	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	24795	1	1

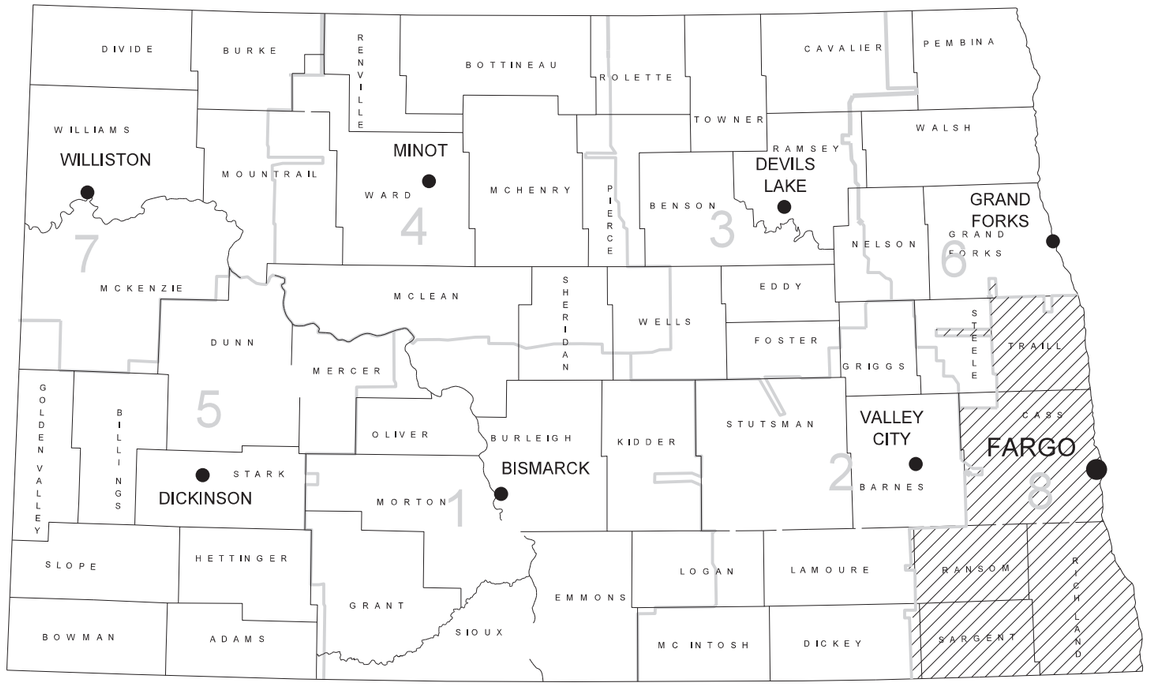
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

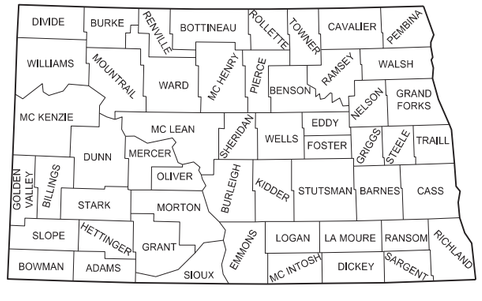
HES-8-999(063)
Cass, Ransom, Richland, Sargent, Traill
Fargo District

Pavement Marking Replacement

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	7/1/2025
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION — NET MILES — GROSS MILES
HES-8-999(063)





STATE COUNTY MAP

DESIGNER
Lyle Landstorm
DESIGNER
Connor Wilson
DESIGNER

ND DEPARTMENT OF TRANSPORTATION
FARGO DISTRICT

joe peyerl
joe peyerl
01/23/26

NDDOT FARGO DISTRICT

LYLE LANDSTROM
REGISTERED
PROFESSIONAL
PE-4079
01/23/26
ENGINEER
NORTH DAKOTA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	2	1

TABLE OF CONTENTS

PLAN SECTIONS

LIST OF STANDARD DRAWINGS

SPECIAL PROVISIONS

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	4	1

NDDOT FARGO DISTRICT

Notes:

1.	H8-010(044)000 & H-8-010(049)002	Chip Seal.
2.	HEN-8-032(051)020	Roundabout
3.	IM-8-094(118)347	CPR
4.	IM-8-029(203)101	Reconstruction
5.	IM-8-029(214)011	CPR / Stitching
6.	SS-8-018(122)000	Chip Seal
7.	NH-8-013(067)365	Chip Seal
8.	SS-8-032(052)036	Chip Seal
9.	SS-8-013(068)920	Chip Seal
10.	SS-8-018(123)055	Chip Seal
11.	H-8-999(064)	District Patching

SARGENT
RANSOM
RICHLAND
CASS
TRAILL

FORT RANSOM
ELLIOT
ELLIOTT
LISBON
ENDERLIN
SHELDON
ALICE
TOWER CITY
BUFFALO
PAGE
AYR
AMENIA
HUNTER
GALESBURG
CLIFFORD
PORTLAND
MAYVILLE
HATTON
BUXTON
ARTHUR
CASSELTON
MAPLETON
WEST FARGO
FARGO
HARWOOD
GRANDIN
GARDNER
HILLSBORO
DAVENPORT
KINDRED
WALCOTT
COLFAX
CHRISTINE
HICKSON
ABERCROMBIE
LEONARD
WYNDMERE
BARNEY
MOORETON
DWIGHT
GREAT BEND
WAHPETON
FAIRMOUNT
HANKINSON
LIDGERWOOD
MILNOR
GWINNER
COGSWELL
FORMAN
RUTLAND
CAYUGA
HAVANNA

Note 1
Note 2
Note 3
Note 4
Note 5
Note 6
Note 7
Note 8
Note 9
Note 10
Note 11

RP 101.373
RP 110.943
RP 77.9
RP 77.4
RP 69.15
RP 88.27
RP 59.84
RP 59.692
RP 53.9
RP 50.4
RP 44
RP 11.3

Edgeline Only
Edgeline Only

Work Areas
Omitted Areas
Coordinate with Construction

SCOPE OF WORK

LYLE LANDSTROM
REGISTERED
PROFESSIONAL
ENGINEER
NORTH DAKOTA
PE-4079
01/20/26

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HES-8-999(063)	6	1

NOTES

GENERAL NOTES

100-P01 COORDINATION OF PROJECTS: Another project in the vicinity of this project is under contract during the 2026 construction season. This project is H-8-999(064) – District Patching.

107-P01 RAILROAD COORDINATION: Install longitudinal striping as a mobile operation. Install RR Crossing Markings as shown on D-762-1 so that all equipment, materials, and workers are 25 feet or more measured from the nearest rail.

Email the RR Company a minimum of 7 days before beginning work at each crossing. Retain proof and receipt of email from the RR Company for records. If notice of receipt is not received, call the person as identified below."

Company	Name of Contact	Title	Email	Phone	Crossing ID (USDOT)	Milepost
BNSF	Alexis Jones	Manager of Public Projects: MN, ND, SD, Manitoba	alexis.jones@bnsf.com	(901) 495-3778	081782M 087060B 086728L	400 384.404 136
CPKC	Brian Osborne	Manager of Public Works	brian.osborne@cpkcr.com	612-330-4555	691883E	265
DMVW	Jeff Wood	Manager	jwood@dmvwrr.com	701-223-9282	690359F	11.76

Cost to be included in the price bid for other items.

107-P02 RAILROAD PROTECTIVE LIABILITY INSURANCE:
Include the cost of railroad insurance in the contract to cover the number of crossings for each company identified as follows:

Current Spec	Current Code	Unit	Description	Covers Company	Number of Crossings
107	121	L SUM	RAILWAY PROTECTION INSURANCE-COMPANY A	BNSF	3
107	122	L SUM	RAILWAY PROTECTION INSURANCE-COMPANY B	DMVW	1

Upon receiving proof of approval of the policies by the railroad company, the Department will pay the Contractor the lump sum contract unit price.

107-111 RAILROAD PROTECTIVE LIABILITY INSURANCE: This project crosses the Dakota, Missouri Valley & Western Railroad Company at 11.76. The type of work that will be performed within the railroad right of way is edgeline, centerline, replacing railroad markings. Direct inquiries regarding protective liability insurance to:

JEFF WOOD
Executive Vice President
Dakota, Missouri Valley & Western Railroad, Inc.
3501 East Rosser Avenue
Bismarck, ND 58501
701-223-9282 off.
jwood@dmvwrr.com

Obtain information regarding crossing number 690359F from the Federal Railroad Administration website: http://safetydata.fra.dot.gov/Officeofsafety/

107-115 RAILROAD PROTECTIVE LIABILITY INSURANCE: This project crosses the BNSF Railway Company at RP 3.02, 18.87, 66.69, 75.19, 84.77, 114.039, 114.039, 124.01, 136.35, 384.86, 395.94. The type of work that will be performed within the railroad right of way is edgeline, centerline, replacing railroad markings. Direct inquiries regarding protective liability insurance to:

Rosa Martinez
Marsh USA Inc.
4400 Comerica Bank Tower
Dallas, TX 75201-7357, USA
214-303-8519
Rosa.M.Martinez@marsh.com

Obtain information regarding crossing number 071145F, 09335G, 070867J, 071103U, 092991B, 086871W, 96531R, 087080M, 086728L, 087060B, and 087090T from the Federal Railroad Administration website: http://safetydata.fra.dot.gov/Officeofsafety/

762-P01 PREFORMED PATTERNED PAVEMENT MARKING-GROOVED: Remove all existing pavement markings after the grooving is complete. Do not groove deeper than the original groove. Include the cost of removing existing markings in the unit price bid for grooved markings.

762-P02 REPLACEMENT OF PAVEMENT MARKINGS NOT IDENTIFIED IN THE PLANS: Although the plans have identified specific locations to be remarked, it is difficult to determine all of them prior to the construction season. The intent is to reapply any worn pavement markings that are found during this project, it is anticipated that additional quantities will be used.

ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HES-8-999(063)	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
103	0100	CONTRACT BOND	L SUM	1	1
107	0121	RAILWAY PROTECTION INSURANCE - COMPANY A	L SUM	1	1
107	0122	RAILWAY PROTECTION INSURANCE - COMPANY B	L SUM	1	1
702	0100	MOBILIZATION	L SUM	1	1
762	0103	PVMT MK PAINTED-MESSAGE	SF	29	29
762	0109	PVMT MK INSTALLATION - 6IN	MILE	1,495	1,495
762	0111	EPOXY PVMT MK 12IN LINE	LF	1,670	1,670
762	0112	EPOXY PVMT MK MESSAGE	SF	3,505	3,505
762	0113	EPOXY PVMT MK 4IN LINE	LF	3,791	3,791
762	0115	EPOXY PVMT MK 8IN LINE	LF	230	230
762	0117	EPOXY PVMT MK 24IN LINE	LF	1,283	1,283
762	0118	EPOXY PVMT MK CURB TOP & FACE	LF	150	150
762	0122	PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)	SF	1,084	1,084
762	0806	METHYL METHACRYLATE PVMT MK 6IN LINE	LF	301	301
762	0808	METHYL METHACRYLATE PVMT MK 8IN LINE	LF	30	30
762	0824	METHYL METHACRYLATE PVMT MK 24IN LINE	LF	182	182
762	0830	METHYL METHACRYLATE PVMT MK MESSAGE	SF	32	32
762	1104	PVMT MK PAINTED 4IN LINE	LF	2,006	2,006
762	1108	PVMT MK PAINTED 8IN LINE	LF	32	32
762	1112	PVMT MK PAINTED 12IN LINE	LF	50,440	50,440
762	1124	PVMT MK PAINTED 24IN LINE	LF	3,120	3,120
762	1140	PVMT MK PAINTED CURB TOP & FACE	LF	62	62
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED	LF	1,101	1,101
762	1307	PREFORMED PATTERNED PVMT MK 6IN LINE-GROOVED	LF	3,549	3,549
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED	LF	1,560	1,560
762	1315	PREFORMED PATTERNED PVMT MK 12IN LINE-GROOVED	LF	3,856	3,856
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED	LF	622.5	622.5
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST-GROOVED	LF	200	200

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HES-8-999(063)	11	1

ESTIMATED QUANTITIES

ROUTE	LOCATION	FROM REF PT	TO REF PT	ROADWAY MILES	6" C.L. MILES	6" BARRIER MILES	6" EDGELINE MILES	6" TOTAL MILES	TABLE NOTE
ND 10	Lynchburg going East	0	12.5	12.5				0	Omit for Const. Chip Seal
ND 11	RP 106.242 to RP 128+/- at Forman	106.242	128.149	21.907	5.477	5.000	43.084	53.561	
ND 11	E. side of Forman to MN Border	128.149	182.459	54.310	13.028	15.500	108.620	137.148	
ND 13	Jct ND 1 to Gwinner 25 mph Zone	318.385	338.537	20.152	5.038	5.100	20.152	30.290	
ND 13	Gwinner 25 mph Zone	338.537	339.390	0.853	0.000	1.706	0.810	2.516	To 45 mph zone
ND 13	Gwinner to Jct ND 18	339.390	365.465	26.075	6.519	6.200	52.150	64.869	
ND13	Jct ND 18 to Jct I-29	365.465	380.194	14.729				0.000	Omit for Const. Chip Seal
ND 13	Jct I-29 to Wahpeton	380.194	390.819	21.250	5.561	0.000	44.488	50.049	
Old ND 13	Jct ND13 to Jct ND 127	920.114	921.579	1.579				0	Omit for Const. Chip Seal
ND 18	SD Line to Jct. ND 11	0.000	9.198	9.198				0.000	Omit for Const. Chip Seal
ND18	Jct ND 11 to Jct ND 13	9.198	24.827	15.629	3.907	2.930	31.258	38.096	
ND 18	Wyndemere 25 mph Zone	24.827	25.726	0.899	0.030	1.678	0.808	2.516	
ND 18	Wyndemenre to E. Jct 46	25.726	50.650	24.924	6.231	4.673	49.848	60.752	
ND 18	E. Jct. 46 to Casselton 25 mph Zone	50.650	55.589	4.939	1.235	5.800	9.878	16.913	
ND18	W Jct ND 46 Leonard N to Casselton	55.589	73.262	17.673				0	Omit for Const. Chip Seal
ND 18	Casselton 25 mph Zone	73.262	75.955	2.693	0.000	1.500	1.140	2.640	
ND 18	Casselton to Arthur 25 mph Zone	75.955	89.394	13.439	3.360	1.200	26.878	31.438	
ND 18	Arthur 25 mph Zone	89.394	90.056	0.662	0.000	1.324	0.160	1.484	
ND 18	Arthur to Hunter 25 mph Zone	90.056	95.420	5.364	1.341	0.100	10.728	12.169	
ND 18	Hunter 25 mph Zone	95.420	95.976	0.556	0.390	0.550	0.572	1.512	
ND 18	Hunter to Traill Co. Liine	95.976	99.075	3.099	0.775	0.000	6.198	6.973	
ND 18	Trail Co. Line to Blanchard	99.075	106.903	7.828	1.957	1.468	15.656	19.081	
ND 18	Blanchard to MayvIlle 25 mph Zone	106.903	121.585	14.682	3.671	2.000	29.364	35.035	
ND 18	Mayville 25 mph Zone	121.585	121.884	0.299	0.082	0.150	0.360	0.592	
ND 18	Mayville to Portand 25 mph Zone.	123.233	123.618	0.385	0.240	1.780	3.300	5.320	
ND 18	Portland 25 mph Zone	123.618	124.375	0.757	0.070	1.280	0.560	1.910	
ND 18	Portland 35 mph zone	124.375	124.509	0.134	0.000	0.268	0.000	0.268	
ND 18	Portland to Jct. ND 200	124.509	129.127	4.618	1.155	0.416	9.236	10.807	
ND 18	Jct ND 200 to Jct. ND 15	129.127	144.129	15.002	3.751	4.500	30.004	38.255	

Note: Reference points may vary slightly.

PAVEMENT MARKING

ND 10, ND 11, ND 13, ND 18

SUMMARY

LYLE LANDSTROM REGISTERED PROFESSIONAL ENGINEER PE-4079 01/20/26 NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HES-8-999(063)	11	2

ESTIMATED QUANTITIES

ROUTE	LOCATION	FROM REF PT	TO REF PT	ROADWAY MILES	6" C.L. MILES	6" BARRIER MILES	6" EDGELINE MILES	6" TOTAL MILES	TABLE NOTE
ND 27	Jct. ND 1 to Lisbon 25 mph Zone	0.000	18.239	18.239	4.560	6.600	36.478	47.638	
ND 27	Lisbon 25 mph Zone to Birch Street	18.239	18.359	0.120	0.030	0.000	0.240	0.270	
ND 27	Lisbon 25 mph Zone, Birch St. to ND 32.	18.357	18.999	0.642				0.000	Markings are Epoxy
ND 27	Lisbon to Jct. ND 18	19.319	44.930	25.611	6.403	5.400	51.222	63.025	
I-29	SD Line to RP 11.3	0.000	11.300	22.600			45.200	45.200	Omit Centerline, Markings are tape
I-29	RP 11.3 to Jct. ND 13	11.300	22.570	22.540				0.000	Omit for Const. CPR.
I-29	Southbound Jct ND 13 to RP 33.4	22.570	33.400	10.830			1.000	1.000	Omit Markings are epoxy, **Except HP Scale**
I-29	Northbound Jct ND 13 to RP 33.4	22.570	33.400	10.830				0.000	Omit, Markings are epoxy 2023
I-29	RP 33.4 to RP 44	33.400	44.000	21.200				0.000	Omit, Epoxy applied in 2020
I-29	RP 44 to RP 50.4	44.000	50.400	12.800			25.600	25.600	Omit, CL = Tape
I-29	RP 50.4 to RP 53.9	50.400	53.900	7.000				0.000	Omit, Markings are Epoxy applied in 2021
I-29	Northbound RP 53.9 to RP 59.692	53.900	59.692	5.792			11.540	11.540	Omit Centerline, Markings are tape
I-29	Southbound RP 53.9 to 59.84	53.900	59.840	5.940			11.880	11.880	Omit Centerline, Markings are tape
I-29	North Bound RP 59.692 to RP 69.15	59.692	69.150	9.458				0.000	Omit - Tape,
I-29	Southbound RP 59.84 to RP 69.15	59.840	69.150	9.310				0.000	Omit - Tape
I-29	Northbound RP 69.15 to RP 77.4	69.150	77.400	8.250			16.500	16.500	Omit Centerline, Markings are tape
I-29	Southbound RP 69.15 to RP 77.9	69.150	77.900	8.750			17.500	17.500	Omit Centerline, Markings are tape
I-29	Northbound RP 77.4 to RP 88.27	77.400	88.270	10.870				0.000	Omit, Epoxy applied in 2024
I-29	Southbound RP 77.9 to RP 88.27	77.900	88.270	10.370				0.000	Omit, Epoxy under warranty
I-29	88.27 to RP 101.5	88.270	101.373	13.103				0.000	Omit markings are Epoxy
I-29	Northbound RP 101.5 to RP 110.943	101.373	110.943	9.570	x			0.000	Omit for Const. Reconstruct
I-29	Southbound RP 101.5 to RP 110.943	101.373	110.943	9.570			0.000	0.000	Omit for Const. Head to Head Traffic
I-29	RP 110.943 to RP 118.012	110.943	118.012	7.069			28.276	28.276	Omit centerline, markings are Tape
I-29	Rest Areas NB at RP 3 (Lake Agassiz)							1.000	Average of 1 mile per rest area, edgeline only
I-29	Ramps & Overheads SD Line to Buxton	0.000	118.012						Avg .4 mile per ramp or loop, & .32 for overheads
	Exits 1,2,8,15, 37, 42,								
	44, 48, 50, 54, 56, 69, 78, 85, 111SB, 118							29.920	62 ramps-loops, 16 overheads
	Exit 104, 111 NB Ramps, Exit 72								Omit for const. Reconstruct 10 ramps & 2 overhead

Pavement Marking Painted 24 IN Line: Stop Bars
31 Rural Interstate Off-Ramps x 60 LF = 1860 LF

Pavement Marking Painted 12 IN Line: Gore Areas
32 Exit Ramps x 580 LF 18,560 LF
32 Entrance Ramps x 390 LF 12,480 LF
Total = 31,040 LF
(Includes Lake Agazziz Rest Area)

PAVEMENT MARKING

ND 27 & I-29

SUMMARY

LYLE LANDSTROM REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA
PE-4079
01/20/26

ESTIMATED QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HES-8-999(063)	11	3

ROUTE	LOCATION	FROM REF PT	TO REF PT	ROADWAY MILES	6" C.L. MILES	6" BARRIER MILES	6" EDGELINE MILES	6" TOTAL MILES	TABLE NOTE
ND 32	SD Line to Forman	0	11.423	11.423	2.85	6.1	22.846	31.796	
ND 32	Forman 25 mph Zone	11.423	12.443	1.020	0.17	1.35	2.04	3.56	To 45 mph zone.
ND 32	Forman to Gwinner 25 mph zone	12.443	21.189	8.746	2.1865	5.44	17.492	25.119	
ND32	Gwinner Jct ND 13 to Froman Jct ND 32	20.465	20.068	0.397				0.000	Omit, for Const. Roundabout
ND 32	Gwinner 25 mph Zone	21.189	21.524	0.335	0.052	0.33	0.67	1.052	
ND 32	Gwinner to Lisbon 40 mph Zone	21.524	35.428	13.904	3.476	1.8	27.808	33.084	
ND 32	Lisbon 40 & 25 mph Zones	35.428	36.896	1.468	0.622	0.115	0.4	1.137	
ND 32	Lisbon to Jct. ND 46	36.896	49.51	12.614				0	Omit, for Const.
ND 38	I-94 to Page	0.000	19.520	19.520	4.880	3.660	39.040	47.580	
ND 46	ND 32 to RP 93.113	79.935	93.113	13.178	3.100	2.330	24.846	30.276	Painted
ND 46	RP 93.113 to RP 106.014	93.113	106.014	12.901	12.901	0.800	25.802	39.503	
ND 46	RP 106.014 to Cass Co. 81	106.014	120.818	14.804	3.701	2.100	29.608	35.409	
US 81	40th Ave. S to 52nd Ave. S	920.000	922.655	2.655				0.000	Omit, markings are Tape
US 81	19th Ave Interchange to Dakota Drive Asphalt Sec.	930.247	930.826	0.426	0.215	1.580	0.580	2.375	Omit Concrete Sec.
I-94	RP 314.863 to near RP 323 (EB)	314.863	323.000	16.274	0.000	0.000	32.548	32.548	Omit Centerline, Preformed Tape.
I-94	RP 314.863 to near RP 324 (WB)	314.863	324.000	18.274	0.000	0.000	36.548	36.548	Omit Centerline, Markings are tape
I-94	Near 323 to 331.246 (EB)	323.000	331.246	16.492				0.000	Omit, Grovved Epoxy
I-94	Near 324 to 331.246 (WB)	324.000	331.246	14.492				0.000	Omit, Grooved Epoxy
I-94	RP 331.246 to 342.833 (WB)	331.246	341.803	10.557	2.639		21.114	23.753	
I-94	RP 331.246 to 342.833 (EB)	331.246	342.833	11.587	0.000	0.000	23.174	23.174	Omit Centerline, preformed
I-94	RP 342.803 to 347.489	342.803	347.489	9.372				0.000	Omit, Markings are grooved epoxy
I-94	RP 347.489 to 352.454	347.489	352.454	4.965				0.000	Omit, for Const. CPR
I-94	Ramps & Overheads Exit 314 to Exit 342	315.652	342.803						Avg .40 mile/ramp. .32 mile per overhead
	Exits 314, 317, 320, 322, 324, 331, 338, 340, 342,							17.280	36 ramps = paint and 9 ovehead = paint
ND 127	SD Line to Wahpeton 25 mph Zone	0.000	22.317	22.317	5.579	0.900	44.635	51.114	
ND 127	RP 22.317 to Jct. ND 13	22.317	22.695	0.378	0.040	0.370	0.380	0.790	
ND 200	Jct ND 32 to W. Jct. ND 18	359.041	377.411	18.370	4.593	0.890	36.740	42.223	
ND 200	Just E. of E. Jct 18 to E. of I-29	385.232	396.300	11.068	2.767	3.500	22.136	28.403	
ND 200	396.3 to 401.88	396.300	401.880	5.580			11.600	11.600	Omit CL (epoxy) (concrete section)
ND 200	401.88 to 402.65	401.880	402.650	0.770	0.192	0.400	1.540	2.132	
ND 200	402.65 to 403.233	402.650	403.233	0.583				0.000	Omit, Hillsboro curb and gutter section (Tape)
ND 200	403.233 to 406.499	403.233	406.499	3.266	0.817	0.730	0.730	2.277	
ND 200	406.499 to 415.778	406.499	415.778	9.279	2.320	1.701	18.558	22.579	
ND 200A	ND 18 to ND 200	951.437	959.790	8.353	2.088	1.566	16.706	20.360	
ND 210	Wahpeton Bypass	0.000	2.804	2.804			5.600	5.600	Omit Centerline, Preformed Tape.
	TOTAL MILES PAINT			862.271				1494.812	

Note: Reference points may vary slightly.

Pavement Marking Painted 24 IN Line: Stop Bars
19 Rural Interstate Off-Ramps x 60 LF = 1140 LF

Do not paint Stop Bar at WB Exit 331. It is thermoplastic.

Pavement Marking Painted 12 IN Line: Gore Areas
20 Exit Ramps x 580 LF 11,600 LF
20 Entrance Ramps x 390 LF 7,800 LF
Total = 19,400 LF
(Includes Truck Parking Area, RP 337)

PAVEMENT MARKING

ND 32, ND 38, ND 16, US 81, I-94

SUMMARY

LYLE LANDSTROM REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA
PE 4079
01/20/26

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HES-8-999(063)	11	4

ESTIMATED QUANTITIES

Preformed Plastic Pavement Markings

Hwy	Location	RP	Direction	6" (LF)	24" (LF)	Msg. (SF	Notes
10	Main Ave. W. Fargo & 15th St.	933.5		275	60		Replace both 15th St. crosswalks
11	ND 11& 168th Ave SE	166	EB			16	1 Lt. Arrow
13	ND 13 & Sargent CR 4	331.36	E & W			64	2 Lt. Arrow, 2 Rt Arrows
13	ND 13 in Gwinner @ 1st St.	338			132		Replace both crosswalks
18	Lidgerwood RR Xing	11.76	Both			48	Replace 1 band NB, 1 band SB (DMV&W)
200	Mayville RR Xing	384.404	Both			265	BNSF
			Totals	**275**	**192**	**393**	

Epoxy Railroad Crossings

Hwy	Location	RP	Direction	Qty (SF)	Rail Road
18	Wyndmere	25.637	Both	265	RRVW
18	Wyndmere	25.934	Both	265	CPKC
18	Hatton	136	Both	265	BNSF
Total				**795**	

762 0112 EPOXY PVMT MK MESSAGE
RAILROAD CROSSINGS WHITE = 795 SF

762 0122 PREFORMED PATTERNED PVMT MK MESSAGE (GROOVED)
(3) Lt. ARROWS, (2) Rt. ARROWS, (2) RR BANDS, (4) rr x-INGS = 393 SF.

762 1307 PREFORMED PATTERNED PVMT MK 6 IN LINE - (GROOVED)
WHITE CROSSWALK LINES = 275 LF

762 1325 PREFORMED PATTERNED PVMT MK 24 IN LINE - (GROOVED)
WHITE STOP BARS = 222 LF

EPOXY, PREFORMED,

LOCATIONS NOT SHOWN
ON DETAIL SHEETS

LYLE LANDSTROM
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PROFESSIONAL
ENGINEER
PE-4079
01/20/26
NORTH DAKOTA

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HES-8-999(063)	11	5

Section and Sheet No.

