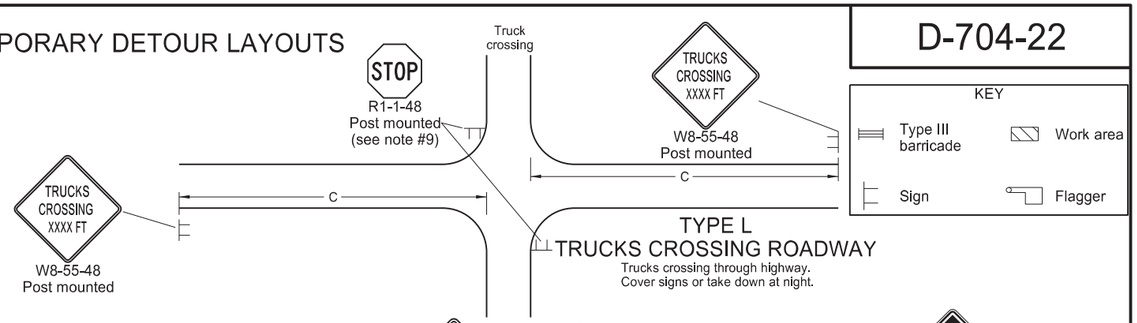
D-704-22

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



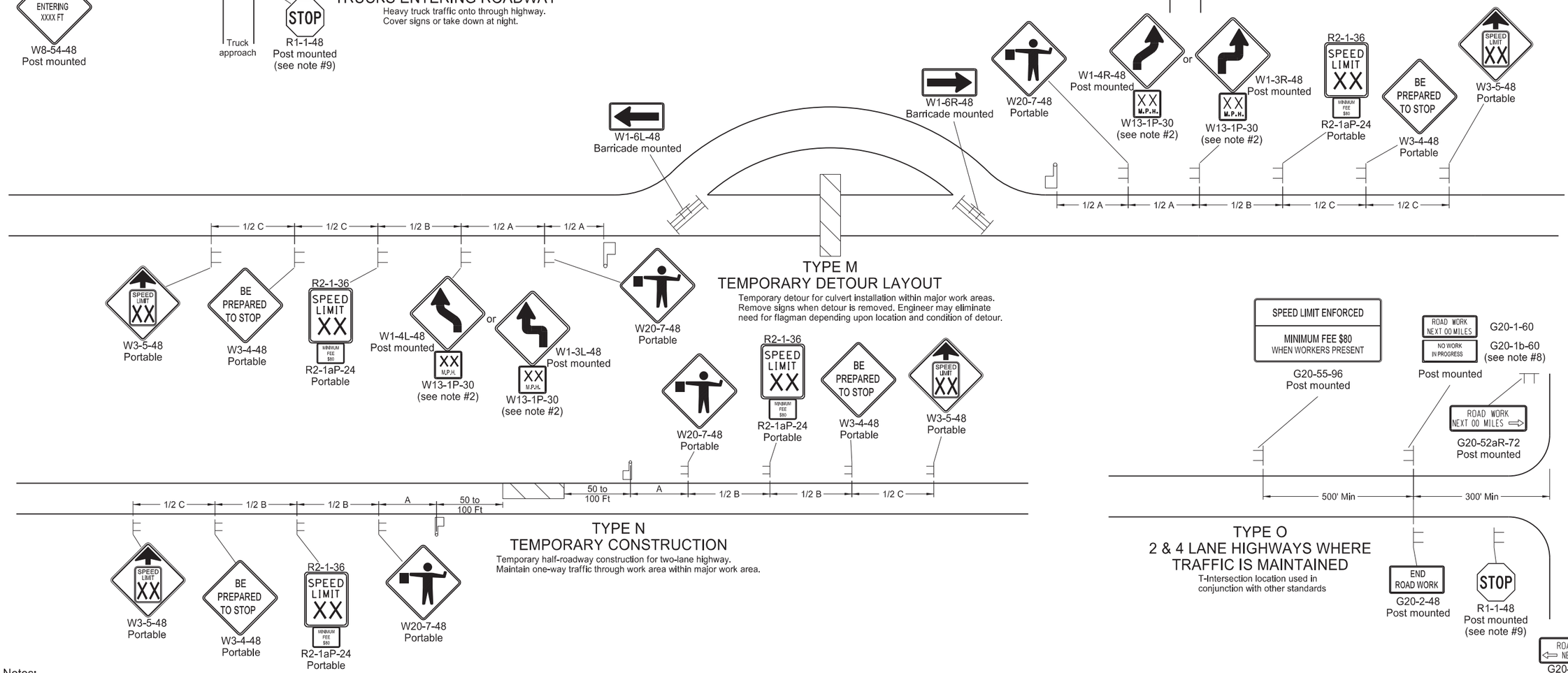
TYPE K
TRUCKS ENTERING ROADWAY

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



TYPE L
TRUCKS CROSSING ROADWAY

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



TYPE M
TEMPORARY DETOUR LAYOUT

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

TYPE N
TEMPORARY CONSTRUCTION

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

TYPE O
2 & 4 LANE HIGHWAYS WHERE TRAFFIC IS MAINTAINED

T-Intersection location used in conjunction with other standards

Notes:

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

ADVANCE WARNING SIGN SPACING

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

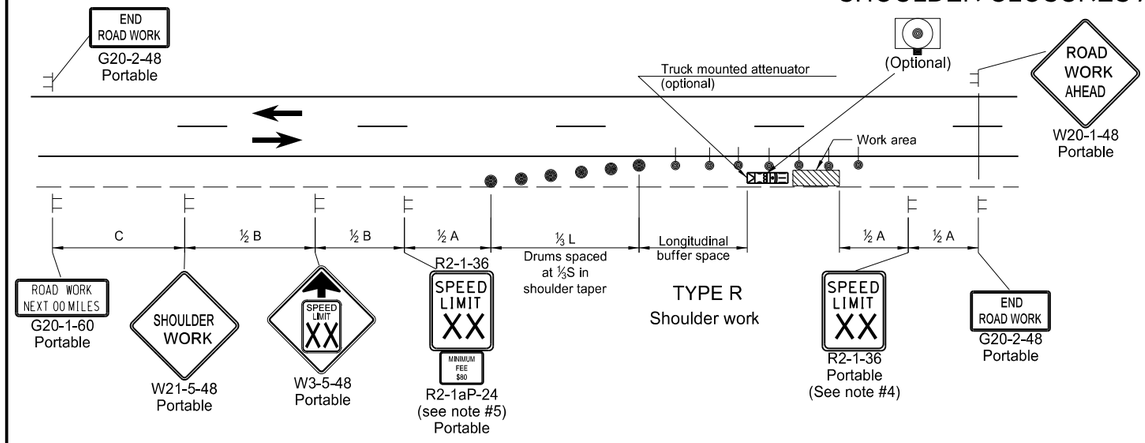
DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work

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ENGINEER
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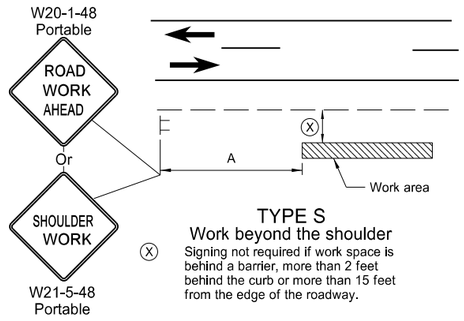
11/29/22

SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS

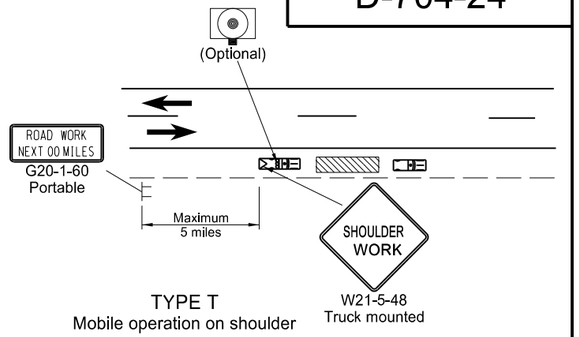
D-704-24



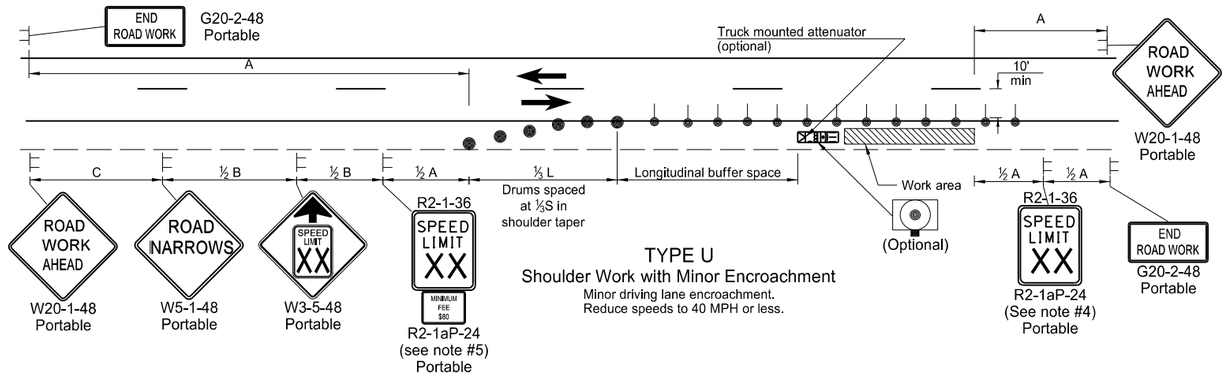
TYPE R
Shoulder work



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.

