

DESIGN DATA				
Traffic		Average Daily		
Current	2022	Pass: 44,135	Trucks: 2480	Total: 46,615
Preventive Maintenance				

NORTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

IM-1-094(009)147  
IM-1-194(247)000  
NHU-1-810(035)000

JCT ND 25 TO 3 MI E OF JCT US 83  
HWY 194; JCT I-94 TO ND 810  
MEMORIAL HWY/I-94B-EXPRESSWAY BRIDGE  
Seal Coat

	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	IM-1-094(009)147	24541	1	1
		IM-1-194(247)000	24542		
		NHU-1-810(035)000	24543		

GOVERNING SPECIFICATIONS	Date Published and Adopted by the North Dakota Department of Transportation
Standard Specifications	7/1/2024
Supplemental Specifications	NONE

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
IM-1-094(009)147	13.372	15.072
IM-1-194(247)000	0.991	1.072
NHU-1-810(035)000	0.735	0.863



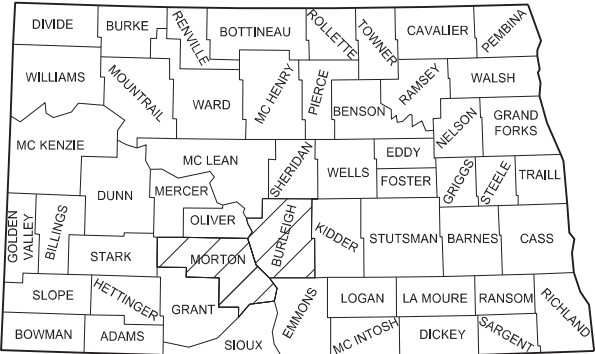
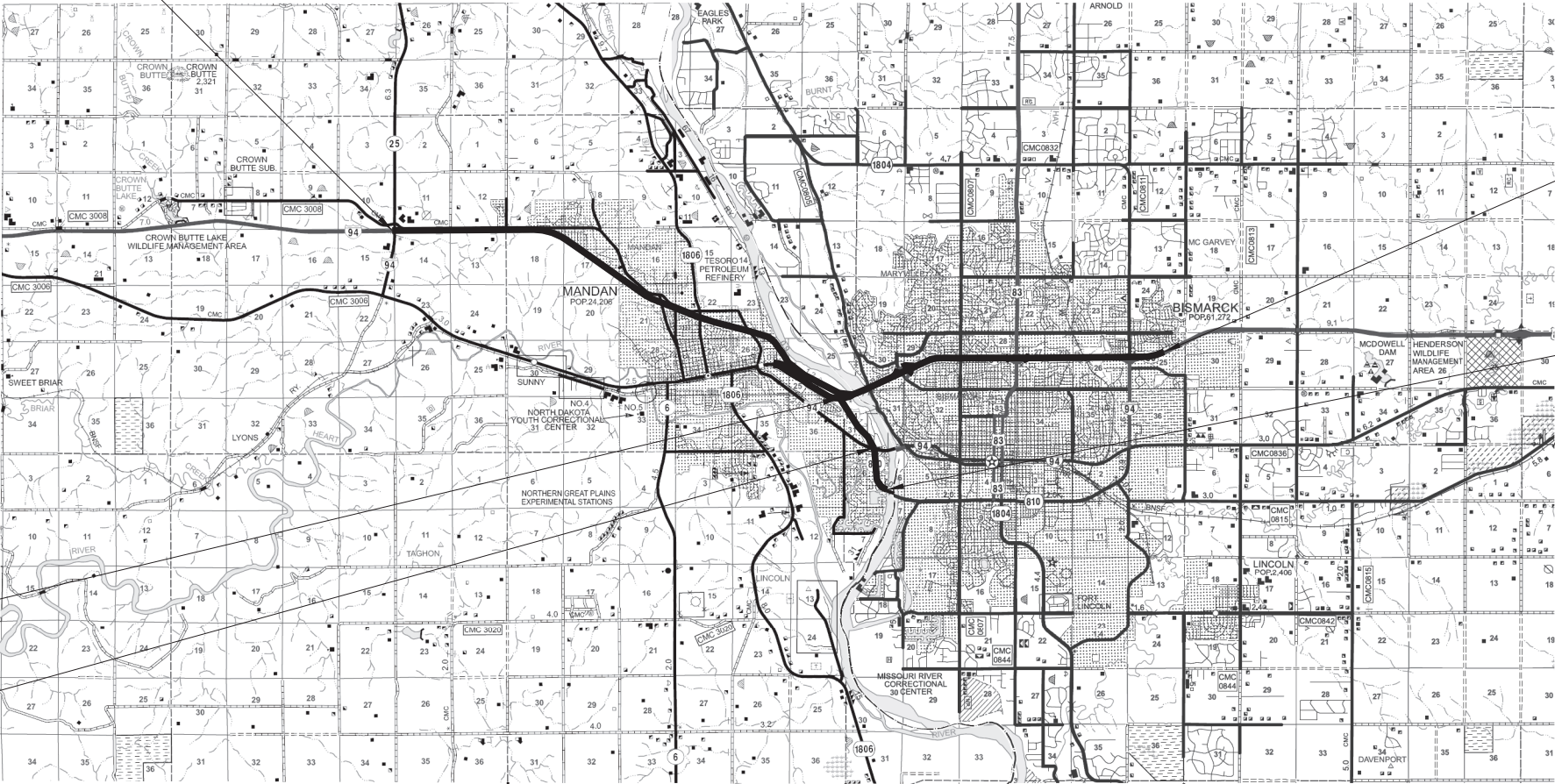
Begin PCN 24541  
RP 147.023