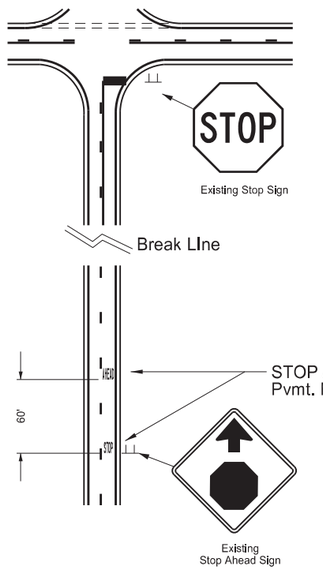
SPEC	CODE	ITEM	UNIT	11_2	11_3	11_4	120_1	120_2	120-3	120_4	120_5	120_6	120_7	120_8	120_9	120_10	120_11	120_12	120_13	120_14	120_15	120_16	120_17	120_18	120_19	120_20	120_21	Totals
762	103	PVMT MK PAINTED-MESSAGE	SF					29																				29
762	108	PVMT MK INSTALLION 4"	MILE																									0
762	109	PVMT MK INSTALLION 6"	MILE			1495																						1495
762	111	PVMY MK EPOXY 12" (Non-grooved)	LF								920	750																1670
762	112	EPOXY PVMT. MKING. MESSAGE	SF			795	2652										29	29										3505
762	113	EPOXY PVMT. MKING. 4 IN LINE	LF															3791										3791
762	115	EPOXY PVMT. MKING. 8 IN LINE	LF														115	115										230
762	117	EPOXY PVMT. MKING. 24 IN LINE	LF				1283																					1283
762	118	EPOXY PVMT MK CURB TOP & FACE	LF														95	55										150
762	122	PREF PATT PVMT MK MESSAGE-GROOVED	SF			393			44	48				66	16	16			319		16	64	38	64					1084
762	806	METHYL METHACRYLATE PVMT MK 6 IN LINE	LF																							118	183	301
762	808	METHYL METHACRYLATE PVMT MK 8 IN LINE	LF							30																		30
762	824	METHYL METHACRYLATE PVMT MK 24 IN LINE	LF							140																12	30	182
762	830	METHYL METHACRYLATE PVMT MK MESSAGE	SF							32																		32
762	1104	PVMT MK PAINTED 4IN LINE	LF					2006																				2006
762	1108	PVMT MK PAINTED 8IN LINE	LF					32																				32
762	1112	PVMT MK PAINTED 12 IN LINE	LF	31040	19400																							50440
762	1124	PVMT MK PAINTED 24 IN LINE	LF	1980	1140																							3120
762	1140	PVMT MK PAINTED CURB TOP AND FACE	LF					62																				62
762	1305	PREFORMED PATT PAVEMENT MARKING 4 IN LINE	LF						63						220	315			160			215	128					1101
762	1307	PREFORMED PATT PAVEMENT MARKING 6 IN LINE	LF			458				1300			1110							564				117				3549
762	1309	PREFORMED PATT PAVEMENT MARKING 8 IN LINE	LF							52					88				170		930	150		170				1560
762	1315	PREFORMED PATT PAVEMENT MARKING 12 IN LINE	LF								1896	1960																3856
762	1325	PREFORMED PATT PAVEMENT MARKING 24 IN LINE	LF			222				96				60	38						34				172.5			622.5
762	1344	PREF PATT PVMT MK 7 IN LINE CONTRAST - GROOVED	LF							60					30						50	60						200

SHEET TOTALS

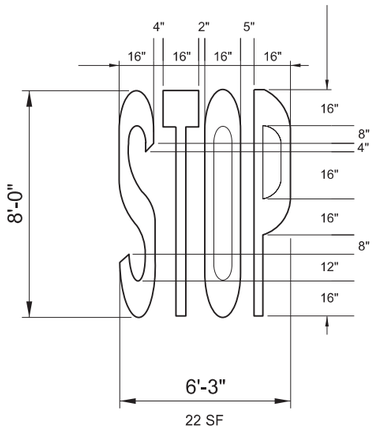
LYLE LANDSTROM REGISTERED PROFESSIONAL PE-4979 ENGINEER NORTH DAKOTA
01/20/26

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HES-8-999(063)	120	1

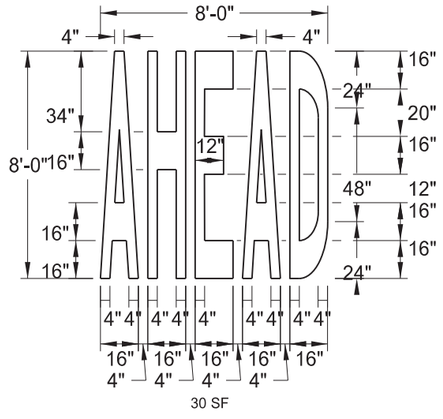
Intersection	Town	RP	Dir	Stop Bar Marking LF	Stop Ahead Marking SF	Comments
ND 11 & Co 2	West of Cogswell	115.23	NB	24		
			SB	24		
ND 11 & Co 4	Cogswell	121.43	NB	16	52	
			SB	16	52	
ND11 & ND32	South of Forman	129.47	WB	12	52	
ND 11 & Co 10	Rutland	135.74	NB	18	52	
			SB	20	52	
ND 11 & Co 12	Cayuga	141.73	NB	24		
			SB	24	52	
ND 11 & Co 14	W. of Lidgerwood	146.73	NB	0	0	Epoxy 2024
ND 11 & ND 18 (W Jct)	Lidgerwood	11.76 (ND18)	NB	18	0	
			SB	17	52	
ND 11 & ND 18 (E Jct)	East of Lidgerwood	155.25	NB	18	52	
ND 11 & Co 21	Hankinson	165.6	NB	20		Epoxy (2023)
			SB	18		Epoxy (2023)
ND 11 & Co 81	Oswald	173.89	NB	12	52	
			SB	17	52	
ND 11 & ND 127	Fairmount	7.976 (ND127)	NB	15	52	
			SB	28	52	
ND 13 & Co 2	Crete	324.36	NB	18	52	
			SB	14	52	
ND 13 & Co 4	Stirum	331.36	NB	24	52	Stop Ahead Sign
			SB	24		Gravel Road Now
ND 13 & Co 10	South of Milnor	348.13	NB	25	52	
ND 13 & 141 Ave SE (Co 10)	Milnor	350.45	SB			
ND 13 & Co 12	East of Milnor	353.47	NB	18	52	
ND 13 & Co 14	W. of Wyndmere	356.48	SB	14	52	
ND 13 & Co 3	East of Barney	372.5	NB	20	52	
ND 13 & Co 1	West of Mooreton	377.52	NB	11	52	
ND 13 & Mooreton Ave (Co 1)	Mooreton	377.96	SB	18	52	
ND 13 & Co 81	Dwight	384.64	SB	28	52	
ND 18 & E Jct. ND 32	Gwinner	19	NB			Omit for Construction
ND 18 & ND 46	South of Leonard	55.589	SB	12	0	Epoxy (2025)
		50.65	NB	12	52	
ND 18 & Co 6	Chaffee	66.33	EB	16	52	
			WB	16		
ND 18 & Co 32	Amenia	82.96	WB	14		
ND 18 & Co 4	South of Arthur	86.02	EB	23		
			WB	23	52	
ND 18 & Co 34	Arthur	90.02	EB	12		
			WB	16		
ND 18 & Co 26	South of Hunter	93.04	EB	24	52	
			WB	24	52	
ND 18 & ND 200	North of Blanchard	106.88	WB	0	0	Epoxy (2025)
ND 18 & ND 200	Mayville	121.81	NB	0	0	Epoxy (2025)
ND 18 & Co 19	South of Hatton	131.13	EB	18		
			WB	18		
ND 18 & Co 23	Hatton	136.1	EB	12	52	
		137.1	WB	14		
ND 27 & Co 58 (West)	Ft Ransom	6.98	SB	18	52	
ND 27 & Co 58 (East)	Englevale	7.97	NB	22	52	
ND 27 & Co 57	Elliott	12.48	NB	25	52	
ND 27 & Co 54 (West)	E Sheyenne River	27.94	SB	24	52	
ND 27 & Co 54 (East)	By Potato Buildings	28.98	NB	22	52	
ND 27 & Co 53	McLeod Museum	37.01	NB	15	52	
ND 27 & ND 18		44.973	EB	12	52	
			EB	16		
ND 32 & Co 7	Havana	1.02	WB	18		
ND 32 & Co 1	North of Forman	15.173	EB	17		
			WB	24	52	
ND 32 & Co 13	Lisbon	49	EB	0	0	Omit for Construction
ND 38 & 34th St SE (Co 10)	Buffalo South	2.95	EB	16	52	
ND 38 & Main St (Co 10)	Buffalo North	3.05	WB	14		
ND 38 & Co 4	Ayr	12.45	WB	24	52	
ND 38 & Co 26	Page	19.47	EB	24	52	
			WB	16	52	
ND 46 & ND 32	West of Enderlin	49.5	NB	16	52	
ND 46 & Co 38	East of Enderlin	85.78	SB	30	52	
ND 46 & Co 3	West of Kindred	110.75	NB	14	52	
ND 46 & Co 15	Kindred	111.93	SB	24	52	
ND 46 & Co 26	East of Kindred	114.74	NB	16	52	
ND 46 & Co 17	East of Kindred	116	SB	12	52	
ND 200 & ND 18	North of Portland	129.12	EB	12	52	
ND200 & Co 8	East of Finley	369	SB	12	52	
ND 200 & Co 13	North of Hillsboro	399.33	EB	16	52	
			WB	16	52	
ND 200 & Co 11	Hillsboro	402.88	WB	16		
ND 200 & Co 81	South of Hillsboro	406.5	NB		52	
			SB		52	
		1283			**2652**	



Typical Application



22 SF



30 SF

"STOP AHEAD" Pavement Marking Details

SPEC	CODE	BID ITEM	QTY	UNIT
762	112	EPOXY PVMT MK Message	2652	SF
762	117	EPOXY PVMT MK 24IN Line	1283	LF

STOP AHEAD - Repainting

Various Locations

FARGO District

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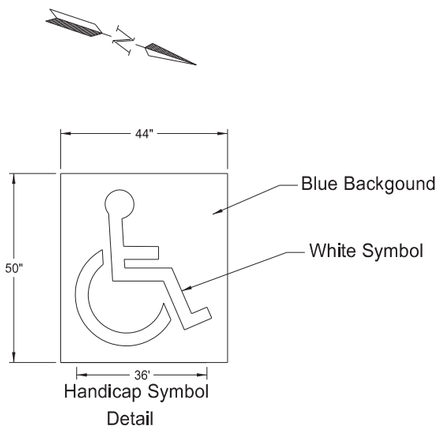
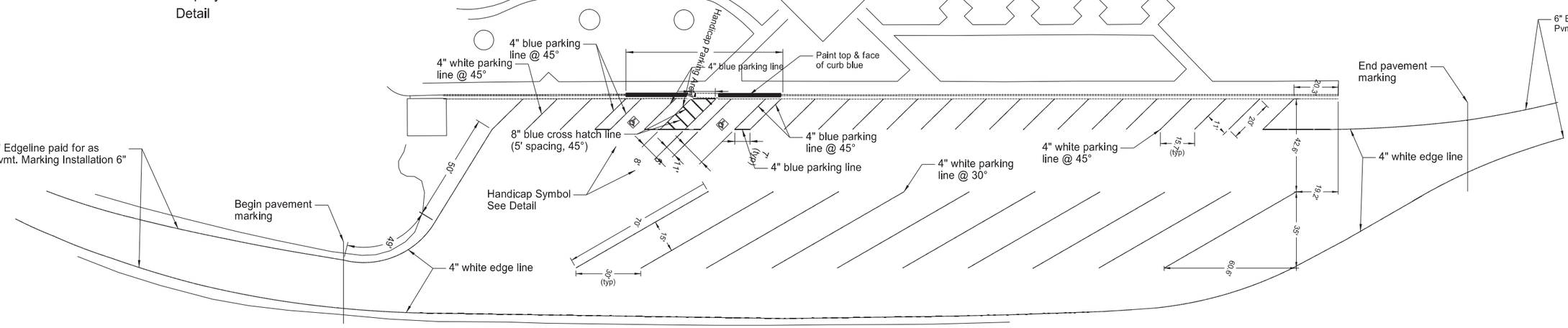
NORTH DAKOTA
01/20/26

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	2

SPEC	CODE	BID ITEM	QTY	UNIT
762	103	PVMT MK PAINTED MESSAGE		
		Handicap Symbols (2)	29	SF
762	1104	PVMT MK PAINTED 4IN LINE		
		White Parking line	1060	LF
		Blue Parking Line	211	LF
		White Edgeline	735	LF
		Total	2006	LF
762	1108	PVMT MK PAINTED 8IN LINE		
		Blue cross hatch line	32	LF
762	1140	PAINT PVMT MK CURB TOP & FACE		
		Blue	62	LF



Handicap Symbol
Detail



Note:
The intention is to re-apply over the top of the existing markings.

PAVEMENT MARKING LAYOUT

Lake Agassiz Rest Area

I-29 RP 3

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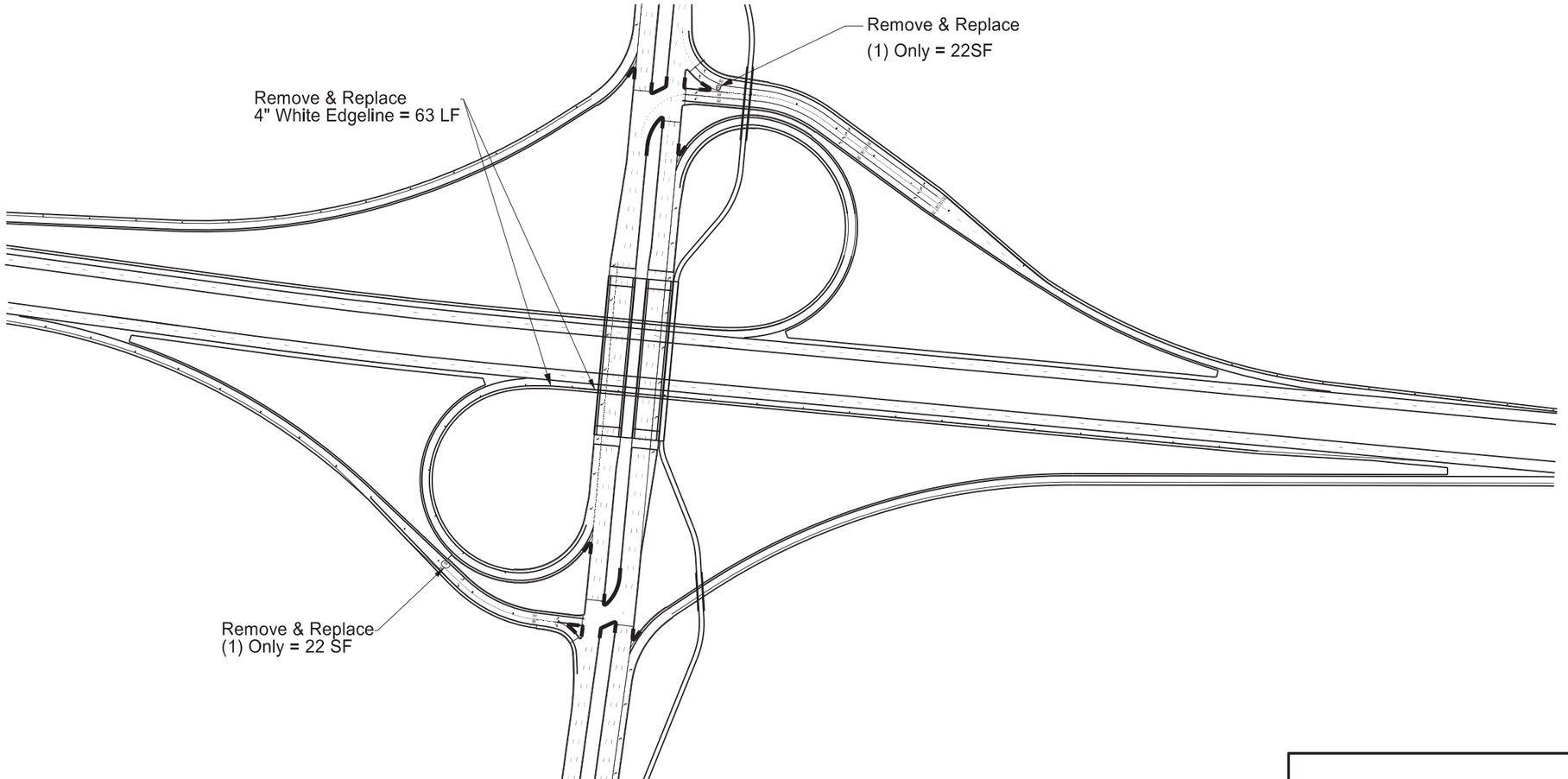
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	3

SPEC	CODE	BID ITEM	QTY	UNIT
762	122	PREFORMED PATTERNED PVMT MK - MESSAGE GROOVED (2) Only	44	SF
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED White Edgeline	63	LF



Pavement Marking

I-29 & 52nd Ave. S.

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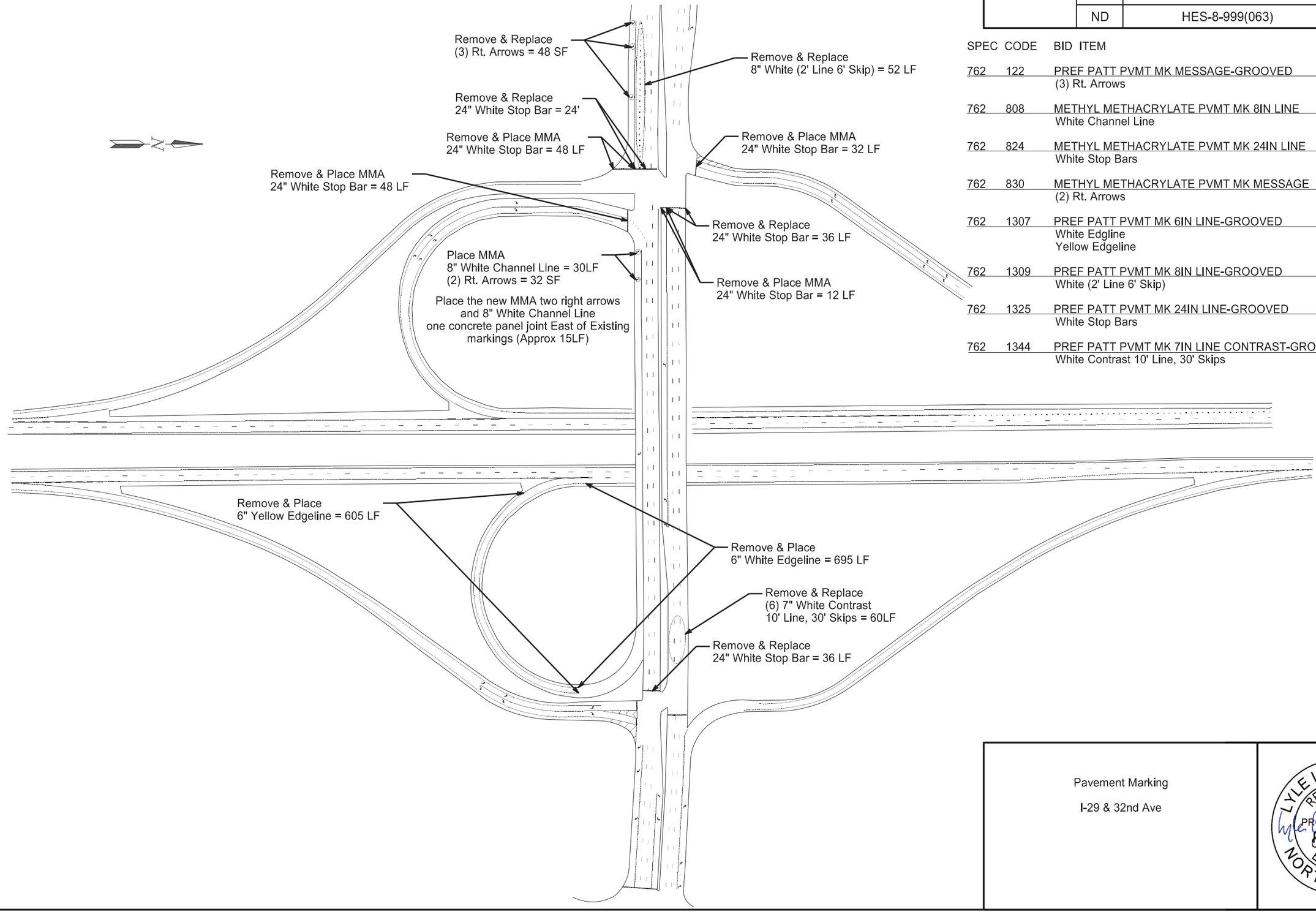
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	HES-8-999(063)	120	4



SPEC	CODE	BID ITEM	QTY	UNIT
762	122	PREF PATT PVMT MK MESSAGE-GROOVED		
		(3) Rt. Arrows	48	SF
762	808	METHYL METHACRYLATE PVMT MK 8IN LINE		
		White Channel Line	30	LF
762	824	METHYL METHACRYLATE PVMT MK 24IN LINE		
		White Stop Bars	140	LF
762	830	METHYL METHACRYLATE PVMT MK MESSAGE		
		(2) Rt. Arrows	32	SF
762	1307	PREF PATT PVMT MK 6IN LINE-GROOVED		
		White Edgline	695	LF
		Yellow Edgeline	605	LF
762	1309	PREF PATT PVMT MK 8IN LINE-GROOVED		
		White (2' Line 6' Skip)	52	LF
762	1325	PREF PATT PVMT MK 24IN LINE-GROOVED		
		White Stop Bars	96	LF
762	1344	PREF PATT PVMT MK 7IN LINE CONTRAST-GROOVED		
		White Contrast 10' Line, 30' Skips	60	LF

Pavement Marking

I-29 & 32nd Ave

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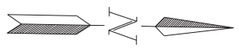
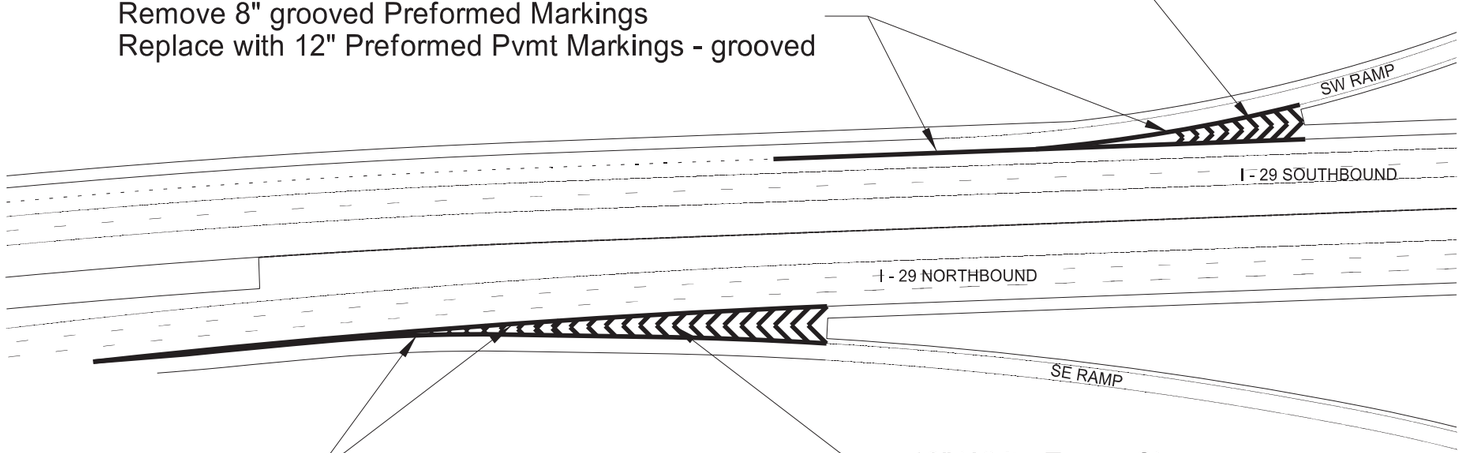
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	5

SPEC	CODE	BID ITEM	QTY	UNIT
762	0111	EPOXY PVMT MK 12 IN LINE		
		White Chevrons	920	LF
762	1315	PREFORMED PATTERNED PVMT MK 12 IN LINE GROOVED		
		White Channelization	1895	LF



Remove 8" grooved Preformed Markings
Replace with 12" Preformed Pvmt Markings - grooved

12" White Epoxy Chevrons
10' Spacing @ 45 deg.



Remove 8" Grooved Preformed Markings
Replace with 12" Preformed Pvmt Markings - grooved.

12" White Epoxy Chevrons
10' Spacing @ 45 deg.

Note:
Do not overspray epoxy onto surface of the preformed tape.
The 4" difference of width for the 12" preformed pavement marking shall be directed away from the adjacent vehicle lane.

I-29 / I-94
Interchange
Gore Details
RP 62.9

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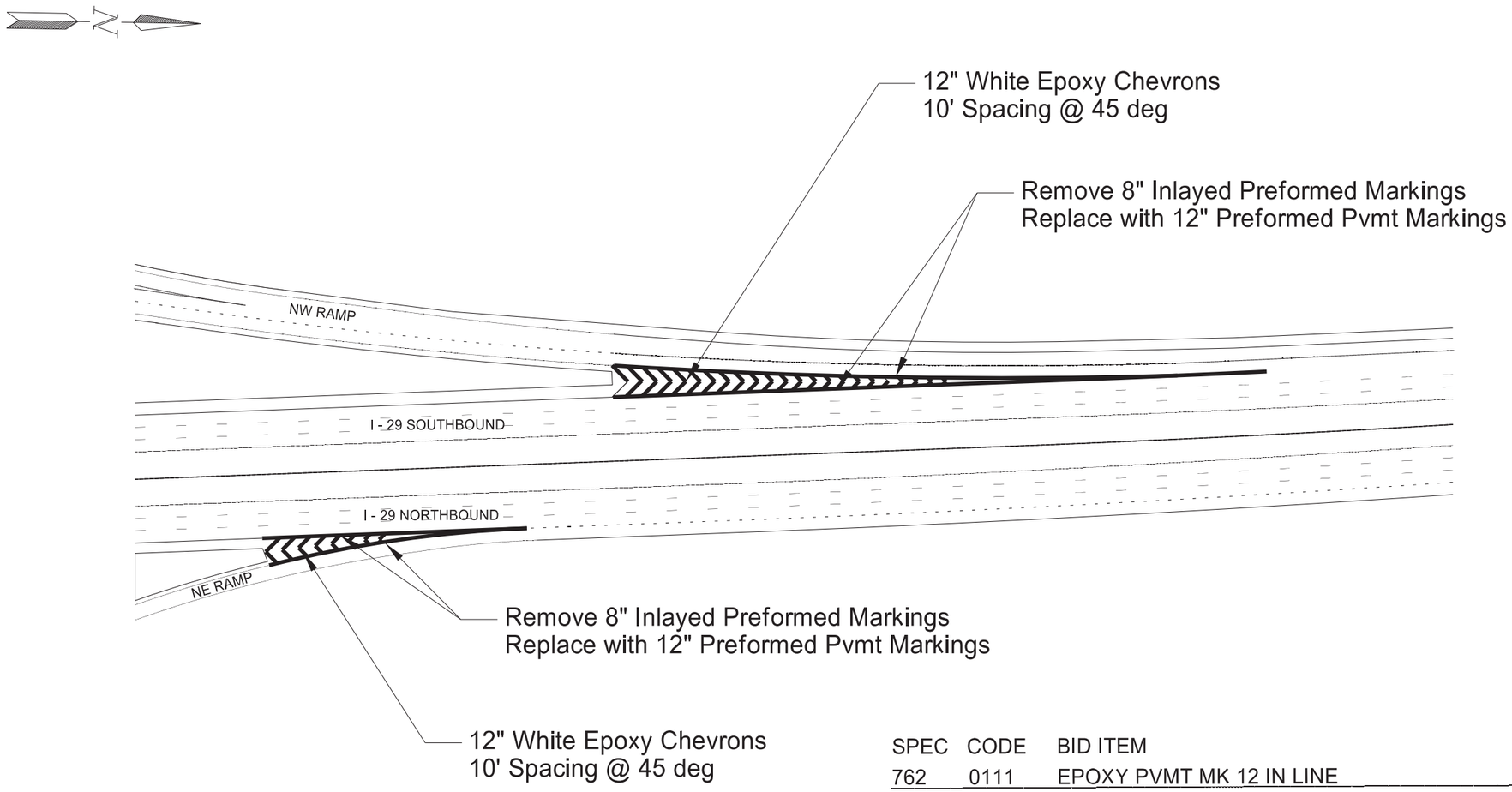
PE 4079
01/20/26

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	6



SPEC	CODE	BID ITEM	QTY	UNIT
762	0111	EPOXY PVMT MK 12 IN LINE		
		White Chevrons	750	LF
762	1315	PREFORMED PATTERNED PVMT MK 12 IN LINE - GROOVED		
		White Channelization	1960	LF

Note:
Do not overspray epoxy onto the surface of the preformed tape.
The 4" difference of width for the 12" preformed pavement marking shall be directed away from the adjacent vehicle lane.