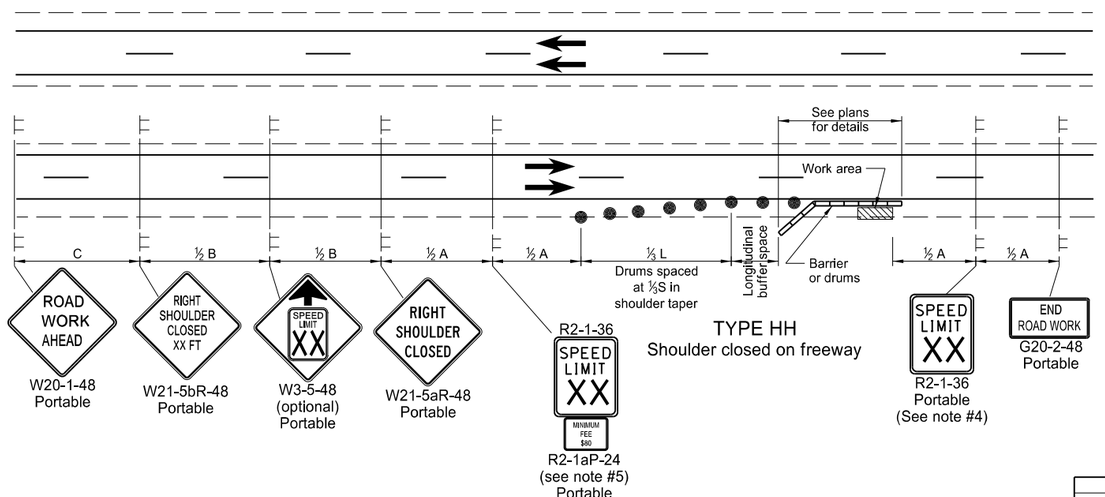


TYPE T
Mobile operation on shoulder

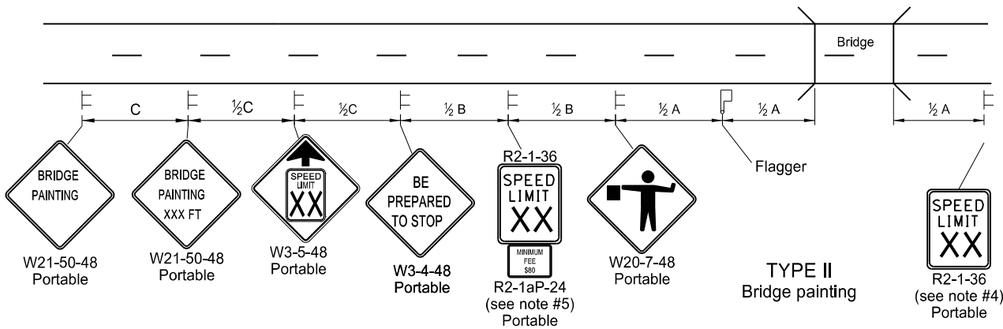


TYPE U
Shoulder Work with Minor Encroachment
Minor driving lane encroachment.
Reduce speeds to 40 MPH or less.

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.



TYPE HH
Shoulder closed on freeway



TYPE II
Bridge painting

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 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

Longitudinal Buffer Space

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
8-17-17	Updated notes & revised signs
11-01-19	Revised drum spacing & signs nos.

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

C

$^{1}_{2}$ C

$^{1}_{2}$ B

$^{1}_{2}$ B

$^{1}_{2}$ A

$^{1}_{2}$ A

ROAD

MACHINERY
XXX FT

SPEED
LIMIT
XX

BE

XXX
FEET

SPEED
LIMIT
XX
MINIMUM
FEE
980

R2-1aP-24

road

$^{1}_{2}$ A

SPEED
LIMIT
XX

TYPE Y

R2-1-48

LIMIT
XX
MINIMUM
FEE
980

$^{1}_{2}$ B

SPEED
LIMIT
XX

W3-5-48

$^{1}_{2}$

Other

$^{1}_{2}$ B

TYPE Z

C

$^{1}_{2}$C

$^{1}_{2}$B

$^{1}_{2}$B

A

2S Ft + A +$^{1}_{2}$B

SURVEY
CREW

W21-6-48
Portable

LIMIT
XX

W3-5-48
Portable

BE

TO STOP

SPEED
LIMIT
XX
MINIMUM
FEE

R2-1aP-24

SPEED
LIMIT
XX

W20-7-48

SPEED
LIMIT
XX

Portable

TYPE AA

Low
Shoulder
or
Shoulder

W21-5-48

Fresh
Oil

Road

WORK

A

or

LOW
SHOULDER

A

ROAD

A

OIL

Portable

TYPE CC

$^{1}_{2}$A

W8-1-48

B

W8-3-48

$^{1}_{2}$A

$^{1}_{2}$A

UNEVEN

DO

PASS

$^{1}_{2}$A

PAVEMENT

00

TYPE FF

TYPE GG

TYPE JJ

KEY

Sign

	Min. (ft)			(mph)	Length
A	B	C			
	150	150		25	115
	280			30	155
360		360		40	200
	720	720		45	250
850	1350	2200		50	305
				55	360
1000		2640		60	425
	1000			65	570
			*	70	645
					820

TYPE KK

1.
2.
3.
4.
5.
6.
7.
8.
9.

$^{1}_{2}$B.

NORTH DAKOTA

9-27-13

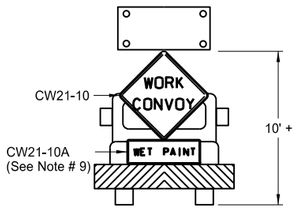
DATE

11-01-19

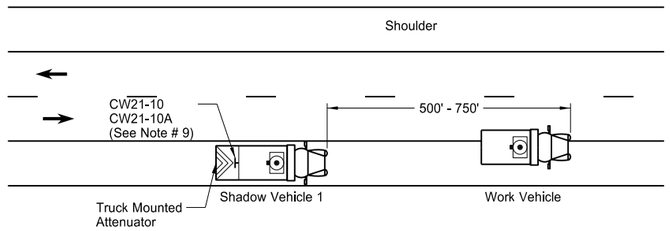
KIRK J. HOFF
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PROFESSIONAL
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ENGINEER
NORTH DAKOTA

02/23/23

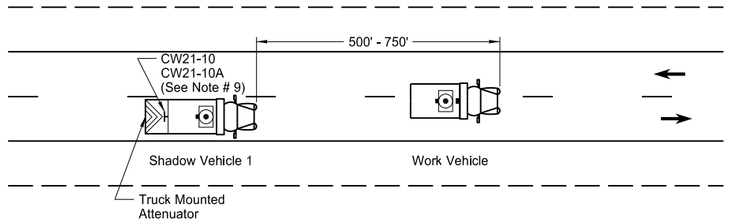
MOBILE OPERATION
(PAVEMENT MARKING)