End PCN 24541  
RP 162.095

End PCN 24543  
RP 0.863

Begin PCN 24542  
RP 0.000

End PCN 24542  
RP 1.072  
Begin PCN 24543  
RP 0.000



STATE COUNTY MAP

DESIGNER Loren Lee
DESIGNER Cole Balzer
DESIGNER

ND DEPARTMENT OF TRANSPORTATION  
Bismarck District

Larry Gangl  
03/17/25

NDDOT Bismarck District



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			D-704-10	Construction Sign Details - Regulatory Signs					
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			D-704-13	Barricade And Channelizing Device Details					
			D-704-14	Construction Sign Punching And Mounting Details					
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			D-704-35	Sign Layout For One Lane Closure - Interstate System					
			D-704-50	Portable Sign Support Assembly					
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			D-762-2	Interstate Pavement Marking 4 Lane Divided Highway					
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Number	Description								
SP 500(24)	Railroad Requirements								
SP 485(24)	Warranty Chip Seal								
PSP 61(24)	Permits and Environmental Considerations								

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	NHU-1-810(035)000		

NOTES

108-P01 INTERIM COMPLETION DATE: The interim completion date for the seal coat work is August 1, 2025. Liquidated damages for failure to complete this work will accrue for each calendar day that expires after August 1, 2025.

401-P01 FOG SEAL: Supply the Fog Seal with a dilution of 50% water and 50% CSS-1H.

420-P02 CHIP SEAL EXCEPTION AREA: An Automatic Traffic Recorder site (ATR) is located on at RP 158.85. Apply a Fog Seal at the rate of 0.05 gal/SY over the loop area. The area includes 100 feet before and 100 feet after the ATR loops for the entire width of the roadway. Ensure aggregate is not applied over this area. Ensure the aggregate on nearby areas does not track onto the ATR loops in the roadway.

420-P03 PAVEMENT SWEEPING: Remove excess seal coat material accumulated along or under guardrail. Utilize a vacuum or pickup type sweeper when working next to jersey barrier sections and curb/gutter sections.

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

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

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

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

Install PRS that meet the following criteria:

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

Use individual PRS constructed in one of the following manners:

- A single piece;
- 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 RAMP CLOSURES: The following ramps will be closed to complete the Bituminous Seal Coat Special Provision work.

- Northbound Tyler Parkway to westbound I-94 loop on-ramp
- Northbound Tyler Parkway to eastbound I-94 on-ramp
- Southbound Hwy 194 to eastbound Memorial Hwy flyover off-ramp
- Westbound Memorial Hwy to southbound Hwy 810 loop on-ramp
- Eastbound Memorial Hwy to southbound Hwy 810 on-ramp
- Eastbound Memorial Hwy to northbound Hwy 194 loop on-ramp
  - Close eastbound Memorial Hwy to eastbound Memorial Hwy bridge through-street (beneath Hwy 194) at the same time as the Eastbound Memorial Hwy to northbound Hwy 194 loop on-ramp closure

Close a maximum of one on-ramp and one off-ramp at a time. Do not close ramps at multiple interchanges at a time. Only close ramps between the hours of 9AM-3PM. Complete all work for the Bituminous Seal Coat Special Provision and short-term striping in one day for each ramp closure. The Engineer will assess liquidated damages at \$2,500 per hour if any ramps are closed outside the hours of 9AM-3PM or if work on a ramp continues into additional calendar days.