I-29 / I-94
Interchange
Gore Details
RP 63.65

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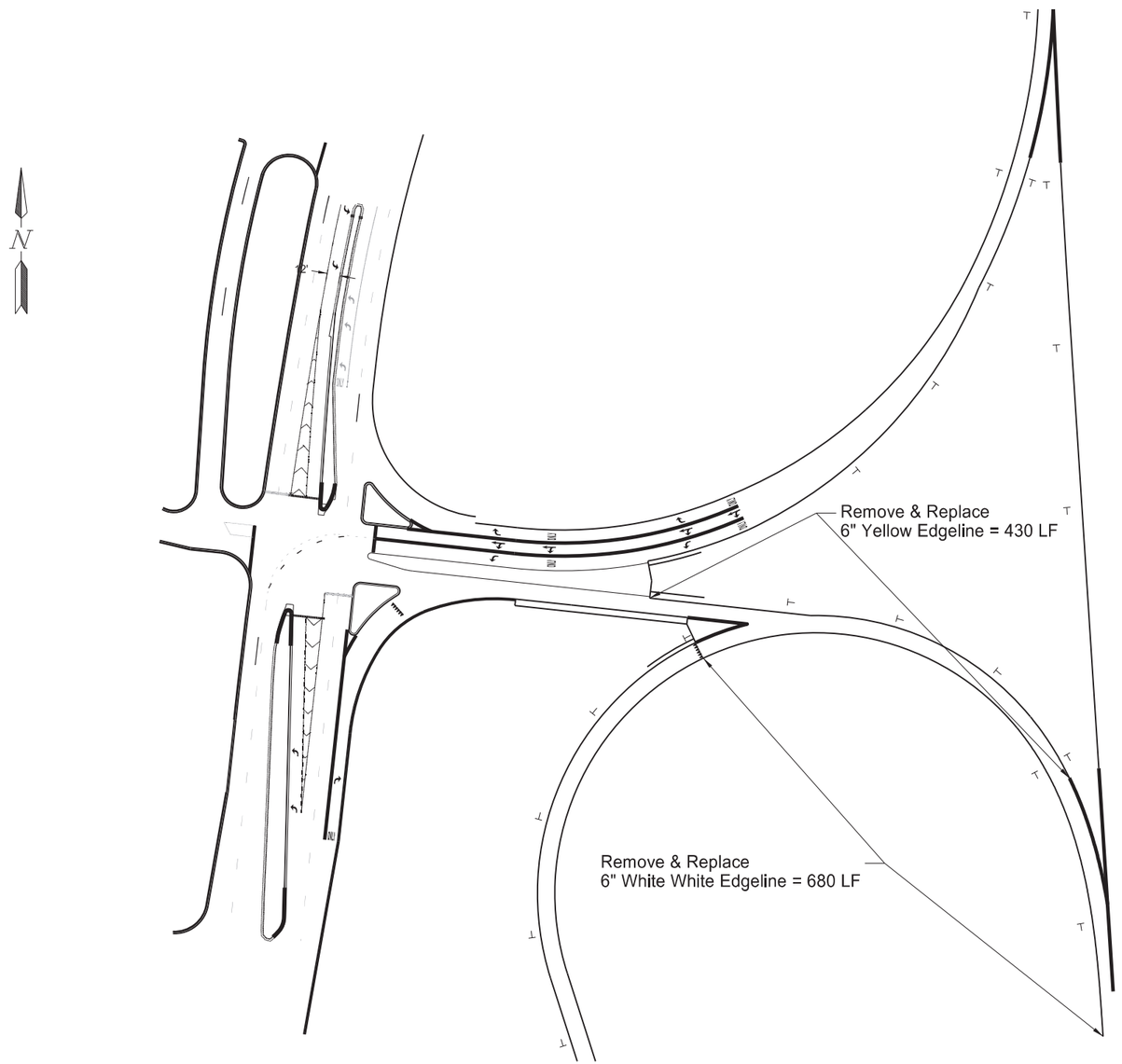
01/20/26
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	7



SPEC	CODE	BID ITEM	QTY	UNIT
762	1307	PREFORMED PATTEREND PAVEMENT MK 6 IN LINE GROOVED		
		Yellow Edge Line	430	LF
		White Edge Line	680	LF
		Total	1110	LF

Pavement Marking

I-29 Southbound
and
13th Ave S

I-29 Northbound NE Ramp

Fargo ND

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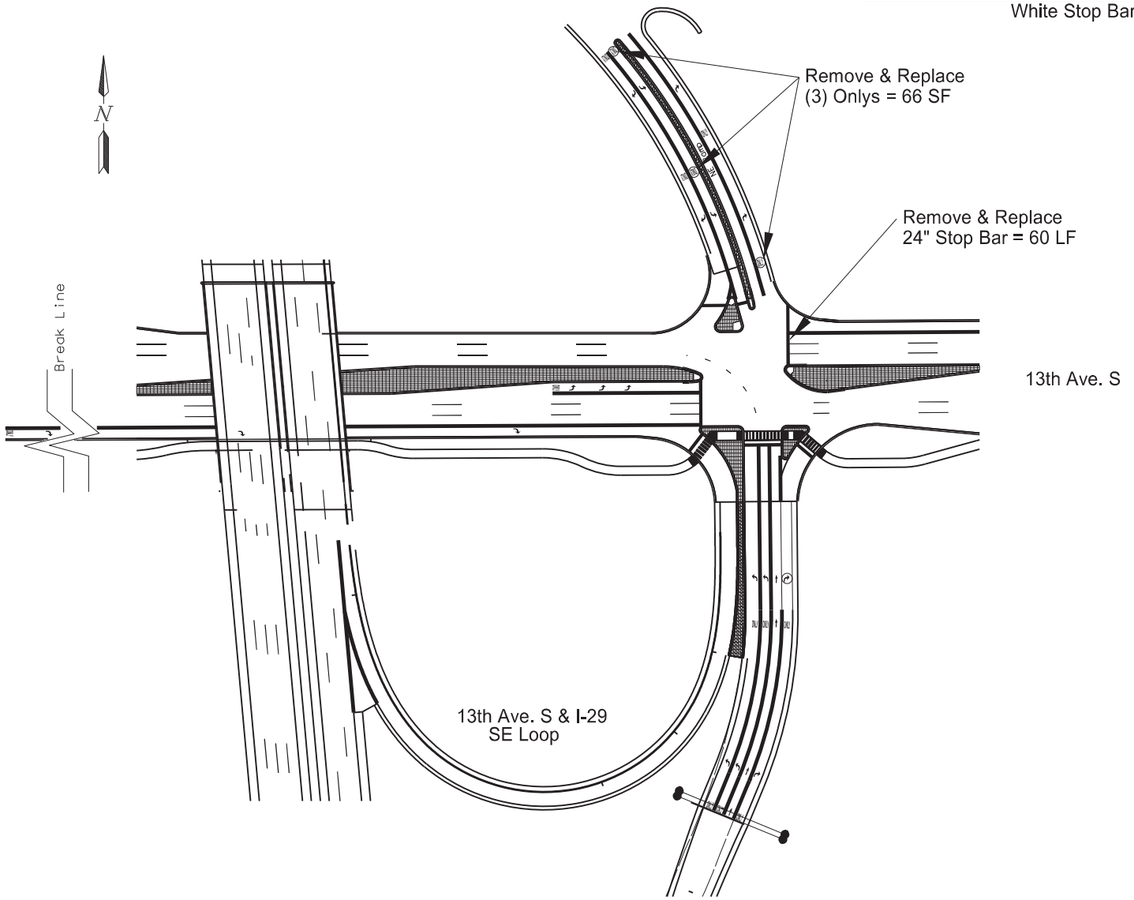
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	8

SPEC	CODE	BID ITEM	QTY	UNIT
762	112	PREFORMED PATTERNED PVMT MK-MESSAGE GROOVED (3) Onlys	66	SF
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED White Stop Bar	60	LF



I-29 Northbound & 13th Ave.

Pavement Marking

I-29 Northbound & 13th Ave.

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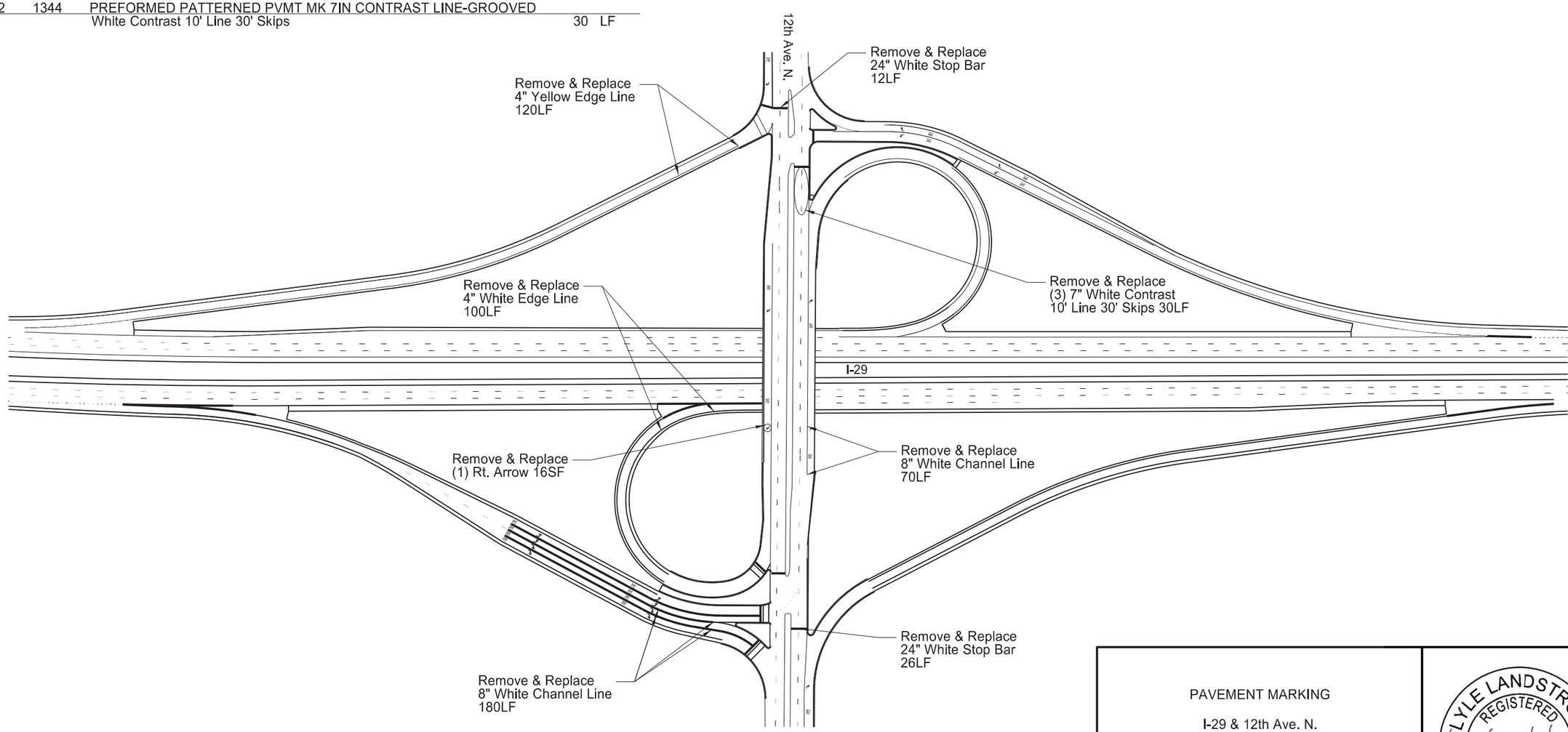
NORTH DAKOTA

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	9

SPEC	CODE	BID ITEM	QTY	UNIT
762	122	PREFORMED PATTERNED PVMT MKING MESG-GROOVED		
		(1) Rt. Arrow	16	SF
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE-GROOVED		
		White Edge Line	100	LF
		Yellow Edge Line	120	LF
		Total	220	LF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		White Channel Line	88	LF
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED		
		Stop Bars	38	LF
762	1344	PREFORMED PATTERNED PVMT MK 7IN CONTRAST LINE-GROOVED		
		White Contrast 10' Line 30' Skips	30	LF



PAVEMENT MARKING

I-29 & 12th Ave. N.

FARGO ND

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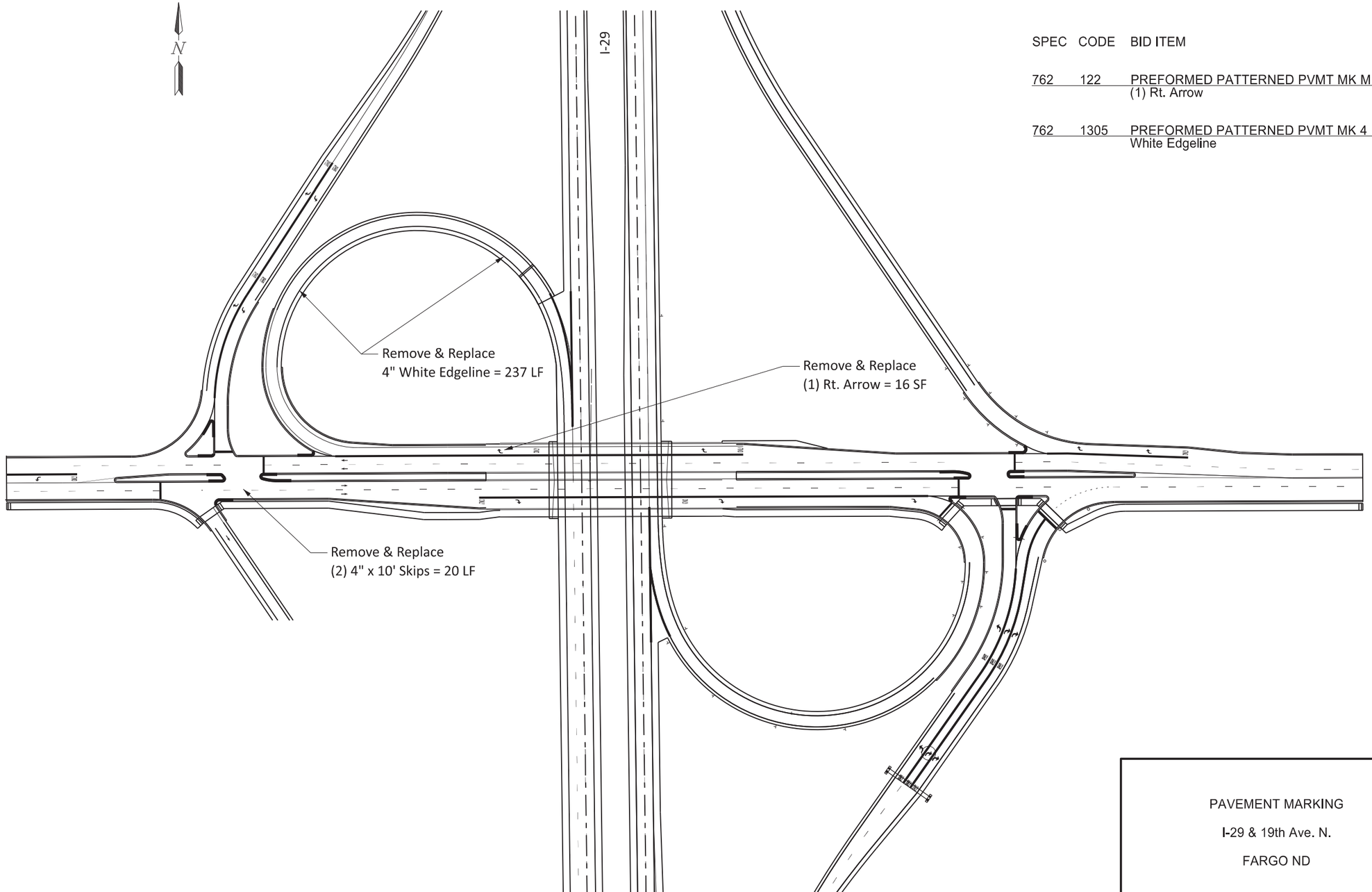
PE 4079
01/20/26

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	10



SPEC	CODE	BID ITEM	QTY	UNIT
762	122	PREFORMED PATTERNED PVMT MK MESSAGE GROOVED		
		(1) Rt. Arrow	16	SF
762	1305	PREFORMED PATTERNED PVMT MK 4 IN LINE GROOVED		
		White Edgeline	315	LF

PAVEMENT MARKING

I-29 & 19th Ave. N.

FARGO ND

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NORTH DAKOTA
01/20/26

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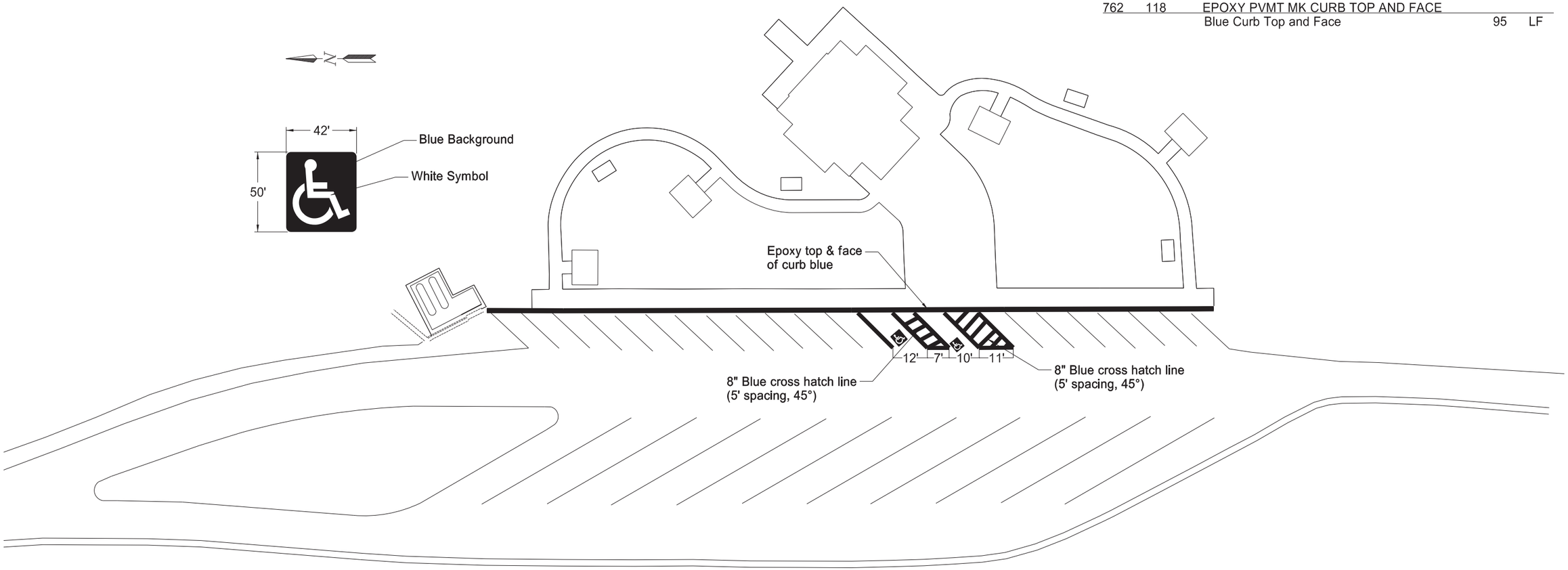
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	11

SPEC	CODE	BID ITEM	QTY	UNIT
762	112	EPOXY PVMT MK MESSAGE		
		Handicap Symbols (2)	30	SF
762	115	EPOXY PVMT MK 8IN LINE		
		Blue Cross Hatch Line (5' spacing, 45°)	115	LF
762	118	EPOXY PVMT MK CURB TOP AND FACE		
		Blue Curb Top and Face	95	LF



Pavement Marking

Elm River Rest Area NB

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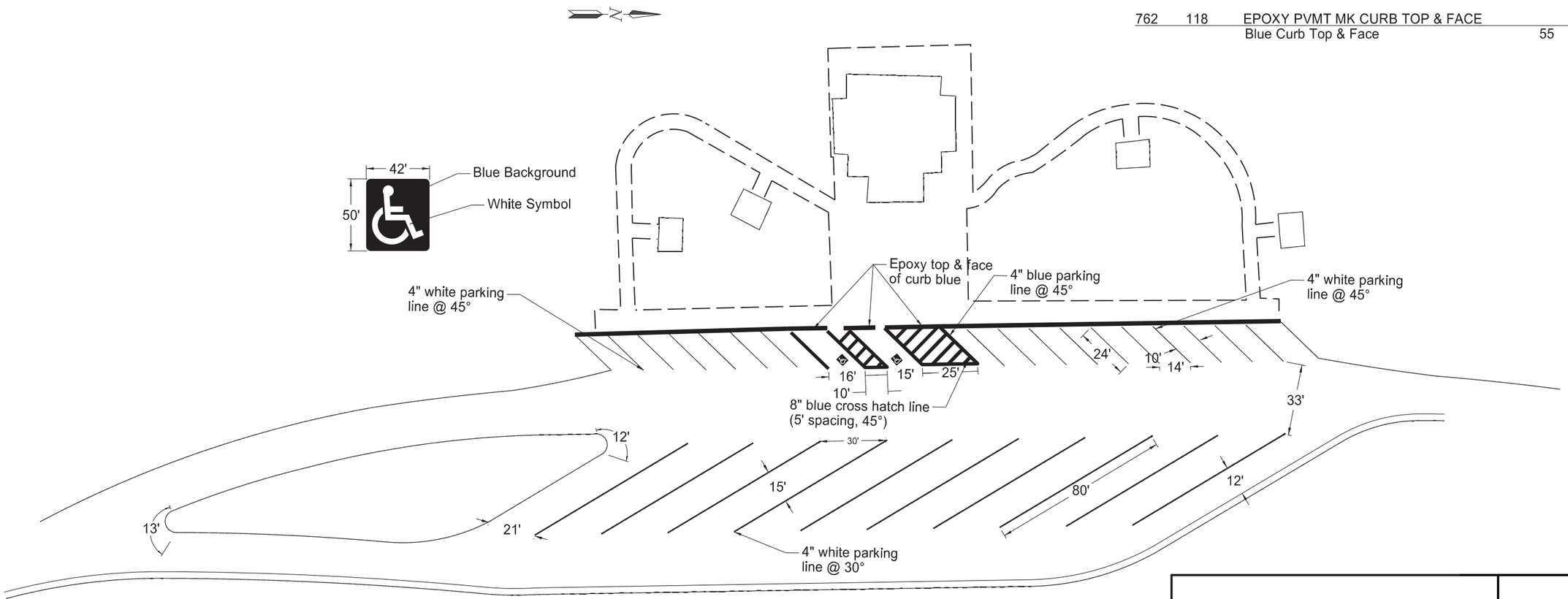
NORTH DAKOTA
PE-4079
01/20/26

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	12

SPEC	CODE	BID ITEM	QTY	UNIT
762	112	EPOXY PVMT MK MESSAGE		
		Handicap Symbols (2)	30	SF
762	113	EPOXY PVMT MK 4IN LINE		
		White Line	456	LF
		White Edge Line	819	LF
		White Parking Line	1123	LF
		Yellow Edge Line	1239	LF
		Blue Parking Line	154	LF
		Total	3791	LF
762	115	EPOXY PVMT MK 8IN LINE		
		Blue Cross Hatch Line (5' spacing, 45°)	115	LF
762	118	EPOXY PVMT MK CURB TOP & FACE		
		Blue Curb Top & Face	55	LF



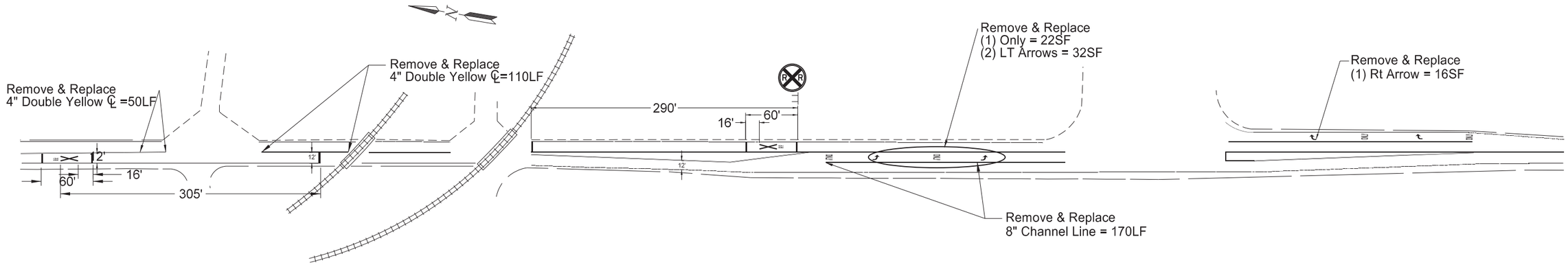
Pavement Marking

Elm River Rest Area SB

LYLE LANDSTROM REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA PE-4079 01/20/26

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	13

SPEC	CODE	BID ITEM	QTY	UNIT
762	122	PREF PATT PVMT MK MESSAGE-GROOVED		
		Railroad Markings	265	SF
		(1) Only	22	SF
		(2) LT Arrows	32	SF
		Total	319	SF
762	1305	PREF PATT PVMT MK 4IN LINE-GROOVED		
		Double Yellow - Centerline	160	LF
762	1308	PREF PATT PVMT MK 8IN LINE-GROOVED		
		8" Channel Line (White) - Turn lanes	170	LF



ND Hwy 200 At Beet Plant

Pavement Marking

Beet Plant Turn Lanes
& BNSF Railroad Crossings

ND200 RP 400

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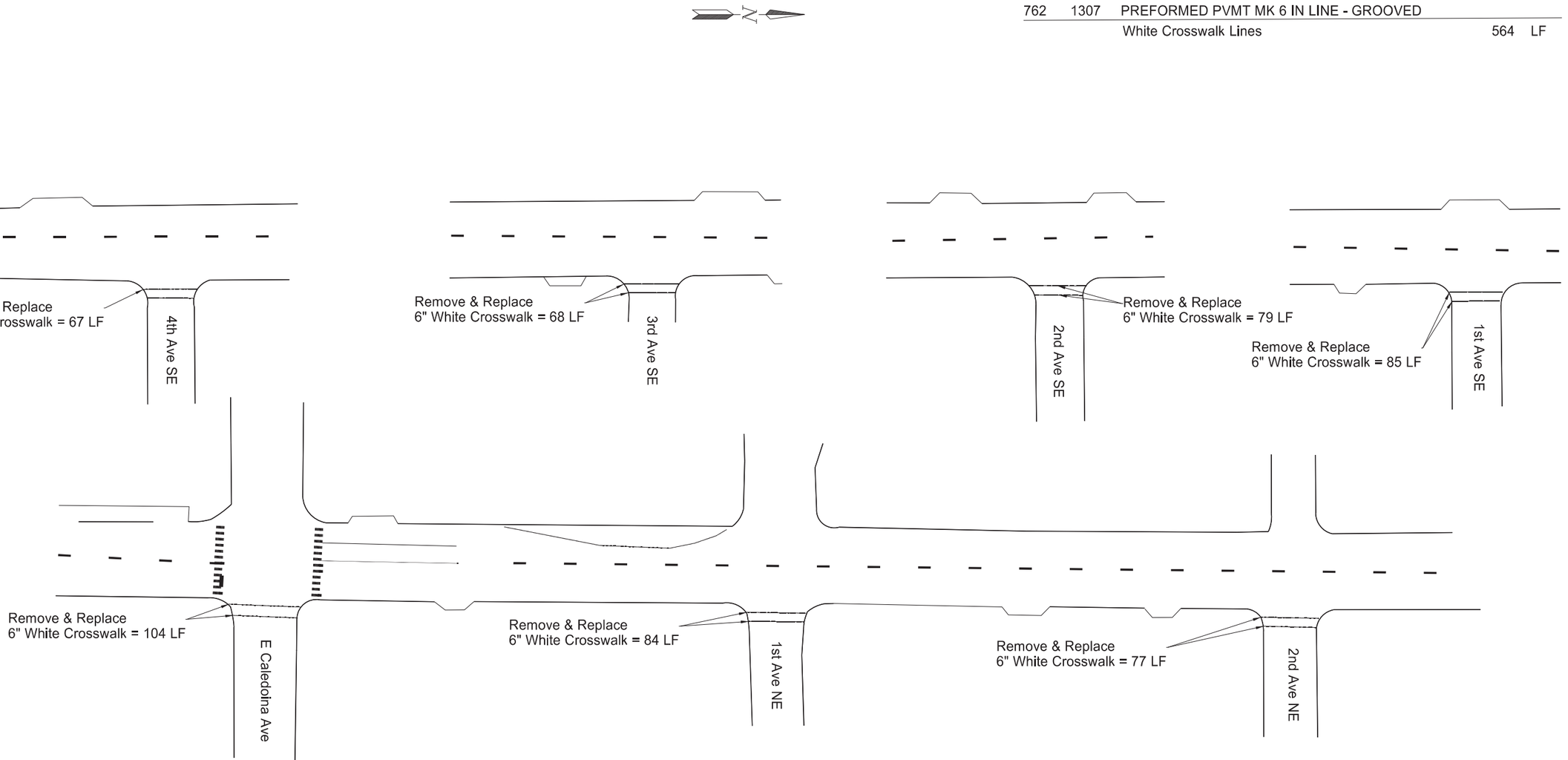
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	14

SPEC	CODE	BID ITEM	QTY	UNIT
762	1307	PREFORMED PVMT MK 6 IN LINE - GROOVED		
		White Crosswalk Lines	564	LF



Pavement Markings

Hillsboro Crosswalks

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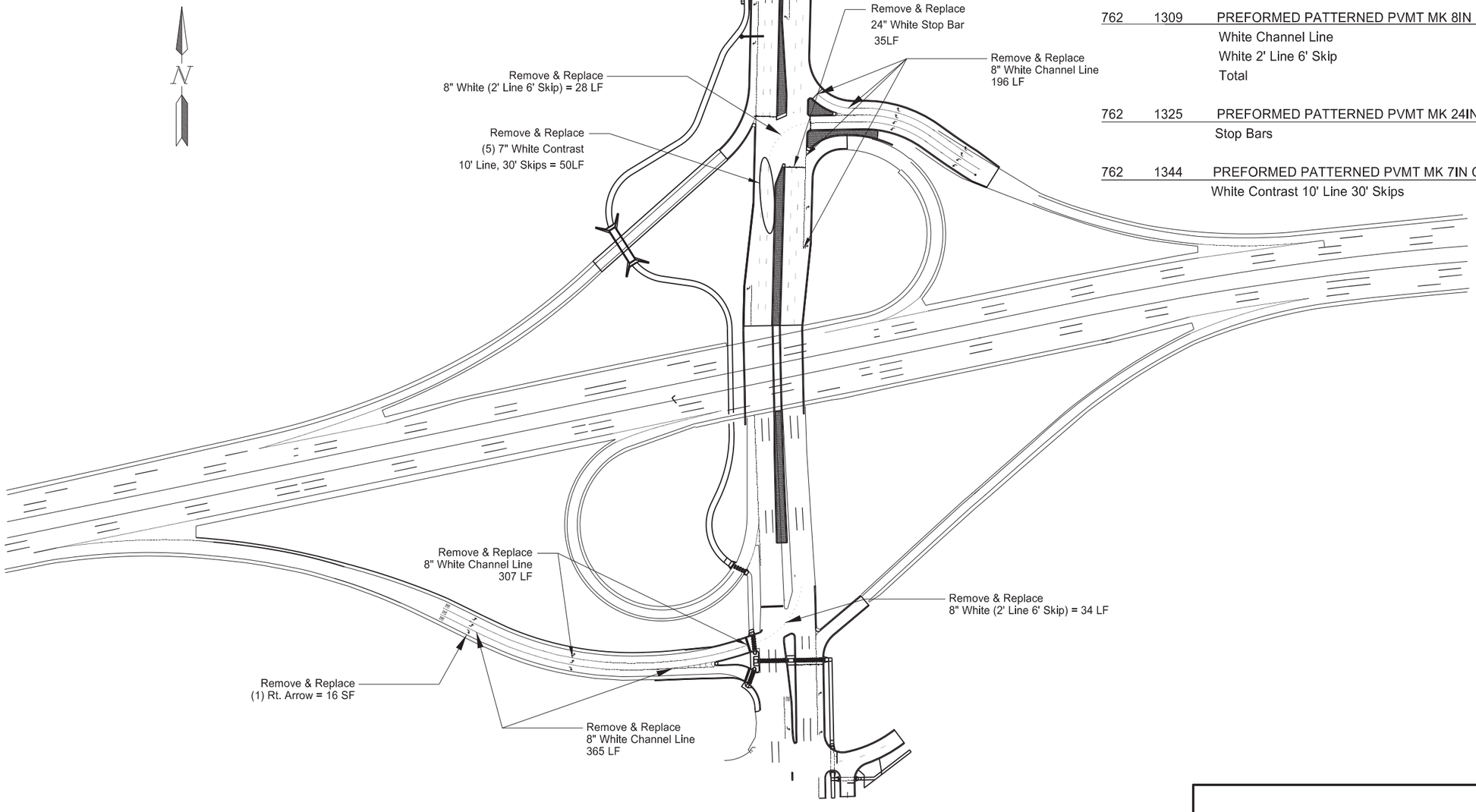
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	15



SPEC	CODE	BID ITEM	QTY	UNIT
762	122	PREFORMED PATTERNED PVTT MKING MSG-GROOVED		
		(1) Rt. Arrow	16	SF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED		
		White Channel Line	868	LF
		White 2' Line 6' Skip	62	LF
		Total	930	LF
762	1325	PREFORMED PATTERNED PVMT MK 24IN LINE-GROOVED		
		Stop Bars	34	LF
762	1344	PREFORMED PATTERNED PVMT MK 7IN CONTRAST LINE-GROOVED		
		White Contrast 10' Line 30' Skips	50	LF

Pavement Marking

I-94 & University Dr.