Typical Shadow Vehicle 1
Two-Way Roaday

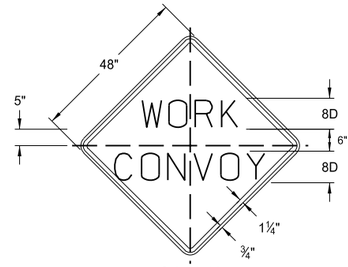


Two-Way Roadway with Paved Shoulders

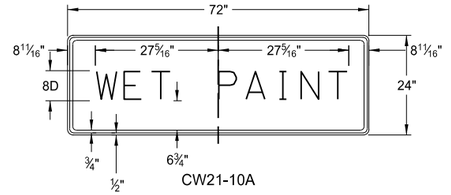


Two-Way Roadway without Paved Shoulders

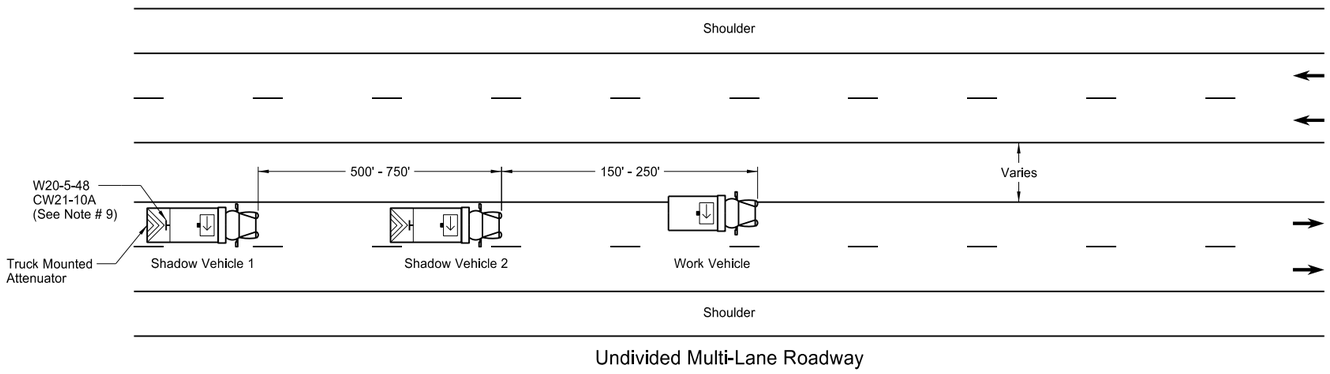
Sign Details



CW21-10

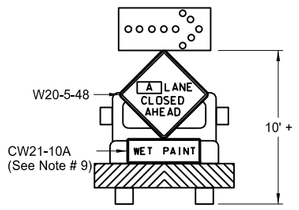


CW21-10A



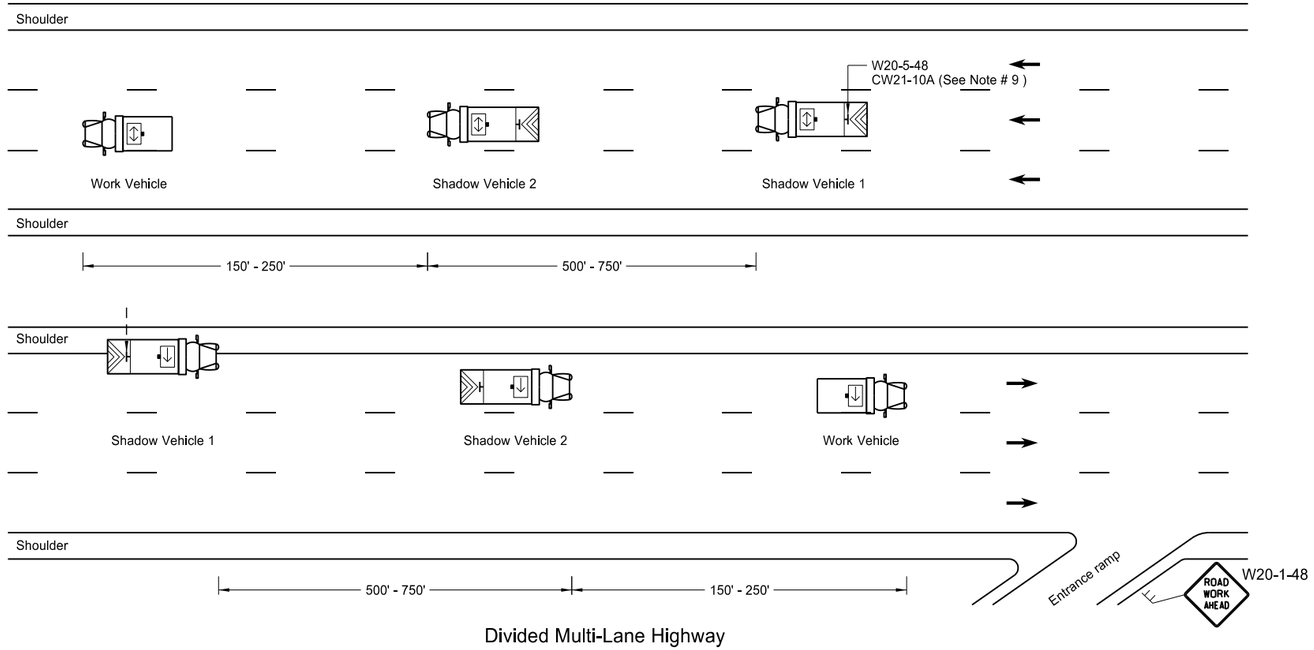
Undivided Multi-Lane Roadway

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

This document was originally issued and sealed by Kirk J Hoff, Registration Number PE-4683, on 11/08/19 and the original document is stored at the North Dakota Department of Transportation

KEY

Sign

Min. (ft)

A	B	C
	360	
720	720	

ROAD
WORK
AHEAD

RUMBLE

SPEED
XX

BE

TO STOP

R2-1-36

LIMIT
XX
MINIMUM

W20-7-48

Flagger

1/2 C

1/2 C

1/2 C

1/2 C

1/2 B

Portable

A

2S Ft + A + $^1/_2$ B

SPEED
LIMIT
XX

R2-1-36
Portable

3' Max.

2' Max.

10' Min.

2S Ft + A + $^1/_2$ B

LIMIT
XX

2S Ft

W20-7-48

R2-1-36

SPEED
LIMIT
XX
MINIMUM
FEE
$80

A

BE

1/2 B

TO STOP

W3-4-48

1/2 C

SPEED
LIMIT
XX

W3-5-48

RUMBLE

1/2 C

WORK
AHEAD

1.
2.
3.
4.

NORTH DAKOTA

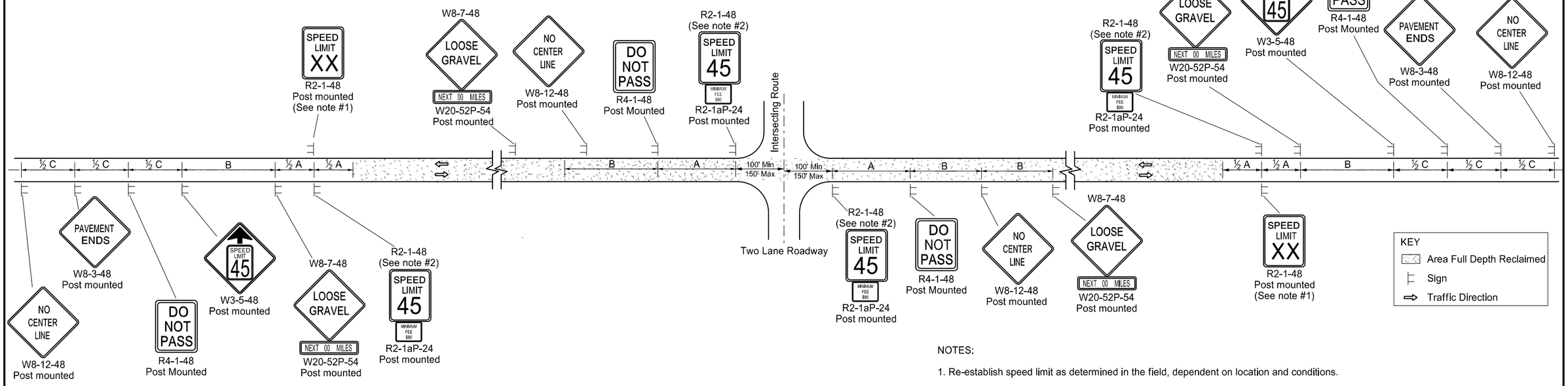
DATE

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

03/07/23

MAINTAINING TRAFFIC THROUGH AREA ALREADY FULL DEPTH RECLAIMED

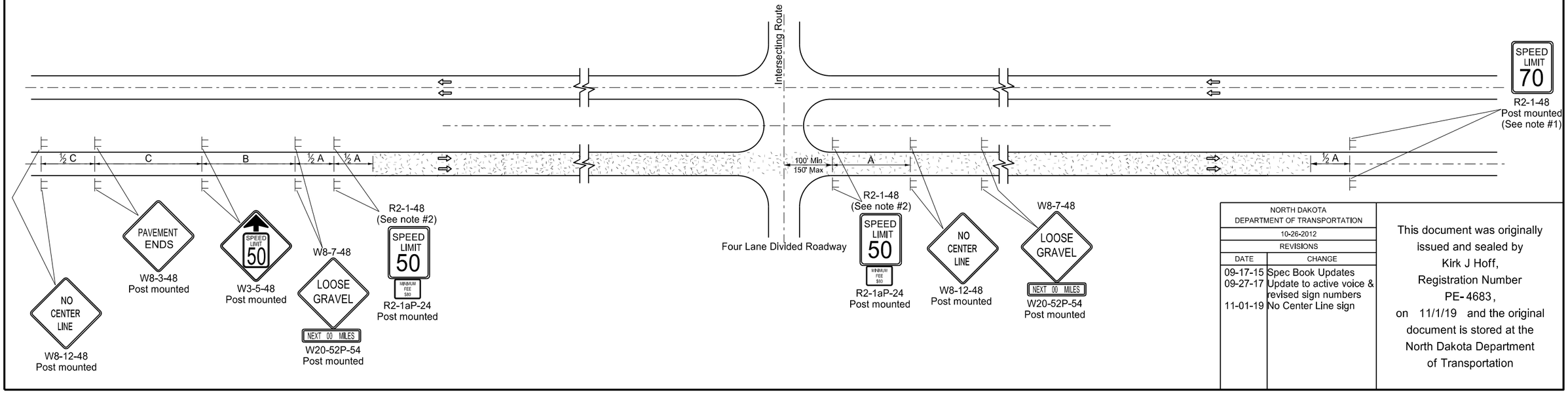
D-704-37



NOTES:

1. Re-establish speed limit as determined in the field, dependent on location and conditions.
2. Determine the reduced speed limit based on the in-place speed limit before construction. When speed limits are reduced more than 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 after the first speed limit sign and ½A before the end of the pavement.
3. Install flags on non-portable warning signs in urban areas. Mount the 24 inch square flags, perpendicular to the edges of the diamond sign, above the edge so the limp flag will not touch the sign. Rural areas will not require flags.
4. Cover existing speed limit signs within reduced speed zone.
5. Place signs R2-1-48, R2-1aP-24, W8-7-48, W20-52P-54 and R4-1-48 for two lane, two way operation just after all important intersections and at 5 mile intervals thereafter. Place sign W8-12-48 just after all important intersections and at 2 mile intervals thereafter until the short term center line pavement marking is in place. Place no short term pavement markings after the mine and blend operation until after the prime operation.
6. As an option use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
7. Use other traffic control layouts as required in immediate work areas. Install sign R2-1aP-24 below speed limit signs when the speed limit is reduced in the work area.

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

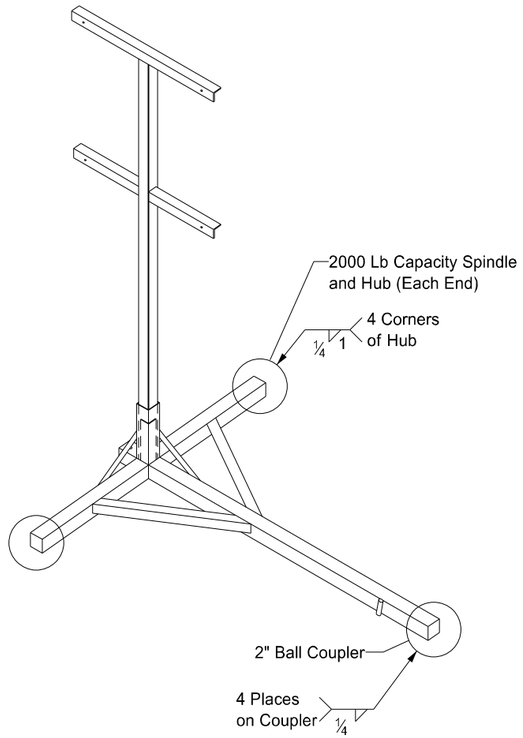


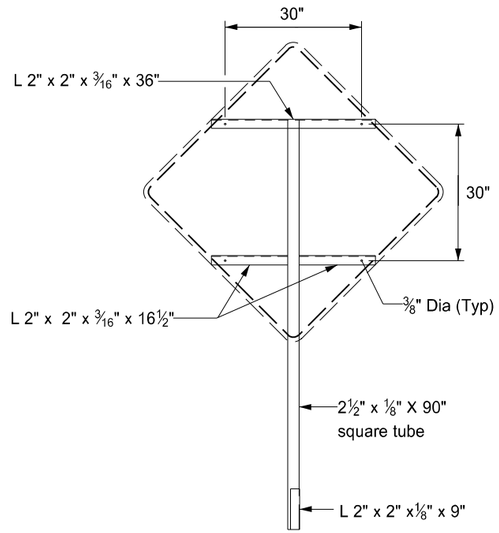
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-26-2012	
REVISIONS	
DATE	CHANGE
09-17-15	Spec Book Updates
09-27-17	Update to active voice & revised sign numbers
11-01-19	No Center Line sign