Traffic control device quantities are based on the following list:

1. Section 100 Sheet 3, ramp closure layout





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NOTES

704-P02 TRAFFIC CONTROL FOR SEAL COATS ON I-94, HWY 810, and HWY 194: Provide traffic control consisting of a temporary lane closure and flagging. Maintain a minimum 10’ wide lane of traffic on all ramps not listed in note 704-P01. Sweep loose cover coat material from the roadway after the material has set and within 24 hours of application. A minimum of 48 hours after application, sweep loose cover coat material from the roadway a second time. Do not open the roadway to traffic until all sweeping, fog seal, and short-term striping within the lane closure are complete. The Engineer will assess liquidated damages at \$2,500 per hour if any lane closure is setup more than 120 hours.

Traffic control device quantities are based on a 6 mile limitation and the following list:

- 1. Standard D-704-20, terminal and seal coat sign layouts, See Section 100 Sheet 2 for locations
- 2. Standard D-704-22, layouts K and L, trucks entering/crossing roadway
- 3. Standard D-704-34A, lane shift between lane closure and opposite lane closure
- 4. Standard D-704-35, one lane closure interstate system
- 5. Standard D-704-60, interior lane closure on 6 lane interstate
- 6. Standard D-704-61, left lane closure on 6 lane interstate
- 7. Standard D-704-62, right lane closure on 6 lane interstate

704-P03 TRAFFIC CONTROL FOR SEAL COATS ON URBAN STREETS: Maintain two lanes of traffic during the hours of 7AM-9AM and 3PM-6PM on the following streets:

- McKenzie Dr SE

The Engineer will assess liquidated damages at \$2,500 per hour if two lanes of traffic are not maintained during the hours of 7AM-9AM and 3PM-6PM

Always maintain two lanes of traffic on the following roadways:

- Sunset Dr
- Memorial Highway

Traffic control device quantities are based on the following list:

- 1. Standard D-704-20, terminal and seal coat sign layouts, See Section 100 Sheet 2 for locations
- 2. Standard D-704-25, layouts V and X, lane closures on urban streets. Use Delineator drums in lieu of cones shown in D-704-25.

704-P04 TRAFFIC CONTROL FOR SEAL COATS ON ND 25/I-94B (at Exit 147): Provide traffic control consisting of a temporary lane closure and flagging.

Traffic control device quantities are based on the following list:

- 1. Standard D-704-20, terminal and seal coat sign layouts, See Section 100 Sheet 2 for locations
- 2. Standard D-704-33, two-lane temporary road closure

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





Estimated Quantities						STATE	PROJECT NO.	SECTION NO.	SHEET NO.
						ND	IM-1-094(009)147	8	1
SPEC	CODE	ITEM DESCRIPTION	UNIT	IM-1-094(009)147					TOTAL
103	0100	CONTRACT BOND	L SUM	0.86					0.86
420	0405	SEAL COAT	SY	738774					738774
702	0100	MOBILIZATION	L SUM	0.86					0.86
704	1000	TRAFFIC CONTROL SIGNS	UNIT	5324					5324
704	1048	PORTABLE RUMBLE STRIPS	EA	2					2
704	1052	TYPE III BARRICADE	EA	15					15
704	1060	DELINEATOR DRUMS	EA	300					300
704	1067	TUBULAR MARKERS	EA	600					600
704	1087	SEQUENCING ARROW PANEL-TYPE C	EA	3					3
704	1500	OBLITERATION OF PAVEMENT MARKING	SF	820					820
704	4011	PORTABLE CHANGEABLE MESSAGE SIGN	EA	4					4
762	0103	PVMT MK PAINTED-MESSAGE	SF	615					615
762	0200	RAISED PAVEMENT MARKERS	EA	180					180
762	0434	SHORT TERM 8IN LINE-TYPE NR	LF	177					177
762	0436	SHORT TERM 24IN LINE-TYPE NR	LF	547					547
762	0437	SHORT TERM 12IN LINE-TYPE NR	LF	16547					16547
762	0442	SHORT TERM MESSAGE-TYPE NR	SF	679					679
762	0460	SHORT TERM PAINTED LINE-SEAL JOBS	LF	420100					420100
762	1106	PVMT MK PAINTED 6IN LINE	LF	420100					420100
762	1108	PVMT MK PAINTED 8IN LINE	LF	177					177
762	1112	PVMT MK PAINTED 12IN LINE	LF	16547					16547
762	1124	PVMT MK PAINTED 24IN LINE	LF	547					547