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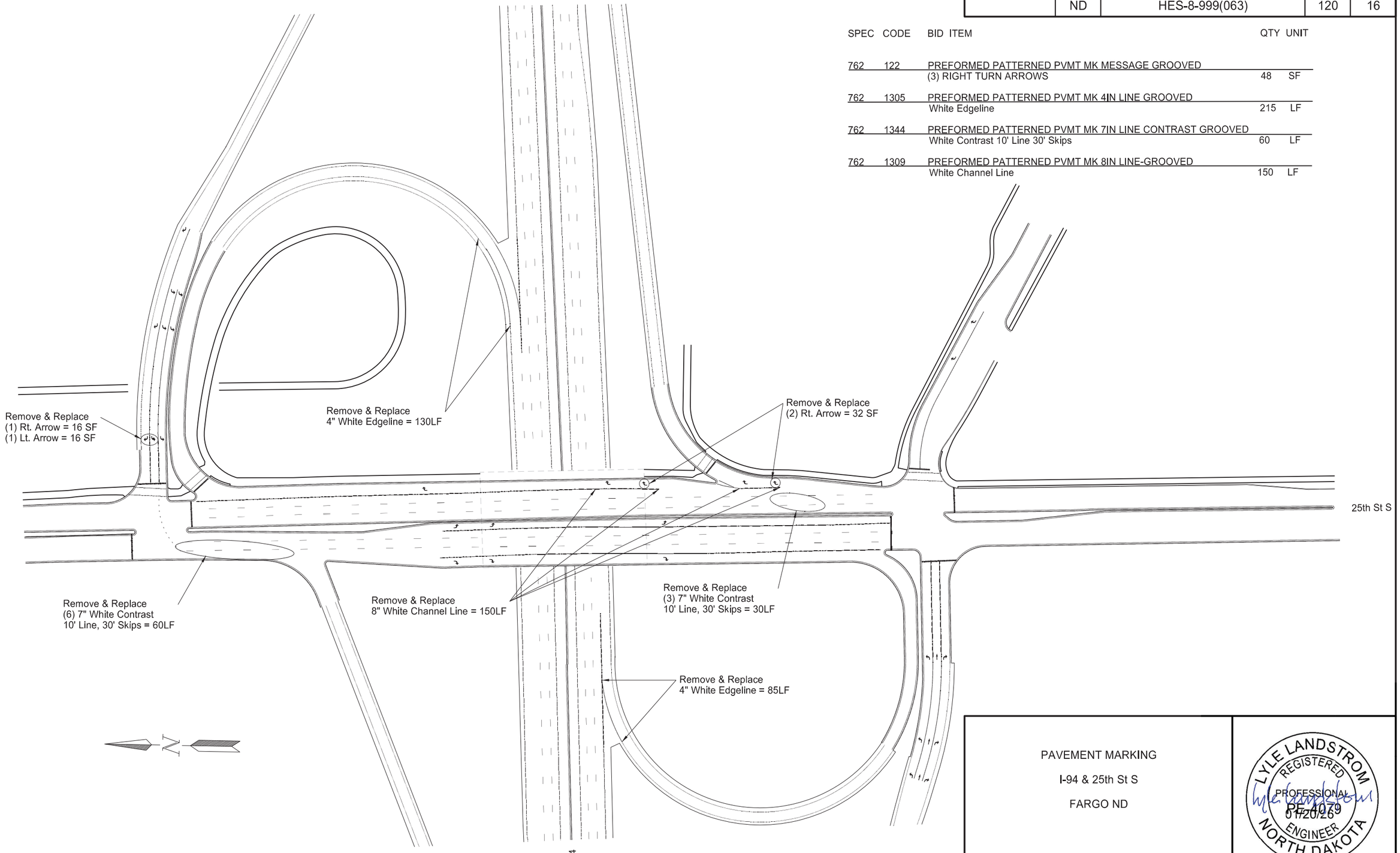
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	16

SPEC	CODE	BID ITEM	QTY	UNIT
762	122	PREFORMED PATTERNED PVMT MK MESSAGE GROOVED (3) RIGHT TURN ARROWS	48	SF
762	1305	PREFORMED PATTERNED PVMT MK 4IN LINE GROOVED White Edgeline	215	LF
762	1344	PREFORMED PATTERNED PVMT MK 7IN LINE CONTRAST GROOVED White Contrast 10' Line 30' Skips	60	LF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE-GROOVED White Channel Line	150	LF



PAVEMENT MARKING

I-94 & 25th St S

FARGO ND

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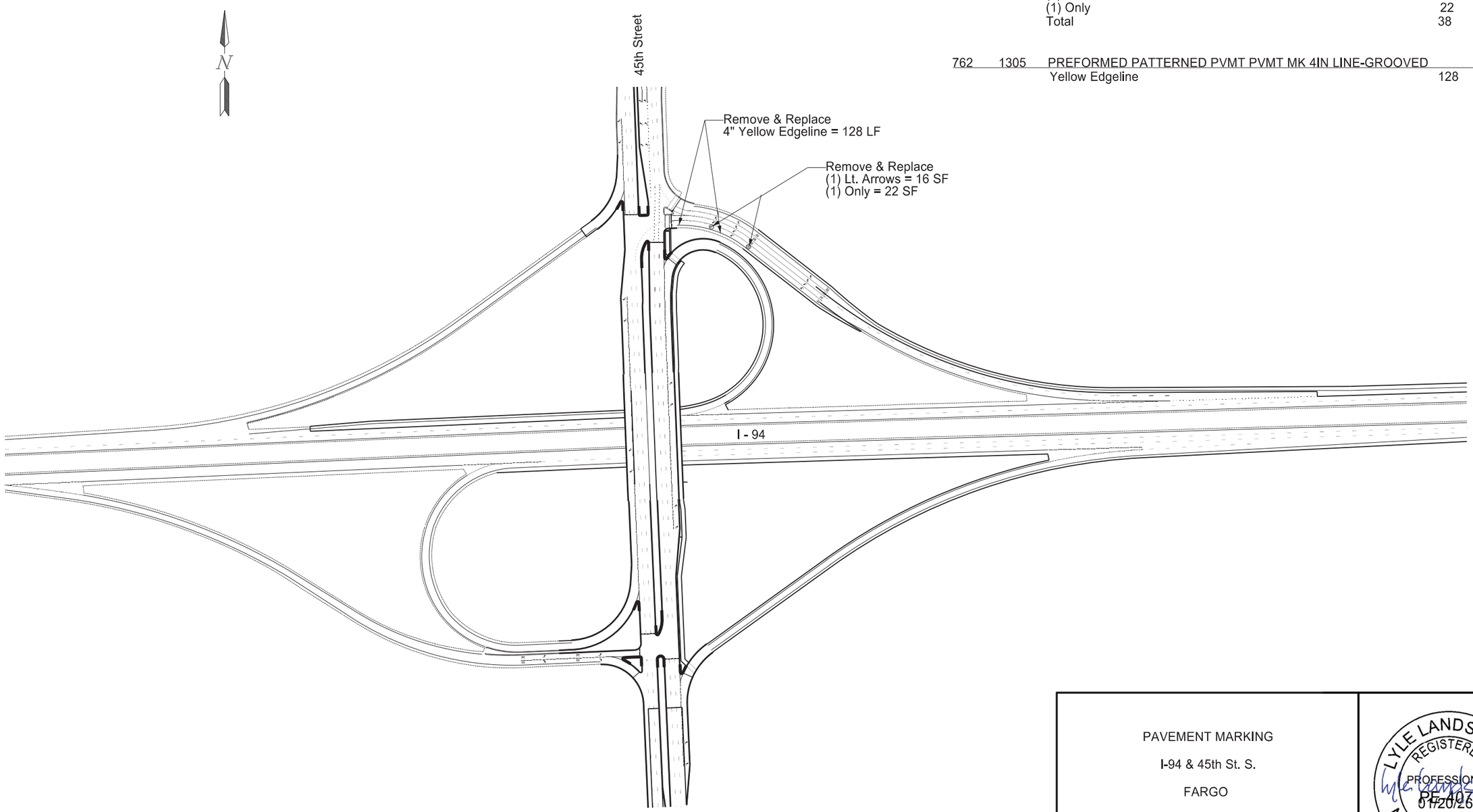
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	17

SPEC	CODE	BID ITEM	QTY	UNIT
762	122	PREFORMED PATTERNED PVMT MK MESSAGE-GROOVED		
		(1) Lt. Arrows	16	SF
		(1) Only	22	SF
		Total	38	SF
762	1305	PREFORMED PATTERNED PVMT PVMT MK 4IN LINE-GROOVED		
		Yellow Edgeline	128	LF



PAVEMENT MARKING

I-94 & 45th St. S.

FARGO

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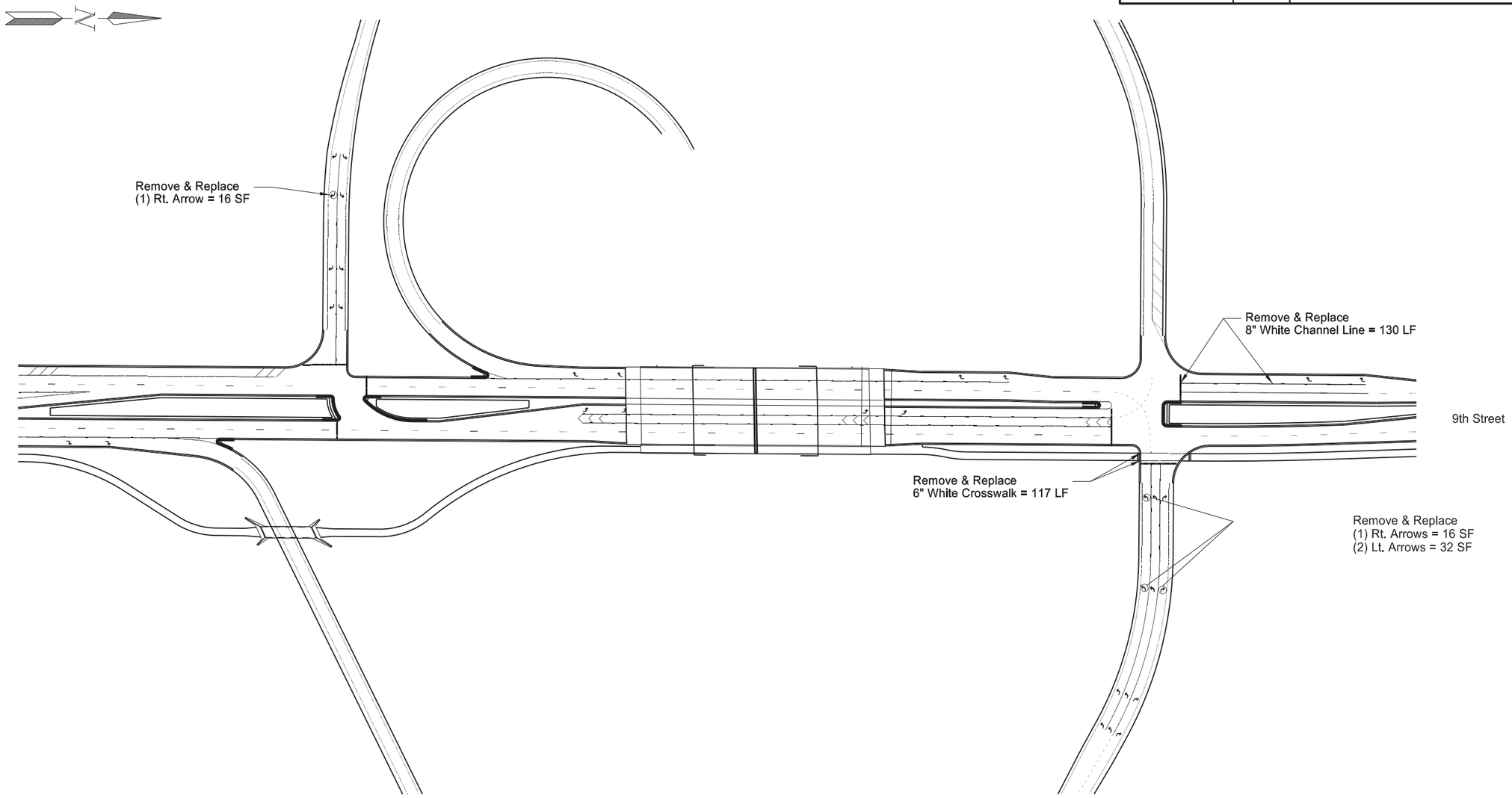
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	18



SPEC	CODE	BID ITEM	QTY	UNIT
762	122	PREFORMED PATTERNED PVMT MK MESSAGE GROOVED		
		(2) Rt. Arrows	32	SF
		(2) Lt. Arrows	32	SF
		Total	64	SF
762	1307	PREFORMED PATTERNED PVMT MK 6IN LINE GROOVED		
		White Crosswalk	117	LF
762	1309	PREFORMED PATTERNED PVMT MK 8IN LINE GROOVED		
		Channel Line	170	LF

PAVEMENT MARKING

I-94 & 9th. Street S.

FARGO ND

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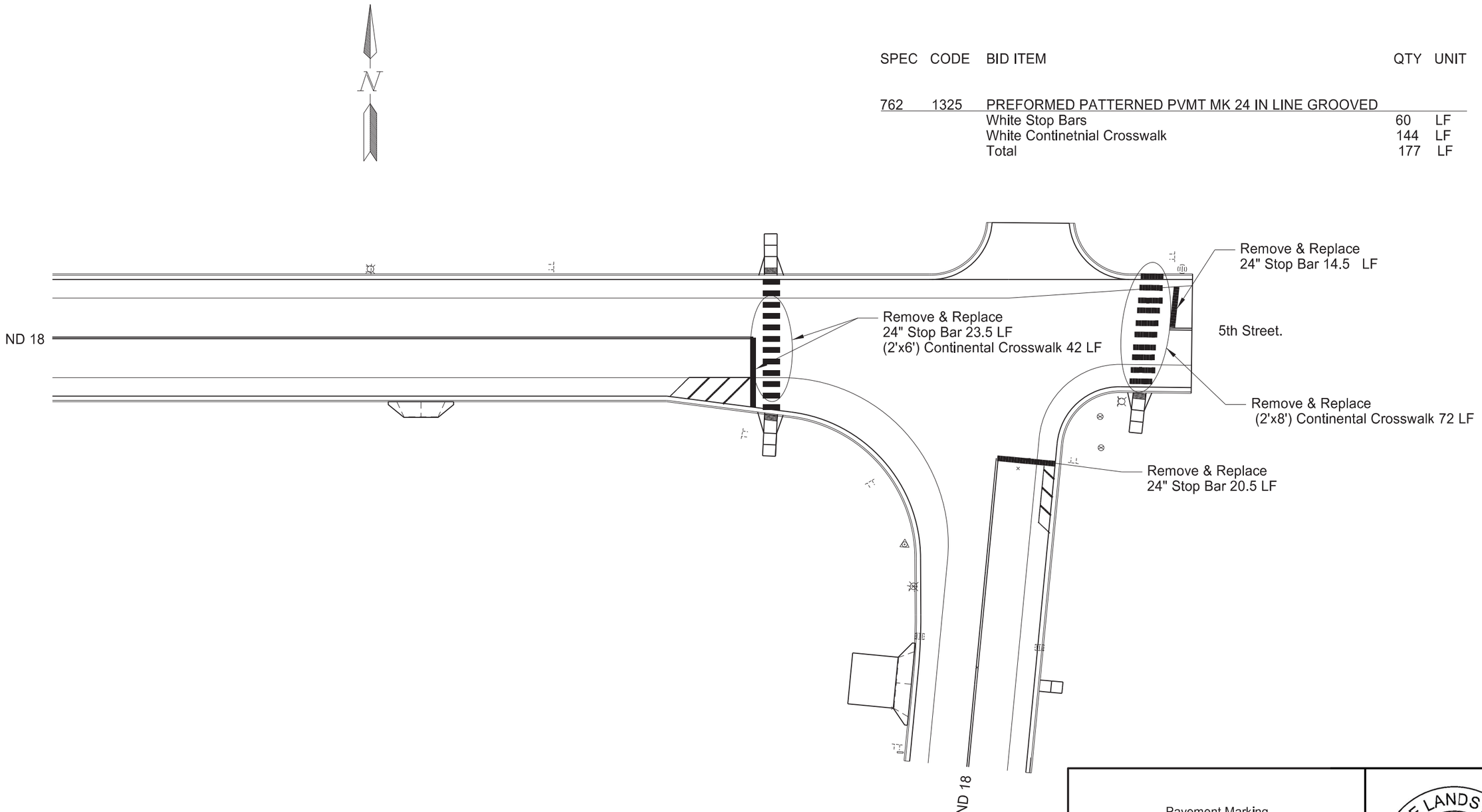
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	19

SPEC	CODE	BID ITEM	QTY	UNIT
762	1325	PREFORMED PATTERNED PVMT MK 24 IN LINE GROOVED		
		White Stop Bars	60	LF
		White Continetnial Crosswalk	144	LF
		Total	177	LF



Pavement Marking

ND18 & 5th St N

Casselton

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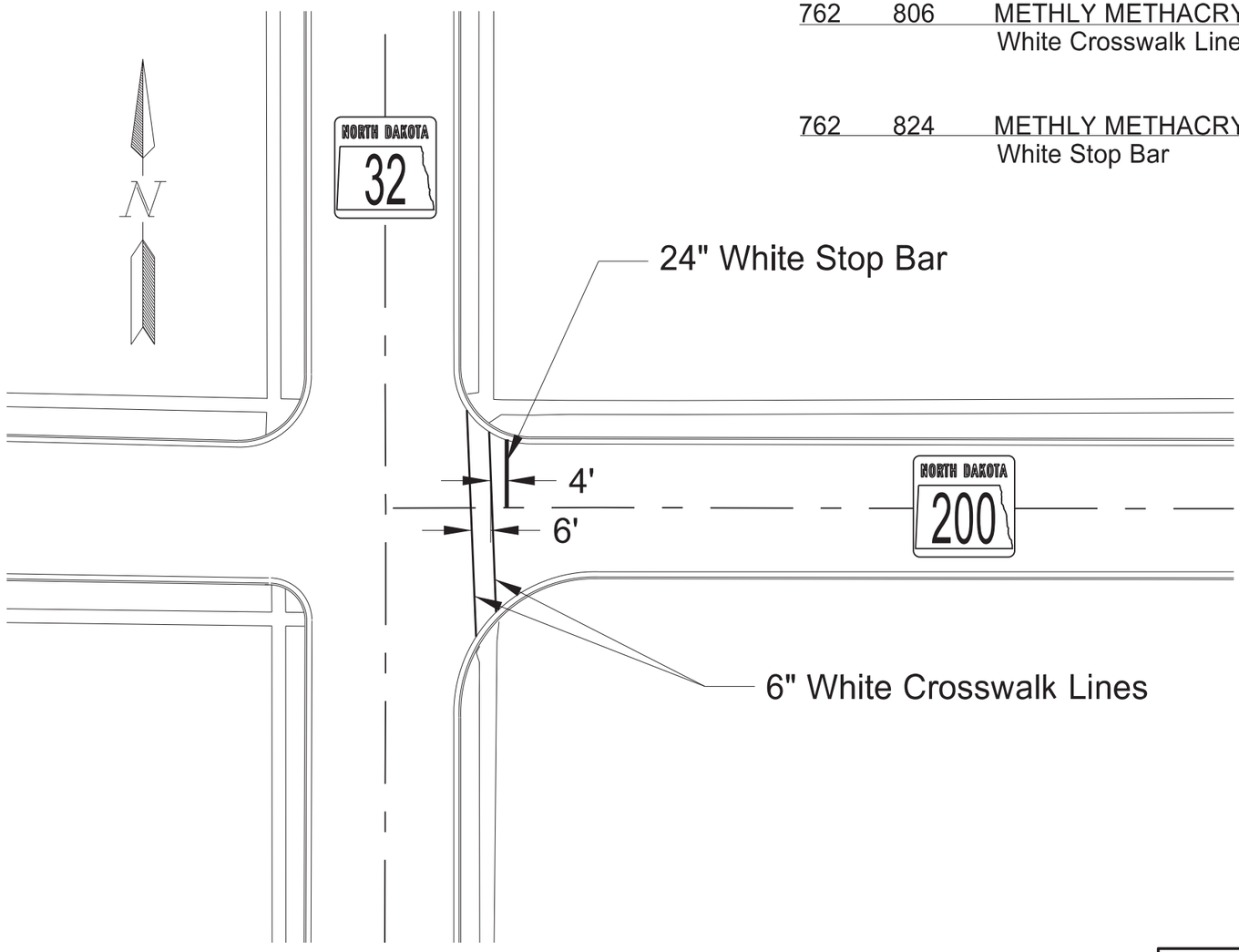
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	20

SPEC	CODE	BID ITEM	QTY	UNIT
762	806	METHLY METHACRYLATE PVMT MK 6IN LINE		
		White Crosswalk Lines	118	LF
762	824	METHLY METHACRYLATE PVMT MK 24IN LINE		
		White Stop Bar	12	LF



Jct. ND 32

Pavement Marking

Jct. ND 32
West Jct. ND 18

Finley

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NORTH DAKOTA
PE 4039
01/20/26

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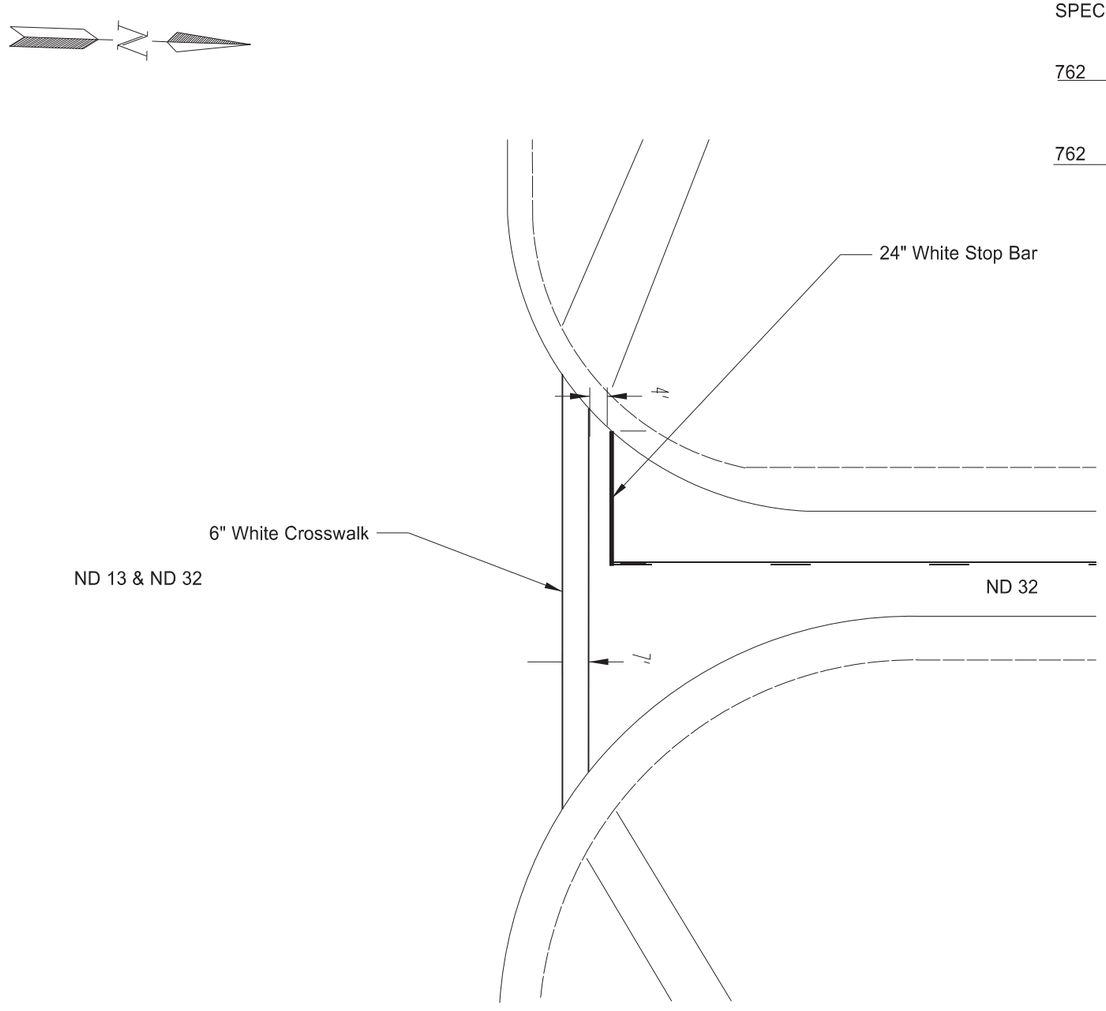
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	HES-8-999(063)	120	21

SPEC	CODE	BID ITEM	QTY	UNIT
762	806	METHLY METHACRYLATE PVMT MK 6IN LINE White Crosswalk	183	LF
762	824	METHLY METHACRYLATE PVMT MK 24IN LINE Stop Bar	30	LF



PAVEMENT MARKING
ND 32 & ND 13

Gwinner

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NDDOT ABBREVIATIONS

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

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
04-14-25	General Revisions

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NDDOT ABBREVIATIONS

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

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
04-14-25	General Revisions

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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	Southeast
SW	Southwest
SB	Southbound
Sp	spaces
Spcl	special
SA	special assembly
SP	special provisions
G	specific gravity
Spk	spike
SB	split barrel sample
SH	sprinkler head
SV	sprinkler valve
Sq	square
Stk	stake
Std	standard
N	standard penetration test
Std Specs	standard specifications
Stm L	steam line
SEC	steel encased concrete
SMA	stone matrix asphalt
SSD	stopping sight distance
SD	storm drain
St	street
SPP	structural plate pipe
SPPA	structural plate pipe arch
Str	structure
Subd	subdivision
Sub	subgrade
Sub Prep	subgrade preperation
Ss	subsoil
SS	supplement specification
Supp	supplemental
Surf	surfacing
Surv	survey
Sym	symmetrical

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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NDDOT ABBREVIATIONS

MEASUREMENTS

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

SURVEY DESCRIPTIONS

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

SOIL TYPES

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

07-01-14

REVISIONS

DATE	CHANGE
12-18-20	Sheet Added - Continued from D-101-3
4-14-25	General Revisions

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LINE STYLES

D-101-20

Existing Topography

- Existing Ground Void
- Existing Cemetary Boundary
- Existing Box Culvert Bridge
- Existing Concrete Surface
- Existing Drainage Structure
- Existing Gravel Surface
- Existing Riprap
- Existing Dirt Surface
- Existing Asphalt Surface
- Existing Tie Point Line
- Existing Railroad Centerline
- Existing Guardrail Cable
- Existing Guardrail Metal
- Existing Edge of Water
- Existing Fence
- Existing Railroad
- Existing Field Line
- Exst Flow
- Existing Curb
- Existing Valley Gutter
- Existing Driveway Gutter
- Existing Curb and Gutter
- Existing Mountable Curb and Gutter

- Existing 3-Cable w Posts
- Site Boundary
- Existing Berm, Dike, Pit, or Earth Dam
- Existing Ditch Block
- Existing Tree Boundary
- Existing Brush or Shrub Boundary
- Existing Retaining Wall
- Existing Planter or Wall
- Existing W-Beam Guardrail with Posts
- Existing Railroad Switch
- Gravel Pit - Borrow Area
- Existing Wet Area-Vegetation Break
- Existing High Tension Cable Guardrail
- Existing High Tension Cable Guardrail with Posts

Proposed Topography

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

Existing Utilities

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

Proposed Utilities

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

Traffic Utilities

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

Sign Structures

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

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

Countours

- Failure Line
- 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	
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

SYMBOLS

D-101-30

- North Arrow (Half Scale)
- Alignment Data Point
- Alignment Monument
- Spot Elevation
- Existing Miscellaneous Spot
- Existing Access Control Arrow
- Existing Benchmark
- Reset USGS Marker
- Iron Monument Found
- Iron Pin R/W Monument
- Property Corner
- Iron Pin Reference Monument
- Right of Way Marker (Exst, Ppsd, Reset)
- Existing Federal Reference Corner
- Existing Section Corner (Full, Quarter, Sixteenth, Meander)
- Existing Witness Corner
- Existing Control Point (CP, GPS-RTK, TRI)
- Existing Traverse PI Aerial Panel
- Existing Reference Marker Point NGS
- Existing EFB Misc
- Existing Bush or Shrub
- Existing Large Evergreen Tree
- Existing Small Evergreen Tree
- Existing Large Tree
- Existing Small Tree
- Existing Tree Trunk
- Cairn or Stone Circle
- Existing Artifact
- Existing Satellite Dish
- Existing Weather Station
- Existing Windmill or Tower
- Reinforced Pavement
- CSB — Continuous Split Barrel Sample
- FA — Flight Auger Sample
- SB — Split Barrel Sample
- T — Thinwall Tube Sample
- N — Standard Penetration Test
- Incl — Inclinometer Tube
- Excavation Unit
- Existing Ground Water Well Bore Hole