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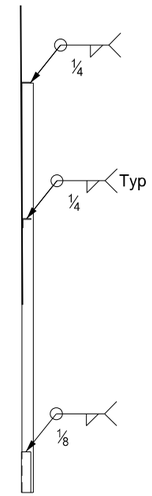
PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50





FRONT

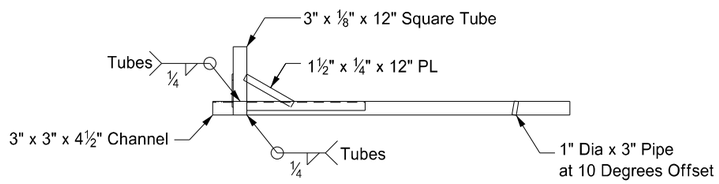


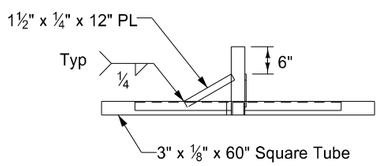
RIGHT

SIGN SUPPORT

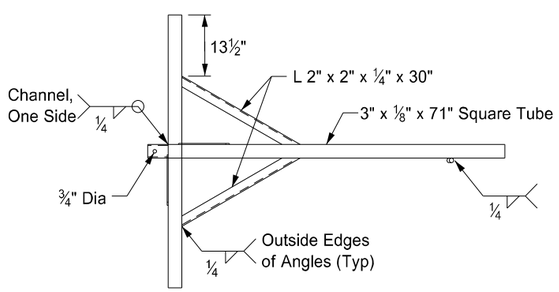
Notes:

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



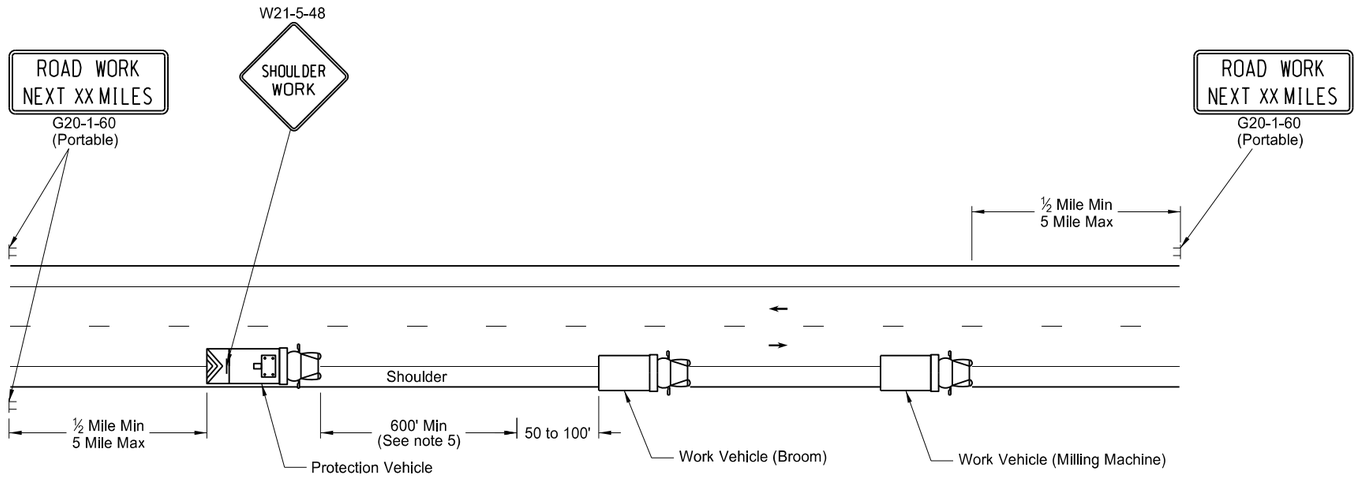
TOP

TRAILER

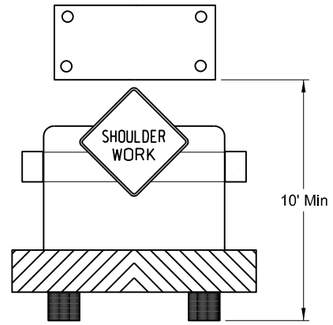
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE
12/02/2020	Updated Note to active voice.

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PE-4683
ENGINEER
NORTH DAKOTA
12 02 2020

MOBILE OPERATION
Grinding Shoulder Rumble Strips



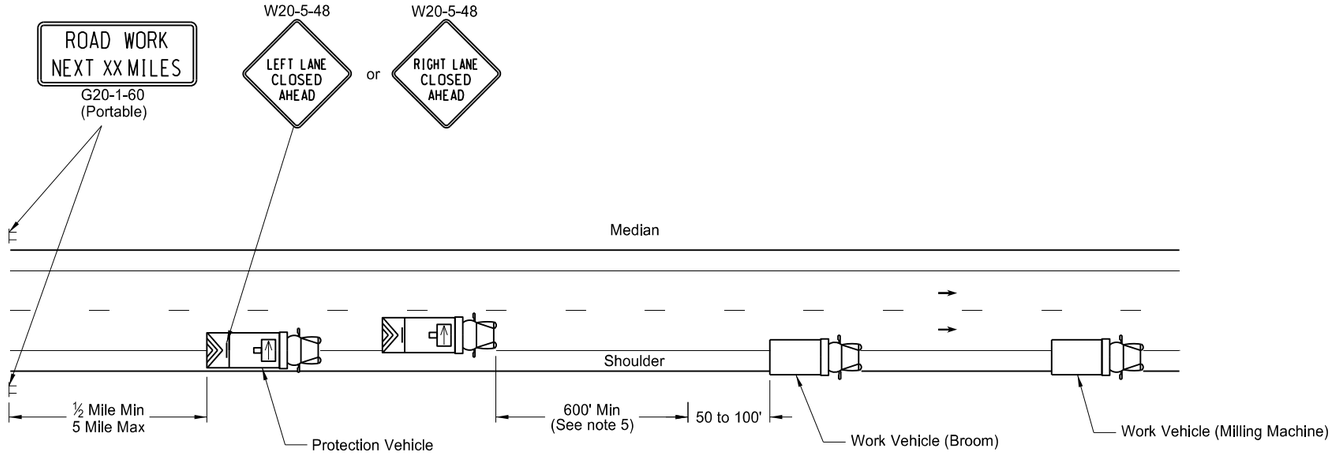
TWO LANE - TWO WAY ROADWAY



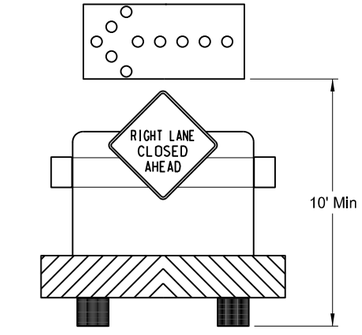
TWO LANE - TWO WAY ROADWAY

Typical Protection Vehicle with
Flashing Arrow Panel In Caution Mode

Notes:
1. Provide truck mounted attenuators on additional vehicles in the convoy, at no additional cost.
2. Provide rotating, flashing, oscillating, or strobe lights on vehicles.
3. Provide Type B or Type C flashing arrow panels that are controlled from inside the vehicle.
4. Provide two - way electronic communication capability in each vehicle.
5. Vary vehicle spacing between the protection vehicle and work vehicle depending on sight distance restrictions. Keep the spacing of the convoy vehicles such that motorists approaching the work convoy can see the protection vehicle in time to slow down and safely pass the work vehicles.
6. Move advance Road Work Ahead signs as the work area moves through the construction zone.