Estimated Quantities						STATE	PROJECT NO.	SECTION NO.	SHEET NO.
						ND	IM-1-194(247)000	8	2
SPEC	CODE	ITEM DESCRIPTION	UNIT	IM-1-194(247)000					TOTAL
103	0100	CONTRACT BOND	L SUM	0.08					0.08
107	0100	RAILWAY PROTECTION INSURANCE	L SUM	1					1
107	0140	RAILROAD COORDINATION	L SUM	1					1
107	0145	RAILROAD FLAGGING	DAY	1600					1600
420	0405	SEAL COAT	SY	65829					65829
702	0100	MOBILIZATION	L SUM	0.08					0.08
704	1500	OBLITERATION OF PAVEMENT MARKING	SF	45					45
762	0434	SHORT TERM 8IN LINE-TYPE NR	LF	311					311
762	0436	SHORT TERM 24IN LINE-TYPE NR	LF	32					32
762	0437	SHORT TERM 12IN LINE-TYPE NR	LF	2906					2906
762	0460	SHORT TERM PAINTED LINE-SEAL JOBS	LF	35477					35477
762	1106	PVMT MK PAINTED 6IN LINE	LF	35477					35477
762	1108	PVMT MK PAINTED 8IN LINE	LF	311					311
762	1112	PVMT MK PAINTED 12IN LINE	LF	2906					2906
762	1124	PVMT MK PAINTED 24IN LINE	LF	32					32

Estimated Quantities						STATE	PROJECT NO.	SECTION NO.	SHEET NO.
						ND	NHU-1-810(035)000	8	3
SPEC	CODE	ITEM DESCRIPTION	UNIT	NHU-1-810(035)000	TOTAL				
103	0100	CONTRACT BOND	L SUM	0.06	0.06				
420	0405	SEAL COAT	SY	46861	46861				
702	0100	MOBILIZATION	L SUM	0.06	0.06				
704	1500	OBLITERATION OF PAVEMENT MARKING	SF	520	520				
762	0436	SHORT TERM 24IN LINE-TYPE NR	LF	98	98				
762	0437	SHORT TERM 12IN LINE-TYPE NR	LF	1787	1787				
762	0460	SHORT TERM PAINTED LINE-SEAL JOBS	LF	37906	37906				
762	1106	PVMT MK PAINTED 6IN LINE	LF	37906	37906				
762	1112	PVMT MK PAINTED 12IN LINE	LF	1787	1787				
762	1124	PVMT MK PAINTED 24IN LINE	LF	98	98				
762	1350	PAVEMENT MARKING MESSAGE-MASKING	SF	48	48				



## BASIS OF ESTIMATE

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ND	IM-1-094(009)147	10	1
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		I-94 WB		I-94 EB		I-94 3-Lane Section		I-194 Mainline		810 3-Lane Section		810 WB/EB					
		RP 147.692 to 152.268 RP 152.348 to 153.008 RP 153.108 to 153.963 RP 154.051 to 154.218 RP 154.302 to 155.342 RP 155.750 to 156.396 RP 156.746 to 158.381 RP 158.446 to 158.751 RP 158.871 to 160.592 RP 160.682 to 162.095		RP 147.719 to 152.302 RP 152.388 to 153.030 RP 153.130 to 154.004 RP 154.089 to 154.245 RP 154.303 to 155.262 RP 155.850 to 156.462 RP 156.787 to 158.404 RP 158.469 to 158.770 RP 158.835 to 160.620 RP 160.715 to 162.095		WB RP 155.342 to 155.750 EB RP 155.262 to 155.850		WB RP 0.027 to RP 1.018 EB RP 0.031 to RP 1.015		WB RP 0.251 to 0.411 EB RP 0.083 to 0.388		WB RP 0.065 to 0.251 RP 0.411 to 0.511 RP 0.545 to 0.846  EB RP 0.043 to 0.083 RP 0.388 to 0.489 RP 0.524 to 0.834					
		Material	Unit	Width (ft)	Area (SY)	Width (ft)	Area (SY)	Width (ft)	Area (ft)	Width (ft)	Area (SY)	Width (ft)	Area (SY)		Totals (SY)		
		Seal Coat	SY	38	290,215	38	287,785	50	29,216	38	44,029	50	13,640		38	23,141	851,464