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

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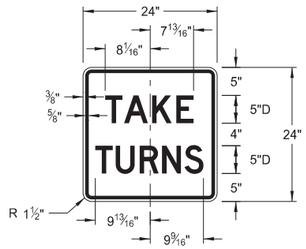
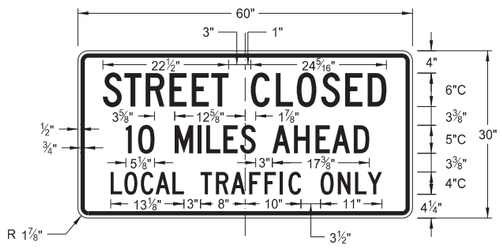
12 18 2020

CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



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



R11-3c-60
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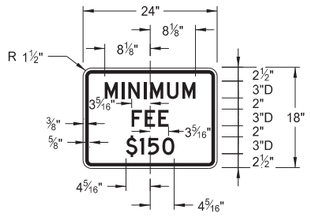

R2-1aP-24
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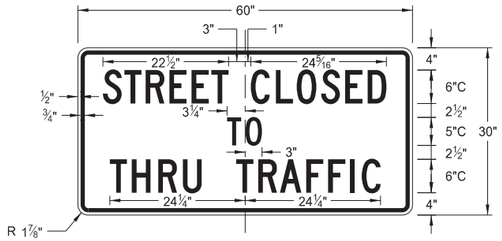

R11-4a-60
Legend: black (non-refl)
Background: white

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

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

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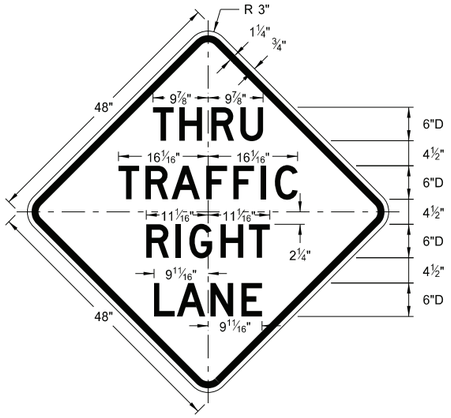
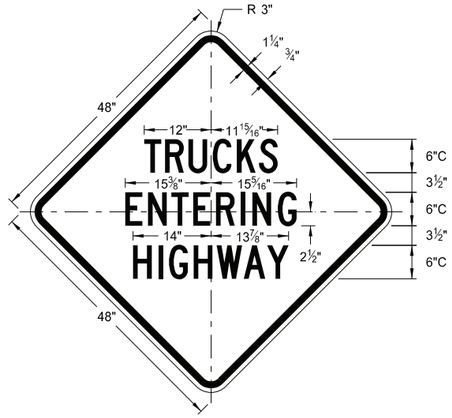
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

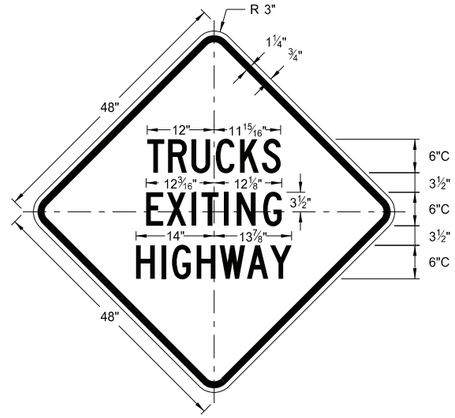
D-704-11



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



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



W8-56-48
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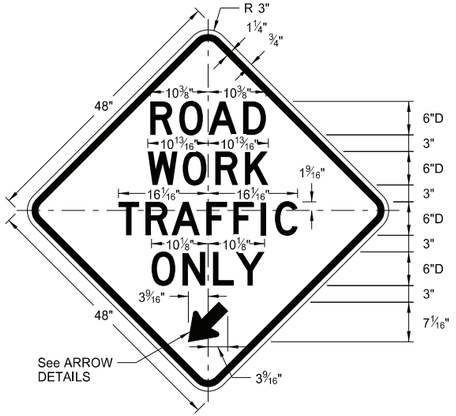
Background: orange



W5-9-48
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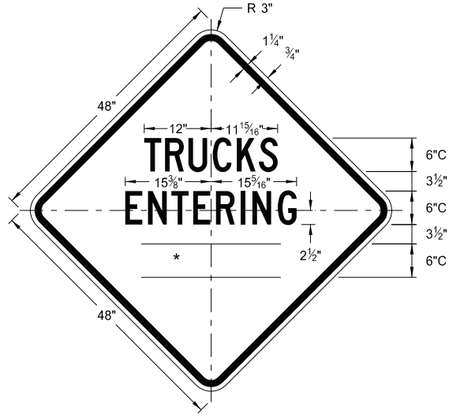
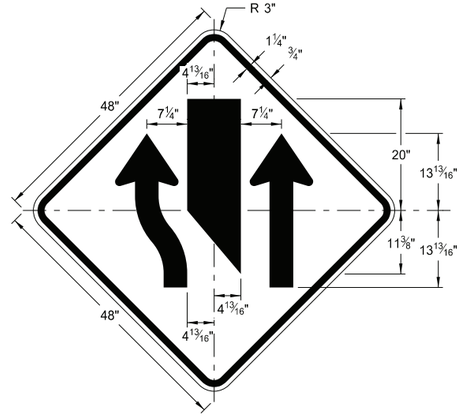
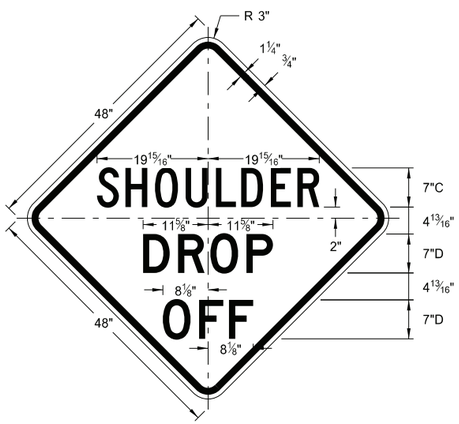
Background: orange



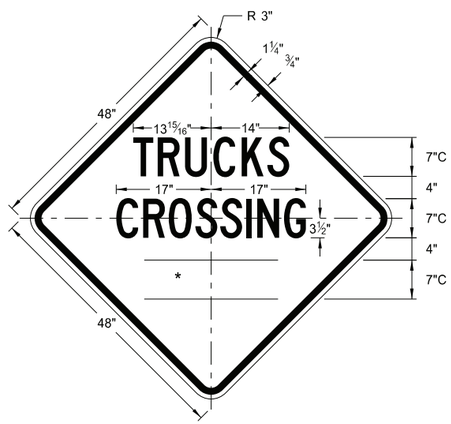
W8-54-48
Legend: black (non-refl)
Background: orange



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



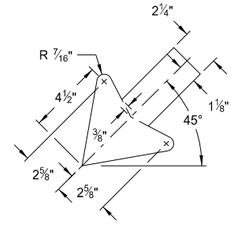
W8-9a-48
Legend: black (non-refl)
Background: orange



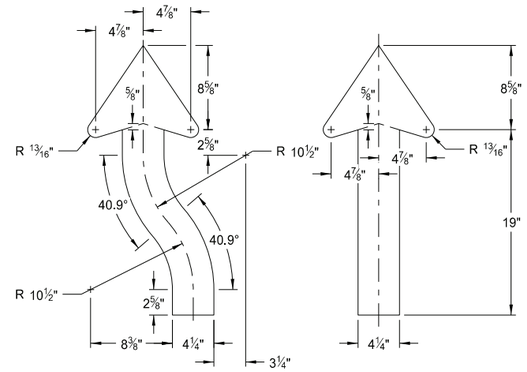
W8-55-48
Legend: black (non-refl)
Background: orange

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

* DISTANCE MESSAGES



W5-9-48



W9-3a-48

ARROW DETAILS

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

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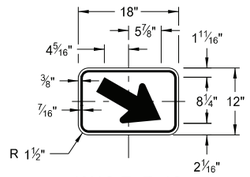
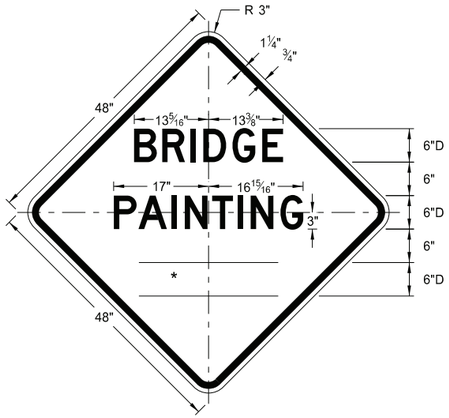
08/01/24

CONSTRUCTION SIGN DETAILS
WARNING SIGNS

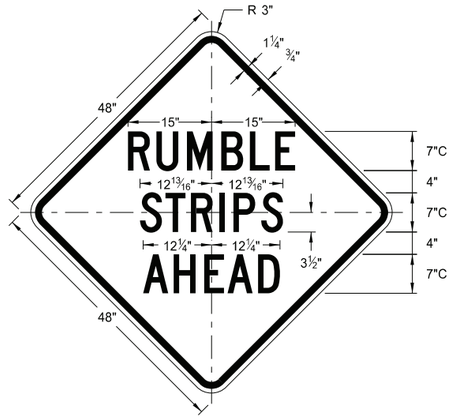
D-704-11A



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



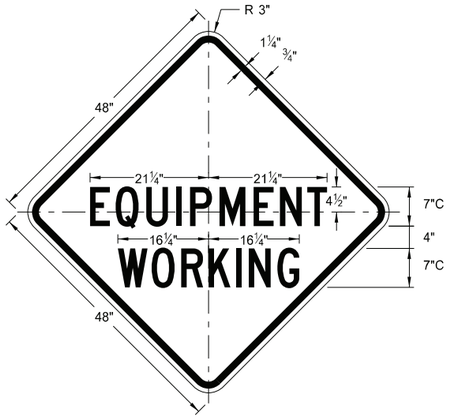
W21-50-48
Legend: black (non-refl)
Background: orange



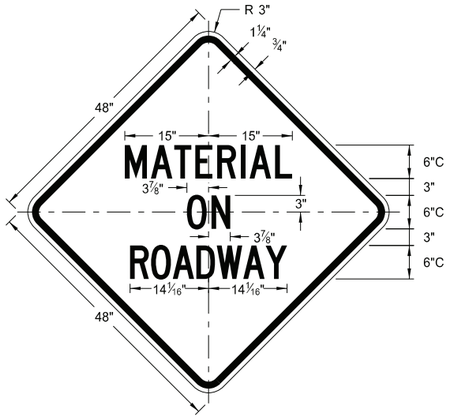
W21-53-48
Legend: black (non-refl)
Background: orange

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

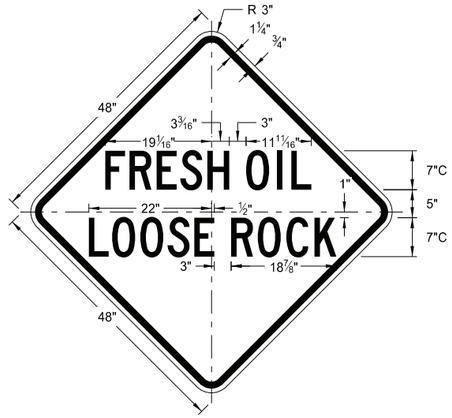
* DISTANCE MESSAGES



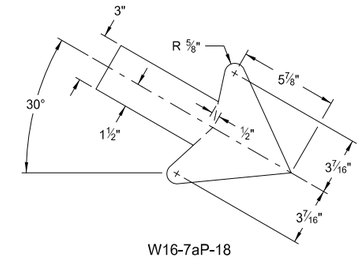
W20-51-48
Legend: black (non-refl)
Background: orange



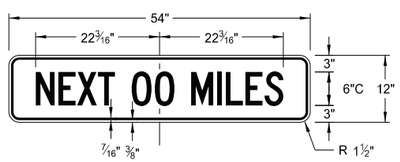
W21-51-48
Legend: black (non-refl)
Background: orange



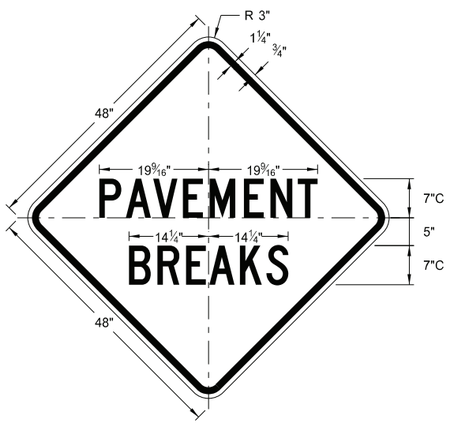
W22-8-48
Legend: black (non-refl)
Background: orange



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.
8-01-24	Electronic Stamp/Signature.

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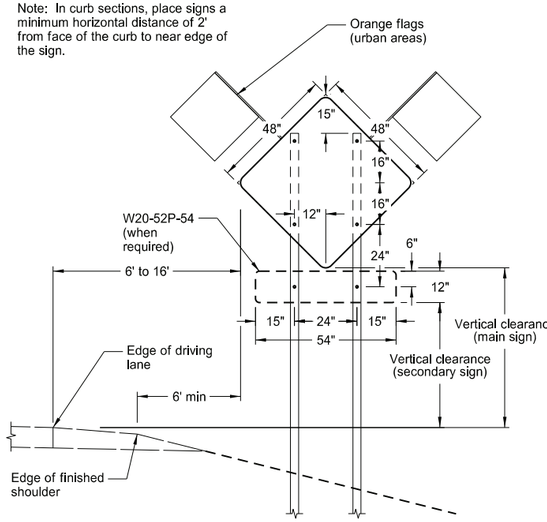
08/01/24

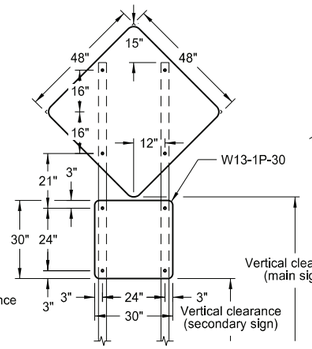
CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

D-704-14

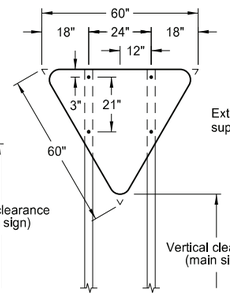
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



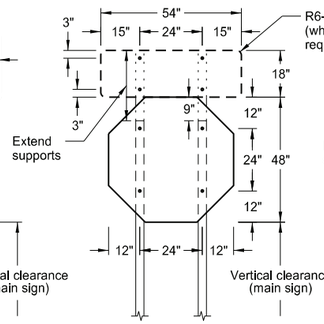
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



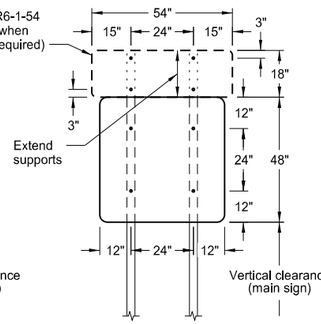
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



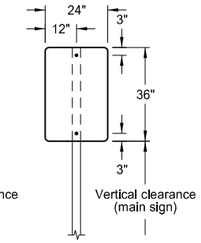
R1-2-60 - YIELD SIGN



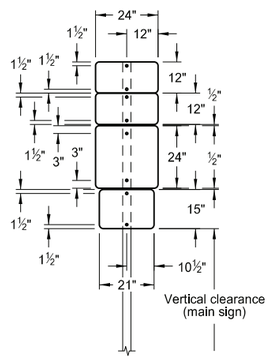
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



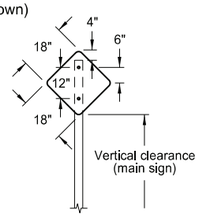
48" x 48" SIGN
(with R6-1-54 sign as required)



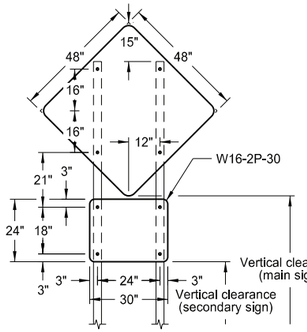
24" x 36" SIGN



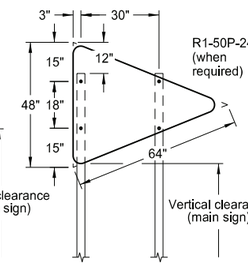
24" x 24"
ROUTE MARKER
ASSEMBLY



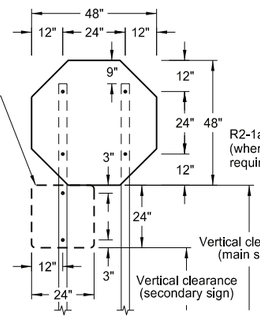
18" x 18"
DIAMOND SIGN



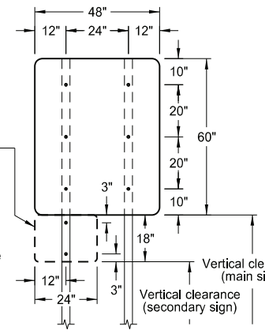
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



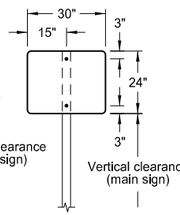
W14-3-64 - PENNANT SIGN



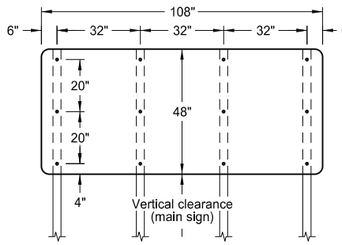
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



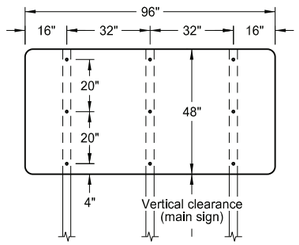
48" x 48" SIGN
(with R2-1aP-24 sign as required)



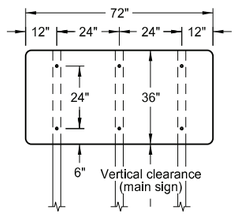
30" x 24" SIGN



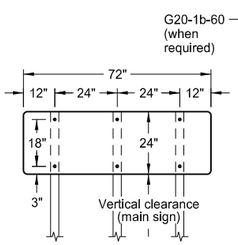
108" x 48" SIGN



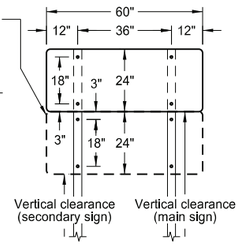
96" x 48" SIGN



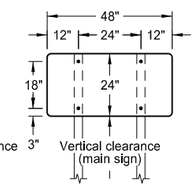
72" x 36" SIGN



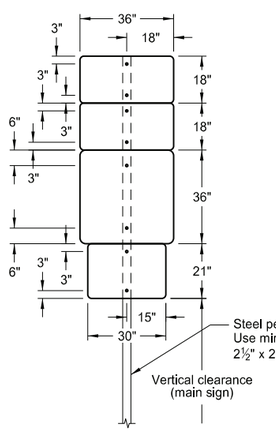
72" x 24" SIGN



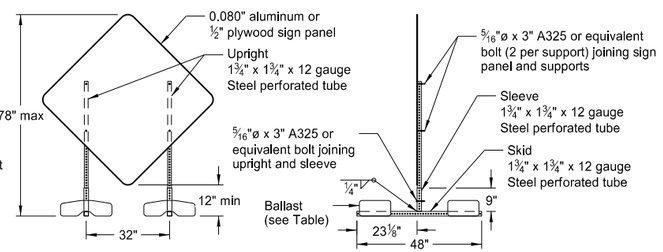
60" x 24" SIGN



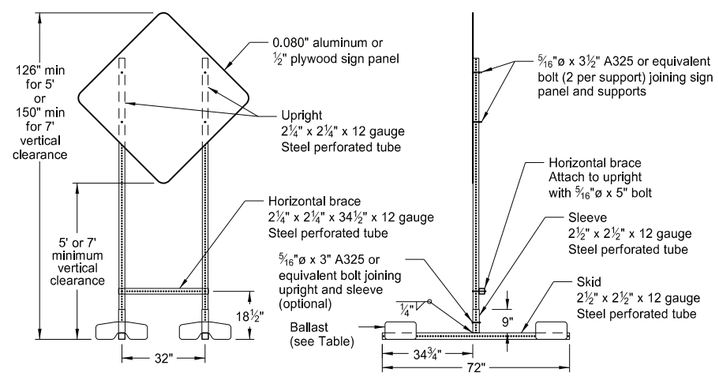
48" x 24" SIGN



36" x 36"
ROUTE MARKER
ASSEMBLY



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

MINIMUM BALLAST
(For each side of sign support base)

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

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

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

10-4-13

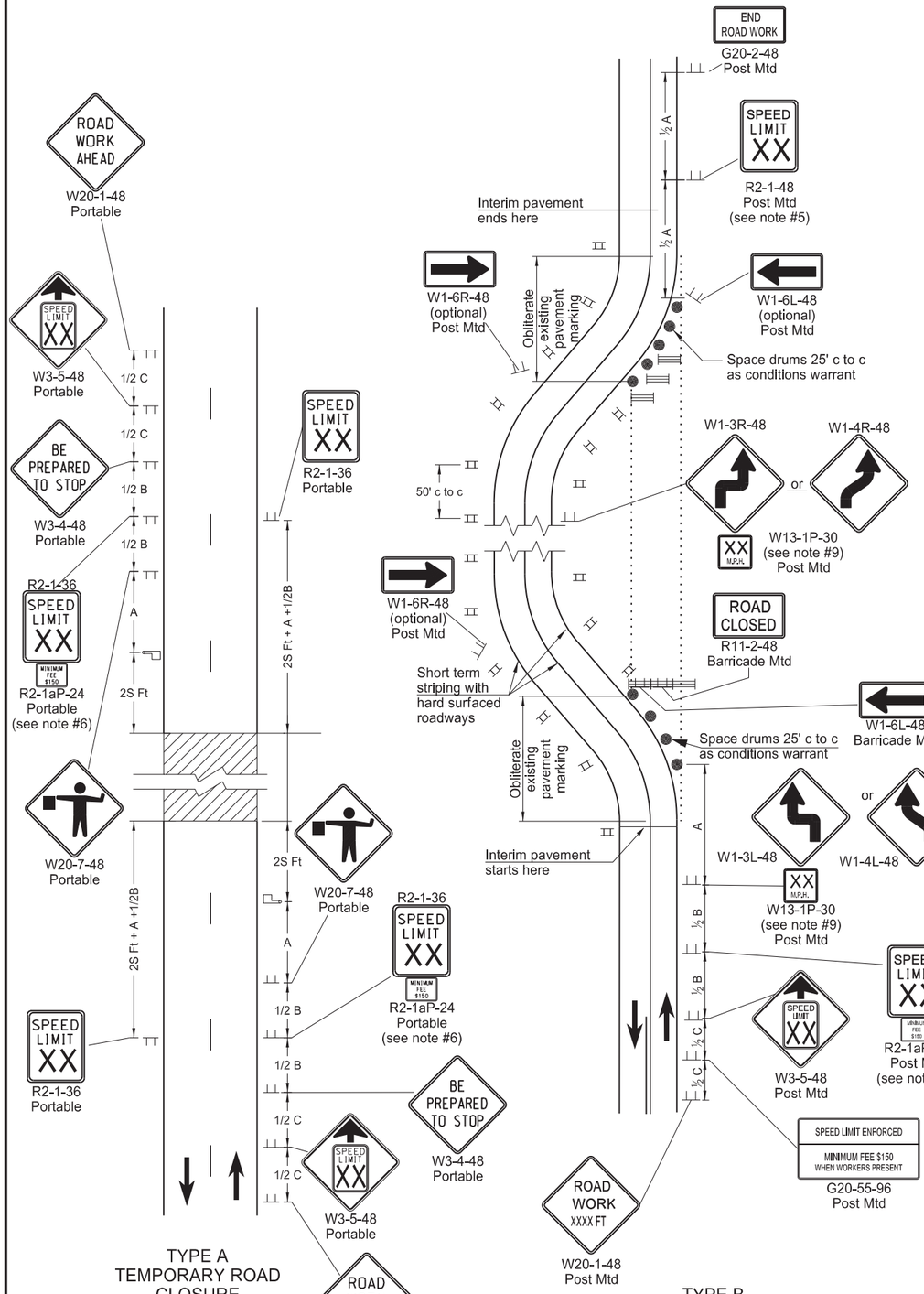
REVISIONS

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

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

08/01/24

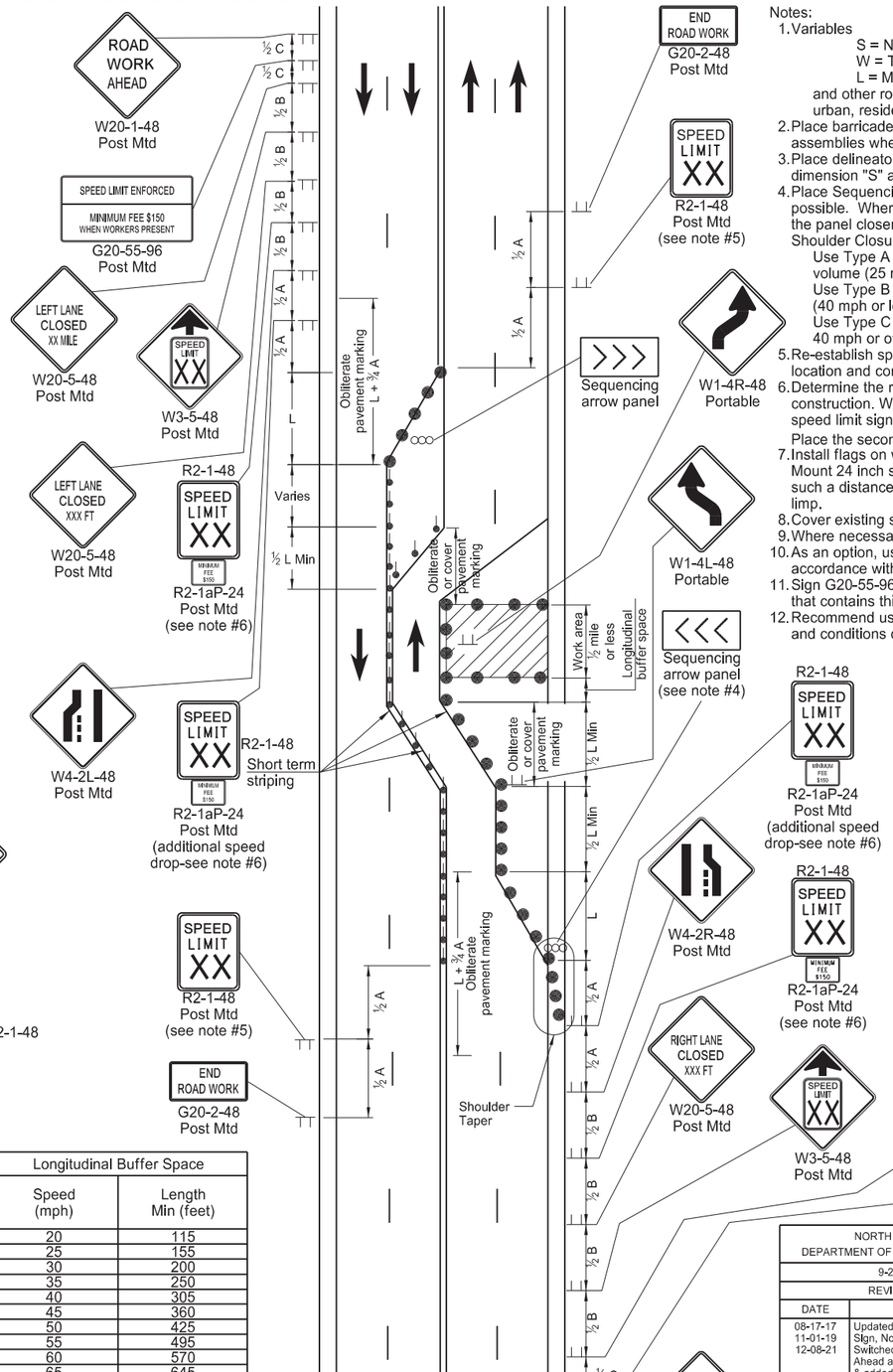
ROAD CLOSURE LAYOUTS



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
80	910



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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

