

STATE COUNTY MAP

BILLINGS COUNTY NORTH DAKOTA PLANS FOR FEDERAL AID PROJECT

STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
ND	SC-0400(021)	23176	1	1

SC-0400(021)
CMC 0428, CMC 0432, CMC 0419, CMC 0434, & CMC 0434 SPUR
 CHIP SEAL COAT AND INCIDENTALS
 County Wide

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
CMC 0428	1.802	1.802
CMC 0434 (E Riv Rd)	2.891	2.906
CMC 0434 (SPUR)	0.561	0.561
CMC 0419 (135 1/2 Ave SW)	2.262	2.264
CMC 0434/0419 (38th St SW)	3.439	3.439
CMC 0432	3.559	3.559
TOTAL	14.514	14.531

EXCEPTION
 SC-0400(021) - CMC 0434 (E Riv Rd):
 BNSF RR Sta 192+59 to 192+69
 10 LF

END SC-0400(021) - CMC 0428
 Sta 95+14 = A point located at the intersection of the I-94 right of way line and the centerline of CMC 0428 in Section 20, Township 140 N, Range 102 W, of the 5th P.M., Billings County, North Dakota

END SC-0400(021) - CMC 0434 (E Riv Rd)
 Sta 193+61 = A point approximately 918 feet east and 133 feet north of the West Quarter Corner of Section 26, Township 140 N, Range 102 W, of the 5th P.M., Billings County, North Dakota

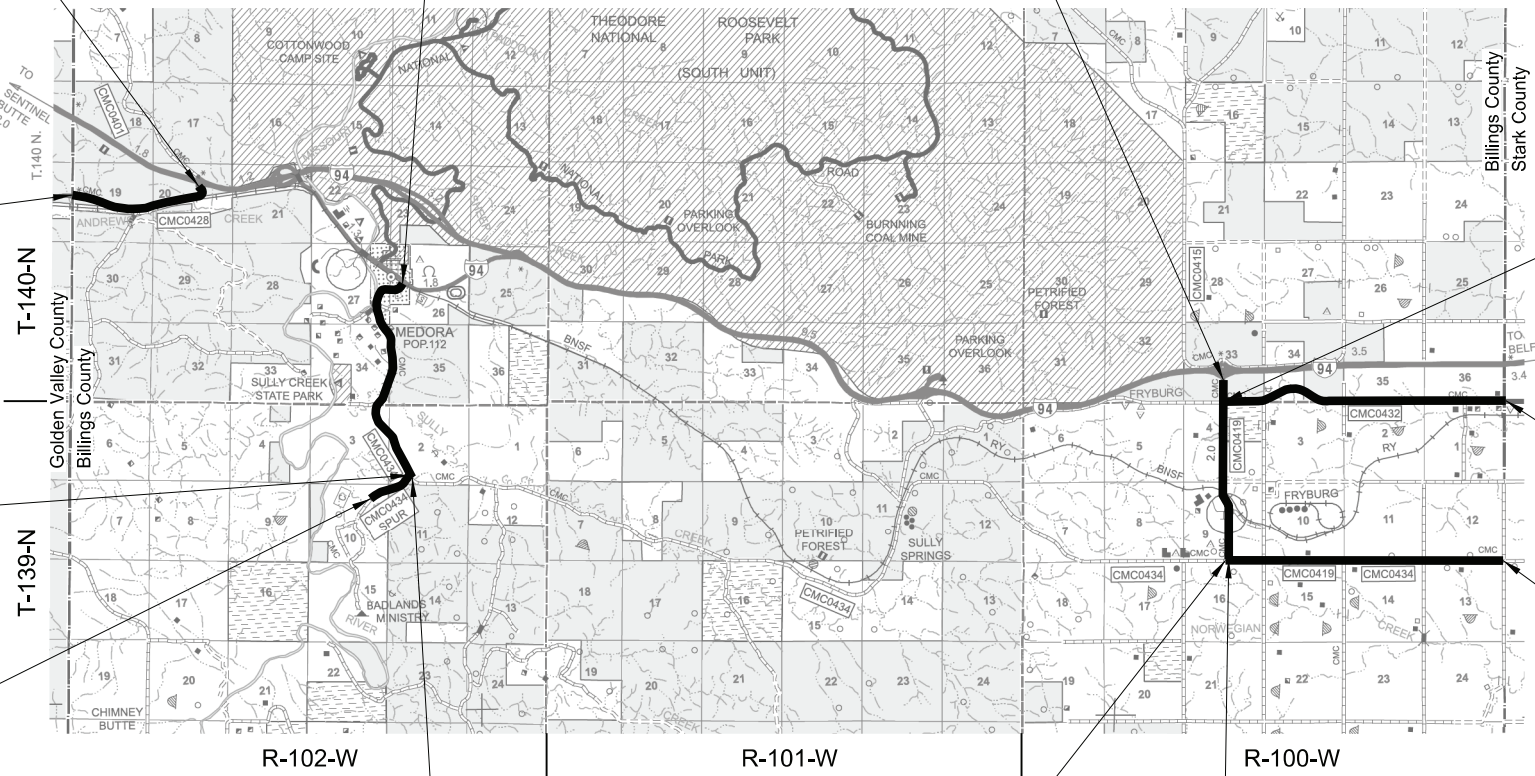
END SC-0400(021) - CMC 0419 (135 1/2 Ave SW)
 Sta 120+22 = A point approximately 1435 feet north and 10 feet east of the North Quarter Corner of Section 4, Township 139 N, Range 100 W, of the 5th P.M., Billings County, North Dakota

BEGIN SC-0400(021) - CMC 0428
 Sta 0+00 = A point located on the centerline of CMC 0428 on the west line of Section 19, Township 140 N, Range 102 W, of the 5th P.M., Billings County, North Dakota

MEDORA CITY LIMITS
 Sta 152+75. The south line of Section 27, Township 140 N, Range 102 W, of the 5th P.M., Billings County, North Dakota

END SC-0400(021) - CMC 0434 SPUR
 Sta 32+12 = A point approximately 1338 feet east and 435 feet north of the Southwest Corner of Section 2, Township 139 N, Range 102 W, of the 5th P.M., Billings County, North Dakota

BEGIN SC-0400(021) - CMC 0434 SPUR
 Sta 2+50 = A point approximately 1153 feet west and 938 feet south of the Northeast Corner of Section 10, Township 139 N, Range 102 W, of the 5th P.M., Billings County, North Dakota



BEGIN SC-0400(021) - CMC 0432
 Sta 673+57 = A point approximately 26 feet east of the North Quarter Corner of Section 4, Township 139 N, Range 100 W, of the 5th P.M., Billings County, North Dakota

END SC-0400(021) - CMC 0432
 Sta 861+50 = The Northeast Corner of Section 1, Township 139 N, Range 100 W, of the 5th P.M., Billings County, North Dakota

END SC-0400(021) - CMC 0434/0419 (38th St SW)
 Sta 325+60 = The Southeast Corner of Section 12, Township 139 N, Range 100 W, of the 5th P.M., Billings County, North Dakota

BEGIN SC-0400(021) - CMC 0434 (E Riv Rd)
 Sta 40+15 = A point approximately 1507 feet east and 326 feet north of the Southwest Corner of Section 2, Township 139 N, Range 102 W, of the 5th P.M., Billings County, North Dakota

BEGIN SC-0400(021) - CMC 0434/0419 (38th St SW)
 Sta 144+00 = A point approximately 2313 feet west and 89 feet north of the Southeast Corner of Section 9, Township 139 N, Range 100 W, of the 5th P.M., Billings County, North Dakota

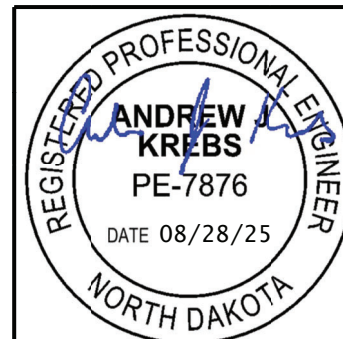
BEGIN SC-0400(021) - CMC 0419 (135 1/2 Ave SW)
 Sta 0+66 = A point approximately 2247 feet west and 152 feet north of the Southeast Corner of Section 9, Township 139 N, Range 100 W, of the 5th P.M., Billings County, North Dakota

U.S.D.A. FOREST SERVICE DAKOTA PRAIRIE GRASSLANDS
CURTIS GRUDNIEWSKI
 Approved By
 Digitally signed by CURTIS GRUDNIEWSKI
 Date: 2025.08.28.09:40:39 -06'00'

EXCEPTION
 SC-0400(021) - CMC 0434 (E Riv Rd):
 Structure #04-106-30.0
 Sta 106+84 to 107+55
 71 LF

EXCEPTION
 SC-0400(021) - CMC 0419 (135 1/2 Ave SW):
 BNSF RR Sta 47+03 to 47+15
 12 LF

DESIGNERS
 Andrew Krebs, PE



677 27TH AVENUE EAST
 DICKINSON, ND 58601
 (701) 483-1284, FAX (855) 288-8055

© KLJ 2025

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-0400(021)	2	1

TABLE OF CONTENTS

<u>SECTION NO.</u>	<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	1	Title Sheet
2	1	Table of Contents, List of Special Provisions, & List of Standard Drawings
6	1-2	Plan Notes
8	1	Estimate of Quantities
10	1	Basis of Estimate
20	1-4	General Details
30	1-4	Typical Sections
100	1-4	Work Zone Traffic Control
120	1-4	Pavement Marking

LIST OF STANDARD DRAWINGS

<u>STANDARD NO.</u>	<u>DESCRIPTION</u>
D-101-1,2,3,4	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20,21	Line Styles
D-101-30,31,32,33	Symbols
D-704-3	Lane Markers (Spotting Tabs for Seal Projects Only)
D-704-7	Breakaway Systems for Construction Zone Signs – Perforated Tube
D-704-8	Breakaway Systems for Construction Zone Signs – U Channel Post
D-704-9	Construction Sign Details – Terminal and Guide Signs
D-704-10	Construction Sign Details – Regulatory Signs
D-704-11,11a	Construction Sign Details – Warning Signs
D-704-14	Construction Sign Punching and Mounting Details
D-704-20	Terminal and Seal Coat Sign Layouts
D-704-22	Construction Truck and Temporary Detour Layouts
D-704-26	Miscellaneous Sign Layouts
D-704-27	Mobile Operation (Pavement Marking)
D-704-33	Two-Lane Roadway Portable Rumble Strips
D-704-50	Portable Sign Support Assembly
D-762-1	Pavement Marking Message Detail
D-762-4	Pavement Marking
D-762-11	Short-Term Pavement Marking

LIST OF SPECIAL PROVISIONS

<u>SP #</u>	<u>DESCRIPTION</u>
SP 638(24)	Warranty Chip Seal
SP 639(24)	Railroad Agreement
SSP 3	Local Agency Contracts



PLAN NOTES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-0400(021)	6	1

100-P01 COORDINATION OF PROJECTS: Another project in the vicinity of this project is under contract during the 2026 construction season. The project is NDDOT Project SS-5-094(152)900, PCN 23114 – Pacific Avenue Reconstruction and is located at the north end of CMC 0434 (E Riv Rd).

100-P02 COORDINATION OF THE GRAND OPENING OF THEODORE ROOSEVELT PRESIDENTIAL LIBRARY: The presidential library grand opening in Medora is scheduled for the week of July 4, 2026. Plan operations so they do not interfere with the scheduled event.

100-P03 COORDINATION OF FOREST SERVICE EVENTS: Two regularly scheduled Forest Service events occur on the Buffalo Gap trail located along CMC 0428 and the Maah Daah Hey trail located along CMC 0434 & 0434 SPUR. They typically take place the last weekend in July and the first weekend in August. Other events could also come up prior to construction. Plan operations so they do not interfere with the scheduled events. Contact Misty Hays at (701) 227-7824 with the Forest Service for more information on the events.

100-P04 NFS LANDS: Do not stockpile, bury, or waste any project materials such as aggregate chips, oil, paint, etc. on Forest Service lands.

100-P05 SHOULDER MOWING: Billings County will mow the existing shoulders prior to chip seal operations. Provide Billings County a two-week notification to complete the mowing prior to chip sealing. The contact is Pat Redmond at (701) 690-6827.

401-P01 FOG SEAL COAT: Use CSS-1H for Fog Seal. Complete the final sweeping within 1-5 calendar days after completion of the seal coat operation. Dilute fog oil to a 50:50 blend with water and apply at a rate of 0.12 Gal/SY (0.06 Gal/SY undiluted.) Dilution at the supplier is required. Apply Fog oil within 2 calendar days after final sweeping. The maintenance period will end 5 days after the application of the fog coat.

401-P02 FOG OIL ACCEPTANCE: CSS-1H will be accepted on certifications.

420-P01 INLET PROTECTION: Prior to beginning chip seal operations, install inlet protection on all storm sewer inlets in the proposed project area to prevent chips and oil from entering the storm sewer system. Inlet protection is to remain in place until final sweeping is complete. Include all associated costs for inlet protection in the price bid for "MOBILIZATION".

420-P02 EXISTING UTILITIES: Cover all existing manhole, gate value boxes, and concrete valley gutters within the proposed project limits immediately prior to chip and fog sealing. Remove the covering after the rolling operation has finished and after the fog seal has cured. Include all associated costs with covering the existing utilities in the price bid for "MOBILIZATION".

420-P03 CHFRS-2P ACCEPTANCE: CHFRS-2P will be accepted on certifications.

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

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

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

Install PRS that meet the following criteria:

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

Use individual PRS constructed in one of the following manners:

- A single piece;
- Interlocking segments; or

- Two pieces hinged at the midpoint.

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

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

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

704-P01 TRAFFIC CONTROL FOR SEAL COATS: Provide traffic control consisting of a temporary lane closure, flagging, and a pilot car.

Traffic control device quantities are based on a 4-mile limitation and following list:

1. Standard D-704-20, Type G and H: For project terminal signing. Sign G20-1b-60 will not be required.
2. Standard D-704-22, Type K: For trucks hauling material.
3. Standard D-704-26, Type KK: For use at intersections within pilot zone.
4. Standard D-704-33: For flagging station setup.

Install and maintain a 35 MPH speed limit after cover coat application and prior to initial sweeping, where the existing speed is greater than 35 MPH. Re-establish the speed limit to pre-construction condition after the initial sweeping. Four (4) additional speed limit signs have been included in the traffic control devices list for this.

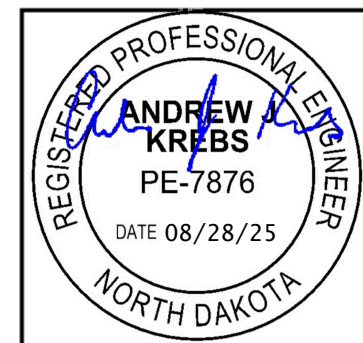
Eight (8) "Wait for Pilot Car" signs have been included in the traffic control devices list. Install and remove the signs as needed.

Traffic control devices will be paid for the maximum required number of each type of device at one time between all the different locations on the project.

704-P02 FLAGGING & PILOT CAR: Furnish flagging and pilot cars as specified in Section 704, "Temporary Traffic Control" required to complete all work on the project. Include the cost of flagging and pilot car in the price bid for other items.

760-P01 RUMBLE STRIPS: Install "RUMBLE STRIPS - INTERSECTION", as per Standard Drawing D-760-5 at the following intersection:

- CMC 0432 / CMC 0419 (135 ½ Ave SW)

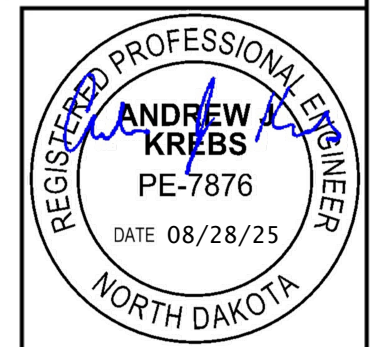


SC-0400(021)		
CMC 0428, 0434, 0434 SPUR, 0419, & 0432		
	Plan Notes Billings County, ND	
DRWN. BY AK	CHKD. BY SPK	PROJECT NO. 2403-01138

PLAN NOTES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-0400(021)	6	2

- 762-150 PAVEMENT MARKING:** If the Engineer and Contractor agree, plan quantity will be used as the measurement for payment for pavement marking items.
- 762-P01 PAVEMENT MARKING WIDTH:** Install all center line and edge line pavement markings at a 4-inch width.
- 762-P02 EDGE LINE:** Edge lines will be continued through private drives and broken for intersections.
- 762-P03 EPOXY PVMT MK MESSAGE:** Install epoxy painted warning messages and 24 inch stop bars on the north and south sides of the BNSF railroad crossing on CMC 0419 (135 ½ Ave SW) at Station 47+09 and on the north side of the BNSF railroad crossing on the West River Rd approach along CMC 0428 according to Standard Drawing D-762-1. These quantities have been provided in the Summary of Quantities.
- 762-P04 PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED):** Complete all seal coat work prior to installing Preformed Patterned Pavement Markings.
- 762-P05 SHORT TERM PAVEMENT MARKINGS:** Plan quantity includes one application of short term center line pavement markings after the fog seal is complete. Quantities for each location are shown below:
- CMC 0428 – 7,370 LF
 - CMC 0434 SPUR - 5,800 LF
 - CMC 0434 (E Riv RD) – 28,936 LF
 - CMC 0419 (135 ½ Ave SW) – 13,770 LF
 - CMC 0434/0419 (38th St SW) – 14,745 LF
 - CMC 0432 – 24,876 LF



SC-0400(021)	
CMC 0428, 0434, 0434 SPUR, 0419, & 0432	
	Plan Notes Billings County, ND
DRWN. BY AK	CHKD. BY SPK
PROJECT NO. 2403-01138	

ESTIMATE OF QUANTITIES

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-0400(021)	8	1

Spec	Code	Description	Unit	Total Quantities
103	0100	CONTRACT BOND	L SUM	1
107	0102	RAILWAY PROTECTION INSURANCE-3 LOCATIONS	L SUM	1
107	0140	RAILWAY COORDINATION	L SUM	1
420	0405	SEAL COAT	SY	270,661
702	0100	MOBILIZATION	L SUM	1
704	1000	TRAFFIC CONTROL SIGNS	UNIT	6,479
704	1048	PORTABLE RUMBLE STRIPS	EA	2
760	0010	RUMBLE STRIPS - INTERSECTION	SET	1
762	0112	EPOXY PVMT MK MESSAGE	SF	398
762	0113	EPOXY PVMT MK 4IN LINE	LF	242,407
762	0114	EPOXY PVMT MK 6IN LINE	LF	432
762	0115	EPOXY PVMT MK 8IN LINE	LF	300
762	0117	EPOXY PVMT MK 24IN LINE	LF	132
762	0122	PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)	SF	310
762	0430	SHORT TERM 4IN LINE-TYPE NR	LF	95,497

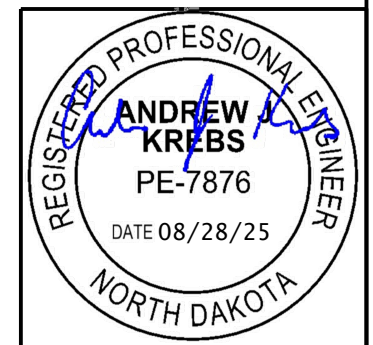


	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-0400(021)	10	1

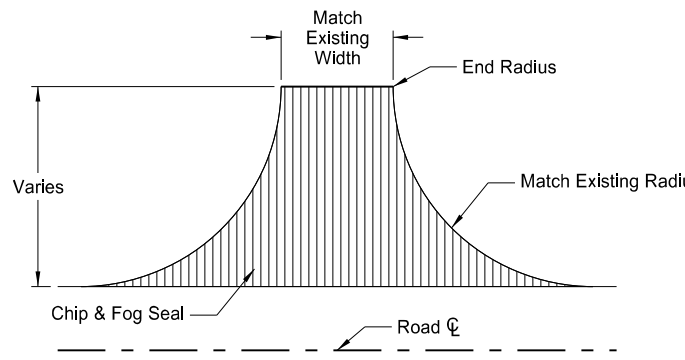
SEAL COAT SUMMARY (PROJECT)										
Description	Begin Station	End Station	Length (LF)	Chip Seal		Fog Seal		*FOG SEAL (GAL)	*CHFRS-2P EMULSIFIED ASPHALT (GAL)	*COVER COAT MATERIAL CL 41 (TON)
				Width (LF)	Area (SY)	Width (LF)	Area (SY)			
				CMC 0428						
Typ Sec 1	0+00	90+50	9,050	23	23,128	24	24,133	1,448	8,789	289
Typ Sec 2	90+50	95+14	464	24	1,237	26	1,340	80	470	15
Approaches (Sheet 20-1)	-	-	-	-	707	-	707	42	269	9
CMC 0428 SUBTOTAL =			9,514		25,072		26,180	1,570	9,528	313
CMC 0434 SPUR										
Typ Sec 1	2+50	32+12	2,962	24	7,899	27	8,886	533	3,002	99
Approaches (Sheet 20-1)	-	-	-	-	313	-	313	19	119	4
CMC 0434 SPUR SUBTOTAL =			2,962		8,212		9,199	552	3,121	103
CMC 0434 (E RIV RD)										
Typ Sec 1	40+15	106+84	6,669	26	19,266	29	21,489	1,289	7,321	241
	107+55	166+62	5,907	26	17,065	29	19,034	1,142	6,485	213
Guardrail (Sheet 20-4)	-	-	-	-	144	-	372	22	55	2
Typ Sec 2	166+62	191+43	2,481	33	9,097	33	9,097	546	3,457	114
	193+45	193+61	16	33	59	33	59	4	22	1
Typ Sec 3	191+43	192+59	116	31	400	31	400	24	152	5
	192+69	193+45	76	31	262	31	262	16	100	3
Approaches (Sheet 20-1)	-	-	-	-	2,615	-	2,615	157	994	33
CMC 0434 (E RIV RD) SUBTOTAL =			15,265		48,908		53,328	3,200	18,586	612
CMC 0419 (135 1/2 AVE SW)										
Typ Sec 1	0+66	47+03	4,637	26	13,396	29	14,941	896	5,090	167
Typ Sec 2	47+15	120+22	7,307	26	21,109	29	23,545	1,413	8,021	264
Approaches (Sheet 20-2)	-	-	-	-	961	-	961	58	365	12
CMC 0419 (135 1/2 AVE SW) SUBTOTAL =			11,944		35,466		39,447	2,367	13,476	443
CMC 0434/0419 (38th St SW)										
Typ Sec 1	144+00	196+00	5,200	32	18,489	36	20,800	1,248	7,026	231
	205+00	325+60	12,060	32	42,880	36	48,240	2,894	16,294	536
Trans Typ 1 to Typ 2	196+00	199+00	300	42	1,400	46	1,533	92	532	18
	202+00	205+00	300	42	1,400	46	1,533	92	532	18
Typ Sec 2	199+00	202+00	300	52	1,733	56	1,867	112	659	22
Approaches (Sheet 20-2)	-	-	-	-	2,020	-	2,020	121	768	25
CMC 0434/0419 (38th St SW) SUBTOTAL =			18,160		67,922		75,993	4,559	25,811	850
CMC 0432										
Typ Sec 1	673+57	861+50	18,793	28	58,467	31	64,731	3,884	22,217	731
Approaches (Sheet 20-3)	-	-	-	-	1,783	-	1,783	107	678	22
CMC 0432 SUBTOTAL =			18,793		60,250		66,514	3,991	22,895	753
GRAND TOTAL =			76,638		245,830		270,661	16,239	93,417	3,074

*For informational purposes only, quantity included and paid for under "Seal Coat"
Fog Seal area totals will be used as the basis for Seal Coat payment

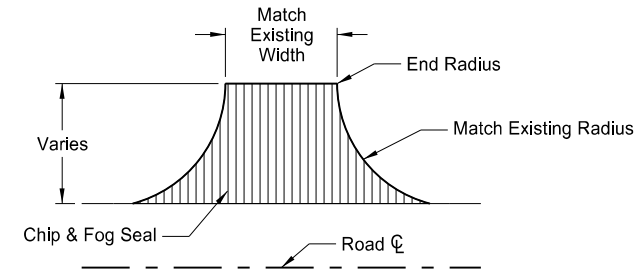
Pavement
Fog Seal @ 0.06 Gal/SY
CHFRS-2P Emulsified Asphalt @ 0.38 Gal/SY
Cover Coat Material Cl 41 @ 25 lb/SY



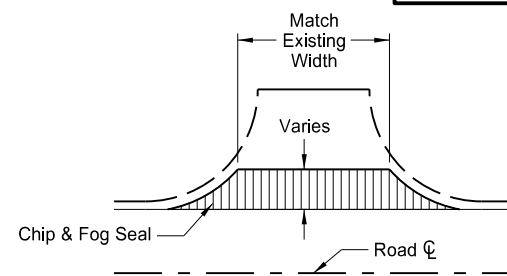
SC-0400(021)	
CMC 0428, 0434, 0434 SPUR, 0419, & 0432	
	Basis of Estimate
	Billings County, ND
DRAWN BY AK	CHECKED BY SPK
PROJECT NO. 2403-01138	



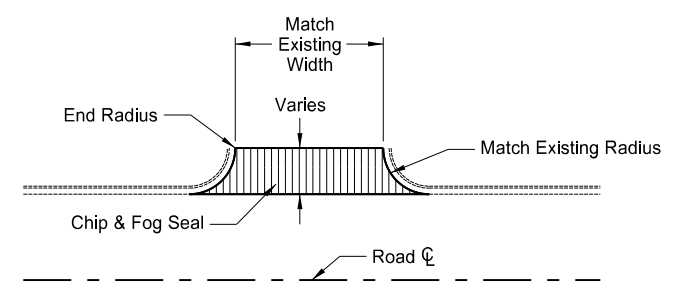
(1) County Road & Major Approach



(2) Private Drive Approach



(3) Field Drive Approach



(4) City of Medora Approach

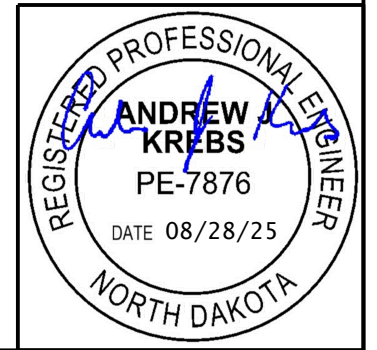
SEAL COAT SUMMARY (APPROACHES)										
Station	Lt or Rt	Approach Type	LEFT		RIGHT		QUANTITIES			Comments
			Chip Seal Area	Fog Seal Area	Chip Seal Area	Fog Seal Area	*FOG SEAL	*CHFRS-2P EMULSIFIED ASPHALT	*COVER COAT MATERIAL CL 41	
			(SY)	(SY)	(SY)	(SY)	(GAL)	(GAL)	(TON)	
CMC 0428										
14+52	Lt	3	16	16			1.0	6.1	0.2	
39+36	Lt	3	16	16			1.0	6.1	0.2	
53+82	Rt	1			600	600	36.0	228.0	7.5	Seal to Cattle Guard
60+07	Rt	3			16	16	1.0	6.1	0.2	
81+45	Lt	3	19	19			1.1	7.2	0.2	
86+73	Rt	3			40	40	2.4	15.2	0.5	
CMC 0428 SUBTOTAL =			51	51	656	656	42	269	9	
CMC 0434 SPUR										
3+94	Lt	2	261	261			15.7	99.2	3.3	
11+55	Rt	3			42	42	2.5	16.0	0.5	
18+44	Rt	3			10	10	0.6	3.8	0.1	
CMC 0434 SPUR SUBTOTAL =			261	261	52	52	19	119	4	
CMC 0434 (E RIV RD)										
41+90	Lt	1	539	539			32.3	204.8	6.7	
96+05	Lt	2	359	359			21.5	136.4	4.5	
115+79	Lt	2	85	85			5.1	32.3	1.1	
124+27	Lt	2	77	77			4.6	29.3	1.0	
134+56	Lt	2	82	82			4.9	31.2	1.0	
144+81	Lt	2	103	103			6.2	39.1	1.3	
144+81	Rt	2			85	85	5.1	32.3	1.1	
166+11	Lt	1	643	643			38.6	244.3	8.0	Seal to Cattle Guard
167+06	Rt	4			135	135	8.1	51.3	1.7	
179+02	Lt	4	86	86			5.2	32.7	1.1	
179+02	Rt	4			86	86	5.2	32.7	1.1	
182+01	Lt	4	97	97			5.8	36.9	1.2	
184+81	Rt	4			97	97	5.8	36.9	1.2	
185+67	Lt	4	97	97			5.8	36.9	1.2	
188+45	Rt	4			44	44	2.6	16.7	0.6	
CMC 0434 (E RIV RD) SUBTOTAL =			2,168	2,168	447	447	157	994	33	