"Totals" include ramp  
area. Sec. 10 Sheet 3

Permanent Pavement Marking – Mainline		
I-94 - Mainline		
EB Centerline Skips – Pvmt MK 6 IN Painted Line	Measured	18,573 LF
EB Edge Lines – Pvmt MK Painted 6 IN Line	Measured	141,705 LF
WB Centerline Skips – Pvmt MK 6 IN Painted Line	Measured	18,464 LF
WB Edge Lines – Pvmt MK Painted 6 IN Line	Measured	142,673 LF
I-194 – Mainline		
Centerline Skips – Pvmt MK 6 IN Painted Line	Measured	2,405 LF
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	19,433 LF
ND 810 - Mainline		
Centerline Skips – Pvmt MK 6 IN Painted Line	Measured	3,460 LF
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	27,688 LF

Permanent Pavement Marking – Ramps		
Location	Basis	Total
<b>I-94 - Exit 147</b>		
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	13,791 LF
Skips – Pvmt MK Painted 6 IN Line	Measured	433 LF
Barrier – Pvmt MK Painted 6 IN Line	Measured	2,416 LF
Stop Bar – Pvmt MK 24 IN Line	Measured	163 LF
Channel Lines – Pvmt MK 12 IN Line	Measured	2,274 LF
<b>I-94 – Mandan Scenic View</b>		
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	2,064 LF
Skips – Pvmt MK 6 IN Line	Measured	303 LF
<b>I-94 - Exit 152</b>		
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	9,870 LF
Skips – Pvmt MK Painted 6 IN Line	Measured	548 LF
Barrier – Pvmt MK Painted 6 IN Line	Measured	2,672 LF
Stop Bar – Pvmt MK 24 IN Line	Measured	291 LF
Crosswalk – Pvmt MK 6 IN Line	Measured	290 LF
Channel Lines – Pvmt MK 12 IN Line	Measured	3,383 LF
Message – Pvmt MK Painted White	Measured	487 SF

**Seal Coat Materials per SY**  
CRS2P Emulsified Asphalt – 0.40 Gal/SY  
Cover Coat Material CI 41 – 23 Lbs/SY  
Fog Seal – 0.05 Gal/SY (0.10 Gal/SY diluted)



BASIS OF ESTIMATE

Permanent Pavement Marking – Ramps		
Location - Type	Basis	Quantity
I-94 – Exit 153		
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	7,140 LF
Skips – Pvmt MK Painted 6 IN Line	Measured	640 LF
Barrier – Pvmt MK Painted 6 IN Line	Measured	4,538 LF
Stop Bar – Pvmt MK 24 IN Line	Measured	93 LF
Crosswalk – Pvmt MK 6 IN Line	Measured	346 LF
Channel Lines – Pvmt MK 12 IN Line	Measured	3,065 LF
Gore Area – Pvmt MK 8 IN Line	Measured	177 LF
Message – Pvmt MK Painted	Measured	128 SF
I-94 – Exit 155		
Centerline Skips – Pvmt MK 6 IN Painted Line	Measured	1,243 LF
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	11,317 LF
Channel Lines – Pvmt MK Painted 12 IN Line	Measured	1,497 LF
I-94 – Exit 156		
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	20,887 LF
Channel Lines – Pvmt MK Painted 12 IN Line	Measured	1,728 LF
Skips – Pvmt MK 6 IN Line	Measured	1,003 LF
I-94 – Exit 157		
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	13,208 LF
Channel Lines – Pvmt MK Painted 12 IN Line	Measured	1,885 LF
Skips – Pvmt MK 6 IN Line	Measured	925 LF
I-94 – Exit 159		
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	4,255 LF
Channel Lines – Pvmt MK Painted 12 IN Line	Measured	1,355 LF
Skips – Pvmt MK 6 IN Line White	Measured	796 LF
I-94 – Exit 161		
Channel Lines – Pvmt MK Painted 12 IN Line	Measured	1,360 LF
I-194 – Memorial Hwy Exit		
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	13,313 LF
Channel Lines – Pvmt MK Painted 12 IN Line	Measured	2,906 LF
Stop Bar – Pvmt MK 24 IN Line	Measured	32 LF
Skips – Pvmt MK 6 IN Line	Measured	326 LF
Channel Lines – Pvmt MK 8 IN Line	Measured	311 LF
ND 810 – McKenzie Drive Exit		
Edge Lines – Pvmt MK Painted 6 IN Line	Measured	6,332 LF
Channel Lines – Pvmt MK Painted 12 IN Line	Measured	1,787 LF
Stop Bar – Pvmt MK 24 IN Line	Measured	98 LF
Skips – Pvmt MK 6 IN Line	Measured	193 LF
Crosswalk – Pvmt MK 6 IN Line	Measured	233 LF

