

DESIGN DATA				
Traffic	Average Daily			
Current 2024	Pass: 3,805	Trucks: 421	Total: 4,226	
Preventive Maintenance				

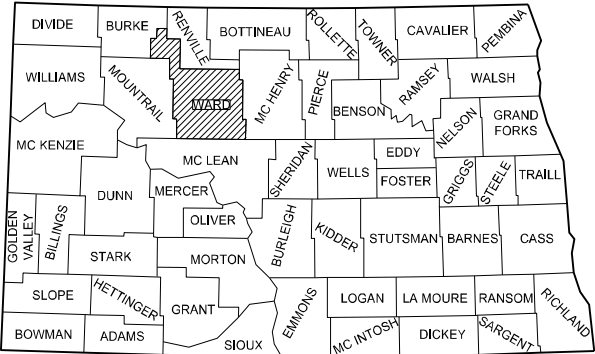
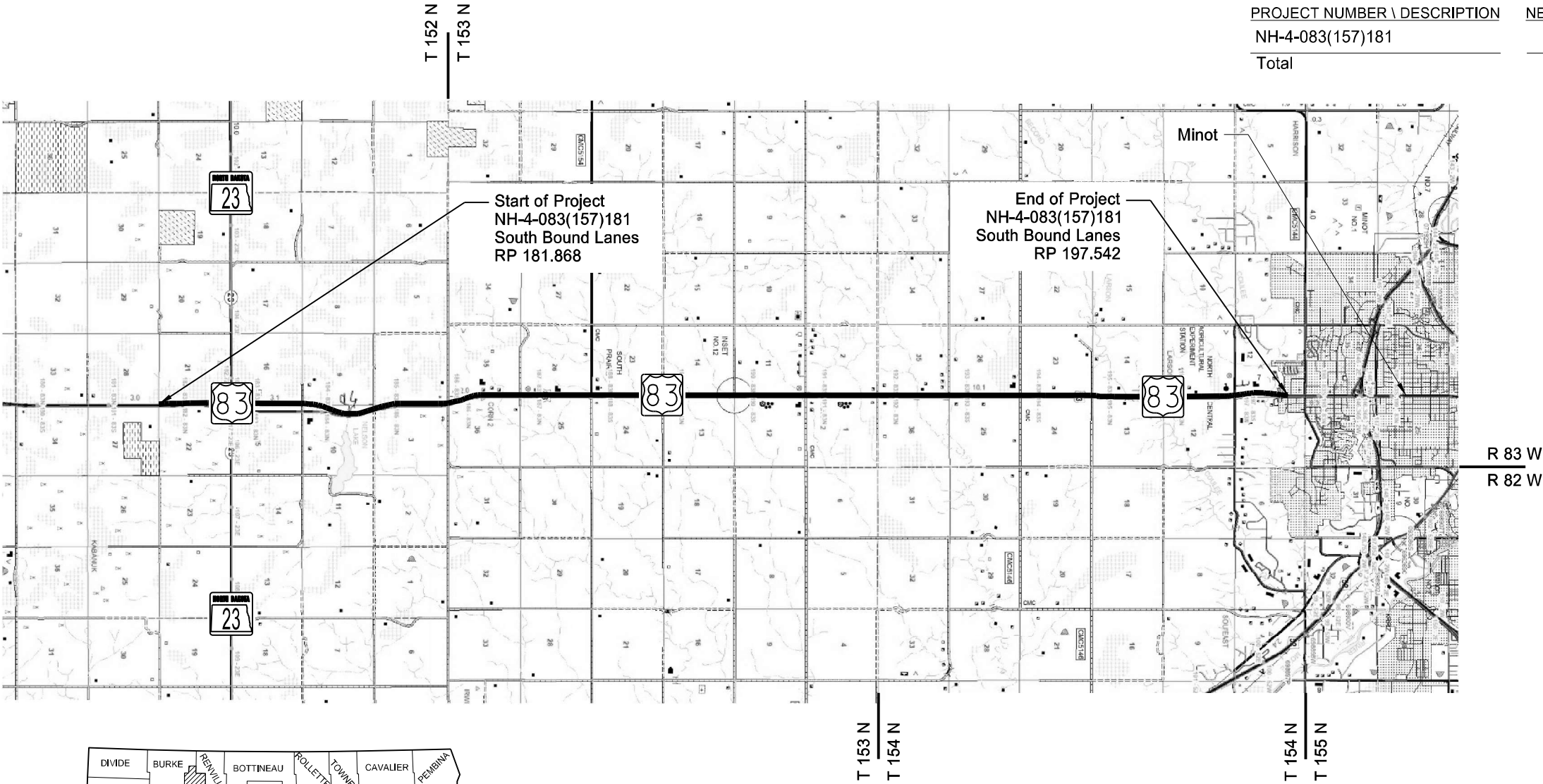
NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

NH-4-083(157)181
Ward County
US 83 SB - S of JCT 23 N to Urban Limit
2" Mill & Overlay

	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	24102	1	1

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
NH-4-083(157)181		15.674
Total	15.674	15.674



STATE COUNTY MAP

DESIGNER Justin Peterson
DESIGNER
DESIGNER

ND DEPARTMENT OF TRANSPORTATION MINOT DISTRICT ENGINEER	12/19/25
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NDDOT MINOT DISTRICT

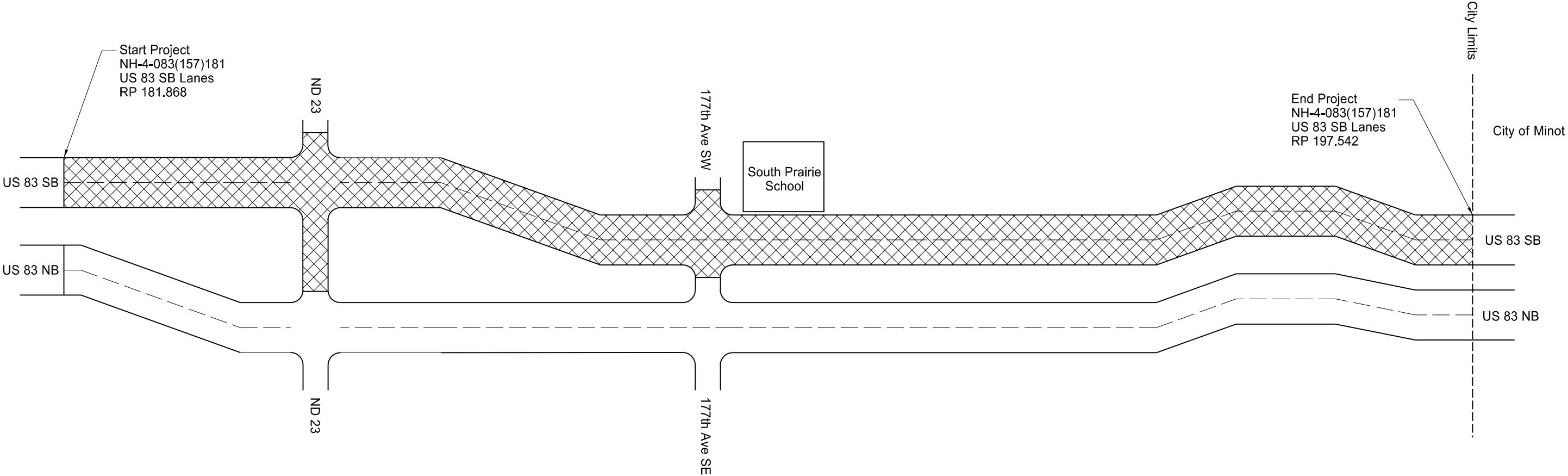
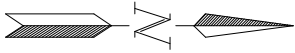
CHAD E. BEGGS
REGISTERED
PROFESSIONAL
ENGINEER
NORTH DAKOTA

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Legend

 2" Mill & Overlay



Scope of Work

US Highway 83
South Bound Lanes

Ward County, ND



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NOTES

- 230-P01

SHOULDER PREPERATION: Remove paragraphs 2 & 3 from the Standard Specification, 230.04 B "Shoulder Preparation"
- 411-P01

MILLING PAVEMENT SURFACE: Delamination areas appearing in the existing surface after completion of the proposed asphalt milling operations are required to be removed as directed by the Project Engineer. Payment for the additional removal will be paid for at the unit price bid for "Milling Pavement Surface".
- 411-P02

EXCESS MILLINGS: Stockpile all excess millings at Minot District DOT Yard located at:
1305 Highway 2 Bypass East
Minot, ND 58701
- 430-143

RAP – SUPERPAVE FAA 45: Incorporate RAP into the mix at a minimum rate of 10 percent.
- 430-P01

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

Place a longitudinal joint at the centerline of the roadway.

Construct each lane and the adjoining shoulder using a single pass or a hot seam.

A hot seam is defined as follows:
 - Constructed using two pavers simultaneously;
 - No more than 300 feet between pavers; and
 - Roll the seam between paver passes in a manner such that the seam is not visible.
- 430-P02

CONTRACTOR CORING: Before placing bituminous material into core holes, apply a tack coat on all sides of the core holes in accordance with Section 401.
- 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 HMA OVERLAYS: Provide traffic control consisting of a temporary lane closure and flagging.

The maximum work zone length is limited to one day's production.

One day's production is defined as the length of roadway that can be paved in a single day plus the length of roadway that can be milled in a single day.

For estimating purposes, the traffic control device list is based on a 6 mile work zone and the following list:
 - Standard D-704-20, Type G. Signing will be required at the junctions:
 - US 83 & 54th Ave SW
 - US 83 & Ward Co. 20
 - US 83 & 247th Ave SW/ND 23
 - Standard D-704-22, Types K and L;
 - Standard D-704-26, Type CC, EE, and GG;
 - Standard D-704-34 – quantities include 114 delineator drums for approaches; and
 - Standard D-704-34A.If all or portions of the lane closure are removed and uneven lanes exist, provide traffic control as specified in Section 704.04 O, "Traffic Control for Uneven Pavement".

Complete work in a manner such that lane closures can safely be removed if no work is to take place for more than 3 consecutive days. Remove lane closures if no work is to take place for more than 3 consecutive days.

The Department will pay for all necessary deployed devices, regardless of the number and length of the lane closures.
- 762-050

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



ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	NH-4-083(157)181	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
----	----	-----	----	-----	-----
103	0100	CONTRACT BOND	L SUM	1	1
109	1000	E-TICKETING	L SUM	1	1
230	0125	SHOULDER PREPARATION	MILE	31.348	31.348
302	0356	AGGREGATE SURFACE COURSE CL 13	TON	80	80
401	0050	TACK COAT	GAL	37,977	37,977
411	0100	MILLING PAVEMENT SURFACE	TON	41,189	41,189
430	0145	RAP - SUPERPAVE FAA 45	TON	39,583	39,583
430	1000	CORED SAMPLE	EA	264	264
430	5818	PG 58H-34 ASPHALT CEMENT	TON	1,781	1,781
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	316	316
704	1000	TRAFFIC CONTROL SIGNS	UNIT	4,218	4,218
704	1048	PORTABLE RUMBLE STRIPS	EA	6	6
704	1052	TYPE III BARRICADE	EA	6	6
704	1060	DELINEATOR DRUMS	EA	228	228
704	1067	TUBULAR MARKERS	EA	795	795
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	2	2
706	0550	BITUMINOUS LABORATORY	EA	1	1
706	0600	CONTRACTOR'S LABORATORY	EA	1	1
760	0010	RUMBLE STRIPS - INTERSECTION	SET	2	2
760	0025	SINUSOIDAL RUMBLE STRIP - ASPHALT SHOULDER	MILE	29.868	29.868
762	0103	PVMT MK PAINTED-MESSAGE	SF	1,466	1,466
762	0432	SHORT TERM 6IN LINE-TYPE NR	LF	66,029	66,029
762	1106	PVMT MK PAINTED 6IN LINE	LF	202,976	202,976
762	1108	PVMT MK PAINTED 8IN LINE	LF	671	671
762	1112	PVMT MK PAINTED 12IN LINE	LF	9,335	9,335
762	1124	PVMT MK PAINTED 24IN LINE	LF	60	60

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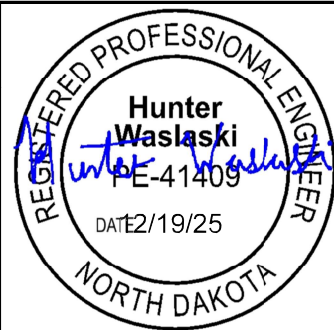
BASIS OF ESTIMATE

Mainline Table 1

		<u>Typical Section 1 - US 83</u> (1.631 Miles)			<u>Typical Section 3 - US 83</u> (0.030 Miles)			<u>Typical Section 5 - US 83</u> (0.075 Miles)			<u>Typical Section 7 - US 83</u> (0.153 Miles)			<u>Typical Section 9 - US 83</u> (11.178 Miles)			<u>Mainline Table 1</u> <u>Summary</u>	
		RP 195.376 to RP 195.807 RP 196.006 to RP 196.656 RP 196.761 to RP 196.801 RP 196.890 to RP 196.974 RP 197.050 to RP 197.375 RP 197.441 to RP 197.542			RP 197.375 to RP 197.405			RP 196.656 to RP 196.731			RP 195.897 to RP 195.951 RP 196.801 to RP 196.855 RP 196.974 to RP 197.019			RP 183.000 to RP 184.385 RP 184.486 to RP 185.788 RP 185.893 to RP 187.790 RP 187.920 to RP 188.798 RP 188.912 to RP 189.793 RP 189.908 to RP 190.301 RP 190.406 to RP 190.796 RP 190.910 to RP 191.808 RP 191.922 to RP 192.806 RP 192.900 to RP 193.804 RP 193.909 to RP 195.275				
		<u>Area (CY):</u>		<u>1,914</u>	<u>Area (CY):</u>		<u>45</u>	<u>Area (CY):</u>		<u>104</u>	<u>Area (CY):</u>		<u>260</u>	<u>Area (CY):</u>		<u>13,116</u>	<u>Total</u> <u>(Units)</u>	<u>Total</u> <u>(CY)</u>
<u>Material - Mainline</u>	<u>Unit</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>		
RAP - Superpave FAA 45 @ 2 Ton/CY	Ton	36	2,347	3,828	45.5	2,966	90	42.5	2,770	208	52	3,390	520	36	2,347	26,232	30,878	15,439
Tack Coat @ 0.10 Gal/SY	Gal		2,112	3,445		2,670	80		2,493	187		3,051	467		2,112	23,608	27,787	
PG 58H-34 Asphalt Cement @ 4.5%/Ton	Ton		106	172		133	4		125	9		153	23		106	1,180	1,390	

Mainline Table 2

		<u>Typical Section 13 - US 83</u> (0.319 Miles)			<u>Typical Section 14 - US 83</u> (0.131 Miles)			<u>Typical Section 15 - US 83</u> (0.342 Miles)			<u>Typical Section 16 - US 83</u> (0.940 Miles)			<u>Typical Section 18 - US 83</u> (0.138 Miles)			<u>Typical Section 19</u> <u>US 83 / ND 23</u> <u>Median Cross-Over</u> (0.090 Miles)			<u>Mainline Table 2</u> <u>Summary</u>	
		RP 188.798 to RP 188.887 RP 190.301 to RP 190.381 RP 191.808 to RP 191.893 RP 195.275 to RP 195.340			RP 184.385 to RP 184.456 RP 192.806 to RP 192.866			RP 185.788 to RP 185.857 RP 187.790 to RP 187.860 RP 189.793 to RP 189.853 RP 190.796 to RP 190.875 RP 193.804 to RP 193.868			RP 181.868 to RP 182.675 RP 182.867 to RP 183.000			RP 182.675 to RP 182.813			RP 105.370 to RP 105.460				
		<u>Area (CY):</u>		<u>500</u>	<u>Area (CY):</u>		<u>205</u>	<u>Area (CY):</u>		<u>669</u>	<u>Area (CY):</u>		<u>1,072</u>	<u>Area (CY):</u>		<u>301</u>	<u>Area (CY):</u>		<u>14</u>	<u>Total</u> <u>(Units)</u>	<u>Total</u> <u>(CY)</u>
<u>Material - Mainline</u>	<u>Unit</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>	<u>Width</u> <u>(ft)</u>	<u>Qty.</u> <u>per</u> <u>Mile</u>	<u>Total</u> <u>(Units)</u>		
RAP - Superpave FAA 45 @ 2 Ton/CY	Ton	48	3,129	1,000	48	3,129	410	60	3,911	1,338	35	2,282	2,144	67	4,368	602	36	2,346	28	5,522	2,761
Tack Coat @ 0.10 Gal/SY	Gal		2,816	898		2,816	369		3,520	1,204		2,053	1,940		3,961	542		2,112	220	5,173	
PG 58H-34 Asphalt Cement @ 4.5%/Ton	Ton		141	45		141	18		176	60		103	96		197	27		106	1	248	



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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BASIS OF ESTIMATE

Taper Table 1

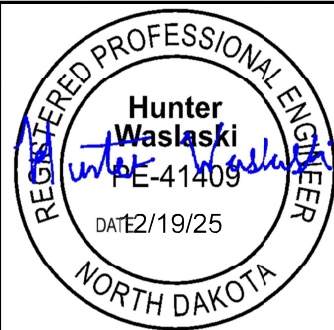
		<u>Typical Section 2 - US 83</u> <u>(0.072 Miles)</u>			<u>Typical Section 4 - US 83</u> <u>(0.030 Miles)</u>			<u>Typical Section 6 - US 83</u> <u>(0.121 Miles)</u>			<u>Typical Section 8 - US 83</u> <u>(0.090 Miles)</u>			<u>Taper Table 1</u> <u>Summary</u>	
		RP 195.340 to RP 195.376 RP 197.405 to RP 197.441			RP 196.731 to RP 196.761			RP 195.951 to RP 196.006 RP 196.855 to RP 196.890 RP 197.019 to RP 197.050			RP 195.807 to RP 195.897				
<u>Material - Taper</u>	<u>Unit</u>	<u>Area</u> <u>(SY)</u>	<u>Area</u> <u>(CY)</u>	<u>Total</u> <u>(Units)</u>	<u>Area</u> <u>(SY)</u>	<u>Area</u> <u>(CY)</u>	<u>Total</u> <u>(Units)</u>	<u>Area</u> <u>(SY)</u>	<u>Area</u> <u>(CY)</u>	<u>Total</u> <u>(Units)</u>	<u>Area</u> <u>(SY)</u>	<u>Area</u> <u>(CY)</u>	<u>Total</u> <u>(Units)</u>	<u>Total</u> <u>(Units)</u>	<u>Total</u> <u>(CY)</u>
RAP - Superpave FAA 45 @ 2 Ton/CY	Ton	2,275	14	28	875	5	10	3,595	22	44	3,445	21	42	124	62
Tack Coat @ 0.10 Gal/SY	Gal			228			88			360			345	1,019	
PG 58H-34 Asphalt Cement @ 4.5%/Ton	Ton			1			0			2			2	6	

Taper Table 2

		<u>Typical Section 10 - US 83(</u> <u>0.079 Miles)</u> RP 188.887 to RP 188.912RP 190.381 to RP 190.406RP 191.893 to RP 191.922			<u>Typical Section 11 - US 83(</u> <u>0.064 Miles)</u> RP 184.456 to RP 184.486RP 192.866 to RP 192.900			<u>Typical Section 12 - US 83(</u> <u>0.227 Miles)</u> RP 185.857 to RP 185.893RP 187.860 to RP 187.920RP 189.853 to RP 189.908RP 190.875 to RP 190.910RP 193.868 to RP 193.909			<u>Typical Section 17 - US 83(</u> <u>0.048 Miles)</u> RP 182.813 to RP 182.867			<u>Taper Table</u> <u>2Summary</u>	
<u>Material - Taper</u>	<u>Unit</u>	<u>Area</u> <u>(SY)</u>	<u>Area</u> <u>(CY)</u>	<u>Total</u> <u>(Units)</u>	<u>Area</u> <u>(SY)</u>	<u>Area</u> <u>(CY)</u>	<u>Total</u> <u>(Units)</u>	<u>Area</u> <u>(SY)</u>	<u>Area</u> <u>(CY)</u>	<u>Total</u> <u>(Units)</u>	<u>Area</u> <u>(SY)</u>	<u>Area</u> <u>(CY)</u>	<u>Total</u> <u>(Units)</u>	<u>Total</u> <u>(Units)</u>	<u>Total</u> <u>(CY)</u>
RAP - Superpave FAA 45 @ 2 Ton/CY	Ton	2,660	16	32	1,775	11	22	6,695	41	82	1,840	11	22	158	79
Tack Coat @ 0.10 Gal/SY	Gal			266			178			670			184	1,297	
PG 58H-34 Asphalt Cement @ 4.5%/Ton	Ton			1			1			4			1	7	

Approach Table

		<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>	<u>(5)</u>	<u>(6)</u>	<u>Approach Table</u> <u>Summary</u>	
		<u>Paved</u> <u>Section</u> <u>Line</u>	<u>Gravel</u> <u>Section</u> <u>Line</u>	<u>Paved</u> <u>Private</u> <u>Drive</u>	<u>Gravel</u> <u>Private</u> <u>Drive</u>	<u>Field</u> <u>Drive</u>	<u>Paved</u> <u>Median</u> <u>Approach</u>		
<u>Number of Locations</u>		3	12	5	7	20	52	<u>Total</u> <u>(Units)</u>	<u>Total</u> <u>(CY)</u>
<u>Description</u>	<u>Unit</u>	<u>Total Units</u>	<u>Total Units</u>	<u>Total Units</u>	<u>Total Units</u>	<u>Total Units</u>	<u>Total Units</u>		
RAP - Superpave FAA 45 @ 2 Ton/CY	Ton	175	671	118	138	193	1,606	2,901	1,449
Tack Coat @ 0.10 Gal/SY	Gal	210	604	142	125	174	1,446	2,701	
PG 58H-34 Asphalt Cement @ 4.5%/Ton	Ton	8	30	5	6	9	72	130	
Aggregate Surface Course - CL 13 @ 1.875 Ton/CY	Ton	---	25	---	15	40	---	80	



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BASIS OF ESTIMATE

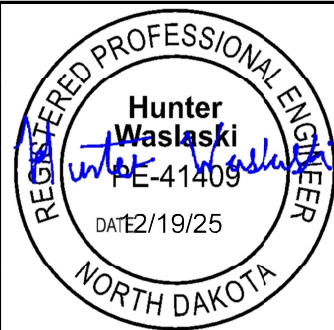
**Estimated Asphalt
Material Quantities
Summary**

		<u>Mainline Table #1</u>		<u>Mainline Table #2</u>		<u>Taper Table #1</u>		<u>Taper Table #2</u>		<u>Approach Table #1</u>		<u>Total Estimated Summary</u>	
<u>Material</u>	<u>Unit</u>	<u>Total (Units)</u>	<u>Total (CY)</u>	<u>Total (Units)</u>	<u>Total (CY)</u>	<u>Total (Units)</u>	<u>Total (CY)</u>	<u>Total (Units)</u>	<u>Total (CY)</u>	<u>Total (Units)</u>	<u>Total (CY)</u>	<u>Total (Units)</u>	<u>Total (CY)</u>
RAP - Superpave FAA 45 @ 2 Ton/CY	Ton	30,878	15,439	5,522	2,761	124	62	158	79	2,901	1,449	39,583	19,790
Tack Coat @ 0.10 Gal/SY	Gal	27,787		5,173		1,019		1,297		2,701		37,977	
PG 58H-34 Asphalt Cement @ 4.5%/Ton	Ton	1,390		248		6		7		130		1,781	
Aggregate Surface Course - CL 13 @ 1.875 Ton/CY	Ton	---		---		---		---		80		80	

HMA Cored Samples							
	A	B		C			
<u>Specification Section</u>	<u>Distance (Ft) / 1000</u>	<u>Lanes</u>	<u>Joints</u>	<u>Lifts</u>	<u>Quantity (A x B X C)</u>	<u>Quantity (1 per Mile)</u>	<u>Unit</u>
430.04 I.2.b(1) "General"	83	2	---	1	166	---	EA
SSP 4 Longitudinal Joint Density in HMA Pavements (Centerline)	83	---	1	1	83	---	EA
430.04 I.2.b(3) "Pavement Thickness Determination Cores"	---	---	---	---	---	15	EA
				Total	249	15	EA

Rumble Strips	
Pay Quantity	Edgeline
Miles	29.868

Saw Slotted Rumble Strips	
Location	RP
US 83 Median EB Lane	105.492
US 83 Median WB Lane	105.473



BASIS OF ESTIMATE

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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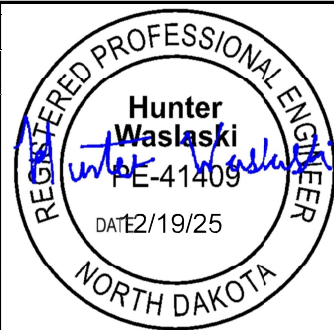
Milling Pavement Surface					
Location			{A}	{B}	{C} = (AxB)/9
Typical #	Starting RP	Ending RP	Milling Length (Ft)	Milling Width (Ft)	Total (SY)
1	197.441	197.542	533	36	2,133
1	197.050	197.375	1,716	36	6,864
1	196.890	196.974	444	36	1,774
1	196.761	196.801	211	36	845
1	196.006	196.656	3,432	36	13,728
1	195.376	195.807	2,276	36	9,103
3	197.375	197.405	158	46	801
5	196.656	196.731	396	43	1,870
7	196.974	197.019	238	52	1,373
7	196.801	196.855	285	52	1,647
7	195.897	195.951	285	52	1,647
9	193.909	195.275	7,212	36	28,850
9	192.900	193.804	4,773	36	19,092
9	191.922	192.806	4,668	36	18,670
9	190.910	191.808	4,741	36	18,966
9	190.406	190.796	2,059	36	8,237
9	189.908	190.301	2,075	36	8,300
9	188.912	189.793	4,652	36	18,607
9	187.920	188.798	4,636	36	18,543
9	185.893	187.790	10,016	36	40,065
9	184.486	185.788	6,875	36	27,498
9	183.000	184.385	7,313	36	29,251
13	195.275	195.340	343	48	1,830
13	191.808	191.893	449	48	2,394
13	190.301	190.381	422	48	2,253
13	188.798	188.887	470	48	2,506
14	192.806	192.866	317	48	1,690
14	184.385	184.456	375	48	1,999
15	193.804	193.868	338	60	2,253
15	190.796	190.875	417	60	2,781
15	189.793	189.853	317	60	2,112
15	187.790	187.860	370	60	2,464
15	185.788	185.857	364	60	2,429
16	182.867	183.000	734	35	2,854
16	181.868	182.675	4,261	35	16,570
18	182.675	182.813	729	67	5,424
Total:					327,423

Milling Pavement Surface (Approaches)		
Location		Total (SY)
RP	Location	
197.387	RIGHT	169
197.106	LEFT	101
196.985	RIGHT	297
196.972	RIGHT	199
196.821	RIGHT	291
196.821	LEFT	278
196.672	LEFT	280
196.33	RIGHT	185
196.225	RIGHT	210
196.077	RIGHT	173
195.823	RIGHT	414
195.292	RIGHT	220
195.292	LEFT	174
195.112	RIGHT	189
194.824	RIGHT	241
194.624	RIGHT	179
194.319	RIGHT	253
193.82	RIGHT	300
193.679	RIGHT	250
193.321	RIGHT	290
193.079	RIGHT	239
192.906	RIGHT	236
192.822	RIGHT	251
192.762	RIGHT	204
192.573	RIGHT	269
192.442	RIGHT	256
192.442	LEFT	238
192.073	RIGHT	252
191.819	RIGHT	273
191.31	RIGHT	323
Total:		7,234

Milling Pavement Surface (Approaches)		
Location		Total (SY)
RP	Location	
190.812	RIGHT	265
190.312	RIGHT	310
190.063	RIGHT	218
189.809	RIGHT	281
189.655	RIGHT	239
189.312	RIGHT	229
188.813	RIGHT	379
188.564	RIGHT	214
188.309	RIGHT	250
188.036	RIGHT	227
187.811	RIGHT	457
187.811	LEFT	716
187.313	RIGHT	274
186.95	RIGHT	281
186.815	RIGHT	320
186.318	RIGHT	273
185.944	RIGHT	256
185.803	RIGHT	298
185.475	RIGHT	220
185.065	RIGHT	310
184.754	RIGHT	249
184.401	RIGHT	327
184.401	LEFT	619
184.245	RIGHT	220
183.709	RIGHT	360
182.714	RIGHT	1,179
182.714	LEFT	1,102
182.284	RIGHT	159
182.195	RIGHT	249
182.003	RIGHT	209
Total:		10,690

Milling Pavement Surface (Tapers)			
Location - ND 23 Median Cross-Over			Total (SY)
Typical #	Starting RP	Ending RP	
RP 182.724 US 83			
	ND Hwy 23	ND Hwy 23	2,195
	105.370	105.460	
	Total:		2,195

Milling Pavement Surface (Tapers)			
Location			Total (SY)
Typical #	Starting RP	Ending RP	
2	195.340	195.376	1,315
2	197.405	197.441	960
4	196.731	196.761	875
6	195.951	196.006	1,680
6	196.855	196.890	1,065
6	197.019	197.050	850
8	195.807	195.897	3,445
10	188.887	188.912	745
10	190.381	190.406	875
10	191.893	191.922	1,040
11	184.456	184.486	740
11	192.866	192.900	1,035
12	185.857	185.893	1,055
12	187.860	187.920	1,690
12	189.853	189.908	1,550
12	190.875	190.910	1,085
12	193.868	193.909	1,315
17	182.813	182.867	1,840
Total:			23,160



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BASIS OF ESTIMATE

	Estimated Milled Material Quantity		
	Area (SY)	Depth (IN)	Total (TON)*
Mainline	327,423	2	36,380
ND 23 Cross-Over	2,195	2	244
Tapers	23,160	2	2,573
Approaches	17,924	Varies	1,992
Less 10% for losses			4,119
Total			37,070

* 2 Ton/CY

Estimated Required & Remaining Milled Material Quantities		
	% RAP by Mix Design	
Milled Material Required for Production of RAP - Superpave FAA 45	10% Min	20% Max
(39,583 tons RAP - Superpave FAA 45)	3,958	7,917
Milling Material to become the property of the NDDOT	33,112	29,154

Pavement Marking:

Pavement Markings: NH-4-083(157)181					
Spec	Code	Bid Item	Basis	Permanent	Temporary
762	103	PVMT MK PAINTED-MESSAGE	LEFT TURN ARROW (White) (SF)	608	---
762	103	PVMT MK PAINTED-MESSAGE	RIGHT TURN ARROW (White) (SF)	544	---
762	103	PVMT MK PAINTED-MESSAGE	STRAIGHT ARROW (White) (SF)	48	---
762	103	PVMT MK PAINTED-MESSAGE	STRAIGHT & RIGHT ARROW (White) (SF)	162	---
762	103	PVMT MK PAINTED-MESSAGE	"STOP" Message (White) (SF)	44	---
762	103	PVMT MK PAINTED-MESSAGE	"AHEAD" Message (White) (SF)	60	---
762	432	SHORT TERM 6IN LINE-TYPE NR	CENTERLINE DASHES (White) (LF)	---	62,069*
762	432	SHORT TERM 6IN LINE-TYPE NR	CENTERLINE DOUBLE BARRIER (Yellow) (LF)	---	3,960*
762	1106	PVMT MK PAINTED 6IN LINE	CENTERLINE DASHES (White) (LF)	20,690	---
762	1106	PVMT MK PAINTED 6IN LINE	CENTERLINE DOUBLE BARRIER (Yellow) (LF)	1,320	---
762	1106	PVMT MK PAINTED 6IN LINE	EDGE LINE (Yellow) (LF)	81,771	---
762	1106	PVMT MK PAINTED 6IN LINE	EDGE LINE (White) (LF)	99,195	---
762	1108	PVMT MK PAINTED 8IN LINE	45° GORE STRIPING (White) (LF)	671	---
762	1112	PVMT MK PAINTED 12IN LINE	TURN LANE BARRIER LINE (White) (LF)	9,335	---
762	1124	PVMT MK PAINTED 24IN LINE	STOP BAR (White) (LF)	60	---

* Allows for application after milling and each pavement lift

Pavement Markings: NH-4-083(157)181		
Beginning RP	Ending RP	6" White Centerline
		Distance (LF)
197.542	181.868	20,690



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BASIS OF ESTIMATE

Pavement Marking: (cont.)

Pavement Markings: NH-4-083(157)181		
Beginning RP	Ending RP	6" Yellow Edgeline
		Distance (LF)
197.542	197.442	528
197.441	197.406	185
197.405	197.382	121
197.380	197.046	1,764
197.045	197.020	132
197.019	196.985	180
196.975	196.881	496
196.880	196.856	127
196.855	196.821	180
196.811	196.672	734
196.667	196.330	1,779
196.320	196.002	1,679
196.001	195.967	180
195.966	195.898	359
195.897	195.823	391
195.822	195.376	2,355
195.375	195.341	180
195.340	195.286	285
195.287	194.829	2,418
194.818	193.910	4,794
193.909	193.874	185
193.873	193.820	280
193.819	192.826	5,243
192.817	191.923	4,720
191.922	191.894	148
191.893	191.824	364
191.809	191.320	2,582

Pavement Markings: NH-4-083(157)181		
Beginning RP	Ending RP	6" Yellow Edgeline
		Distance (LF)
191.310	190.896	2,186
190.895	190.876	100
190.875	190.812	333
190.811	190.412	2,107
190.411	190.382	153
190.381	190.312	364
190.302	189.878	2,239
189.877	189.854	121
189.853	189.814	206
189.804	188.913	4,704
188.912	188.888	127
188.887	188.813	391
188.812	187.886	4,889
187.885	187.861	127
187.860	187.811	259
187.810	186.820	5,227
186.805	186.323	2,545
186.308	185.884	2,239
185.883	185.858	132
185.857	185.803	285
185.802	184.406	7,371
184.396	183.719	3,575
183.709	182.857	4,499
182.856	182.813	227
182.812	182.709	544
182.708	181.868	4,435

Pavement Markings: NH-4-083(157)181		
Beginning RP	Ending RP	6" White Edgeline
		Distance (LF)
197.542	197.110	2,281
197.096	197.051	238
197.050	197.020	158
197.019	196.985	180
196.975	196.891	444
196.890	196.856	180
196.855	196.821	180
196.811	196.762	259
196.761	196.732	153
196.731	196.672	312
196.667	195.972	3,670
195.971	195.952	100
195.951	195.823	676
195.822	194.829	5,243
194.818	193.910	4,794
193.909	193.874	185
193.873	193.820	280
193.819	192.901	4,847
192.900	192.867	174
192.866	192.826	211
192.817	191.824	5,243
191.809	190.911	4,741

Pavement Markings: NH-4-083(157)181		
Beginning RP	Ending RP	6" White Edgeline
		Distance (LF)
190.910	190.876	180
190.875	190.812	333
190.811	190.312	2,635
190.302	189.878	2,239
189.909	189.878	164
189.877	189.814	333
189.804	187.916	9,969
187.915	187.881	180
187.880	187.811	364
187.810	186.820	5,227
186.805	186.323	2,545
186.308	185.894	2,186
185.893	185.858	185
185.857	185.803	285
185.802	184.482	6,970
184.481	184.457	127
184.456	184.406	264
184.396	183.714	3,601
183.709	182.867	4,446
185.866	182.813	16,120
182.812	182.709	544
182.708	181.868	4,435



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BASIS OF ESTIMATE

Pavement Marking: (cont.)

Pavement Markings: NH-4-083(157)181		
Center Point	Angle	8" White Gore Stripe
		Distance (LF)
195.898	45° Right	4
195.898	45° Left	4
195.893	45° Right	4
195.893	45° Left	4
195.889	45° Right	5
195.889	45° Left	5
195.884	45° Right	7
195.884	45° Left	7
195.879	45° Right	8
195.879	45° Left	8
195.874	45° Right	10
195.874	45° Left	10
195.870	45° Right	11
195.870	45° Left	11
195.865	45° Right	13
195.865	45° Left	13
195.860	45° Right	14
195.860	45° Left	14
195.855	45° Right	15
195.855	45° Left	15
195.851	45° Right	15
195.851	45° Left	15
195.846	45° Right	17
195.846	45° Left	17
195.841	45° Right	17
195.841	45° Left	17
182.842	45° Right	3
182.842	45° Left	3

Pavement Markings: NH-4-083(157)181		
Center Point	Angle	8" White Gore Stripe
		Distance (LF)
182.838	45° East	4
182.838	45° West	4
182.833	45° East	5
182.833	45° West	5
182.828	45° East	6
182.828	45° West	6
182.823	45° East	6
182.823	45° West	6
182.819	45° East	8
182.819	45° West	8
182.814	45° East	8
182.814	45° West	8
182.809	45° East	8
182.809	45° West	8
182.804	45° East	8
182.804	45° West	8
182.800	45° East	8
182.800	45° West	8
182.795	45° East	8
182.795	45° West	8
182.790	45° East	8
182.790	45° West	8
182.785	45° East	8
182.785	45° West	8
182.781	45° East	8
182.781	45° West	8
182.776	45° East	8
182.776	45° West	8

Pavement Markings: NH-4-083(157)181		
Center Point	Angle	8" White Gore Stripe
		Distance (LF)
182.771	45° Right	8
182.771	45° Left	8
182.767	45° Right	8
182.767	45° Left	8
182.762	45° Right	8
182.762	45° Left	8
182.757	45° Right	8
182.757	45° Left	8
182.752	45° Right	8
182.752	45° Left	8
182.748	45° Right	8
182.748	45° Left	8
182.743	45° Right	8
182.743	45° Left	8
182.738	45° Right	8
182.738	45° Left	8
182.733	45° Right	8
182.733	45° Left	8
182.729	45° Right	8
182.729	45° Left	8
182.724	45° Right	8
182.724	45° Left	8
182.719	45° Right	8
182.719	45° Left	8

Pavement Markings: NH-4-083(157)181		
Beginning RP	Ending RP	12" Turn Lane Stripe
		Distance (LF)
197.406	197.387	100
197.020	196.985	185
197.020	196.985	185
196.856	196.826	158
196.856	196.826	158
196.732	196.677	290
195.967	195.828	734
195.952	195.828	655
195.898	195.828	370
195.341	195.292	259
193.874	193.824	264
193.874	193.824	264
192.867	192.826	216
191.894	191.824	370
190.876	190.817	312
190.876	190.817	312
190.382	190.312	370
189.878	189.814	338
189.854	189.814	211
188.887	188.819	359
187.881	187.822	312
187.861	187.822	206
185.858	185.803	290
185.858	185.814	232
184.457	184.406	269
182.847	182.714	702
182.847	182.813	180
182.812	182.714	517
182.812	182.714	517



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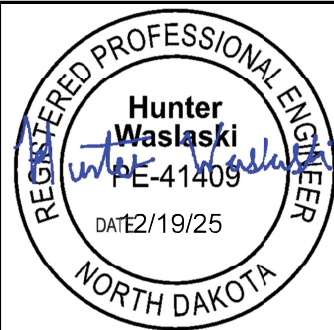
BASIS OF ESTIMATE

Pavement Marking: (cont.)