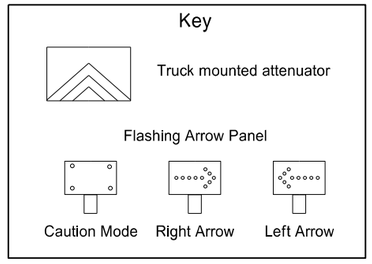


INTERSTATE & 4 LANE DIVIDED HIGHWAY



INTERSTATE & 4 LANE DIVIDED HIGHWAY

Typical Protection Vehicle with Flashing Arrow
Panel In Flashing Arrow Mode

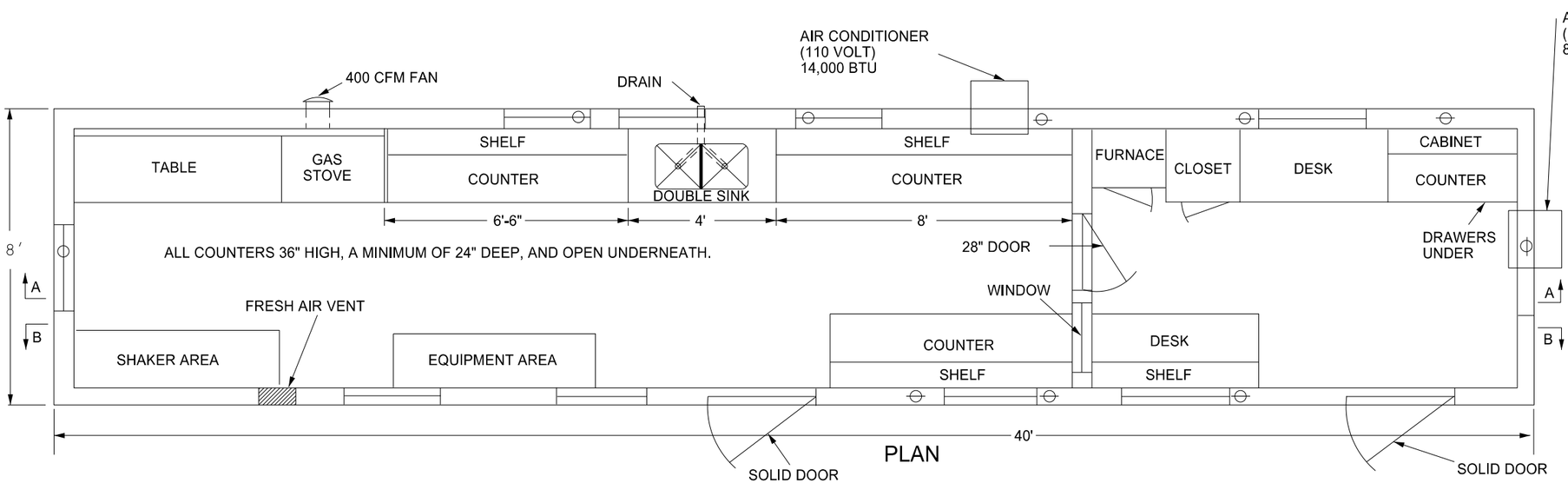


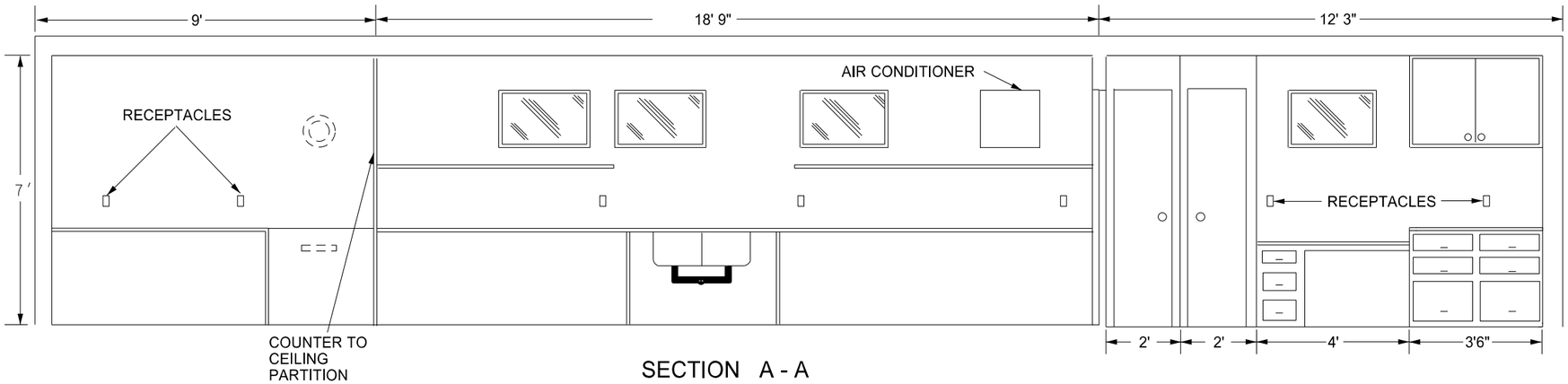
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-15-12	
REVISIONS	
DATE	CHANGE
8-17-17	Updated notes & signs
10-03-19	New Design Engineer PE Stamp

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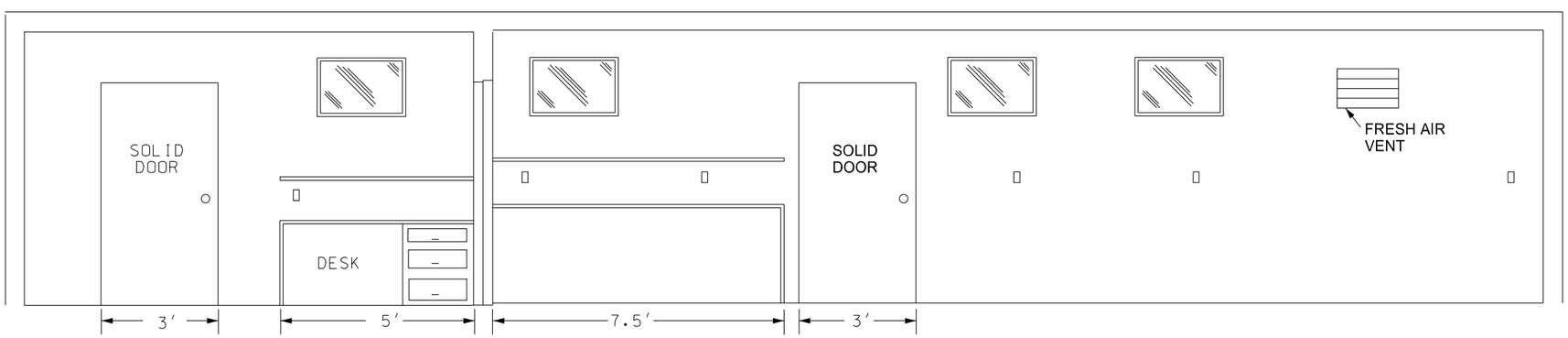
BITUMINOUS LABORATORY

D-706-1





SECTION A - A



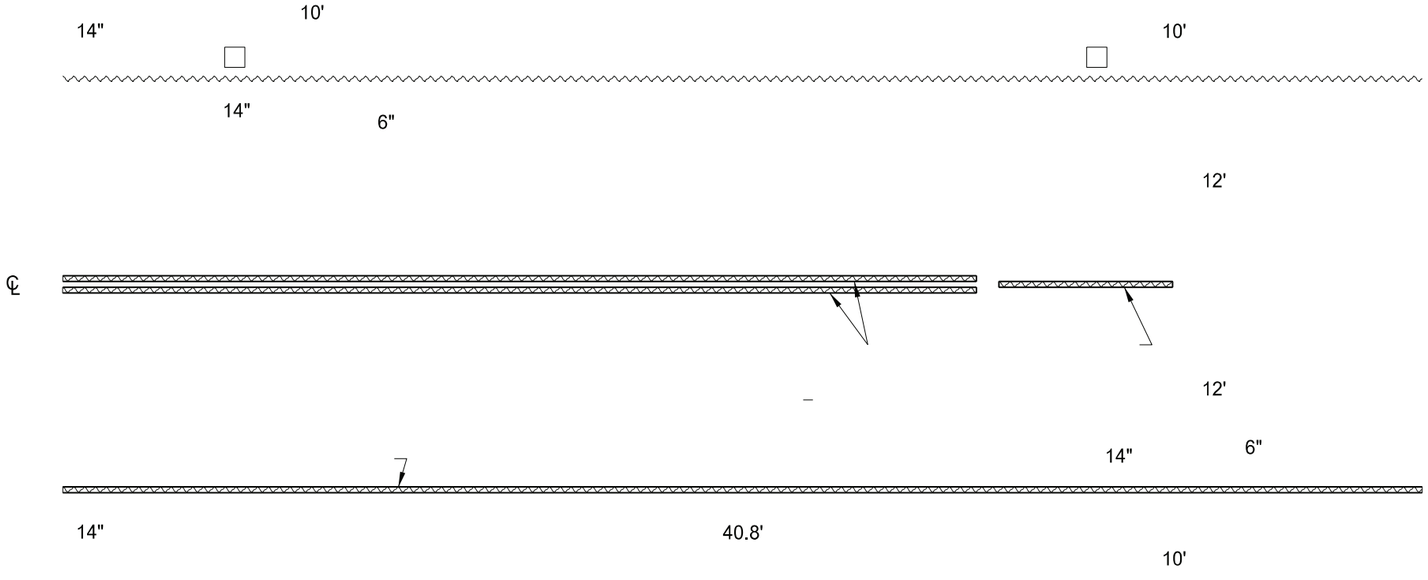
SECTION B - B

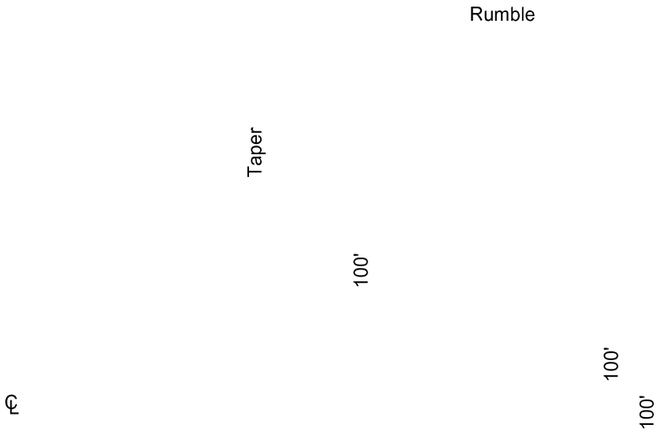
Provide a laboratory with the following:

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.