*For informational purposes only, quantity included and paid for under "Seal Coat" Fog Seal area totals will be used as the basis for Seal Coat payment

Notes:

- Actual Chip & Fog Seal locations may vary in the field, as approved by the Engineer.
- Match existing pavement dimensions as they appear in the field.
- Quantity totals have been included in the Seal Coat Summary in the Basis of Estimate.
- See Section 20, Sheets 1-3 for locations.
- Chip Seal = CHFRS-2P Oil + Cover Coat Material CI 41
Seal Coat = Area measured for payment (Fog Seal Area)

Pavement
Fog Seal @ 0.06 Gal/SY
CHFRS-2P Emulsified Asphalt @ 0.38 Gal/SY
Cover Coat Material CI 41 @ 25 lb/SY



Legend

- 1 = County Road & Major Approach
- 2 = Private Drive Approach
- 3 = Field Drive Approach
- 4 = City of Medora Approach

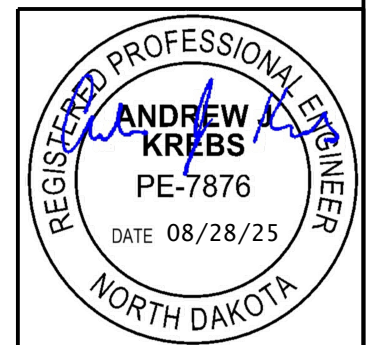
SC-0400(021)	
CMC 0428, 0434, 0434 SPUR, 0419, & 0432	
	Approach Details
	Billings County, ND
DRWN BY AK	CHKD BY SPK
PROJECT NO. 2403-01138	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	20	2

SEAL COAT SUMMARY (APPROACHES)										
Station	Lt or Rt	Approach Type	LEFT		RIGHT		QUANTITIES			Comments
			Chip Seal Area	Fog Seal Area	Chip Seal Area	Fog Seal Area	*FOG SEAL	*CHFRS-2P EMULSIFIED ASPHALT	*COVER COAT MATERIAL CL 41	
			(SY)	(SY)	(SY)	(SY)	(GAL)	(GAL)	(TON)	
CMC 0419 (135 1/2 AVE SW)										
28+30	Rt	2			13	13	0.8	4.9	0.2	
43+95	Lt	1	201	201			12.1	76.4	2.5	
48+77	Rt	2			16	16	1.0	6.1	0.2	
53+74	Rt	3			14	14	0.8	5.3	0.2	
60+09	Lt	3	85	85			5.1	32.3	1.1	
67+20	Rt	3			16	16	1.0	6.1	0.2	
105+86	Lt	1	341	341			20.5	129.6	4.3	Seal to Cattle Guard
105+86	Rt	1			275	275	16.5	104.5	3.4	
CMC 0419 (135 1/2 AVE SW) SUBTOTAL =			627	627	334	334	58	365	12	
CMC 0434/0419 (38th St SW)										
144+64	Lt	1	253	253			15.2	96.1	3.2	
144+64	Rt	3			13	13	0.8	4.9	0.2	
167+14	Lt	1	253	253			15.2	96.1	3.2	
167+14	Rt	1			253	253	15.2	96.1	3.2	
174+74	Lt	3	18	18			1.1	6.8	0.2	
193+25	Rt	3			18	18	1.1	6.8	0.2	
193+79	Rt	3			9	9	0.5	3.4	0.1	
193+87	Lt	3	16	16			1.0	6.1	0.2	
200+48	Lt	3	16	16			1.0	6.1	0.2	
219+99	Lt	3	18	18			1.1	6.8	0.2	
219+99	Rt	1			253	253	15.2	96.1	3.2	
227+51	Rt	3			20	20	1.2	7.6	0.3	
246+38	Lt	3	16	16			1.0	6.1	0.2	
246+38	Rt	3			33	33	2.0	12.5	0.4	
254+13	Lt	3	27	27			1.6	10.3	0.3	
256+53	Lt	3	16	16			1.0	6.1	0.2	
272+78	Rt	1			253	253	15.2	96.1	3.2	
272+87	Lt	1	165	165			9.9	62.7	2.1	
285+67	Lt	3	20	20			1.2	7.6	0.3	
285+72	Rt	3			29	29	1.7	11.0	0.4	
295+88	Rt	3			27	27	1.6	10.3	0.3	
298+07	Rt	3			16	16	1.0	6.1	0.2	
299+64	Lt	3	42	42			2.5	16.0	0.5	
315+94	Rt	3			22	22	1.3	8.4	0.3	
325+60	Lt	1	88	88			5.3	33.4	1.1	Seal west half
325+60	Rt	1			126	126	7.6	47.9	1.6	Seal west half
CMC 0434/0419 (38th St SW) SUBTOTAL =			948	948	1,072	1,072	121	768	25	

*For informational purposes only, quantity included and paid for under "Seal Coat"
Fog Seal area totals will be used as the basis for Seal Coat payment

Pavement
Fog Seal @ 0.06 Gal/SY
CHFRS-2P Emulsified Asphalt @ 0.38 Gal/SY
Cover Coat Material Cl 41 @ 25 lb/SY



Legend
1 = County Road & Major Approach
2 = Private Drive Approach
3 = Field Drive Approach
4 = City of Medora Approach

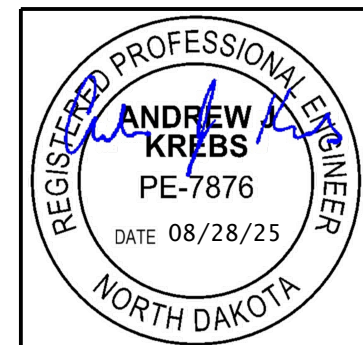
SC-0400(021)		
CMC 0419 (135 1/2 Ave SW) & 0434/0419 (38th St SW)		
	Approach Details	
	Billings County, ND	
DRWN BY AK	CHKD BY SPK	PROJECT NO. 2403-01138

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	20	3

SEAL COAT SUMMARY (APPROACHES)										
Station	Lt or Rt	Approach Type	LEFT		RIGHT		QUANTITIES			Comments
			Chip Seal Area	Fog Seal Area	Chip Seal Area	Fog Seal Area	*FOG SEAL	*CHFRS-2P EMULSIFIED ASPHALT	*COVER COAT MATERIAL CL 41	
			(SY)	(SY)	(SY)	(SY)	(GAL)	(GAL)	(TON)	
CMC 0432										
693+99	Lt	3	64	64			3.8	24.3	0.8	
699+67	Rt	1			265	265	15.9	100.7	3.3	
699+97	Lt	3	53	53			3.2	20.1	0.7	
705+15	Lt	3	47	47			2.8	17.9	0.6	
746+68	Rt	3			42	42	2.5	16.0	0.5	
752+04	Lt	3	47	47			2.8	17.9	0.6	
752+25	Rt	3			42	42	2.5	16.0	0.5	
755+95	Lt	3	47	47			2.8	17.9	0.6	
755+95	Rt	1			165	165	9.9	62.7	2.1	
780+63	Rt	3			47	47	2.8	17.9	0.6	
808+81	Lt	3	47	47			2.8	17.9	0.6	
808+87	Rt	3			53	53	3.2	20.1	0.7	
835+70	Rt	1			183	183	11.0	69.5	2.3	
841+98	Rt	2			123	123	7.4	46.7	1.5	
846+67	Rt	2			150	150	9.0	57.0	1.9	
847+78	Rt	2			123	123	7.4	46.7	1.5	
853+44	Lt	3	53	53			3.2	20.1	0.7	
858+45	Lt	2	136	136			8.2	51.7	1.7	
861+50	Lt	3	35	35			2.1	13.3	0.4	Seal west half
861+50	Rt	2			61	61	3.7	23.2	0.8	Seal west half
CMC 0432 SUBTOTAL =			529	529	1,254	1,254	107	678	22	
APPROACHES GRAND TOTAL =			4,584	4,584	3,815	3,815	504	3,193	105	

*For informational purposes only, quantity included and paid for under "Seal Coat" Fog Seal area totals will be used as the basis for Seal Coat payment

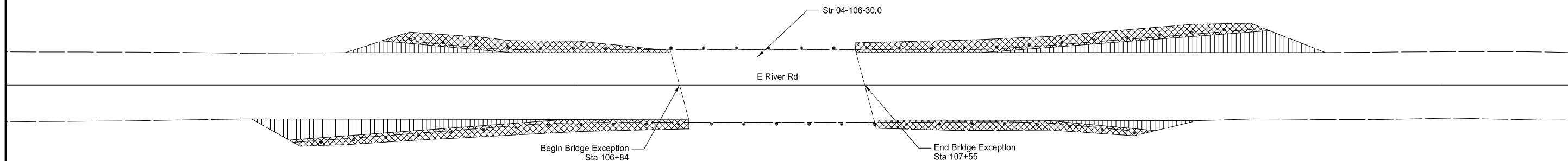
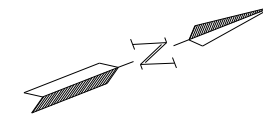
Pavement
 Fog Seal @ 0.06 Gal/SY
 CHFRS-2P Emulsified Asphalt @ 0.38 Gal/SY
 Cover Coat Material Cl 41 @ 25 lb/SY





Legend
 1 = County Road & Major Approach
 2 = Private Drive Approach
 3 = Field Drive Approach
 4 = City of Medora Approach

SC-0400(021)		
CMC 0432		
	Approach Details	
	Billings County, ND	
DRAWN BY AK	CHECKED BY SPK	PROJECT NO. 2403-01138

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	20	4

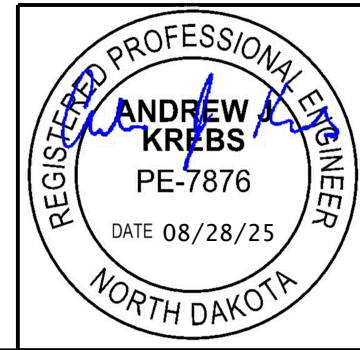



 Chip & Fog Seal
 Fog Seal Only (Apply using hand applicator)

Pavement
 Fog Seal @ 0.06 Gal/SY
 CHFRS-2P Emulsified Asphalt @ 0.38 Gal/SY
 Cover Coat Material Cl 41 @ 25 lb/SY

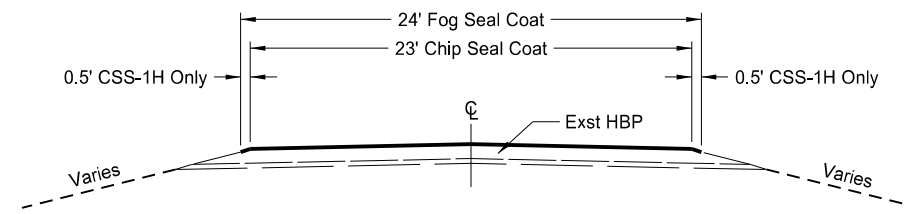
SEAL COAT SUMMARY (GUARDRAIL)					
Description	Chip Seal	Fog Seal	*FOG SEAL (GAL)	*CHFRS-2P EMULSIFIED ASPHALT (GAL)	*COVER COAT MATERIAL CL 41 (TON)
	Area (SY)	Area (SY)			
SW	16	62	3.7	6.1	0.2
SE	54	120	7.2	20.5	0.7
NW	62	137	8.2	23.6	0.8
NE	12	53	3.2	4.6	0.2
TOTAL =	144	372	22	55	2

*For informational purposes only, quantity included and paid for under "Seal Coat"
 Fog Seal area totals will be used as the basis for Seal Coat payment

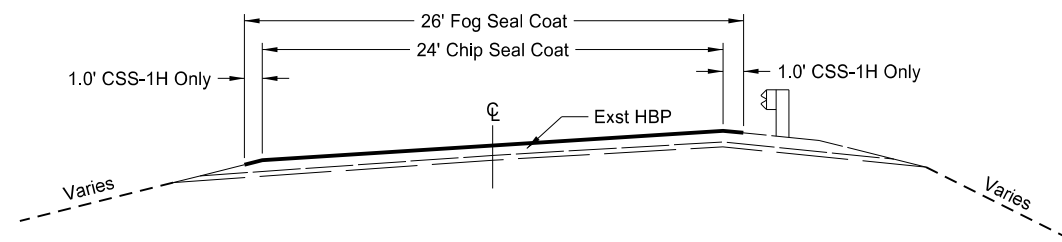


SC-0400(021)	
CMC 0434 (E. Riv Rd)	
	Guardrail Seal Coat Detail
	Billings County, ND
<small>DRAWN BY</small> AK	<small>PROJECT NO.</small> 2403-01138

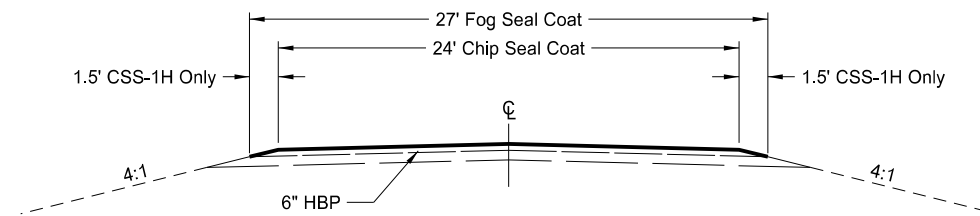
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	30	1



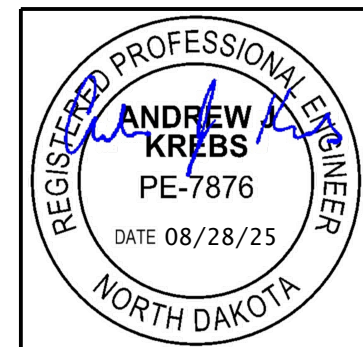
PROPOSED TYPICAL SECTION 1
CMC 0428
STA 0+00 to 90+50



PROPOSED TYPICAL SECTION 2
CMC 0428
STA 90+50 to 95+14

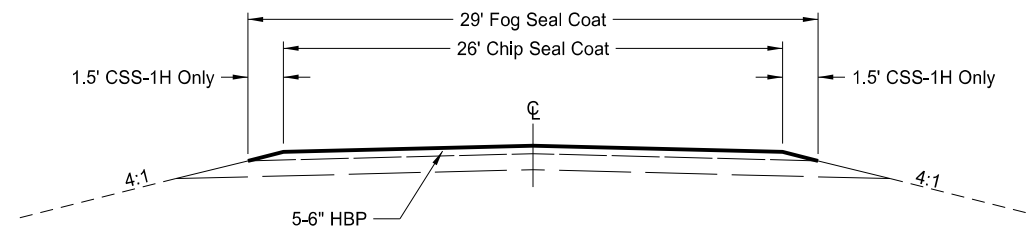


PROPOSED TYPICAL SECTION 1
CMC 0434 SPUR
STA 2+50 to 32+12



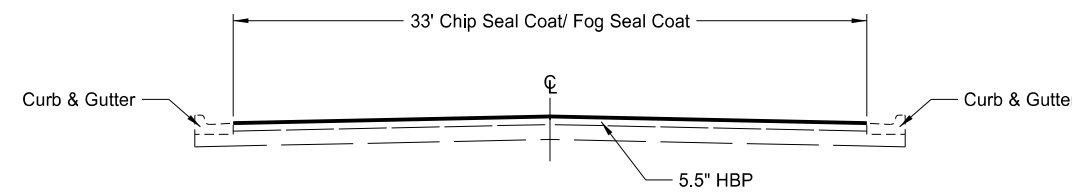
SC-0400(021)	
CMC 0428 & 0434 SPUR	
	Proposed Typical Sections
	Billings County, ND
DRWN BY AK	CHKD BY SPK
PROJECT NO. 2403-01138	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	30	2

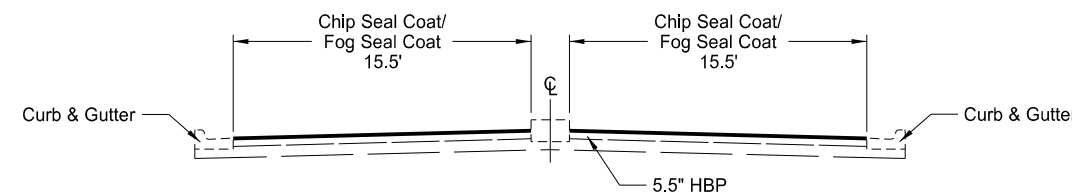


PROPOSED TYPICAL SECTION 1
 CMC 0434 (E Riv Rd)
 STA 40+15 to 106+84
 STA 107+55 to 166+62

Note: Structure #04-106-30.0
 STA 106+84 to 107+55

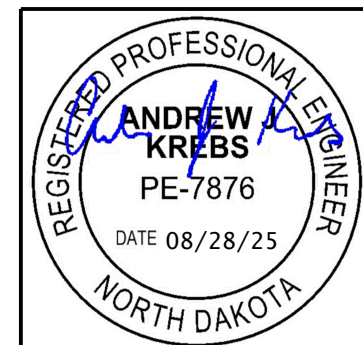


PROPOSED TYPICAL SECTION 2
 CMC 0434 (E Riv Rd)
 STA 166+62 to 191+43
 STA 193+45 to 193+61



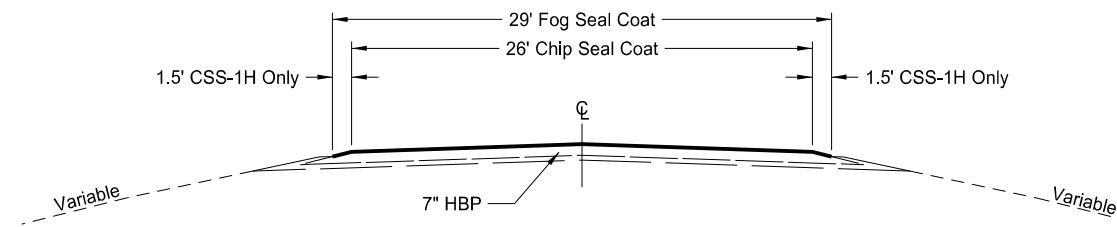
PROPOSED TYPICAL SECTION 3
 CMC 0434 (E Riv Rd)
 STA 191+43 to 192+59
 STA 192+69 to 193+45

Note: BNSF RR Crossing
 STA 192+59 to 192+69



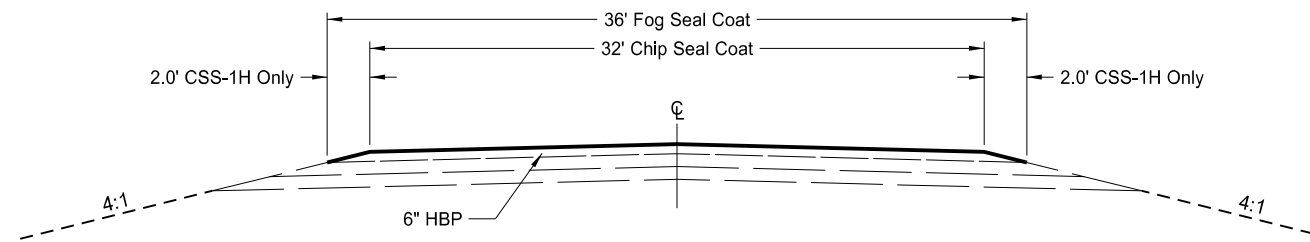
SC-0400(021)	
CMC 0434 (E Riv Rd)	
	Proposed Typical Sections
	Billings County, ND
DRWN BY AK	CHKD BY SPK
PROJECT NO. 2403-01138	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	30	3



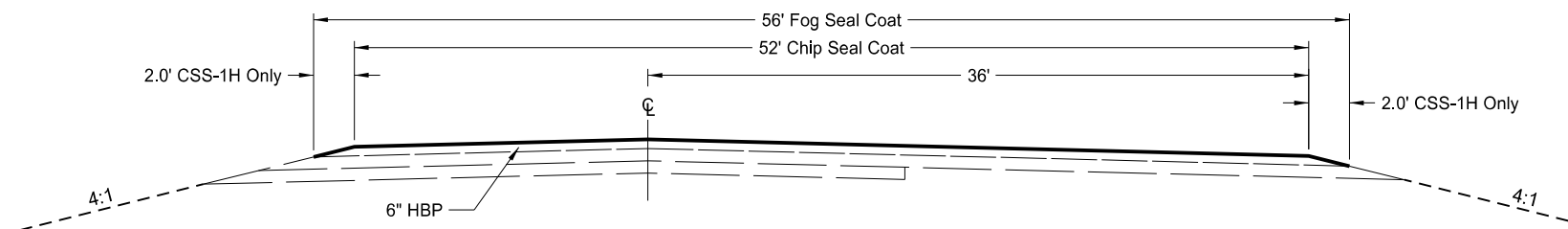
Note: BNSF RR Crossing
STA 47+03 to 47+15

PROPOSED TYPICAL SECTION 1
CMC 0419 (135 1/2 Ave SW)
STA 0+66 to 47+03
STA 47+15 to 120+22



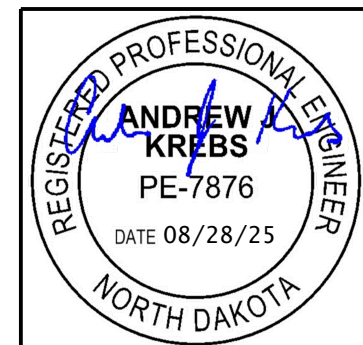
Transition Typ 1 to Typ 2
STA 196+00 to 199+00

PROPOSED TYPICAL SECTION 1
CMC 0434/0419 (38th St SW)
STA 144+00 to 196+00
STA 205+00 to 325+60



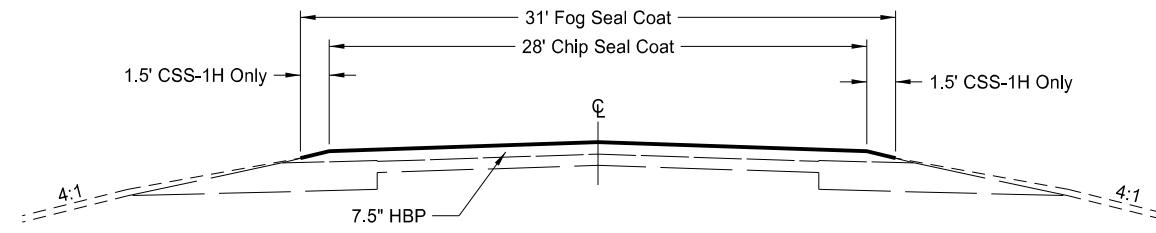
Transition Typ 2 to Typ 1
STA 202+00 to 205+00

PROPOSED TYPICAL SECTION 2
CMC 0434/0419 (38th St SW)
STA 199+00 to 202+00

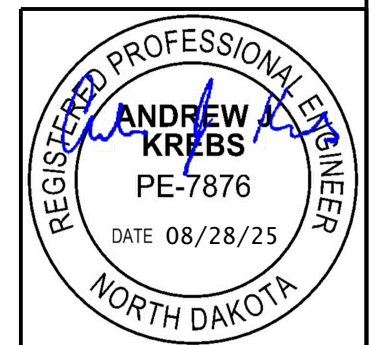



SC-0400(021)	
CMC 0419 (135 1/2 Ave SW) & 0434/0419 (38th St SW)	
KLJ	
Proposed Typical Sections Billings County, ND	
DRWN. BY AK	CHKD. BY SPK
PROJECT NO. 2403-01138	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	30	4



PROPOSED TYPICAL SECTION 1
 CMC 0432
 STA 673+57 to 861+50

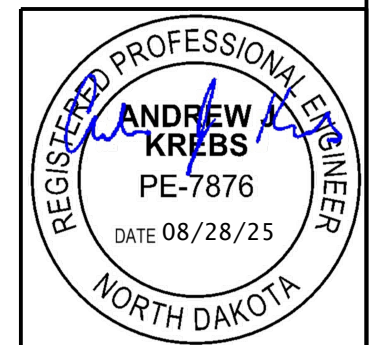
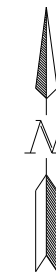
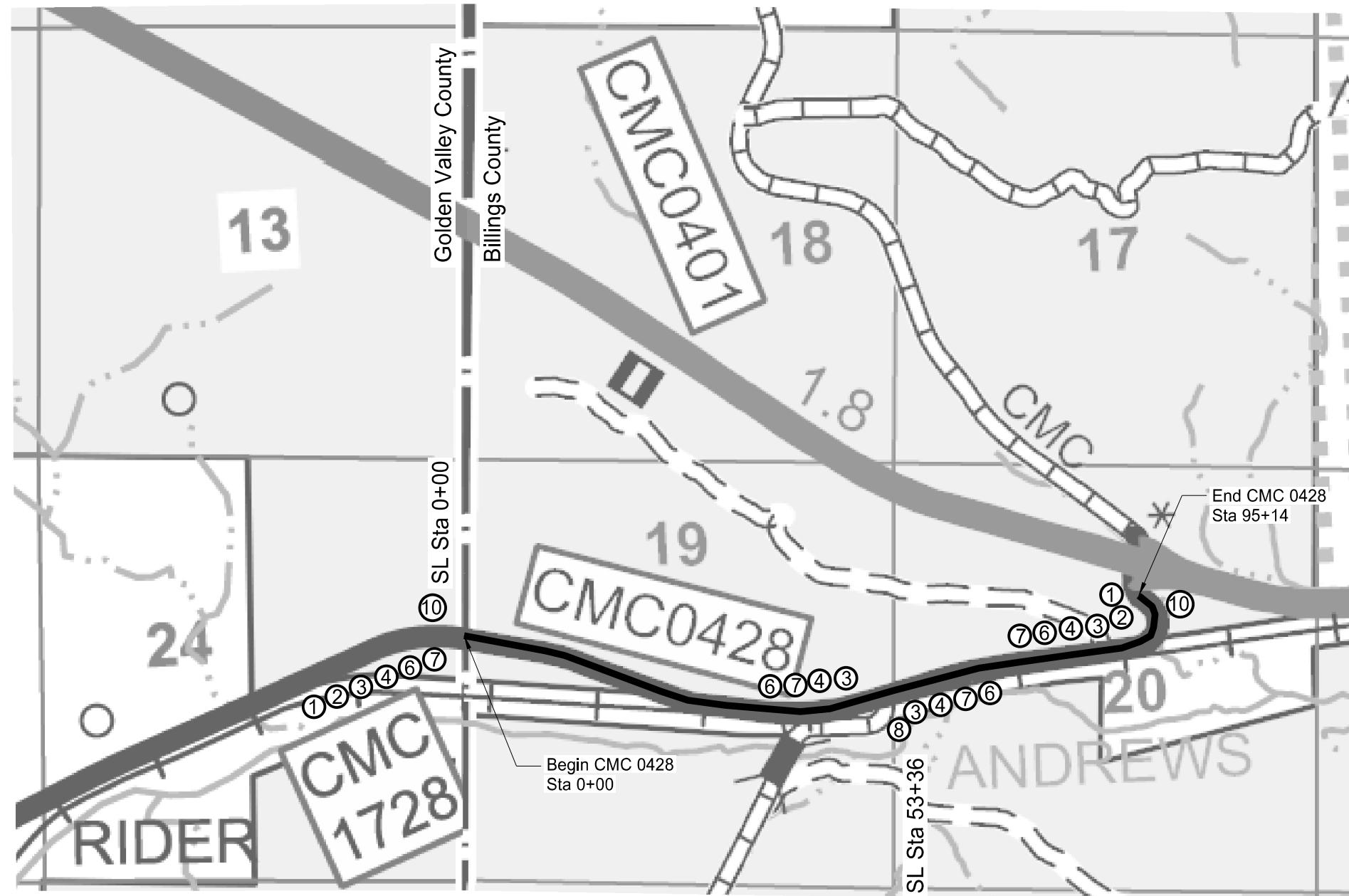