Pavement Markings: NH-4-083(157)181			
RP	Turn Arrows		SF
	Left Turn	Right Turn	
197.020	---	SB	16
197.000	---	SB	16
196.856	---	SB	16
196.841	---	SB	16
196.732	---	SB	16
196.721	---	SB	16
196.702	---	SB	16
195.952	---	SB	16
195.942	---	SB	16
195.893	---	SB	16
195.839	---	SB	16
193.874	---	SB	16
193.864	---	SB	16
193.849	---	SB	16
192.867	---	SB	16
192.847	---	SB	16
190.876	---	SB	16
190.861	---	SB	16
190.841	---	SB	16
189.878	---	SB	16
189.864	---	SB	16
189.844	---	SB	16
187.881	---	SB	16
187.866	---	SB	16
187.852	---	SB	16
185.858	---	SB	16
185.844	---	SB	16

Pavement Markings: NH-4-083(157)181			
RP	Turn Arrows		SF
	Left Turn	Right Turn	
185.829	---	SB	16
184.457	---	SB	16
184.441	---	SB	16
184.426	---	SB	16
182.847	---	SB	16
182.832	---	SB	16
182.763	---	SB	16
197.406	SB	---	16
197.397	SB	---	16
197.020	SB	---	16
197.000	SB	---	16
196.856	SB	---	16
196.841	SB	---	16
195.967	SB	---	16
195.957	SB	---	16
195.903	SB	---	16
195.341	SB	---	16
195.331	SB	---	16
195.312	SB	---	16
193.874	SB	---	16
193.864	SB	---	16
193.849	SB	---	16
191.894	SB	---	16
191.879	SB	---	16
191.854	SB	---	16
190.876	SB	---	16
190.861	SB	---	16

Pavement Markings: NH-4-083(157)181			
RP	Turn Arrows		SF
	Left Turn	Right Turn	
190.841	SB	---	16
190.382	SB	---	16
190.367	SB	---	16
190.343	SB	---	16
189.854	SB	---	16
189.833	SB	---	16
188.887	SB	---	16
188.868	SB	---	16
188.843	SB	---	16
187.861	SB	---	16
187.852	SB	---	16
187.836	SB	---	16
185.858	SB	---	16
185.844	SB	---	16
185.829	SB	---	16
182.812	SB	---	16
182.798	SB	---	16
182.763	SB	---	16



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BASIS OF ESTIMATE

Pavement Marking: (cont.)

Pavement Markings: NH-4-083(157)181			
Beginning RP	Ending RP	6" Yellow Centerline	
		EB Lane	WB Lane
105.431	105.556	DBL Barrier	

Pavement Markings: NH-4-083(157)181			
RP	Length (LF)	24" Stop Bar	
		EB Lane	WB Lane
105.437	30'	EB	---
105.546	30'	--	WB

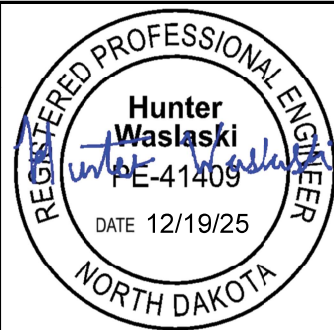
Pavement Markings: NH-4-083(157)181			
Beginning RP	Ending RP	6" White Edgeline	
		EB Lane	WB Lane
105.422	105.443	EB	---
105.422	105.443	---	WB
105.444	105.534	EB	---
105.444	105.534	---	WB
105.535	105.560	EB	---
105.535	105.560	---	WB

	"Stop" Message		"Ahead" Message	
Location	RP	SF	RP	SF
EB Lane	105.449	22	105.461	30
WB Lane	105.534	22	105.522	30

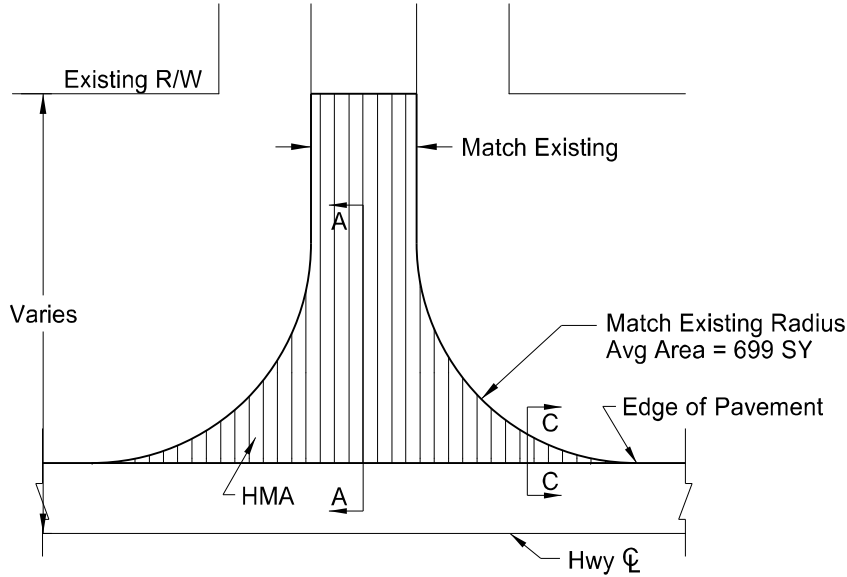
Pavement Markings: NH-4-083(157)181			
RP	Straight Arrow		SF
	Passing Ln	Driving Ln	
182.719	SB	SB	24

Pavement Markings: NH-4-083(157)181			
RP	Straight Arrow		SF
	EB Lane	WB Lane	
105.437	EB	---	12
105.540	---	WB	12

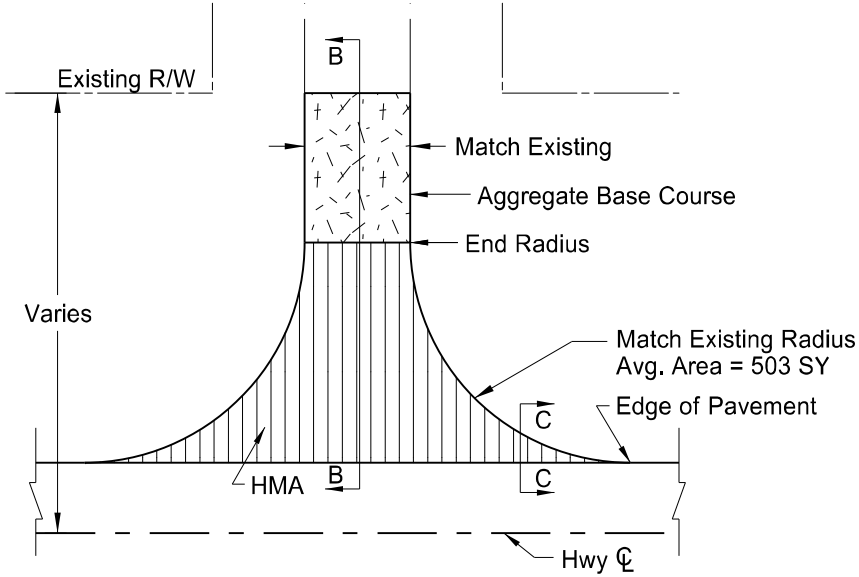
Pavement Markings: NH-4-083(157)181			
RP	Straight/Left Arrow Combo		SF
	EB Lane	WB Lane	
105.443	---	WB	27
105.473	EB	---	27
105.485	EB	---	27
105.492	---	WB	27
105.504	---	WB	27
105.534	EB	---	27



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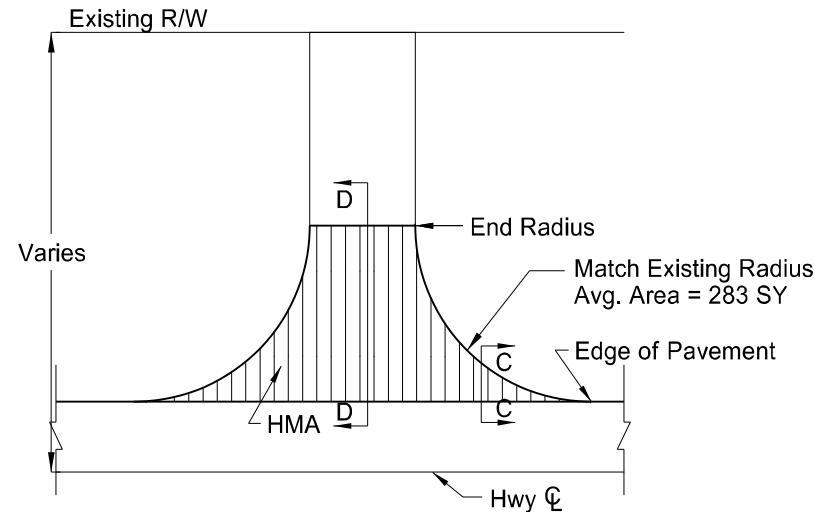
(1) Paved Section Line, County Road, or Street Approach



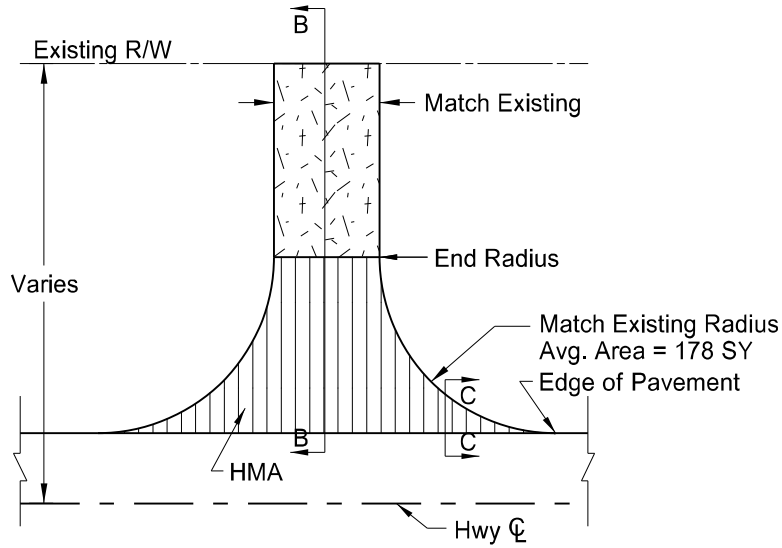
(2) Gravel Section Line, County Road, or Street Approach

Notes:

1. Actual HMA paving and aggregate base course locations may vary in the field, as approved by the Engineer.
2. Quantity totals have been included in the bid items of the "Estimate of Quantities" of the plans.
3. Aggregate Base Course CL 13 has been provided in the quantities to fill in around the radii. This material will be required when sloughs are steeper than 4:1 (see section C-C)
4. See Section 20, Sheet 2 for Section Details



(3) Paved Private Drive Approach



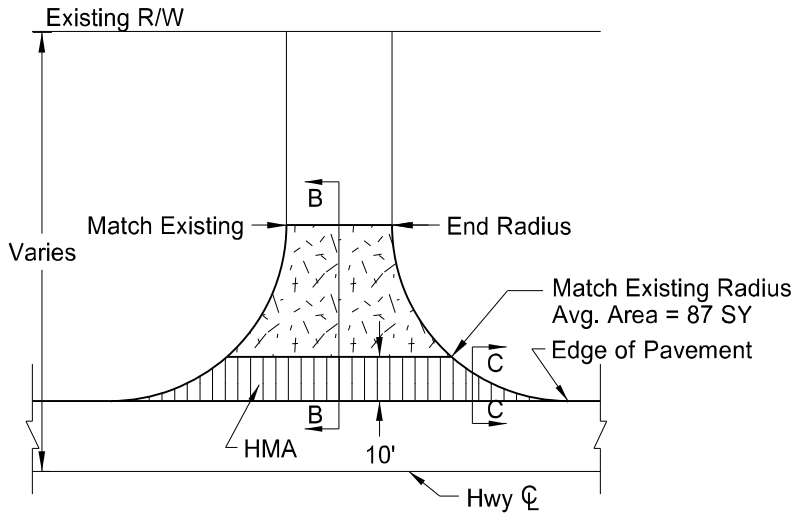
(4) Gravel Private Drive Approach



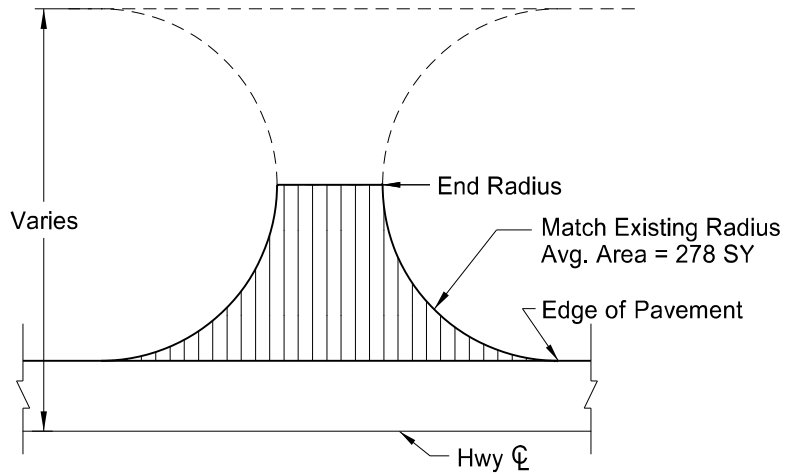
Existing Approach Detail
US Highway 83
South Bound Lane

RP 181.868 to RP 197.542
Ward County, ND

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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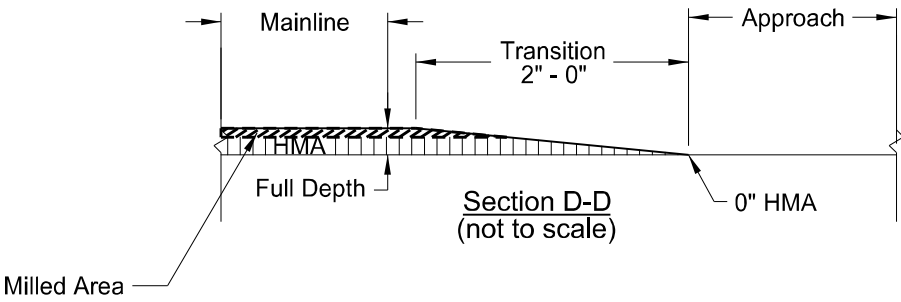
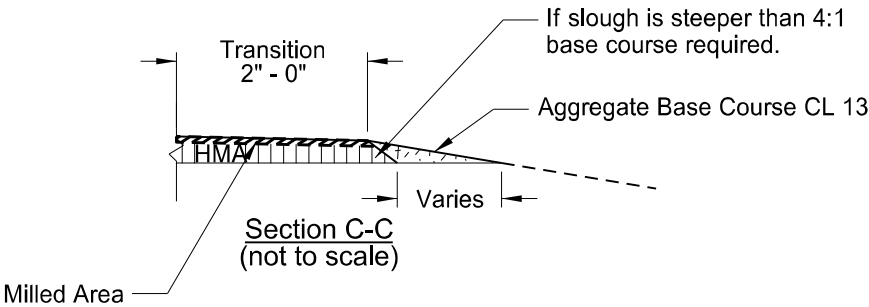
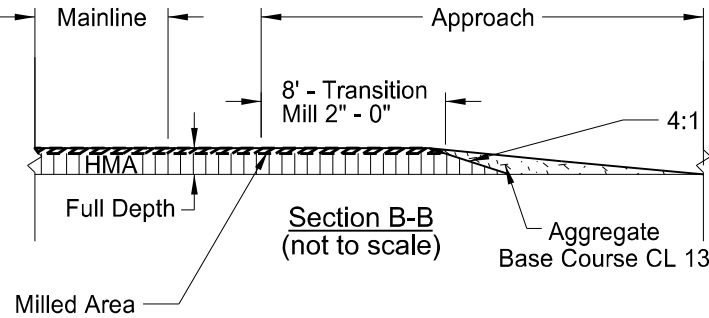
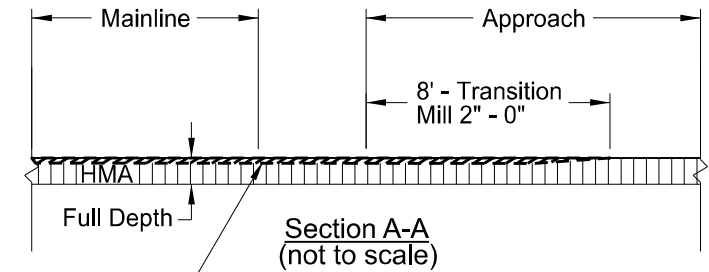


(5) Field Drive Approach



(6) Paved Median Approach

1. Actual HMA paving and aggregate base course locations may vary in the field, as approved by the Engineer.
2. Quantity totals have been included in the bid items of the "Estimate of Quantities" of the plans.
3. Aggregate Base Course CL 13 has been provided in the quantities to fill in around the radii. This material will be required when sloughs are steeper than 4:1 (see section C-C)



BASIS OF ESTIMATE		(1)	(2)	(3)	(4)	(5)	(6)	Total (Units)	Total (CY)
		Paved Section Line	Gravel Section Line	Paved Private Drive	Gravel Private Drive	Field Drive	Paved Median Approach		
Number of Locations		3	12	5	7	20	52		
Description	Unit	Total	Total	Total	Total	Total	Total		
RAP - Superpave FAA 45 @ 2 Ton/CY	TON	175	671	118	138	193	1,606	2,901	1,449
Tack Coat @ 0.10 Gal/SY	GAL	210	604	142	125	174	1,446	2,701	
PG 58H-34 Asphalt Cement @ 4.5%/Ton	TON	8	30	5	6	9	72	130	
Aggregate Base Course - CL 13	TON	---	25	---	15	40	---	80	

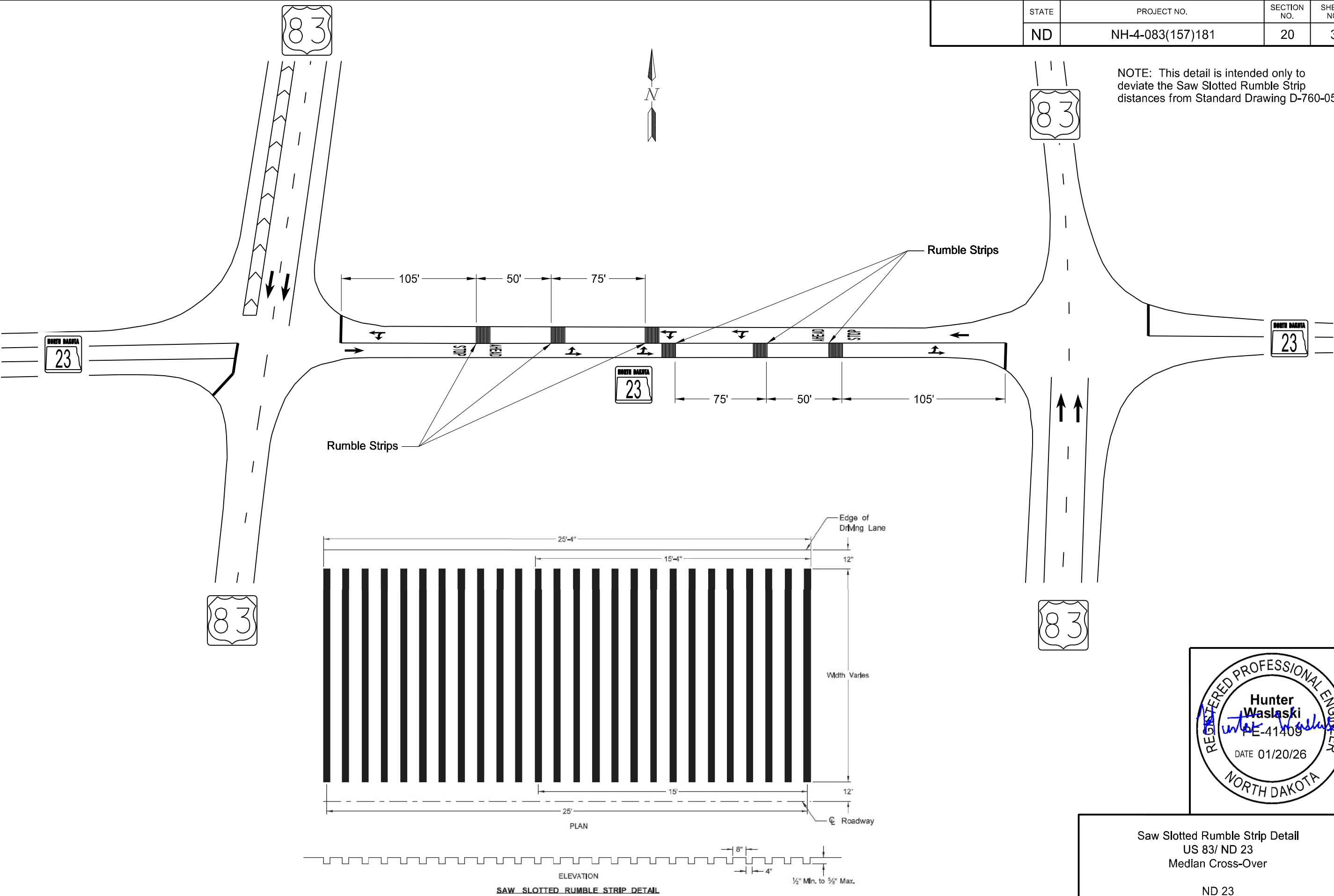


Existing Approach Detail
US Highway 83
South Bound Lane

RP 181.868 to RP 197.542
Ward County, ND

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	20	3

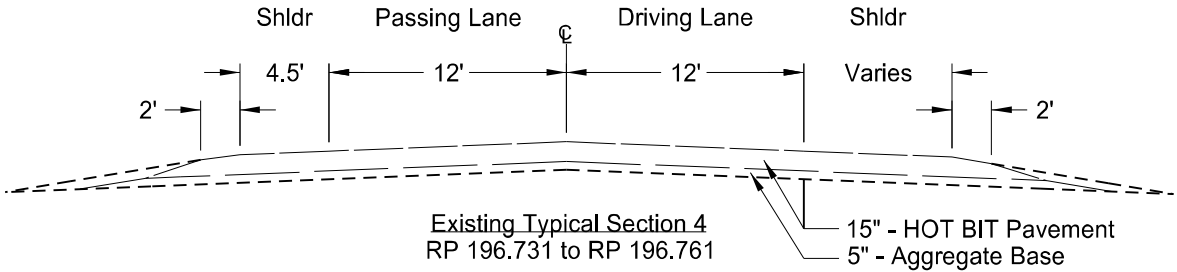
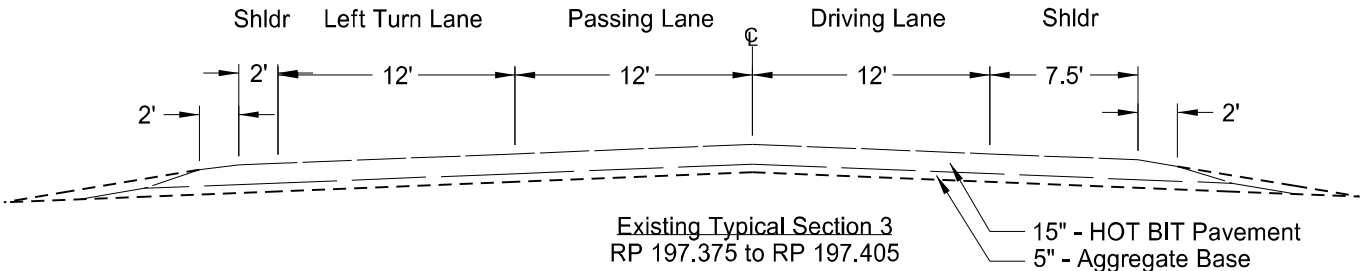
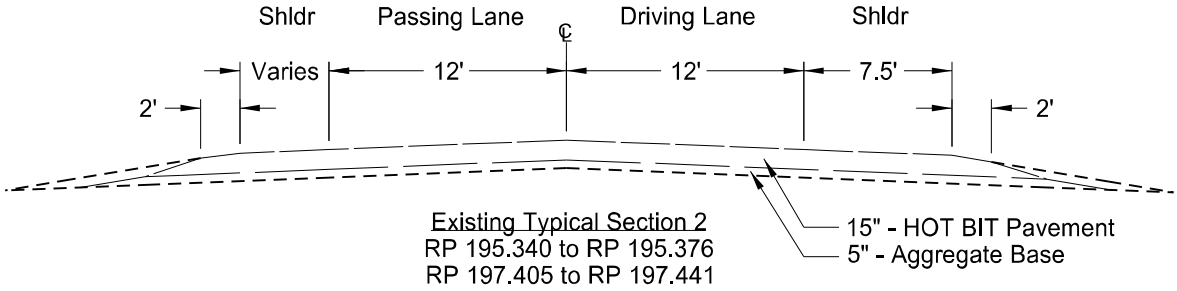
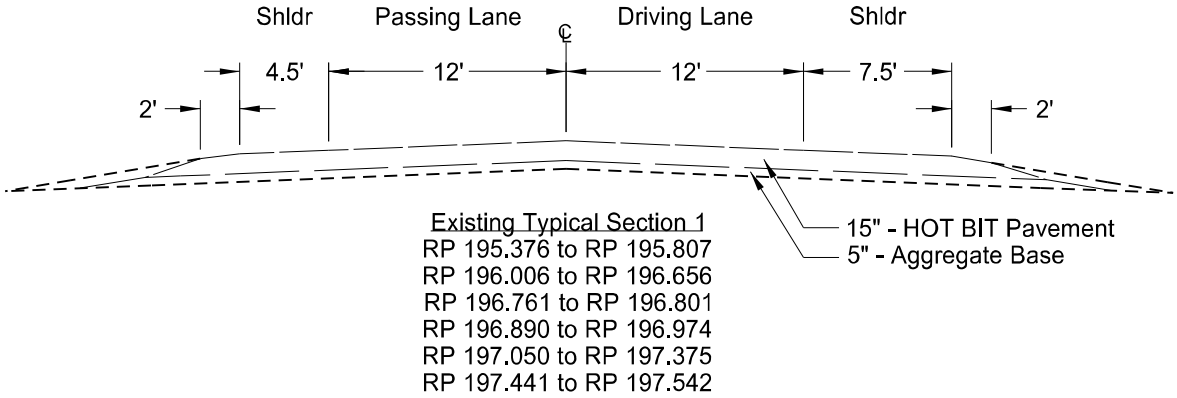
NOTE: This detail is intended only to deviate the Saw Slotted Rumble Strip distances from Standard Drawing D-760-05.



Saw Slotted Rumble Strip Detail
US 83/ ND 23
Median Cross-Over

ND 23
RP 105.370 to RP 105.460
Ward County, ND

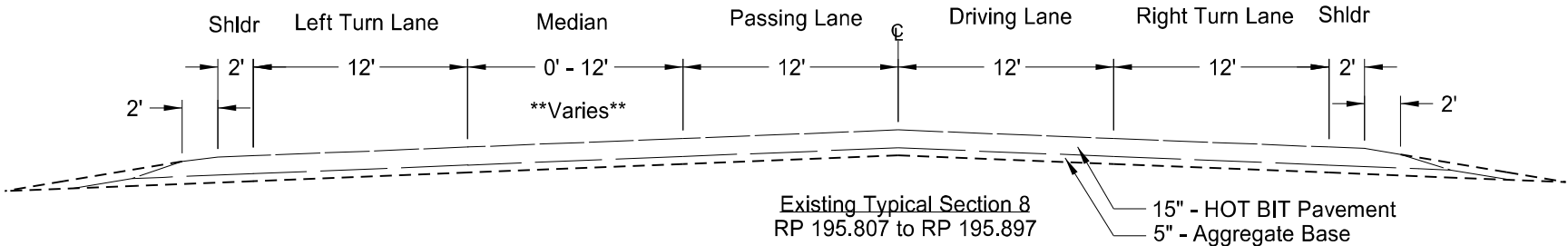
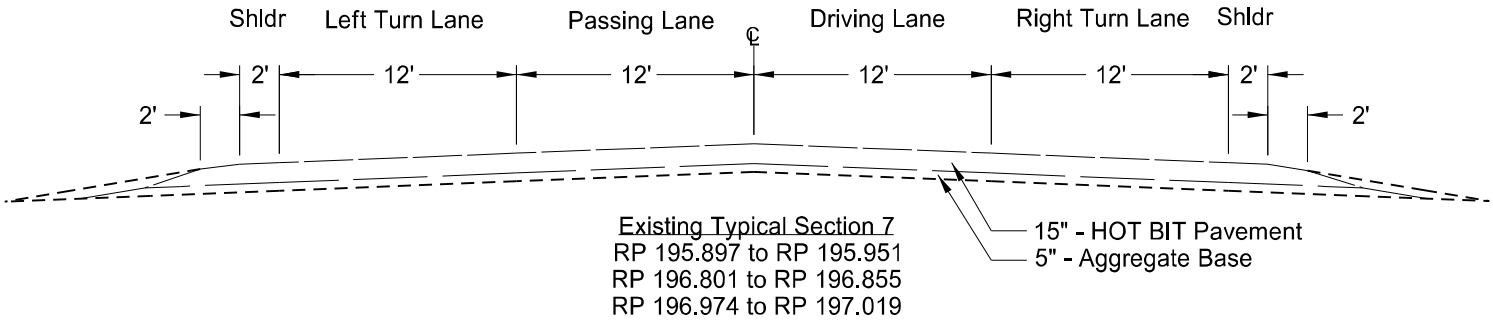
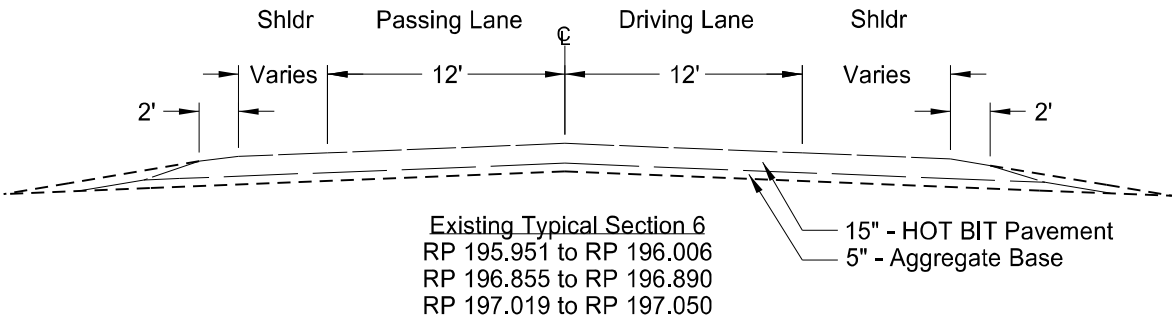
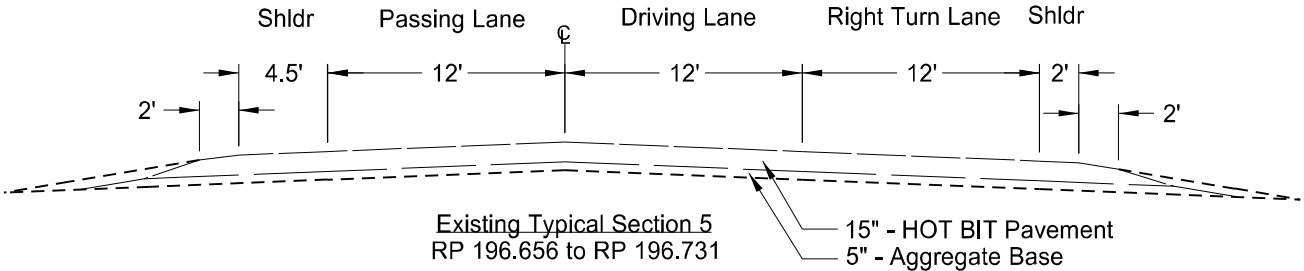
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	30	1



Existing Typical Sections
US Highway 83

Ward County, ND

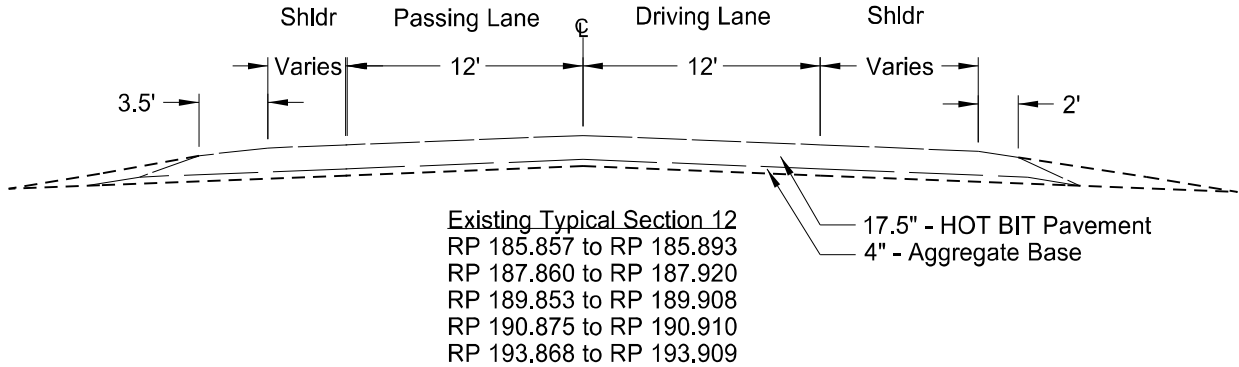
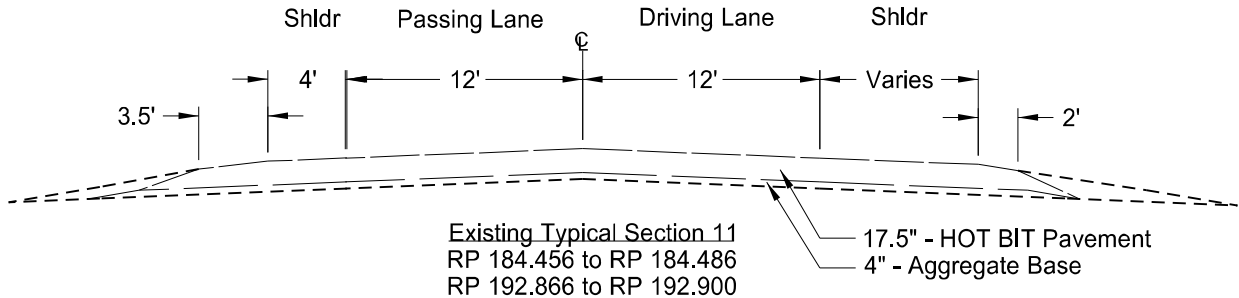
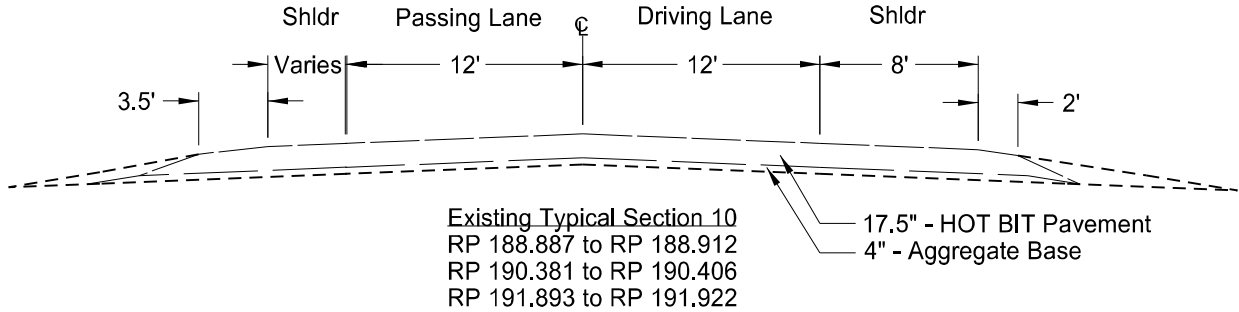
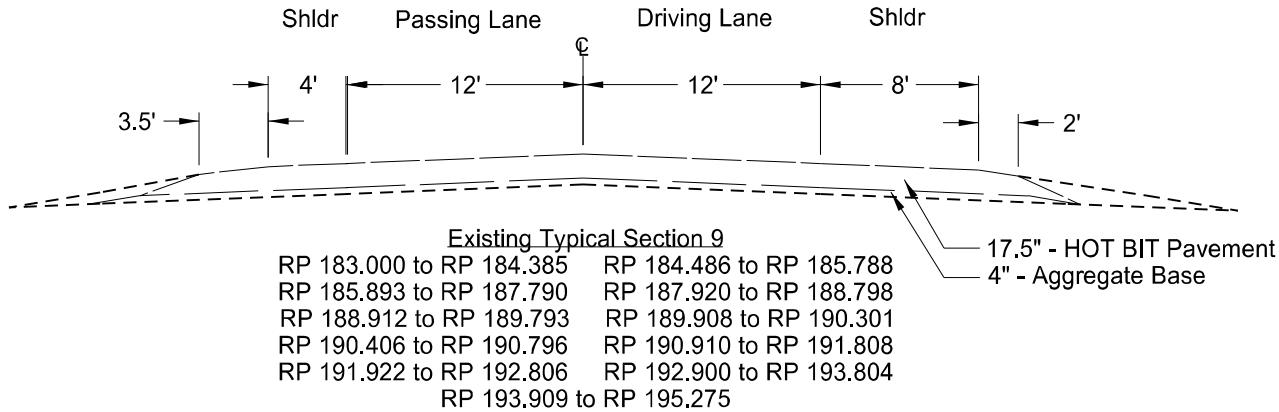
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	ND	NH-4-083(157)181	30	2



Existing Typical Sections
US Highway 83

Ward County, ND

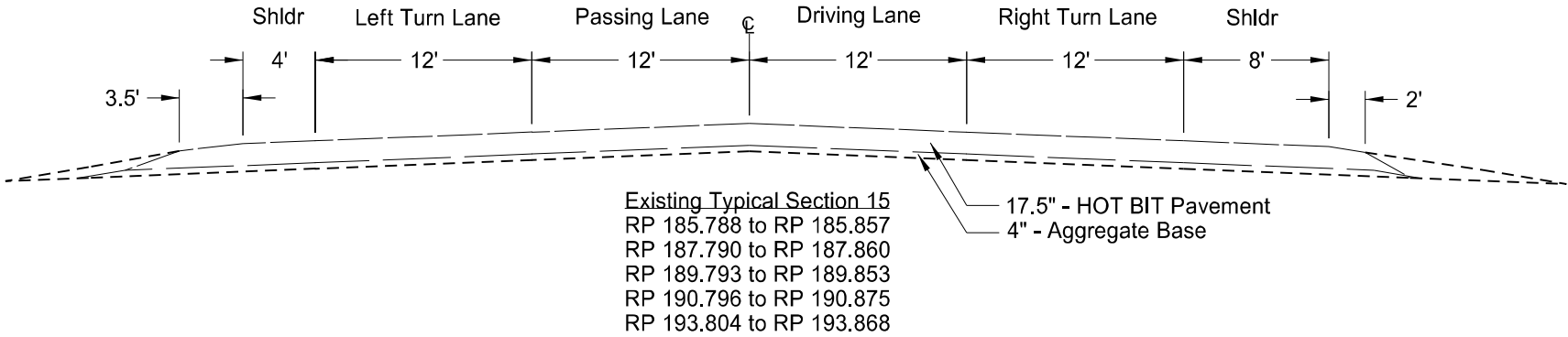
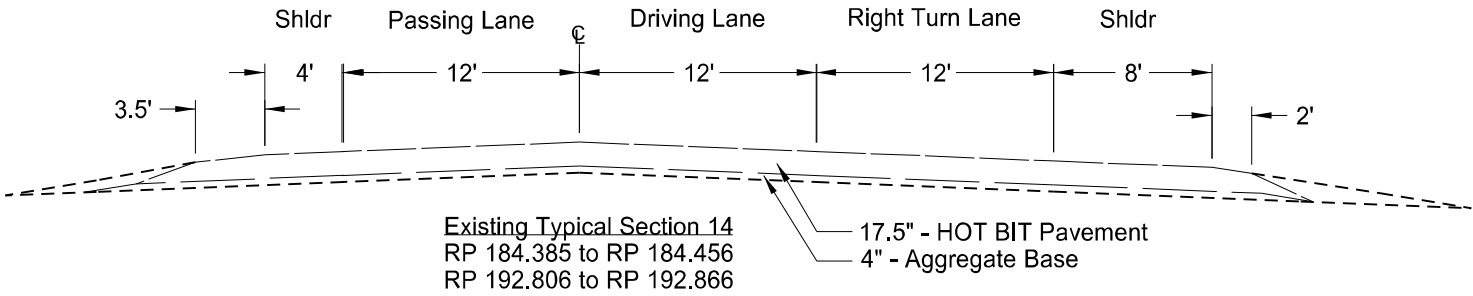
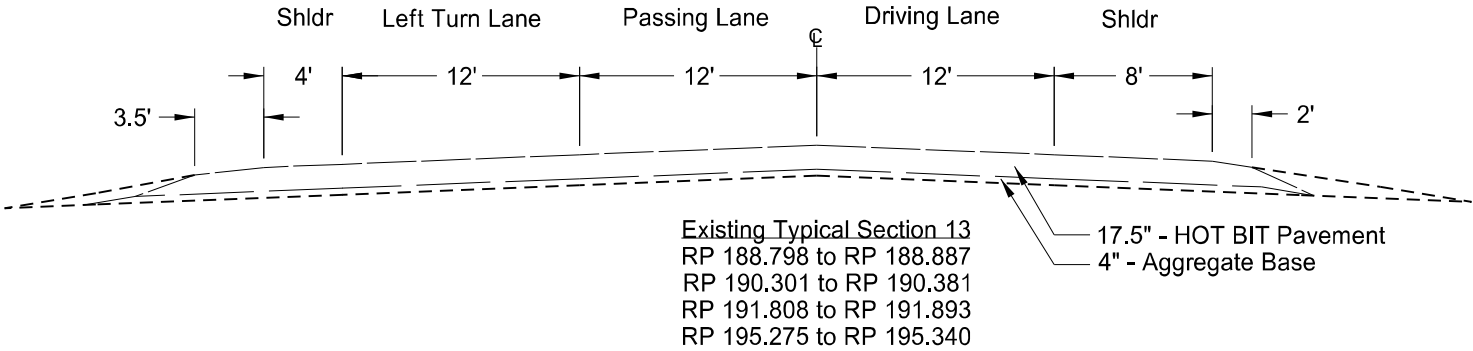
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	30	3