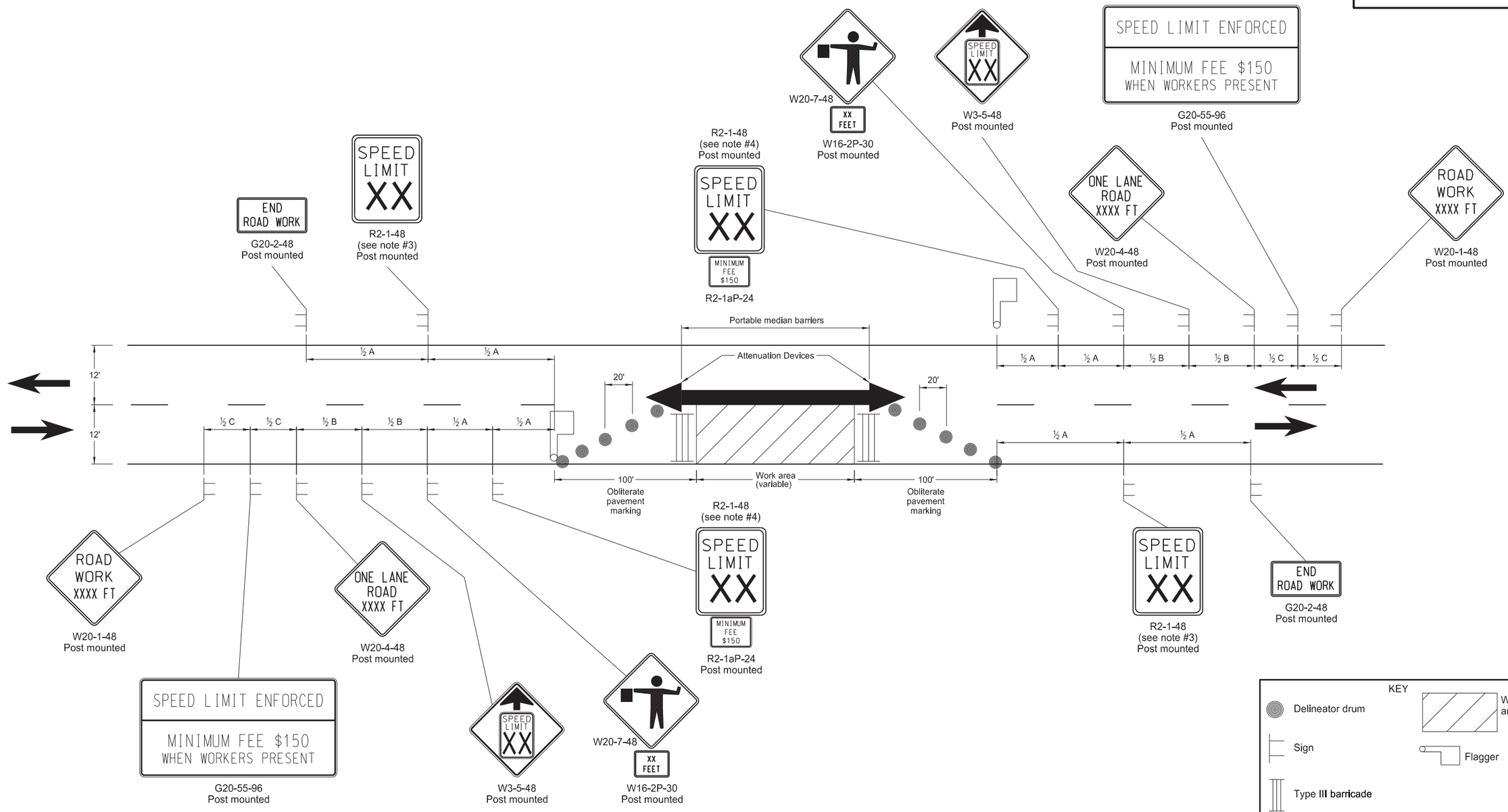
REVISIONS

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

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

SIGN LAYOUT FOR ONE LANE CLOSURE TWO LANE ROADWAY

D-704-17



KEY

- Delineator drum
- Work area
- Sign
- Flagger
- Type III barricade

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

Notes:

1. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
2. Remove existing striping as required. Use back to back delineators when inslope is 4:1 or flatter and roadway alignment is visible to approaching vehicles. Place back to back vertical panels when roadways have steep slopes and alignment is not visible to approaching traffic.
3. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
4. 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.
5. 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.
6. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
7. Cover existing speed limit signs within a reduced speed zone.
8. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or if work is less than 15 days.
9. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Note update & sign numbers
11-01-19	Removed signs & revised note
12-08-21	Switched order of Road Work XXXX and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
08-21-24	Pvmt Mkg Width & Med Barrier
06-30-25	Legislative Changes

KIRK J. HOFF
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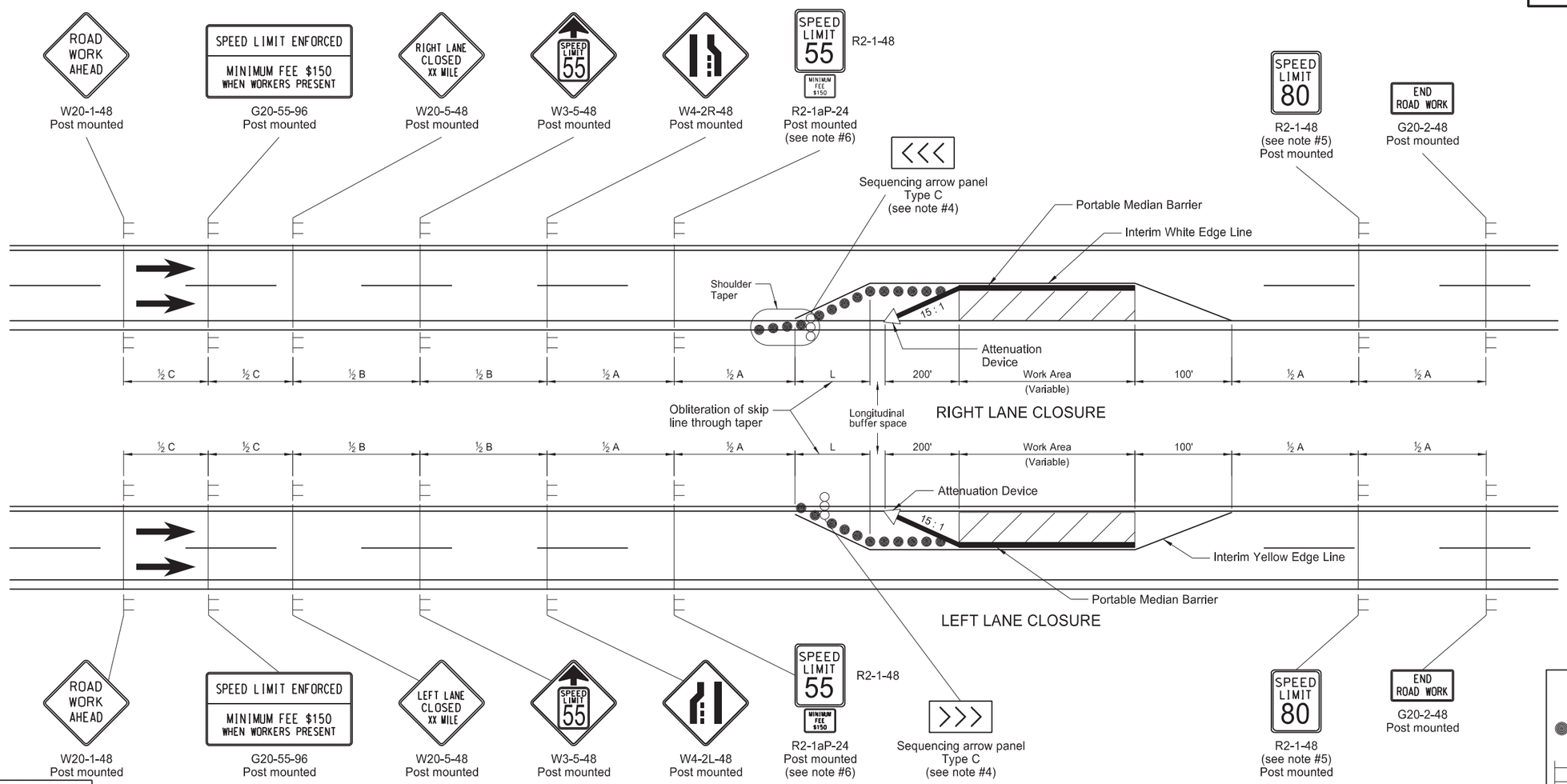
06/30/25
ENGINEER
NORTH DAKOTA

SIGN LAYOUT FOR INTERSTATE SYSTEM ONE LANE CLOSURE

D-704-18



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

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

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

Notes:

1. Variables
   S = Numerical value of posted speed limit, off-peak 85th percentile speed prior to work starting, or anticipated operating speed in MPH.
   W = The width of offset in feet.
   L = Minimum taper length in feet. S x W for freeways, expressways, and roads with speeds of 45 mph or greater, or
   W x S^2 /60 for urban, residential, and streets with speeds of 40 mph or less.
2. Place barricades on moveable assemblies and signs on portable assemblies when located on the roadway.
3. Space delineator drums used for tapering traffic and on tangent at 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 the roadway surface. See Shoulder Closure Standard Drawing. Use Type C on roadways with high traffic speeds and volumes (over 40 mph or 5000 ADT or greater).
5. Re-establish speed limit. 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 a reduced speed zone.
9. As an option, use portable sign supports in lieu of post mounted signs in accordance with the Standard D-704-14.
10. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or if work is less than 15 days.
11. Reduce speed limit further, if location and conditions dictate.

KEY

- Delineator Drum
- Sign
- Attenuation Device
- Sequencing Arrow Panel
- Work Area

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-27-13

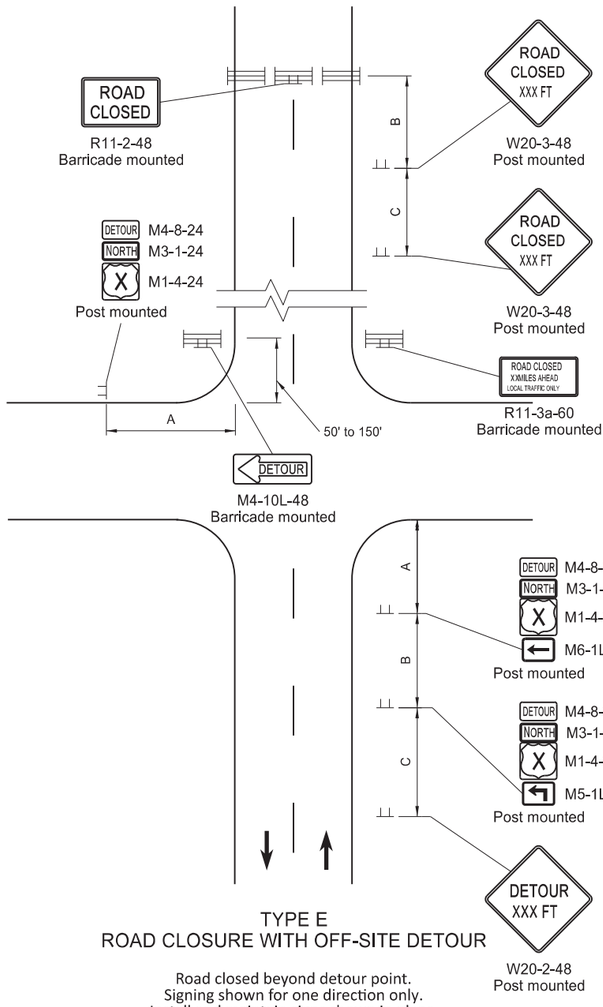
REVISIONS

DATE	CHANGE
01-13-16	Changed to Interim yellow edge line
03-15-16	Removed Do Not Pass signs & updated notes
08-17-17	Updated notes & sign numbers
11-01-19	Note, sign #, & pvmt obllt change
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
08-21-24	Portable Median Barriers
06-30-25	Legislative Changes

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

ROAD CLOSURE AND LANE CLOSURE ON A TWO WAY ROAD LAYOUTS

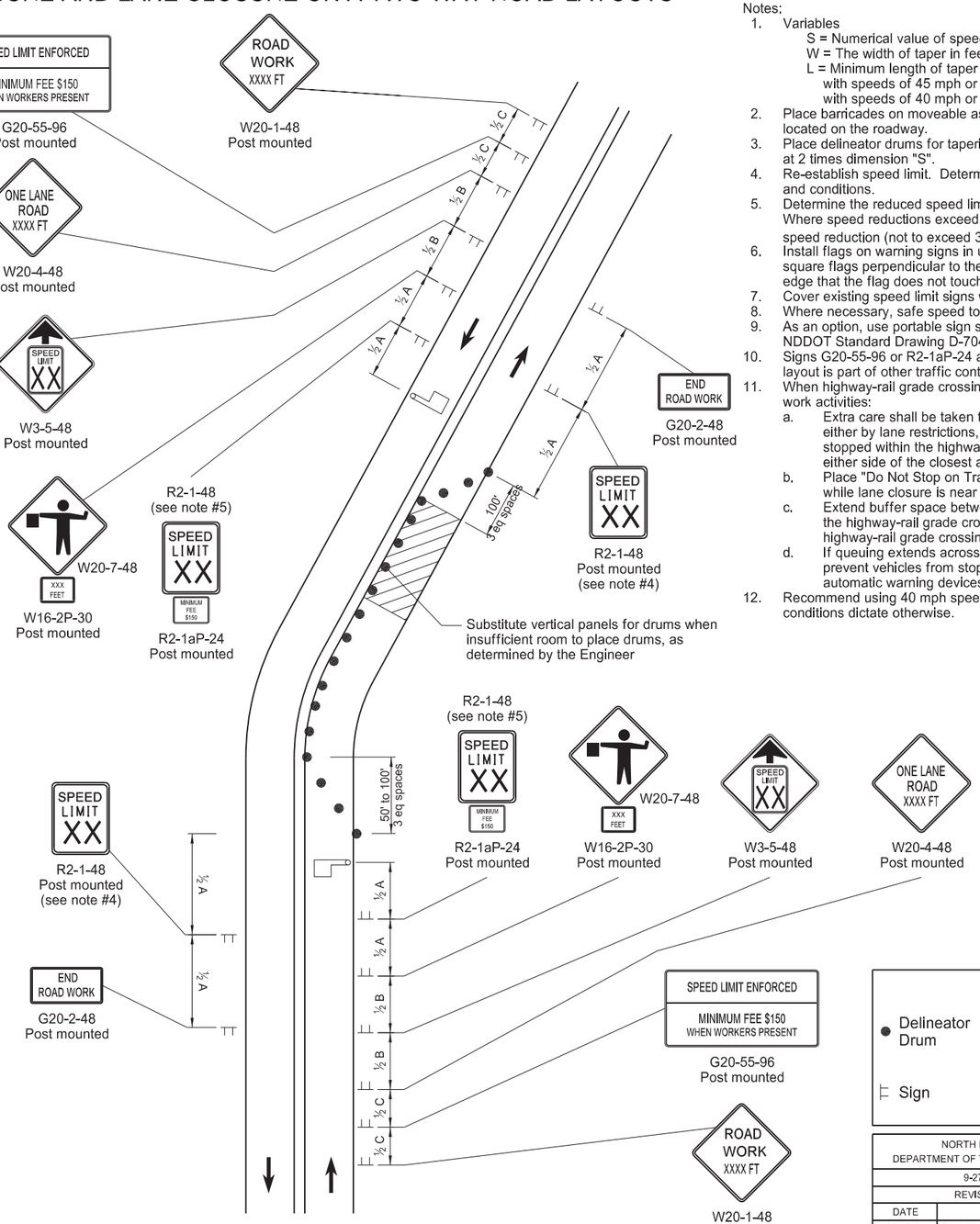
D-704-19



TYPE E
ROAD CLOSURE WITH OFF-SITE DETOUR

Road closed beyond detour point.
Signing shown for one direction only.
Install and maintain signs shown in plans.

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



TYPE F
LANE CLOSURE ON A TWO LANE ROAD USING FLAGGERS

Two lane highway with one lane closed.
Flagger at point visible to approaching traffic.

Notes:

1. Variables
   S = Numerical value of speed limit or 85th percentile.
   W = The width of taper in feet
   L = Minimum length of taper in feet. S x W for freeways, expressways, and roads with speeds of 45 mph or greater, or W x $S^2/60$ for urban, residential, and streets with speeds of 40 mph or less.
2. Place barricades on moveable assemblies and signs on portable assemblies when located on the roadway.
3. Place delineator drums for tapering traffic at 3 equal spaces and for tangents space them at 2 times dimension "S".
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 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. Where necessary, safe speed to be determined by the Engineer.
9. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
10. Signs G20-55-96 or R2-1aP-24 are not required when pilot car operation is used, if this layout is part of other traffic control that contains this sign, or if work is less than 15 days.
11. When highway-rail grade crossings exist either within or in the vicinity of the roadway work activities:
    a. Extra care shall be taken to minimize the probability of conditions being created, either by lane restrictions, flagging or other operations, where vehicles might be stopped within the highway-rail grade crossing (considered as being 15 feet on either side of the closest and farthest rail.)
    b. Place "Do Not Stop on Tracks" sign (R8-8-24) near cross buck in each direction while lane closure is near tracks.
    c. Extend buffer space between work zone and lane closure transition upstream of the highway-rail grade crossing to prevent flagging queue from extending across highway-rail grade crossing.
    d. If queuing extends across highway-rail crossing, provide flagger at crossing to prevent vehicles from stopping within the crossing (even when automatic warning devices are in place.)
12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

KEY

- Delineator Drum
- Type III Barricade
- Flagger
- Sign
- Work/Hazard Area

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
03-13-14	Revised Sign Cell "ROAD WORK XXX FT"
08-17-17	Update notes & sign numbers
11-01-19	Revised signs, sign #s, & notes
12-08-21	Switched order of Road Work XXX and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

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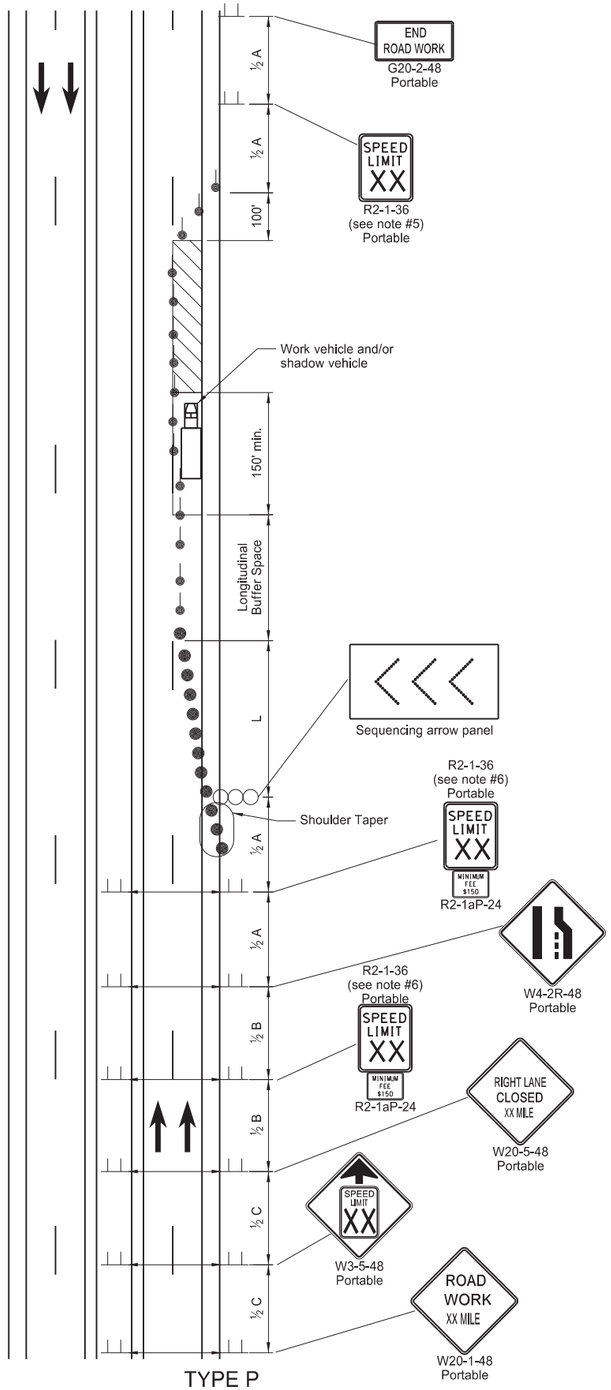
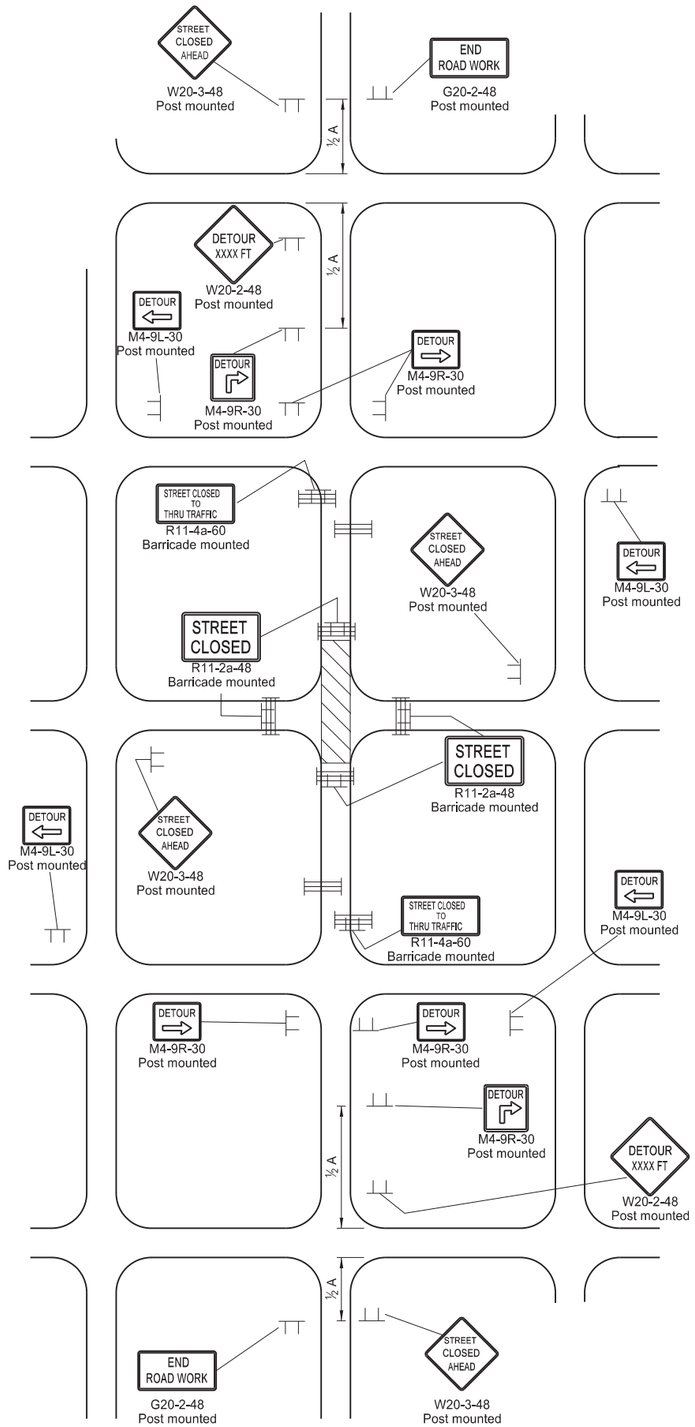
06/30/25
ENGINEER
NORTH DAKOTA

SHORT TERM URBAN DETOUR AND LANE CLOSURE ON A DIVIDED HIGHWAY LAYOUTS

D-704-23



TYPE P
STATIONARY LANE CLOSURE ON A DIVIDED HIGHWAY
4 lane divided roadway where ½ of roadway is closed.
Short-term (more than 1 hour within a single daylight period.)



TYPE Q
DETOUR FOR A CLOSED STREET
Where city streets are used for detouring traffic.
Urban projects do not require the G20-55-96 and R2-1aP-24 signs.

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 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. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
3. Space delineator drums for tapering traffic at dimension "S". Space delineator drums or tubular markers for tangents at 2 times "S".
4. Place Sequencing Arrow Panels at the beginning of taper. Where shoulder width does not provide sufficient room, move panel closer to the work area and place on roadway surface.
   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-established speed limit. 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 a reduced speed zone.
9. Covered (when approved by engineer) or obliterated payment marking measured as as Obliteration of Pavement Marking.
10. Change intersection control on detour for Type Q when determined necessary by the engineer.
11. Engineer to determine safe speed where necessary. When parking is present, place signs so they are entirely visible above parked vehicles or at the edge of the parking area so they are visible to oncoming traffic.
12. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
13. Recommend using 40 mph speed limit in vicinity of workers for Layout Type P, unless location and conditions dictate otherwise.

KEY

Type III barricade	Work area
Sign	Sequencing arrow panel
Delineator Drum	Tubular Markers

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION
9-27-13
REVISIONS

DATE	CHANGE
08-17-17	Removed speed limit signs, & updated notes & sign numbers
11-01-19	Revised sign numbers & note
12-08-21	Added Dollars At Work sign
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

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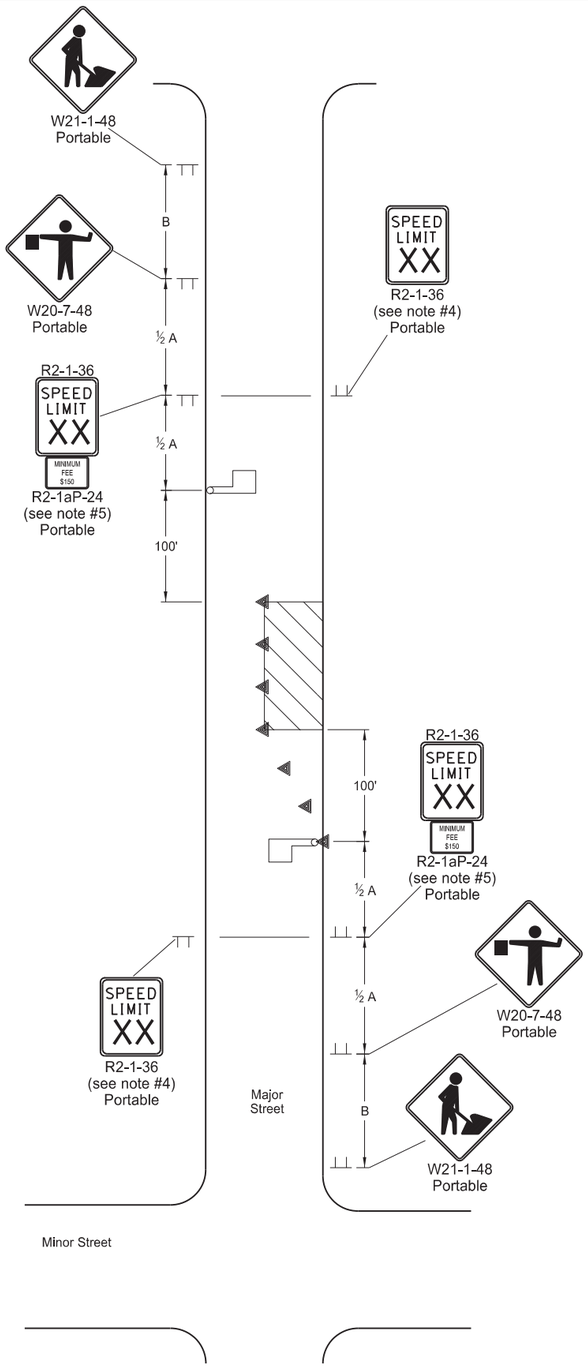
ENGINEER
NORTH DAKOTA

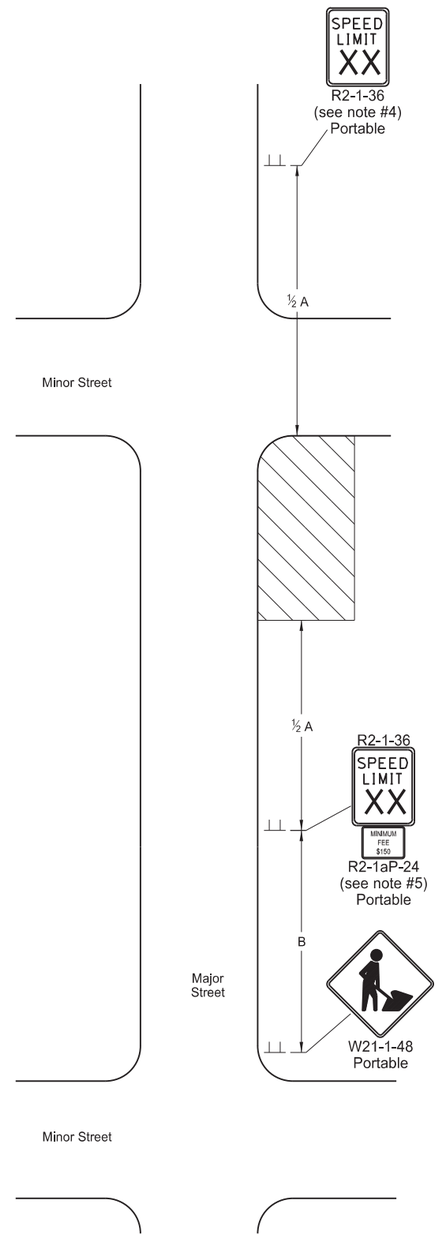
LANE CLOSURES ON URBAN STREETS LAYOUTS

D-704-25



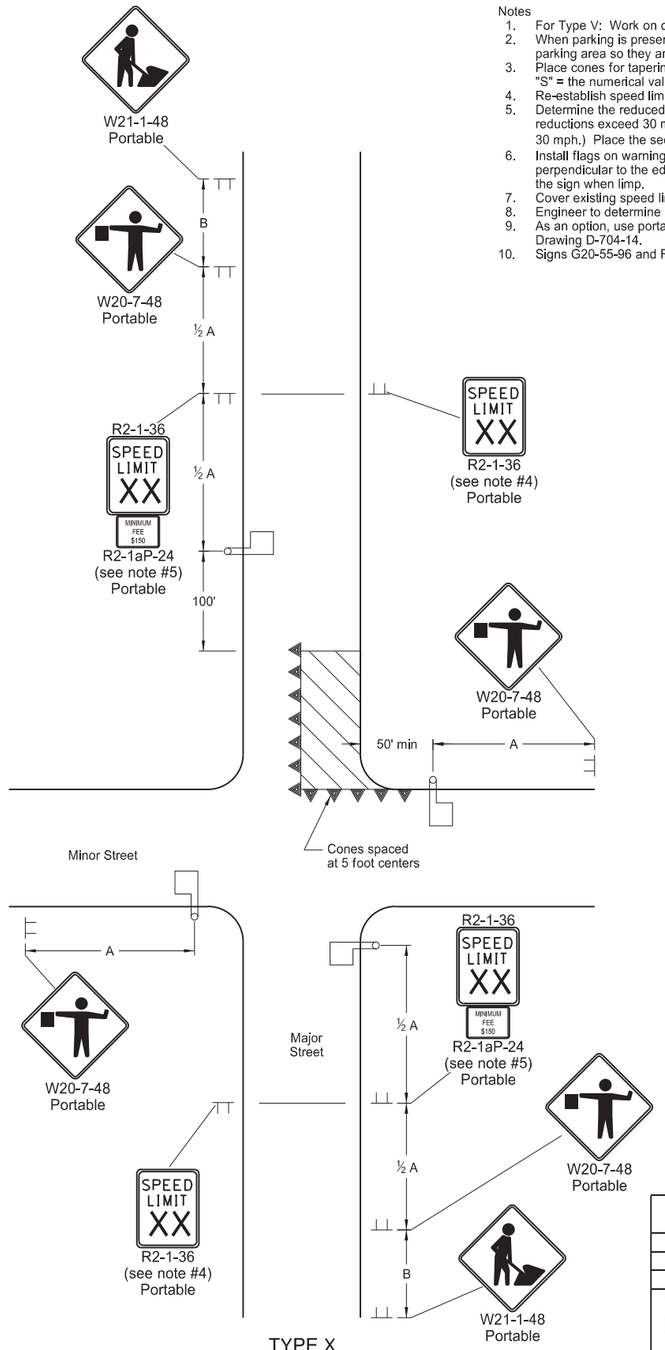
TYPE V
LANE CLOSURE ON URBAN STREET

Portion of roadway closed to traffic only
during daylight hours (mid block location).