SC-0400(021)		
CMC 0432		
 Proposed Typical Sections Billings County, ND		
DRWN. BY AK	CHKD. BY SPK	PROJECT NO. 2403-01138

- ① G20-1-60 Road Work Next __ Miles
- ② G20-55-96 Speed Limit Enforced - Min Fee \$150
- ③ W8-12-48 No Center Line (Place according to D-704-20 Note #6, Skid Mount Sign)
- ④ R4-1-48 Do Not Pass
- ⑤ W3-5-48 Speed Reduction Ahead
- ⑥ W22-8-48 Fresh Oil Loose Rock
- W20-52P-54 Next __ Miles
- ⑦ R2-1-48 45 MPH or maintain existing if less
- R2-1aP-24 Minimum Fee \$150
- ⑧ G20-50a-72 Road Work Next __ Miles Rt & Lt Arrows
- ⑨ G20-52a-72 Road Work Next __ Miles Rt or Lt Arrow
- ⑩ G20-2-48 End Road Work
- ⑪ R2-1-48 55 MPH

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	100	2

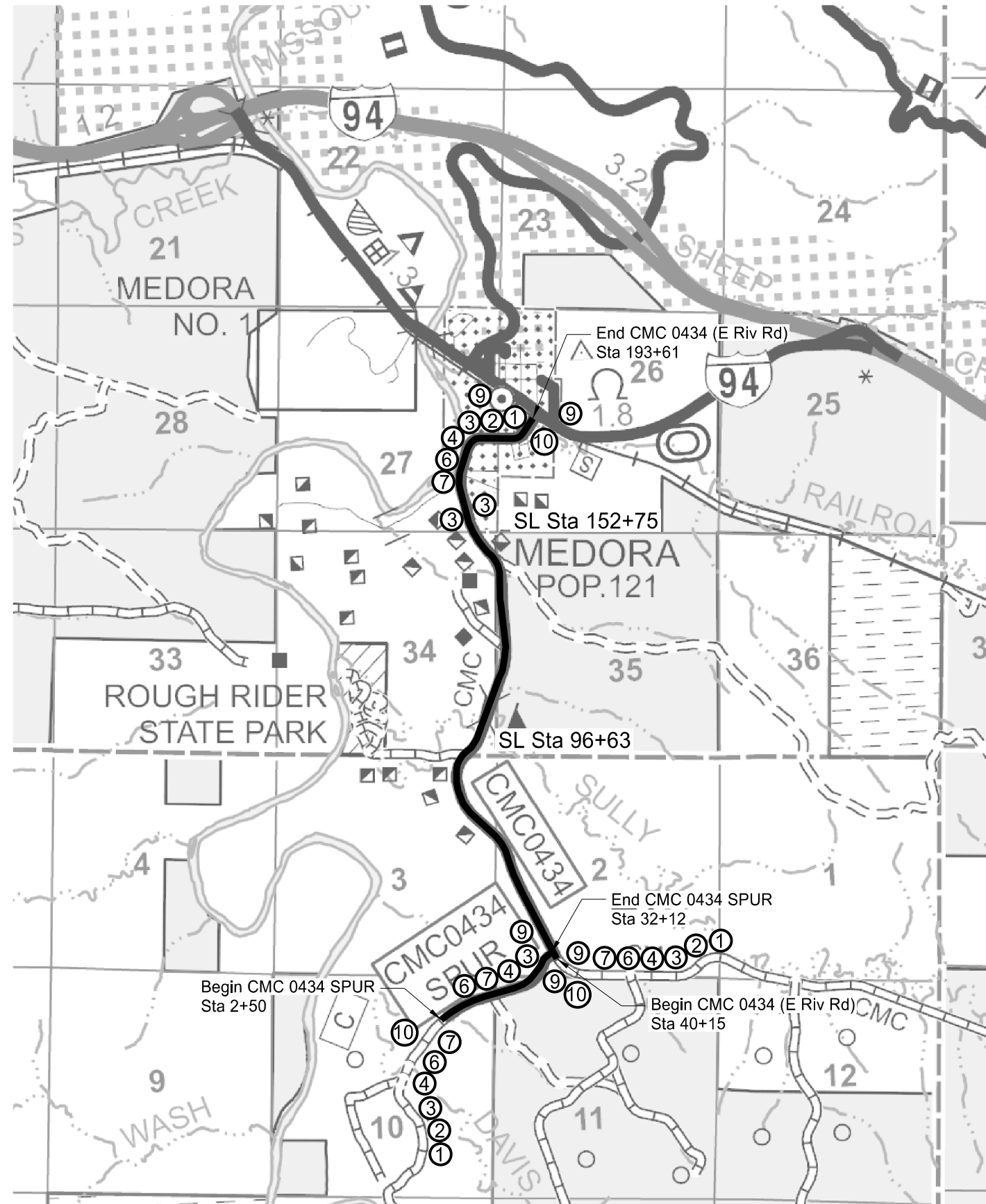
Note: Existing Speed Limit on CMC 0428 is 45 MPH



The sign layout as shown is for general information purposes only. The Contractor will be required to conform to MUTCD and the Standard Drawings when installing the traffic control signing.

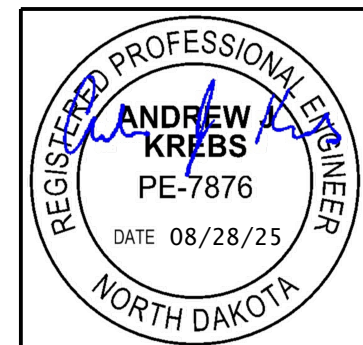
	SC-0400(021)	
	CMC 0428	
Work Zone Traffic Control		
Billings County, ND		
DRAWN BY AK	CHECKED BY SPK	PROJECT NO. 2403-01138

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	100	3



- ① G20-1-60 Road Work Next __ Miles
- ② G20-55-96 Speed Limit Enforced - Min Fee \$150
- ③ W8-12-48 No Center Line (Place according to D-704-20 Note #6, Skid Mount Sign)
- ④ R4-1-48 Do Not Pass
- ⑤ W3-5-48 Speed Reduction Ahead
- ⑥ W22-8-48 Fresh Oil Loose Rock
- W20-52P-54 Next __ Miles
- ⑦ R2-1-48 45 MPH or maintain existing if less
- R2-1aP-24 Minimum Fee \$150
- ⑧ G20-50a-72 Road Work Next __ Miles Rt & Lt Arrows
- ⑨ G20-52a-72 Road Work Next __ Miles Rt or Lt Arrow
- ⑩ G20-2-48 End Road Work
- ⑪ R2-1-48 55 MPH

Notes: All intersecting streets in the City of Medora shall receive a G20-50a-72 sign. (10 Total) ⑧
 Existing Speed Limit on CMC 0434 SPUR is 35 MPH
 Existing Speed Limit on CMC 0434 E Riv Rd south of Medora is 35 MPH
 Existing Speed Limit on CMC 0434 E Riv Rd thru Medora is 25 MPH



SC-0400(021)	
CMC 0434 (E Riv Rd) & 0434 SPUR	
Work Zone Traffic Control	
Billings County, ND	
DRAWN BY AK	CHECKED BY SPK
PROJECT NO. 2403-01138	

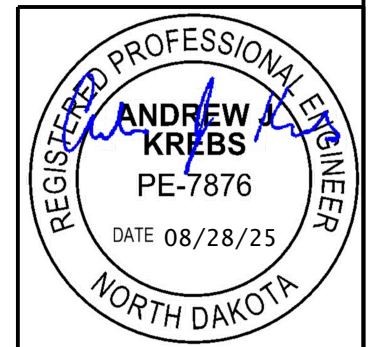
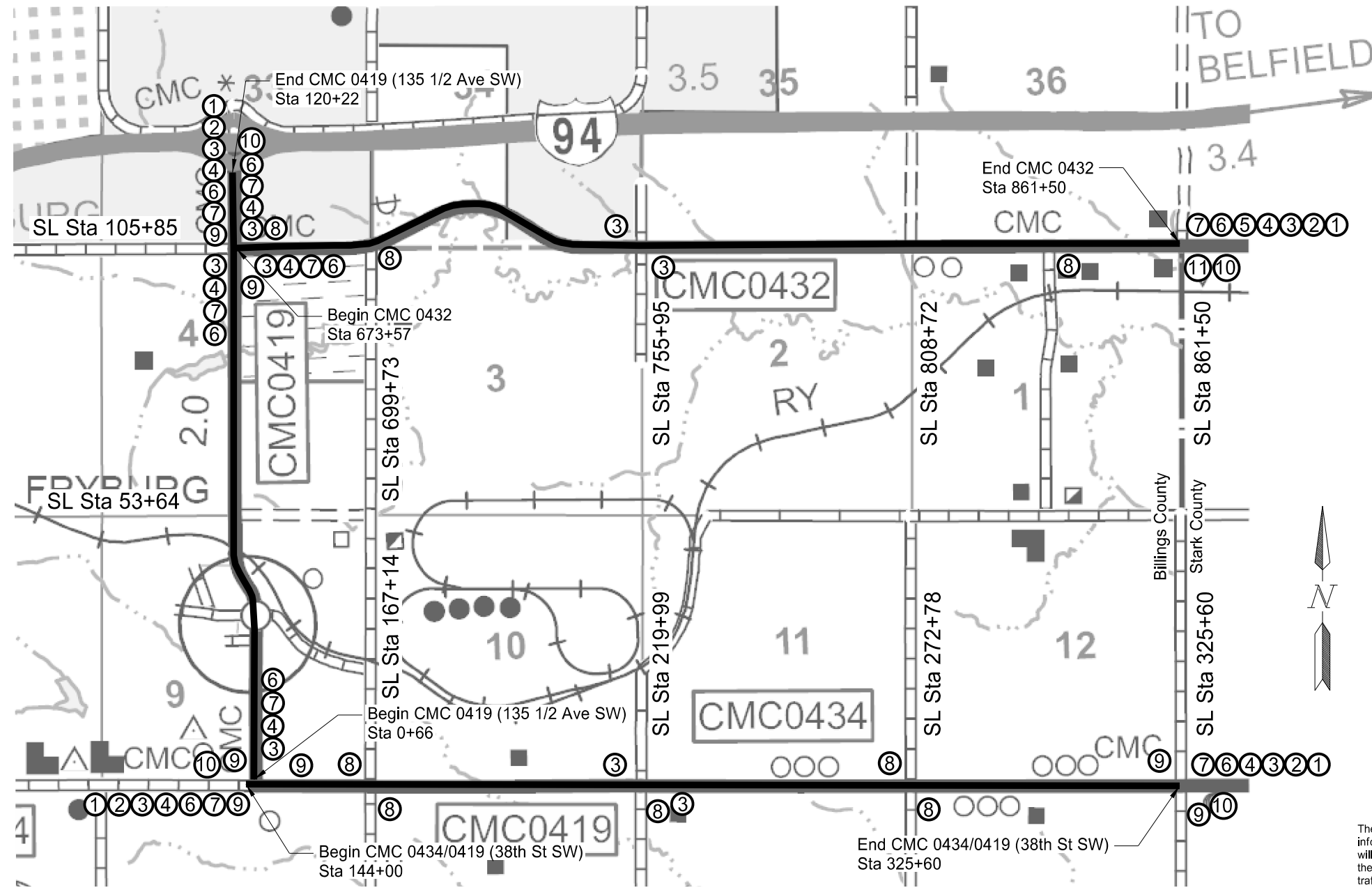
The sign layout as shown is for general information purposes only. The Contractor will be required to conform to MUTCD and the Standard Drawings when installing the traffic control signing.



- ① G20-1-60 Road Work Next __ Miles
- ② G20-55-96 Speed Limit Enforced - Min Fee \$150
- ③ W8-12-48 No Center Line (Place according to D-704-20 Note #6, Skid Mount Sign)
- ④ R4-1-48 Do Not Pass
- ⑤ W3-5-48 Speed Reduction Ahead
- ⑥ W22-8-48 Fresh Oil Loose Rock
- W20-52P-54 Next __ Miles
- ⑦ R2-1-48 45 MPH or maintain existing if less
- R2-1aP-24 Minimum Fee \$150
- ⑧ G20-50a-72 Road Work Next __ Miles Rt & Lt Arrows
- ⑨ G20-52a-72 Road Work Next __ Miles Rt or Lt Arrow
- ⑩ G20-2-48 End Road Work
- ⑪ R2-1-48 55 MPH

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	100	4

Notes: All intersecting streets in the City of Fryburg shall receive a G20-50a-72 sign. (4 Total) ⑧
 Existing Speed Limit on CMC 0419 (135 1/2 Ave SW) north of Fryburg is 45 MPH
 Existing Speed Limit on CMC 0419 (135 1/2 Ave SW) thru Fryburg is 25 MPH
 Existing Speed Limit on CMC 0434/0419 (38th St SW) is 45 MPH
 Existing Speed Limit on CMC 0432 is 55 MPH



SC-0400(021)	
CMC 0419 (135 1/2 Ave SW), 0434/0419 (38th St SW), & 0432	
Work Zone Traffic Control Billings County, ND	
DRAWN BY AK	CHECKED BY SPK
PROJECT NO. 2403-01138	

The sign layout as shown is for general information purposes only. The Contractor will be required to conform to MUTCD and the Standard Drawings when installing the traffic control signing.

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	120	1

NO PASSING ZONES: CMC 0428							Double Barrier
Westbound (LT)			Eastbound (RT)			Quantity (LF)	
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		
37+80	50+14	1,234	37+80	50+14	1,234	1,234	
80+64	95+14	1,450	80+64	95+14	1,450	1,450	
SUBTOTAL =		2,684	SUBTOTAL =		2,684	2,684	
			TOTAL NPZ =		5,368		

EPOXY PVMT MK 4IN LINE SUMMARY: CMC 0428							
White						Yellow	
Westbound (LT)			Eastbound (RT)			Description	Quantity (LF)
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		
0+00	95+14	9,514	0+00	53+64	5,489	Centerline Skips	1,710
			53+89	95+14	4,258	No Passing Zones	5,368
						West Riv Rd Appr	292
SUBTOTAL =		9,514	SUBTOTAL =		9,747	TOTAL YELLOW =	7,370
			TOTAL WHITE =		19,261	TOTAL 4IN LINE =	26,631

NO PASSING ZONES: CMC 0434 SPUR							Double Barrier
Westbound (LT)			Eastbound (RT)			Quantity (LF)	
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		
2+50	3+47	97	2+50	3+47	97	97	
4+42	32+45	2,803	4+42	32+45	2,803	2,803	
SUBTOTAL =		2,900	SUBTOTAL =		2,900	2,900	
			TOTAL NPZ =		5,800		

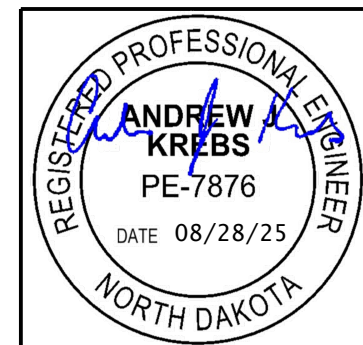
EPOXY PVMT MK 4IN LINE SUMMARY: CMC 0434 SPUR							
White						Yellow	
Westbound (LT)			Eastbound (RT)			Description	Quantity (LF)
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		
2+50	3+47	97	2+50	32+88	3,038	Centerline Skips	0
4+42	32+88	2,846				No Passing Zones	5,800
SUBTOTAL =		2,943	SUBTOTAL =		3,038	TOTAL YELLOW =	5,800
			TOTAL WHITE =		5,981	TOTAL 4IN LINE =	11,781

NO PASSING ZONES: CMC 0434 (E RIV RD)							Double Barrier
Southbound (LT)			Northbound (RT)			Quantity (LF)	
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		
40+15	41+59	144	40+15	41+59	144	144	
42+47	95+50	5,303	42+47	95+50	5,303	5,303	
96+50	165+70	6,920	96+50	165+70	6,920	6,920	
166+48	168+87	239	166+48	168+87	239	239	
169+45	176+58	713	169+45	176+58	713	713	
177+14	178+74	160	177+14	178+74	160	160	
179+34	181+72	238	179+34	181+72	238	238	
182+32	184+50	218	182+32	184+50	218	218	
185+10	185+40	30	185+10	185+40	30	30	
186+00	188+15	215	186+00	188+15	215	215	
188+75	191+43	268	188+75	191+43	268	268	
193+45	193+65	20	193+45	193+65	20	20	
SUBTOTAL =		14,468	SUBTOTAL =		14,468	14,468	
			TOTAL NPZ =		28,936		

EPOXY PVMT MK 4IN LINE SUMMARY: CMC 0434 (E RIV RD)							
White						Yellow	
Southbound (LT)			Northbound (RT)			Description	Quantity (LF)
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		
40+15	41+59	144	40+15	166+63	12,648	Centerline Skips	0
42+47	95+50	5,303				No Passing Zones	28,936
96+50	165+70	6,920					
SUBTOTAL =		12,367	SUBTOTAL =		12,648	TOTAL YELLOW =	28,936
			TOTAL WHITE =		25,015	TOTAL 4IN LINE =	53,951

EPOXY PVMT MK 6IN LINE: CMC 0434 (E RIV RD)				
White				
Station to	Station	Location	Quantity (LF)	Description
178+75	179+29	Lt	94	Crosswalk: 6' Spacing
178+75	179+29	Rt	94	Crosswalk: 6' Spacing
181+74	182+28	Lt	94	Crosswalk: 6' Spacing
184+61	185+01	Rt	75	Crosswalk: 6' Spacing
185+47	185+87	Lt	75	Crosswalk: 6' Spacing
TOTAL 6IN LINE =			432	

EPOXY PVMT MK 24IN LINE: CMC 0434 (E RIV RD)			
White			
Station to	Station	Quantity (LF)	Description
178+74	178+80	60	Continental Crosswalk
185+33	185+39	60	Continental Crosswalk
TOTAL 24IN LINE =		120	



SC-0400(021)	
CMC 0428, 0434 (E Riv Rd), & 0434 SPUR	
	Pavement Marking
	Billings County, ND
<small>DRAWN BY</small> AK	<small>CHKD. BY</small> SPK
<small>PROJECT NO.</small> 2403-01138	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	120	2

NO PASSING ZONES: CMC 0419 (135 1/2 AVE SW)							Double Barrier
Southbound (LT)			Northbound (RT)			Quantity (LF)	
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		Quantity (LF)
0+70	17+00	1,630	0+70	10+00	930	930	
24+00	32+83	883	20+00	32+83	1,283	883	
33+53	40+00	647					
46+43	47+03	60	42+80	47+03	423	60	
47+15	56+00	885	47+15	50+00	285	285	
80+60	85+00	440	73+40	78+00	460	-	
98+00	105+35	735	91+00	98+00	700	-	
112+90	120+22	732	106+15	120+22	1,407	732	
SUBTOTAL =		6,012	SUBTOTAL =		5,488	2,890	
			TOTAL NPZ =		11,500		

EPOXY PVMT MK 4IN LINE SUMMARY: CMC 0419 (135 1/2 AVE SW)							
White						Yellow	
Southbound (LT)			Northbound (RT)			Description	Quantity (LF)
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		
0+70	28+00	2,730	0+70	32+90	3,220	Centerline Skips	2,270
28+80	32+90	410	33+60	46+96	1,336	No Passing Zones	11,500
33+60	43+55	995	47+08	105+73	5,885		
44+40	47+11	271	105+97	120+22	1,445		
47+23	105+35	5,812					
106+15	120+22	1,407					
SUBTOTAL =		11,625	SUBTOTAL =		11,886	TOTAL YELLOW =	13,770
			TOTAL WHITE =		23,511	TOTAL 4IN LINE =	37,281

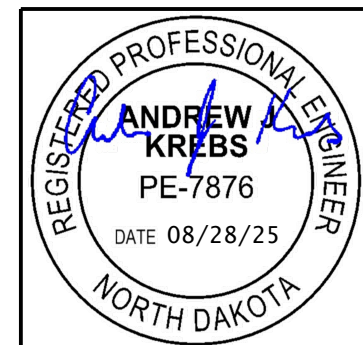
NO PASSING ZONES: CMC 0434/0419 (38th St SW)							Double Barrier
Westbound (LT)			Eastbound (RT)			Quantity (LF)	
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		Quantity (LF)
144+95	149+90	495					
167+60	174+00	640	161+00	166+70	570	-	
220+44	225+39	495	214+59	219+54	495	-	
236+00	247+00	1,100	227+00	238+00	1,100	200	
259+00	264+00	500	250+00	255+00	500	-	
273+23	278+18	495	267+38	272+33	495	-	
287+00	291+00	400	278+00	282+00	400	-	
315+00	325+15	1,015	306+00	325+15	1,915	1,015	
SUBTOTAL =		5,140	SUBTOTAL =		5,475	1,215	
			TOTAL NPZ =		10,615		

EPOXY PVMT MK 4IN LINE SUMMARY: CMC 0434/0419 (38th St SW)							
White						Yellow	
Westbound (LT)			Eastbound (RT)			Description	Quantity (LF)
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		
144+00	144+52	77	144+00	166+70	2,270	Centerline Skips	4,130
144+76	166+70	2,219	167+60	219+54	5,194	No Passing Zones	10,615
167+60	272+52	10,492	220+44	272+33	5,189		
273+22	325+25	5,203	273+23	325+15	5,192		
SUBTOTAL =		17,991	SUBTOTAL =		17,845	TOTAL YELLOW =	14,745
			TOTAL WHITE =		35,836	TOTAL 4IN LINE =	50,581

NO PASSING ZONES: CMC 0432							Double Barrier
Westbound (LT)			Eastbound (RT)			Quantity (LF)	
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		Quantity (LF)
673+57	702+00	2,843	673+57	694+00	2,043	2,043	
718+00	725+00	700	709+00	716+00	700	-	
737+00	745+00	800	725+00	736+00	1,100	-	
758+00	772+00	1,400	750+00	781+00	3,100	1,400	
780+00	790+00	1,000	-	-	-	100	
802+00	808+00	600	793+00	800+00	700	-	
819+00	852+00	3,300	810+00	844+00	3,400	2,500	
SUBTOTAL =		10,643	SUBTOTAL =		11,043	6,043	
			TOTAL NPZ =		21,686		

EPOXY PVMT MK 4IN LINE SUMMARY: CMC 0432							
White						Yellow	
Westbound (LT)			Eastbound (RT)			Description	Quantity (LF)
Station to	Station	Quantity (LF)	Station to	Station	Quantity (LF)		
673+57	861+50	18,793	673+57	699+17	2,560	Centerline Skips	3,190
			700+17	755+50	5,533	No Passing Zones	21,686
			756+40	835+25	7,885		
			836+15	861+50	2,535		
SUBTOTAL =		18,793	SUBTOTAL =		18,513	TOTAL YELLOW =	24,876
			TOTAL WHITE =		37,306	TOTAL 4IN LINE =	62,182

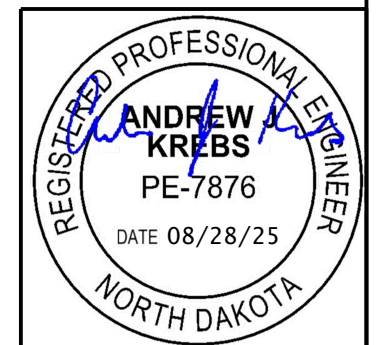
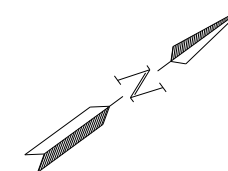
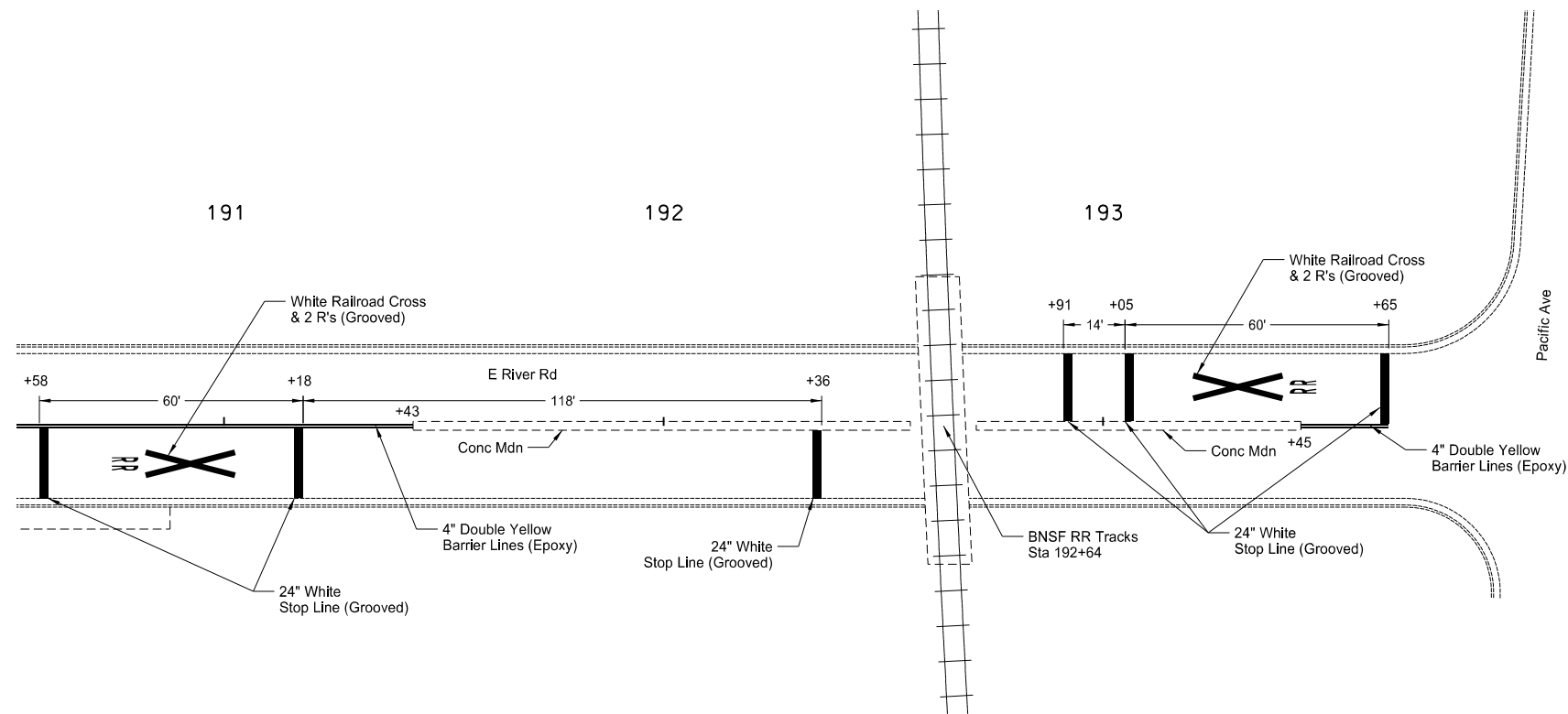
EPOXY PVMT MK 24IN LINE: CMC 0432		
White		
Station	Location	Quantity (LF)
673+58	Lt	12
TOTAL 24IN LINE =		12