Existing Typical Sections
US Highway 83

Ward County, ND

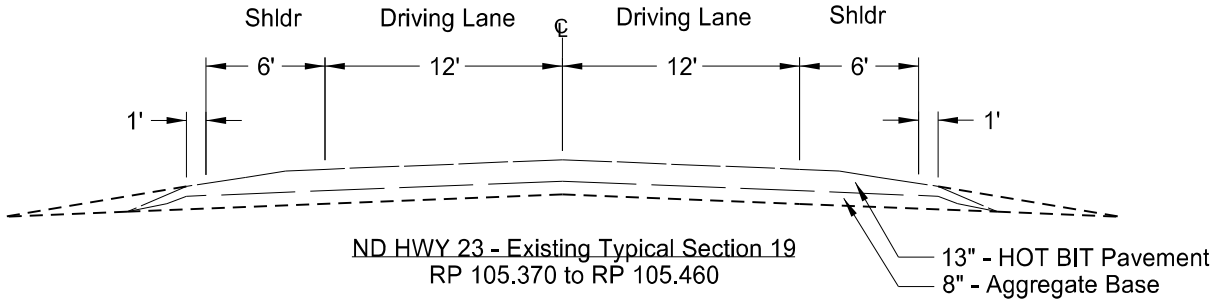
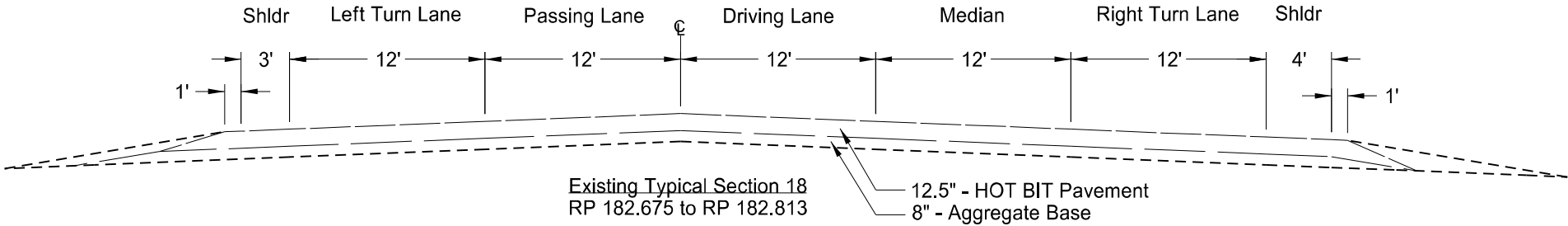
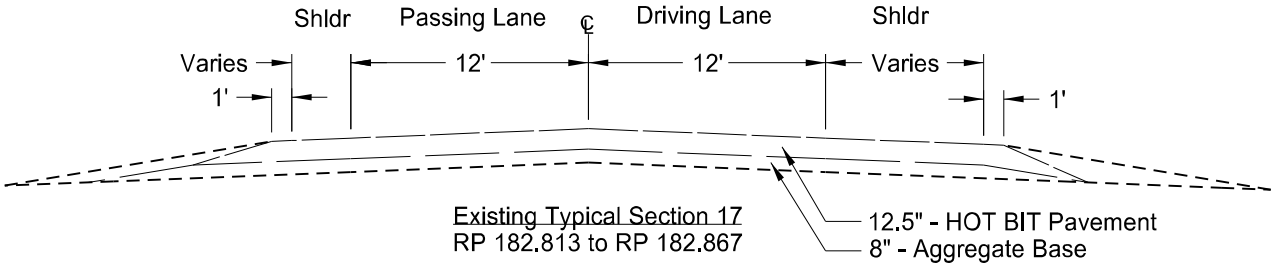
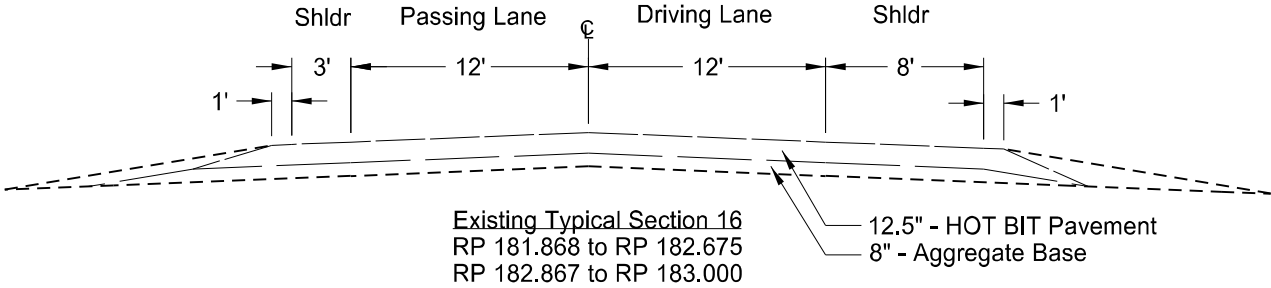
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	30	4



Existing Typical Sections
US Highway 83

Ward County, ND

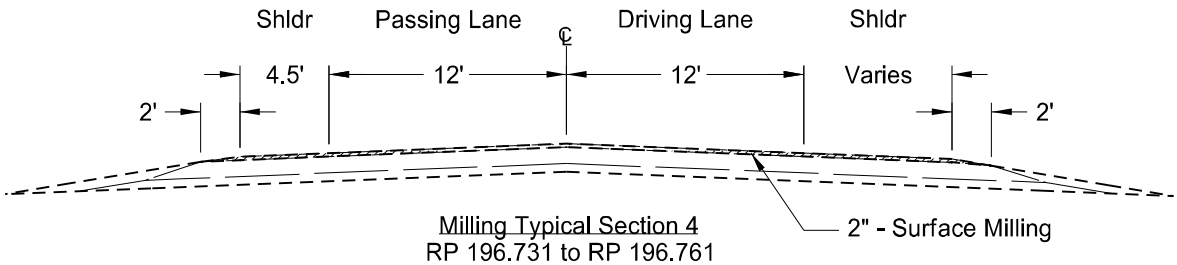
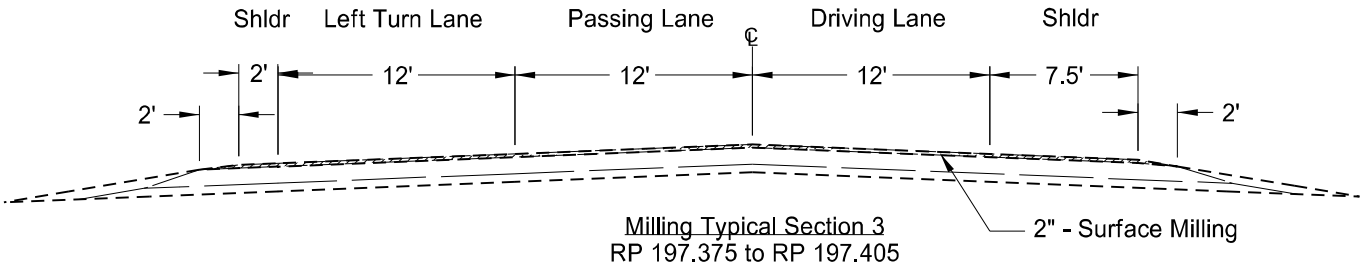
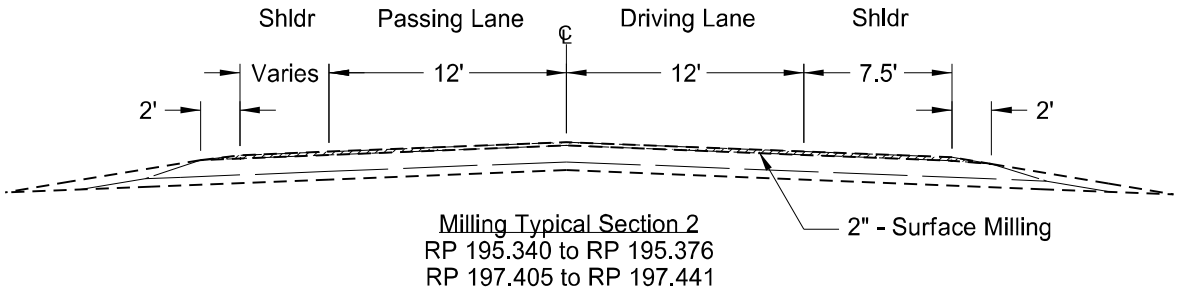
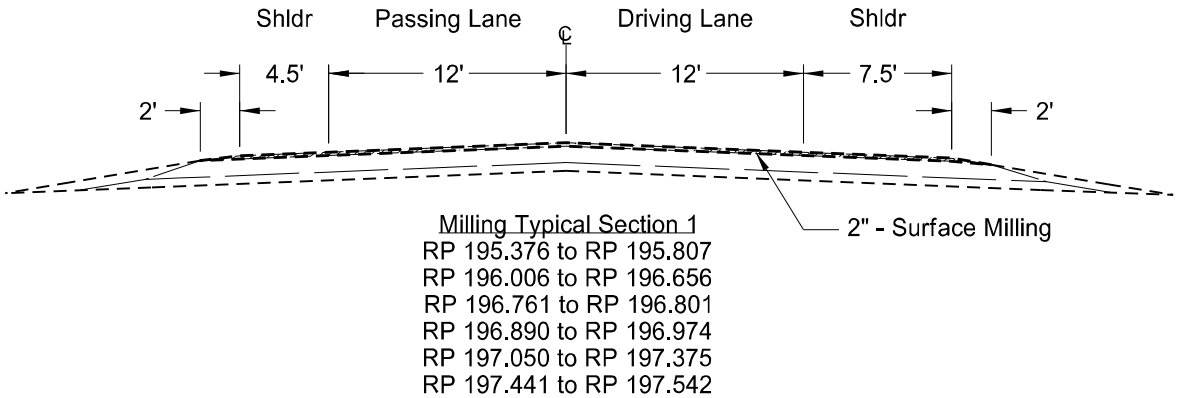
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	ND	NH-4-083(157)181	30	5



Existing Typical Sections
US Highway 83

Ward County, ND

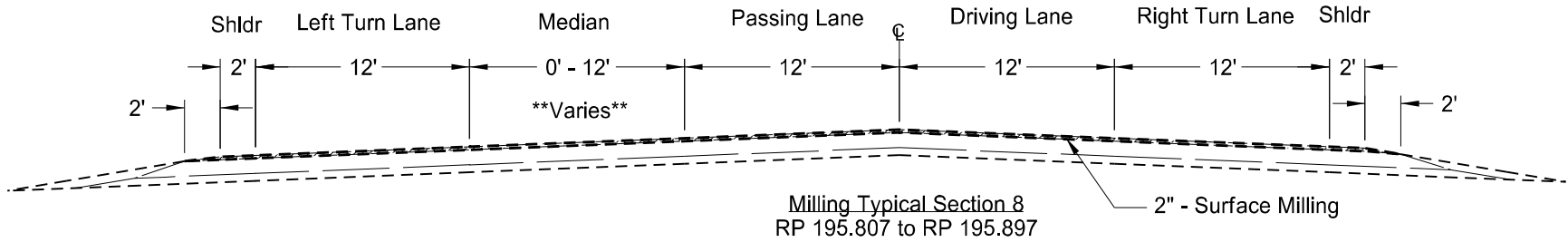
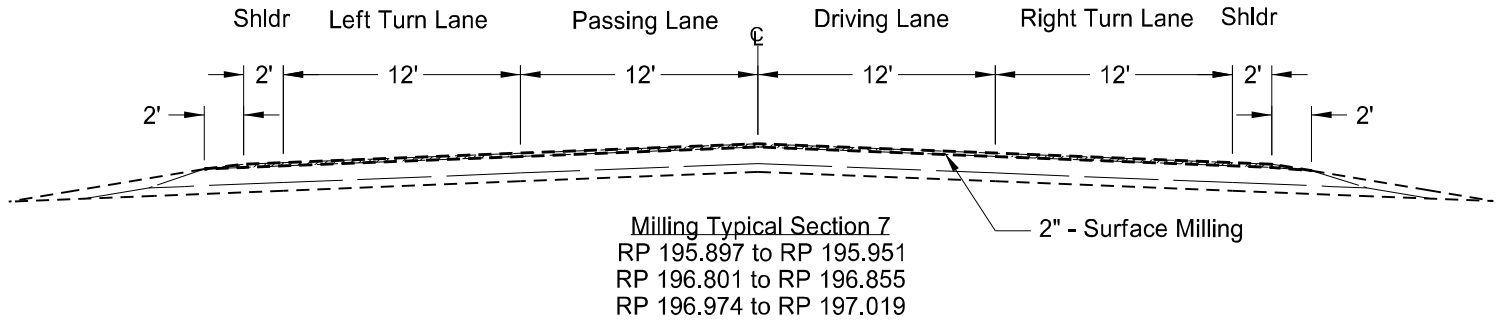
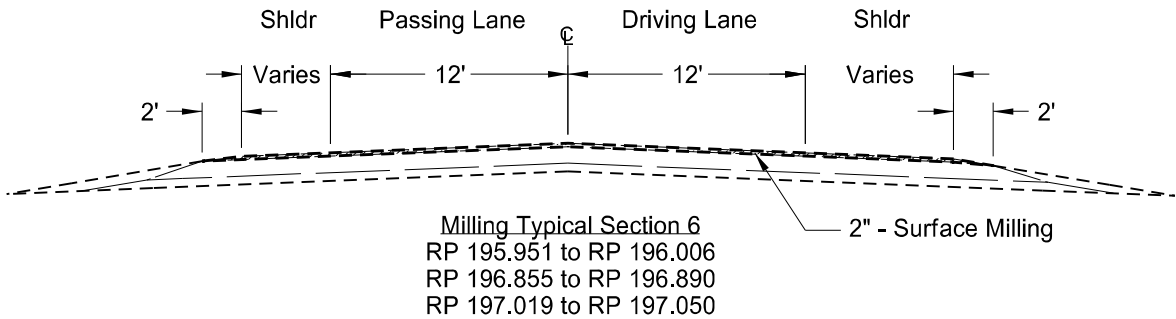
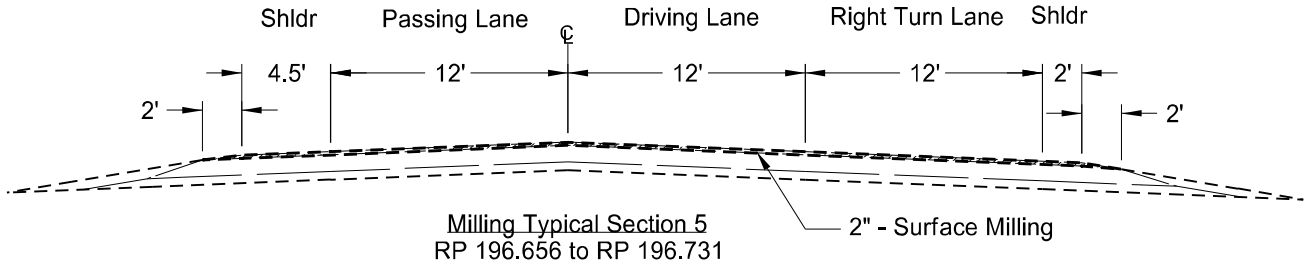
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Milling Typical Sections
US Highway 83

Ward County, ND

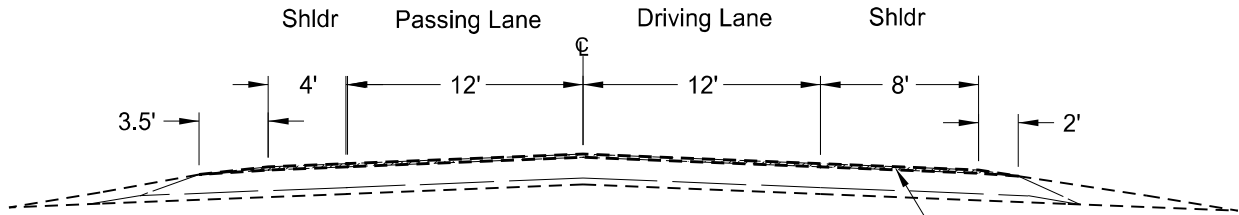
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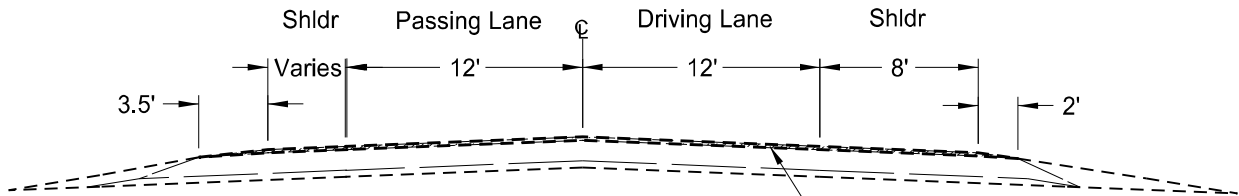
Milling Typical Sections
US Highway 83

Ward County, ND

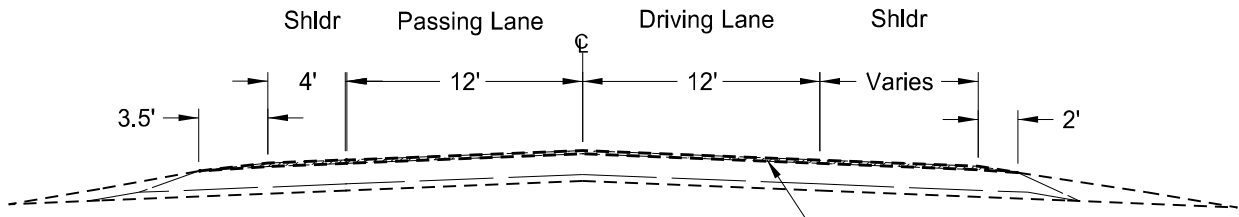
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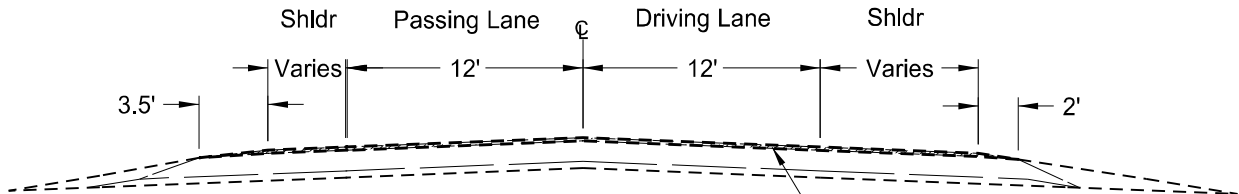
Milling Typical Section 9
RP 183.000 to RP 184.385 RP 184.486 to RP 185.788
RP 185.893 to RP 187.790 RP 187.920 to RP 188.798
RP 188.912 to RP 189.793 RP 189.908 to RP 190.301
RP 190.406 to RP 190.796 RP 190.910 to RP 191.808
RP 191.922 to RP 192.806 RP 192.900 to RP 193.804
RP 193.909 to RP 195.275



Milling Typical Section 10
RP 188.887 to RP 188.912
RP 190.381 to RP 190.406
RP 191.893 to RP 191.922



Milling Typical Section 11
RP 184.456 to RP 184.486
RP 192.866 to RP 192.900



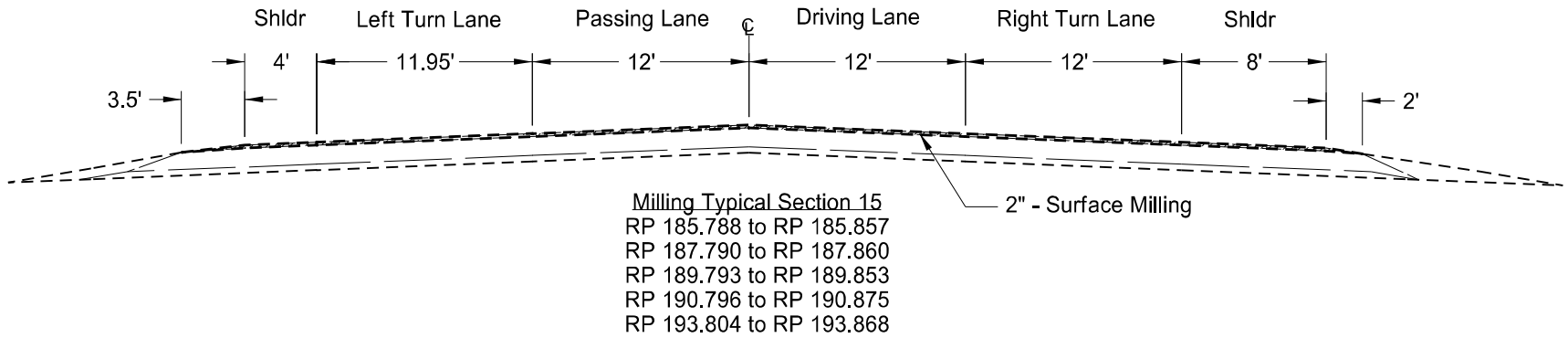
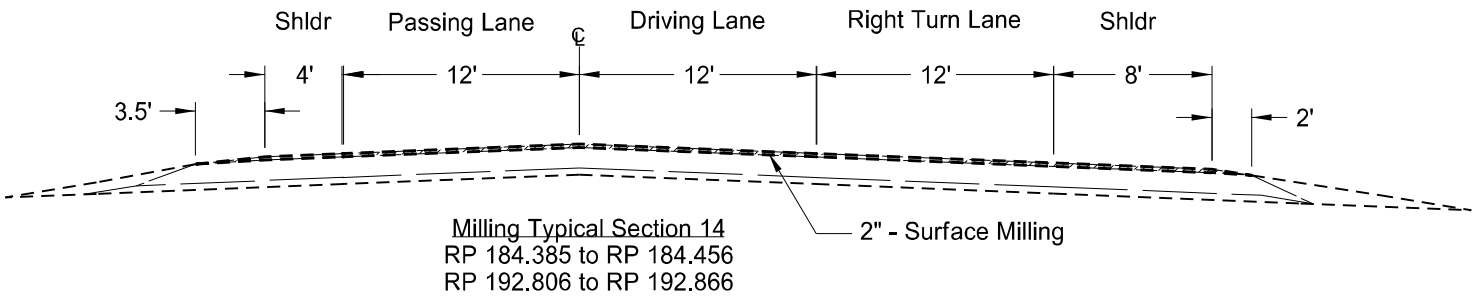
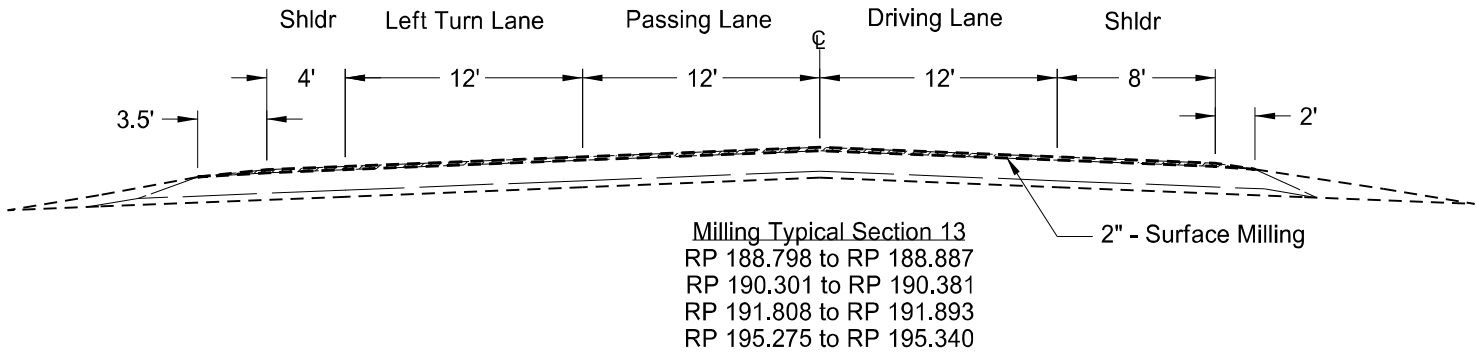
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RP 185.857 to RP 185.893
RP 187.860 to RP 187.920
RP 189.853 to RP 189.908
RP 190.875 to RP 190.910
RP 193.868 to RP 193.909



Milling Typical Sections
US Highway 83

Ward County, ND

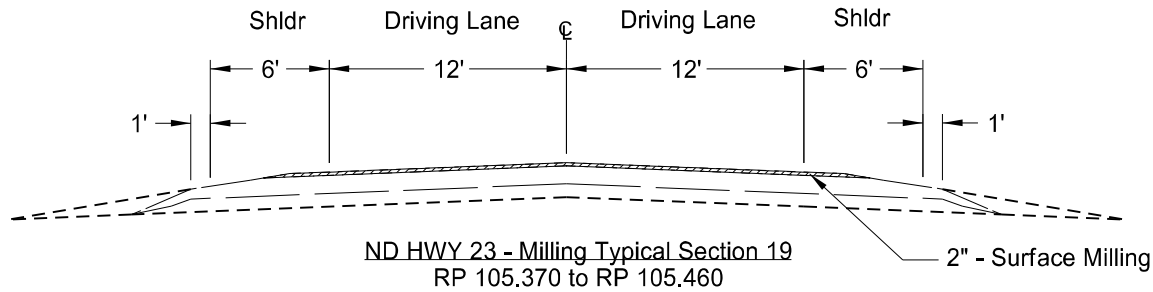
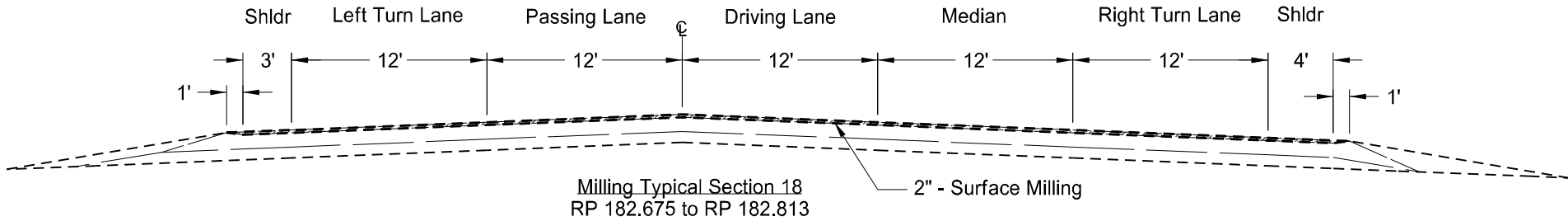
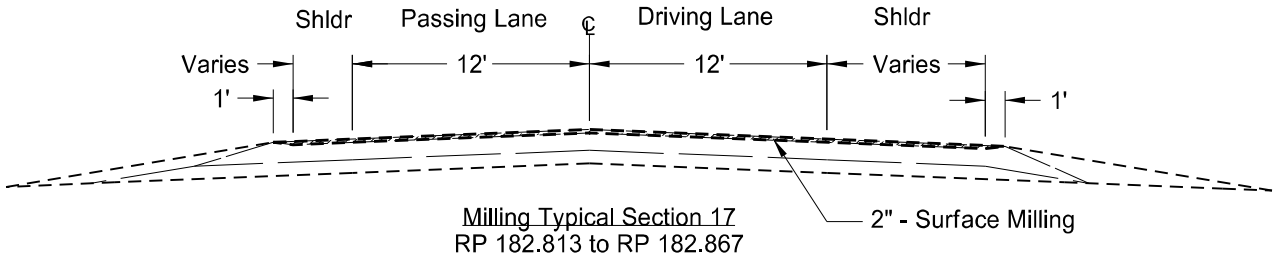
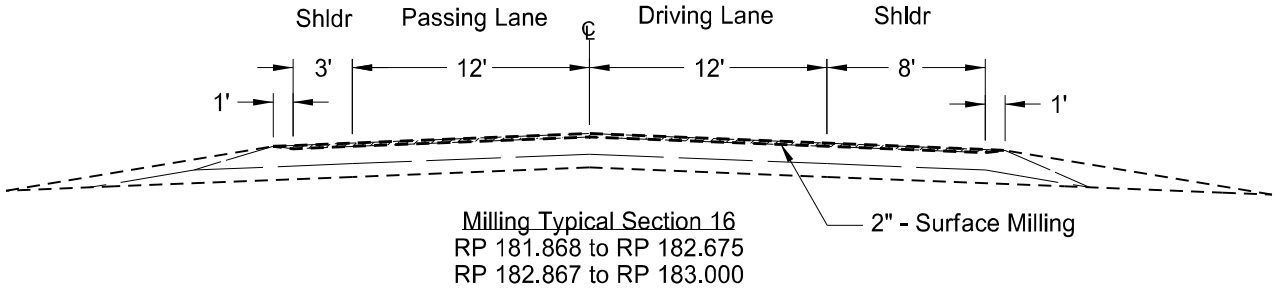
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	30	9



Milling Typical Sections
US Highway 83

Ward County, ND

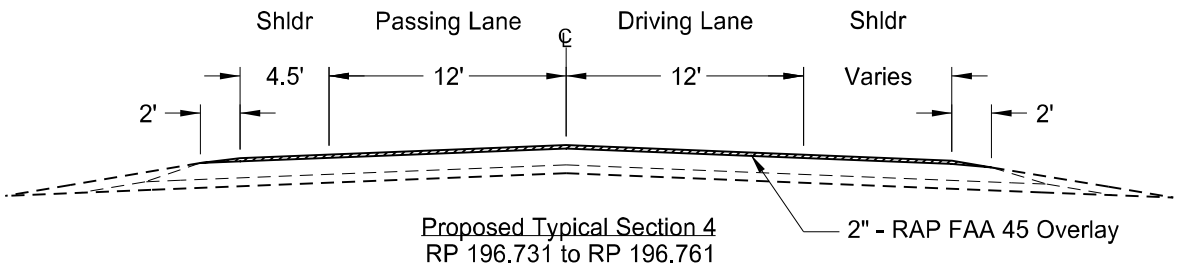
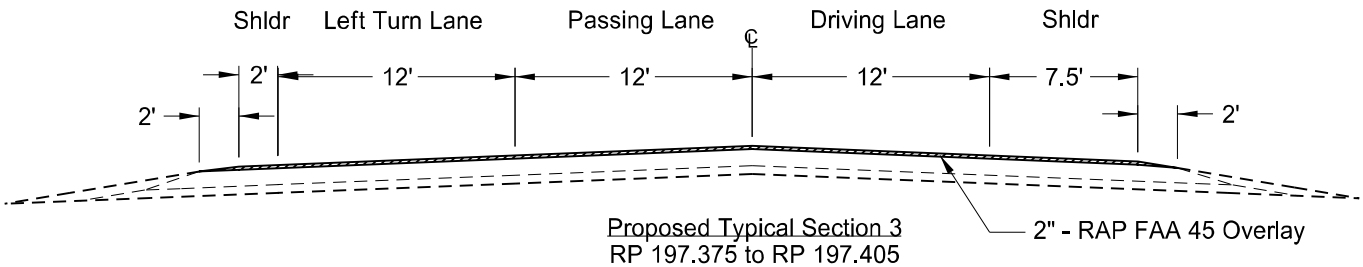
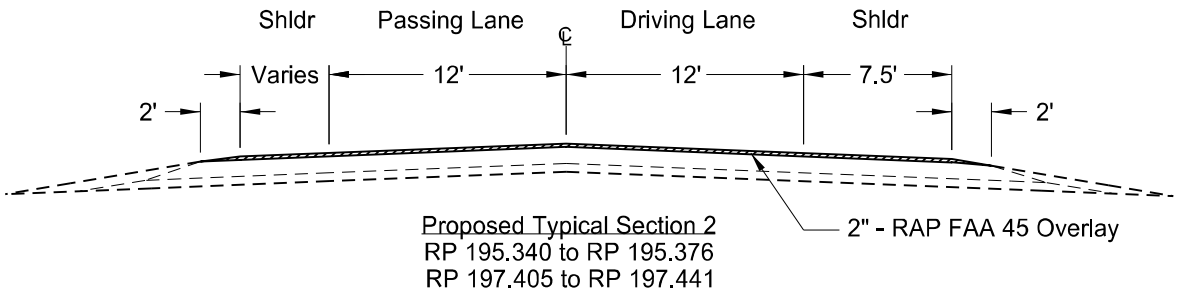
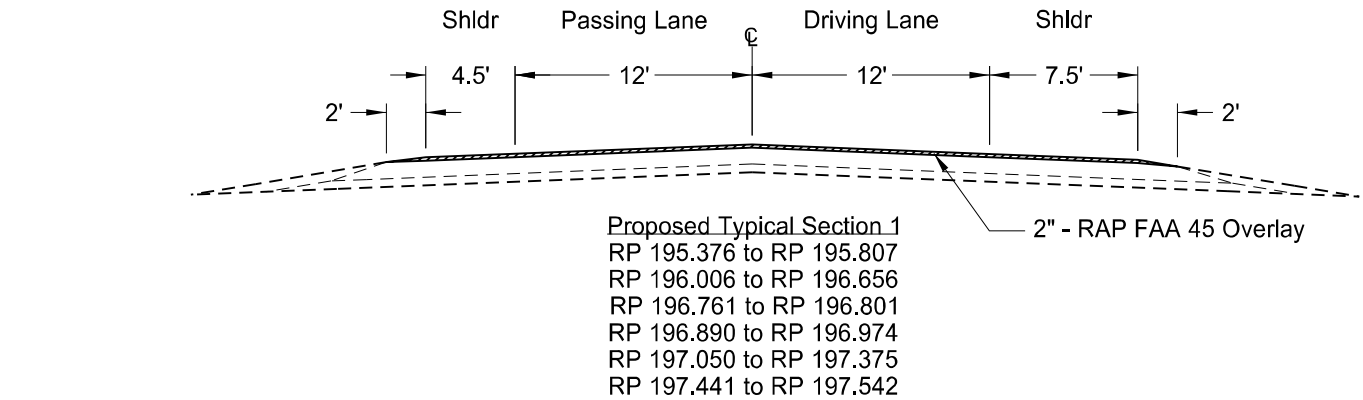
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	30	10



Milling Typical Sections
US Highway 83

Ward County, ND

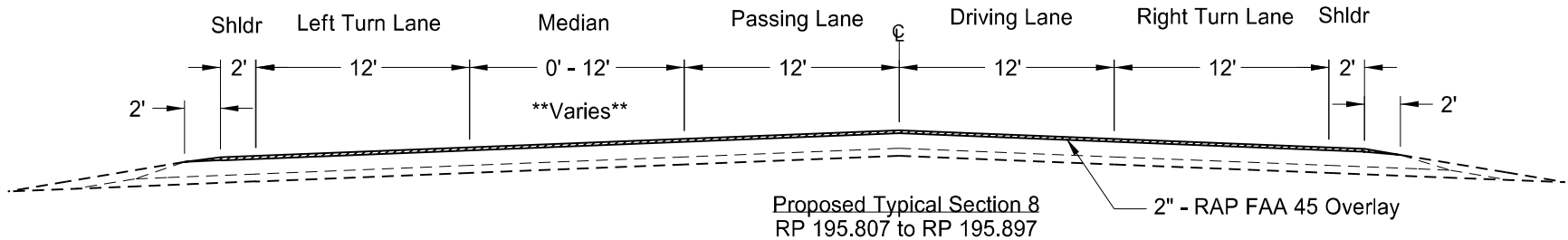
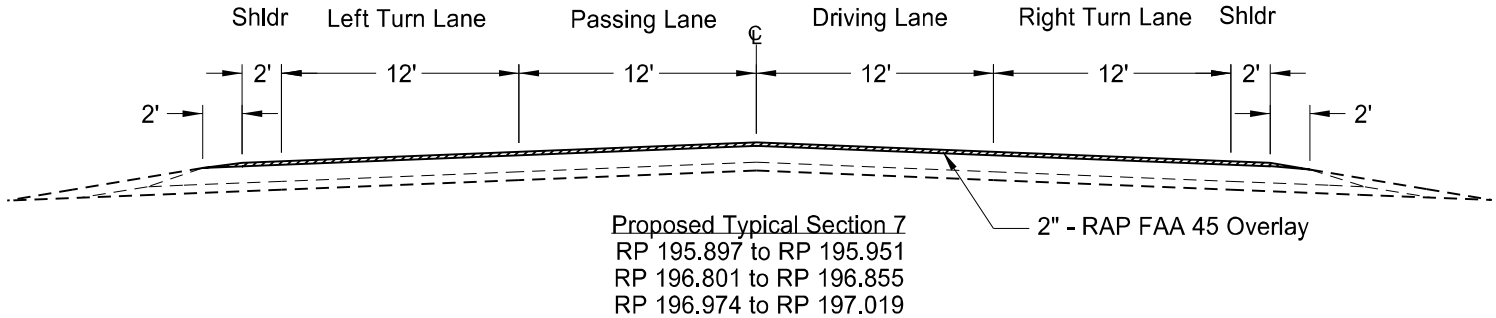
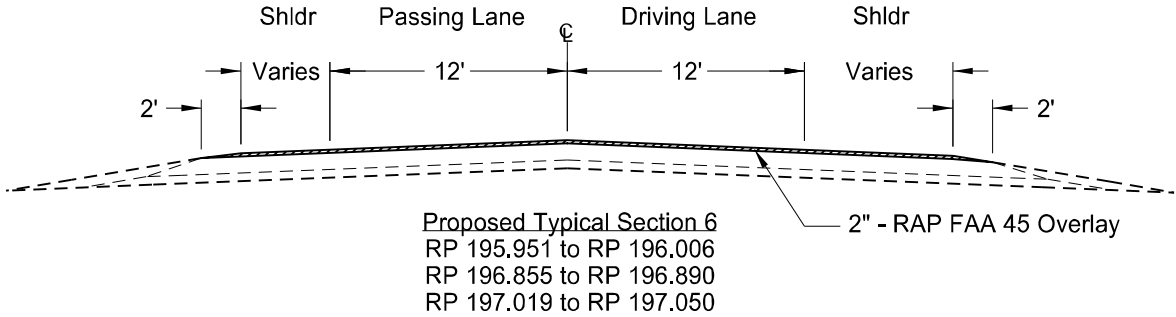
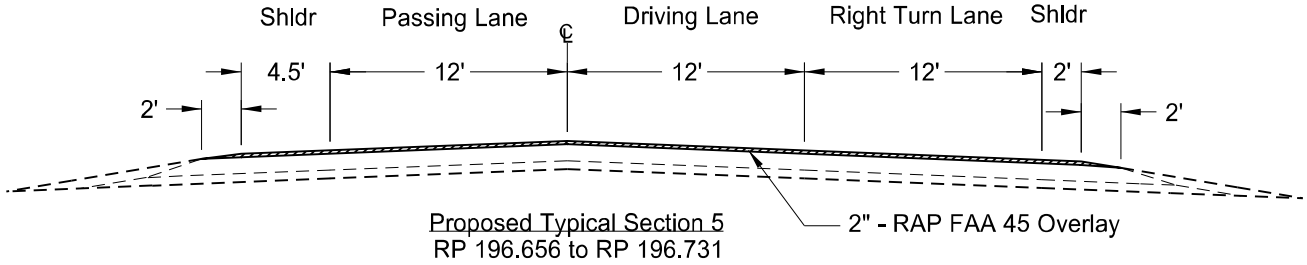
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Proposed Typical Sections
US Highway 83