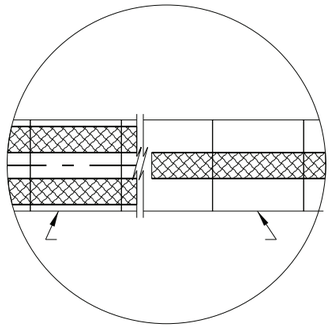
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
07-30-14	Changed standard's title and revised notes.
01-11-16	Revised notes.
08-27-19	New Design Engineer PE Stamp

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12"

12" 12"

4'



Inset D

Depth	MIL	in
0	62.5	1/16
	156	
3 1/2	281	9/32
5 1/4		7/16
7	500	1/2
8 3/4		7/16
10 1/2	281	9/32
	156	
14	62.5	

NOTES:

NORTH DAKOTA

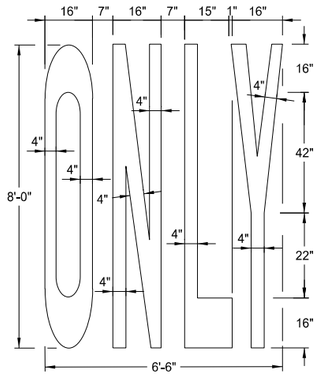
DATE
4-19-10
9-08-11 10-25-19
3-07-23 5-26-23

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

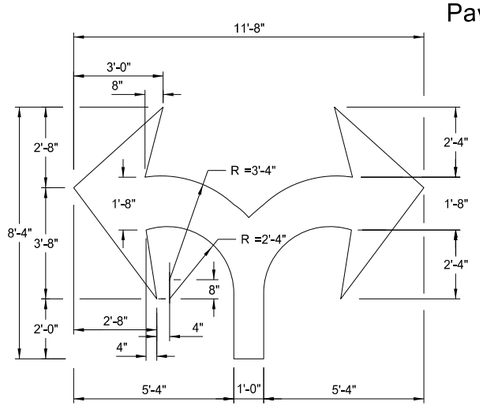
05/26/23

Pavement Marking Message Details

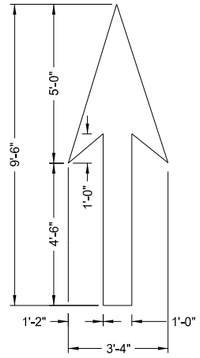
D-762-1



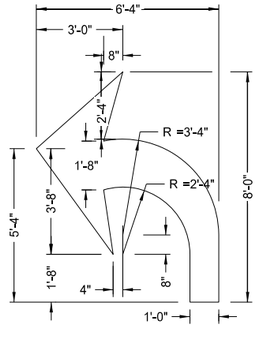
22 S. F.



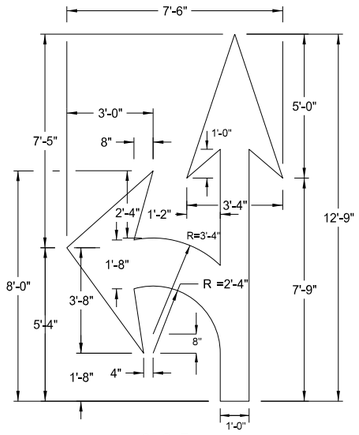
29 S. F.



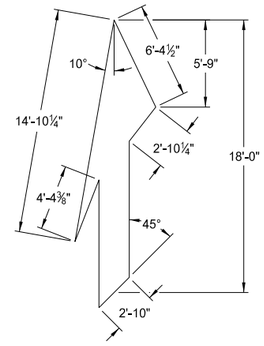
12 S. F.



16 S. F.

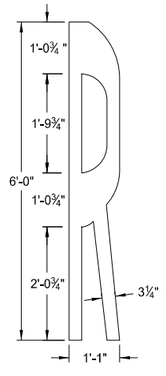


27 S. F.

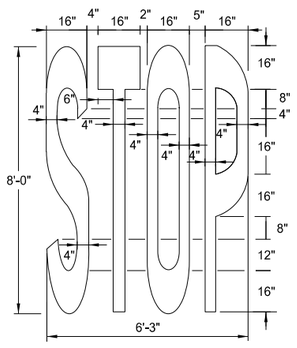


41 S. F.

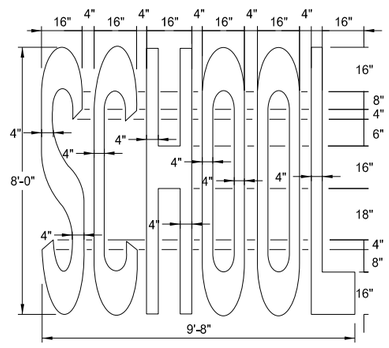
Note: Rotate merge arrow 20° from edge of roadway.



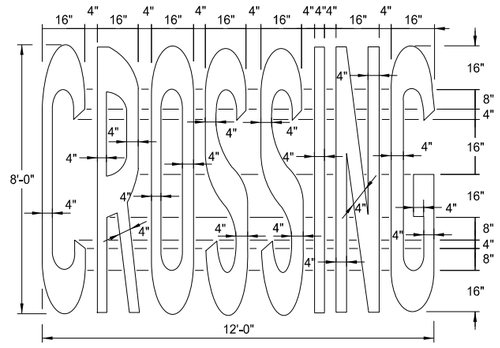
4 S. F.



22 S. F.



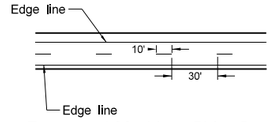
34.5 S. F.



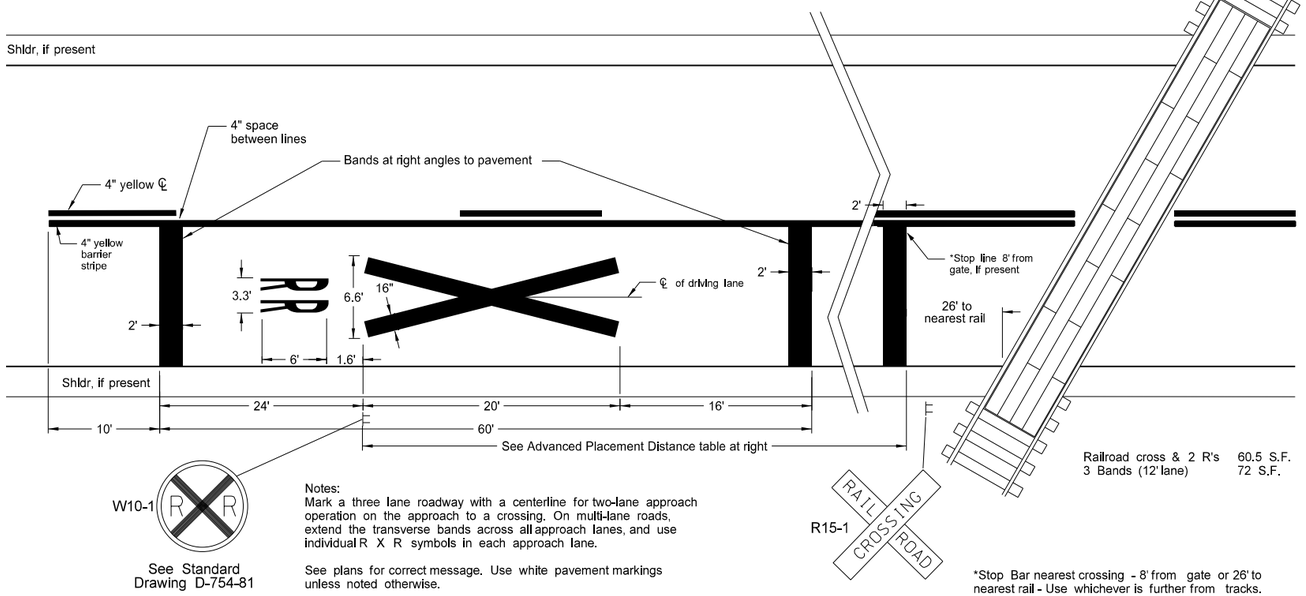
46 S. F.

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



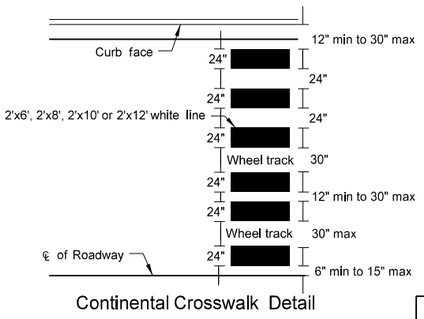
Centerline Pavement Marking Skip Spacing Detail



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.

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



Continental Crosswalk Detail

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

12-6-11

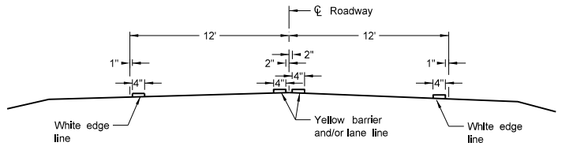
REVISIONS

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

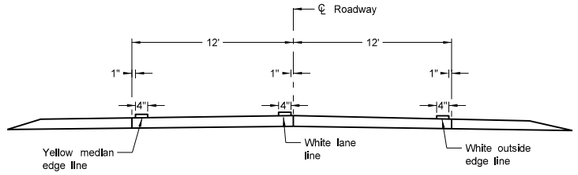
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PAVEMENT MARKING

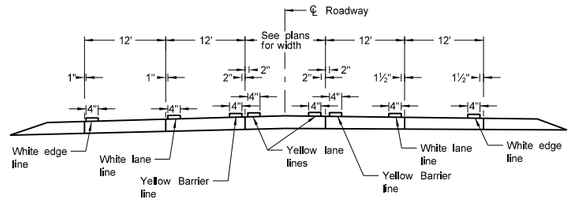
D-762-4



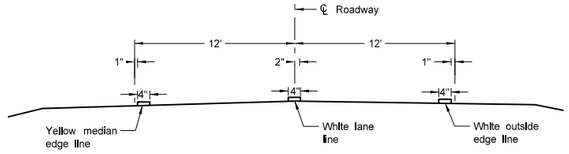
Two Lane Two Way
RURAL ROADWAY



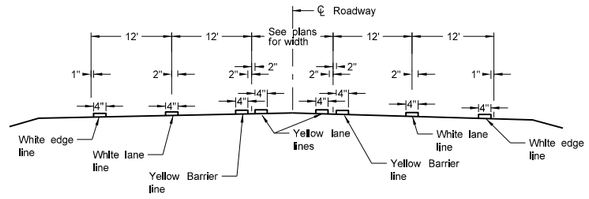
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



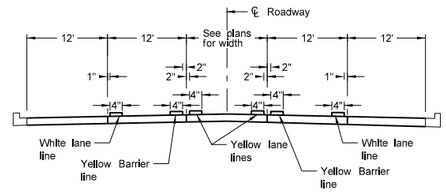
RURAL FIVE LANE ROADWAY
Concrete Section



Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



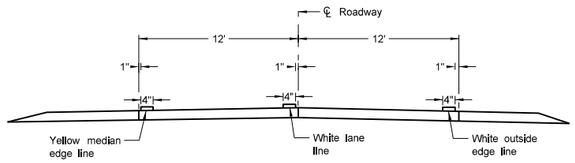
RURAL FIVE LANE ROADWAY
Asphalt Section



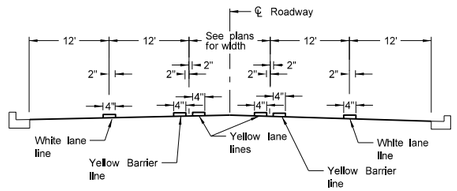
URBAN FIVE LANE SECTION
Concrete Section

NOTES:

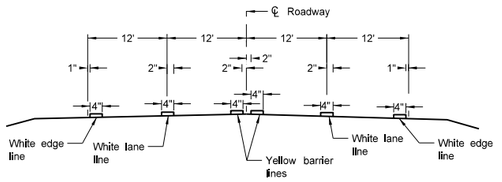
1. Continue edge lines through private drives and field drives. Break edge lines for intersections.