SC-0400(021)	
CMC 0419 (135 1/2 Ave SW), 0434/0419 (38th St SW), & 0432	
	Pavement Marking
	Billings County, ND
DRAWN BY AK	CHECKED BY SPK
PROJECT NO. 2403-01138	

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	120	3

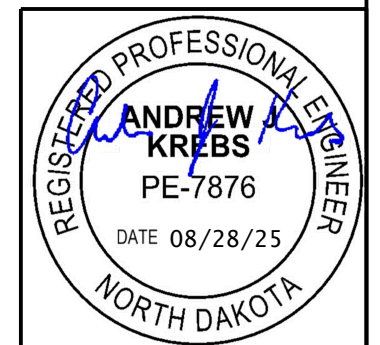
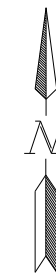
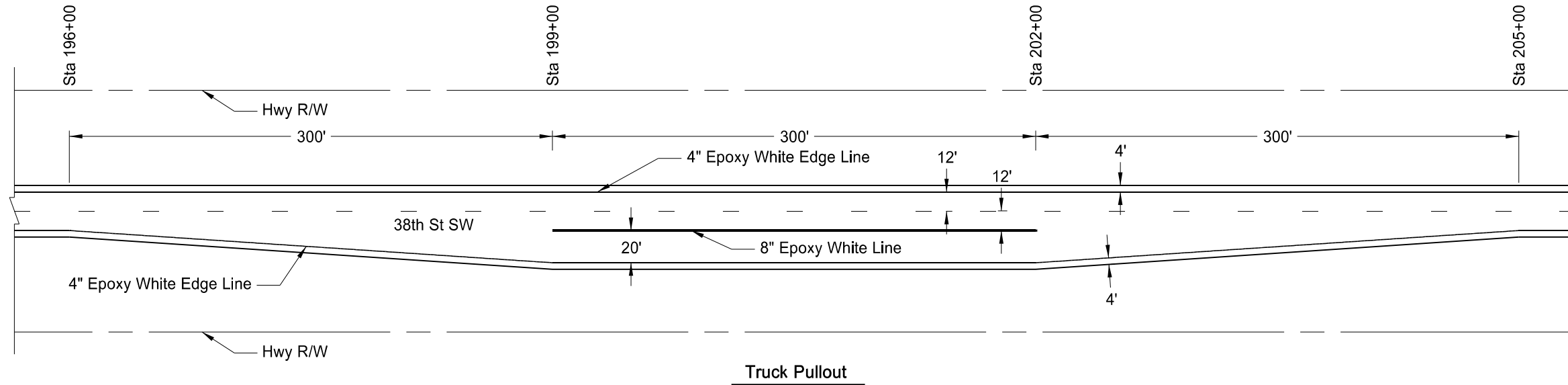
SPEC CODE	BID ITEM	QTY	UNIT
762 0122	PREFORMED PATTERNED PVMT MK-MESSAGE(GROOVED)		
	Railroad Cross & 2 R's (2)	121	SF
	24" Railroad Bands (6)	189	SF
	Total =	310	SF



SC-0400(021)	
CMC 0434 (E Riv Rd)	
	Pavement Marking Layout
	Billings County, ND
<small>DRAWN BY</small> AK	<small>PROJECT NO.</small> 2403-01138

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	SC-0400(021)	120	4

SPEC CODE	BID ITEM	QTY	UNIT
762 0115	EPOXY PVMT MK 8IN LINE Sta 199+00 to 202+00 Rt	300	LF



SC-0400(021) CMC 0434/0419 (38th St SW)			
	Truck Pullout Pavement Marking Details Billings County, ND		
	<table border="1"> <tr> <td>DRAWN BY AK</td> <td>CHECKED BY SPK</td> <td>PROJECT NO. 2403-01138</td> </tr> </table>	DRAWN BY AK	CHECKED BY SPK
DRAWN BY AK	CHECKED BY SPK	PROJECT NO. 2403-01138	

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

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 C 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
 DInt delineate
 DIntr delineator
 Depr depression
 Desc description
 Det detail
 DWP detectable warning panel
 Dtr detour
 Dia or \emptyset 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

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

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



NDDOT ABBREVIATIONS

D-101-2

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

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



NDDOT ABBREVIATIONS

D-101-3

Salv	salvage(d)	Tel	telephone
San	sanitary sewer line	Tel B	Telephone Booth
Sec	section	Tel P	telephone pole
SL	section line	Tv	television
Sep	separation	Temp	temperature
Seq	sequence	Temp	temporary
Serv	service	TBM	temporary bench mark
Sht	sheet	T	thinwall tube sample
Shtng	sheeting	Ts	topsoil
Shldr	shoulder	Traf	traffic
Sw or Sdwk	sidewalk	TSCB	traffic signal control box
SD	sight distance	Tr	trail
SN	sign number	Transf	transformer
Sig	signal	Trans	transition
Sgl	single	TT	transmission tower
SRCP	slotted reinforced concrete pipe	TES	traversable end section
SC	slow curing	Trans	transverse
SS	slow setting	Trtd	treated
Sm	small	Trmt	treatment
S	South	Qc	triaxial compression
SE	Southeast	TERO	tribal employment rights ordinance
SW	Southwest	Tpl	triple
SB	Southbound	Typ	typical
Sp	spaces		
Spcl	special	Qu	unconfined compressive strength
SA	special assembly	Ugrnd	underground
SP	special provisions	Util	utility
G	specific gravity		
Spk	spike	VG	valley gutter
SB	split barrel sample	Vap	vapor
SH	sprinkler head	Vert	vertical
SV	sprinkler valve	VCP	vitrified clay pipe
Sq	square	Vol	volume
Stk	stake	VSFS	vehicle speed feedback sign
Std	standard		
N	standard penetration test	Wkwy	walkway
Std Specs	standard specifications	W	water content
Stm L	steam line	WGV	water gate valve
SEC	steel encased concrete	WL	water line
SMA	stone matrix asphalt	WM	water main
SSD	stopping sight distance	WMV	water main valve
SD	storm drain	W Mtr	water meter
St	street	WSV	water service valve
SPP	structural plate pipe	WW	water well
SPPA	structural plate pipe arch	Wrng	wearing
Str	structure	WIM	weigh in motion
Subd	subdivision	W	west
Sub	subgrade	WB	westbound
Sub Prep	subgrade preparation	Wrng	wiring
Ss	subsoil	W/	with
SS	supplement specification	W/o	without
Supp	supplemental		
Surf	surfacing		
Surv	survey		
Sym	symmetrical		

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



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
4-14-25	- Continued from D-101-3 General Revisions



NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM 702 Communications
 ACCENT Accent Communications
 AGASSIZ WU Agassiz Water Users District
 AGC Associated General Contractors of America
 ALL PL Alliance Pipeline
 ALL SEAS WU All Seasons Water Users District
 AMOCO PI Amoco Pipeline Company
 AMRDA HESS Amerada Hess Corporation
 AT&T AT&T Corporation
 B PAW Bear Paw Energy Incorporated
 BAKER ELEC Baker Electric
 BASIN ELEC Basin Electric Cooperative Incorporated
 BEK TEL Bek Communications Cooperative
 BELLE PL Belle Fourche Pipeline Company
 BLM Bureau of Land Management
 BNSF Burlington Northern Santa Fe Railway
 BOEING Boeing
 BRNS RWD Barnes Rural Water District
 BURK-DIV ELEC Burke-Divide Electric Cooperative
 BURL WRD Burleigh County Water Resource District
 CABLE ONE Cable One
 CABLE SERV Cable Services
 CAP ELEC Capital Electric Cooperative Incorporated
 CASS CO ELEC Cass County Electric Cooperative
 CASS RWU Cass Rural Water Users District
 CAV ELEC Cavalier Rural Electric Cooperative
 CBLCOM Cablecom Of Fargo
 CENEX PL Cenex Pipeline
 CENT PL WATER DIST Central Pipe Line Water District
 CENT PWR ELEC Central Power Electric Cooperative
 CENTURYLINK CenturyLink
 COE Corps of Engineers
 CONS COMM Consolidated Communications
 CONS TELCOM Consolidated Telcom
 CONT RES Continental Resource Inc
 CPR Canadian Pacific Railway
 D O E Department Of Energy
 DAK CARR Dakota Carrier Network
 DAK CENT TEL Dakota Central Telephone
 DAK RWD Dakota Rural Water District
 DGC Dakota Gasification Company
 DICKEY R NET Dickey Rural Networks
 DICKEY WRD Dickey County Water Resource District
 DICKEY TEL Dickey Telephone
 DNRR Dakota Northern Railroad
 DOME PL Dome Pipeline Company
 DVELEC Dakota Valley Electric Cooperative
 DVMW Dakota, Missouri Valley & Western
 E CENT REG WD East Central Water District
 ENBRDG Enbridge Pipelines Incorporated
 ENVENTIS Enventis Telephone
 EQUINOR Equinor Pipeline
 FALK MNG Falkirk Mining Company
 FHWA Federal Highway Administration
 G FKS-TRL WD Grand Forks-traill Water District
 GETTY TRD & TRAN Getty Trading & Transportation
 GLDN W ELEC Golden West Electric Cooperative

GTR RAMSEY WD Greater Ramsey Water District
 GT PLNS NAT GAS Great Plains Natural Gas Company
 HALS TEL Halstad Telephone Company
 IDEA1 Idea1
 INT-COMM TEL Inter-Community Telephone Company
 KANEB PL Kaneb Pipeline Company
 KEM ELEC Kem Electric Cooperative Incorporated
 KOCH GATH SYS Koch Gathering Systems Incorporated
 LKHD PL Lakehead Pipeline Company
 LWR YELL R ELEC Lower Yellowstone Rural Electric
 LUMEN Lumen Technologies Incorporated
 MCKNZ CON McKenzie Consolidated Telcom
 MCKNZ ELEC McKenzie Electric Cooperative
 MCKNZ WRD McKenzie County Water Resource District
 MCLEOD McLeod USA
 MCLN ELEC McLean Electric Cooperative
 MCLN-SHRDN R WAT McLean-Sheridan Rural Water District
 MDU Montana-dakota Utilities
 MIDCO MidContinent Communications
 MIDSTATE TEL Midstate Telephone Company
 MINOT CABLE Minot Cable Television
 MINOT TEL Minot Telephone Company
 MISS VALL COMM Missouri Valley Communications Incorporated
 MISS W W S Missouri West Water System
 MNKOTA PWR Minnkota Power
 MOR-GRAN-SOU ELEC Mor-gran-sou Electric Cooperative
 MOUNT-WILLI ELEC Mountrail-williams Electric Cooperative
 MLGC Moore & Liberty - Griggs County
 MUNICIPAL City Water And Sewer
 MUNICIPAL City Of '.....'
 N CENT ELEC North Central Electric Cooperative
 N PRAIR REG WD North Prairie Regional Water District
 ND PKS & REC North Dakota Parks And Recreation
 ND TEL North Dakota Telephone Company
 NDDOT North Dakota Department of Transportation
 NE REG WD Northeast Regional Water District
 NDSU SOIL SCI DEPT NDSU Soil Science Department
 NEMONT TEL Nemont Telephone
 NODAK R ELEC Nodak Rural Electric Cooperative
 NOON FRMS TEL Noonan Farmers Telephone Company
 NPR Northern Plains Railroad
 NSP Northern States Power
 NTHN BRDR PL Northern Border Pipeline
 NTHN PLNS ELEC Northern Plains Electric Cooperative Incorporated
 NTHWSTRN REF Northwestern Refinery Company
 NW COMM Northwest Communication Cooperation
 NWRWD Northwest Rural Water District
 ONEOK Oneok gas
 OSHA Occupational Safety and Health Administration
 OTTR TL PWR Otter Tail Power Company
 PAAP Plains All American Pipeline
 P L E M Prairielands Energy Marketing
 POLAR COM Polar Communications
 PVT ELEC Private Electric
 QWEST Qwest Communications
 R&T REG WD R & T Water District

RED RIV COMM Red River Communications
 RESVTN TEL Reservation Telephone
 ROBRTS TEL Roberts Company Telephone
 R-RIDER ELEC Roughrider Electric Cooperative
 RRVW Red River Valley & Western Railroad
 S CENT REG WD South Central Regional Water District
 SE W U Southeast Water Users Incorporated
 SCOTT CABLE Scott Cable Television Dickinson
 SHERDN ELEC Sheridan Electric Cooperative
 SHEYN VLY ELEC Sheyenne Valley Electric Cooperative
 SKYTECH Skyland Technologies Incorporated
 SLOPE ELEC Slope Electric Cooperative Incorporated
 SOURIS RIV TELCOM Souris River Telecommunications
 ST WAT COMM State Water Commission
 STATE LN WATER State Line Water Cooperative
 STER ENG Sterling Energy
 STUT RWD Stutsman Rural Water District
 SW PL PRJ Southwest Pipeline Project
 SWWA Southwest Water Authority
 SUNOCO Sunoco LP
 T M C Turtle Mountain Communications
 TCI TCI of North Dakota
 TESORO HGH PLNS PL Tesoro High Plains Pipeline
 TRI-CNTY WU Tri-County Water Users Incorporated
 TRL CO WRD Traill County Water Resource District
 UNTD TEL United Telephone
 UPPR SOUR WD Upper Souris Water District
 US SPRINT U.S. Sprint
 USAF MSL CABLE U.S.A.F. Missile Cable
 USFWS US Fish and Wildlife Service
 USW COMM U.S. West Communications
 VRNDRY ELEC Verendrye Electric Cooperative
 W RIV TEL West River Telephone Incorporated
 WAPA Western Area Power Administration
 WAWSA Western Area Water Supply Authority
 WEB W. E. B. Water Development Association
 WILLI WRD Williams County Water Resource District
 WILSTN BAS PL Williston Basin Interstate Pipeline Company
 WLSH RWD Walsh Water Rural Water District
 WOLVRTN TEL Wolverton Telephone
 XLENER Xcel Energy
 YSVR Yellowstone Valley Railroad

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
05-20-18	General Revisions
12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions



LINE STYLES

D-101-20

Existing Topography

- Void — Void — Void — V 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
- - - - -x- - - - - 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

Proposed Topography

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

Existing Utilities

- — — — — E — Existing Electrical
- — — — — FO — Existing Fiber Optic Line
- — — — — FO — Existing TV Fiber Optic
- — — — — G — Existing Gas Pipe
- — — — — OH — Existing Overhead Utility Line
- — — — — P — Existing Power
- — — — — PL — Existing Fuel Pipeline
- — — — — PL — Existing Undefined Above Ground Pipe Line
- - - - - SAN - - - - - Existing Sanitary Sewer
- - - - - SAN FM - - - - - Existing Sanitary Force Main
- - - - - SD - - - - - Existing Storm Drain
- - - - - SD FM - - - - - Existing Storm Drain Force Main
- - - - - Existing Culvert
- — — — — T — Existing Telephone Line
- — — — — TV — Existing TV Line
- — — — — W — 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

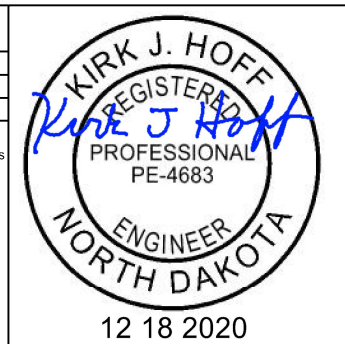
Traffic Utilities

- - - - - 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	Added and Revised Items, Organized by Functional Groups General Revisions
12-18-20	



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 Typical

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

Geotechnical

- D ----- D ----- Geotextile Fabric Type D
- **Geo** ----- **Geo** ----- Geogrid
- R ----- R ----- Geotextile Fabric Type R
- R ----- R ----- Geotextile Fabric Type R1
- RR ----- RR ----- Geotextile Fabric Type RR
- S ----- S ----- Geotextile Fabric Type S

Countours

- Depression Contours
- Supplemental Contour

Profile

- Subgrade, Subcut or Ditch Grade
- Topsoil Profile

Striping

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

Pavement Joints

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

Bridge Details

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

Erosion Control

- Limits of Const Transition Line
- Bale Check
- Rock Check
- s ----- s ----- Floating Silt Curtain
- SF ----- SF ----- Silt Fence
- 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	Added and Revised Items, Organized by Functional Groups General Revisions
12-18-20	



SYMBOLS



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



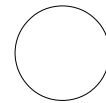
Existing Large Tree



Existing Small Tree



Existing Tree Trunk



Cairn or Stone Circle



Existing Artifact



Existing Satellite Dish



Existing Weather Station



Existing Windmill or Tower



Reinforced Pavement



Continuous Split Barrel Sample



Flight Auger Sample



Split Barrel Sample



Thinwall Tube Sample



Standard Penetration Test



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

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

SYMBOLS

D-101-32

 Existing Luminaire  Luminaire LED  Existing Light Standard Luminaire  Relocate Light Standard  Light Standard Light LED Luminaire  Light Standard 35 Watt High Pressure Sodium Vapor Luminaire  Light Standard 50 Watt High Pressure Sodium Vapor Luminaire  Light Standard 70 Watt High Pressure Sodium Vapor Luminaire  Light Standard 100 Watt High Pressure Sodium Vapor Luminaire  Light Standard 150 Watt High Pressure Sodium Vapor Luminaire  Light Standard 200 Watt High Pressure Sodium Vapor Luminaire  Light Standard 250 Watt High Pressure Sodium Vapor Luminaire  Light Standard 310 Watt High Pressure Sodium Vapor Luminaire  Light Standard 400 Watt High Pressure Sodium Vapor Luminaire  Light Standard 700 Watt High Pressure Sodium Vapor Luminaire  Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire  Emergency Vehicle Detector  Video Detection Camera	  High Mast Light Standard 3 Luminaire (Exst, Ppsd)   High Mast Light Standard 4 Luminaire (Exst, Ppsd)   High Mast Light Standard 5 Luminaire (Exst, Ppsd)   High Mast Light Standard 6 Luminaire (Exst, Ppsd)   High Mast Light Standard 7 Luminaire (Exst, Ppsd)   High Mast Light Standard 8 Luminaire (Exst, Ppsd)   High Mast Light Standard 9 Luminaire (Exst, Ppsd)   High Mast Light Standard 10 Luminaire (Exst, Ppsd)   Overhead Sign Structure Load Center (Exst, Ppsd)   Traffic Signal Controller (Exst, Ppsd)   Pad Mounted Traffic Signal Controller (Exst, Ppsd)   Flashing Beacon (Exst, Ppsd)   Concrete Foundation (Exst, Ppsd)   Pipe Mounted Flasher (Exst, Ppsd)   Pad Mounted Feed Point (Exst, Ppsd)   Pipe Mounted Feed Point with Pad (Exst, Ppsd)   Pole Mounted Feed Point (Exst, Ppsd)   Junction Box (Exst, Ppsd)  Existing Pedestrian Head with Number  Existing Signal Head  Pole Mounted Head  Existing Lighting Standard Pole	 Existing Traffic Signal Standard    Pull Box (Exst-Ppsd-Undefined)   Intelligent Transportation Pull Box (Exst, Ppsd)   Transformer (Exst, Ppsd)    Power Pole (Exst-Ppsd-with Transformer)   Wood Pole (Exst, Ppsd)   Pedestrian Push Button Post (Exst, Ppsd)  Existing Pole  Existing Telephone Pole  Existing Post     Connection Conductor (Ground, Neutral, Phase 1, Phase 2)
---	---	--

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



KIRK J. HOFF

REGISTERED

PROFESSIONAL

PE-4683

ENGINEER

NORTH DAKOTA

12 18 2020

SYMBOLS

D-101-33

			Existing Manhole (Electrical, Gas, Telephone)			Cap or Stub Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water	
			Water Manhole (Exst, Exst with Valve)				
			Sanitary Sewer Manhole (Exst, Ppsd, Exst with Valve)		Existing Pedestal Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined		
			Sanitary Force Main Manhole (Exst, Ppsd, Exst with Valve)				
			Storm Drain Manhole (Exst, Ppsd, Exst with Inlet, Ppsd with Inlet)		Existing Pipe Vent Gas, Fuel, Sanitary, Storm Drain, Water, Undefined		
			Force Main Storm Drain Manhole (Exst, Exst with Valve)				
			Manhole (Ppsd, Ppsd 48 Inch, Exst Undefined)		Valve Exst Gas, Exst Water, Ppsd Water, Exst Undefined		
			Existing Water Appurtenance				
			Sprinkler Head (Exst, Ppsd)		Pump Sanitary, Storm Drain, Exst Water		
			Fire Hydrant (Exst, Ppsd)				
			Cleanout (Exst Sanitary, Underdrain)		Corrugated Metal End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)		
			Existing Catch Basin Inlet (Round, Square)				
			Existing Curb Inlet (Round, Square)		Reinforced Concrete End Section (18, 24, 30, 36, 42, 48, 54, 60 Inch)		
			Existing Slotted Reinforced Concrete Pipe				
			Catch Basin (Riser 30 Inch, Beehive, Type A)		Existing Utility Marker		
			Inlet Mountable Curb (Type A, Type B)		Existing Meter		
			Inlet Saddle Base (Type 1, Type 2)		Existing Fuel Dispensers		
			Inlet Special (Catch Basin, Type 1, Type A)		Existing Fuel Filler Pipes		
			Inlet (Tee, Type 1, Type 2, Type 2 Double)		Existing Fuel Leak Sensors		
			Median Drain				
			Headwall (Exst, Ppsd, Ppsd Single with Vegetation Barrier, Ppsd Double with Vegetation Barrier)				

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

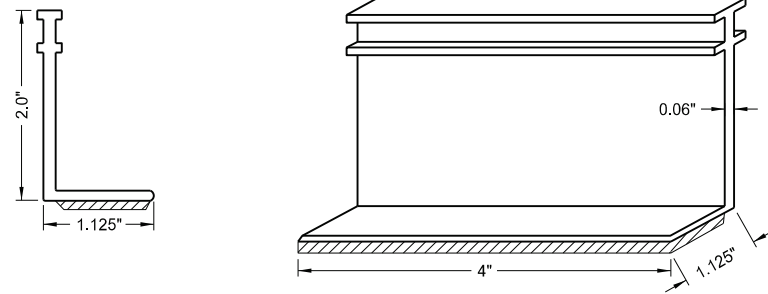


12 18 2020

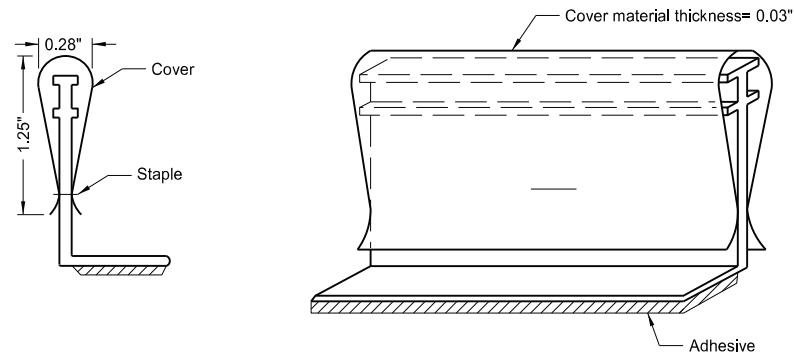
LANE MARKERS (Spotting Tab for Seal Projects only)

Notes:

1. Install lane line markers as shown, prior to beginning the seal coat.
2. Attach cover to vertical part of marker so traffic does not cause it to detach, but it can be easily removed manually.
3. Remove protective covers immediately after seal coat is applied.
4. Remove markers after permanent pavement marking is installed.
5. Use marker body and cover manufactured from polyurethane material.
6. Marker types:
 Type Y - Yellow body and cover with yellow reflective tape on both sides.
 Type W - White body and cover with white reflective tape on one side.
7. Use retroreflective tape with a minimum reflectance of 1200 candle power per foot-candle per square foot, using a .1 degree observation angle and 0 degree entrance angle.
8. Use adhesive conforming to AASHTO M 237.