Ward County, ND

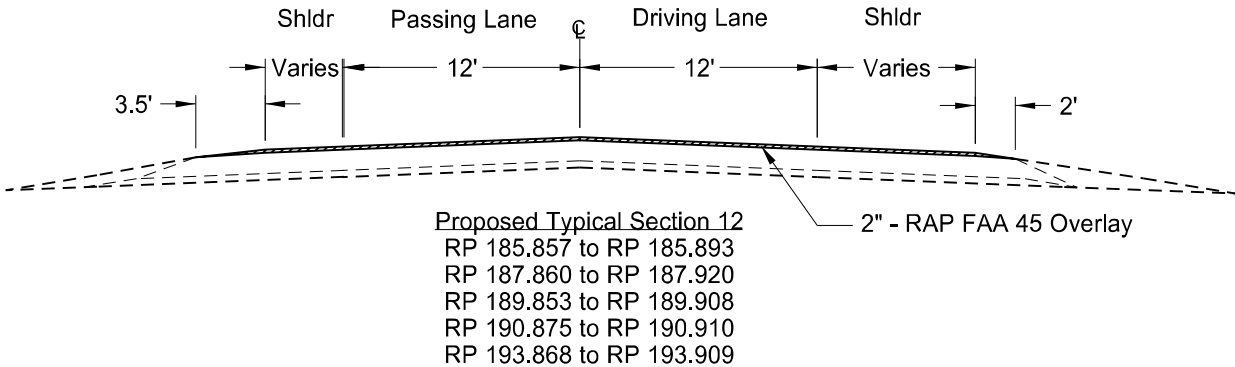
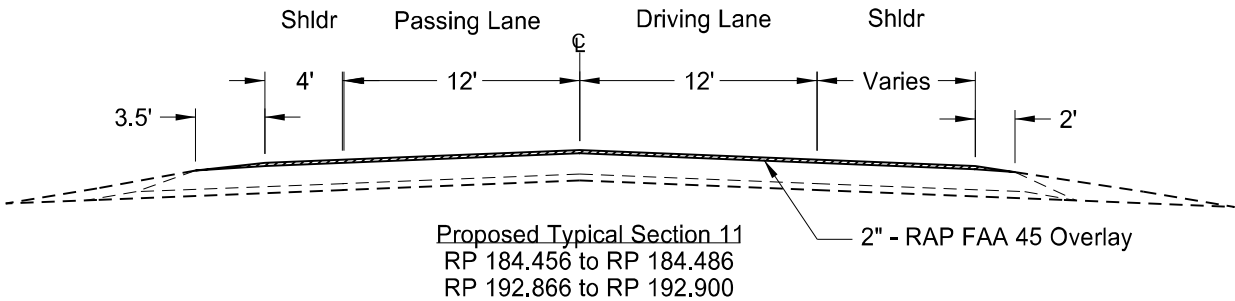
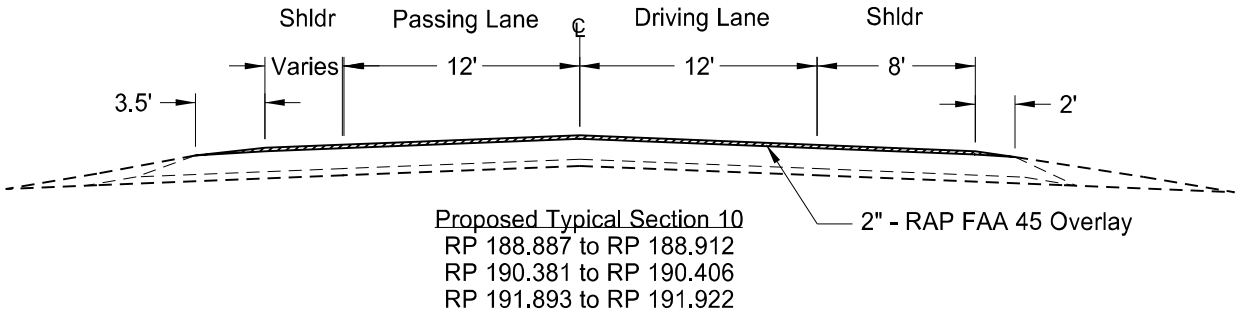
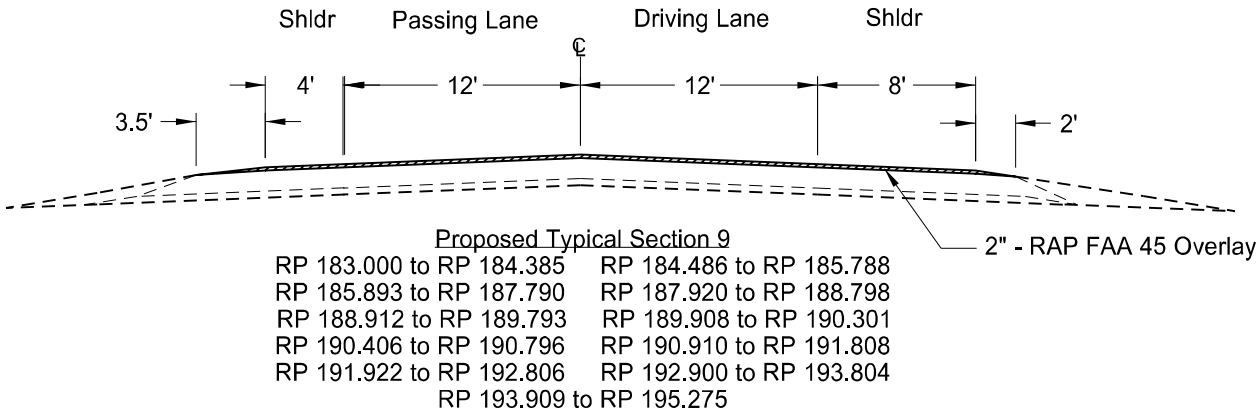
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Proposed Typical Sections
US Highway 83

Ward County, ND

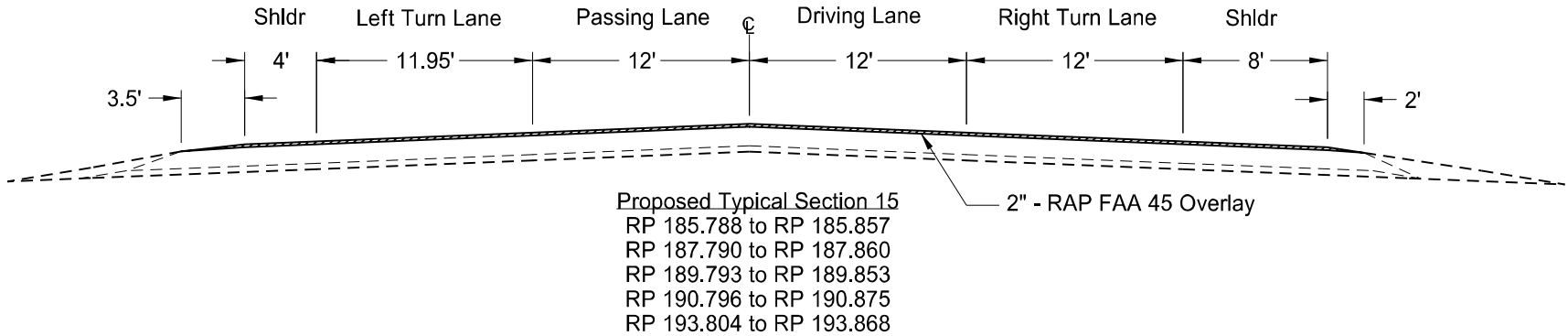
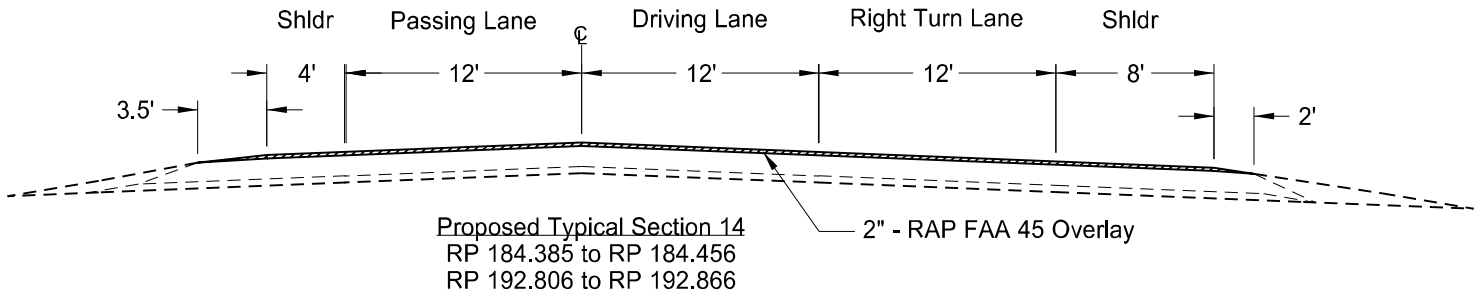
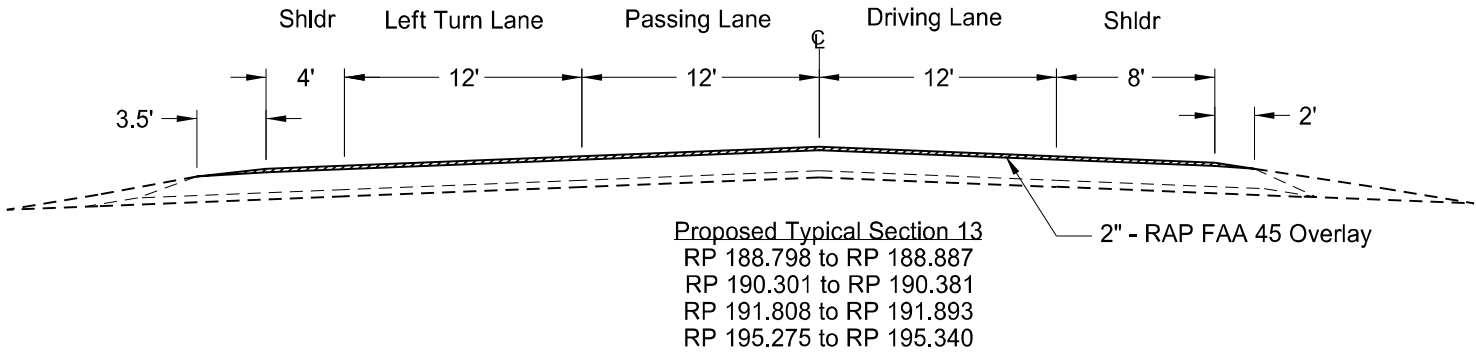
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	30	13



Proposed Typical Sections
US Highway 83

Ward County, ND

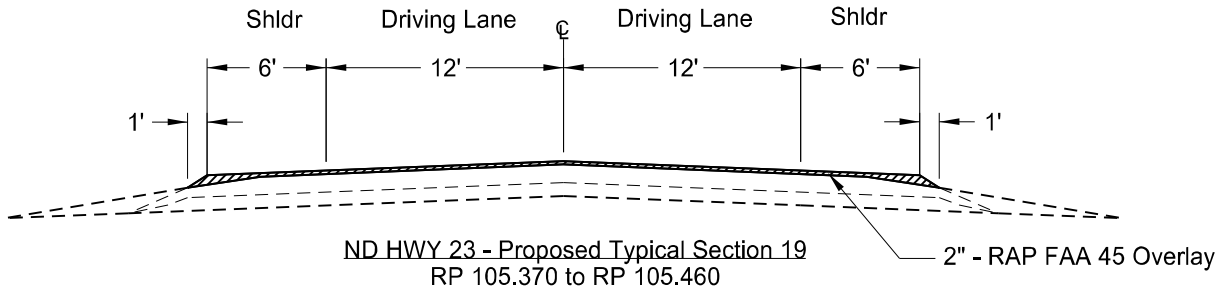
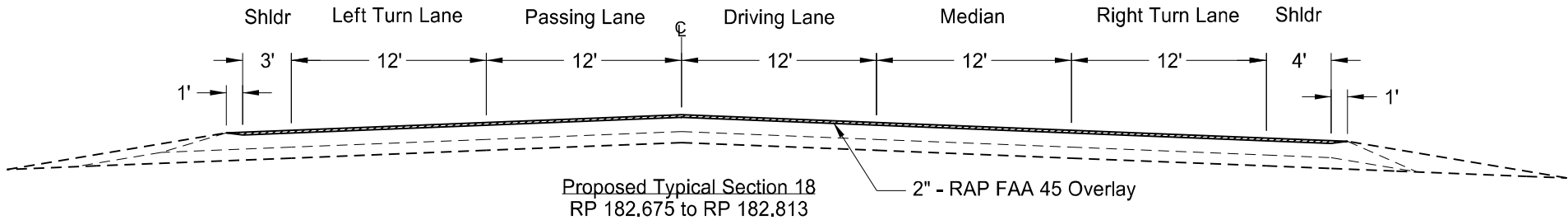
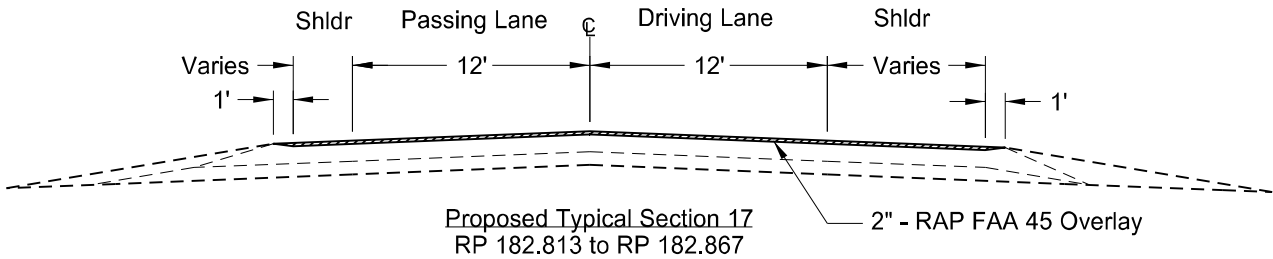
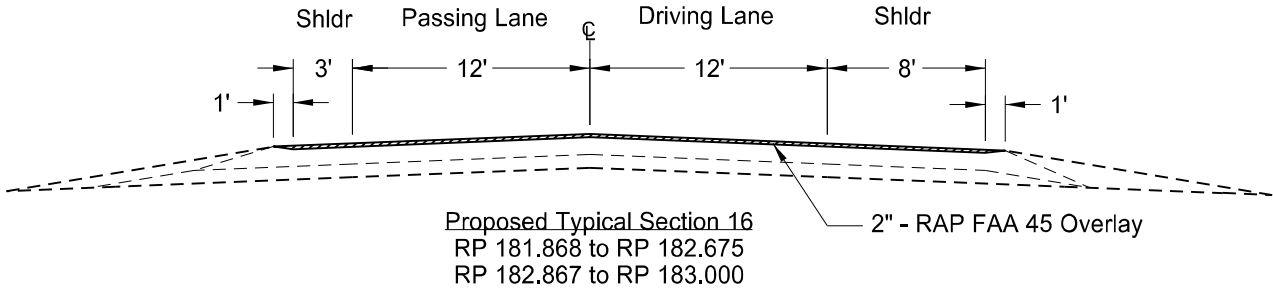
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	ND	NH-4-083(157)181	30	14



Proposed Typical Sections
US Highway 83

Ward County, ND

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	30	15



Proposed Typical Sections
US Highway 83

Ward County, ND

STATE

ND

PROJECT NO.

NH-4-083(157)181

SECTION NO.

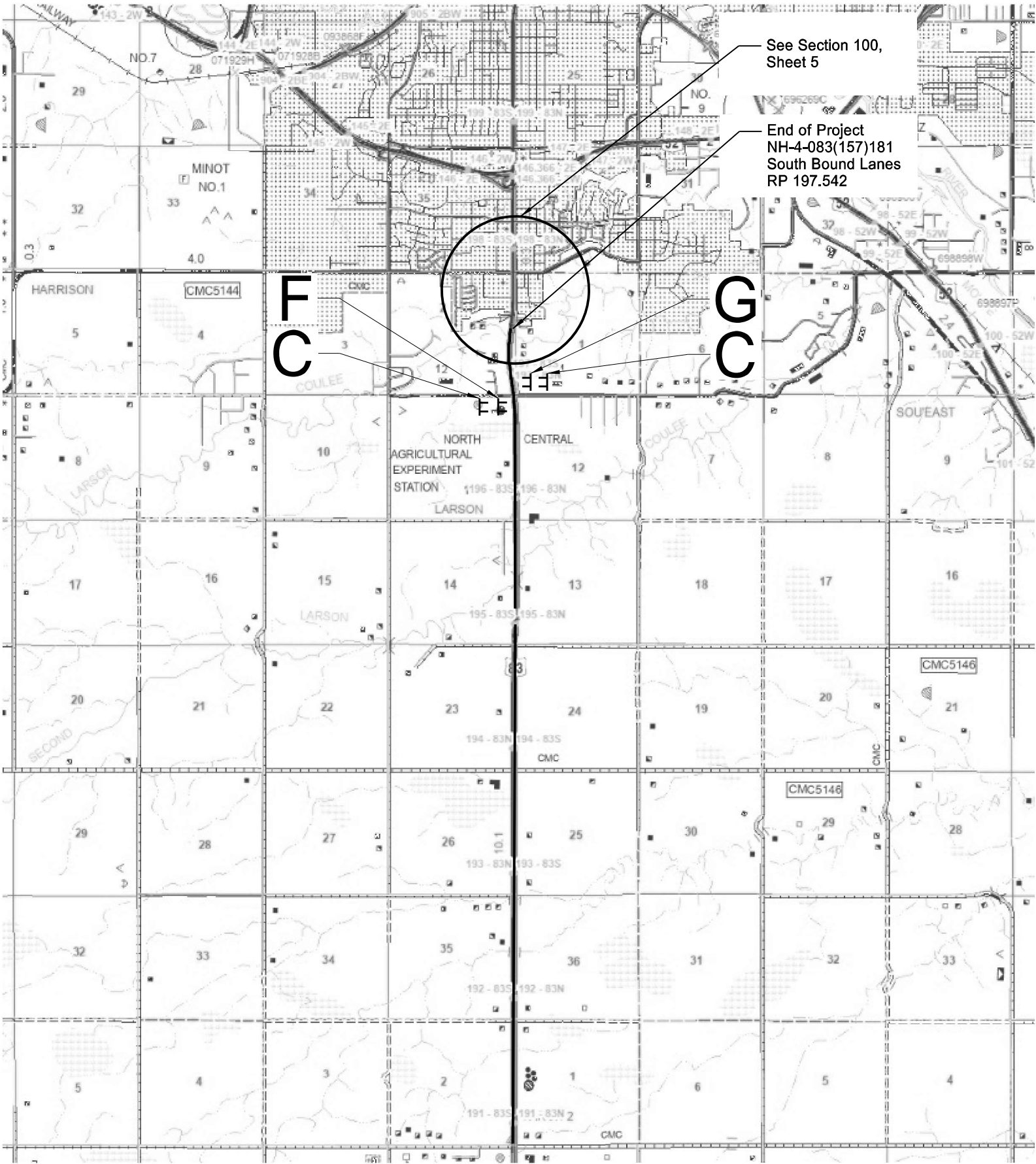
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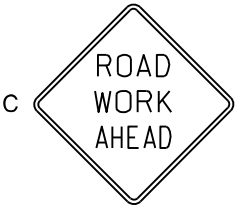
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SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE		35	
G20-1-60	60"x24"	ROAD WORK NEXT __ MILES	2	28	56
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)		18	
G20-2-48	48"x24"	END ROAD WORK	2	26	52
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)		18	
G20-4b-36	36"x30"	WAIT FOR PILOT CAR		18	
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS		43	
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW	8	36	288
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$150 WHEN WORKERS PRESENT	2	59	118
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)		11	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)		10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)		10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)		7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)		7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)		7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)		7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)		7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT		15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)		7	
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)		9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)		9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)		7	
R1-1-48	48"x48"	STOP		32	
R1-2-60	60"x60"	YIELD		29	
R2-1-36	36"x48"	SPEED LIMIT __ (Portable only)	16	30	480
R2-1-48	48"x60"	SPEED LIMIT __		39	
R2-1aP-24	24"x18"	MINIMUM FEE \$150 (Mounted on Speed Limit post)	16	10	160
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-48	48"x60"	DO NOT PASS	6	39	234
R4-7-48	48"x60"	KEEP RIGHT		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)		14	
R7-1-12	12"x18"	NO PARKING ANY TIME		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)		12	
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)		12	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)		15	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)		15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT		35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT		35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT		35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW		26	
W3-1-48	48"x48"	STOP AHEAD		35	
W3-3-48	48"x48"	SIGNAL AHEAD		35	
W3-4-48	48"x48"	BE PREPARED TO STOP	6	35	210
W3-5-48	48"x48"	SPEED REDUCTION AHEAD	6	35	210
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT	4	35	140
W5-1-48	48"x48"	ROAD NARROWS		35	
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE		35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW		35	
W6-3-48	48"x48"	TWO WAY TRAFFIC		35	
W8-1-48	48"x48"	BUMP	8	35	280
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-11-48	48"x48"	UNEVEN LANES	8	35	280
W8-12-48	48"x48"	NO CENTER LINE		35	
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY	8	35	280
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT or _ MILE	4	35	140
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT or _ MILE	4	35	140
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL		35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)		14	
W14-3-64	64"x48"	NO PASSING ZONE		28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)		10	
W20-1-48	48"x48"	ROAD WORK AHEAD or __ FT or _ MILE	14	35	490
W20-2-48	48"x48"	DETOUR AHEAD or __ FT or _ MILE		35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or _ MILE		35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or _ MILE		35	
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or _ MILE	6	35	210
W20-7-48	48"x48"	FLAGGER	6	35	210
W20-8-18	18"x18"	STOP - SLOW PADDLE Back to Back	6	5	30
W20-52P-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)		12	
W21-1-48	48"x48"	WORKERS		35	
W21-2-48	48"x48"	FRESH OIL		35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or _ MILE		35	
W21-5-48	48"x48"	SHOULDER WORK		35	
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED		35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT or _ MILE		35	

SPECIAL SIGNS



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	100	2



W20-1-48



G20-52aR-72



G20-52aL-72

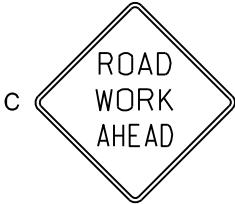
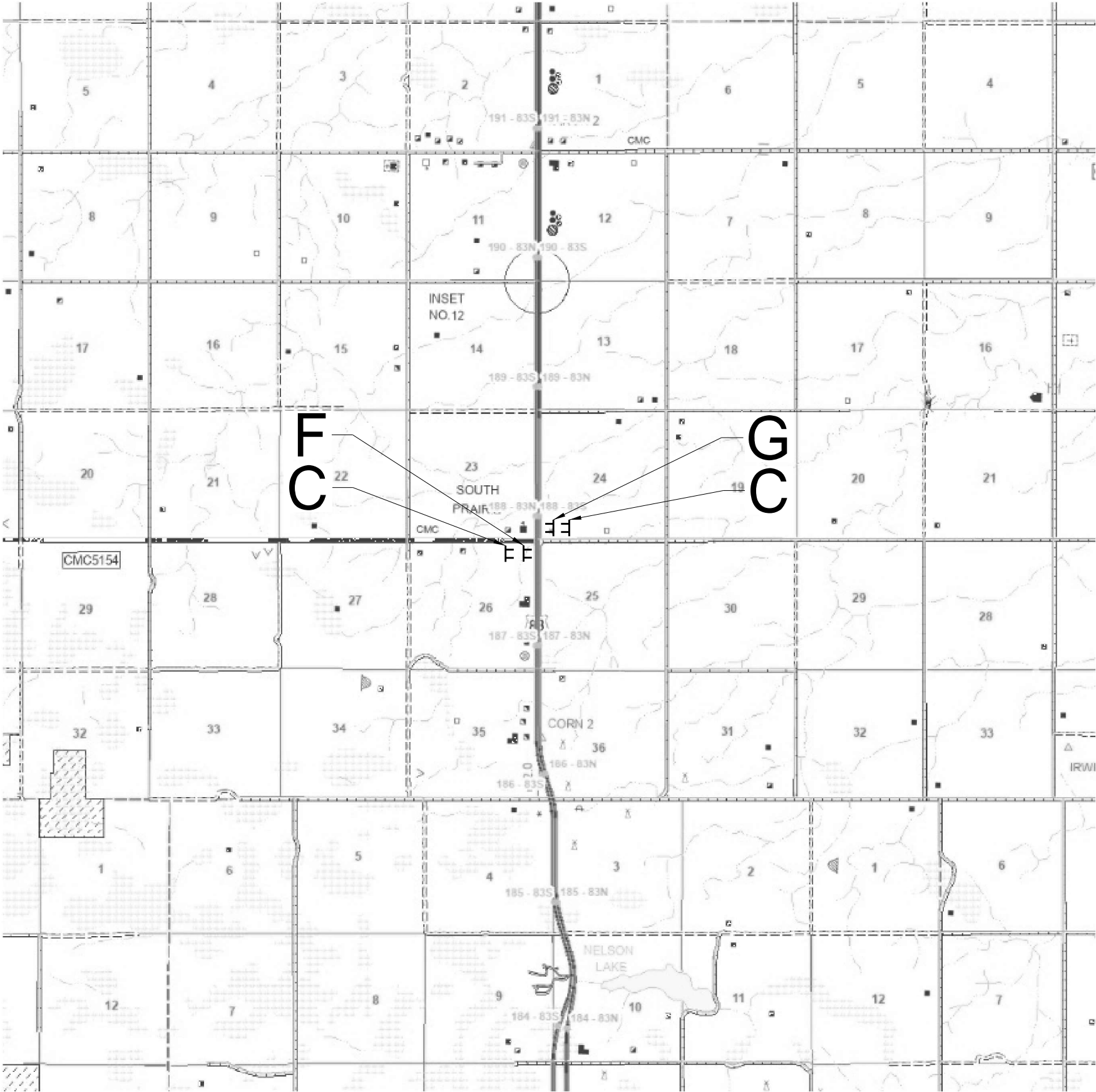
Construction Signage

US Highway 83
South Bound Lane

Ward County, ND



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	100	3



W20-1-48



G20-52aR-72



G20-52aL-72

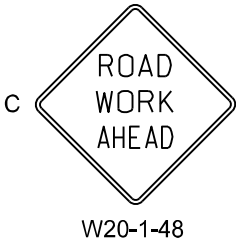
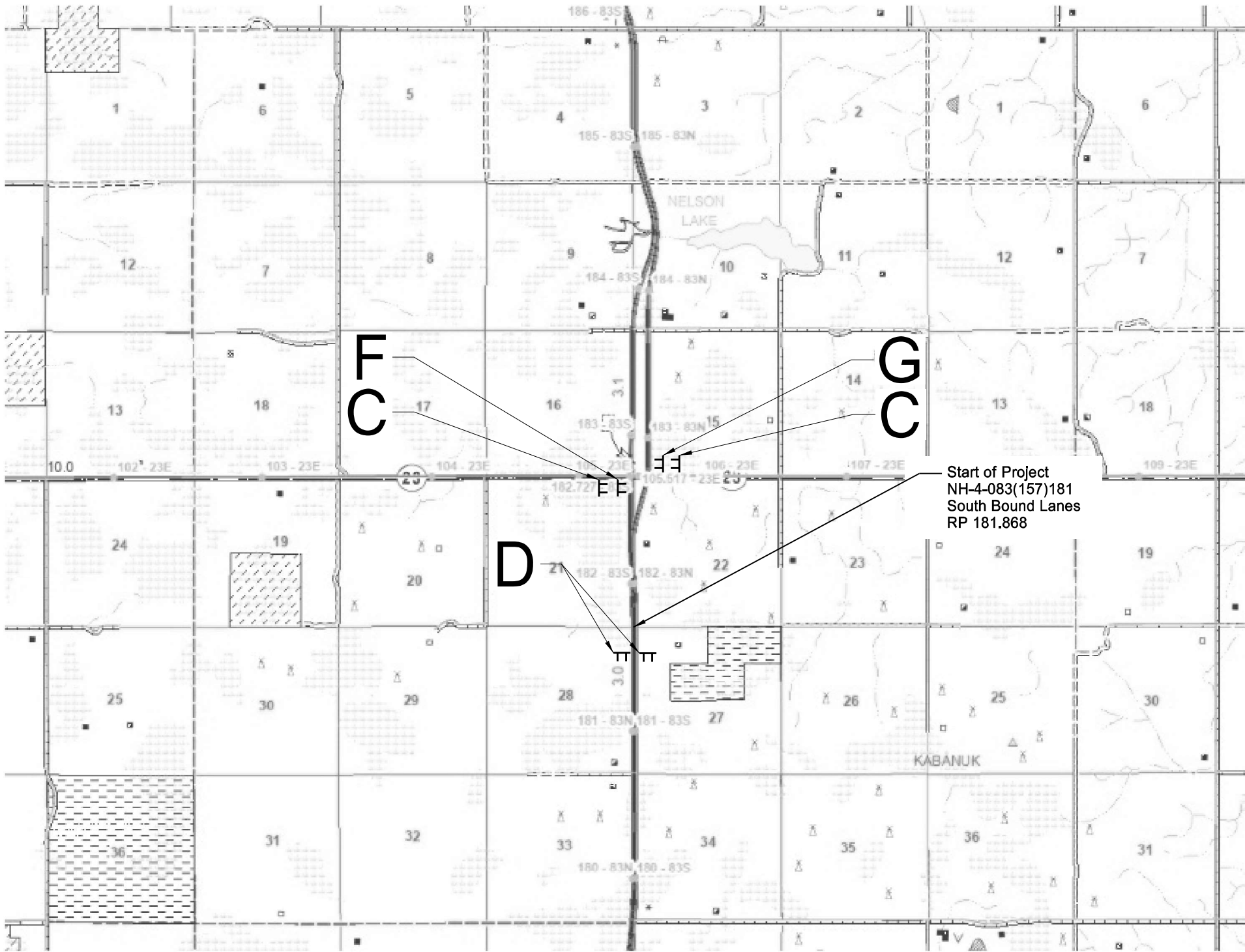
Construction Signage

US Highway 83
South Bound Lane

Ward County, ND



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	100	4



Construction Signage

US Highway 83
South Bound Lane

Ward County, ND

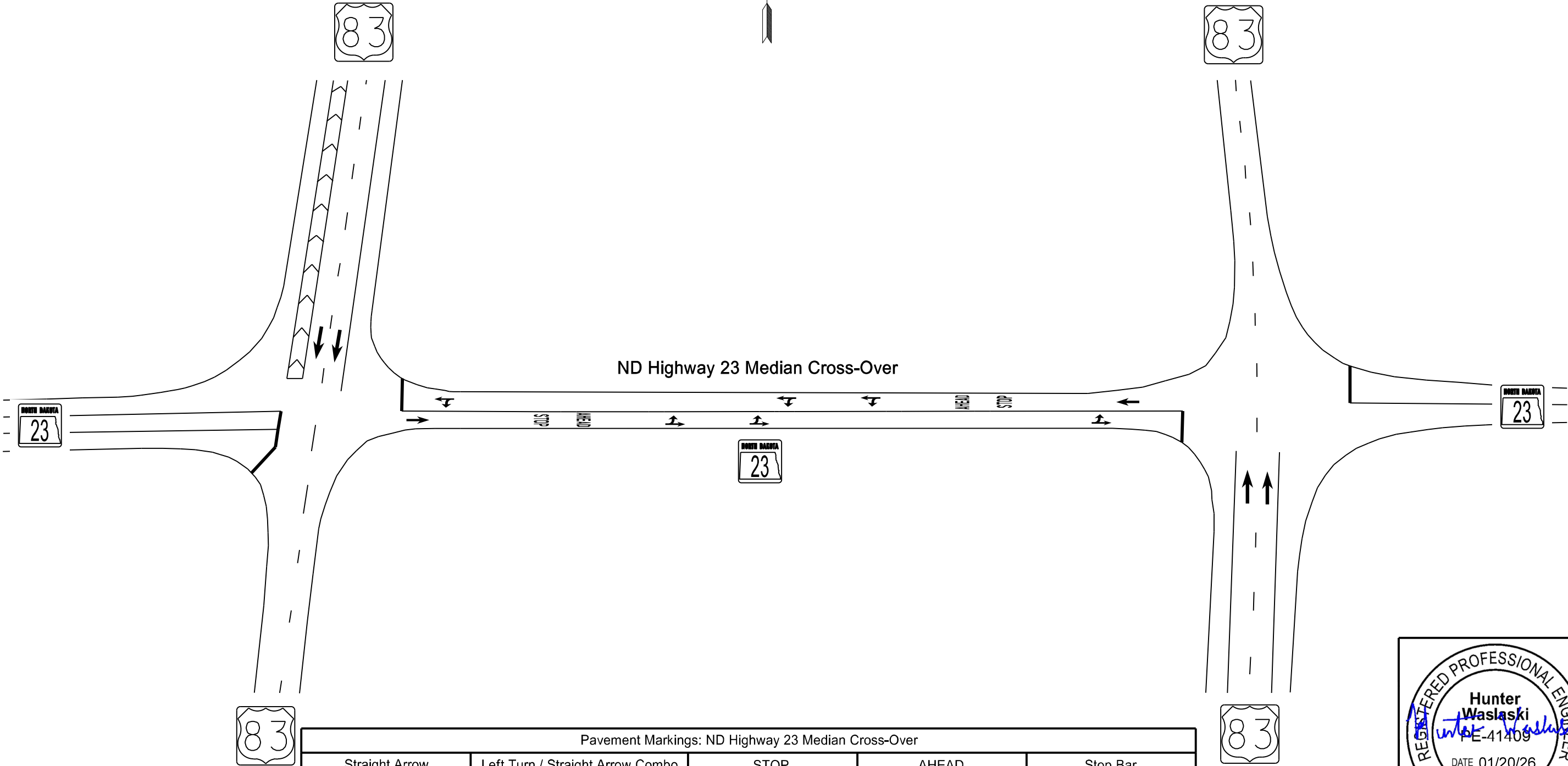




Ward County, ND



	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	NH-4-083(157)181	120	1



Pavement Markings: ND Highway 23 Median Cross-Over				
Straight Arrow	Left Turn / Straight Arrow Combo	STOP	AHEAD	Stop Bar
RP 105.437 - EB Lane	RP 105.443 - WB Lane	RP 105.449 - EB Lane	RP 105.461 - EB Lane	RP 105.437 - EB Lane
RP 105.540 - WB Lane	RP 105.473 - EB Lane	RP 105.534 - WB Lane	RP 105.522 - WB Lane	RP 105.546 - WB Lane
	RP 105.485 - EB Lane			
	RP 105.492 - WB Lane			
	RP 105.504 - WB Lane			
	RP 105.534 - EB Lane			



Pavement Marking Message Detail
US 83/ ND 23
Median Cross-Over

Intersection of US 83 South Bound Lane
Intersection of US 83 North Bound Lane
Intersection of ND 23
Ward County, ND

NDDOT ABBREVIATIONS

D-101-1

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

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REVISIONS	
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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	Rcy	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	PI or $\overline{P}$	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	preformed		
Intmdt	intermediate	Mtd	mounted	Prep	preperation		
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				

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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		
SB	split barrel sample	VG	valley gutter
SH	sprinkler head	Vap	vapor
SV	sprinkler valve	Vert	vertical
Sq	square	VCP	vitrified clay pipe
Stk	stake	Vol	volume
Std	standard	VSFS	vehicle speed feedback sign
N	standard penetration test		
Std Specs	standard specifications	Wkwy	walkway
Stm L	steam line	W	water content
SEC	steel encased concrete	WGV	water gate valve
SMA	stone matrix asphalt	WL	water line
SSD	stopping sight distance	WM	water main
SD	storm drain	WMV	water main valve
St	street	W Mtr	water meter
SPP	structural plate pipe	WSV	water service valve
SPPA	structural plate pipe arch	WW	water well
Str	structure	Wrng	wearing
Subd	subdivision	WIM	weigh in motion
Sub	subgrade	W	west
Sub Prep	subgrade preperation	WB	westbound
Ss	subsoil	Wrng	wiring
SS	supplement specification	W/	with
Supp	supplemental	W/o	without
Surf	surfacing		
Surv	survey		
Sym	symmetrical		

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NDDOT ABBREVIATIONS

D-101-4

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

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

702COM
ACCENT
AGASSIZ WU
AGC
ALL PL
ALL SEAS WU
AMOCO PI
AMRDA HESS
AT&T
B PAW
BAKER ELEC
BASIN ELEC
BEK TEL
BELLE PL
BLM
BNSF
BOEING
BRNS RWD
BURK-DIV ELEC
BURL WRD
CABLE ONE
CABLE SERV
CAP ELEC
CASS CO ELEC
CASS RWU
CAV ELEC
CBLCOM
CENEX PL
CENT PL WATER DIST
CENT PWR ELEC
CENTURYLINK
COE
CONS COMM
CONS TELCOM
CONT RES
CPR
D O E
DAK CARR
DAK CENT TEL
DAK RWD
DGC
DICKY R NET
DICKY WRD
DICKY TEL
DNRR
DOME PL
DVELEC
DVMW
E CENT REG WD
ENBRDG
ENVENTIS
EQUINOR
FALK MNG
FHWA
G FKS-TRL WD
GETTY TRD & TRAN
GLDN W ELEC

702 Communications
Accent Communications
Agassiz Water Users District
Associated General Contractors of America
Alliance Pipeline
All Seasons Water Users District
Amoco Pipeline Company
Amerada Hess Corporation
AT&T Corporation
Bear Paw Energy Incorporated
Baker Electric
Basin Electric Cooperative Incorporated
Bek Communications Cooperative
Belle Fourche Pipeline Company
Bureau of Land Management
Burlington Northern Santa Fe Railway
Boeing
Barnes Rural Water District
Burke-Divide Electric Cooperative
Burleigh County Water Resource District
Cable One
Cable Services
Capital Electric Cooperative Incorporated
Cass County Electric Cooperative
Cass Rural Water Users District
Cavalier Rural Electric Cooperative
Cablecom Of Fargo
Cenex Pipeline
Central Pipe Line Water District
Central Power Electric Cooperative
CenturyLink
Corps of Engineers
Consolidated Communications
Consolidated Telcom
Continental Resource Inc
Canadian Pacific Railway
Department Of Energy
Dakota Carrier Network
Dakota Central Telephone
Dakota Rural Water District
Dakota Gasification Company
Dickey Rural Networks
Dickey County Water Resource District
Dickey Telephone
Dakota Northern Railroad
Dome Pipeline Company
Dakota Valley Electric Cooperative
Dakota, Missouri Valley & Western
East Central Water District
Enbridge Pipelines Incorporated
Enventis Telephone
Equinor Pipeline
Falkirk Mining Company
Federal Highway Administration
Grand Forks-traill Water District
Getty Trading & Transportation
Golden West Electric Cooperative