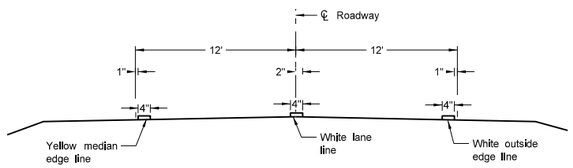
Two Lane Roadway
PRIMARY HIGHWAY
Concrete Section



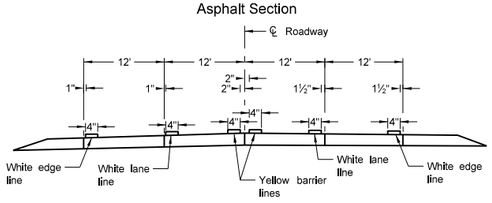
URBAN FIVE LANE SECTION
Asphalt Section



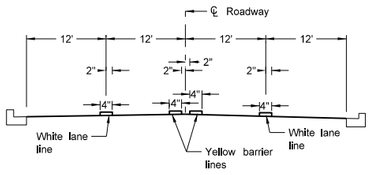
RURAL FOUR LANE ROADWAY
Asphalt Section



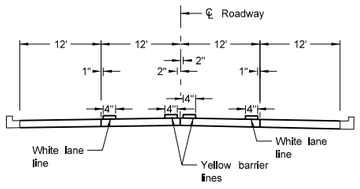
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



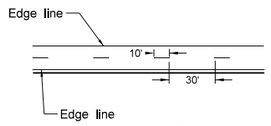
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



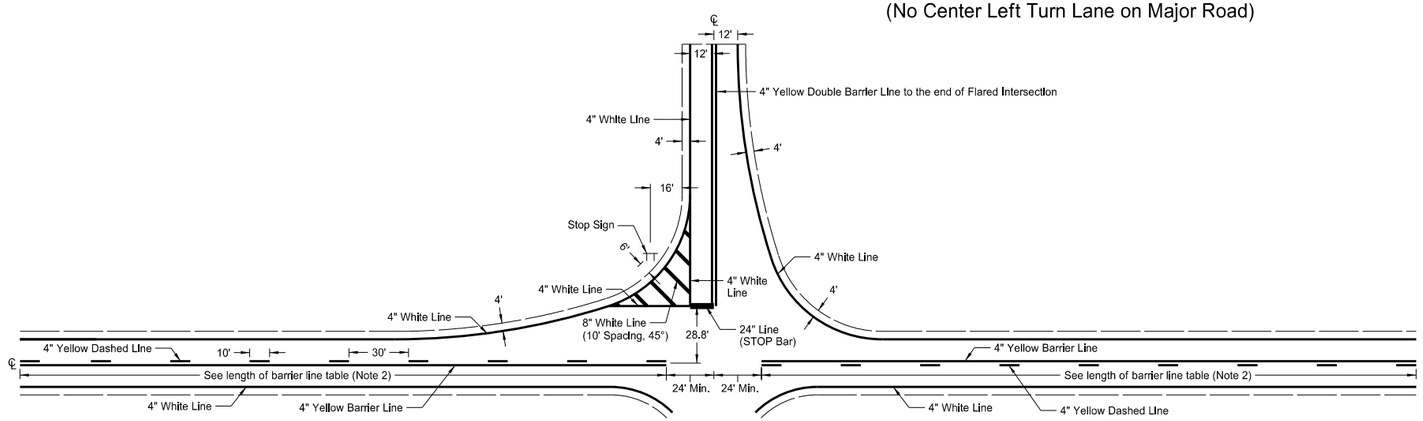
CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

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

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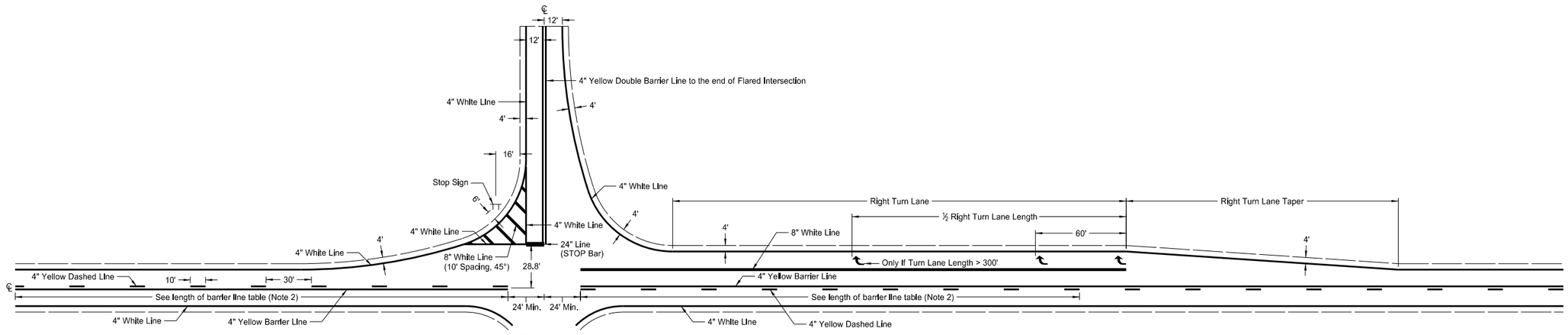
PAVEMENT MARKING FOR STANDARD 90 DEGREE FLARED INTERSECTION

(No Center Left Turn Lane on Major Road)



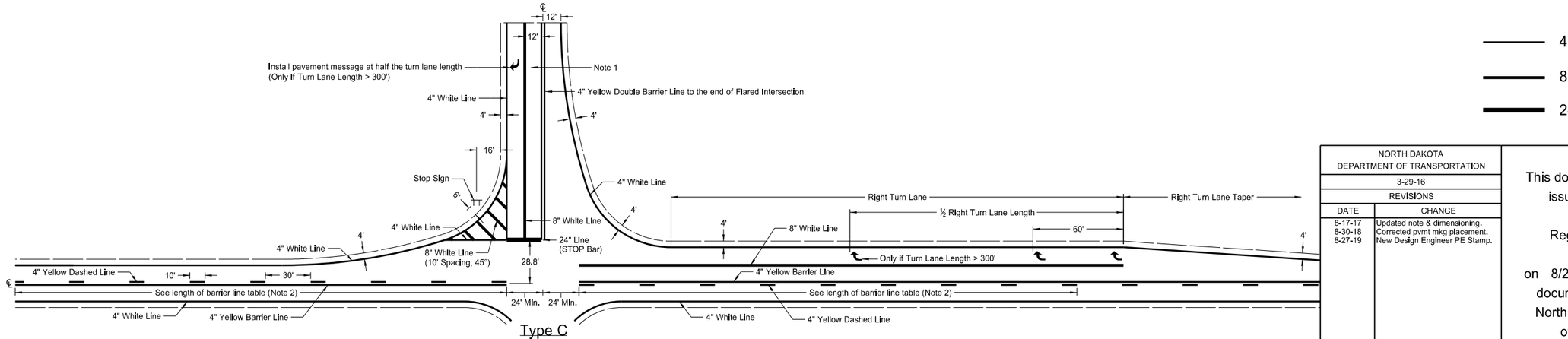
Type A

(No turn lanes present)



Type B

(Right Turn Lane on Major Road)



Type C

(Right Turn Lane on Major Road, and Turn Lane on Minor Road)

Notes

1. At "T" intersections (3-leg), additionally install left turn pavement marking message arrow.
2. The barrier lines have variable distances dependent on speed limit. Obtain barrier line length from table below (stopping sight distance.)

Table for Length of Barrier Line									
Speed Limit (mph)	30	35	40	45	50	55	60	65	70
Minimum Length	200'	250'	305'	360'	425'	495'	570'	645'	730'

4" Marking

8" Marking

24" Marking

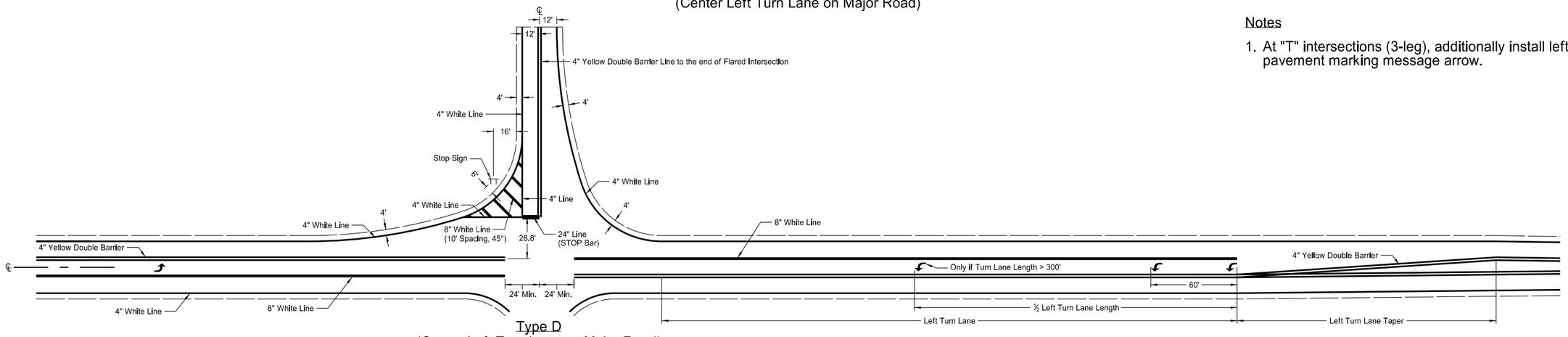
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-29-16	
REVISIONS	
DATE	CHANGE
8-17-17 8-30-18 8-27-19	Updated note & dimensioning. Corrected pvmt mkg placement. New Design Engineer PE Stamp.