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Short Term Painted Line (IM-1-094(246)147) (1 Total Application, After Fog Seal)		
Location - Type	Basis	Quantity
Short Term 6 IN Line	Measured	420,100 LF
Short Term 8 IN Line	Measured	177 LF
Short Term 12 IN Line	Measured	16,547 LF
Short Term 24 IN Line	Measured	547 LF
Message – Short Term White	Measured	679 SF

Short Term Painted Line (IM-1-194(247)000) (1 Total Application, After Fog Seal)		
Location - Type	Basis	Quantity
Short Term 6 IN Line	Measured	35,477 LF
Short Term 8 IN Line	Measured	311 LF
Short Term 12 IN Line	Measured	2,906 LF
Short Term 24 IN Line	Measured	32 LF

Short Term Painted Line (NHU-1-810(035)000) (1 Total Application, After Fog Seal)		
Location - Type	Basis	Quantity
Short Term 6 IN Line	Measured	37,906 LF
Short Term 12 IN Line	Measured	1,787 LF
Short Term 24 IN Line	Measured	98 LF

Pavement Marking Message-Masking (NHU-1-810(035)000)		
Location	Basis	Quantity
McKenzie Drive WB Off Ramp – Wrong Way Arrows	Measured	48 SF



**BASIS OF ESTIMATE**

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RAMP AREA (SY)					Total (SY)
AREA	NW	NE	SW	SE	
Exit 147	4,086	3,843	3,840	4,036	15,805
Scenic View					3,195
Exit 152	6,000	4,536	7,017	3,312	20,865
Exit 153	3,370	5,030	3,035	2,199	13,634
Exit 155	11,995		10,170		22,165
Exit 156	5,210	12,618	10,828	4,974	33,630
Exit 157	3,857	7,531	1,913	3,817	17,118
Exit 159	1,690	959	1,083	1,414	5,146
Memorial Highway Exit	11,283	3,974	1,487	5,056	21,800
McKenzie Dr Exit	1,904	1,839	3,247	3,090	10,080
					163,439







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ATR Exception Area

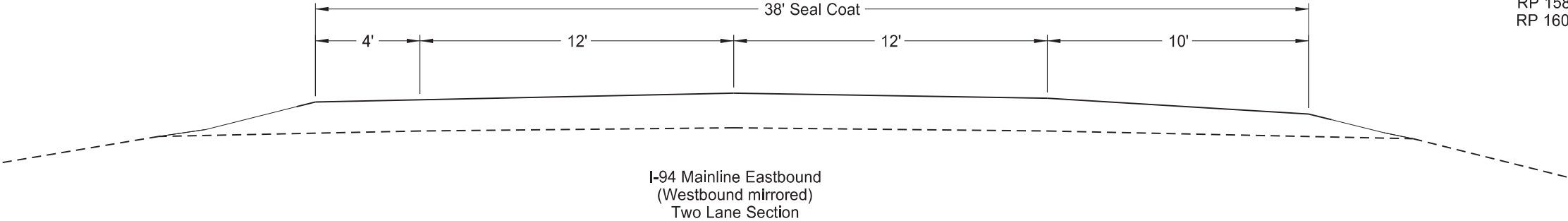
I-94, Hwy 194, and Hwy 810  
Seal Coat



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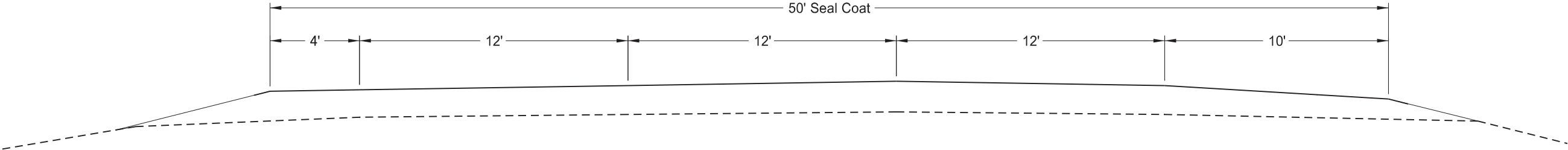
Bridge Exceptions

Westbound	Eastbound
RP 152.268 to 152.348	RP 152.302 to 152.388
RP 153.008 to 153.108	RP 153.030 to 153.130
RP 153.963 to 154.051	RP 154.004 to 154.089
RP 154.218 to 154.302	RP 154.245 to 154.303
RP 156.396 to 156.746	RP 156.462 to 156.787
RP 158.381 to 158.446	RP 158.404 to 158.469
RP 158.751 to 158.871	RP 158.770 to 158.835
RP 160.592 to 160.682	RP 160.620 to 160.715