GTR RAMSEY WD
GT PLNS NAT GAS
HALS TEL
IDEA1
INT-COMM TEL
KANEB PL
KEM ELEC
KOCH GATH SYS
LKHD PL
LWR YELL R ELEC
LUMEN
MCKNZ CON
MCKNZ ELEC
MCKNZ WRD
MCLEOD
MCLN ELEC
MCLN-SHRDN R WAT
MDU
MIDCO
MIDSTATE TEL
MINOT CABLE
MINOT TEL
MISS VALL COMM
MISS W W S
MNKOTA PWR
MOR-GRAN-SOU ELEC
MOUNT-WILLI ELEC
MLGC
MUNICIPAL
MUNICIPAL
N CENT ELEC
N PRAIR REG WD
ND PKS & REC
ND TEL
NDDOT
NE REG WD
NDSU SOIL SCI DEPT
NEMONT TEL
NODAK R ELEC
NOON FRMS TEL
NPR
NSP
NTHN BRDR PL
NTHN PLNS ELEC
NTHWSTRN REF
NW COMM
NWRWD
ONEOK
OSHA
OTTR TL PWR
PAAP
P L E M
POLAR COM
PVT ELEC
QWEST
R&T REG WD

Greater Ramsey Water District
Great Plains Natural Gas Company
Halstad Telephone Company
Idea1
Inter-Community Telephone Company
Kaneb Pipeline Company
Kem Electric Cooperative Incorporated
Koch Gathering Systems Incorporated
Lakehead Pipeline Company
Lower Yellowstone Rural Electric
Lumen Technologies Incorporated
McKenzie Consolidated Telcom
McKenzie Electric Cooperative
McKenzie County Water Resource District
McLeod USA
McLean Electric Cooperative
McLean-Sheridan Rural Water District
Montana-dakota Utilities
MidContinent Communications
Midstate Telephone Company
Minot Cable Television
Minot Telephone Company
Missouri Valley Communications Incorporated
Missouri West Water System
Minnkota Power
Mor-gran-sou Electric Cooperative
Mountrail-williams Electric Cooperative
Moore & Liberty - Griggs County
City Water And Sewer
City Of '.....'
North Central Electric Cooperative
North Prairie Regional Water District
North Dakota Parks And Recreation
North Dakota Telephone Company
North Dakota Department of Transportation
Northeast Regional Water District
NDSU Soil Science Department
Nemont Telephone
Nodak Rural Electric Cooperative
Noonan Farmers Telephone Company
Northern Plains Railroad
Northern States Power
Northern Border Pipeline
Northern Plains Electric Cooperative Incorporated
Northwestern Refinery Company
Northwest Communication Cooperation
Northwest Rural Water District
Oneok gas
Occupational Safety and Health Administration
Otter Tail Power Company
Plains All American Pipeline
Praieliands Energy Marketing
Polar Communications
Private Electric
Qwest Communications
R & T Water District

RED RIV COMM
RESVTN TEL
ROBRTS TEL
R-RIDER ELEC
RRVW
S CENT REG WD
SE W U
SCOTT CABLE
SHERDN ELEC
SHEYN VLY ELEC
SKYTECH
SLOPE ELEC
SOURIS RIV TELCOM
ST WAT COMM
STATE LN WATER
STER ENG
STUT RWD
SW PL PRJ
SWWA
SUNOCO
T M C
TCI
TESORO GHG PLNS PL
TRI-CNTY WU
TRL CO WRD
UNTD TEL
UPPR SOUR WD
US SPRINT
USAF MSL CABLE
USFWS
USW COMM
VRNDRY ELEC
W RIV TEL
WAPA
WAWSA
WEB
WILLI WRD
WILSTN BAS PL
WLSH RWD
WOLVRTN TEL
XLENER
YSVR

Red River Communications
Reservation Telephone
Roberts Company Telephone
Roughrider Electric Cooperative
Red River Valley & Western Railroad
South Central Regional Water District
Southeast Water Users Incorporated
Scott Cable Television Dickinson
Sheridan Electric Cooperative
Sheyenne Valley Electric Cooperative
Skyland Technologies Incorporated
Slope Electric Cooperative Incorporated
Souris River Telecommunications
State Water Commission
State Line Water Cooperative
Sterling Energy
Stutsman Rural Water District
Southwest Pipeline Project
Southwest Water Authority
Sunoco LP
Turtle Mountain Communications
TCI of North Dakota
Tesoro High Plains Pipeline
Tri-County Water Users Incorporated
Traill County Water Resource District
United Telephone
Upper Souris Water District
U.S. Sprint
U.S.A.F. Missile Cable
US Fish and Wildlife Service
U.S. West Communications
Verendrye Electric Cooperative
West River Telephone Incorporated
Western Area Power Administration
Western Area Water Supply Authority
W. E. B. Water Development Association
Williams County Water Resource District
Williston Basin Interstate Pipeline Company
Walsh Water Rural Water District
Wolverton Telephone
Xcel Energy
Yellowstone Valley Railroad

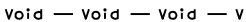
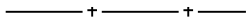
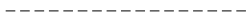
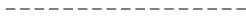
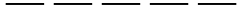
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE
04-23-18 09-20-18 12-18-20 08-16-22 04-14-25	General Revisions General Revisions General Revisions General Revisions General Revisions

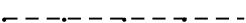
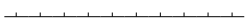
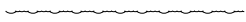
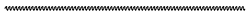
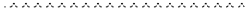
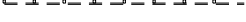
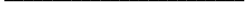


LINE STYLES

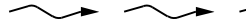
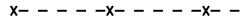
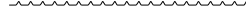
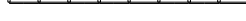
D-101-20

Existing Topography

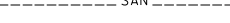
	Existing Ground Void
	Existing Cemetery Boundary
	Existing Box Culvert Bridge
	Existing Concrete Surface
	Existing Drainage Structure
	Existing Gravel Surface
	Existing Riprap
	Existing Dirt Surface
	Existing Asphalt Surface
	Existing Tie Point Line
	Existing Railroad Centerline
	Existing Guardrail Cable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

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

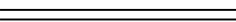
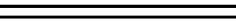
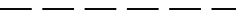
Proposed Topography

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

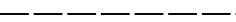
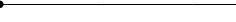
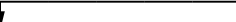
Existing Utilities

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

Proposed Utilities

	24 Inch Pipe
	Reinforced Concrete Pipe
	Under Drain
	Edge Drain

Traffic Utilities

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

Sign Structures

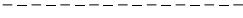
	Existing Overhead Sign Structure
	Existing Overhead Sign Structure Cantilever
	Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		
07-01-14 REVISIONS		
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		12 18 2020

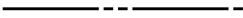
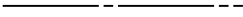
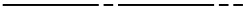
LINE STYLES

D-101-21

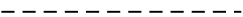
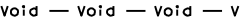
Right Of Way

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

Boundary Control

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

Cross Sections and Typicals

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

Geotechnical

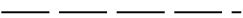
	Geotextile Fabric Type D
	Geogrid
	Geotextile Fabric Type R
	Geotextile Fabric Type R1
	Geotextile Fabric Type RR
	Geotextile Fabric Type S

	Subgrade Reinforcement
	Failure Line

Countours

	Depression Contours
	Supplemental Contour

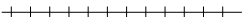
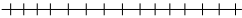
Profile

	Subgrade, Subcut or Ditch Grade
	Topsoil Profile

Striping

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

Pavement Joints

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

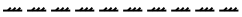
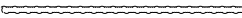
Bridge Details

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

Erosion Control

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

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REGISTERED

PROFESSIONAL

PE-4683

ENGINEER

NORTH DAKOTA

12 18 2020

SYMBOLS

D-101-30



North Arrow (Half Scale)

Alignment Data Point

Alignment Monument

Spot Elevation

Existing Miscellaneous Spot

Existing Access Control Arrow

Existing Benchmark

Reset USGS Marker

Iron Monument Found

Iron Pin R/W Monument

Property Corner

Iron Pin Reference Monument

Right of Way Marker (Exst, Ppsd, Reset)

Existing Federal Reference Corner

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

Existing Witness Corner

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

Existing Traverse PI Aerial Panel

Existing Reference Marker Point NGS

Existing EFB Misc

Existing Bush or Shrub

Existing Large Evergreen Tree

Existing Small Evergreen Tree

Existing Large Tree

Existing Small Tree

Existing Tree Trunk

Cairn or Stone Circle

Existing Artifact

Existing Satellite Dish

Existing Weather Station

Existing Windmill or Tower

Reinforced Pavement

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	
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PE-4683

ENGINEER

NORTH DAKOTA

12 18 2020

SYMBOLS

D-101-31

	Flexible Delineator		Highway Sign (Exst, Ppsd)
	Flexible Delineator Type A (Exst, Ppsd)		Mile Post Type A (Exst-Ppsd-Reset)
	Flexible Delineator Type B (Exst, Ppsd)		Mile Post Type B (Exst, Ppsd)
	Flexible Delineator Type C (Exst, Ppsd)		Mile Post Type C (Exst, Ppsd)
	Flexible Delineator Type D (Exst, Ppsd)		Object Marker Type I (Exst, Ppsd)
	Flexible Delineator Type E (Exst, Ppsd)		Object Marker Type II (Exst, Ppsd)
	Delineator Type A (Exst, Ppsd, Diamond Grade-Reset)		Object Marker Type III (Exst, Ppsd)
	Delineator Type B (Exst, Ppsd, Diamond Grade-Reset)		Existing Reference Marker
	Delineator Type C (Exst, Ppsd, Diamond Grade)		Road Closure Gate 18 Ft (Exst, Ppsd)
	Delineator Type D (Exst, Ppsd, Diamond Grade)		Road Closure Gate 28 Ft (Exst, Ppsd)
	Delineator Type E (Exst, Ppsd, Diamond Grade)		Road Closure Gate 40 Ft (Exst, Ppsd)
	Barricade (Type I, Type II, Type III)		Existing Railroad Battery Box
	Arrow Panel (Caution Mode, Double Direction, Left Directional, Right Directional, Sequencing, Truck Mounted)		Existing RR Profile Spot
	Attenuation Device		Existing Railroad Crossbuck
	Truck Mounted Attenuator		Existing Railroad Frog
	Delineator Drums		Existing Mailbox (Private, Federal)
	Flagger		
	Tubular Marker		
	Traffic Cone		
	Back to Back Vertical Panel Sign		

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SYMBOLS

D-101-32

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

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

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

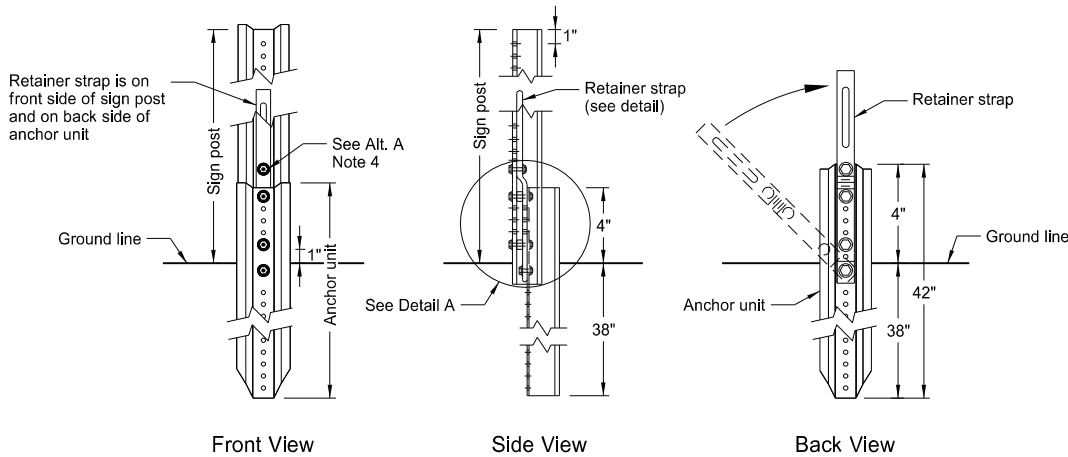
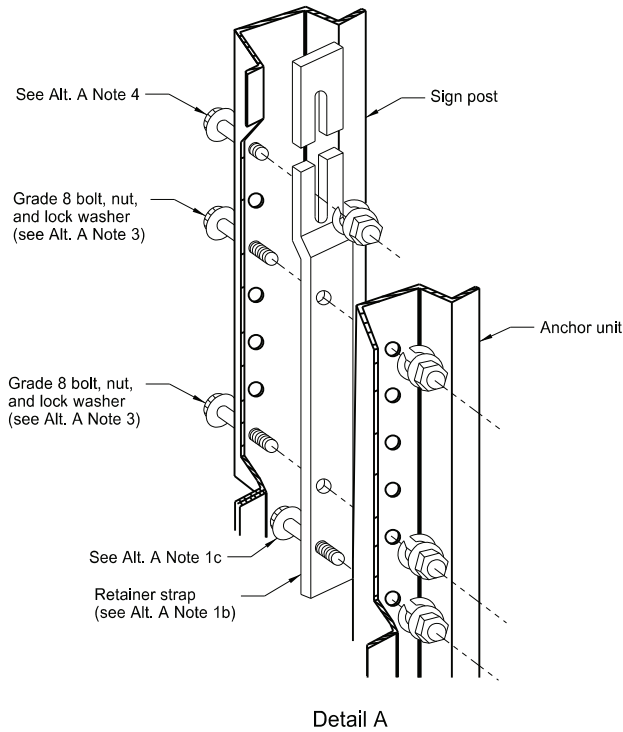
KIRK J. HOFF
REGISTERED
PROFESSIONAL
PE-4683
ENGINEER
NORTH DAKOTA
12 18 2020



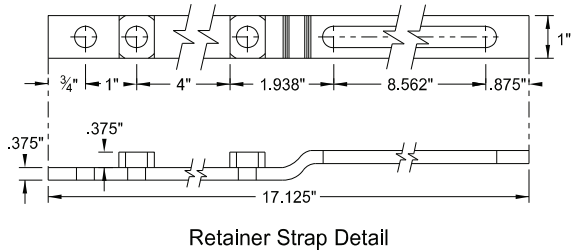
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post

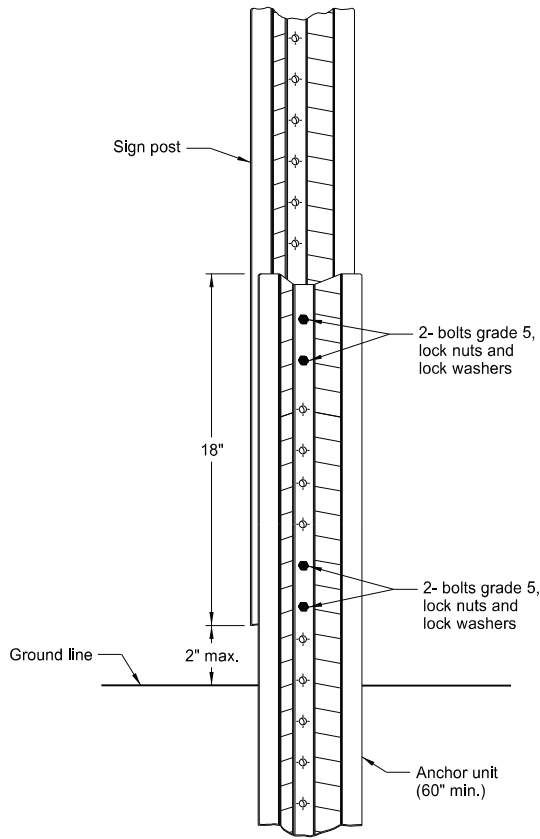


Breakaway U-Channel Detail
Alternate A
Install a maximum of 2 posts within 7'.

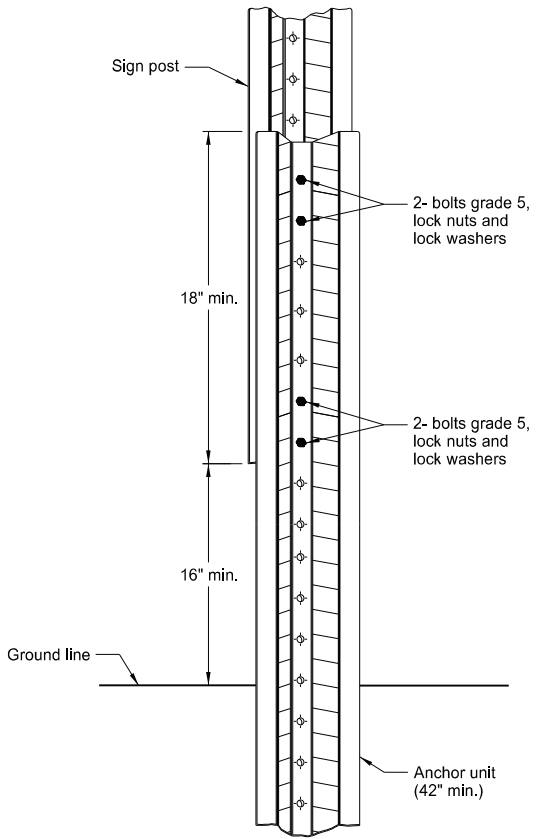


Alternate A Steps of Installation:

- 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.



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'.

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

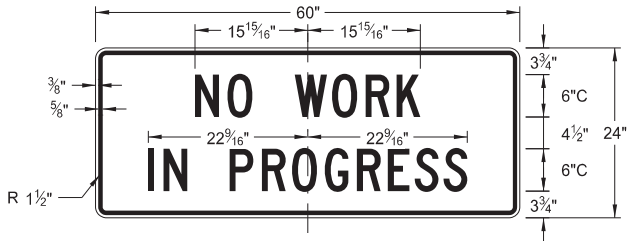


08/01/24

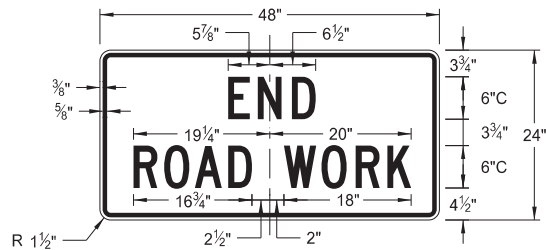
CONSTRUCTION SIGN DETAILS
TERMINAL AND GUIDE SIGNS



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



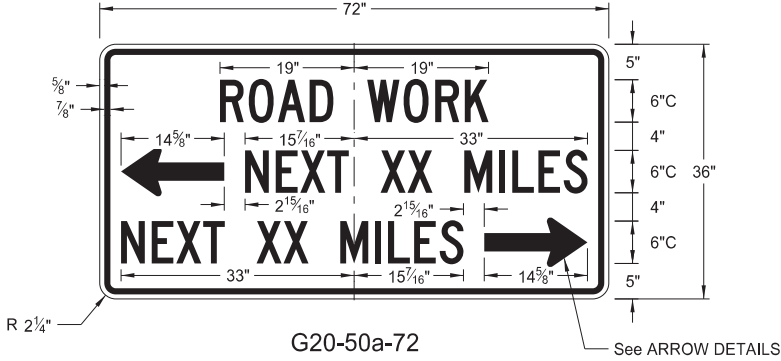
G20-1b-60
Legend: black (non-refl)
Background: orange



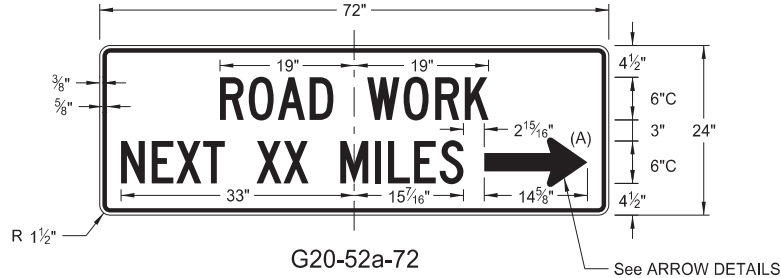
G20-2-48
Legend: black (non-refl)
Background: orange



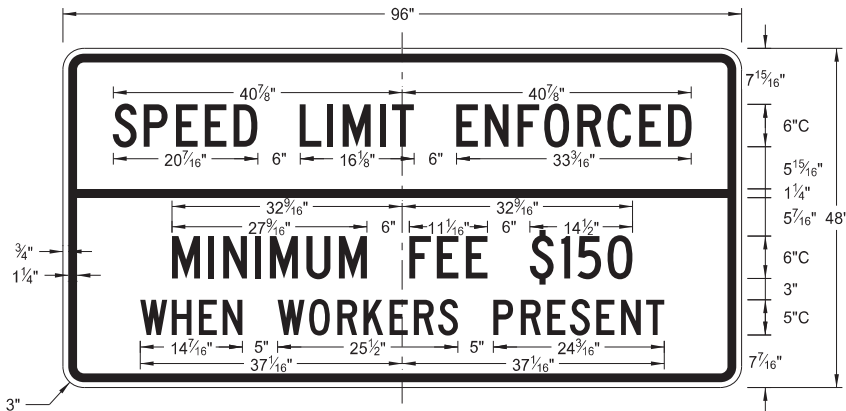
G20-4b-36
Legend: black (non-refl)
Background: orange



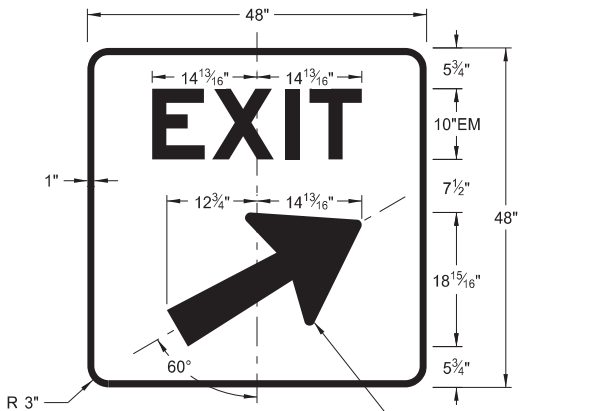
G20-50a-72
Legend: black (non-refl)
Background: orange



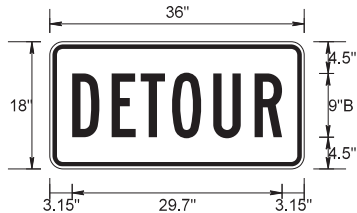
G20-52a-72
Legend: black (non-refl)
Background: orange



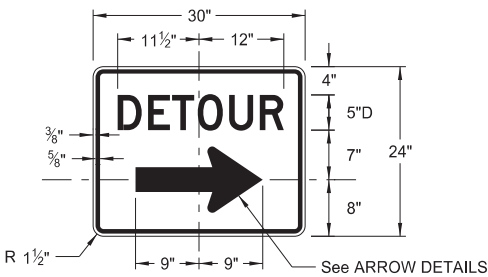
G20-55-96
Legend: black (non-refl)
Background: orange



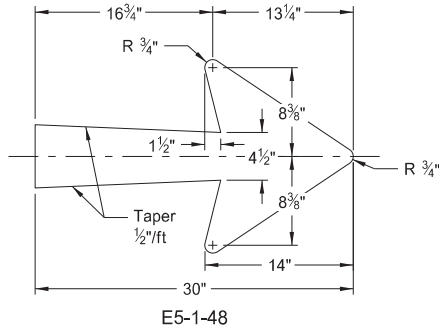
E5-1(L or R)-48
Legend: white
Background: green (orange optional)



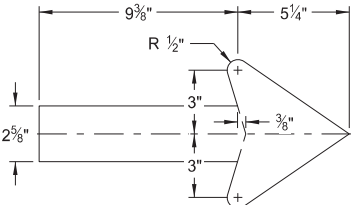
M4-8-36
Legend: black (non-refl)
Background: orange



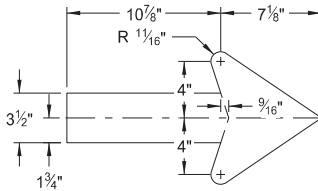
M4-9(L or R)-30 &
M4-9-30
Legend: black (non-refl)
Background: orange



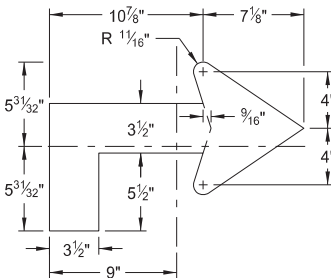
E5-1-48



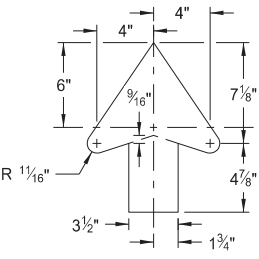
G20-50a-72
G20-52a-72



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:

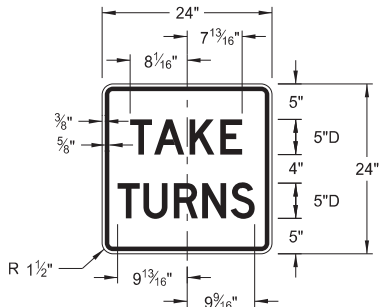
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

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

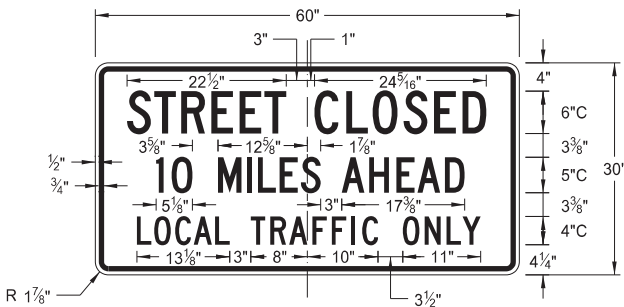


CONSTRUCTION SIGN DETAILS
REGULATORY SIGNS

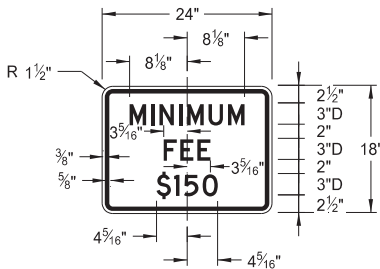
D-704-10



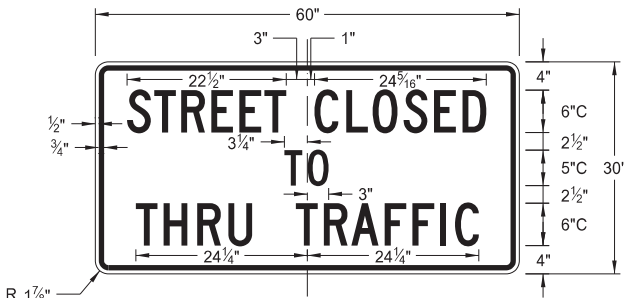
R1-50P-24
Legend: black (non-refl)
Background: white



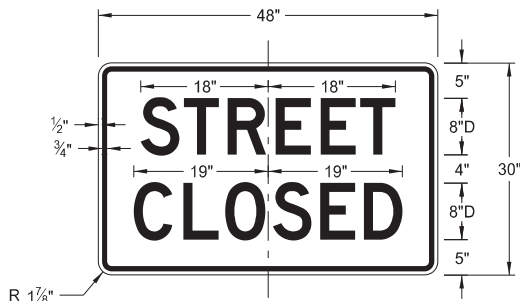
R11-3c-60
Legend: black (non-refl)
Background: white



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

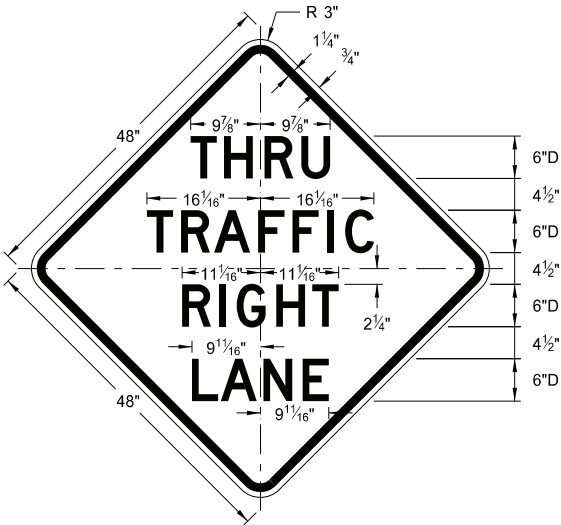
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
08-17-17	Revised sign number
10-03-19	New Design Engineer PE Stamp
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



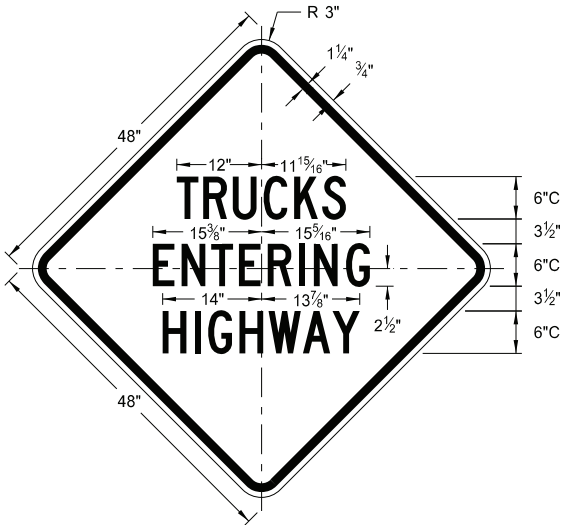
CONSTRUCTION SIGN DETAILS
WARNING SIGNS

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

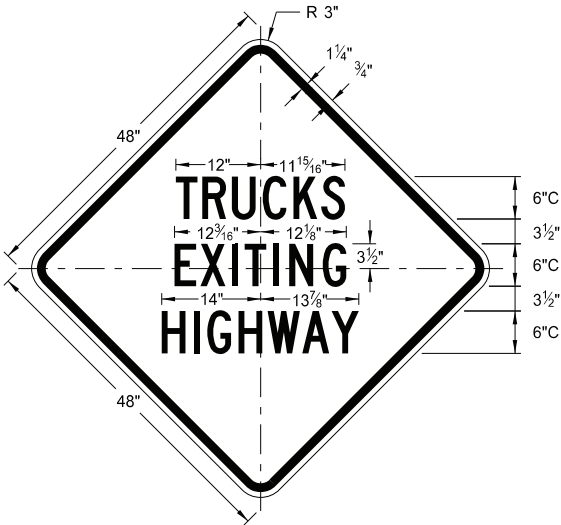
* DISTANCE MESSAGES



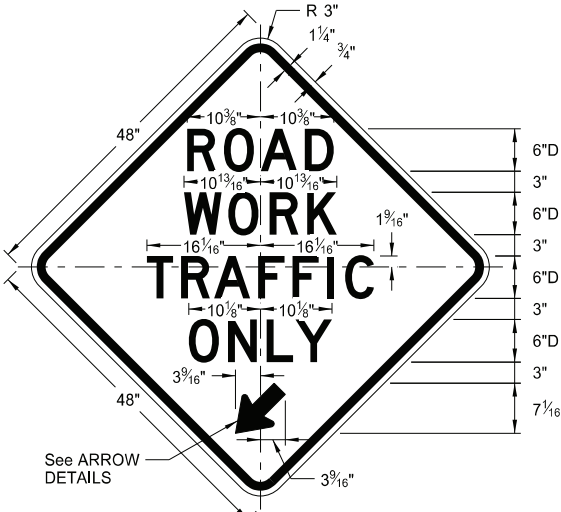
W5-8-48
Legend: black (non-refl)
Background: orange



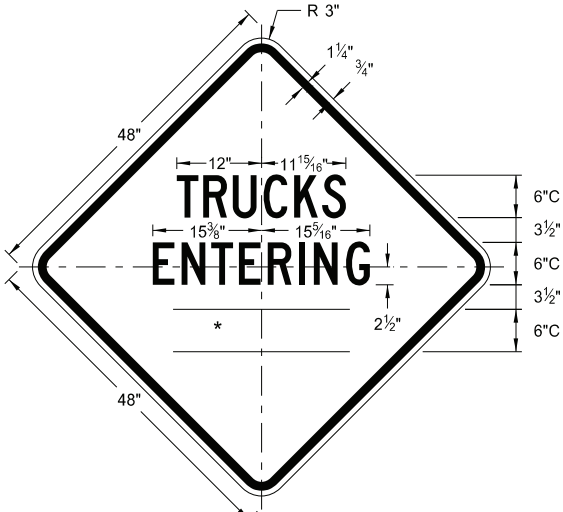
W8-53-48
Legend: black (non-refl)
Background: orange



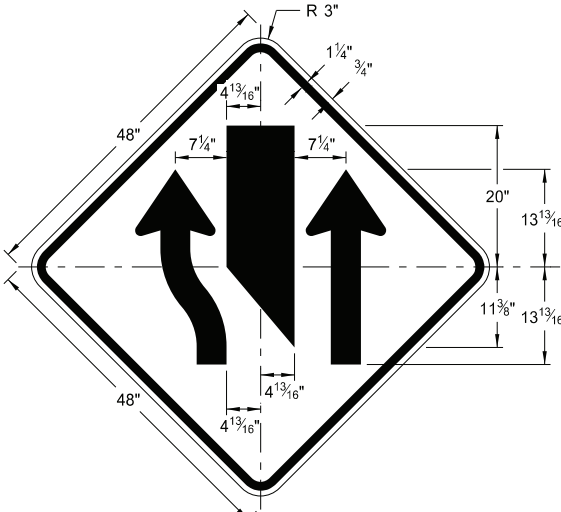
W8-56-48
Legend: black (non-refl)
Background: orange



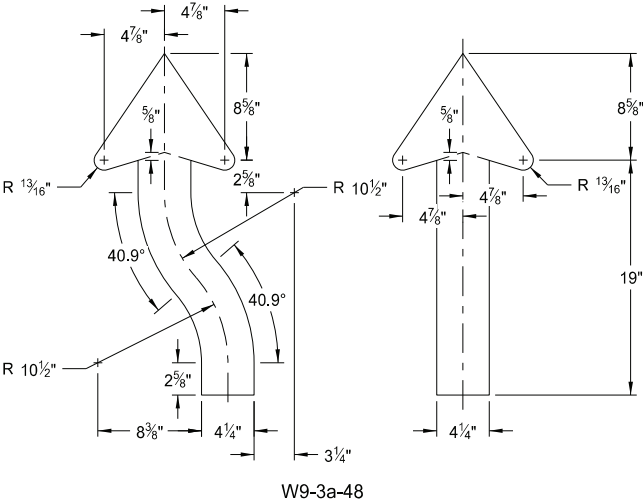
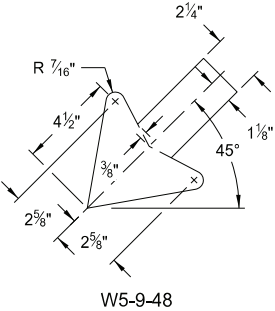
W5-9-48
Legend: black (non-refl)
Background: orange



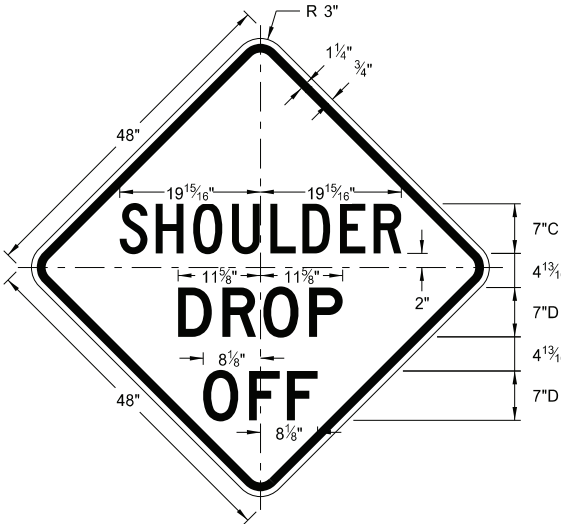
W8-54-48
Legend: black (non-refl)
Background: orange



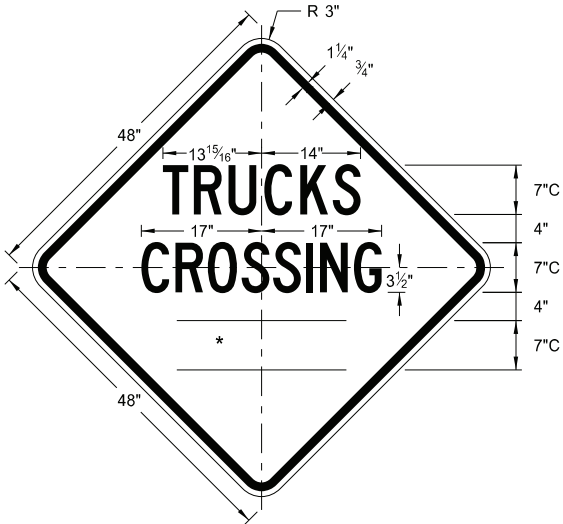
W9-3a-48
Legend: black (non-refl)
Background: orange



ARROW DETAILS



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



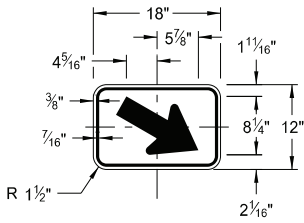
W8-55-48
Legend: black (non-refl)
Background: orange

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

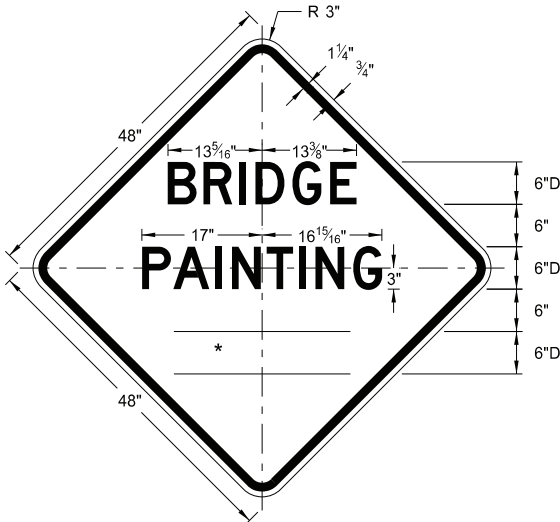


08/01/24

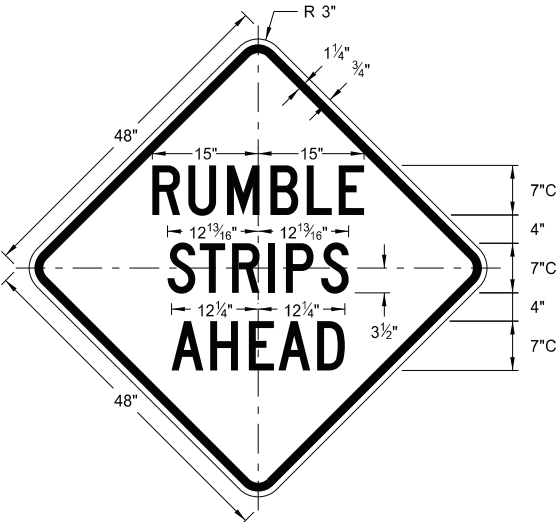
CONSTRUCTION SIGN DETAILS
WARNING SIGNS



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



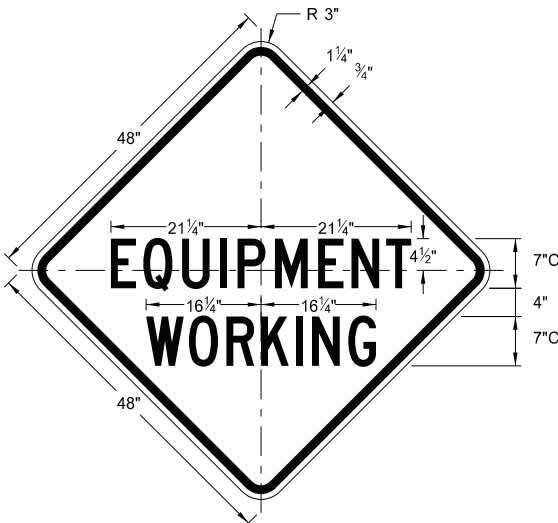
W21-50-48
Legend: black (non-refl)
Background: orange



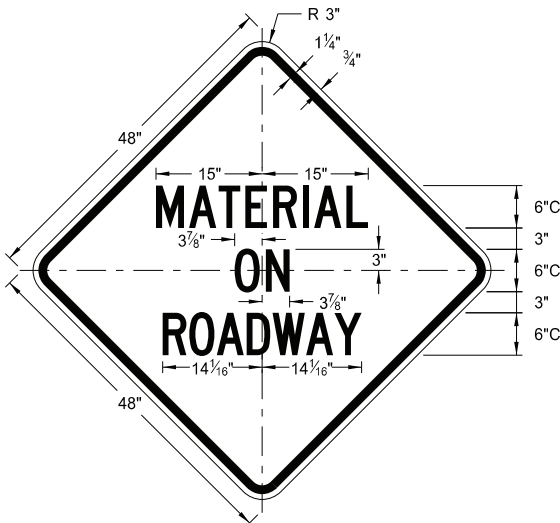
W21-53-48
Legend: black (non-refl)
Background: orange

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

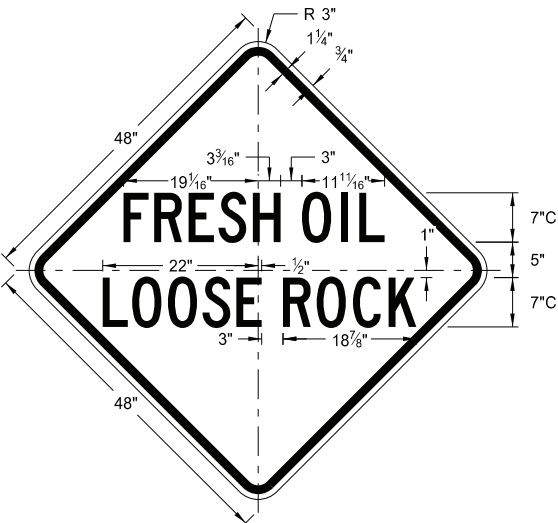
* DISTANCE MESSAGES



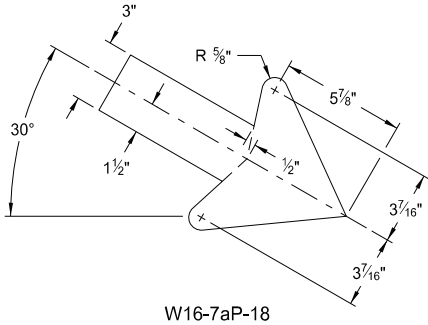
W20-51-48
Legend: black (non-refl)
Background: orange



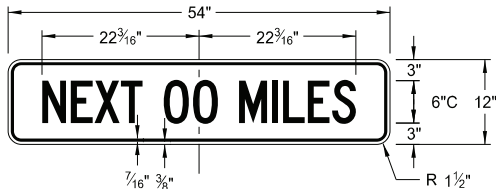
W21-51-48
Legend: black (non-refl)
Background: orange



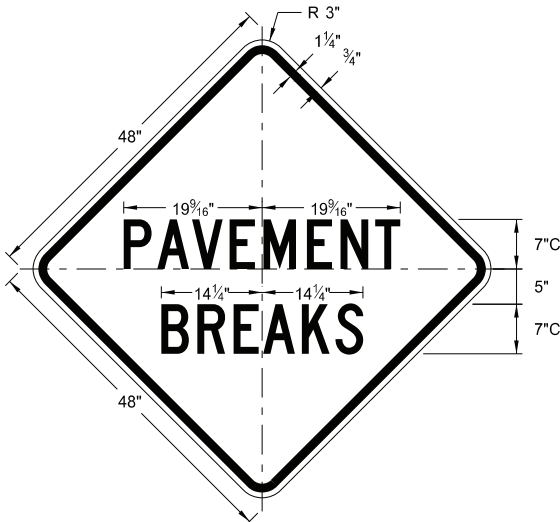
W22-8-48
Legend: black (non-refl)
Background: orange



W16-7aP-18



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



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

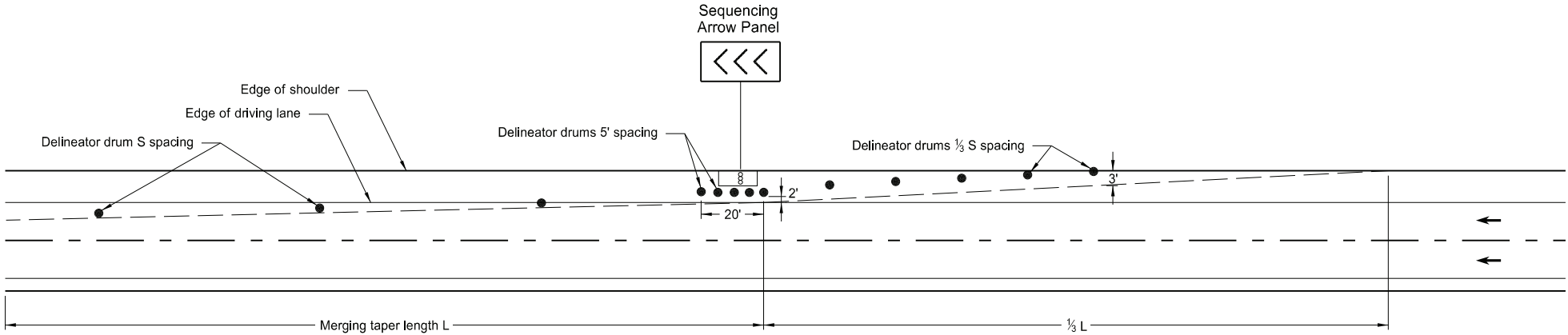
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.
8-01-24	Electronic Stamp/Signature.