TYPE W
WORK BEYOND CURB ON URBAN STREET

Work area outside driving lane and no closure necessary.



TYPE X
LANE CLOSURE NEAR INTERSECTION ON URBAN STREET

Portion of roadway closed to traffic only
during daylight hours (end block location).

Notes

1. For Type V: Work on one side of roadway at a time so as not to block off more than one lane of traffic.
2. When parking is present, place signs so they are entirely visible above parked vehicles or at the edge of the parking area so they are visible to oncoming traffic. Place signs on portable mounts when located on roadway.
3. Place cones for tapering traffic at 3 equal spaces and cones for tangents at dimension "S". "S" = the numerical value of speed limit.
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 ½ B.
6. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inches square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
7. Cover existing speed limit signs within reduced speed zones.
8. Engineer to determine safe speed, when necessary.
9. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
10. Signs G20-55-96 and R2-1aP-24 are not required for urban projects.

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

KEY

Sign — Work area
Cones — Flagger

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

9-27-13

REVISIONS

DATE	CHANGE
08-17-17	Updated notes & removed signs
11-01-19	Revised note & added Min Fee sign
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes

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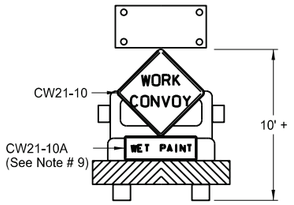
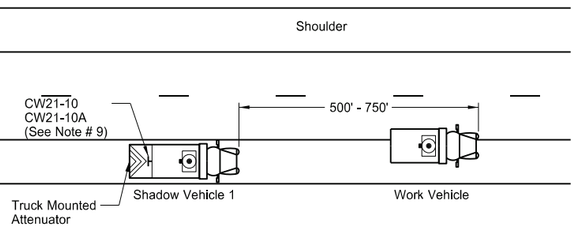
NORTH DAKOTA

MOBILE OPERATION
(PAVEMENT MARKING)

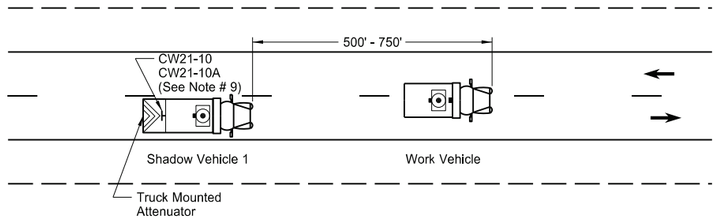
D-704-27



Typical Shadow Vehicle 1
Two-Way Roaday

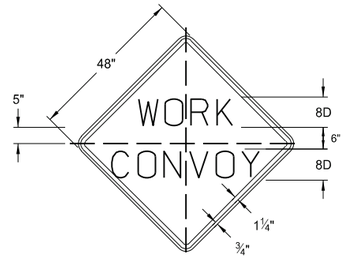


Two-Way Roadway with Paved Shoulders

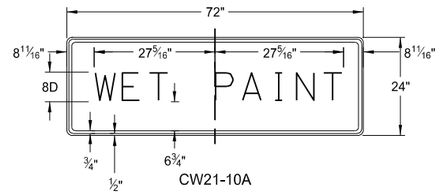


Two-Way Roadway without Paved Shoulders

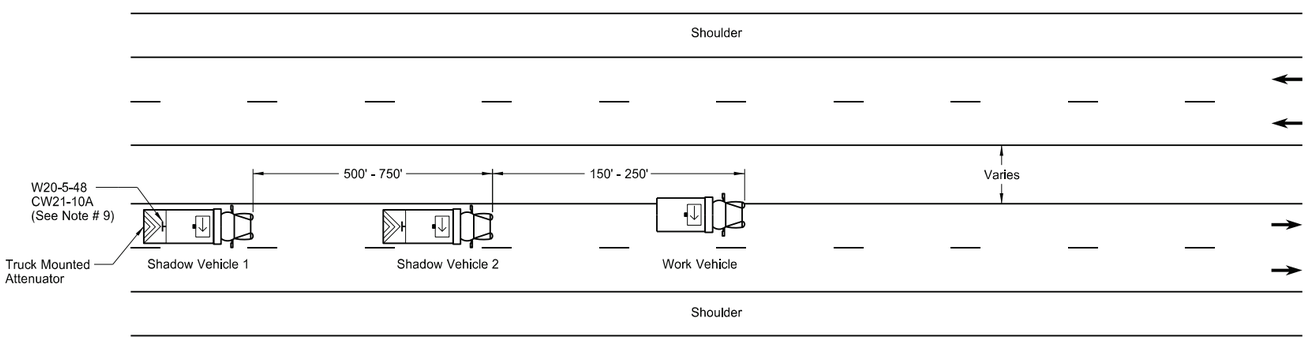
Sign Details



CW21-10

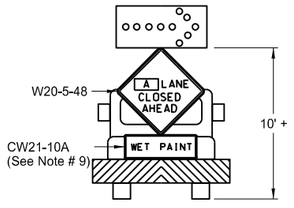


CW21-10A



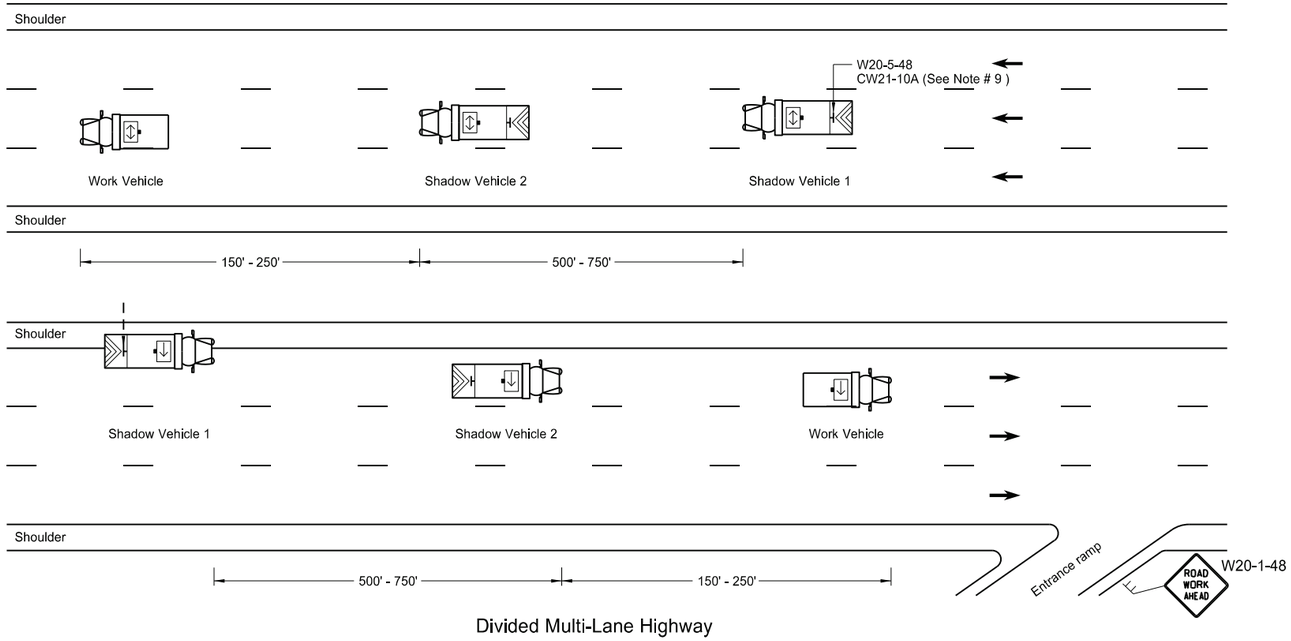
Undivided Multi-Lane Roadway

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



Typical Shadow Vehicle 1 & 2
Multi-Lane Highways

A = Left Right Center



Divided Multi-Lane Highway

KEY

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways
9-27-17	Updated to active voice
11-08-19	Changed Standard Heading
8-02-24	Electronic Stamp/Signature.

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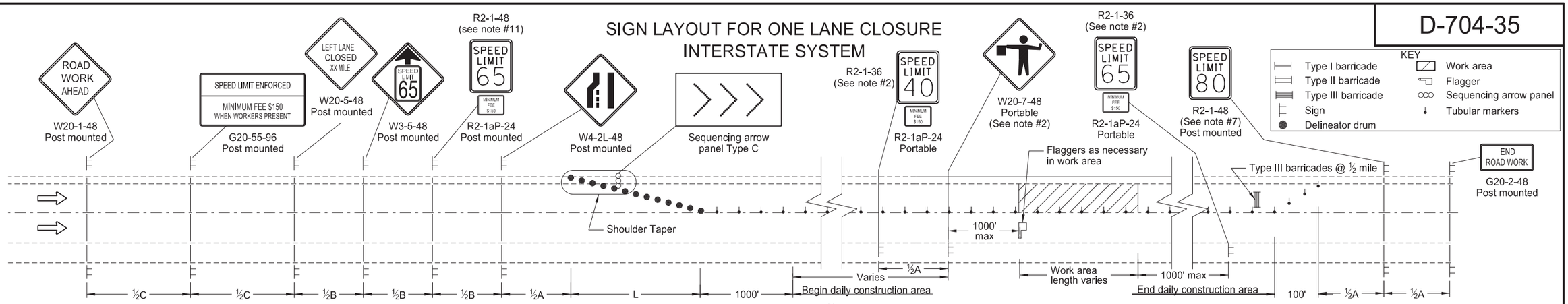
08/02/24

D-704-35

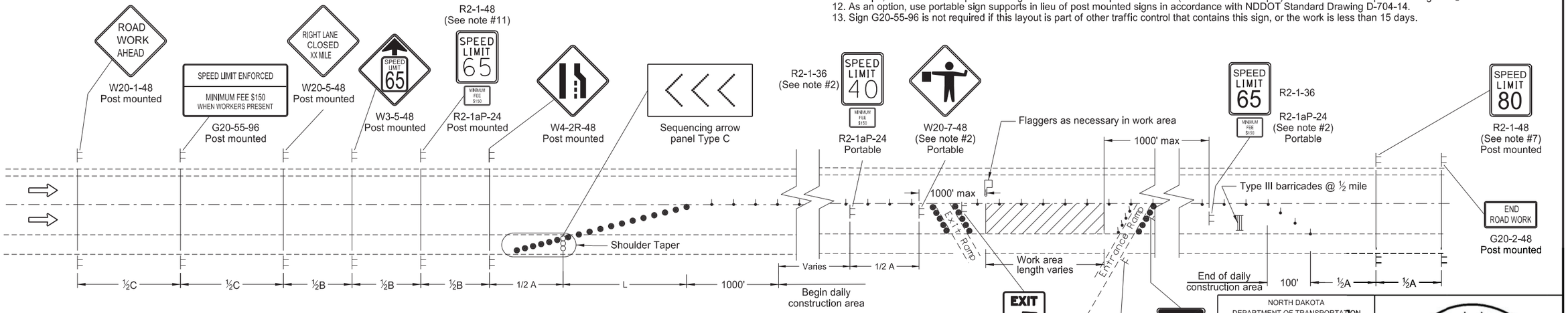
SIGN LAYOUT FOR ONE LANE CLOSURE INTERSTATE SYSTEM



LEFT LANE CLOSED
WORKERS IN WORK AREA

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

Notes:
1. Install advance signs for flagging when flaggers are flagging.
2. Move the advanced flagger sign and the speed limit signs as the work area moves through the construction zone. When the work area is not visible from the flagger, move the flagger station so the work area is visible. Space the 40 mph speed limit sign at ½A in advance of the flagger sign and move the 65 mph speed limit sign. Cover or remove the 40 mph speed limit and Minimum Fee $150 signs and the 65 mph speed limit sign upon completion of the work day or when workers are not present.
3. RAMPS: When the work area encompasses an entrance ramp, install a 40 mph speed limit sign on the ramp and cover any existing yield sign. Install new yield sign as necessary. Remove the ramp speed limit sign when the main line 40 mph speed zone is moved past the ramp.
4. Variables:
   S=Numerical value of speed limit or 85th percentile
   W=The width of taper.
   L=Minimum length of taper, or SxW for freeways, expressways, and all other roads with speeds of 45 mph or greater, or
   WxSxS/60 for urban, residential, and other streets with speeds of 40 mph or less.
5. Space delineator drums for tapering traffic at the dimension "S". Space tubular markers used for tangents at 2 times dimension "S".
6. 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 the roadway surface.
   Use Type C on roadways with high traffic speeds and volumes (over 40 mph or 5000 ADT or greater).
7. Re-establish the speed limit. Determine the exact speed limit in the field, dependent on location and conditions.
8. Cover existing speed limit signs within a reduced speed zone.
9. Upon approval, the Engineer will measure obliterated or covered pavement marking as Obliteration of Pavement Marking.
10. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the diamond sign, and at such a distance above the edge that the flag does not touch the sign when limp.
11. Determine the reduced speed limit dependent on the in place speed limit before construction. When speed limits are to be 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 ½B.
12. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
13. 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.



RIGHT LANE CLOSED
WORKERS IN WORK AREA

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

9-7-2012

REVISIONS

DATE	CHANGE
06-23-14	Revised Note 12
03-15-16	Removed Do Not Pass signs & updated notes
08-17-17	Moved speed signs & added note
10-17-17	Corrected spelling of "shoulder"
11-01-19	Revised tubular Mrkrs symbols
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced, added Dollars At Work, & removed table
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

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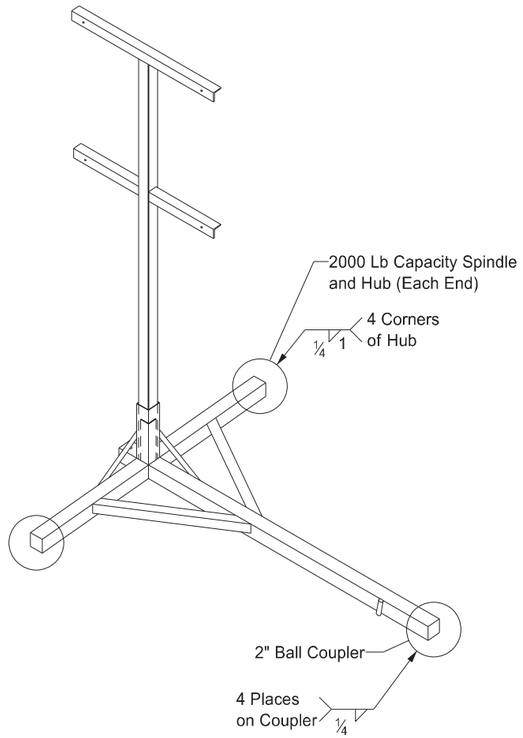
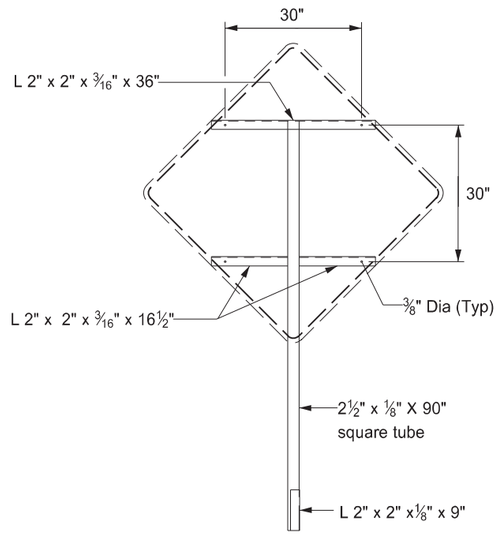
NORTH DAKOTA

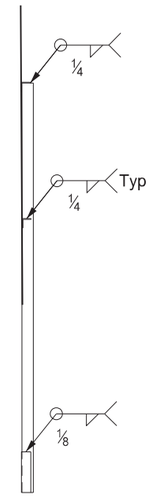
PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50





FRONT

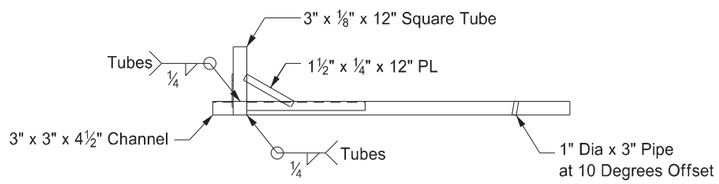


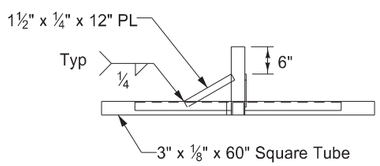
RIGHT

SIGN SUPPORT

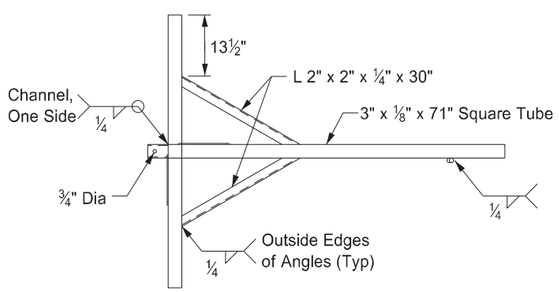
Notes:

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





RIGHT



TOP

TRAILER

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

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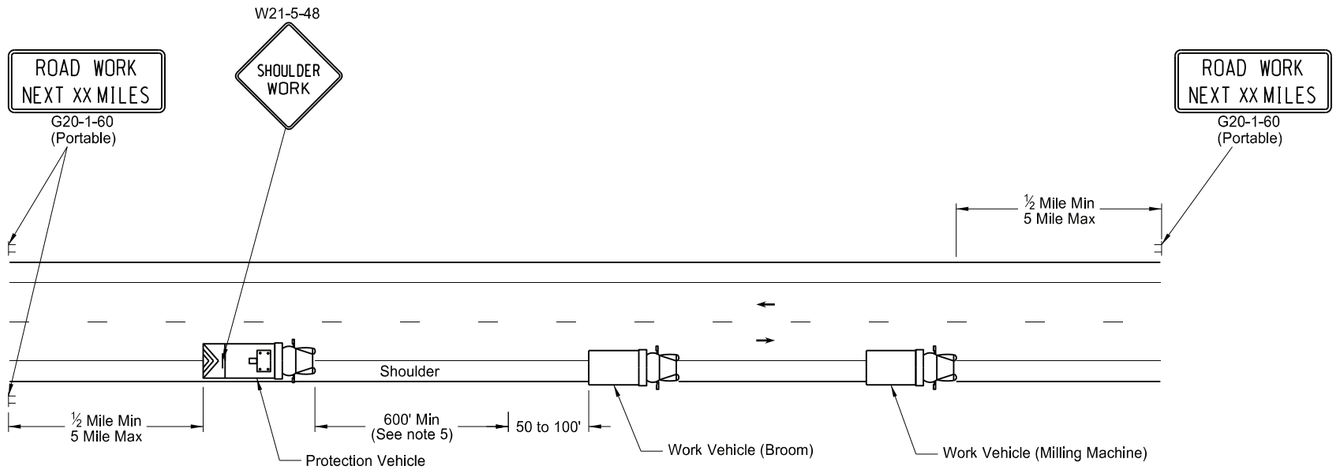
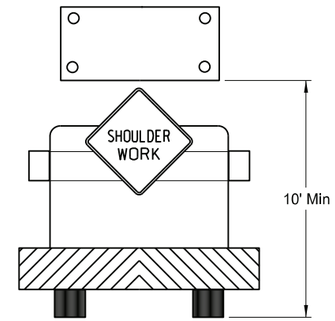
12 02 2020

MOBILE OPERATION
Grinding Shoulder Rumble Strips

D-704-56



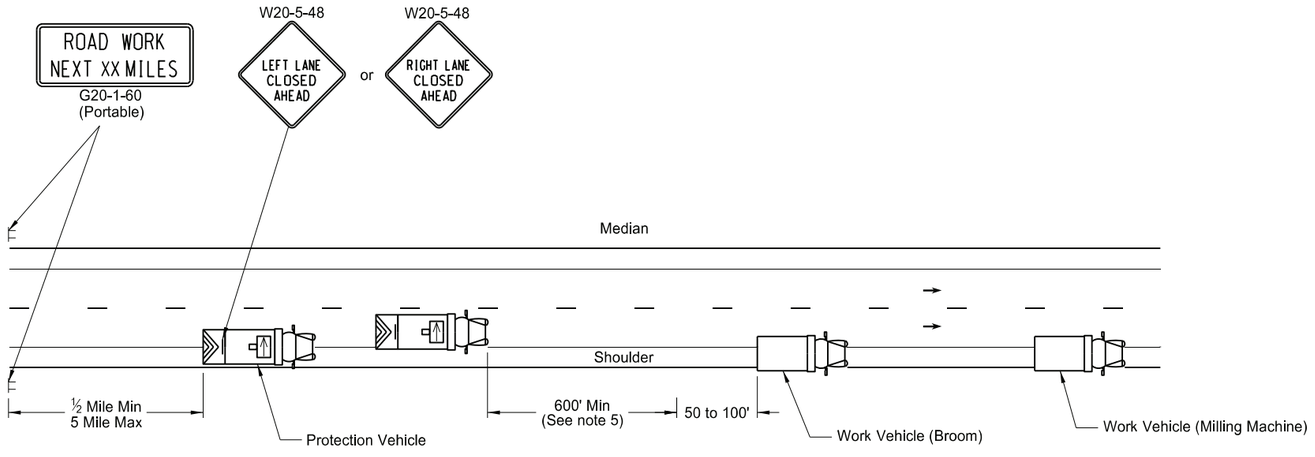
TWO LANE - TWO WAY ROADWAY



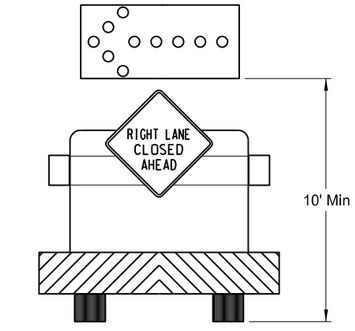
TWO LANE - TWO WAY ROADWAY

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.

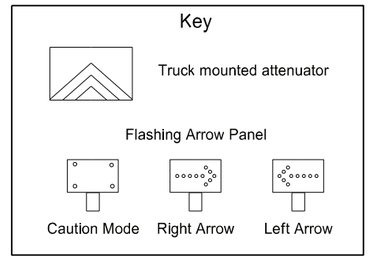


INTERSTATE & 4 LANE DIVIDED HIGHWAY



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
8-02-24	Electronic Stamp/Signature

KIRK J. HOFF
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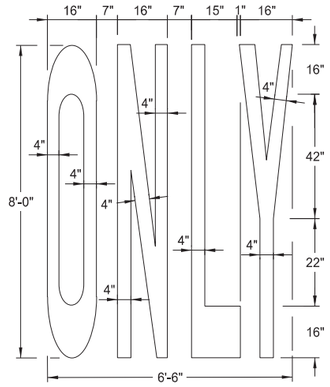
ENGINEER
NORTH DAKOTA

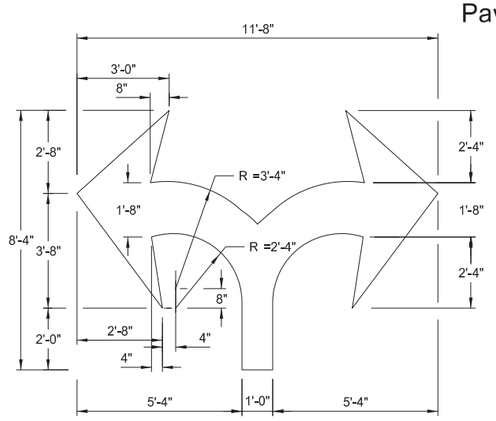
08/02/24

Pavement Marking Message Details

D-762-1



22 S. F.



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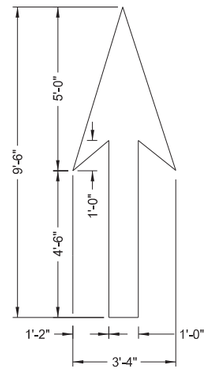

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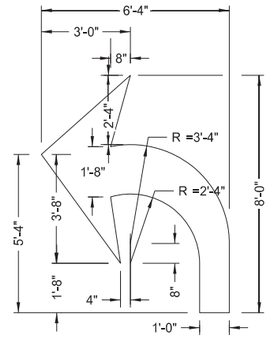
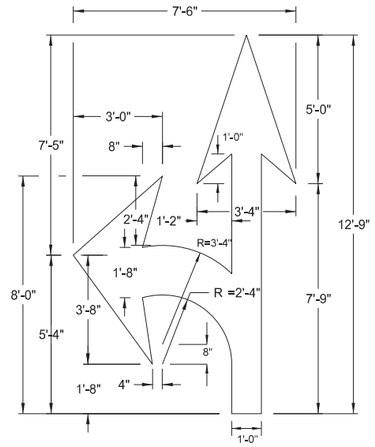
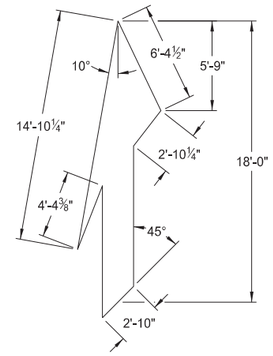


16 S. F.

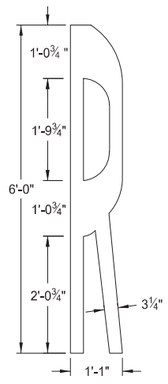


27 S. F.

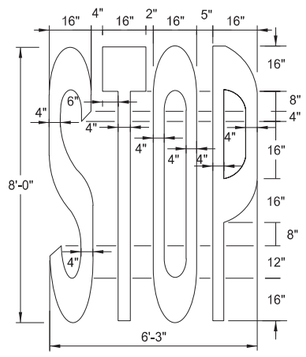


41 S. F.

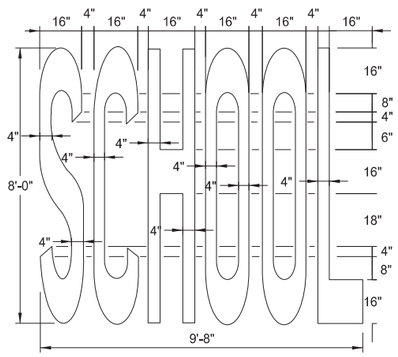
Note: Rotate merge arrow 20° from edge of roadway.



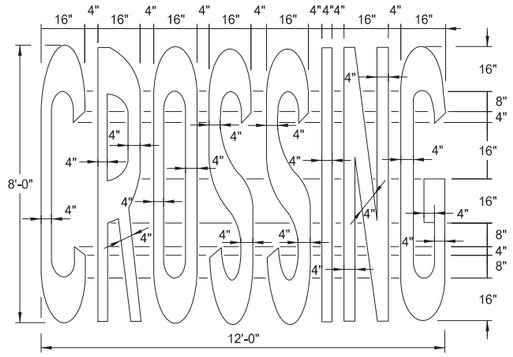
4 S. F.



22 S. F.



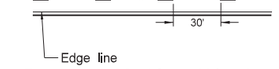
34.5 S. F.



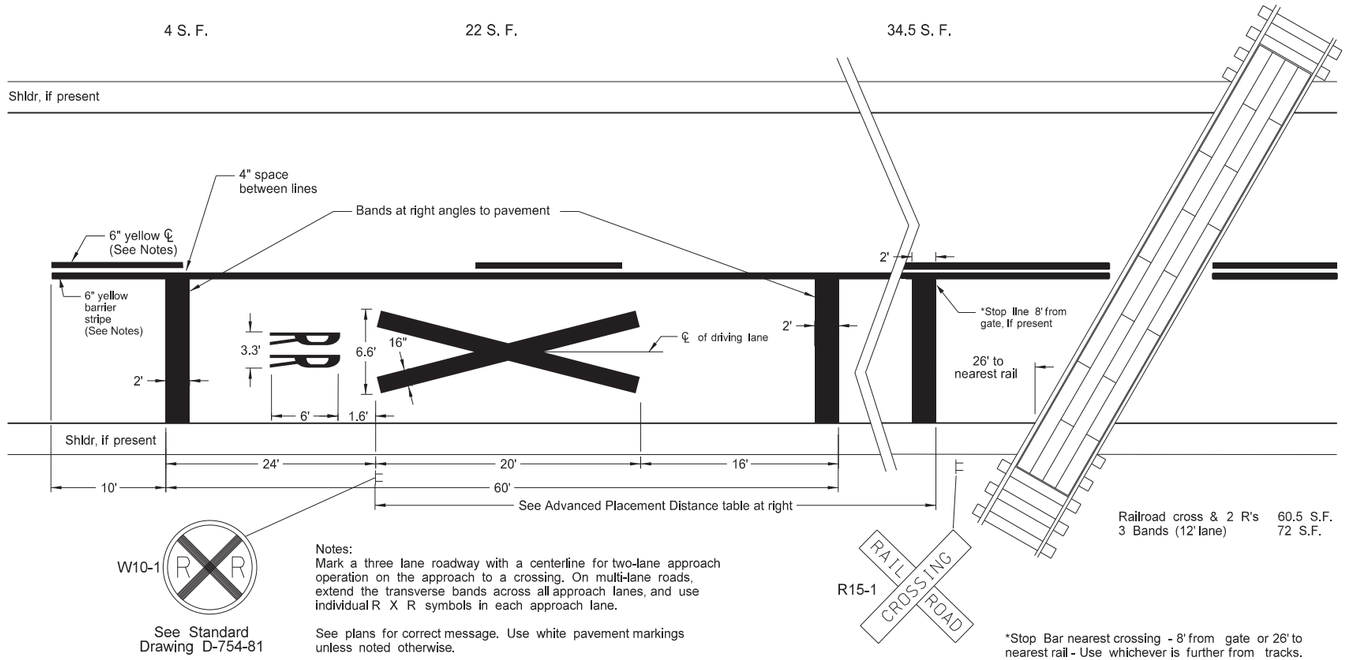
46 S. F.