Westbound  
RP 147.692 to 155.396  
RP 155.750 to 162.095

Eastbound  
RP 147.719 to 155.262  
RP 155.850 to 162.095



Westbound  
RP 155.396 to 155.750

Eastbound  
RP 155.262 to 155.850

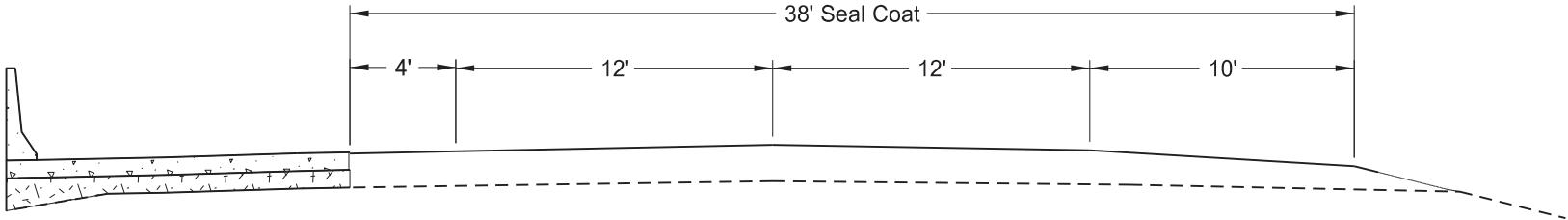
Proposed Typical Section  
I-94 Mainline

I-94, Hwy 194, and Hwy 810  
Seal Coat





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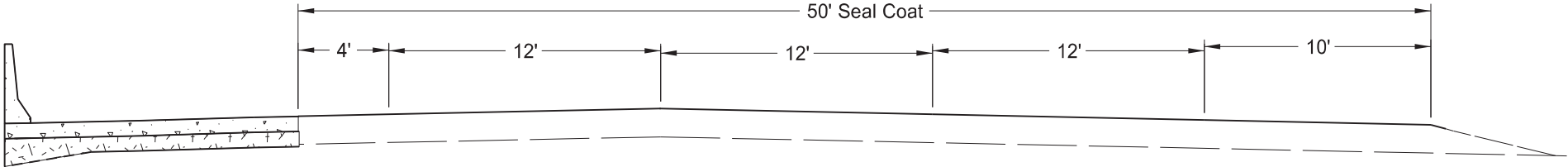
I-194 and ND 810 Eastbound  
(Westbound is mirrored)

ND 810 Westbound  
RP 0.065 to 0.251  
RP 0.411 to 0.511  
RP 0.545 to 0.846

ND 810 Eastbound  
RP 0.043 to 0.083  
RP 0.388 to 0.489  
RP 0.524 to 0.834

I-194 Westbound  
RP 0.027 to 1.018

I-194 Eastbound  
RP 0.031 to 1.015



ND 810 3 Lane Section Eastbound  
(Westbound mirrored)

Westbound  
RP 0.251 to 0.411

Eastbound  
RP 0.083 to 0.388

Proposed Typical Sections  
I-194 & ND 810

I-94, Hwy 194, and Hwy 810  
Seal Coat





STATE	PROJECT NO.	SECTION NO.	SHEET NO.
<b>ND</b>	<b>IM-1-094(009)147</b>	<b>100</b>	<b>1</b>

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
E5-1-48	48"x48"	EXIT GORE	4	35	140
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	4	26	104
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)	1	18	18
G20-4b-36	36"x30"	WAIT FOR PILOT CAR		18	
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS	13	43	559
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW	2	36	72
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$80 WHEN WORKERS PRESENT	4	59	236
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	2	32	64
R1-2-60	60"x60"	YIELD	2	29	58
R2-1-36	36"x48"	SPEED LIMIT __ (Portable only)	16	30	480
R2-1-48	48"x60"	SPEED LIMIT __	12	39	468
R2-1aP-24	24"x18"	MINIMUM FEE \$80 (Mounted on Speed Limit post)	15	10	150
R3-2-48	48"x48"	NO LEFT TURN		35	
R4-1-48	48"x60"	DO NOT PASS	2	39	78
R4-7-48	48"x60"	KEEP RIGHT		39	
R5-1-48	48"x48"	DO NOT ENTER		35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)		14	
R7-1-12	12"x18"	NO PARKING ANY TIME		11	
R10-6-24	24"x36"	STOP HERE ON RED		16	
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)	4	12	48
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	5	35	175
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT	4	35	140
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	2	35	70
W3-5-48	48"x48"	SPEED REDUCTION AHEAD	6	35	210
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT	3	35	105
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		35	
W8-3-48	48"x48"	PAVEMENT ENDS		35	
W8-7-48	48"x48"	LOOSE GRAVEL		35	
W8-11-48	48"x48"	UNEVEN LANES		35	
W8-12-48	48"x48"	NO CENTER LINE	4	35	140
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL		35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY		35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT or __ MILE	2	35	70
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT or __ MILE	2	35	70
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY		35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL	4	35	140
W12-1-48	48"x48"	CROSSING DOUBLE ARROW	2	35	70
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	20	35	700
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	3	35	105
W20-7-48	48"x48"	FLAGGER	10	35	350
W20-8-18	18"x18"	STOP - SLOW PADDLE Back to Back	10	5	50
W20-52P-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)	4	12	48
W21-1-48	48"x48"	WORKERS	4	35	140
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	