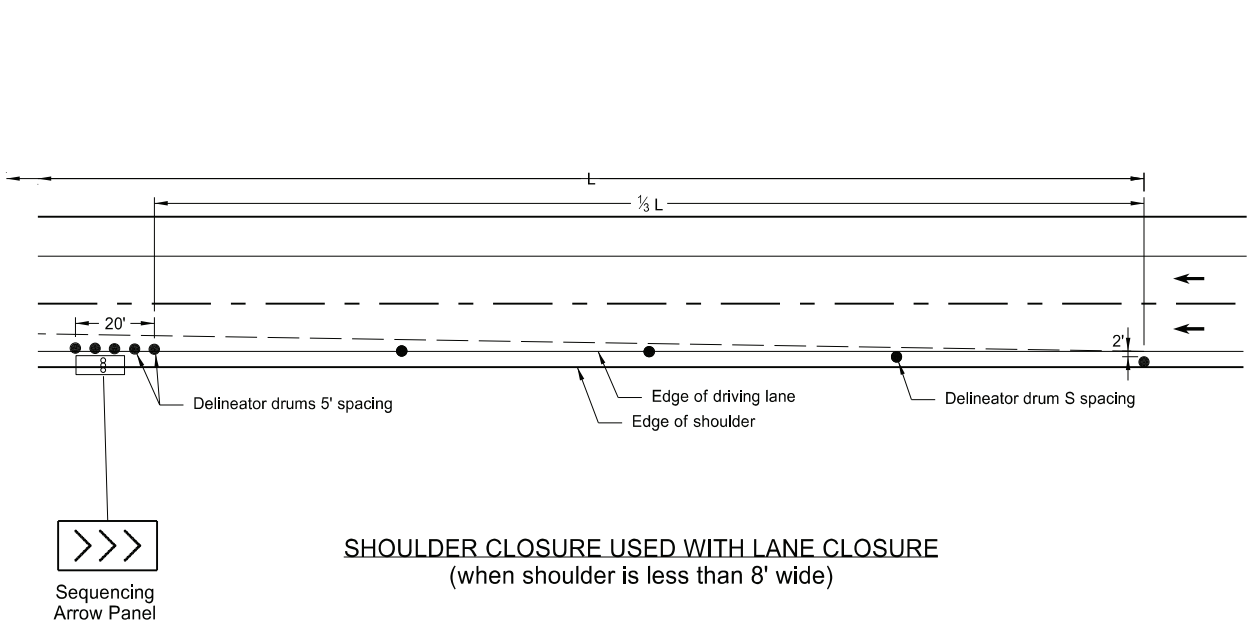
08/01/24

SHOULDER CLOSURE TAPERS

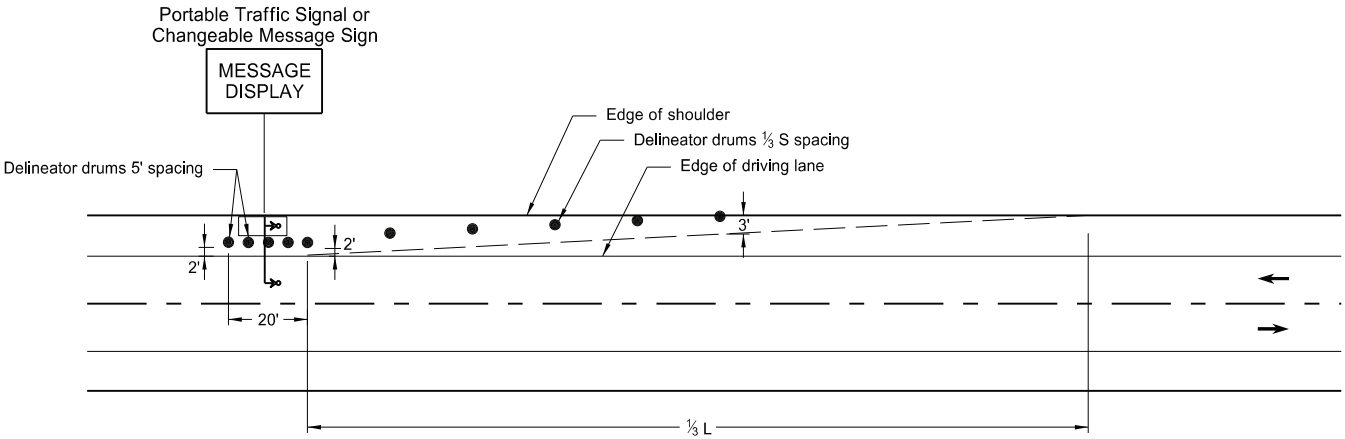
D-704-12



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



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



PORTABLE TRAFFIC SIGNAL OR CHANGEABLE MESSAGE SIGN ON SHOULDER

KEY			
●	Delineator Drum	∞	Sequencing Arrow Panel
•	Message Display	↳	Portable Traffic Signal

Notes:

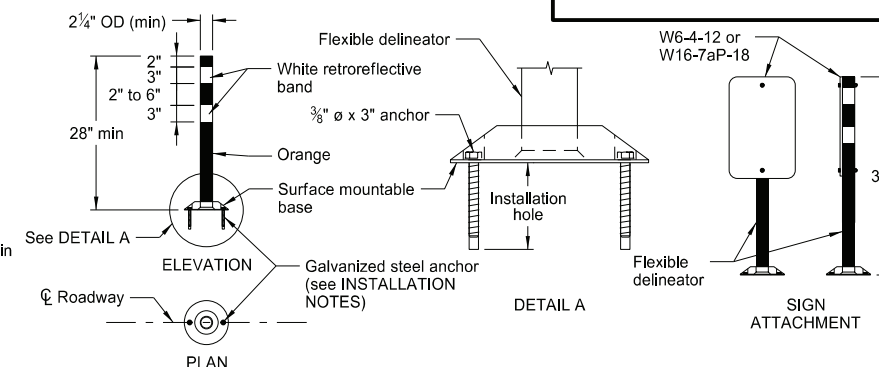
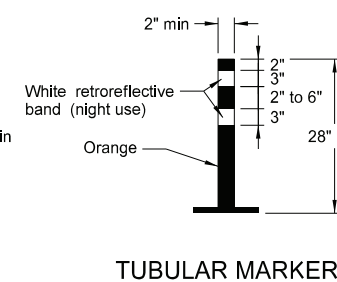
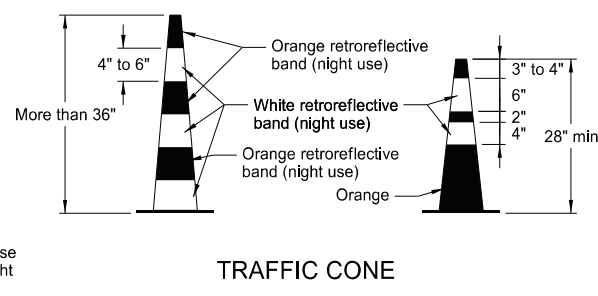
- S = Posted Speed Limit in mph
 W = Width of offset in feet
 L = Taper length in feet
 $L = WS^2/60$ (40mph or less)
 $L = WS$ (45mph or more)
- If a shoulder taper is used, use a length of approximately $\frac{1}{3}L$. If a shoulder is used as a travel lane, use a normal merging or shifting taper.
- When paved shoulders of 8 foot width or more are closed, use channelizing devices to close shoulder in advance, to delineate beginning of work space, and to direct vehicular traffic to remain within the traveled way.

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



08/01/24

D-704-13



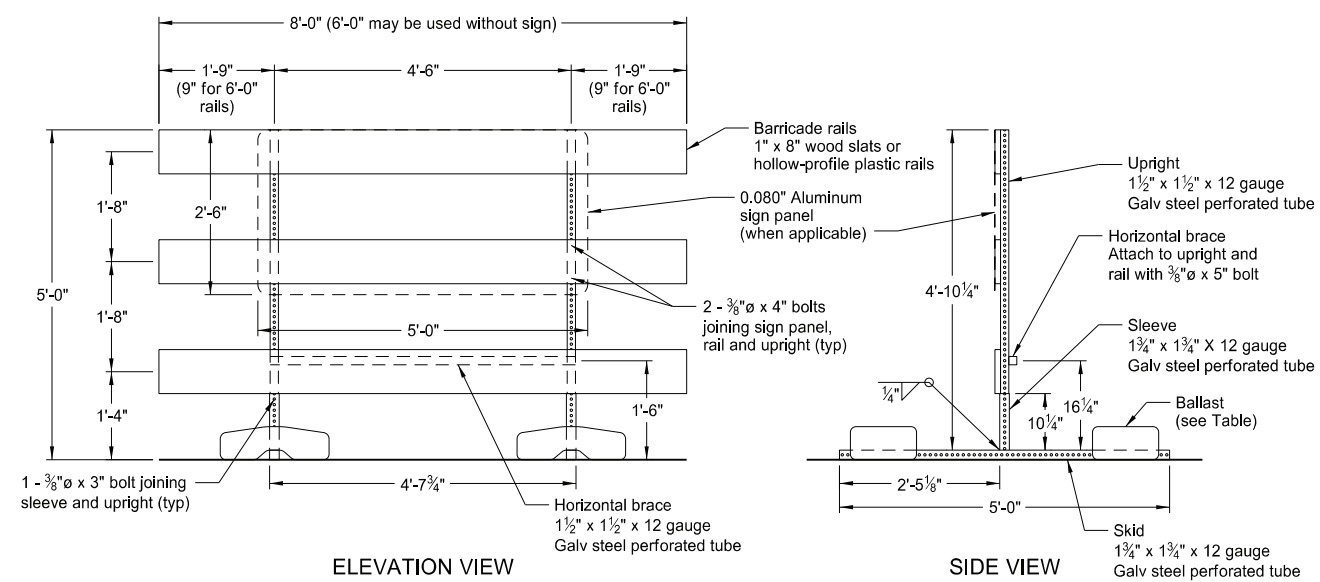
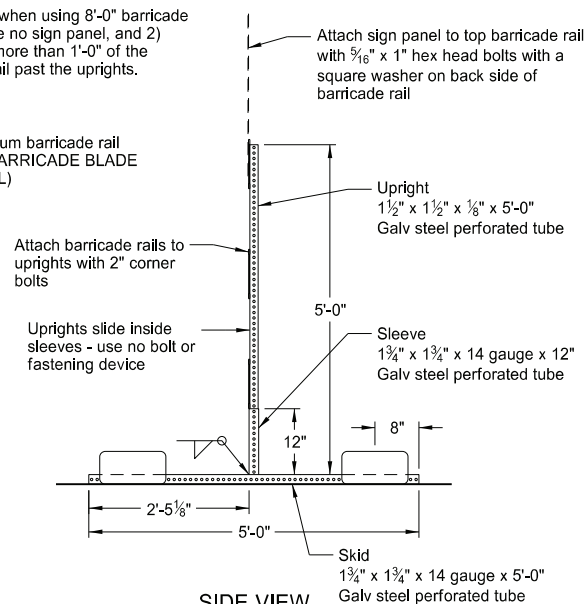
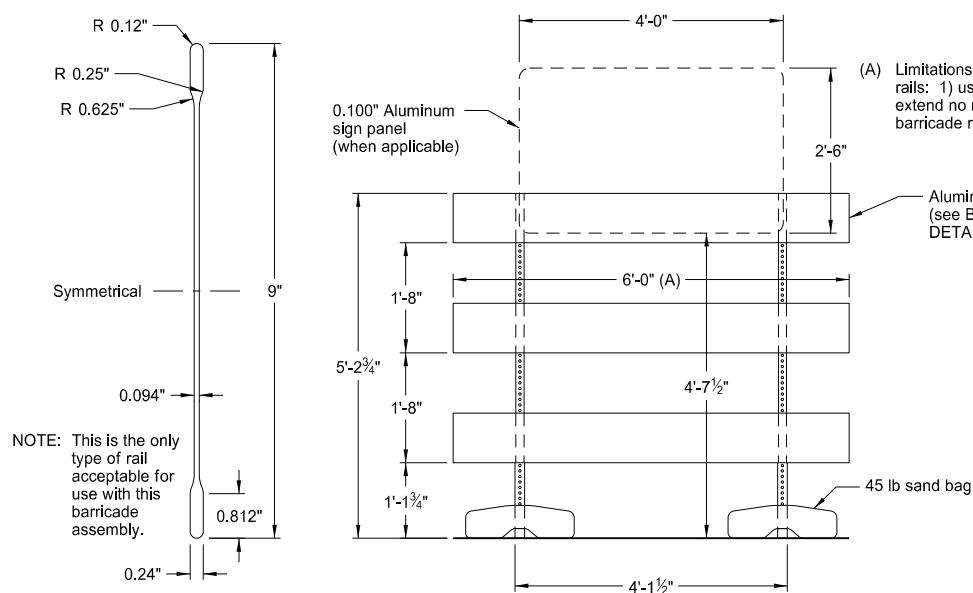
Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective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

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

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

INSTALLATION NOTES:

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



BARRICADE BLADE DETAIL

ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL (Aluminum Barricade Rails)

SIDE VIEW

ELEVATION VIEW

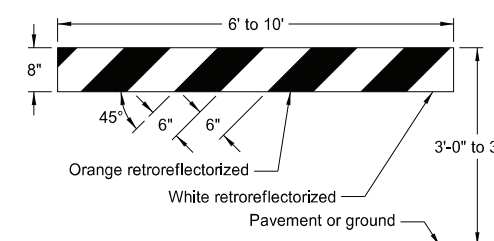
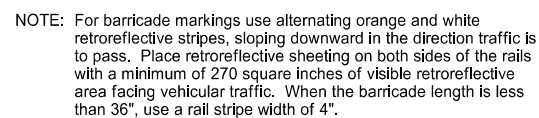
BARRICADE ASSEMBLY DETAIL (Wood or Plastic Rails)

SIDE VIEW

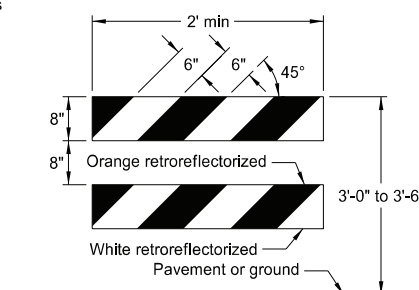
MINIMUM BALLAST
(each side of barricade support)

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

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

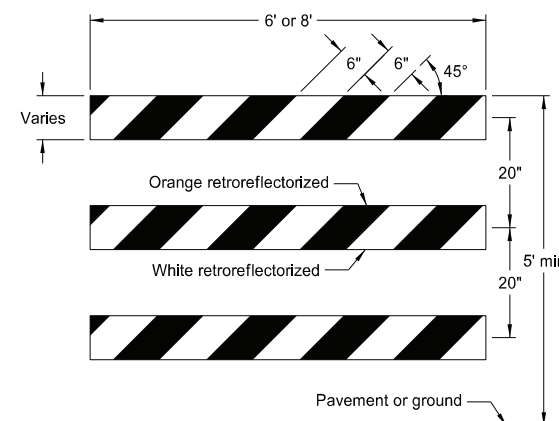


TYPE I BARRICADE

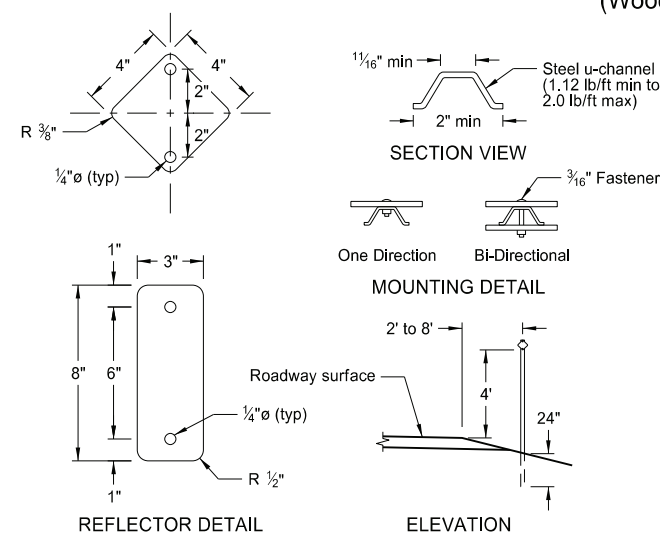


TYPE II BARRICADE

BARRICADE RAIL DETAILS



TYPE III BARRICADE



DELINEATORS

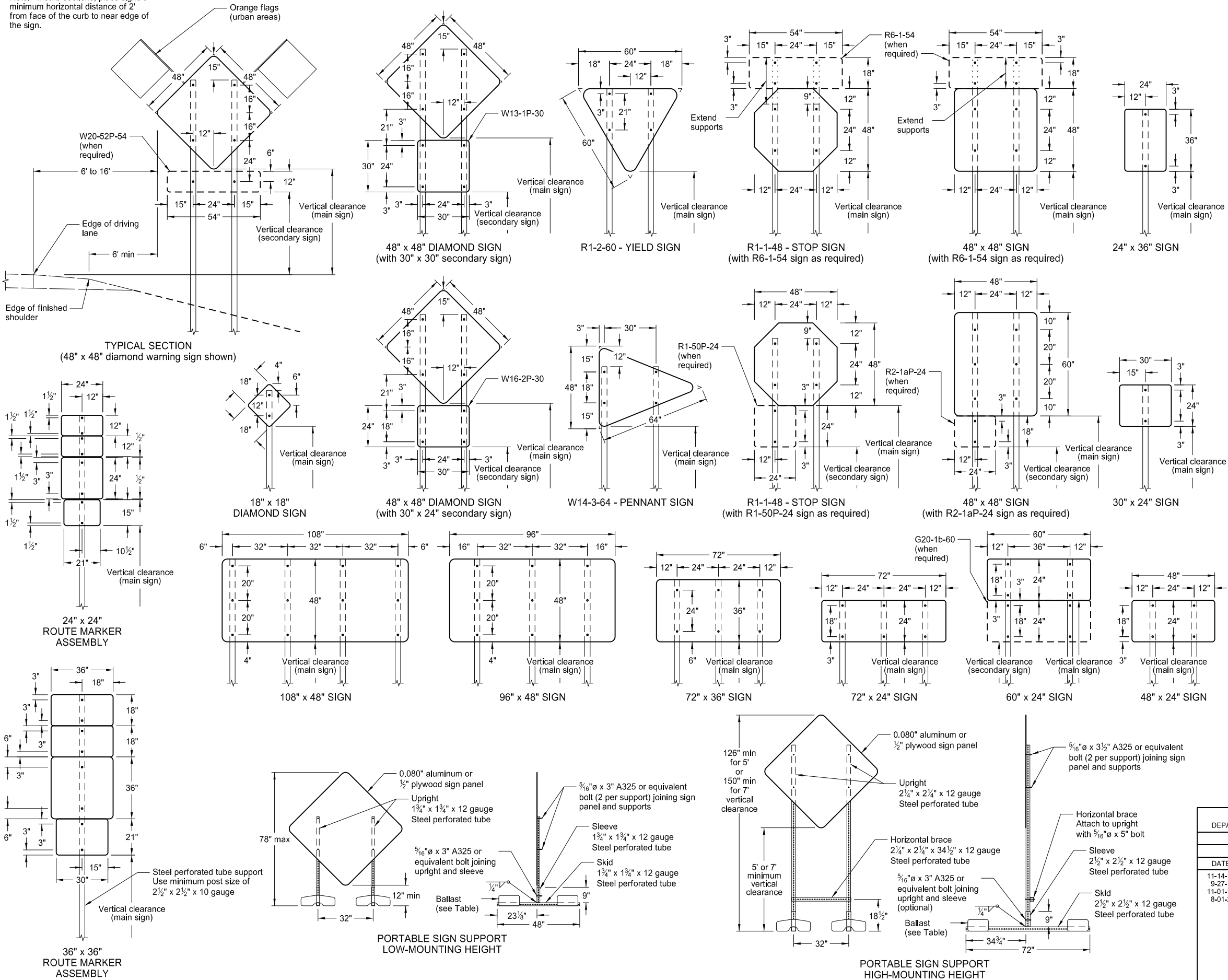
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-3-13	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
11-01-19	Revised details for Flexible Delineator
8-01-24	Electronic Stamp/Signature



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.



NOTES:

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

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

Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.
- 2. Sign Panels: Provide sign panels made of 0.100" aluminum, ½" plywood, or other approved material, except where noted. Punch all holes round for ⅜" bolts.
- 3. Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on lane closure sign)
- 4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

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

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

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

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

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

Use of low-mounting height (minimum 12" vertical clearance) portable signs for 5 days or less, is allowed as long as the view of the sign is not obstructed. Time delays caused by 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

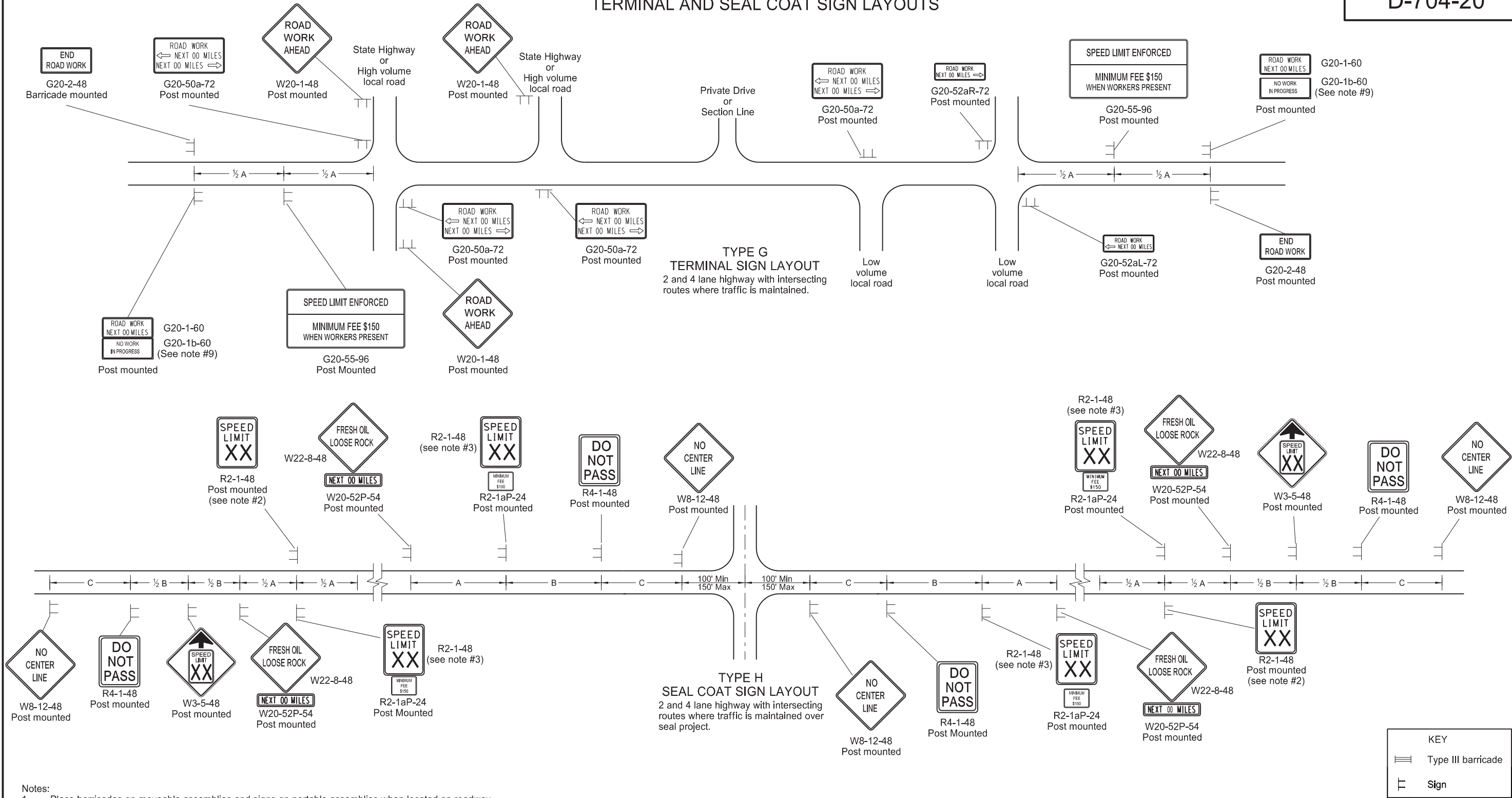


08/01/24



TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



Notes:

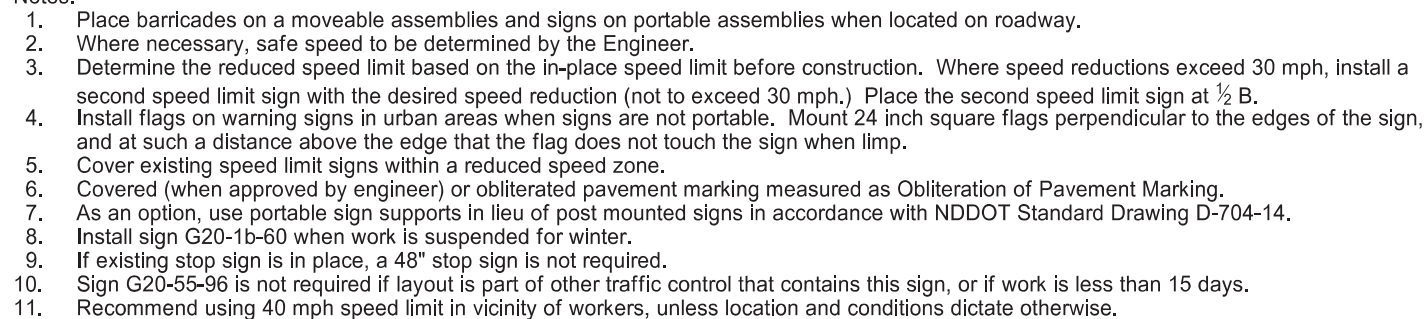
- Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
- Determine the exact speed limit in the field, based on location and conditions.
- Determine the reduced speed limit based on the in place speed limit before construction. Where speed limit reductions 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 $\frac{1}{2}$ 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



D-704-22



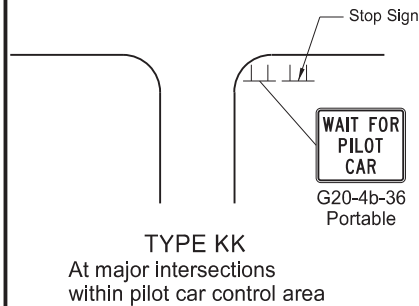
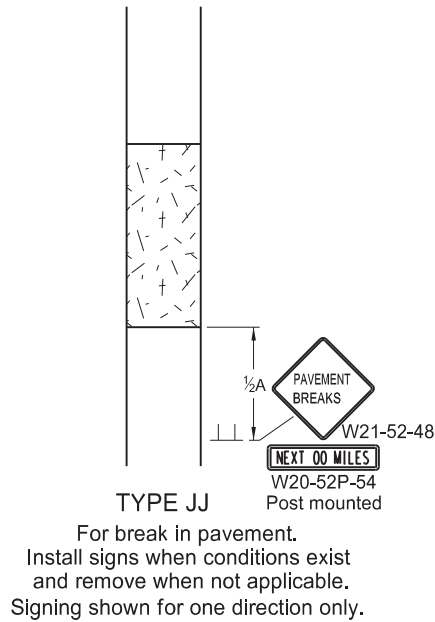
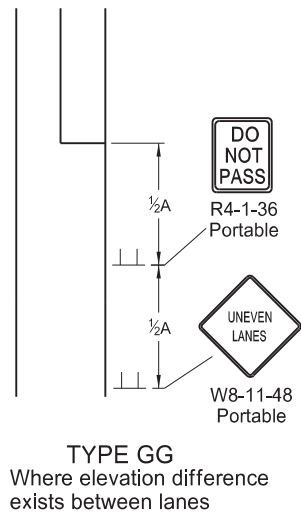
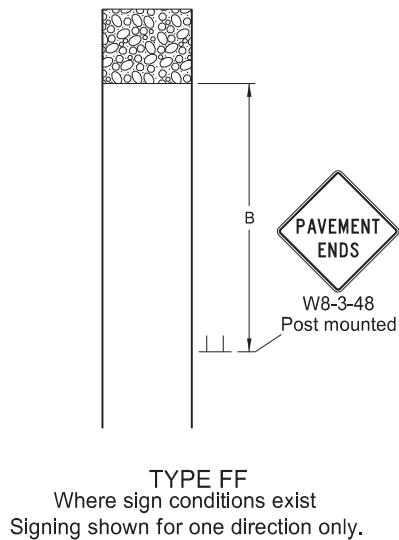
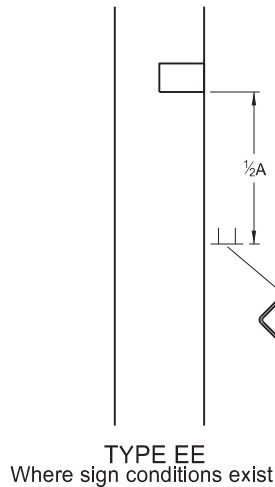
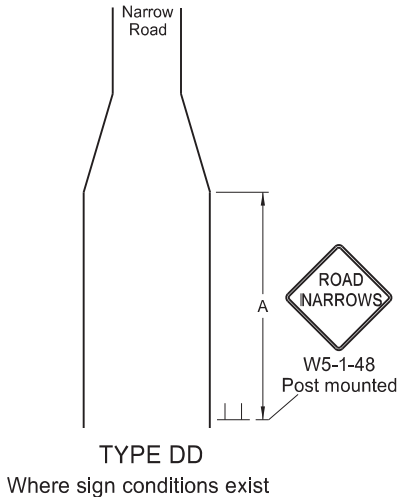
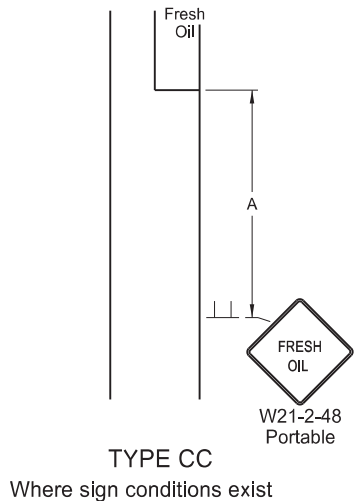
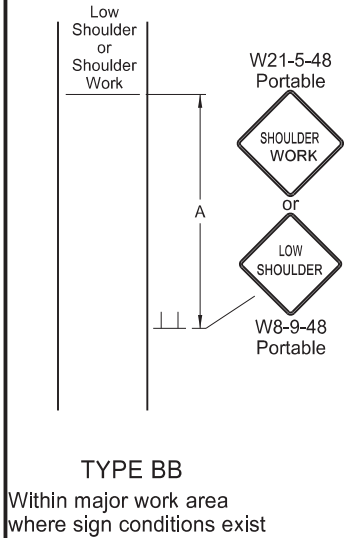
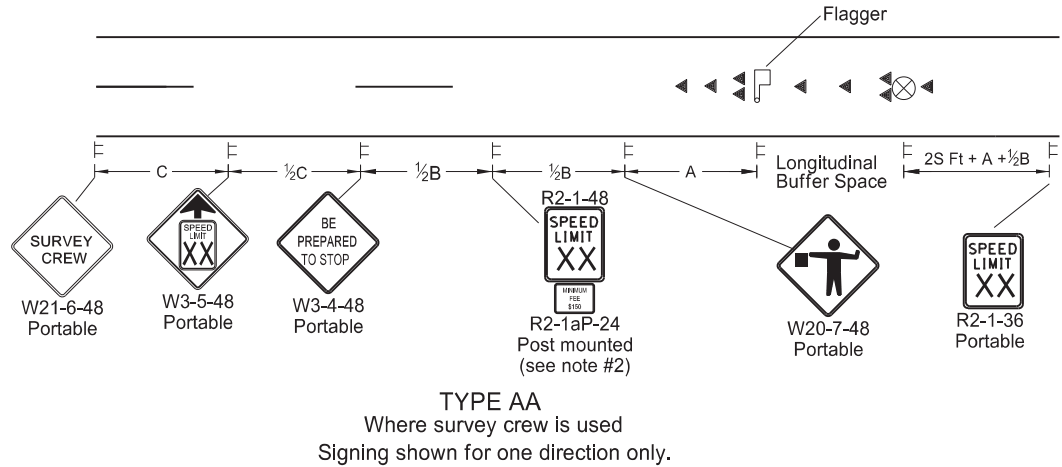
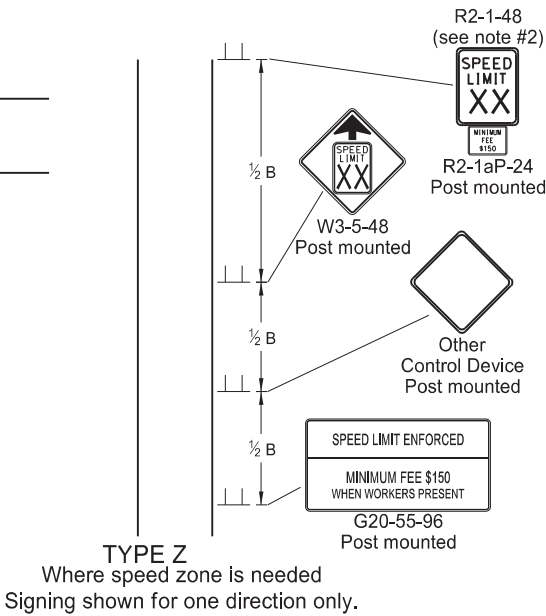
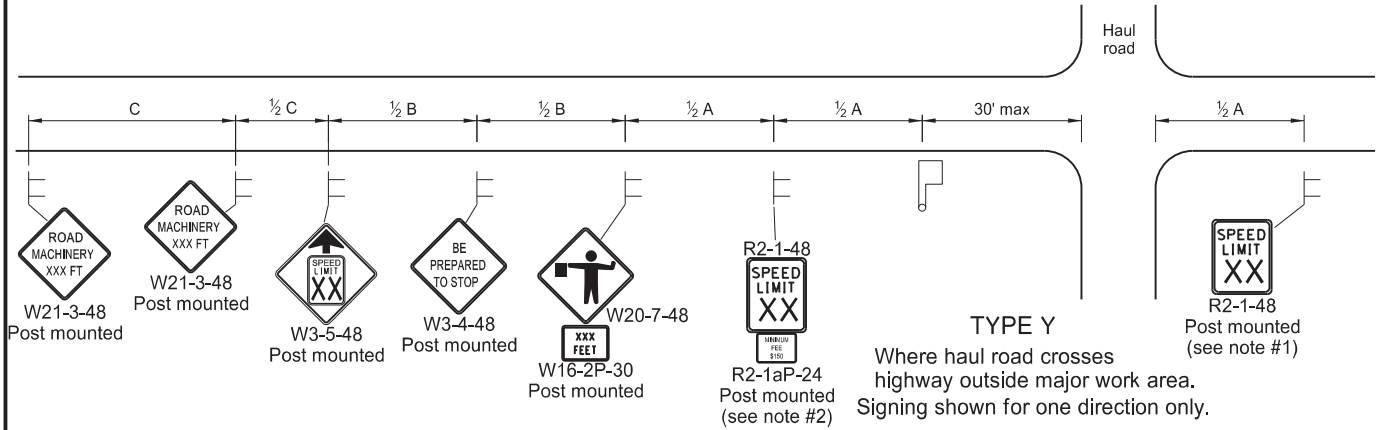
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway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

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



MISCELLANEOUS SIGN LAYOUTS

D-704-26



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

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

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

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

KEY

Flagger

Sign

Cones

Survey Equipment

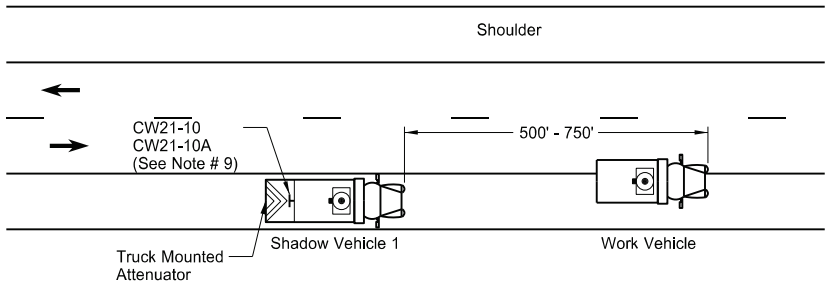
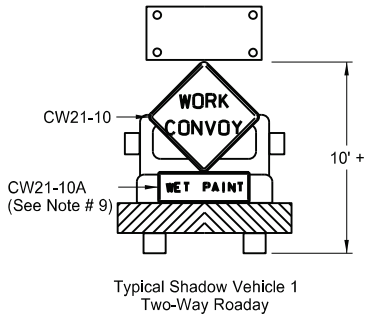
S = Numerical value of speed limit or 85th percentile.