Marker Body



Marker Body with Protective Cover

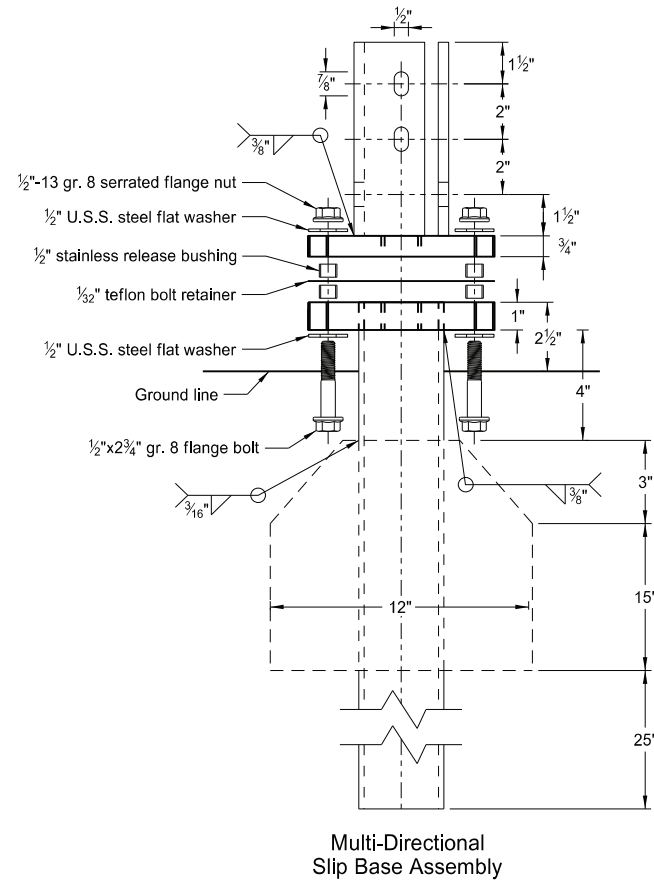
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature



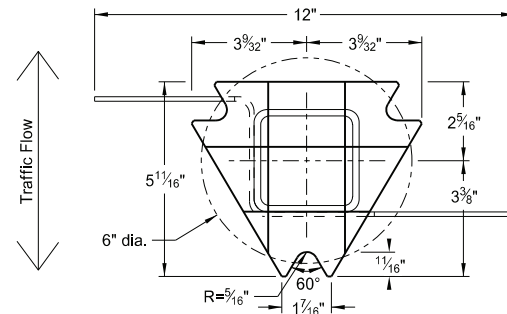
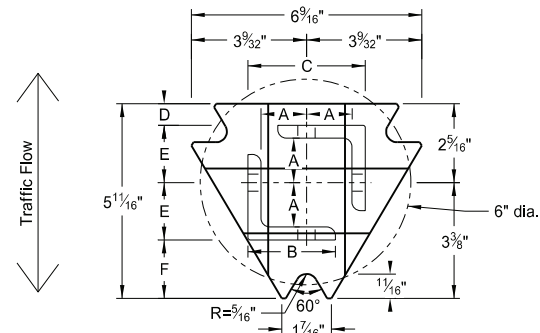
08/01/24

BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

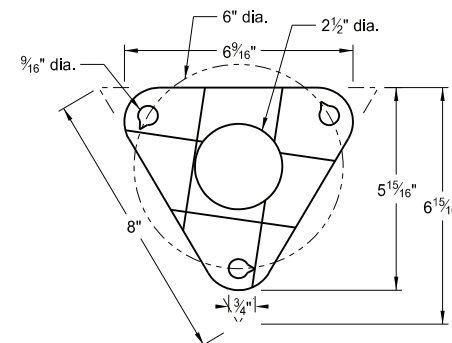
D-704-7



Perforated Tube



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



Notes:

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

Telescoping Perforated Tube

Number of Posts	Post Size in.	Wall Thickness Gauge	Sleeve Size in.	Wall Thickness Gauge	Slip Base	Anchor Size without Slip Base in.
1	2	12			No	2 1/4
1	2 1/4	12			No	2 1/2
1	2 1/2	12			(A)	3
1	2 1/2	10			Yes	
1	2 1/4	12	2	12	Yes	
1	2 1/2	12	2 1/4	12	Yes	
2	2	12			No	2 1/4
2	2 1/4	12			No	2 1/2
2	2 1/2	12			Yes	
2	2 1/2	12			Yes	
2	2 1/4	10	2	12	Yes	
3 & 4	2 1/2	12			Yes	
3 & 4	2 1/2	10			Yes	
3 & 4	2 1/2	12	2 1/4	12	Yes	
3 & 4	2 1/4	12	2	12	Yes	
3 & 4	2 1/2	10	2 3/16	10	Yes	

Properties of Telescoping Perforated Tube

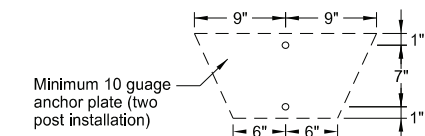
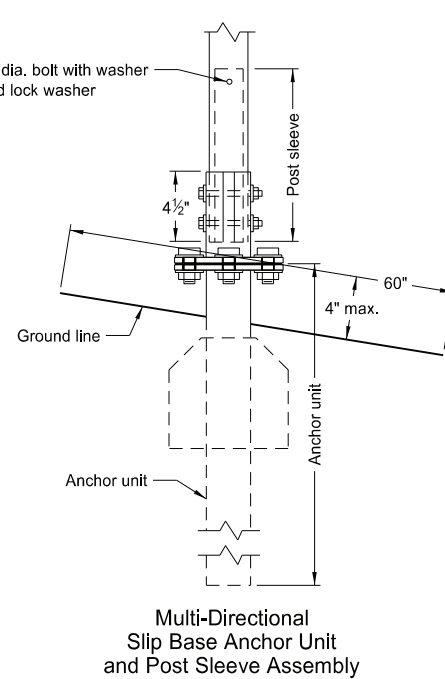
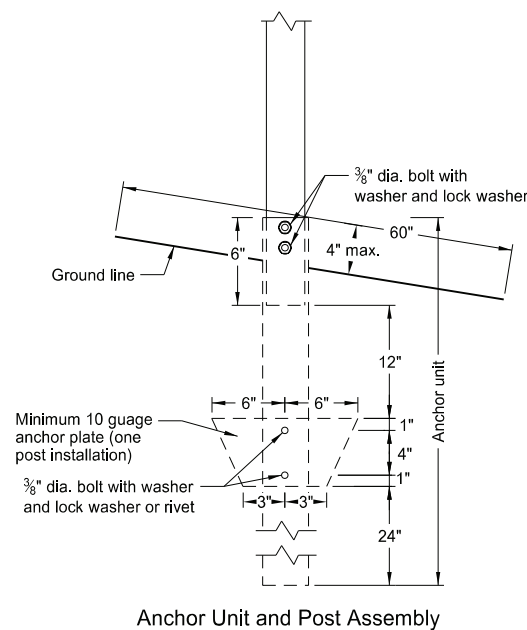
Tube Size in.	Wall Thickness in.	U.S. Standard Gauge	Weight per Foot lbs.	Moment of Inertia in. ⁴	Cross Sec. Area in. ²	Section Modulus in. ³
1 1/2 x 1 1/2	0.105	12	1.702	0.129	0.380	0.172
2 x 2	0.105	12	2.416	0.372	0.590	0.372
2 1/4 x 2 1/4	0.105	12	2.773	0.561	0.695	0.499
2 3/16 x 2 3/16	0.135	10	3.432	0.605	0.841	0.590
2 1/2 x 2 1/2	0.105	12	3.141	0.804	0.803	0.643
2 1/2 x 2 1/2	0.135	10	4.006	0.979	1.010	0.785

Top Post Receiver Data Table

Square Post Sizes (B)	A	B	C	D	E	F
2 3/16"x10 ga.	1 5/64"	2 1/2"	3 1/32"	2 5/32"	1 33/64"	1 7/8"
2 1/2"x10 ga.	1 3/32"	2 1/2"	3 5/16"	5/8"	1 21/32"	1 3/4"

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

(B) For additional wind load, insert the 2 3/16"x10 ga. into 2 1/2"x10 ga.



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

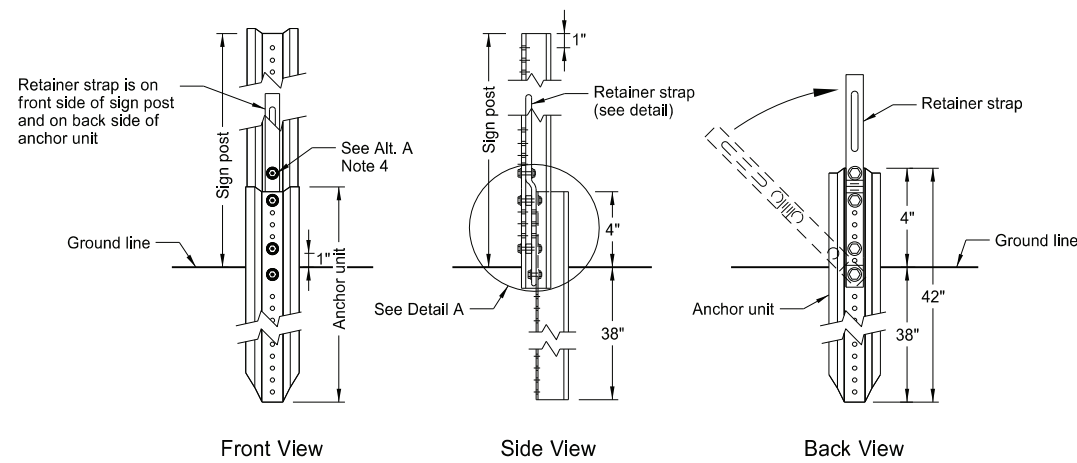
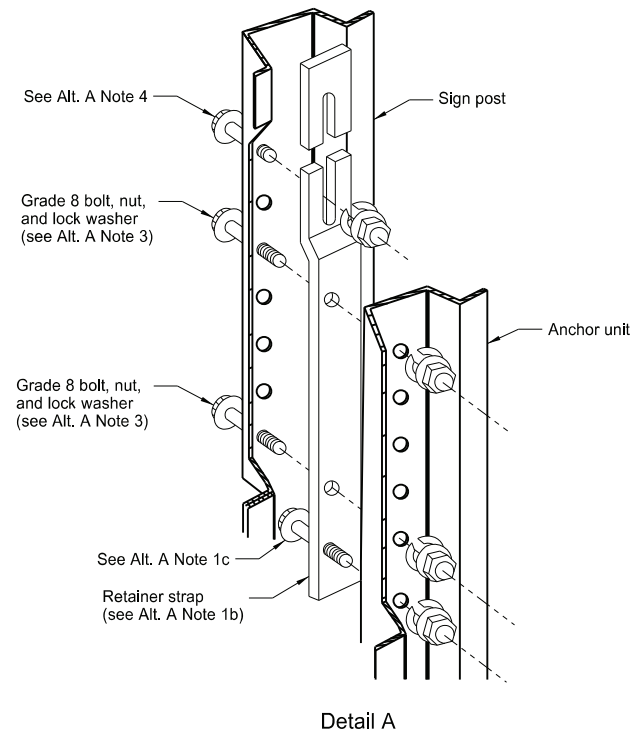


08/01/24

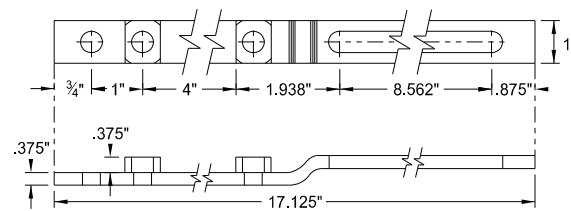
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

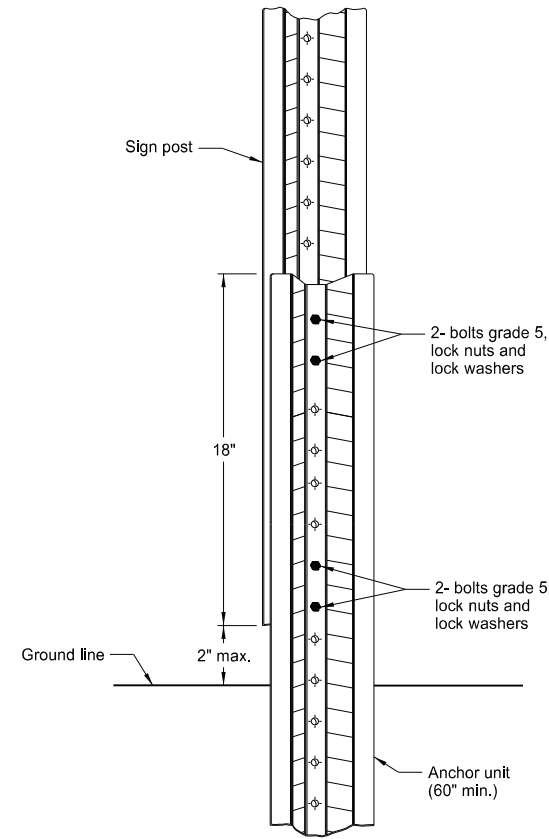
U-Channel Post



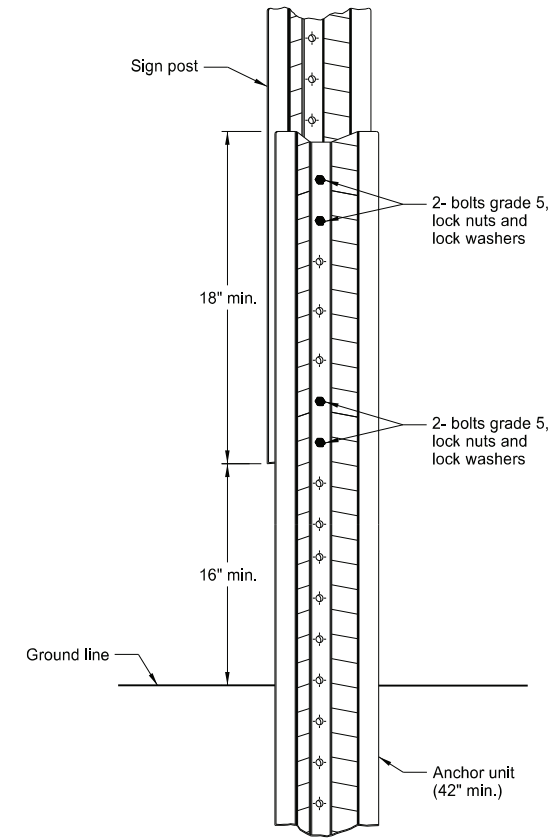
Breakaway U-Channel Detail Alternate A
Install a maximum of 2 posts within 7'.



Retainer Strap Detail



Breakaway U-Channel Splice Detail Alternate B
(2.5 and 3 lb/ft)
Install a maximum of 3 posts within 7'.



Breakaway U-Channel Splice Detail Alternate C
(2.5 and 3 lb/ft)
Install a maximum of 3 posts within 7'.

Alternate A Steps of Installation:

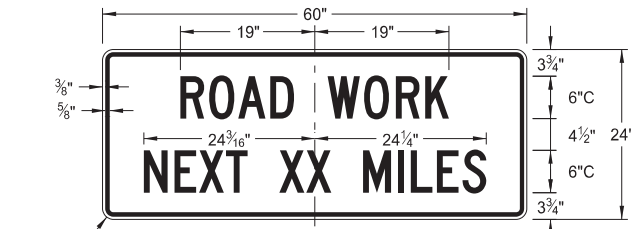
- Drive anchor unit to within 12" of ground level.
 - Establish proper assembly by lining up bottom hole of retainer strap with 6th hole from the top of the anchor unit.
 - Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.
 - Rotate strap 90° to left.
- Drive anchor unit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

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

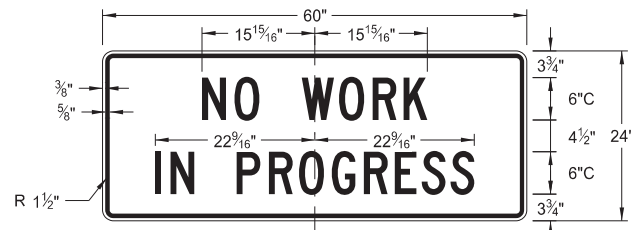


08/01/24

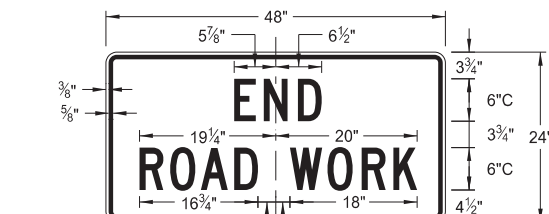
CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS



G20-1-60
Legend: black (non-refl)
Background: orange



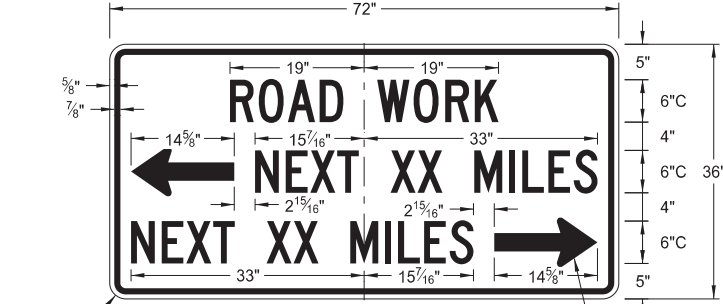
G20-1b-60
Legend: black (non-refl)
Background: orange



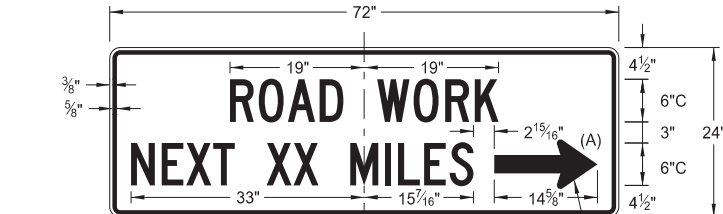
G20-2-48
Legend: black (non-refl)
Background: orange



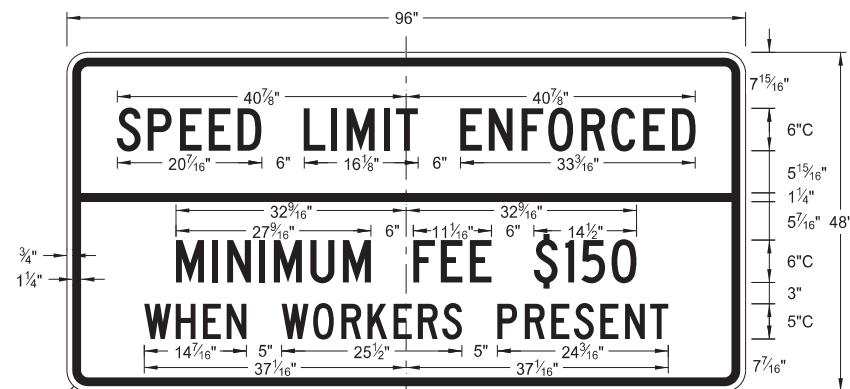
G20-4b-36
Legend: black (non-refl)
Background: orange



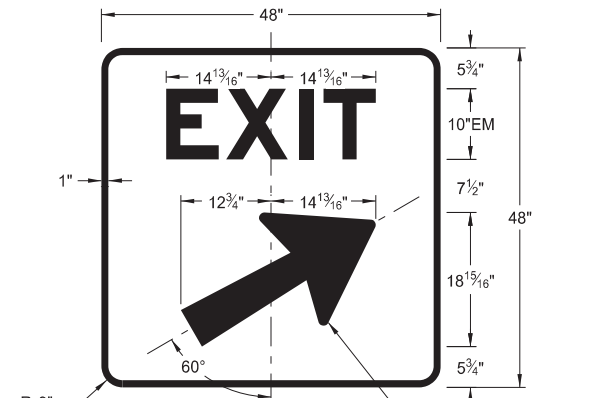
G20-50a-72
Legend: black (non-refl)
Background: orange



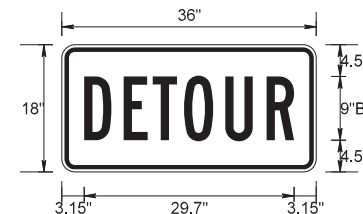
G20-52a-72
Legend: black (non-refl)
Background: orange



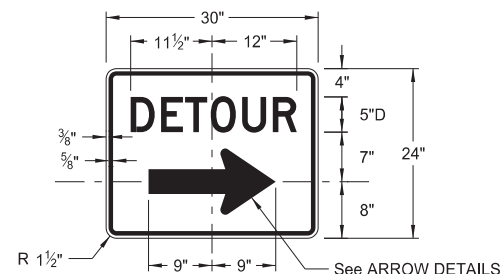
G20-55-96
Legend: black (non-refl)
Background: orange



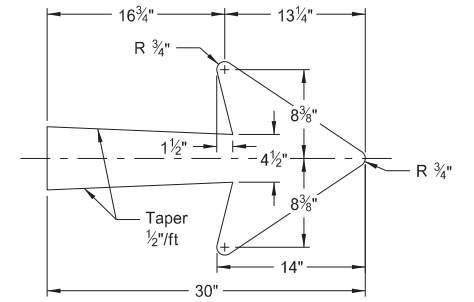
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



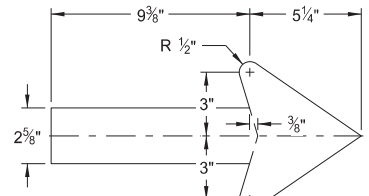
M4-8-36
Legend: black (non-refl)
Background: orange



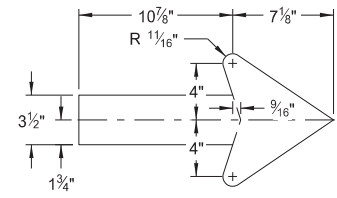
M4-9(L or R)-30 & M4-9-30
Legend: black (non-refl)
Background: orange



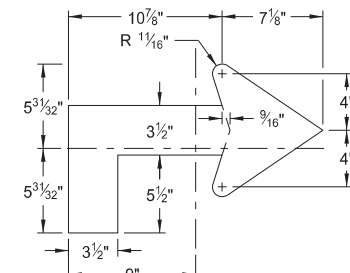
E5-1-48



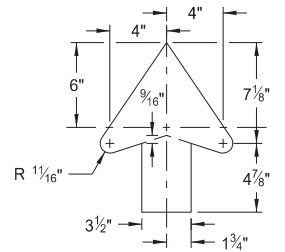
G20-50a-72
G20-52a-72



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



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



M4-9-30
Straight

ARROW DETAILS

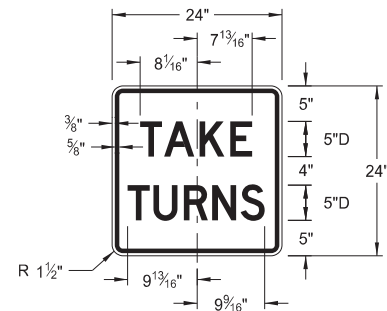
NOTES:

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

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



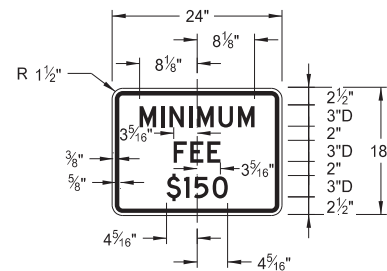
CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS



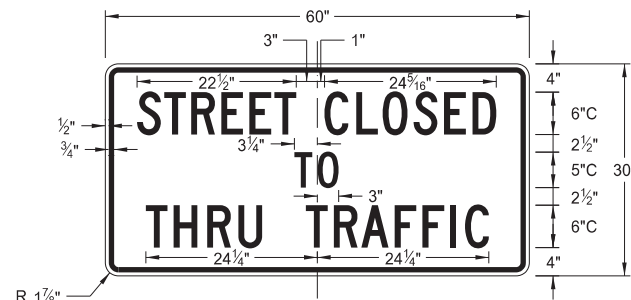
R1-50P-24
Legend: black (non-refl)
Background: white



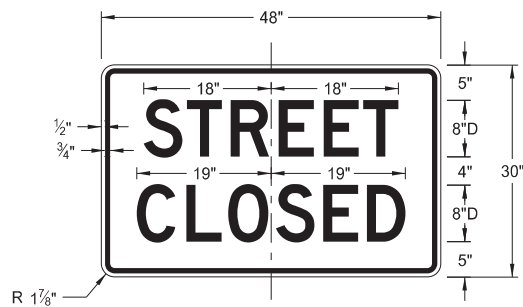
R11-3c-60
Legend: black (non-refl)
Background: white



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



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

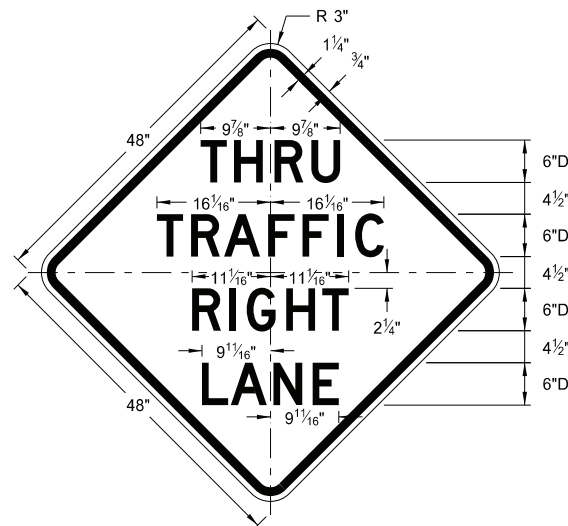


R11-2a-48
Legend: black (non-refl)
Background: white

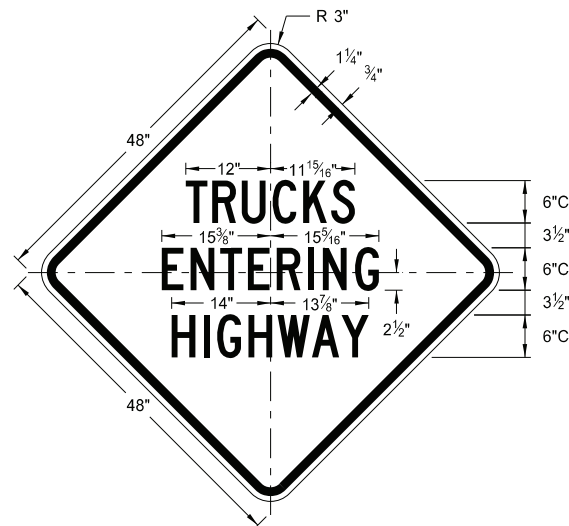
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



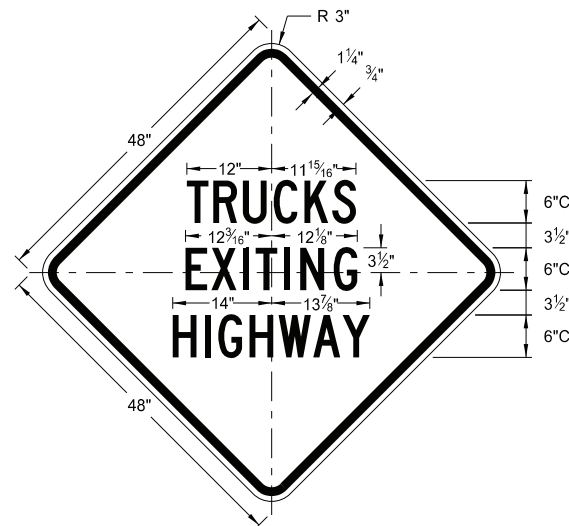
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



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



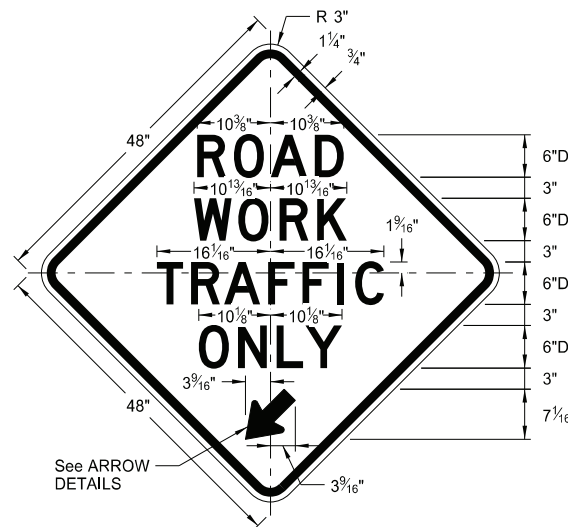
W8-53-48
Legend: black (non-refl)
Background: orange



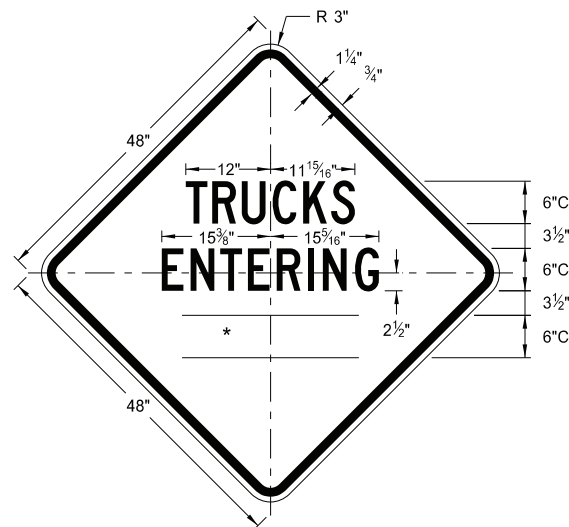
W8-56-48
Legend: black (non-refl)
Background: orange

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

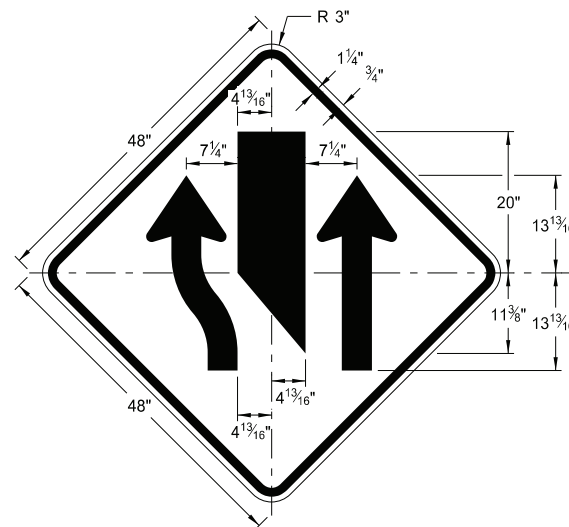
* DISTANCE MESSAGES



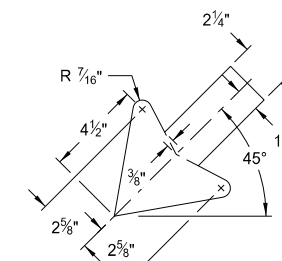
W5-9-48
Legend: black (non-refl)
Background: orange