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

Chevron Crosshatching Table



Centerline Pavement Marking Skip Spacing Detail



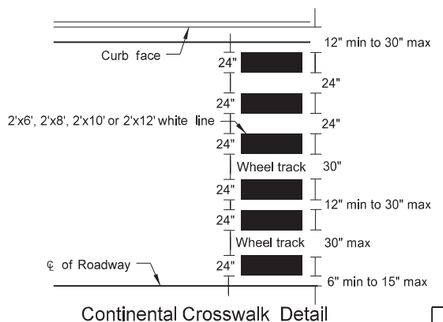
Notes:
Mark a three lane roadway with a centerline for two-lane approach operation on the approach to a crossing. On multi-lane roads, extend the transverse bands across all approach lanes, and use individual R X R symbols in each approach lane.

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

Railroad cross & 2 R's 3 Bands (12' lane) — 60.5 S.F. 72 S.F.

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

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



Continental Crosswalk Detail

NOTES:

1. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
2. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

12-6-11

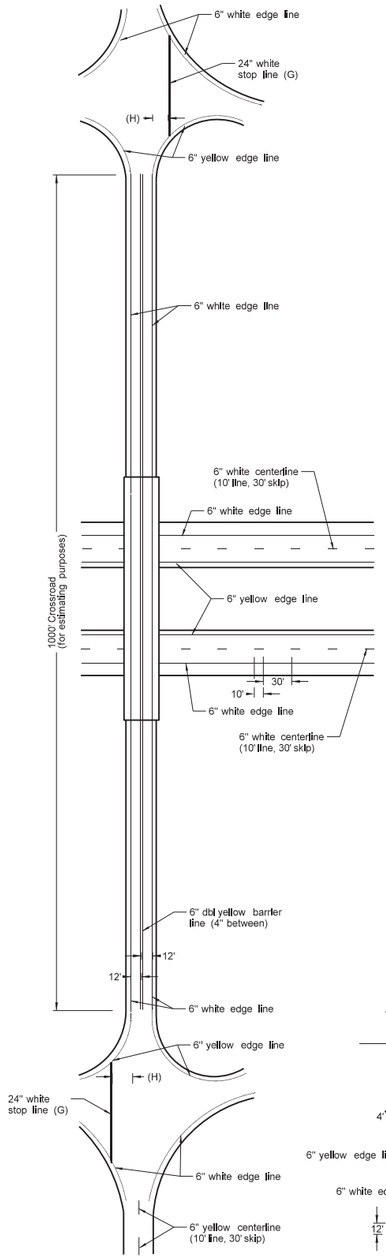
REVISIONS

DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
01-28-2020	Revised min Stop Bar distance to rail.
11-22-2023	Revised pavement marking widths.

KIRK J. HOFF REGISTERED PROFESSIONAL PE-4683 11/22/23 ENGINEER NORTH DAKOTA

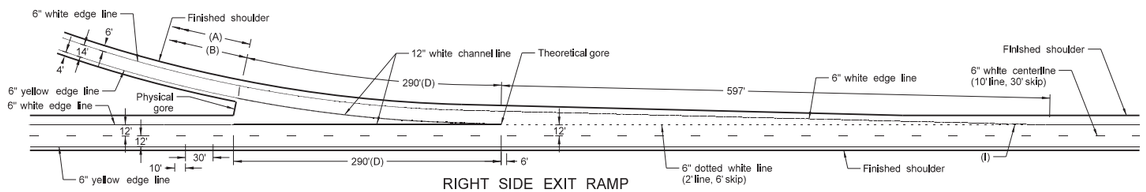
INTERSTATE PAVEMENT MARKING
4 LANE DIVIDED HIGHWAY

D-762-2

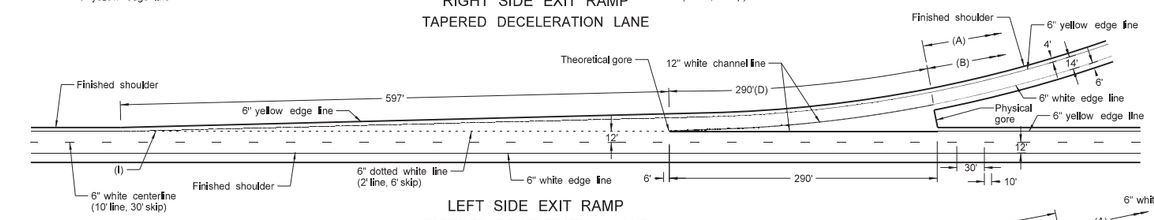


CROSS-ROAD & STRUCTURE

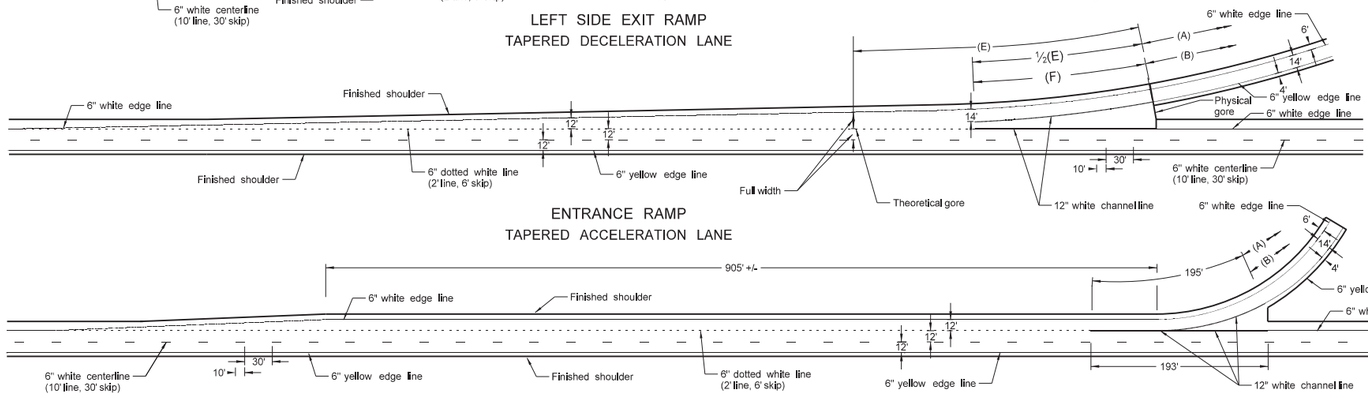
Engineer will determine length striped.



RIGHT SIDE EXIT RAMP
TAPERED DECELERATION LANE

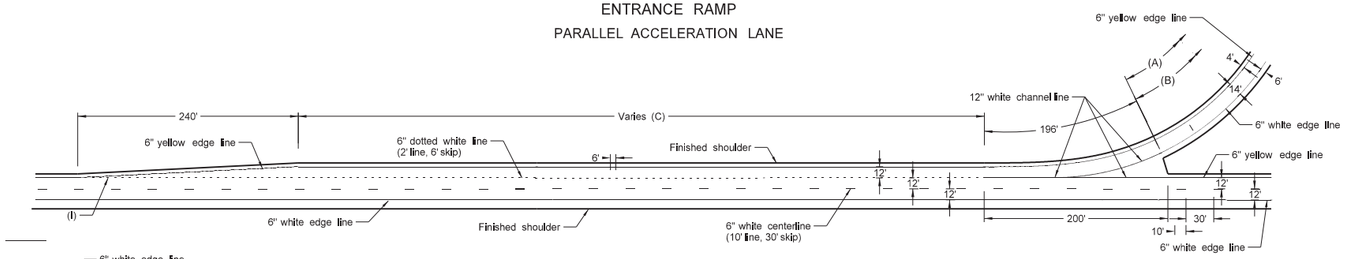


LEFT SIDE EXIT RAMP
TAPERED DECELERATION LANE

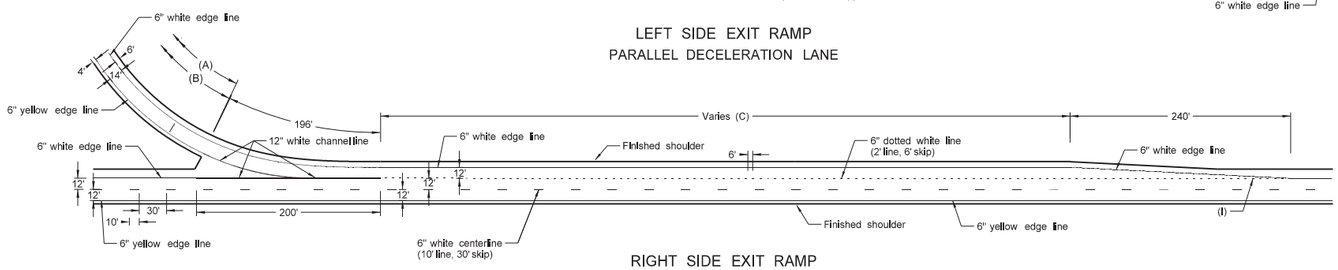


ENTRANCE RAMP
TAPERED ACCELERATION LANE

ENTRANCE RAMP
PARALLEL ACCELERATION LANE



LEFT SIDE EXIT RAMP
PARALLEL DECELERATION LANE



RIGHT SIDE EXIT RAMP
PARALLEL DECELERATION LANE

NOTE:

(A) Normal width white edge line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.

Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.

(B) Normal width yellow edge line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.

Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.

(C) Assume "varies" equals 790' for purpose of estimate. Place pavement marking from beginning of taper to the 12" line.
(D) Beginning of physical gore to theoretical gore.
(E) If the distace is less than 350' extend the 12" channel line to the theoretical gore, otherwise use 195'.
(F) Use 195' for estimating purposes.
(G) Not required for gravel surface crossroad approaches.
(H) 4' minimum, 15' maximum from nearest edge of intersection traveled way.
(I) Extend dotted line until it touches the edgeline.

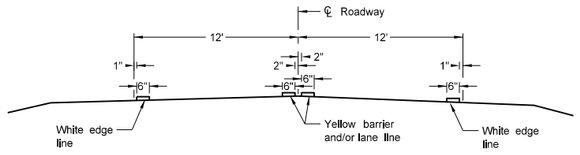
BASIS OF ESTIMATE		
LOCATION	ITEM	
Right or Left Side Exit Ramp TAPERED	12" White channel line	580 LF
	24" White stop line	60 LF
	6" White dotted line	148 LF
	6" White edge line	1115 LF
	6" Yellow edge line	1075 LF
Entrance Ramp TAPERED	12" White channel line	390 LF
	6" White dotted line	258 LF
	6" White edge line	1270 LF
	6" Yellow edge line	1075 LF
Right or Left Side Exit Ramp PARALLEL	12" White channel line	396 LF
	24" White stop line	60 LF
	6" White dotted line (C)	258 LF
	6" White edge line	1115 LF
	6" Yellow edge line	1075 LF
Entrance Ramp PARALLEL	12" White channel line	388 LF
	6" White dotted line	283 LF
	6" White edge line	1275 LF
	6" Yellow edge line	1075 LF
Main Line (Both Roadways)	6" White lane line, 10' line, 30' skip	2640 LF/MI
	6" White edge line	10,560 LF/MI
	6" Yellow edge line	10,560 LF/MI
Cross Road	6" White edge line	2000 LF
	6" Dbl yellow barrier line (4" between)	2000 LF

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-3-11	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice
10-25-19	Replaced 2' Max dim with Note (I)
11-05-21	Revised labels
11-22-23	Revised pvmt marking widths
1-17-24	Revised wide pvmt marking width

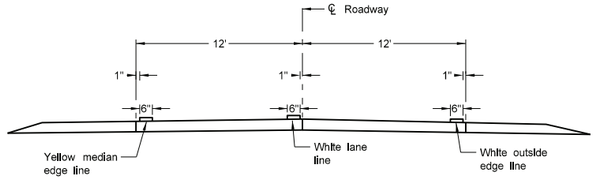
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
01/17/24
ENGINEER
NORTH DAKOTA

PAVEMENT MARKING

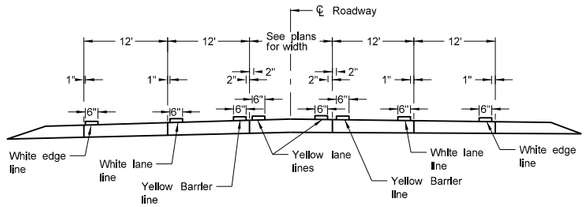
D-762-4



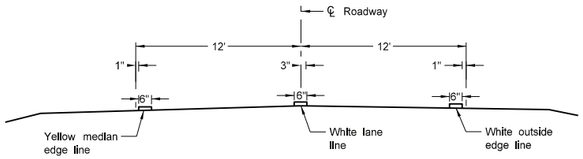
Two Lane Two Way
RURAL ROADWAY



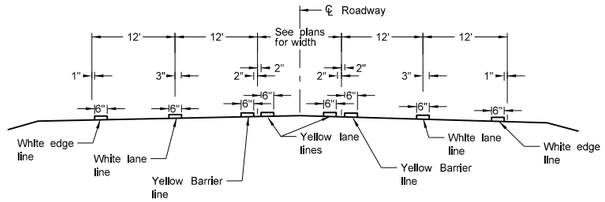
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



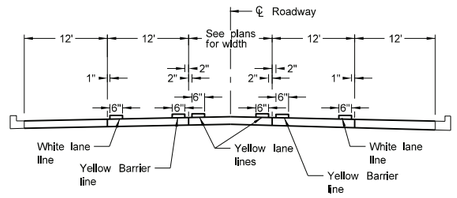
RURAL FIVE LANE ROADWAY
Concrete Section



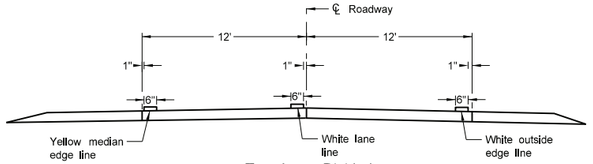
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphat Section



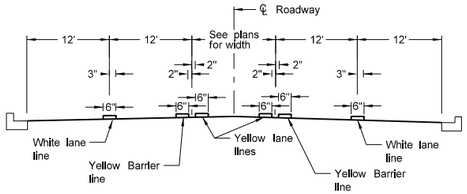
RURAL FIVE LANE ROADWAY
Asphalt Section



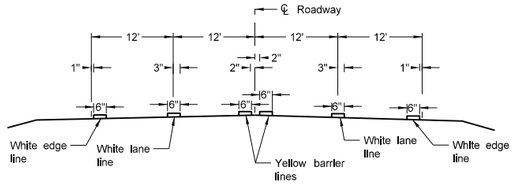
URBAN FIVE LANE SECTION
Concrete Section



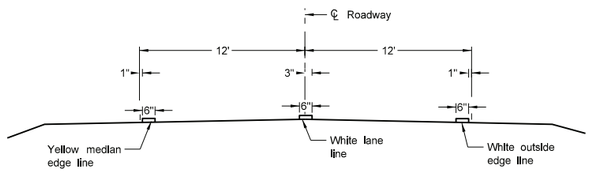
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Concrete Section



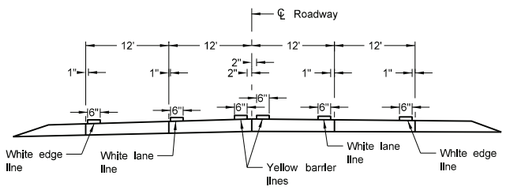
URBAN FIVE LANE SECTION
Asphalt Section



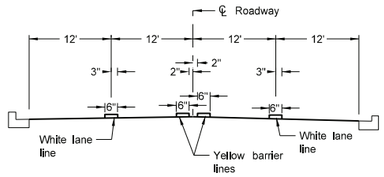
RURAL FOUR LANE ROADWAY
Asphalt Section



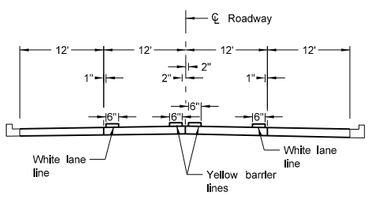
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



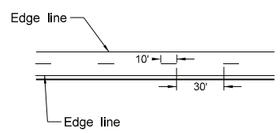
RURAL FOUR LANE ROADWAY
Concrete Section



URBAN FOUR LANE SECTION
Asphalt Section



URBAN FOUR LANE SECTION
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

NOTES:

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

   For section lines, county roads, and street approaches, stripe the radii and edge lines of the paved surface within the right of way except where curb and gutter is present.

2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph,

3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits < 40 mph.

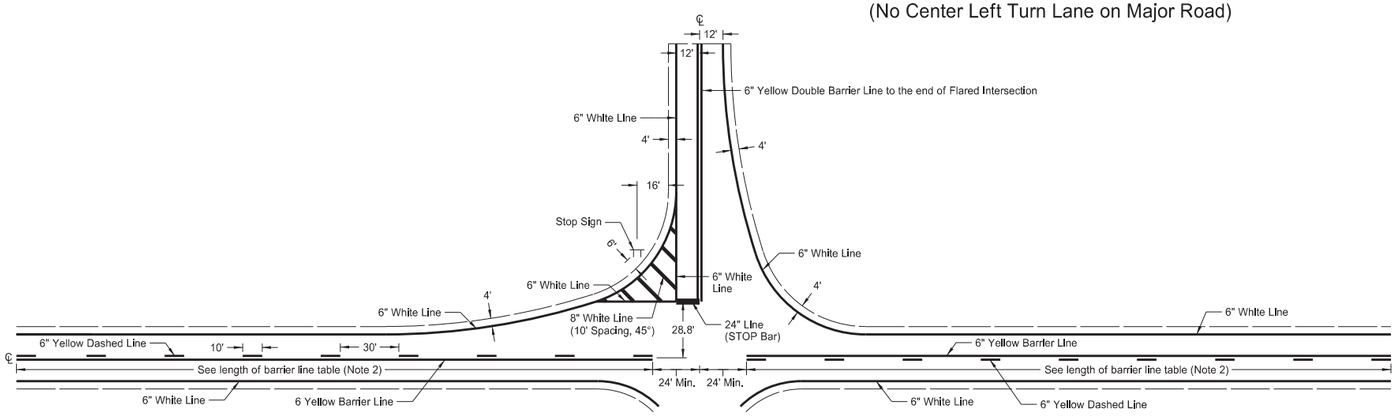
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
07-09-24	Modified Note 1.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
07/09/24
ENGINEER
NORTH DAKOTA

PAVEMENT MARKING FOR STANDARD 90 DEGREE FLARED INTERSECTION

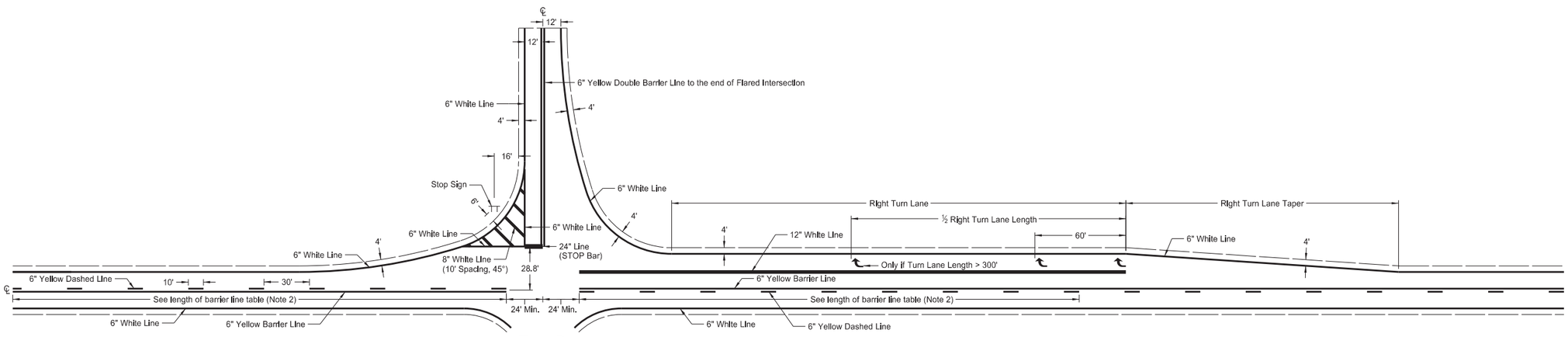
D-762-5

(No Center Left Turn Lane on Major Road)



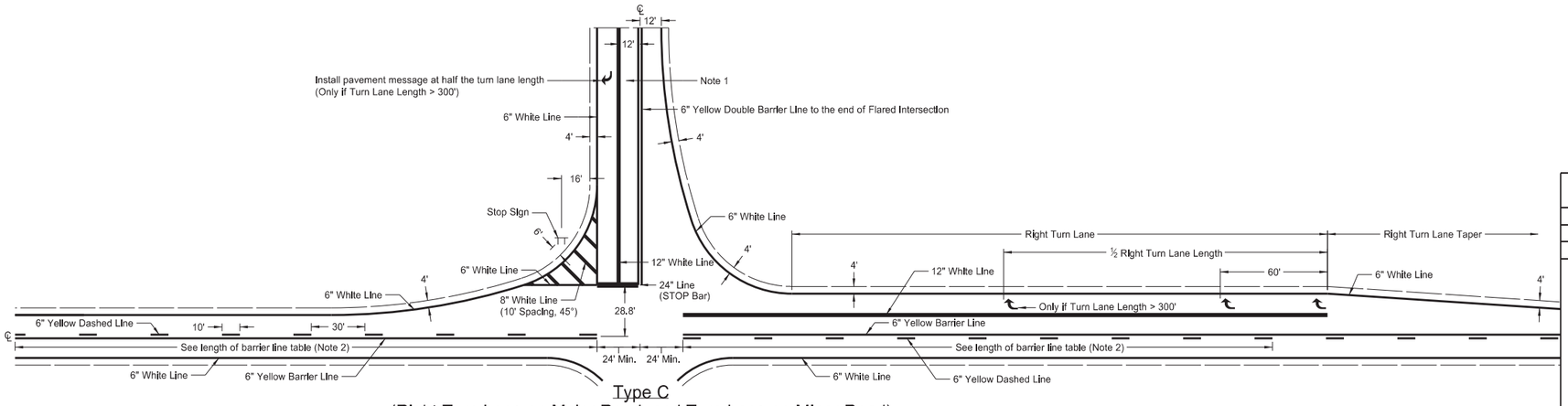
Type A

(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.)
3. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
4. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40.
5. Wide line - 8 inches wide if 4 inch normal width lines are used and 12 inches wide if 6 inch normal width lines are used.

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'

6" Marking

8" Marking

12" Marking

24" Marking

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

3-29-16

REVISIONS

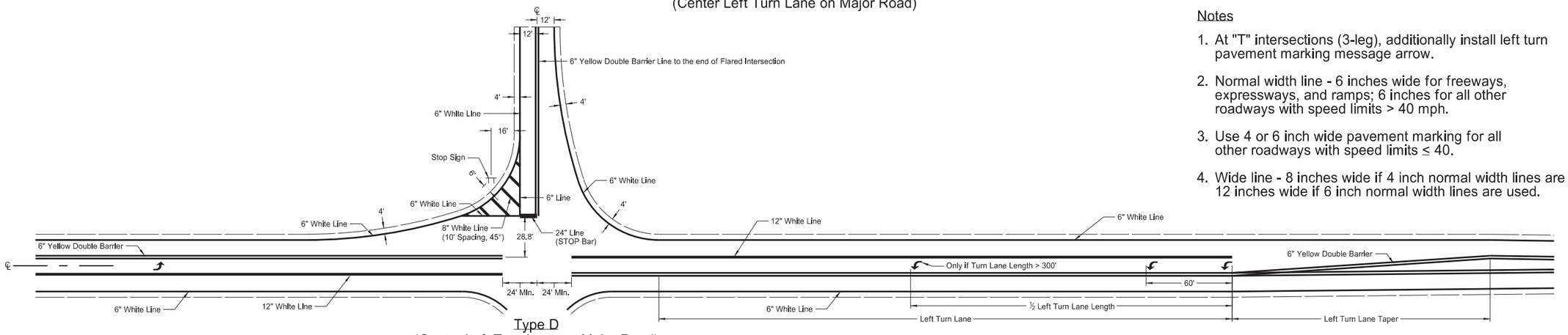
DATE	CHANGE
8-17-17	Updated note & dimensioning.
8-30-18	Corrected pvmt mkg placement.
8-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
1-17-24	Revised wide pvmt mkg width.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
01/17/24
ENGINEER
NORTH DAKOTA

PAVEMENT MARKING FOR STANDARD 90 DEGREE FLARED INTERSECTION

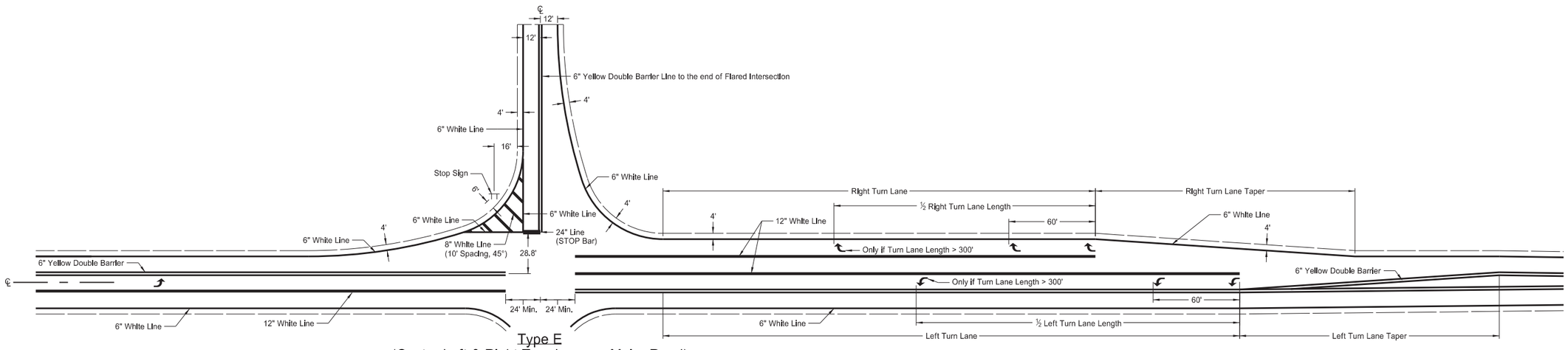
D-762-6

(Center Left Turn Lane on Major Road)



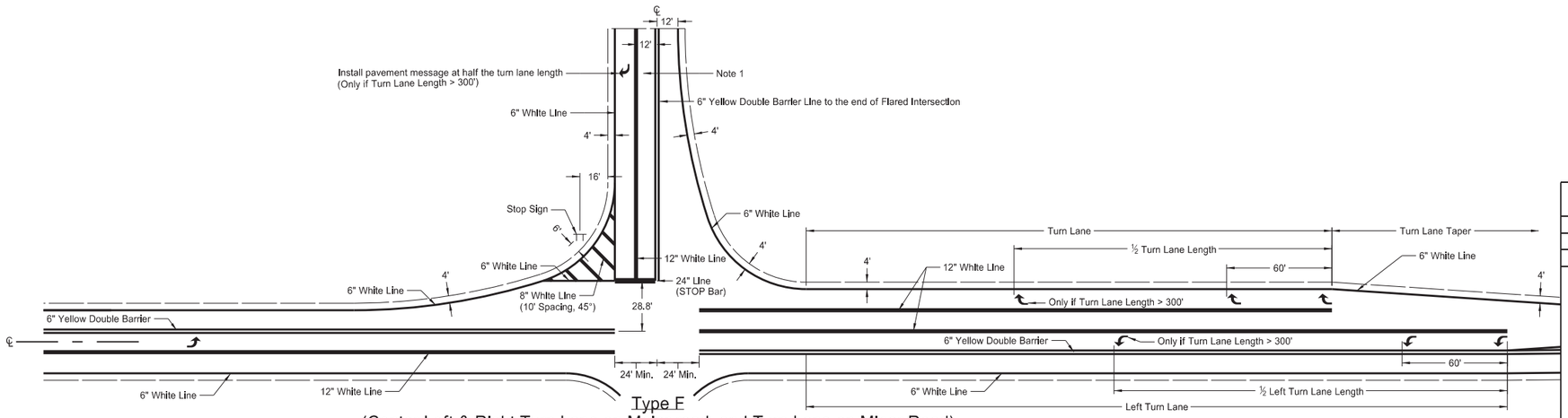
Type D

(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.
2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40.
4. Wide line - 8 inches wide if 4 inch normal width lines are used and 12 inches wide if 6 inch normal width lines are used.

6" Marking
8" Marking
12" 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.
11-22-23	Revised pavement marking widths.
1-17-24	Revised wide pvmt mkg width.

KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
01/17/24
ENGINEER
NORTH DAKOTA