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

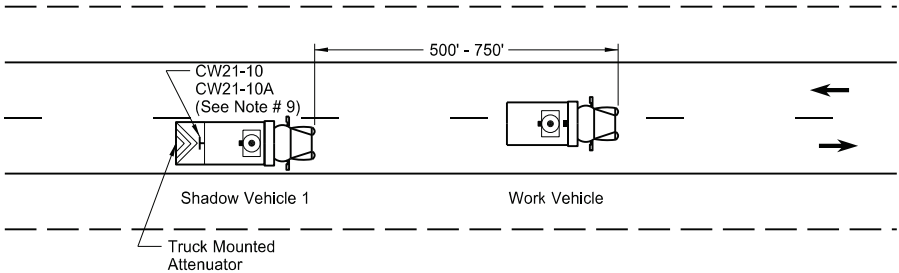


MOBILE OPERATION
(PAVEMENT MARKING)

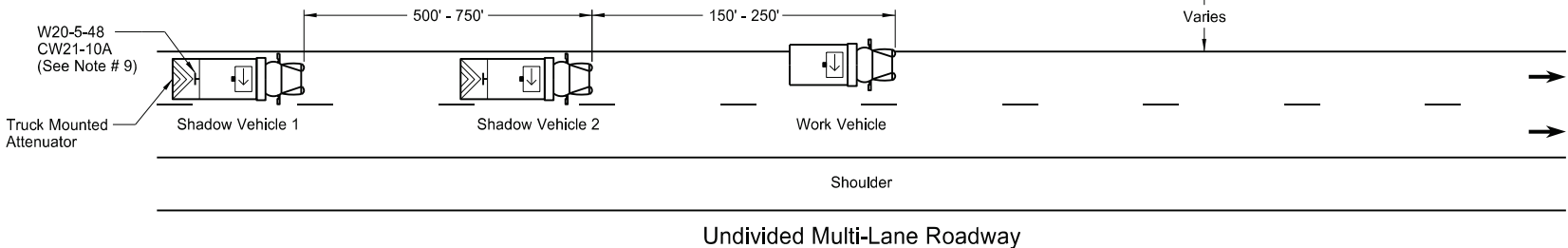
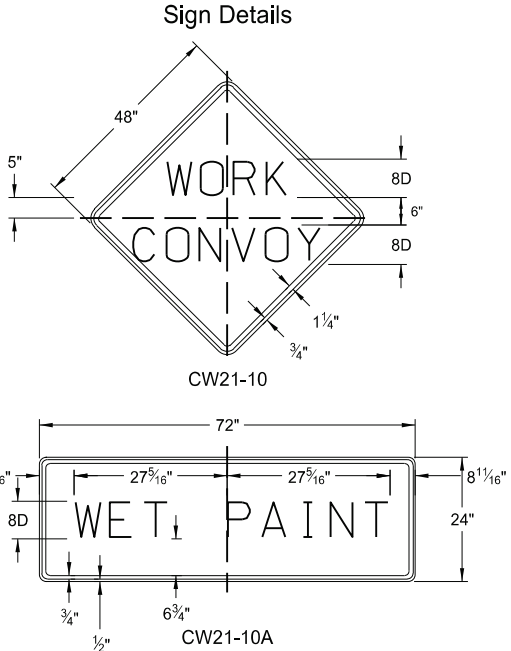
D-704-27



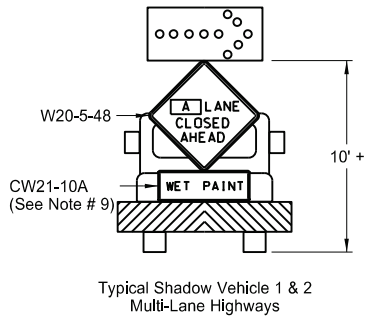
Two-Way Roadway with Paved Shoulders



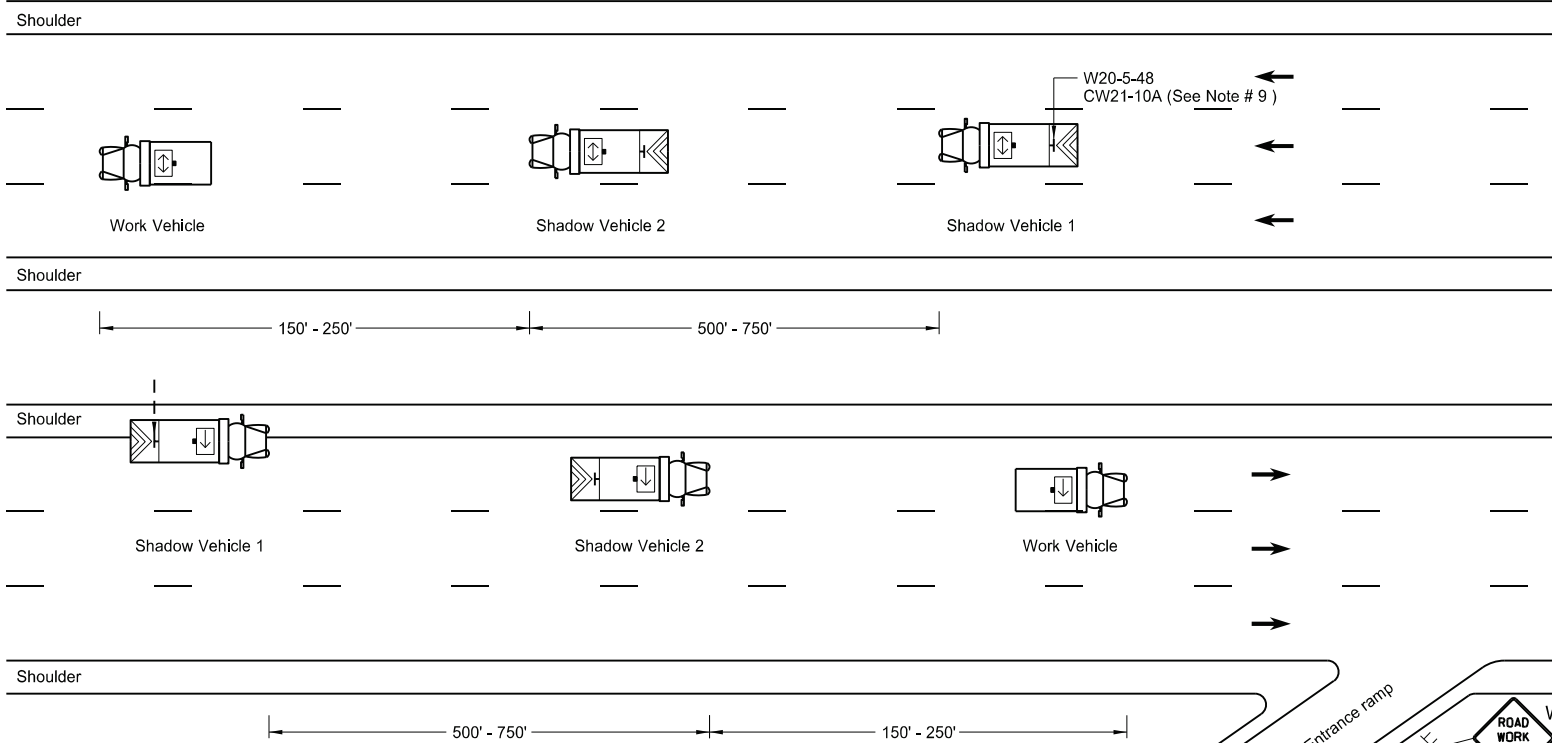
Two-Way Roadway without Paved Shoulders



Undivided Multi-Lane Roadway

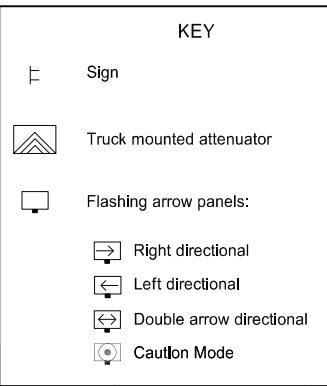


A = ☐ Left ☐ Right ☐ Center



Divided Multi-Lane Highway

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



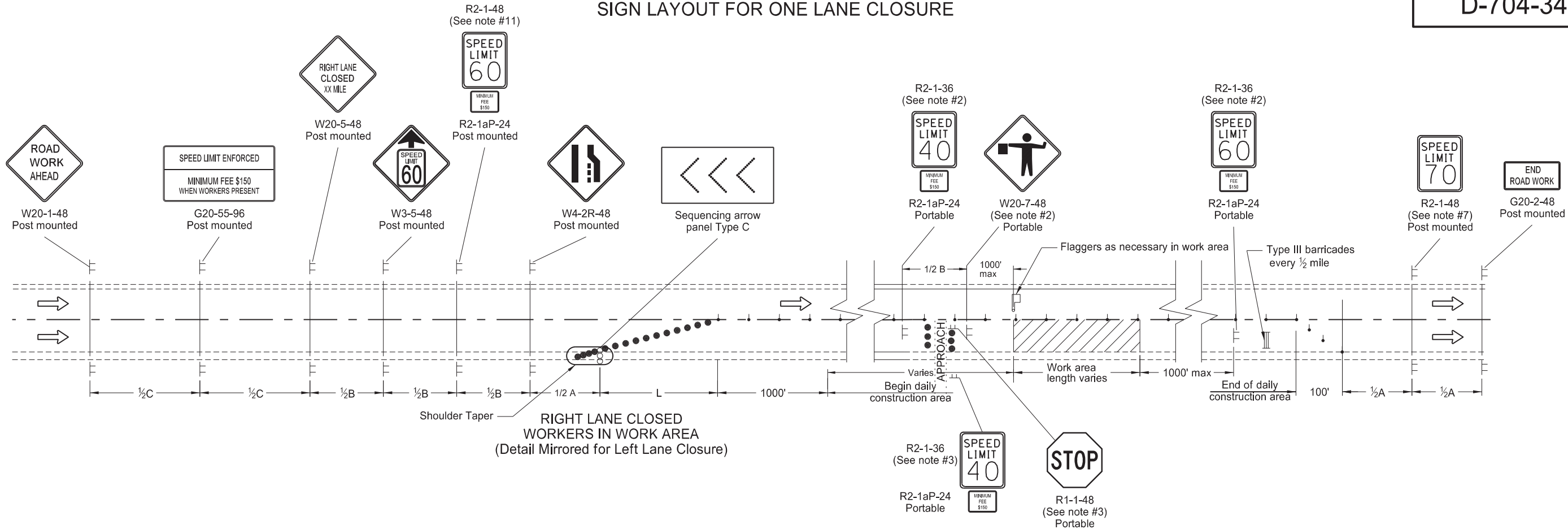
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways
9-27-17	Updated to active voice
11-08-19	Changed Standard Heading
6-02-24	Electronic Stamp/Signature.



08/02/24

SIGN LAYOUT FOR ONE LANE CLOSURE

D-704-34



Notes:

1. Install advance signs for flagging when flaggers are flagging.
2. Move the advanced flagger sign and speed limit signs as the work area moves through the construction zone. When the work area is not visible from the flagger, move the flagger station so the work area is visible. Place the 40 mph speed limit sign at 1/2A in advance of the flagger sign and move the 60 mph speed limit sign. Cover or remove the 40 mph speed limit and the Minimum Fee \$150 signs upon completion of the work day or when workers are not present. Determine the exact speed limit in the field, dependent on location and conditions.
3. Approaches: When the work area encompasses an approach, install a 40 mph speed limit sign to control the approach. Cover the existing stop sign and install a new portable stop sign when the approach is on the side of the lane closure. Remove the approach speed limit sign once the main line 40 mph speed zone is moved past the approach.
4. Variables:
S=Numerical value of speed limit or 85th percentile
W=The width of taper.
L=Minimum length of taper, or SxW for freeways, expressways, and all other roads with speeds of 45 mph or greater, or (WxSxS)/60 for urban, residential, and other streets with speeds of 40 mph or less.
5. Space delineator drums for tapering traffic at the dimension "S". Space tubular markers used for tangents at 2 times dimension "S".
6. Place sequencing arrow panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on the roadway surface.
Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less and 750 ADT or less).
Use Type B on roadways with moderate traffic speeds and volumes (40 mph or less and 5000 ADT or less).
Use Type C on roadways with high traffic speeds and volumes (over 40 mph or over 5000 ADT).
7. Re-establish the speed limit. Determine the exact speed limit in the field, dependent on location and conditions.
8. Cover existing speed limit signs within a reduced speed zone.
9. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the diamond sign, and at such a distance above the edge that the flag does not touch the sign when limp.
10. Determine the reduced speed limit dependent on the in place speed limit before construction. Where speed limits are to be reduced more than 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2B.
11. As an option use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
12. 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.

KEY	
	Type I barricade
	Type II barricade
	Type III barricade
	Sign
	Delineator drum
	Work area
	Flagger
	Sequencing arrow panel
	Tubular markers

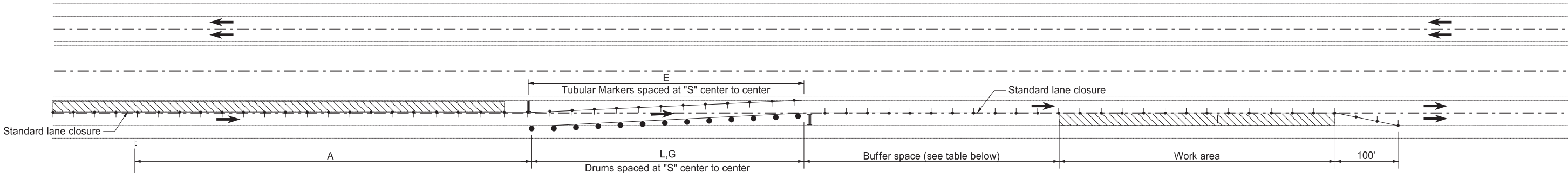
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-26-2012	
REVISIONS	
DATE	CHANGE
03-15-16	Removed Do Not Pass signs & updated notes
08-17-17	Updated notes & sign numbers & moved Speed Limit signs
11-01-19	Removed shldr taper details & revised tubular mkr symbol
12-08-21	Switched order of Road Work and Spd Limit Enforced, removed table, & added Dollars At Work
11-29-22 06-30-25	Removed Dollars At Work Legislative Changes



TRAFFIC CONTROL SYSTEM
LANE SHIFT BETWEEN A LANE CLOSURE AND AN OPPOSITE LANE CLOSURE

D-704-34A



QUANTITIES	
TYPE III BARRICADES	2 Each
DELINEATOR DRUMS	13 Each
TUBULAR MARKERS	13 Each
RAISED PAVEMENT MARKERS (White)	Varies
OBLITERATION OF PAVEMENT MARKING	Varies

KEY	
Work area	Delineator drum
Type III barricade	Tubular markers
Traffic Direction	Sign

LEGEND	
E	Obliteration of pavement marking (10' line, 30' skip centerline)
G	Raised pavement markers (white) 5' ctrs.

- Notes
- Variables
 - S = Numerical value of posted speed limit, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.
 - W = Width of offset in feet.
 - L = Taper length in feet. Speeds 40 mph or less $L=WS^2/60$. Speeds 45 mph or greater $L= WS$.
 - Place signs and barricade on roadway on moveable assemblies.
 - Cover existing speed limit signs within reduced speed zones.
 - Upon approval, the Engineer will measure obliterated or covered pavement marking as Obliteration of Pavement Marking.
 - As an option, use portable sign supports in lieu of post mounted sign in accordance with NDDOT Standard Drawing D-704-14.
 - Place "Minimum Fee \$150" signs below speed limit signs when placing traffic control devices to reduce speed.
 - When duration of work is 14 days or less, obliteration of pavement marking (10' line, 30' skip, centerline) and raised pavement markers are not required.

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

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

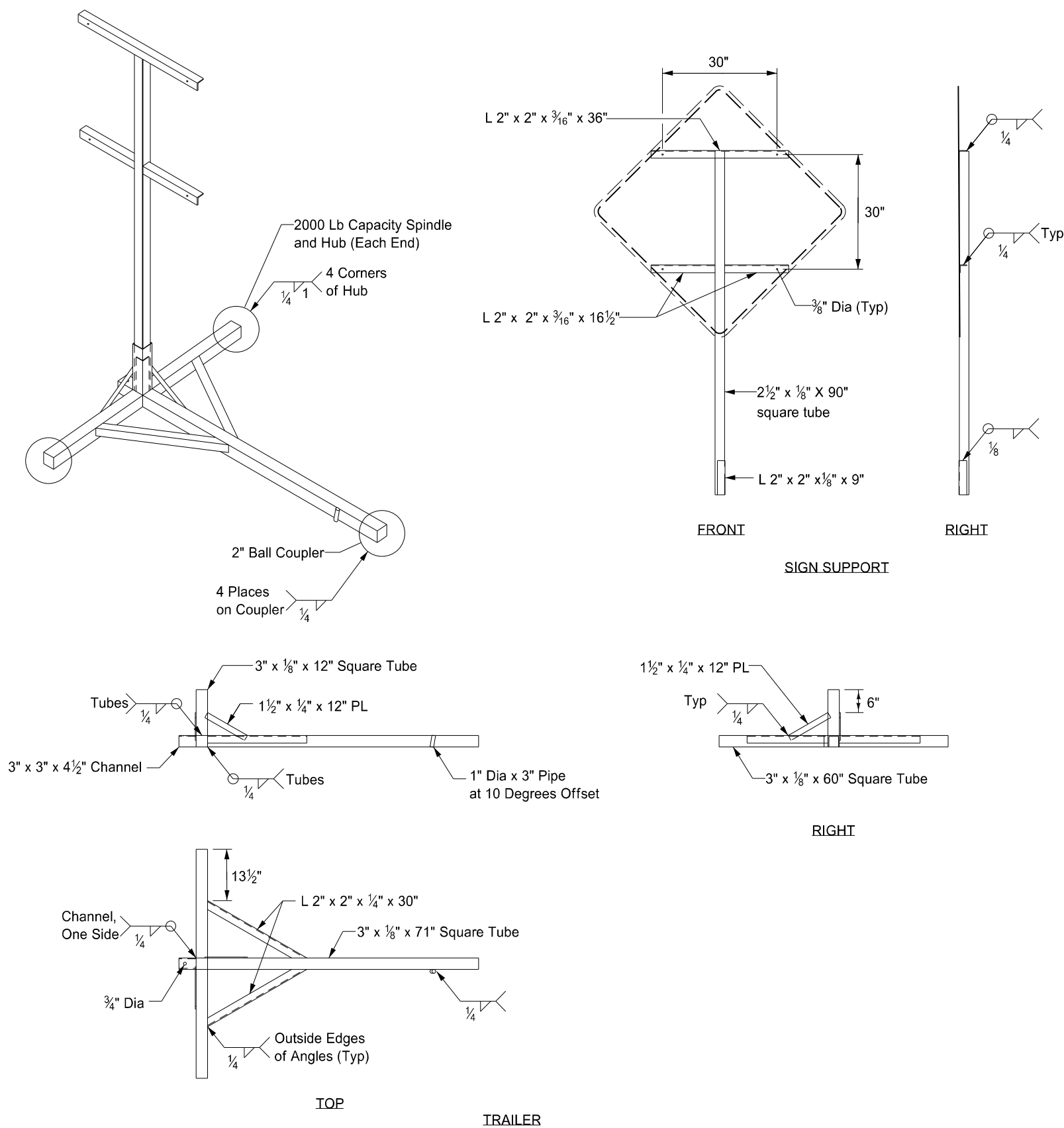
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-26-2012	
REVISIONS	
DATE	CHANGE
09-27-17	Updated to active voice
11-01-19	Clarified work zone
08-02-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



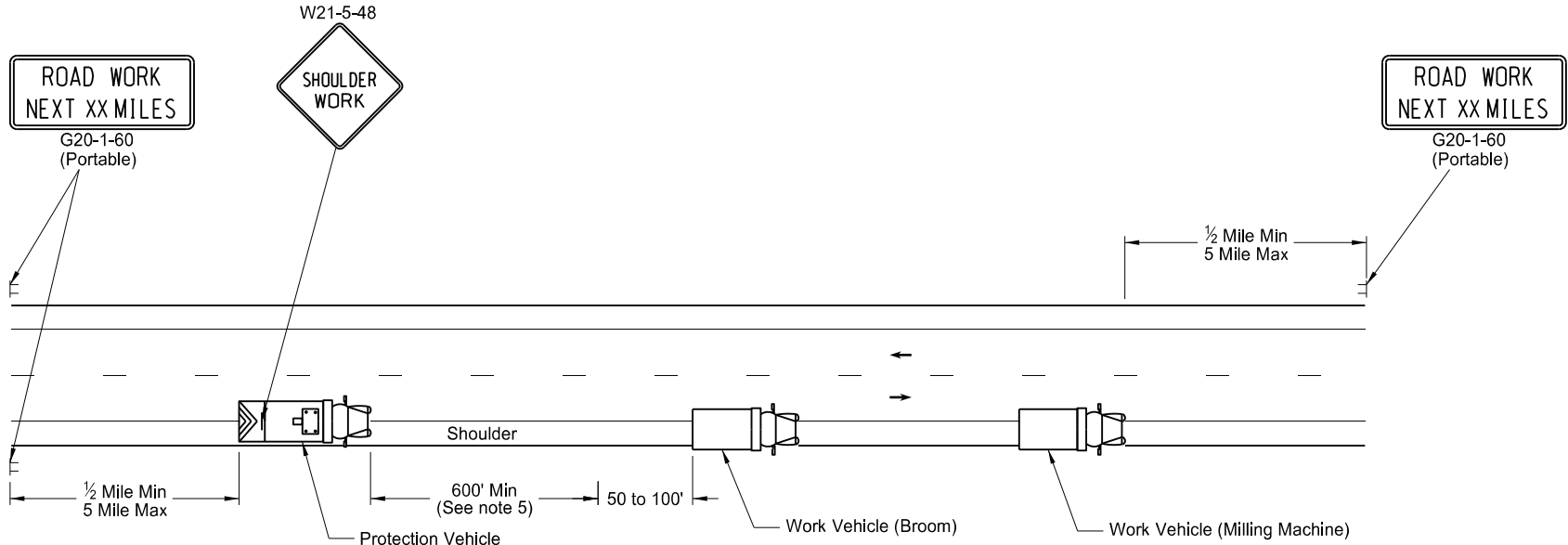
- Notes:
- 1. Maximum 250 pound weight of assembly.
 - 2. Use a 14" wheel and tire.
 - 3. Use no automotive and equipment axle assemblies for trailer-mounted sign supports.
 - 4. Other NCHRP 350 or MASH crash tested assemblies are acceptable.

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

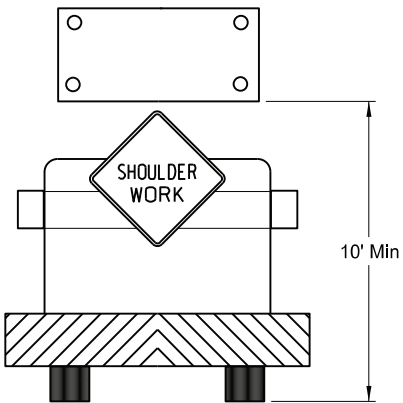


MOBILE OPERATION
Grinding Shoulder Rumble Strips

D-704-56



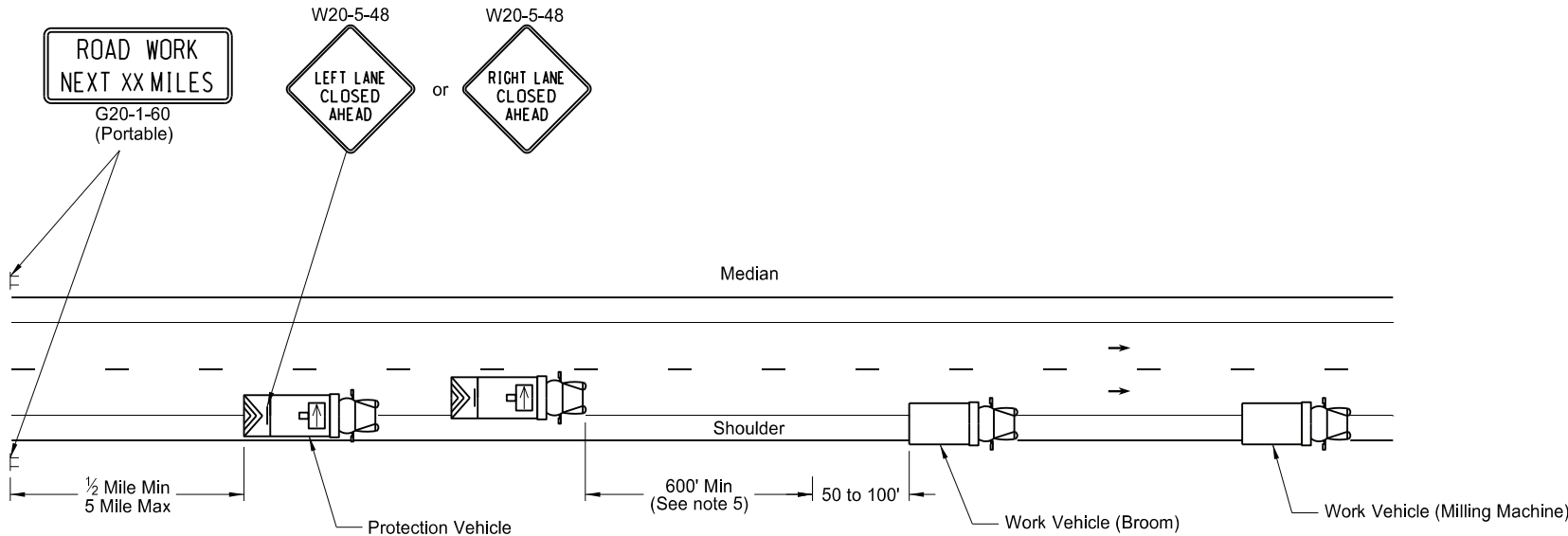
TWO LANE - TWO WAY ROADWAY



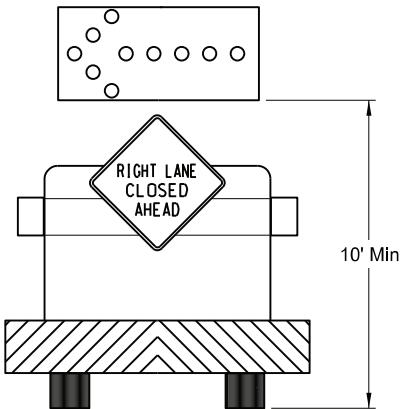
TWO LANE - TWO WAY ROADWAY

Typical Protection Vehicle with
Flashing Arrow Panel In Caution Mode

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

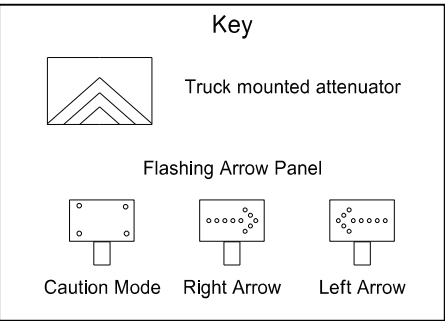


INTERSTATE & 4 LANE DIVIDED HIGHWAY



INTERSTATE & 4 LANE DIVIDED HIGHWAY

Typical Protection Vehicle with Flashing Arrow
Panel In Flashing Arrow Mode



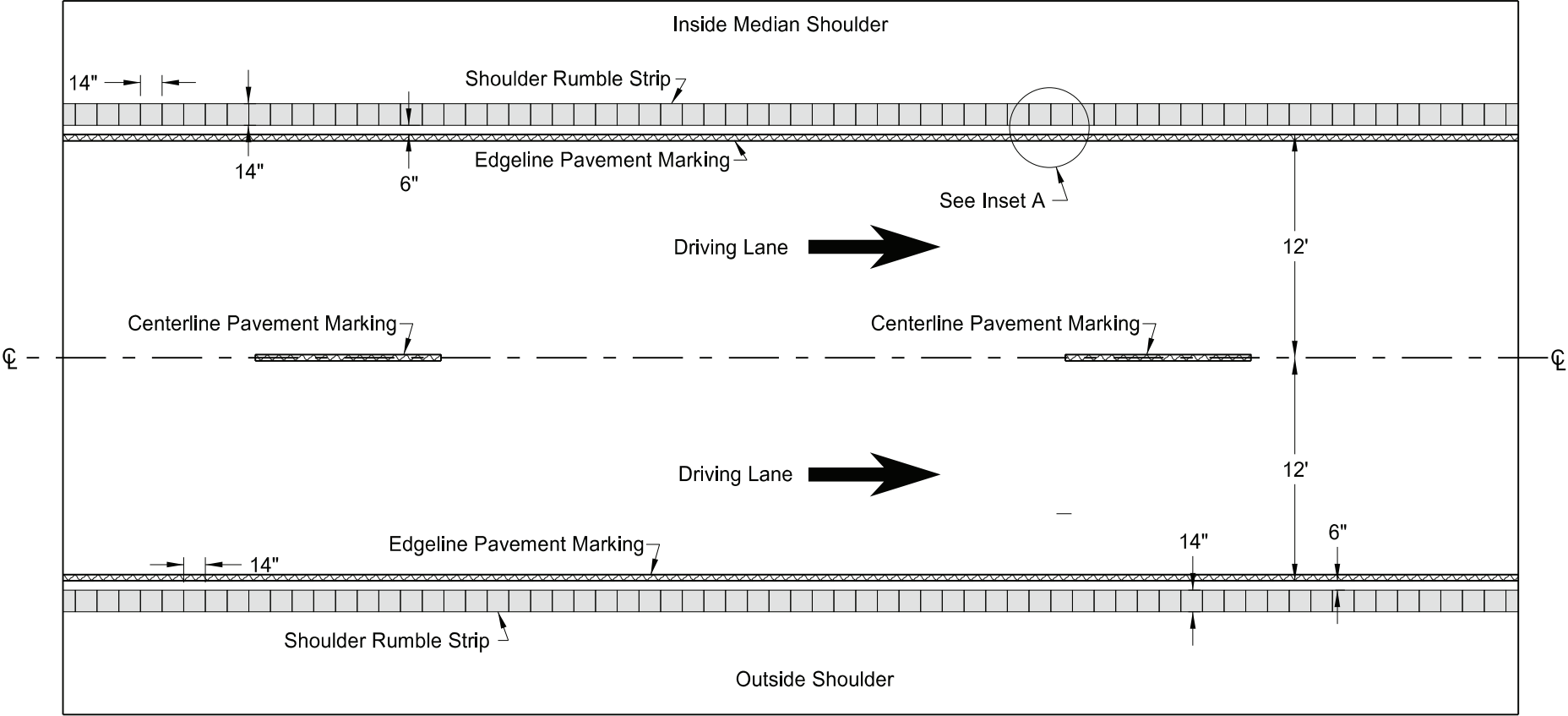
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-15-12	
REVISIONS	
DATE	CHANGE
8-17-17	Updated notes & signs
10-03-19	New Design Engineer PE Stamp
8-02-24	Electronic Stamp/Signature



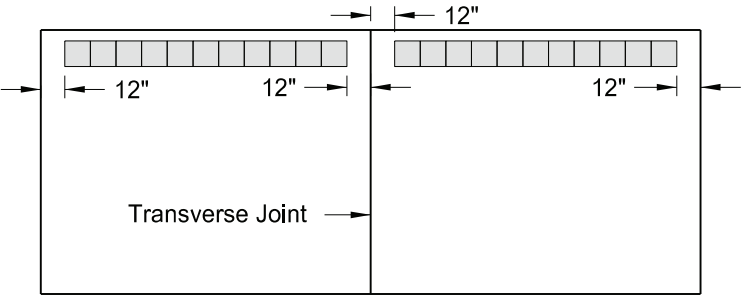
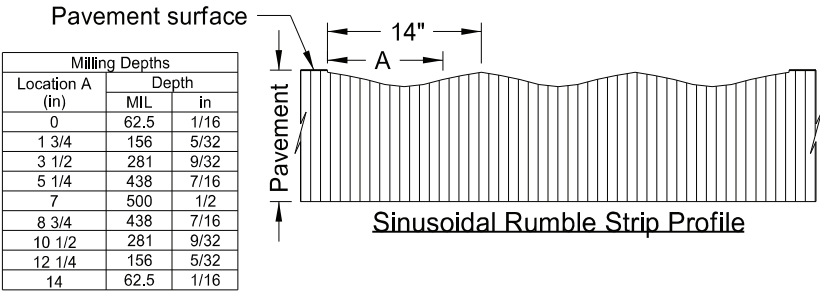
RUMBLE STRIPS
DIVIDED HIGHWAYS (NON-INTERSTATE)

NOTES:

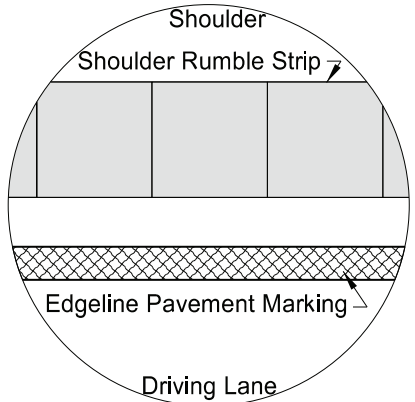
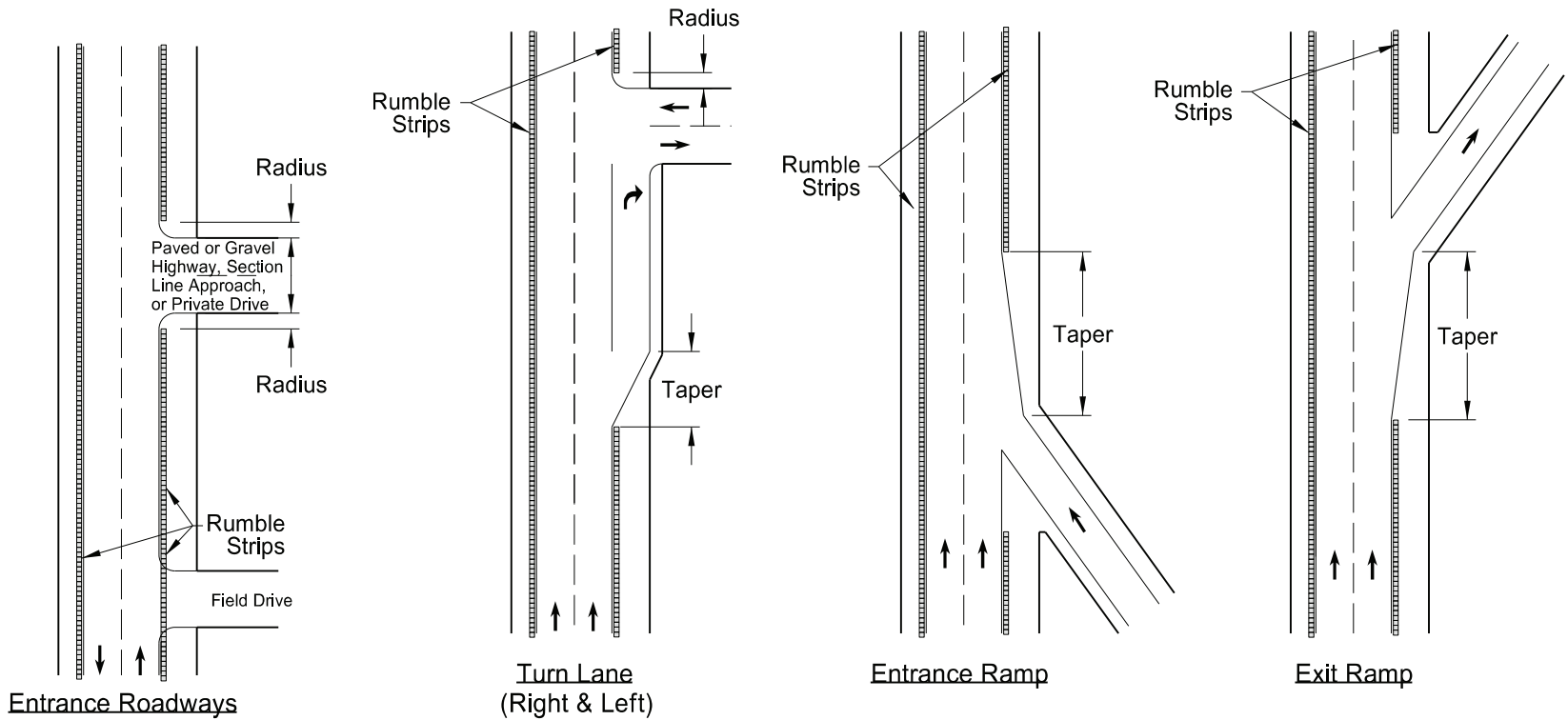
1) Discontinue rumble strips through the entire length of turn lanes and tapers, at ramps and tapers, and at the radius of paved or gravel highways, section line approaches, and private drives.



Divided Highways (Non-Interstate)



Discontinue rumble strip approx. 12" on both sides of PCC transverse joint



Inset A - Shoulder Rumble Strip
(Layout for opposite shoulder reversed)

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-29-09	
REVISIONS	
DATE	CHANGE
2-25-10	Note 4 was added.
9-08-11	Revised Notes and D-760-2.
8-27-19	New Design Engr PE Stamp.
11-16-21	Added rumbles to end of taper.
5-26-23	Rumble strips made sinusoidal.