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PAVEMENT MARKING FOR STANDARD 90 DEGREE FLARED INTERSECTION

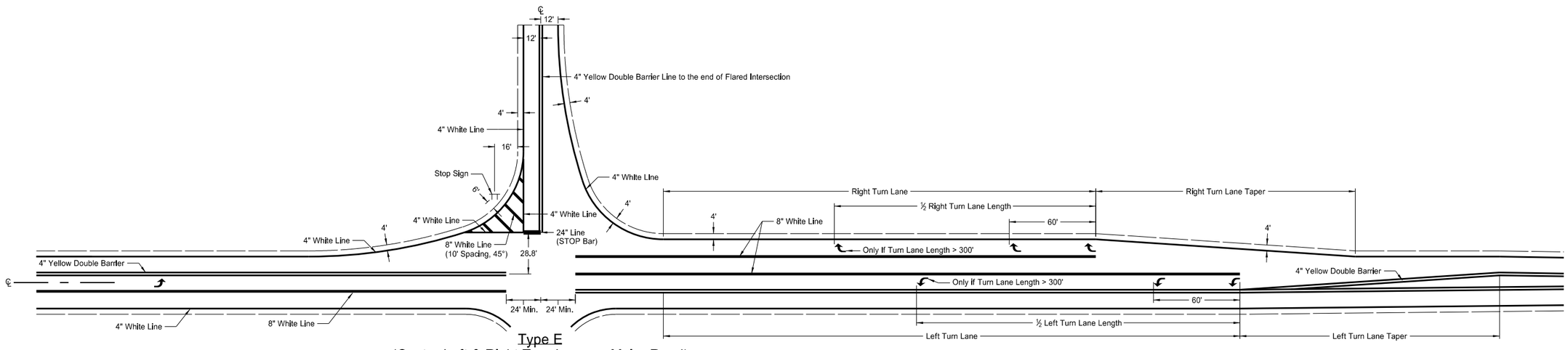
D-762-6

(Center Left Turn Lane on Major Road)



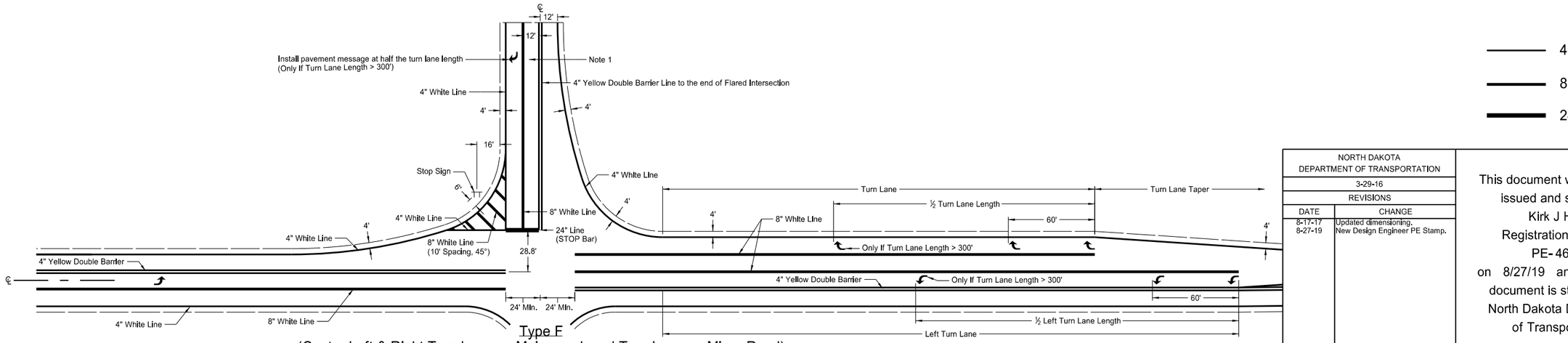
Type D

(Center Left Turn Lane on Major Road)



Type E

(Center Left & Right Turn Lane on Major Road)



Type F

(Center Left & Right Turn Lane on Major road, and Turn Lane on Minor Road)

Notes

1. At "T" intersections (3-leg), additionally install left turn pavement marking message arrow.

4" Marking

8" Marking

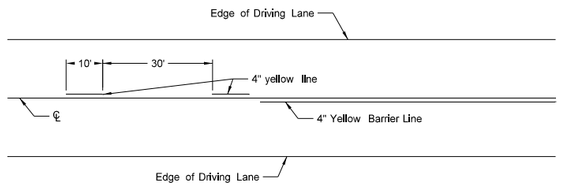
24" Marking

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-29-16	
REVISIONS	
DATE	CHANGE
8-17-17	Updated dimensioning.
8-27-19	New Design Engineer PE Stamp.

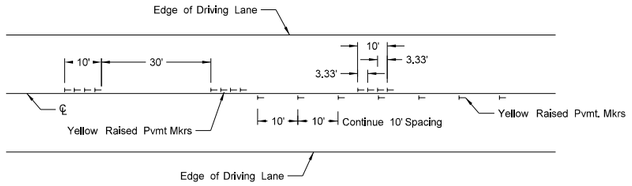
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SHORT-TERM PAVEMENT MARKING

D-762-11

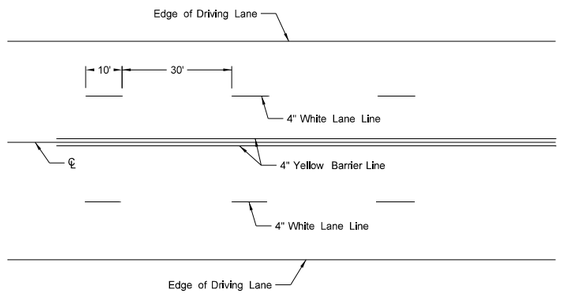


Painted or Tape Lines

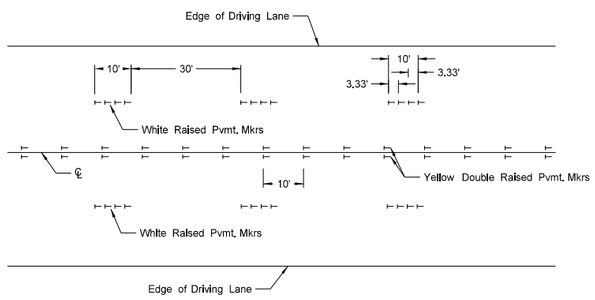


Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

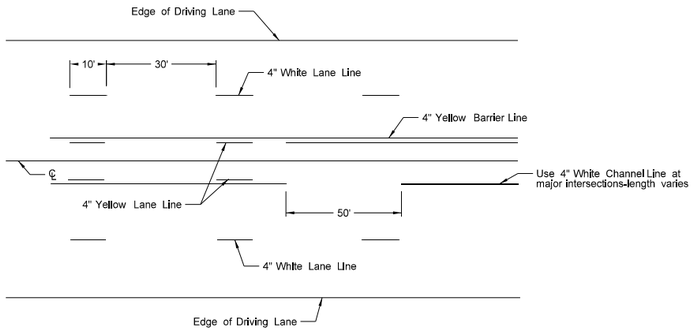


Painted or Tape Lines

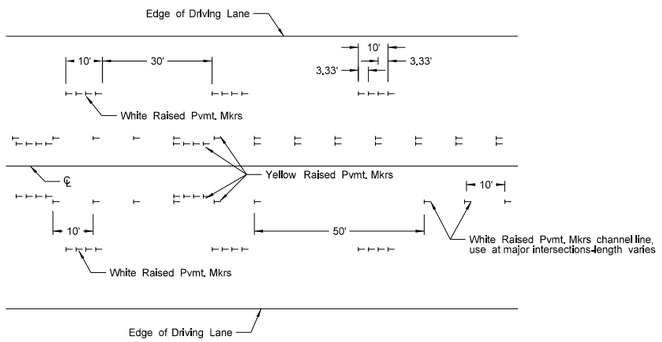


Raised Pavement Markers

FOUR LANE ROADWAY

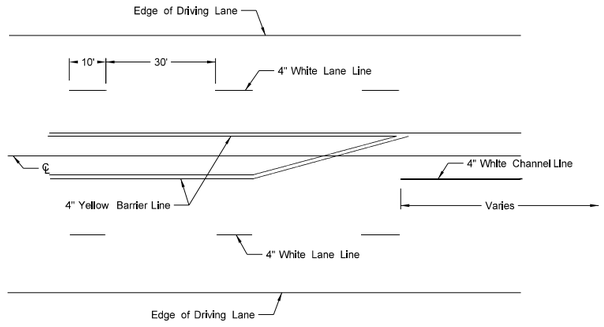


Painted or Tape Lines

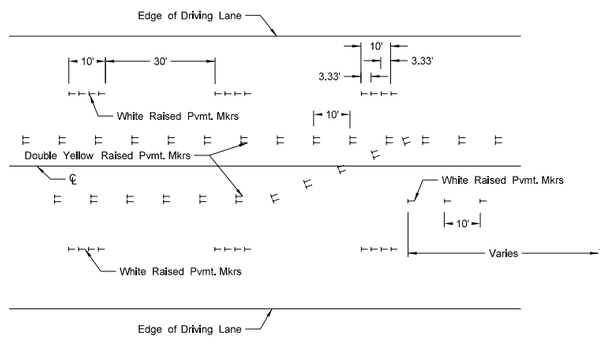


Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTES:

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

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

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