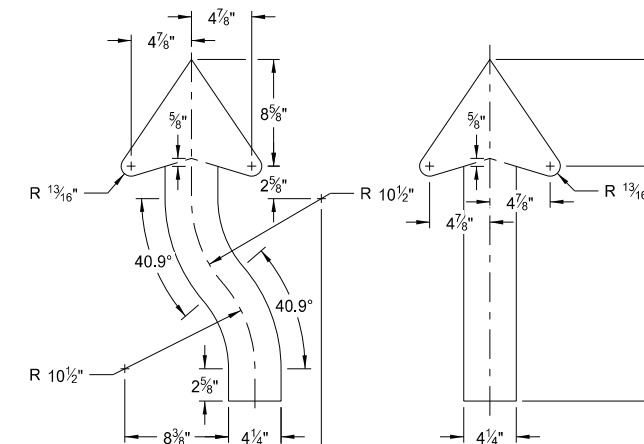
W8-54-48
Legend: black (non-refl)
Background: orange



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

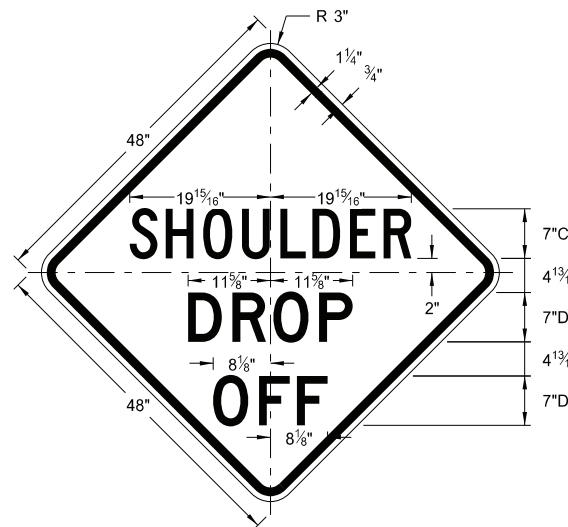


W5-9-48

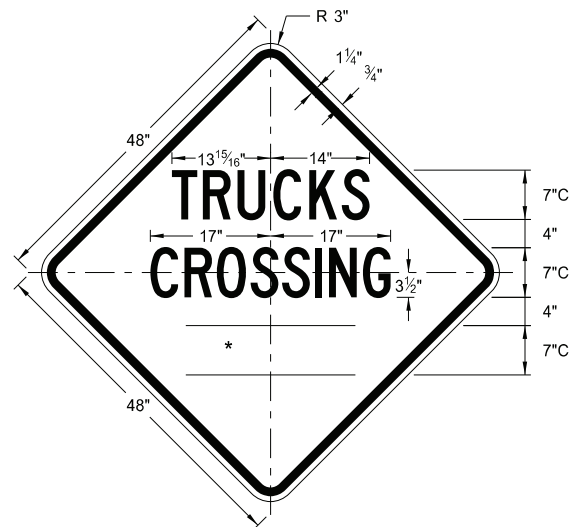


W9-3a-48

ARROW DETAILS



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



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

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

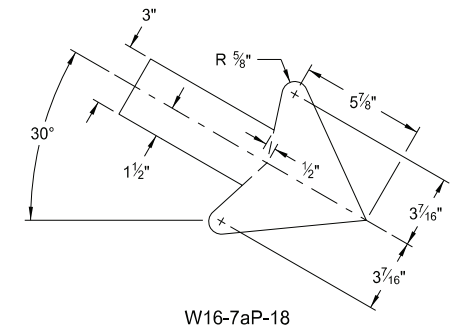


08/01/24

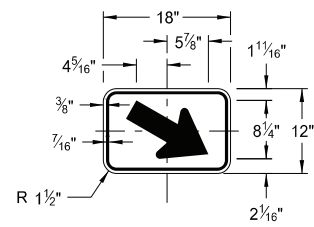
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

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

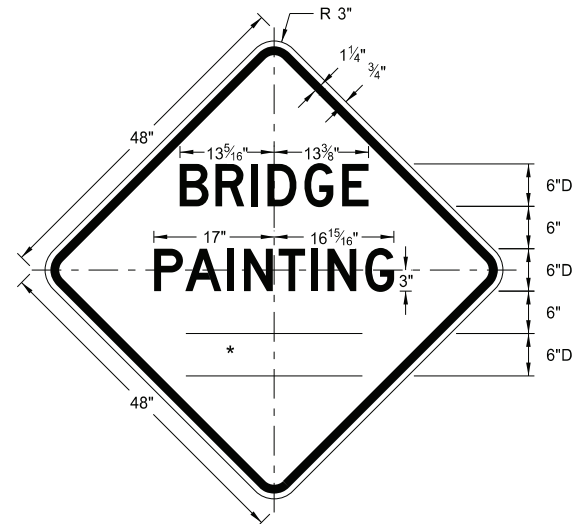


W16-7aP-18



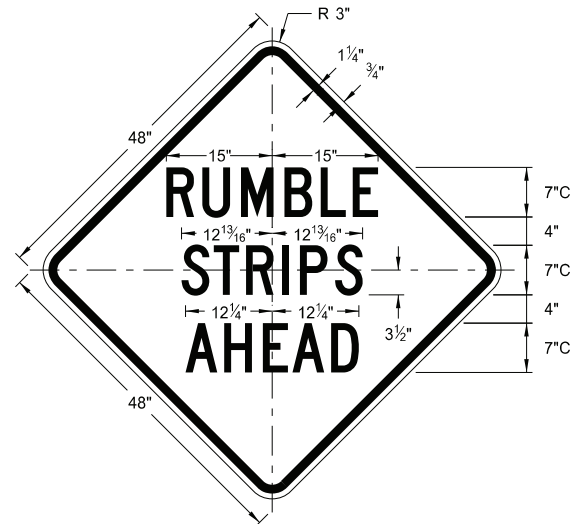
W16-7aP-18

Legend: black (non-refl)
Background: orange



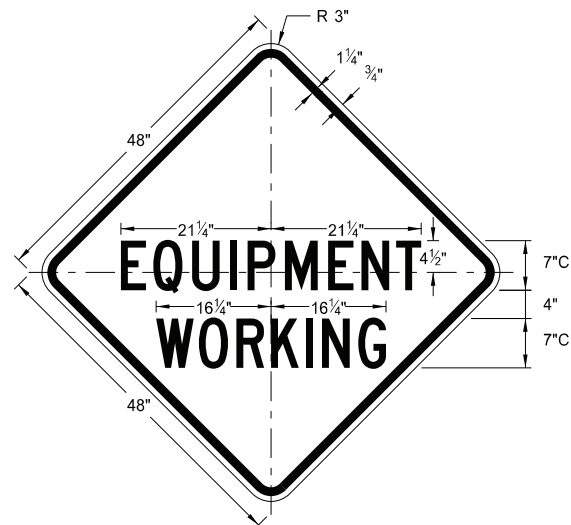
W21-50-48

Legend: black (non-refl)
Background: orange



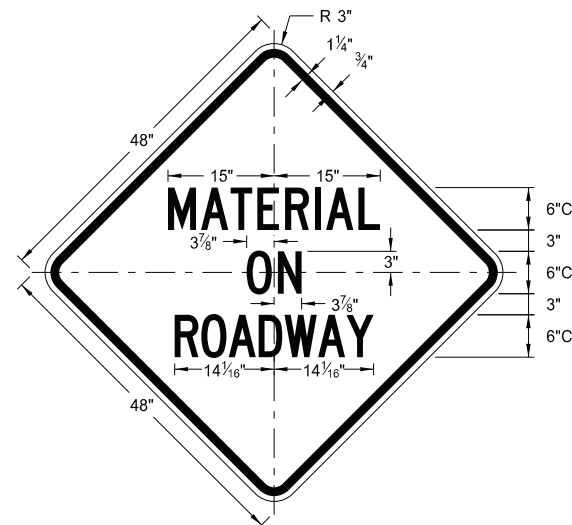
W21-53-48

Legend: black (non-refl)
Background: orange



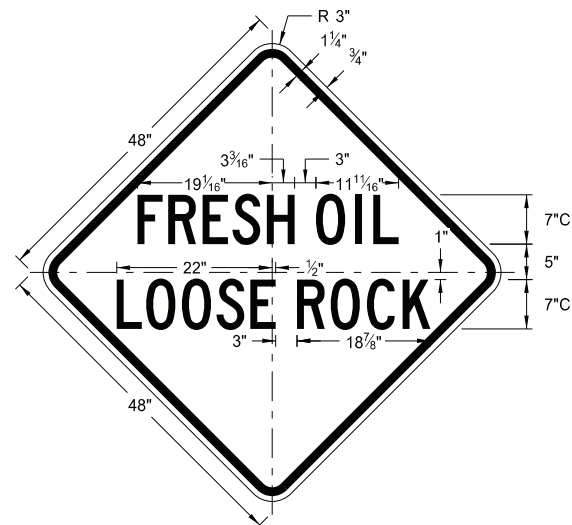
W20-51-48

Legend: black (non-refl)
Background: orange



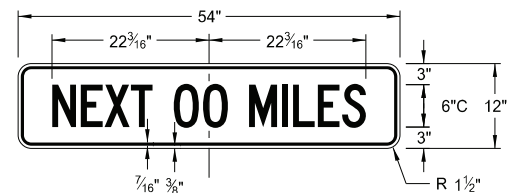
W21-51-48

Legend: black (non-refl)
Background: orange



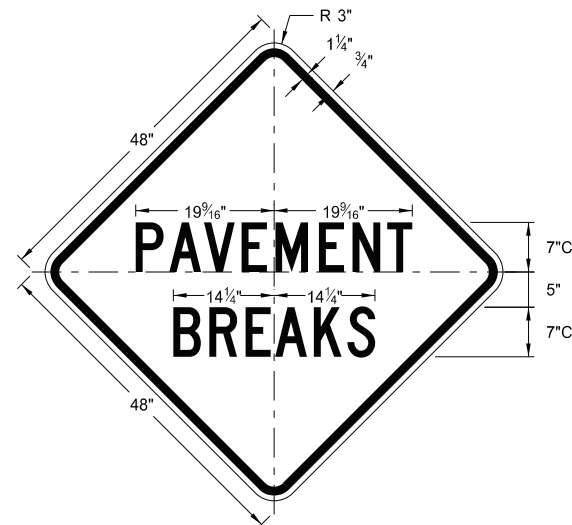
W22-8-48

Legend: black (non-refl)
Background: orange



W20-52P-54

Legend: black (non-refl)
Background: orange



W21-52-48

Legend: black (non-refl)
Background: orange

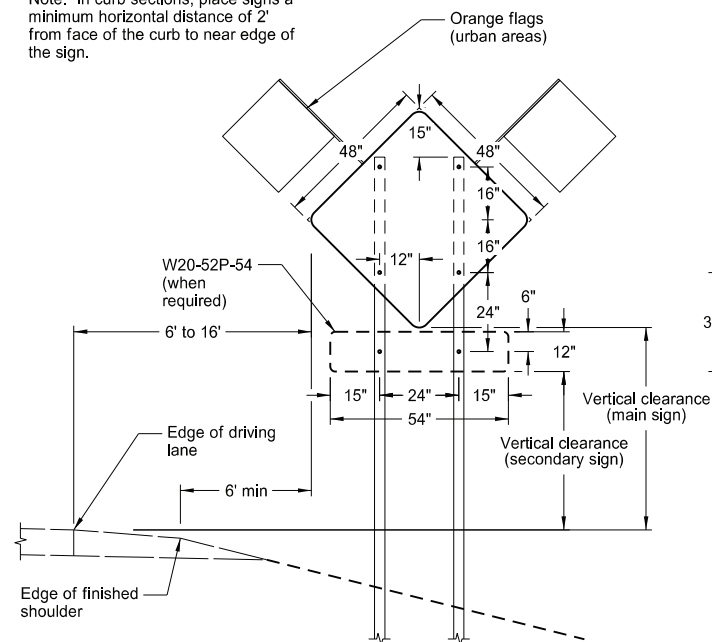
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.
8-01-24	Electronic Stamp/Signature.



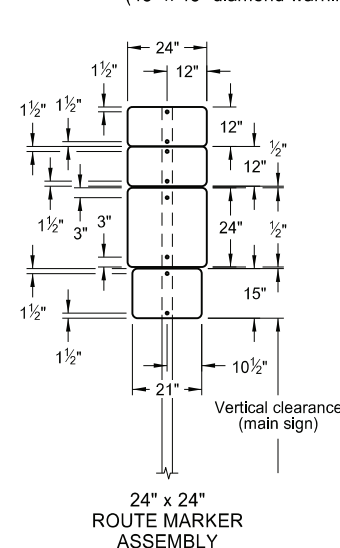
08/01/24

CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

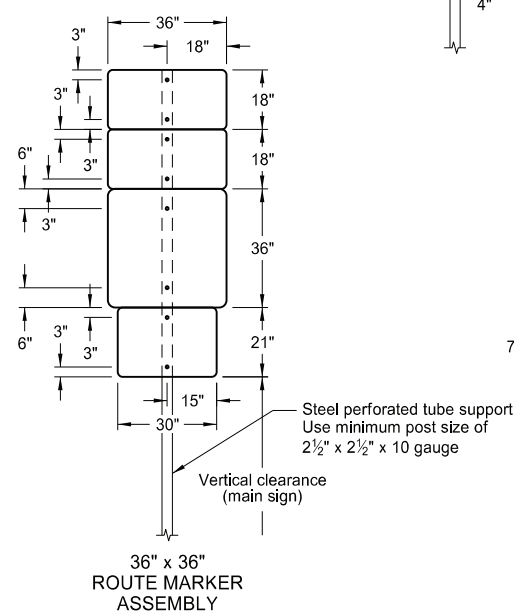
Note: In curb sections, place signs a minimum horizontal distance of 2' from face of the curb to near edge of the sign.



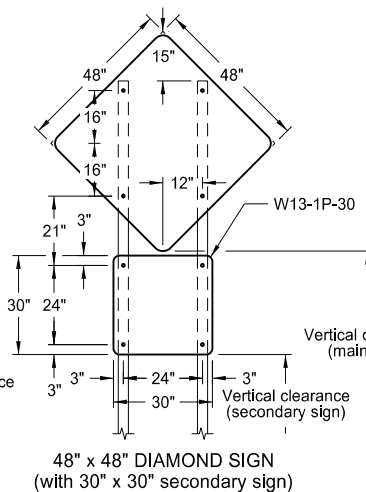
TYPICAL SECTION
(48" x 48" diamond warning sign shown)



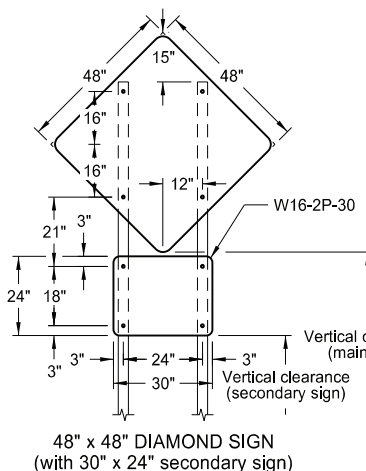
24" x 24" ROUTE MARKER ASSEMBLY



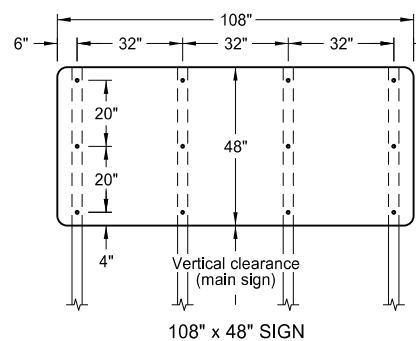
36" x 36" ROUTE MARKER ASSEMBLY



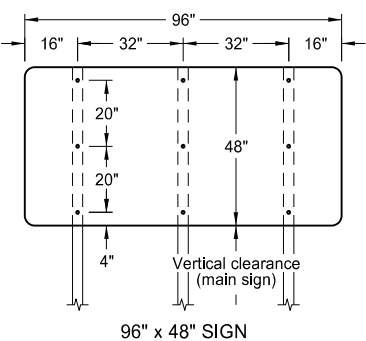
48" x 48" DIAMOND SIGN
(with 30" x 30" secondary sign)



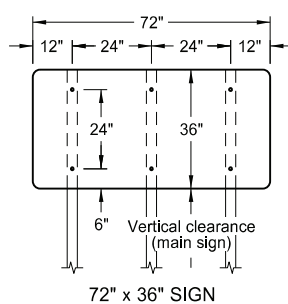
48" x 48" DIAMOND SIGN
(with 30" x 24" secondary sign)



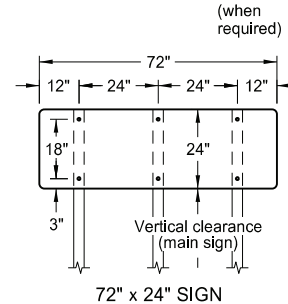
108" x 48" SIGN



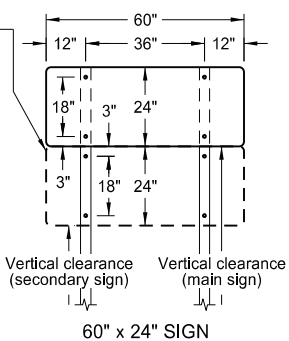
96" x 48" SIGN



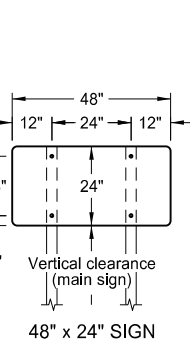
72" x 36" SIGN



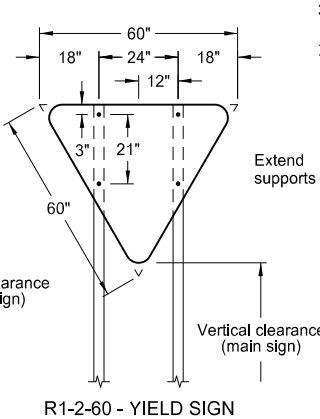
72" x 24" SIGN



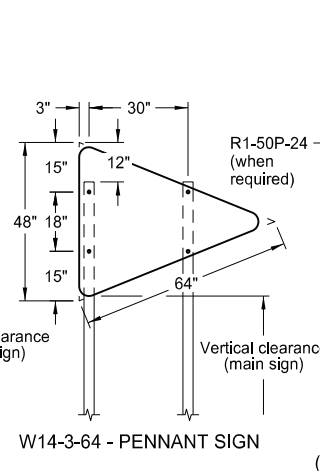
60" x 24" SIGN



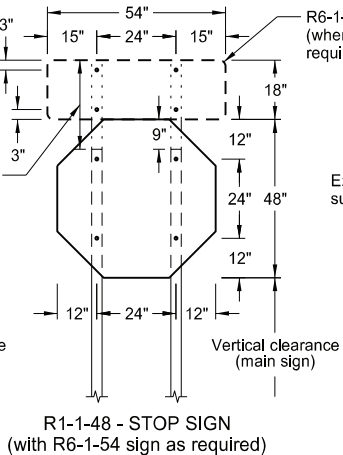
48" x 24" SIGN



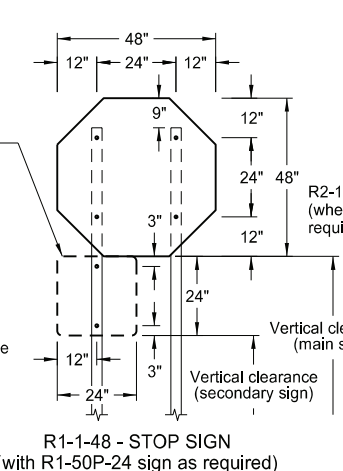
R1-2-60 - YIELD SIGN



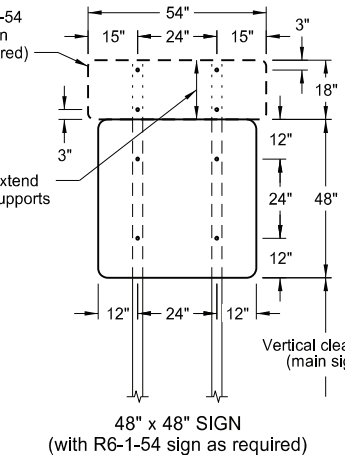
W14-3-64 - PENNANT SIGN



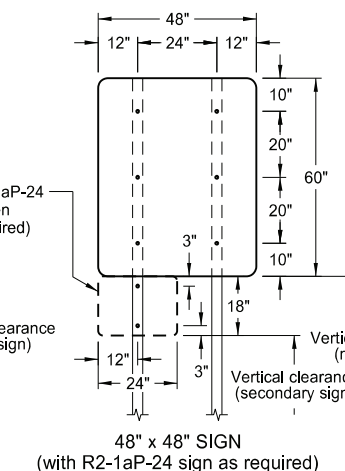
R1-1-48 - STOP SIGN
(with R6-1-54 sign as required)



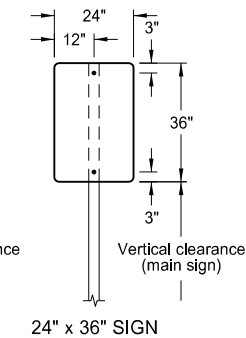
R1-1-48 - STOP SIGN
(with R1-50P-24 sign as required)



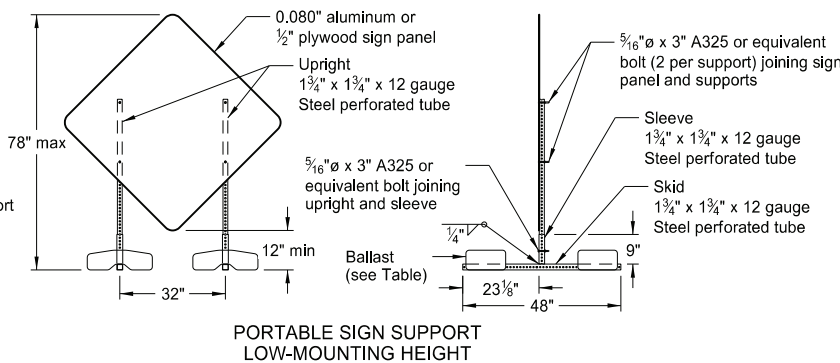
48" x 48" SIGN
(with R6-1-54 sign as required)



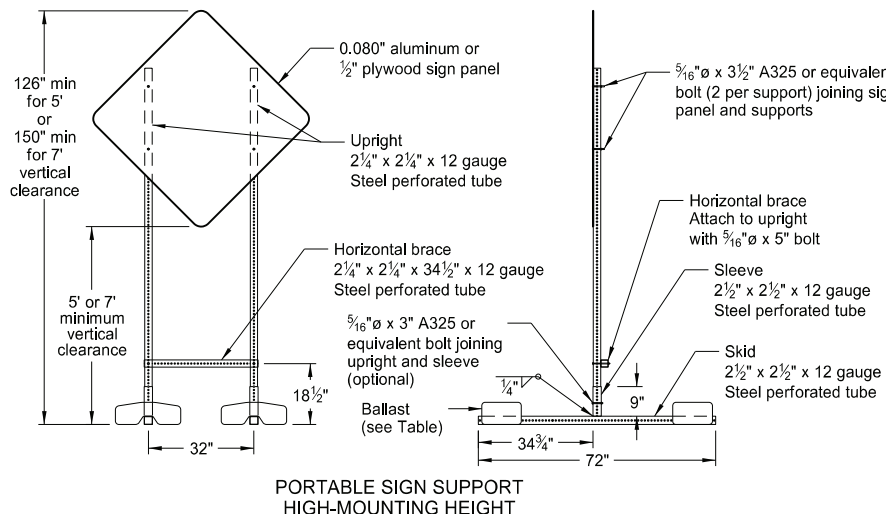
48" x 48" SIGN
(with R2-1aP-24 sign as required)



24" x 36" SIGN



PORTABLE SIGN SUPPORT
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT
HIGH-MOUNTING HEIGHT

NOTES:

- 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 2 1/2" x 2 1/2" 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.
- Sign Panels: Provide sign panels made of 0.100" aluminum, 1/2" plywood, or other approved material, except where noted. Punch all holes round for 3/8" bolts.
- 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)
- 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

- 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.

- 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 unforeseen 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

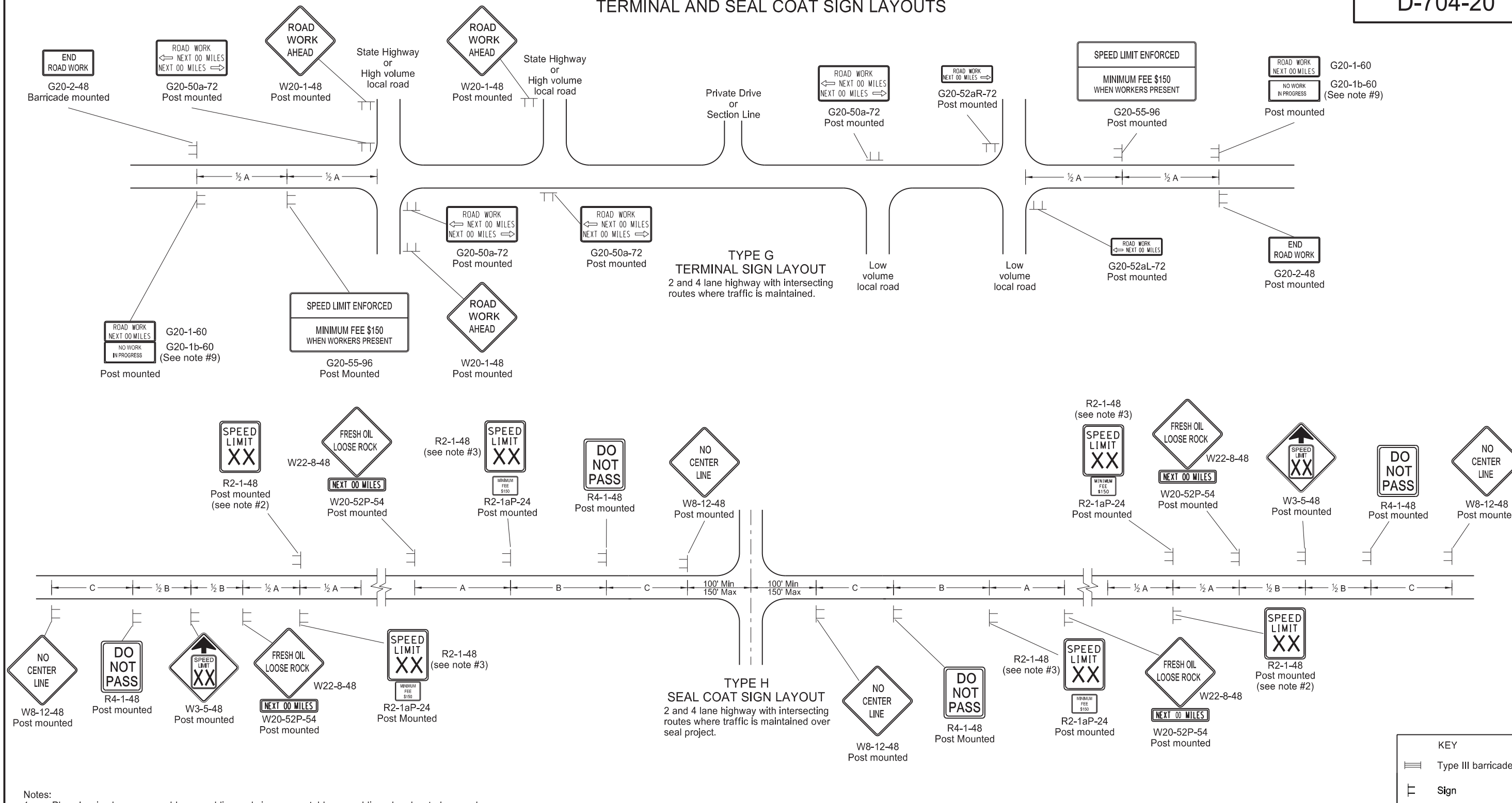
Note: The number of sandbags are based on a wind speed of 55 MPH. Place sandbags at or near the ends of sklds.