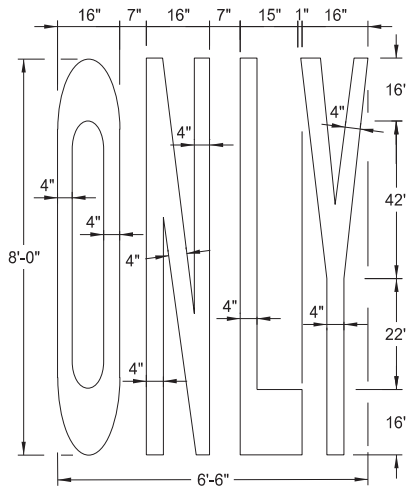
05/26/23



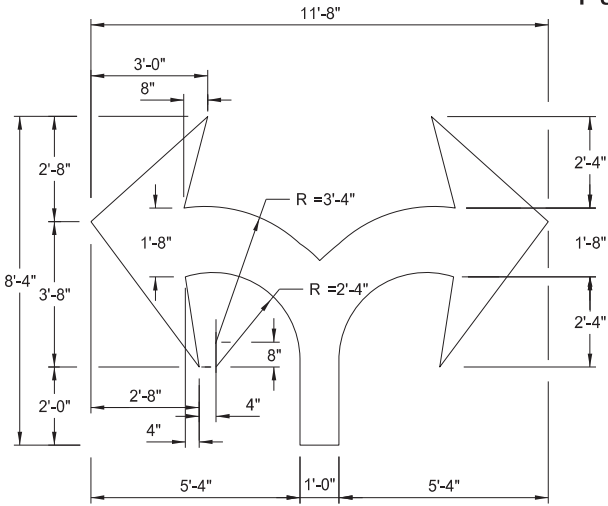
08/09/24

Pavement Marking Message Details

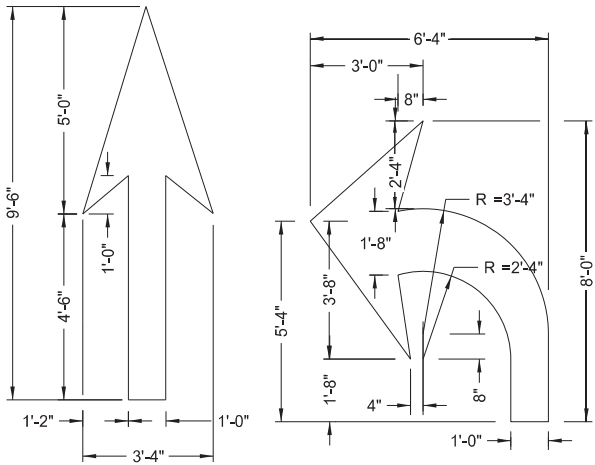
D-762-1



22 S. F.

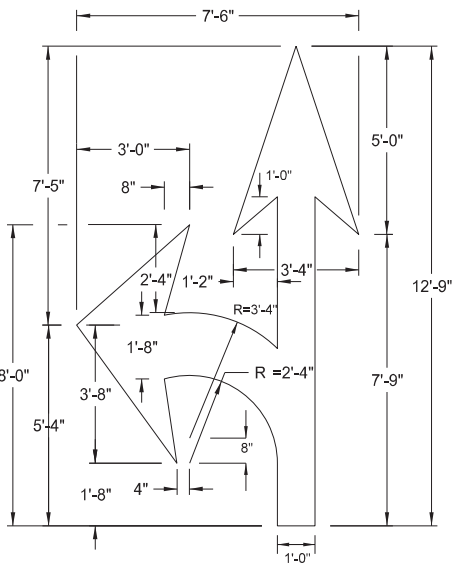


29 S. F.

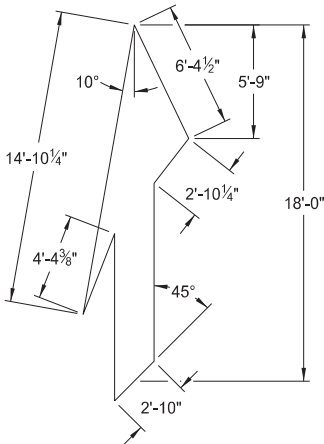


12 S. F.

16 S. F.



27 S. F.

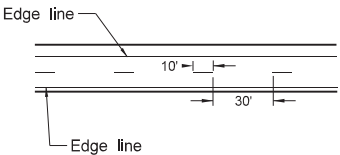


41 S. F.

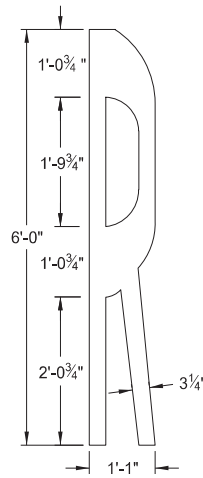
Note: Rotate merge arrow
20° from edge of roadway

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

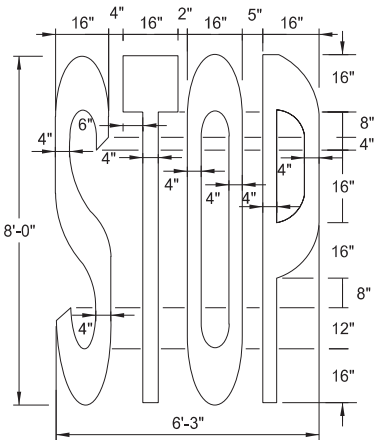
Chevron Crosshatching Table



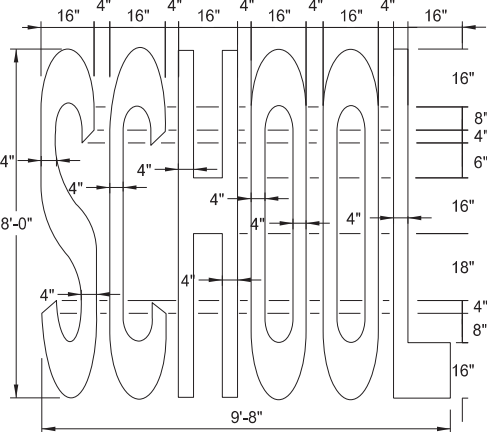
Centerline Pavement Marking Skip Spacing Detail



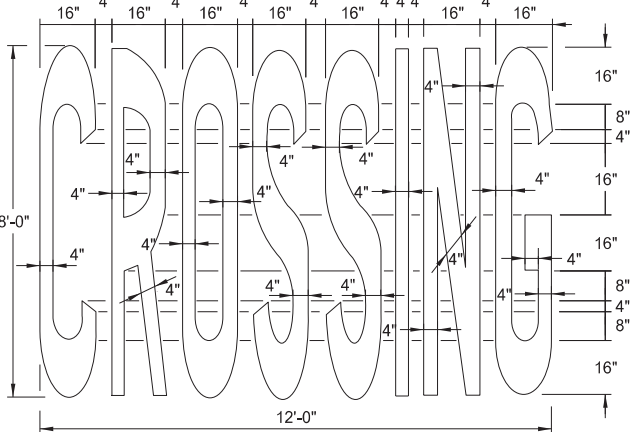
4 S. F.



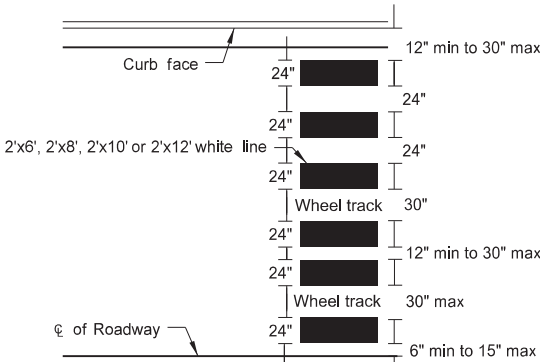
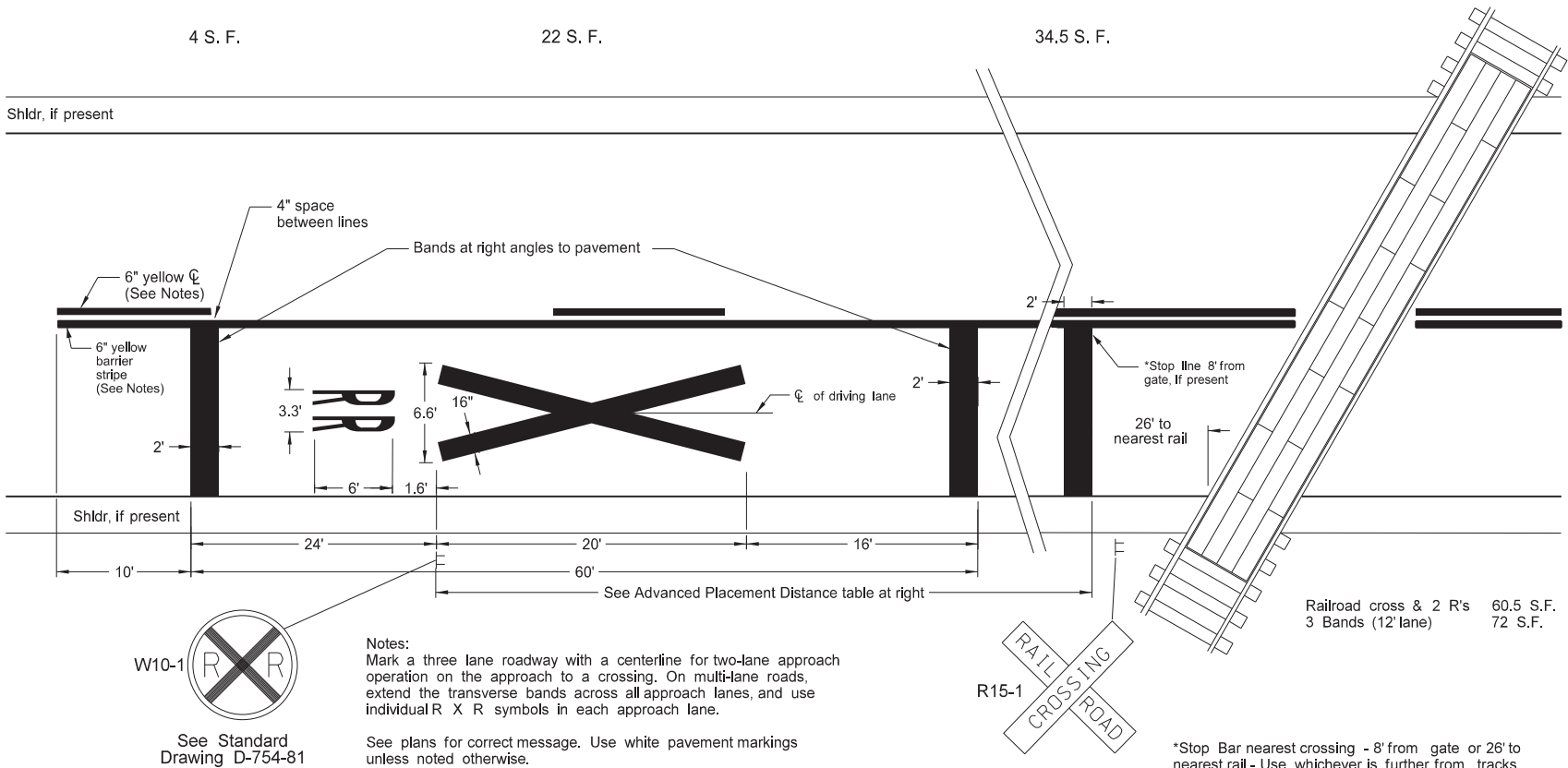
22 S. F.



34.5 S. F.



46 S. F.



Continental Crosswalk Detail

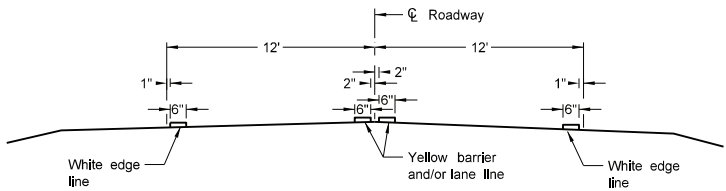
Posted or 85th Percentile Speed	Advance Distance
20 mph	min. 100 ft
25 mph	min. 100 ft
30 mph	min. 100 ft
35 mph	min. 100 ft
40 mph	125 ft
45 mph	175 ft
50 mph	250 ft
55 mph	325 ft
60 mph	400 ft
65 mph	475 ft
70 mph	550 ft

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-6-11	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
01-28-2020	Revised min Stop Bar distance to rail.
11-22-2023	Revised pavement marking widths.

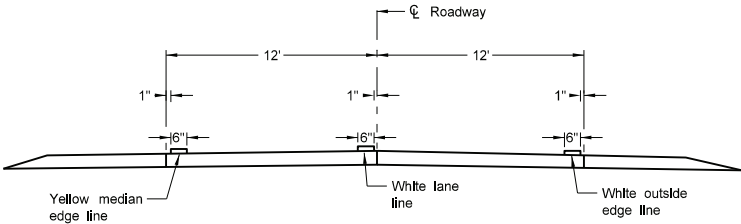


PAVEMENT MARKING

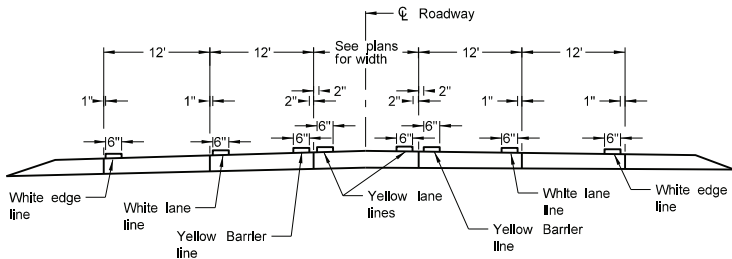
D-762-4



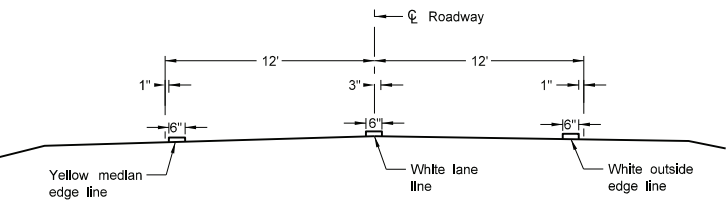
Two Lane Two Way
RURAL ROADWAY



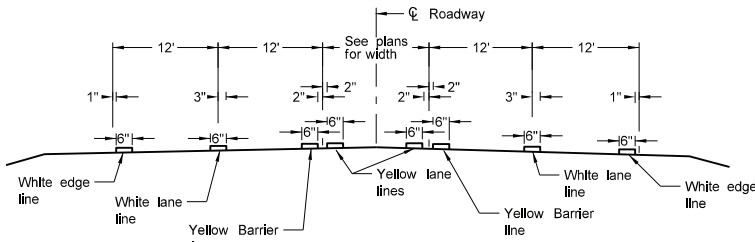
Two Lane Roadway
INTERSTATE HIGHWAY
Concrete Section



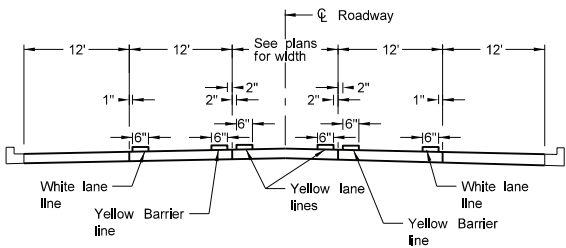
RURAL FIVE LANE ROADWAY
Concrete Section



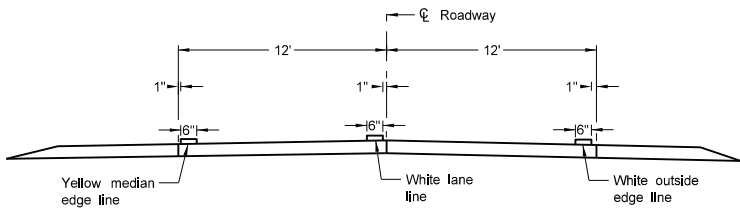
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Asphalt Section



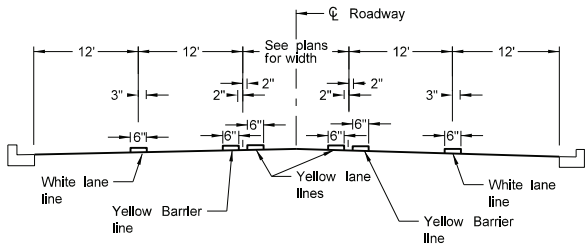
RURAL FIVE LANE ROADWAY
Asphalt Section



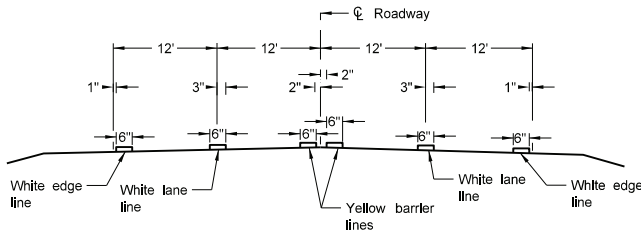
URBAN FIVE LANE SECTION
Concrete Section



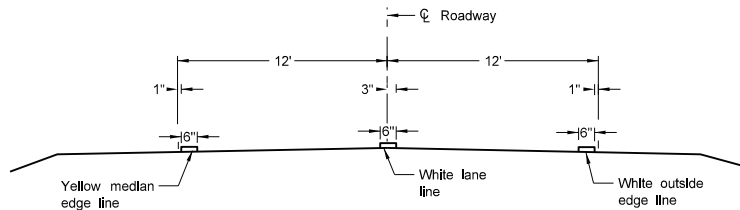
Two Lane Divided
Rural Roadway
PRIMARY HIGHWAY
Concrete Section



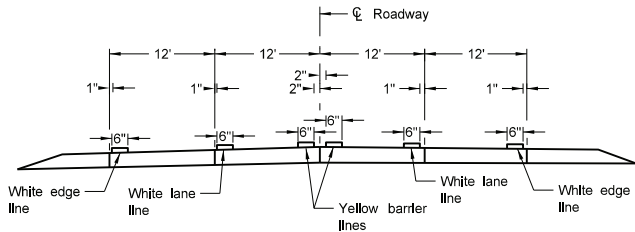
URBAN FIVE LANE SECTION
Asphalt Section



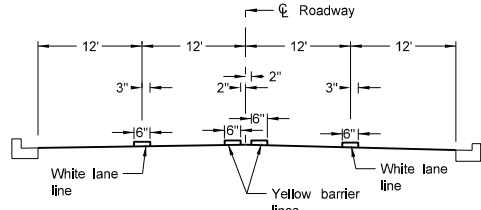
RURAL FOUR LANE ROADWAY
Asphalt Section



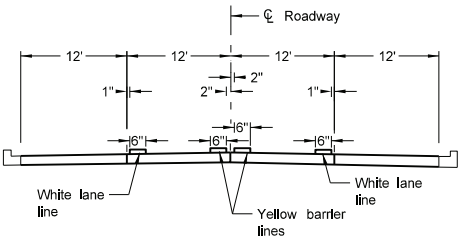
Two Lane Roadway
INTERSTATE HIGHWAY
Asphalt Section



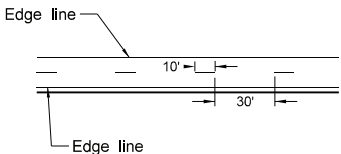
RURAL FOUR LANE ROADWAY
Concrete Section



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.



PAVEMENT MARKING FOR STANDARD 90 DEGREE FLARED INTERSECTION

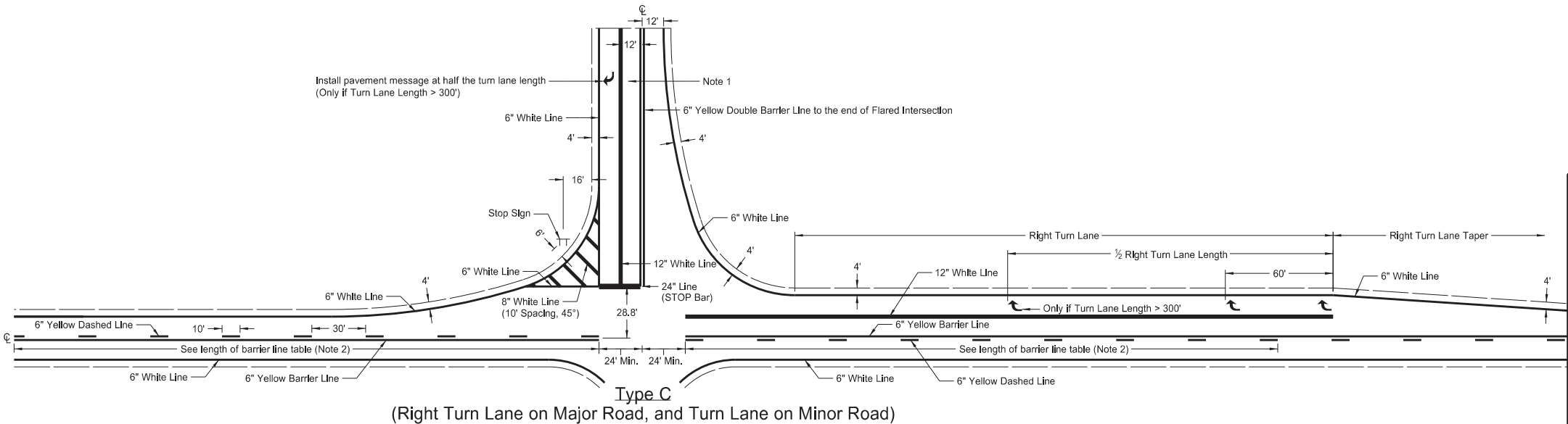
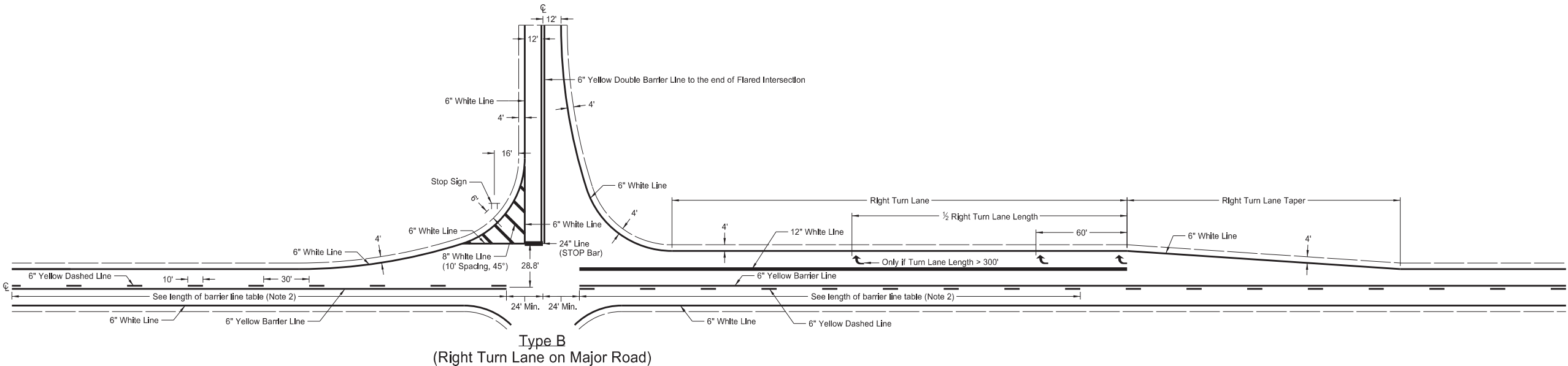
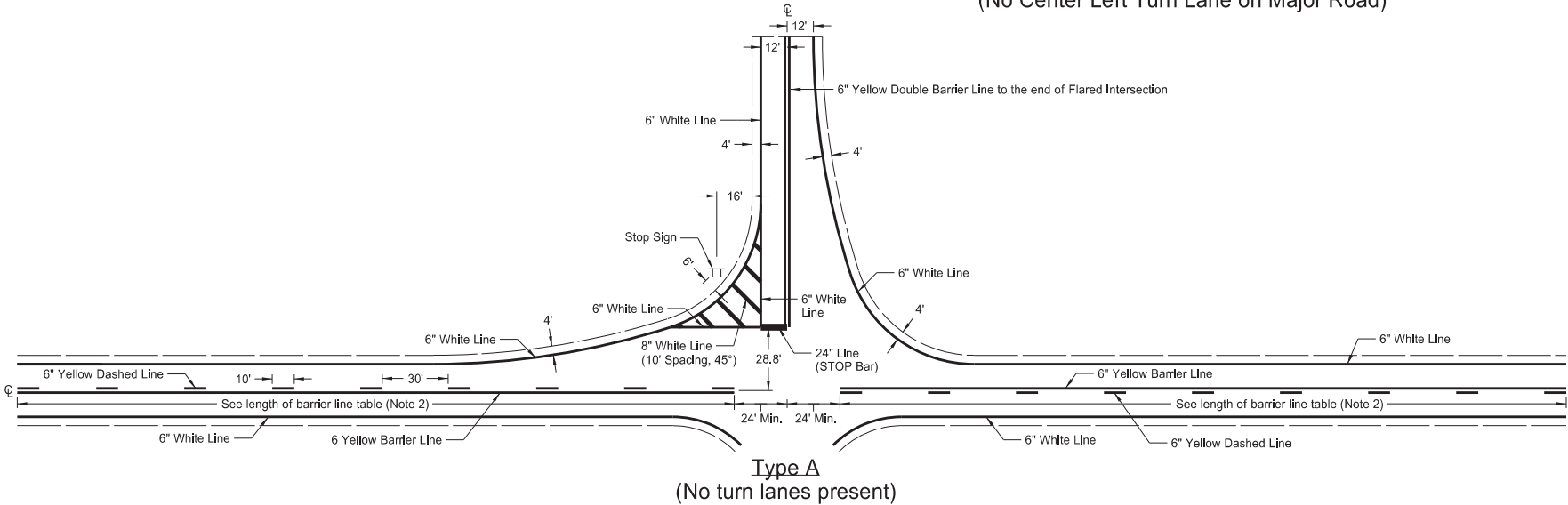
(No Center Left Turn Lane on Major Road)

D-762-5

Notes

- 1. At "T" intersections (3-leg), additionally install left turn pavement marking message arrow.
- 2. The barrier lines have variable distances dependent on speed limit. Obtain barrier line length from table below (stopping sight distance.)
- 3. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
- 4. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40.
- 5. Wide line - 8 inches wide if 4 inch normal width lines are used and 12 inches wide if 6 inch normal width lines are used.

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



- 6" Marking
- 8" Marking
- 12" Marking
- 24" Marking

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-29-16	
REVISIONS	
DATE	CHANGE
8-17-17	Updated note & dimensioning.
8-30-18	Corrected pvmt mkg placement.
8-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
1-17-24	Revised wide pvmt mkg width.

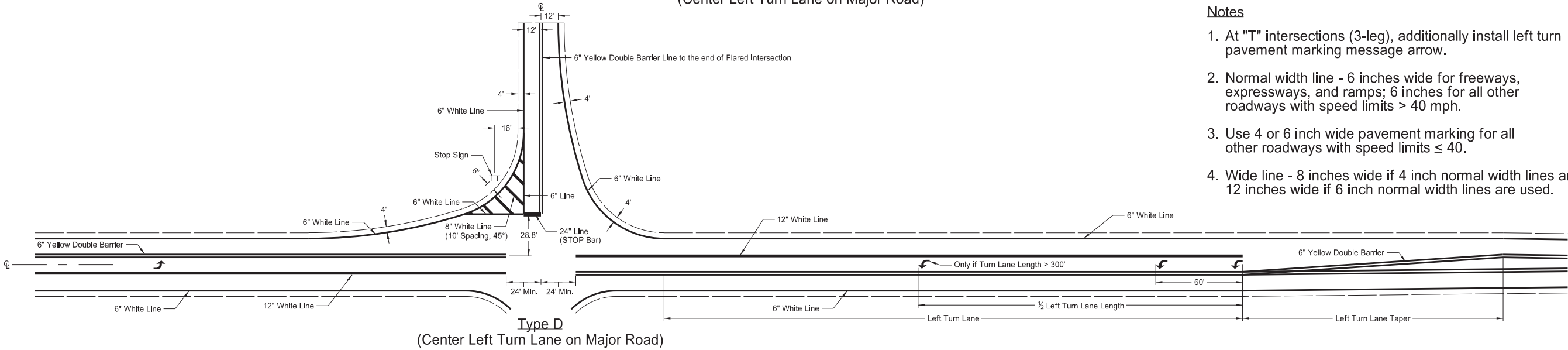


PAVEMENT MARKING FOR STANDARD 90 DEGREE FLARED INTERSECTION

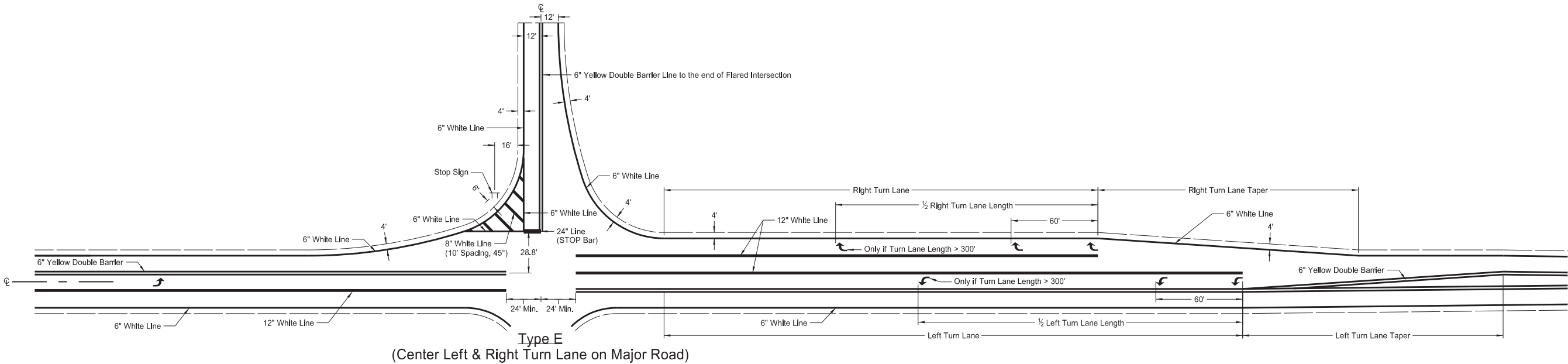
(Center Left Turn Lane on Major Road)

Notes

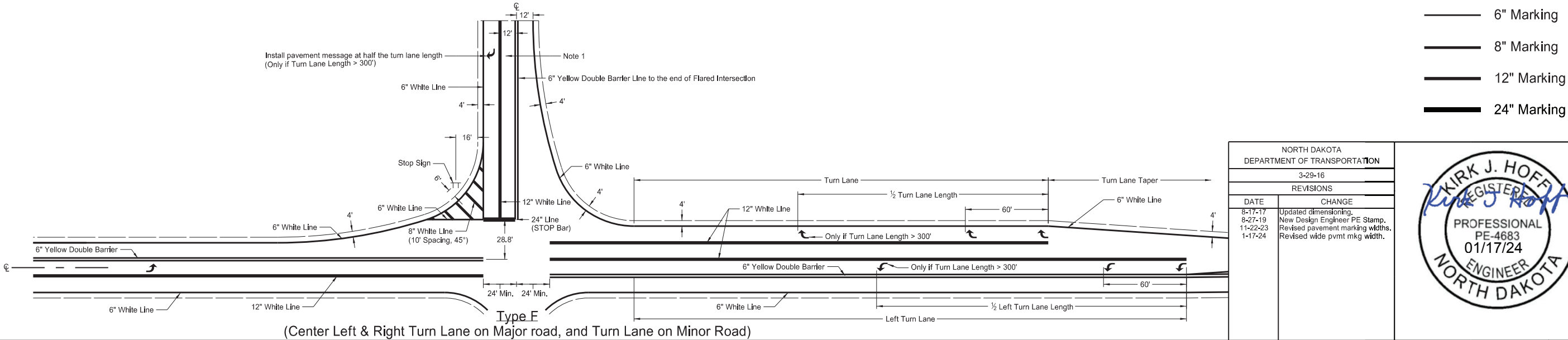
- 1. At "T" intersections (3-leg), additionally install left turn pavement marking message arrow.
- 2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
- 3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40.
- 4. Wide line - 8 inches wide if 4 inch normal width lines are used and 12 inches wide if 6 inch normal width lines are used.



Type D
(Center Left Turn Lane on Major Road)



Type E
(Center Left & Right Turn Lane on Major Road)



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

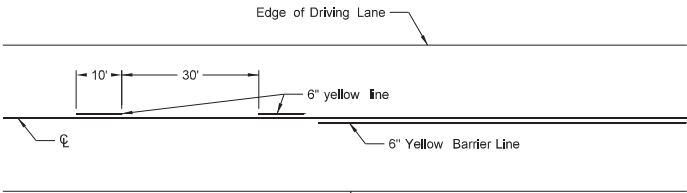
- 6" Marking
- 8" Marking
- 12" Marking
- 24" Marking

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
3-29-16	
REVISIONS	
DATE	CHANGE
8-17-17	Updated dimensioning.
8-27-19	New Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths.
1-17-24	Revised wide pvmt mkg width.

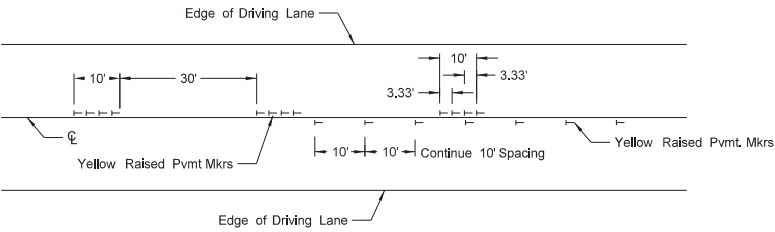


SHORT-TERM PAVEMENT MARKING

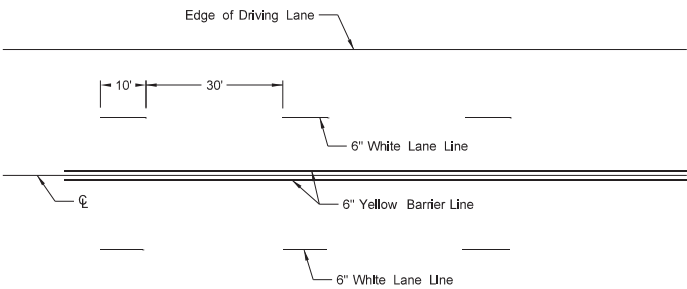
D-762-11



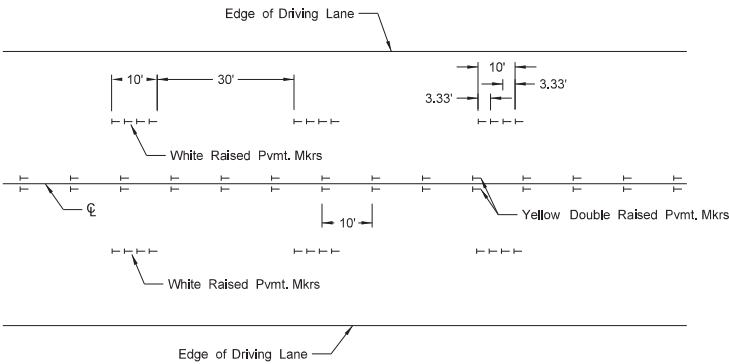
Painted or Tape Lines



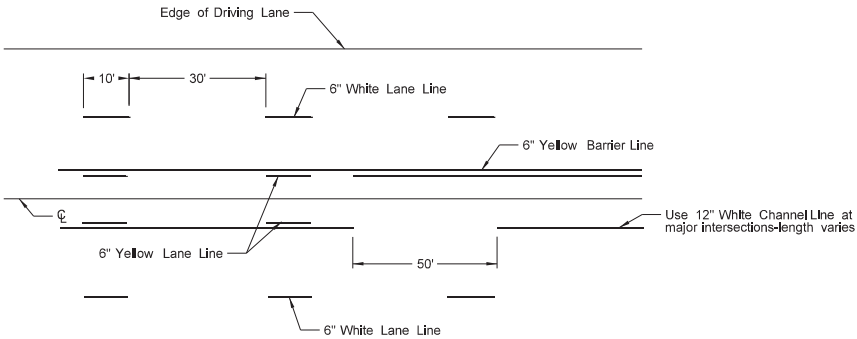
Raised Pavement Markers
TWO-LANE TWO-WAY ROADWAY



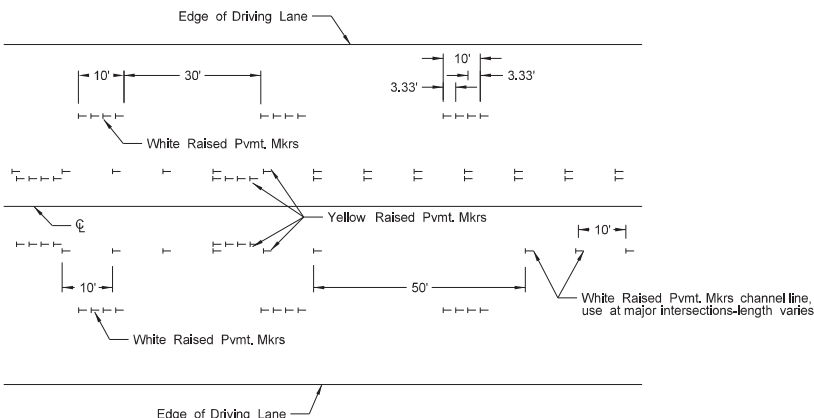
Painted or Tape Lines



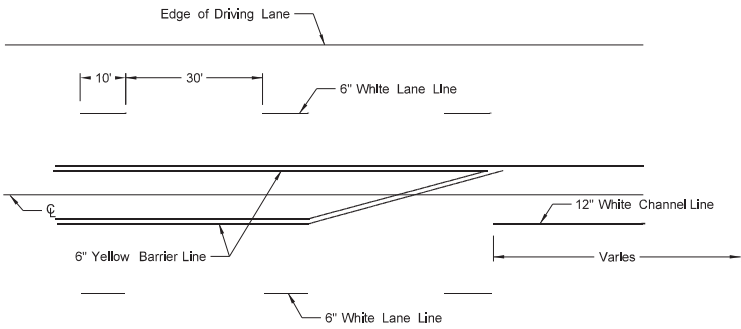
Raised Pavement Markers
FOUR LANE ROADWAY



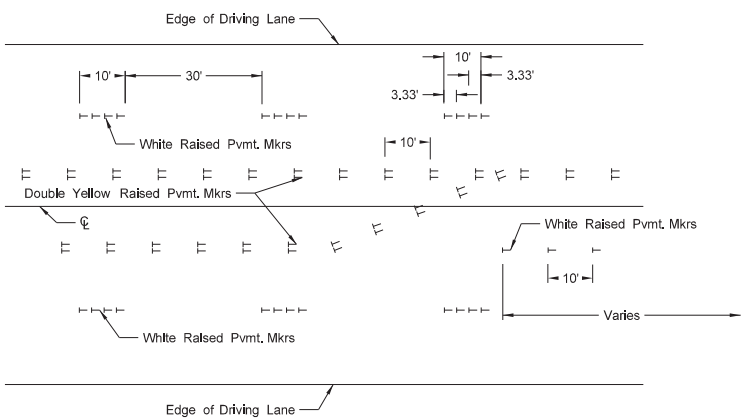
Painted or Tape Lines



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 Design Engineer PE Stamp.
11-22-23	Revised pavement marking widths
1-17-24	Revised wide pvmt marking width.