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



08/01/24

TERMINAL AND SEAL COAT SIGN LAYOUTS



- Notes:
- Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
 - Determine the exact speed limit in the field, based on location and conditions.
 - Determine the reduced speed limit based on the in place speed limit before construction. Where speed limit reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 MPH.) Place the second speed limit sign at 1/2 B.
 - 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.
 - Cover existing speed limit signs within a reduced speed zone.
 - On seal coat projects, place signs R2-1-48, R2-1aP-24, R4-1-48, W22-8-48 and W20-52P-54 after all important intersections and at five mile intervals. Place sign W8-12-48 after all important intersections and at 2 mile intervals until short term center line pavement marking is placed.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Drawing D-704-14.
 - Cover or remove speed limit signs from layout Type H when loose aggregate is removed.
 - Install sign G20-1b-60 when work is suspended for winter.
 - Use other traffic control layouts in immediate work areas. Place sign R2-1aP-24 below speed limit signs in reduced speed limit work areas.
 - 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.
 - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated notes & sign numbers
11-01-19	Updated note & sign
12-08-21	Switched order of Road Work and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes

KEY

≡ Type III barricade

⊥ Sign

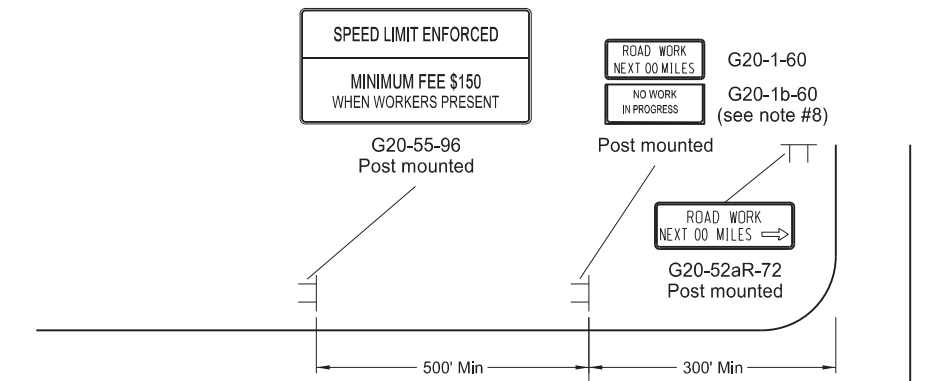
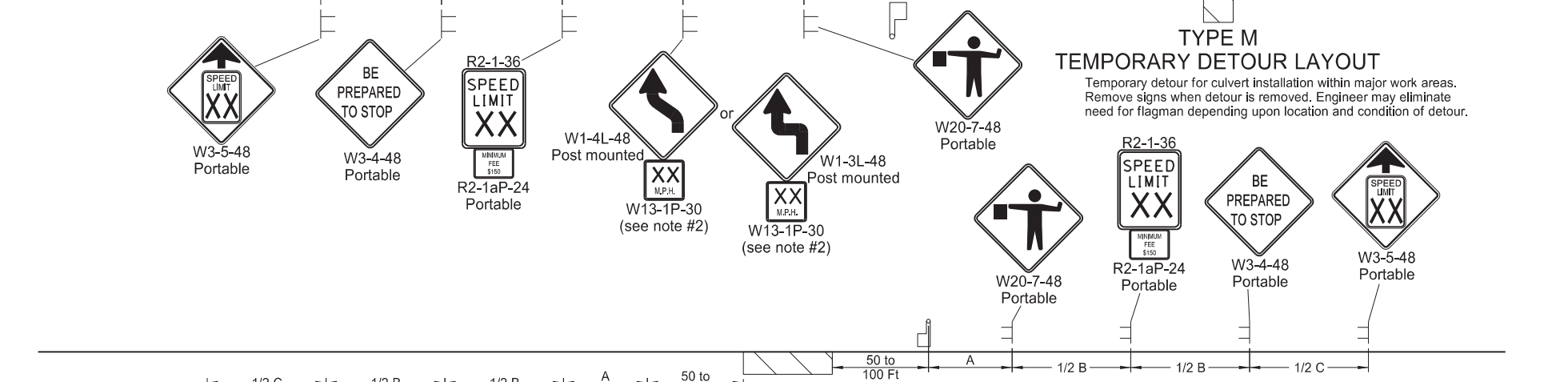
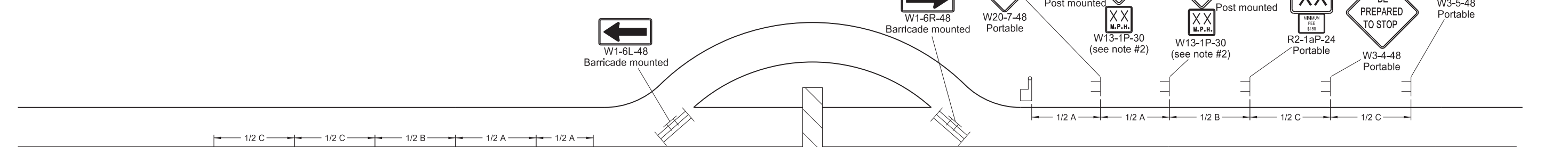
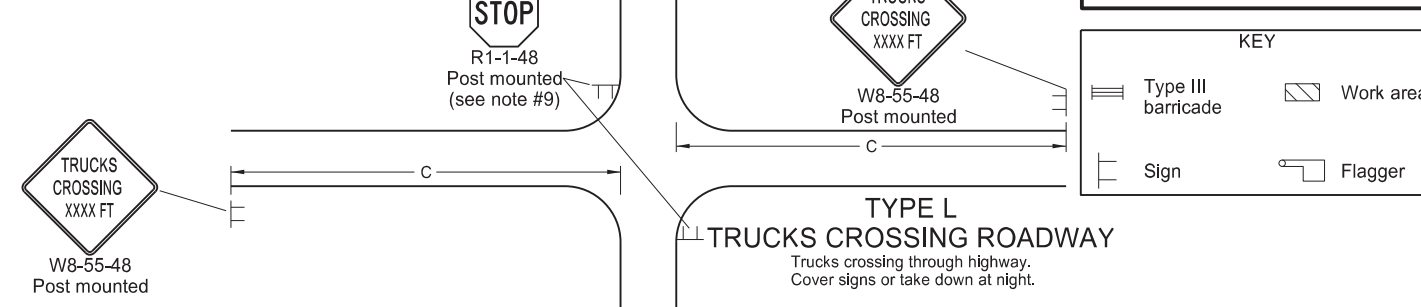
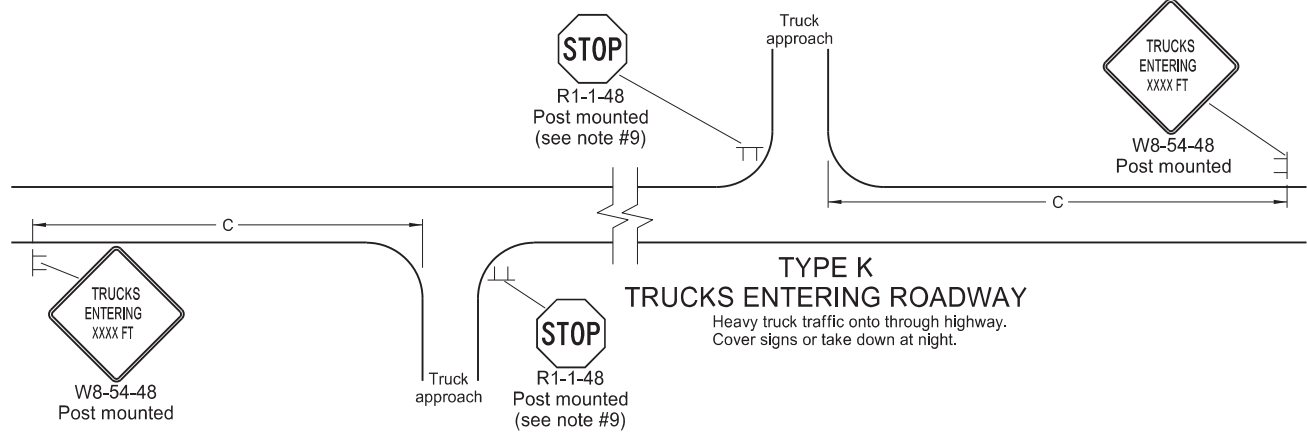


D-704-22

CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

KEY

- Type III barricade
- Sign
- Work area
- Flagger



- Notes:
- Place barricades on a moveable assemblies and signs on portable assemblies when located on roadway.
 - Where necessary, safe speed to be determined by the Engineer.
 - 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 1/2 B.
 - 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.
 - Cover existing speed limit signs within a reduced speed zone.
 - Covered (when approved by engineer) or obliterated pavement marking measured as Obliteration of Pavement Marking.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - Install sign G20-1b-60 when work is suspended for winter.
 - If existing stop sign is in place, a 48" stop sign is not required.
 - Sign G20-55-96 is not required if layout is part of other traffic control that contains this sign, or if work is less than 15 days.
 - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

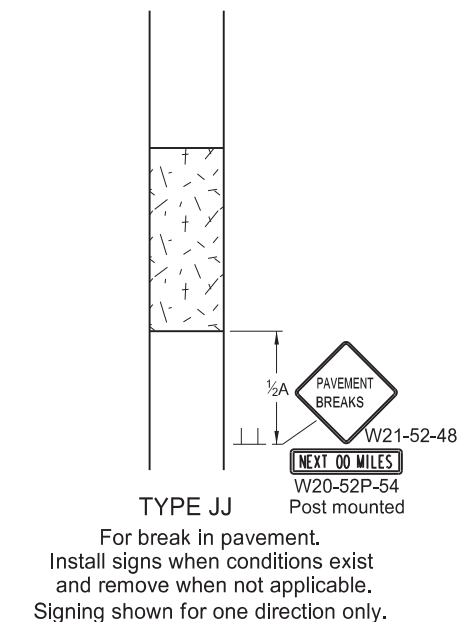
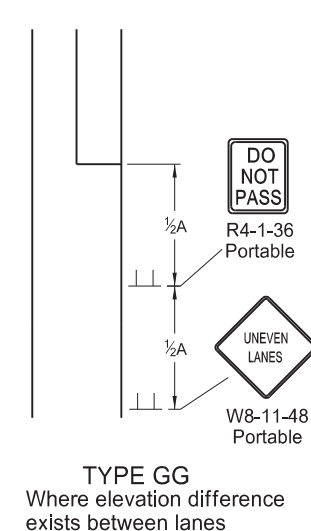
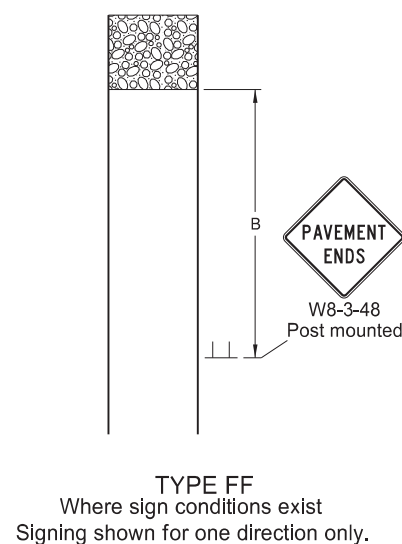
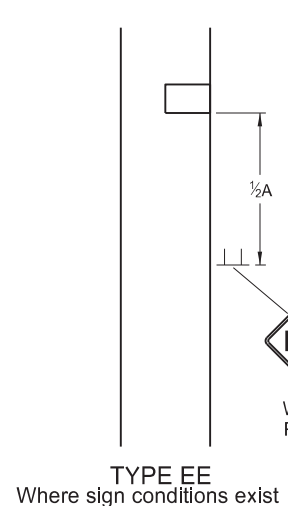
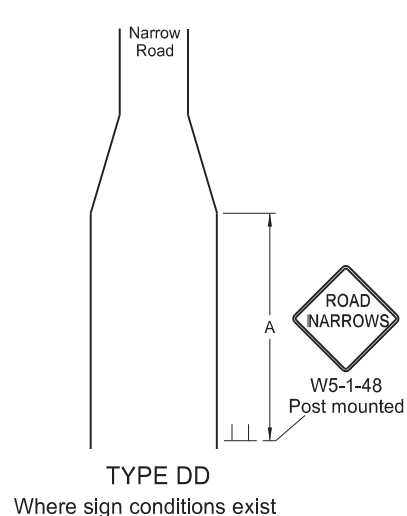
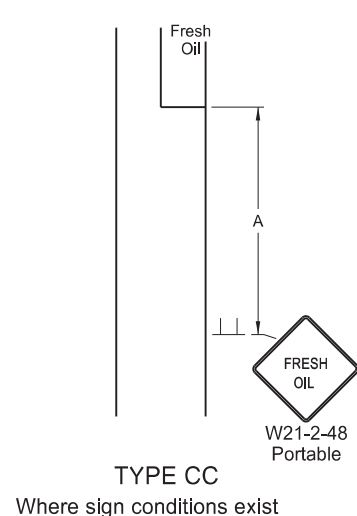
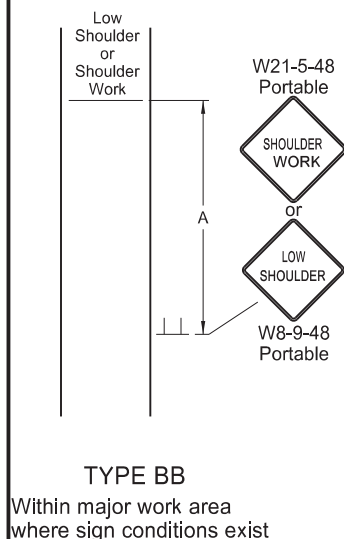
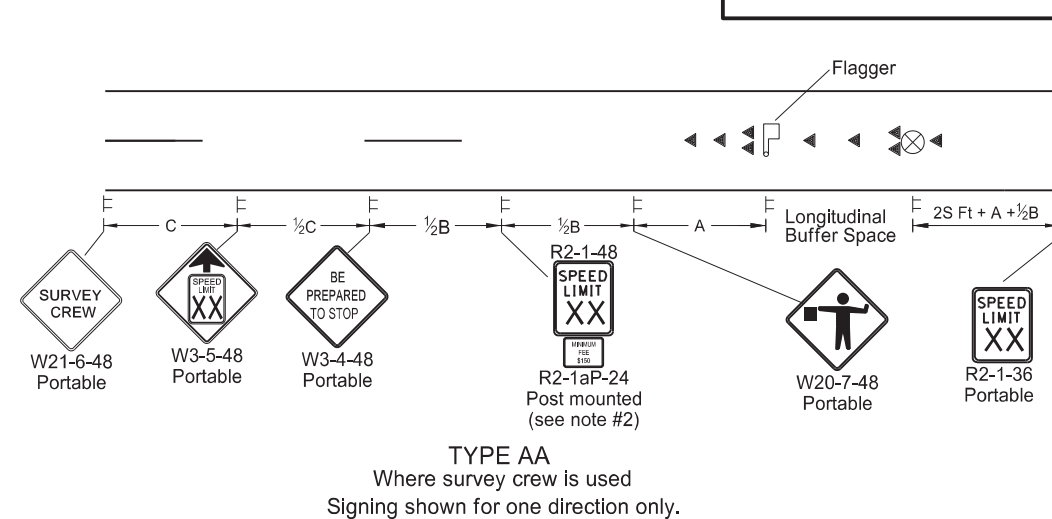
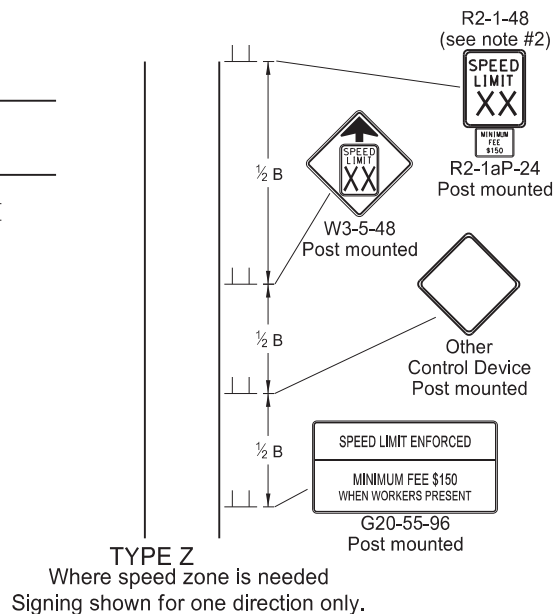
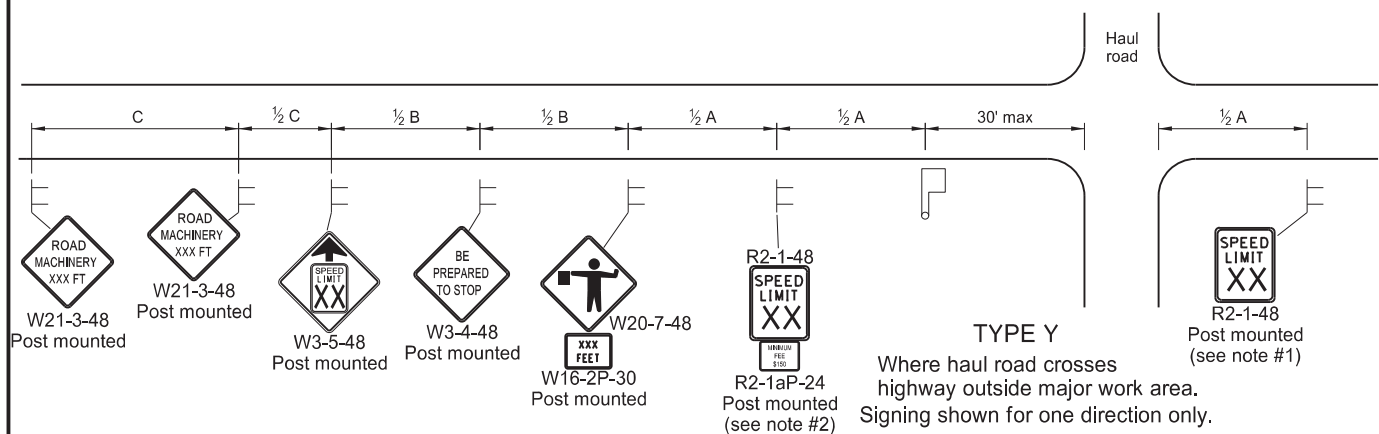
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Update notes & sign numbers
11-01-19	Revised sign numbers & note 7
12-09-21	Added Speed Limit Enforced and Dollars At Work signs
11-29-22	Removed Dollars At Work
06-30-25	Legislative Changes



MISCELLANEOUS SIGN LAYOUTS

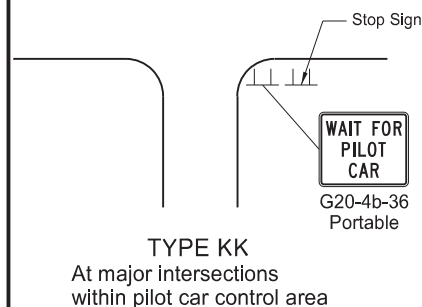
D-704-26



KEY

- Flagger
- Sign
- Cones
- Survey Equipment

S = Numerical value of speed limit or 85th percentile.



- Notes**
- Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions. Determine reduced speed limit based on in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.)
 - Place the second speed limit sign at 1/2B.
 - 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.
 - Cover existing speed limit signs within reduced speed zones.
 - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
 - Sign G20-55-96 is not required if this standard is part of other traffic control layouts, or work is less than 15 days.
 - When pilot car operation is used, place sign G20-4b-36 "Wait For Pilot Car" at major intersections within pilot car control area.
 - Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
 - Layouts shown for one direction only.

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

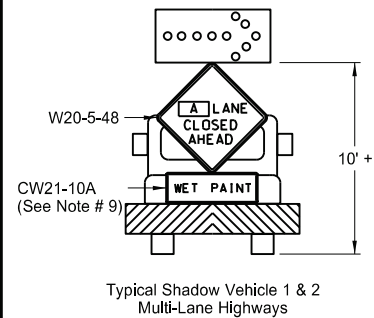
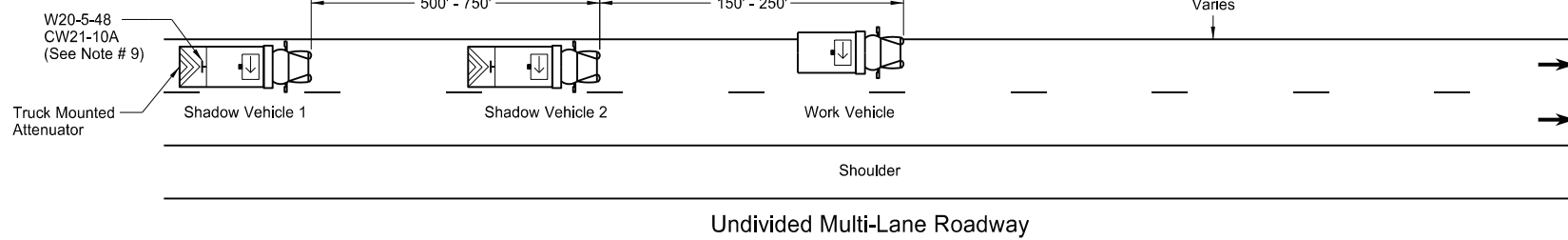
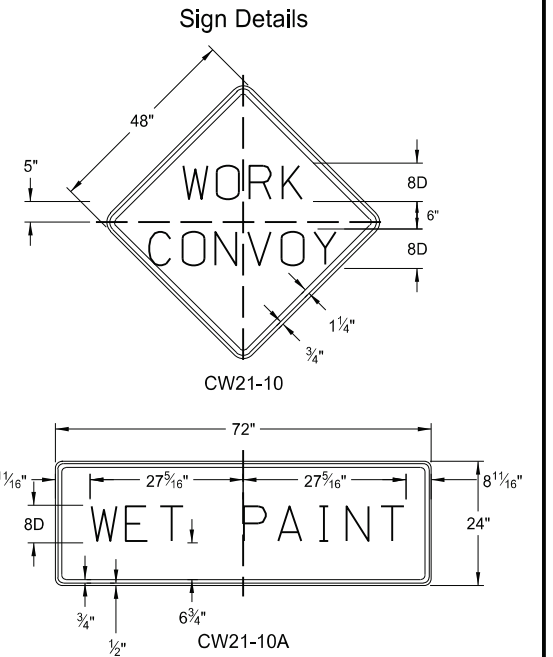
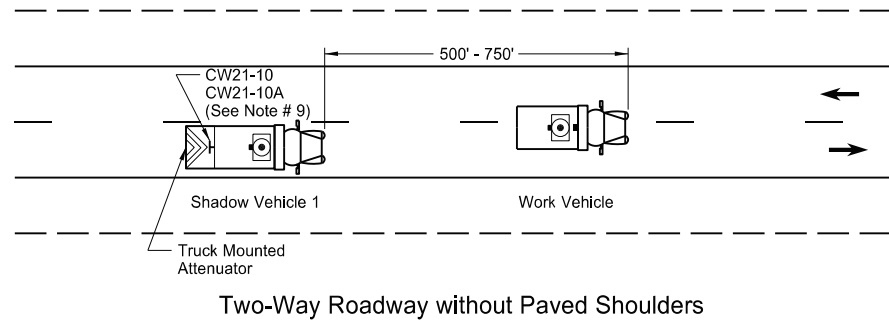
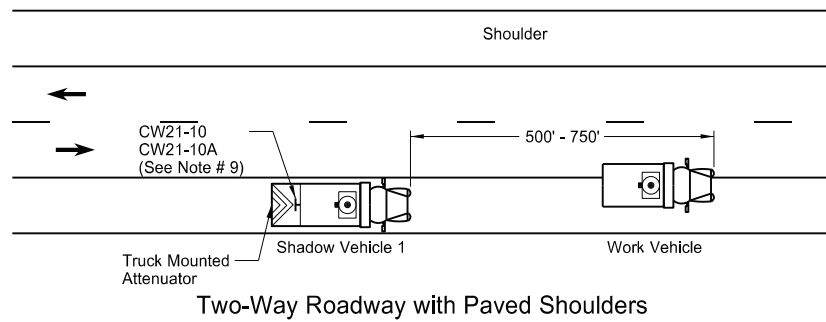
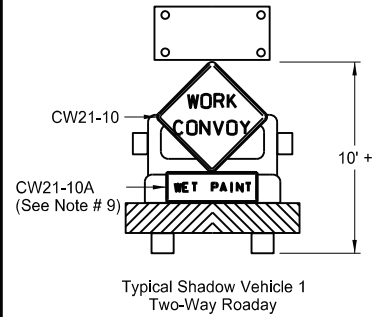
Longitudinal Buffer Space	
*Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

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

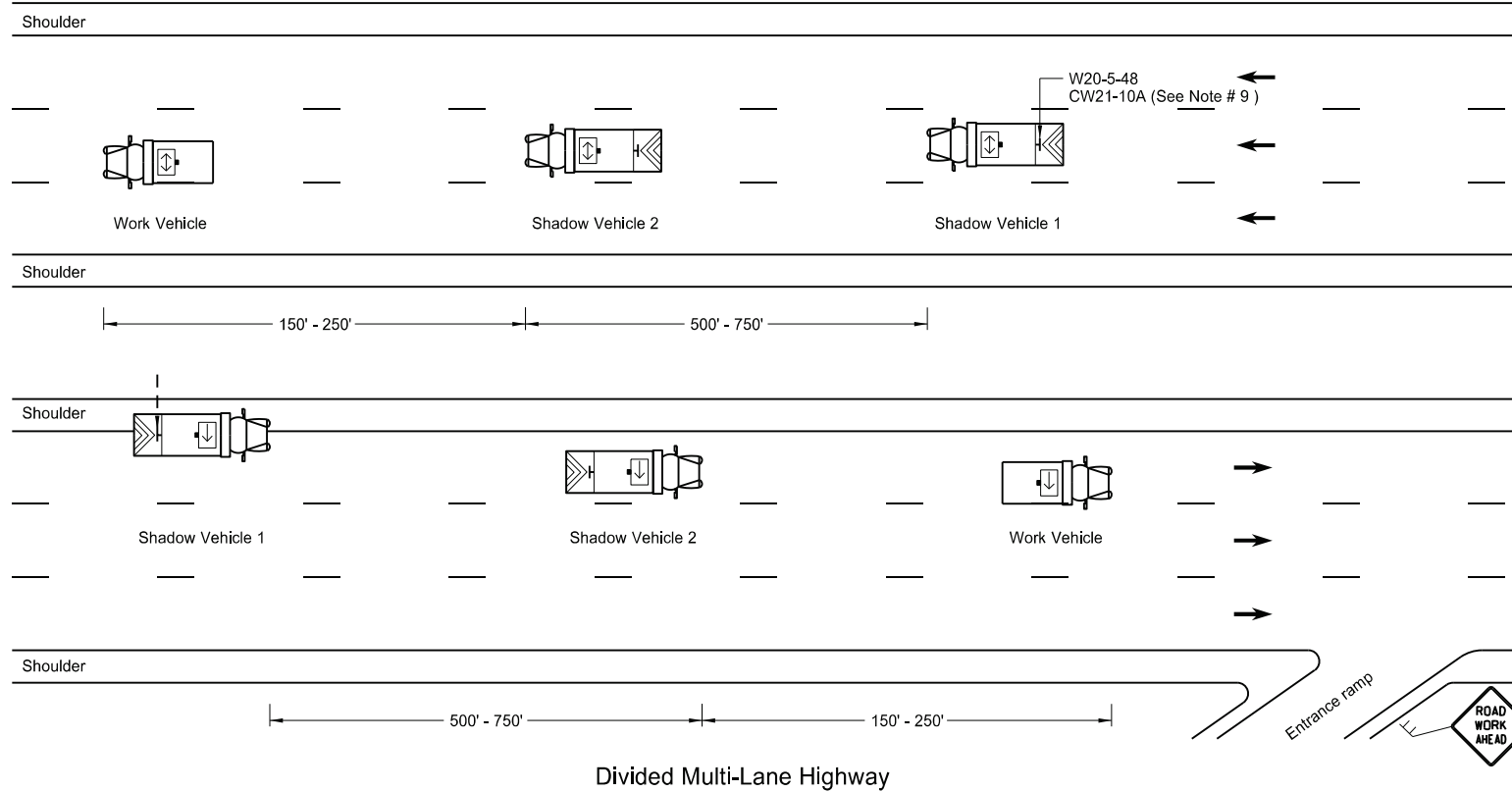
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Added speed limit signs. Updated notes & sign numbers
11-01-19	Revised note 5 & sign numbers
02-23-23	Revised distance & removed signs
06-30-25	Legislative Changes



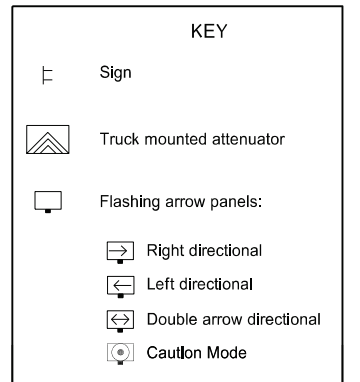
MOBILE OPERATION
(PAVEMENT MARKING)



A = Left Right Center



- Notes
- Use additional vehicles you choose to be in the convoy with truck mounted attenuators, at your own expense.
 - Display yellow rotating beacons or strobe lights on shadow and work vehicles, unless otherwise stated in the plans.
 - Use Type B or Type C flashing arrow panels controlled from inside the vehicle.
 - Provide each vehicle with two-way electronic communication capability.
 - Move shadow vehicle 1 first to shadow other convoy vehicles when convoy changes lane.
 - 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.
 - Sign Colors
Letters = Black
Border = Black
Background = Orange
 - As an option, use shadow vehicle 2 the paint tender vehicle.
 - Use sign CW21-10A only during painting operation.
 - Pull over work and shadow vehicles periodically to allow motor vehicle traffic to pass on two lane - two way roadways.



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.



08/02/24

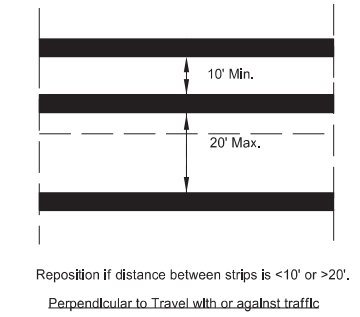
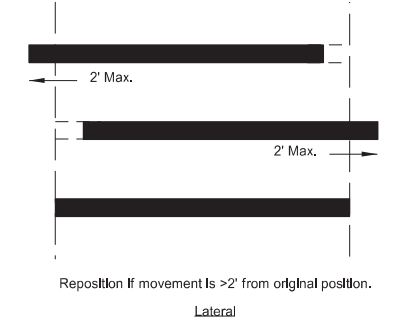
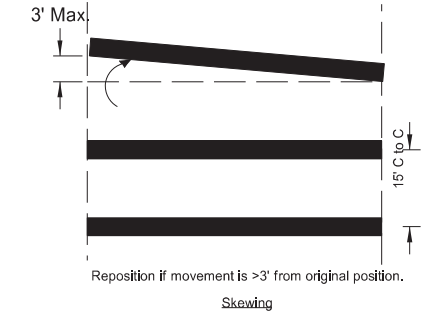
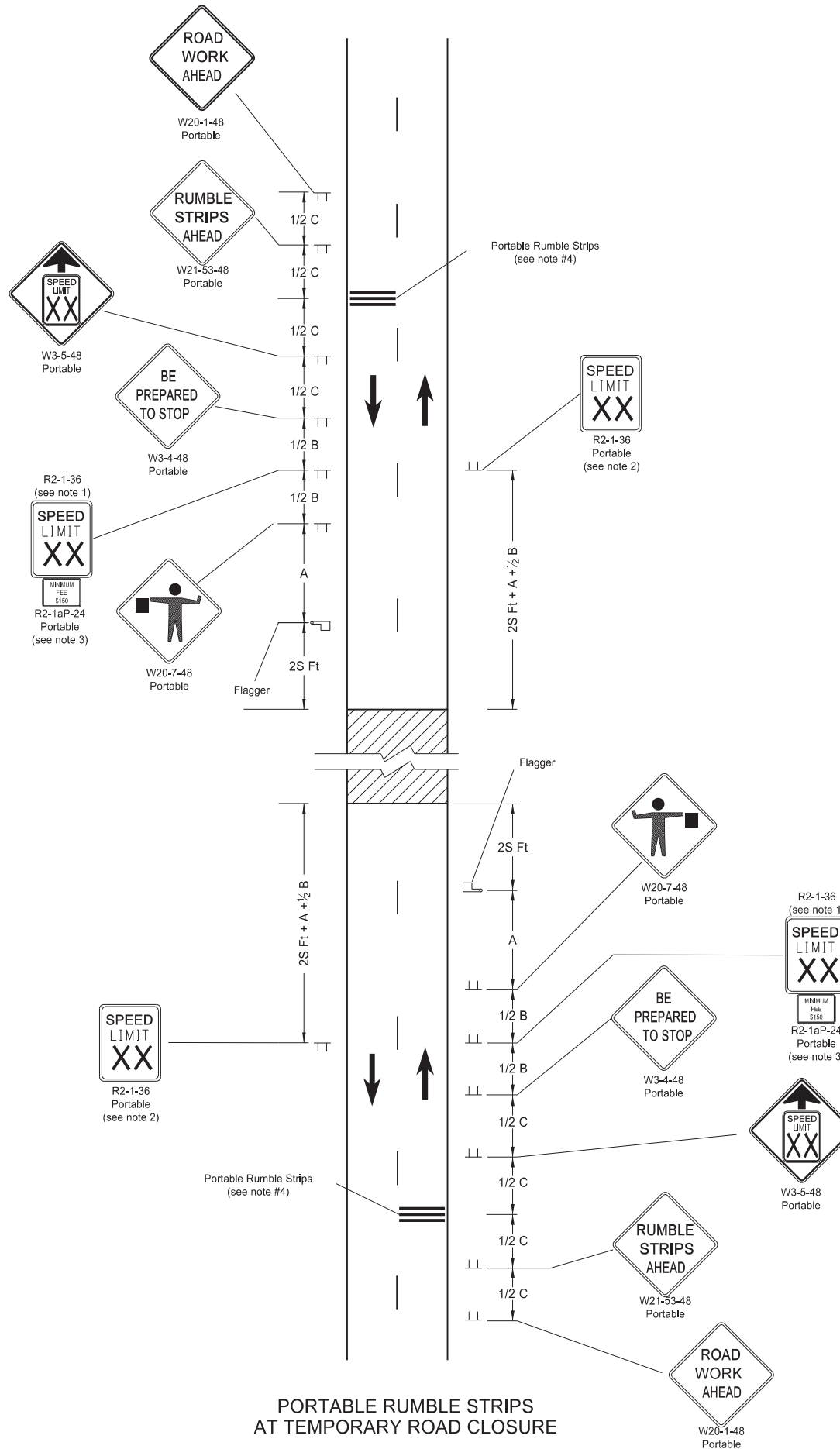
Two-Lane Roadway Portable Rumble Strips

KEY

	Work area
	Flagger
	Sign

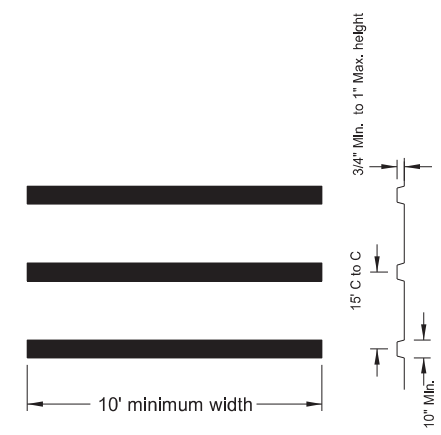
S = Numerical value of speed limit or 85th percentile.

Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - High Speed (over 45 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720



PORTABLE RUMBLE STRIPS ARRAY TYPES OF MOVEMENT AND MAXIMUM ALLOWANCES

- Notes:
- Determine speed in the field based on location and conditions.
 - Re-establish the speed limit. Determine the exact speed limit in the field, dependent on location and conditions.
 - Sign R2-1aP-24 is not required when pilot car operation is used.
 - Do not use rumble strips on a non paved surface or in a pre-construction speed zone of 45 mph or less.



PORTABLE RUMBLE STRIPS ARRAY DETAIL

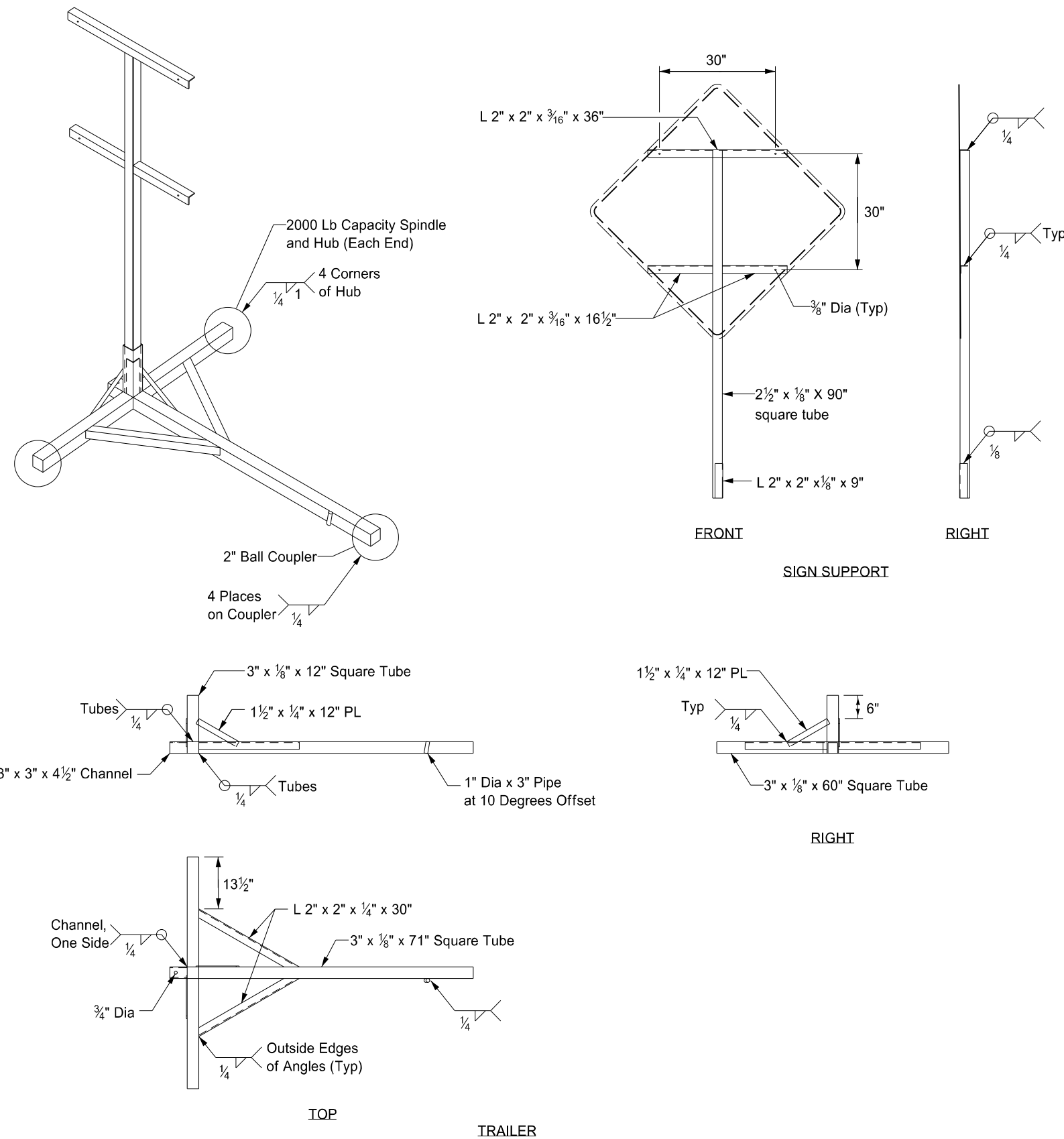
PORTABLE RUMBLE STRIPS AT TEMPORARY ROAD CLOSURE

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
02-22-22	
REVISIONS	
DATE	CHANGE
03-07-23	Use changed to min 45 mph
06-30-25	Legislative Changes



PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



Notes:

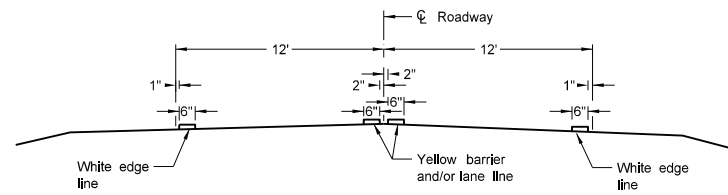
- ①. Maximum 250 pound weight of assembly.
- ②. Use a 14" wheel and tire.
- ③. Use no automotive and equipment axle assemblies for trailer-mounted sign supports.
- ④. Other NCHRP 350 or MASH crash tested assemblies are acceptable.

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

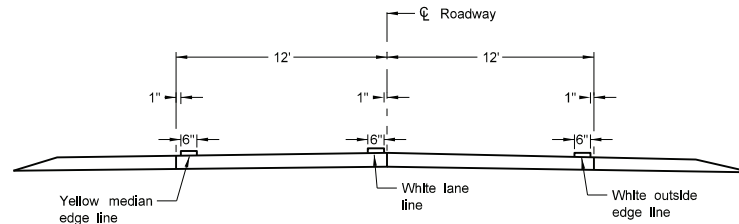
KIRK J. HOFF
 REGISTERED
 PROFESSIONAL
 PE-4683
 ENGINEER
 NORTH DAKOTA
 12 02 2020

PAVEMENT MARKING

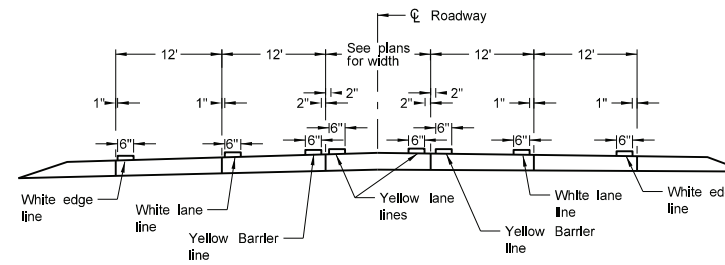
D-762-4



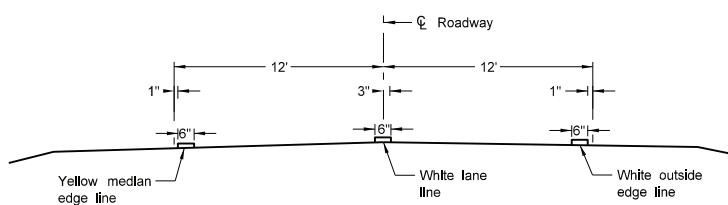
Two Lane Two Way
RURAL ROADWAY



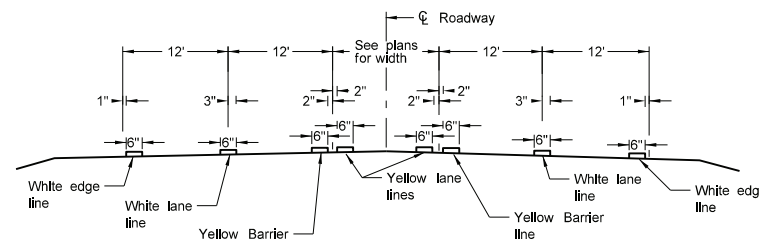
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



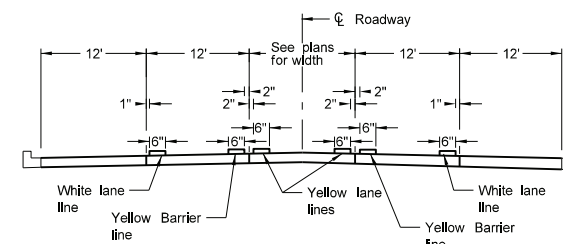
RURAL FIVE LANE ROADWAY
Concrete Section



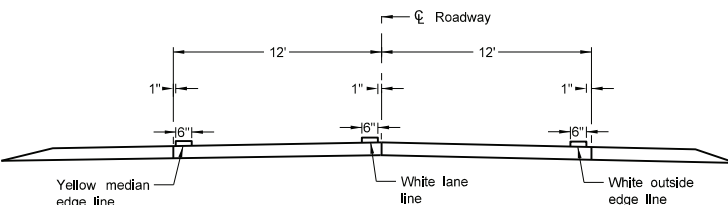
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



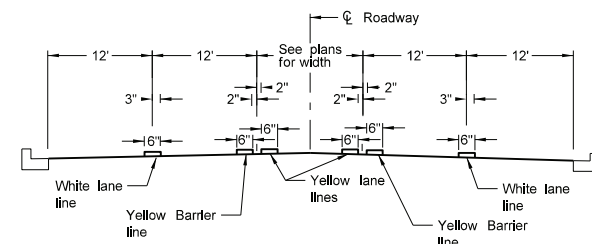
RURAL FIVE LANE ROADWAY
Asphalt Section



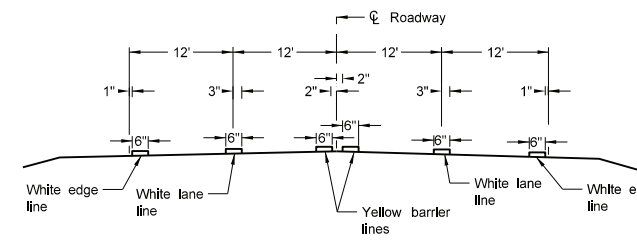
URBAN FIVE LANE SECTION
Concrete Section



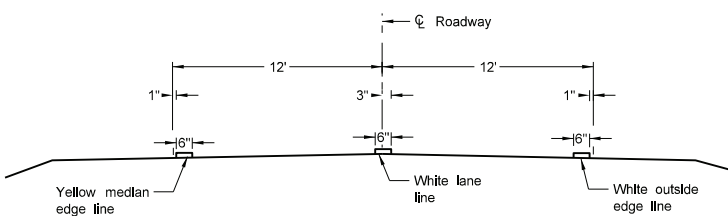
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Concrete Section



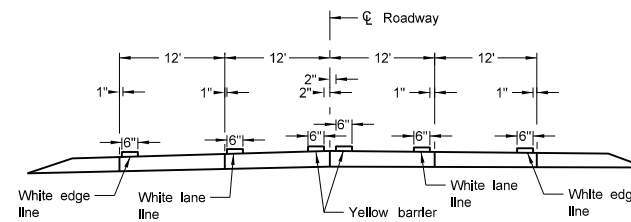
URBAN FIVE LANE SECTION
Asphalt Section



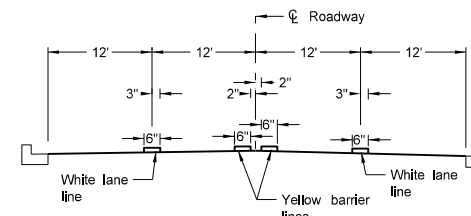
RURAL FOUR LANE ROADWAY
Asphalt Section



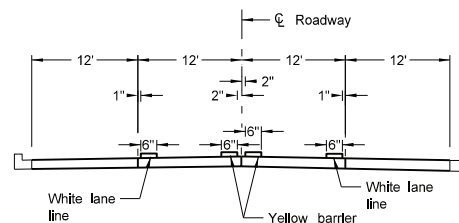
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



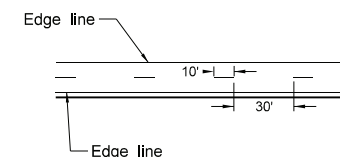
RURAL FOUR LANE ROADWAY
Concrete Section



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.

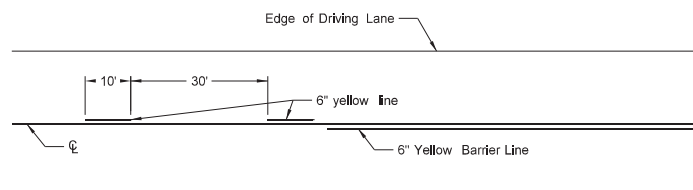
For section lines, county roads, and street approaches, stripe the radii and edge lines of the paved surface within the right of way except where curb and gutter is present.
2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 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.

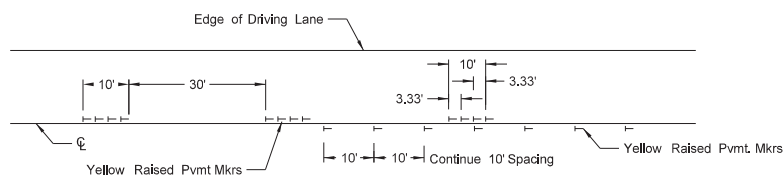


SHORT-TERM PAVEMENT MARKING

D-762-11

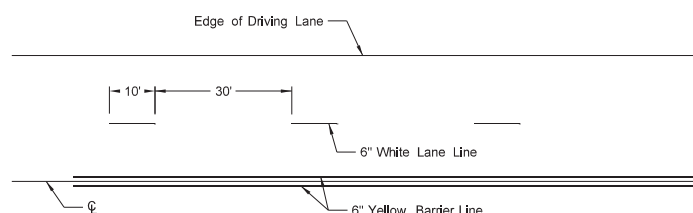


Painted or Tape Lines

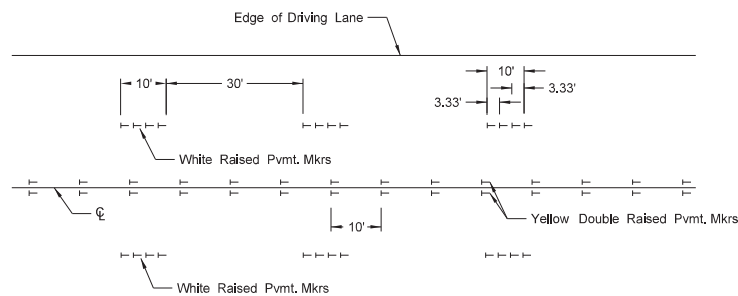


Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

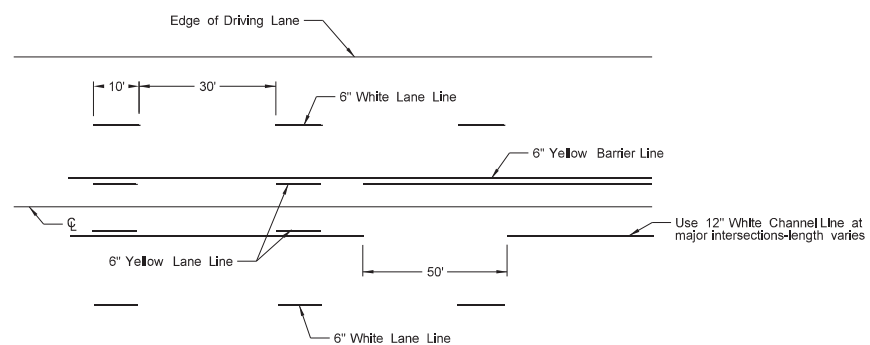


Painted or Tape Lines

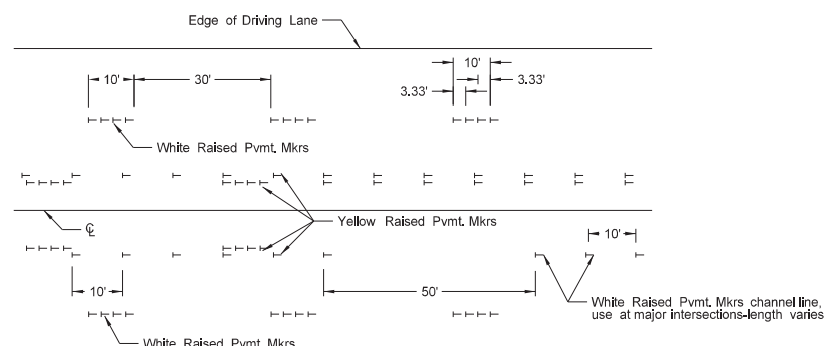


Raised Pavement Markers

FOUR LANE ROADWAY

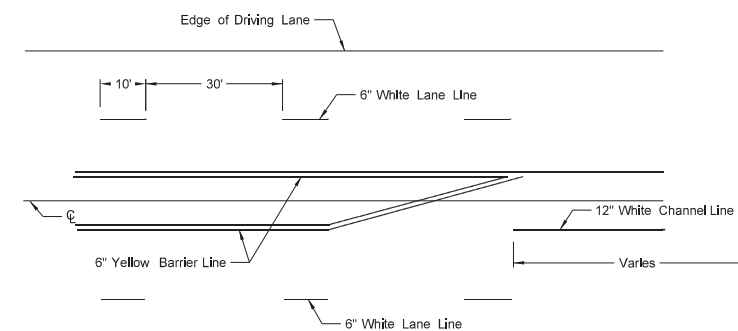


Painted or Tape Lines

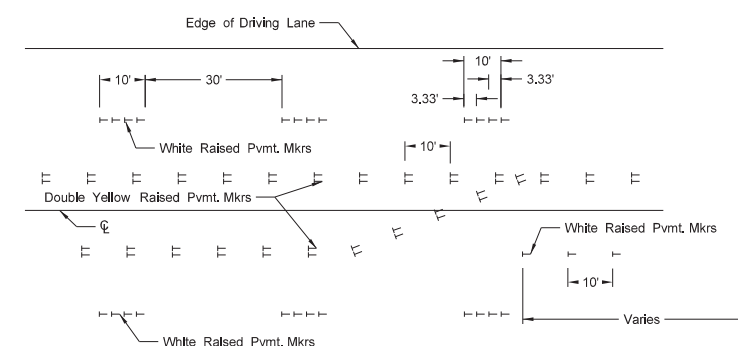


Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTES:

1. Place no passing zones on two-lane two-way roadways as shown. In lieu of short term no passing zone pavement markings, place no passing zone signs. Replace no passing zone signs with short term no passing zone pavement marking within three days.
2. Place short term center line stripe (paint) on top lift to match exact placement of permanent stripe.
3. Remove raised markers and tape markings after permanent pavement marking is installed.
4. Normal width line - 6 inches wide for freeways, expressways, and ramps;
6 inches for all other roadways with speed limits > 40 mph.
5. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.
6. Wide lines - 8 inches wide if 4 inch normal width lines are used and
12 inches wide if 6 inch normal width lines are used.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE
3-29-16	Re-numbered to be D-762-11 (previously was D-762-6)
10-17-17	Updated to active voice.
8-27-19	New Desgn Engineer PE Stamp.
11-22-23	Revised pavement marking widths
1-17-24	Revised wide pvmt marking width.