[illegible][illegible]

SPEC & CODE			
704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	5324

SPEC & CODE	DESCRIPTION	UNIT	QUANTITY
704-0100	FLAGGING	MHR	
<b>704-1048</b>	<b>PORTABLE RUMBLE STRIPS</b>	<b>EACH</b>	<b>2</b>
704-1050	TYPE I BARRICADES	EACH	
<b>704-1052</b>	<b>TYPE III BARRICADES</b>	<b>EACH</b>	<b>15</b>
<b>704-1060</b>	<b>DELINEATOR DRUMS</b>	<b>EACH</b>	<b>300</b>
704-1065	TRAFFIC CONES	EACH	
<b>704-1067</b>	<b>TUBULAR MARKERS</b>	<b>EACH</b>	<b>600</b>
704-1070	DELINEATOR	EACH	
704-1072	FLEXIBLE DELINEATORS	EACH	
704-1080	STACKABLE VERTICAL PANELS	EACH	
704-1081	VERTICAL PANELS - BACK TO BACK	EACH	
704-1085	SEQUENCING ARROW PANEL - TYPE A	EACH	
704-1086	SEQUENCING ARROW PANEL - TYPE B	EACH	
<b>704-1087</b>	<b>SEQUENCING ARROW PANEL - TYPE C</b>	<b>EACH</b>	<b>3</b>
<b>704-1500</b>	<b>OBLITERATION OF PVMT MK</b>	<b>SF</b>	<b>1385</b>
704-3501	PORTABLE PRECAST CONCRETE MED BARRIER	LF	
704-3510	PRECAST CONCRETE MED BARRIER - STATE FURNISHED	EACH	
<b>704-4011</b>	<b>PORTABLE CHANGEABLE MESSAGE SIGN</b>	<b>EACH</b>	<b>4</b>
<b>762-0200</b>	<b>RAISED PAVEMENT MARKERS</b>	<b>EACH</b>	<b>180</b>
762-0420	SHORT TERM 4IN LINE - TYPE R	LF	
762-0430	SHORT TERM 4IN LINE - TYPE NR	LF	
<b>762-0434</b>	<b>SHORT TERM 8IN LINE-TYPE NR</b>	<b>LF</b>	<b>177</b>
<b>762-0436</b>	<b>SHORT TERM 24IN LINE-TYPE NR</b>	<b>LF</b>	<b>677</b>
<b>762-0437</b>	<b>SHORT TERM 12IN LINE-TYPE NR</b>	<b>LF</b>	<b>21240</b>
<b>762-0442</b>	<b>SHORT TERM MESSAGE-TYPE NR</b>	<b>SF</b>	<b>679</b>
<b>762-0460</b>	<b>SHORT TERM PAINTED LINE-SEAL JOBS</b>	<b>LF</b>	<b>420100</b>

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



## Traffic Control Devices List

## I-94, Hwy 194, and Hwy 810

## Seal Coat

Sign Sequence A

ROAD WORK  
NEXT 00 MILES

G20-1a-60

SPEED LIMIT ENFORCED  
MINIMUM FEE \$80  
WHEN WORKERS PRESENT

G20-55-96

Sign Sequence B



W20-1-48

ROAD WORK  
NEXT 00 MILES

G20-50a-72

Sign Sequence C

ROAD WORK  
NEXT 00 MILES

G20-1a-60

Sign Sequence D

END  
ROAD WORK

G20-2-48

Sign Sequence E



W20-1-48

ROAD WORK  
NEXT 00 MILES

G20-52a(L/R)-72



W8-12-48  
Per standard  
drawing D704-20  
note 6

STATE

ND

PROJECT NO.

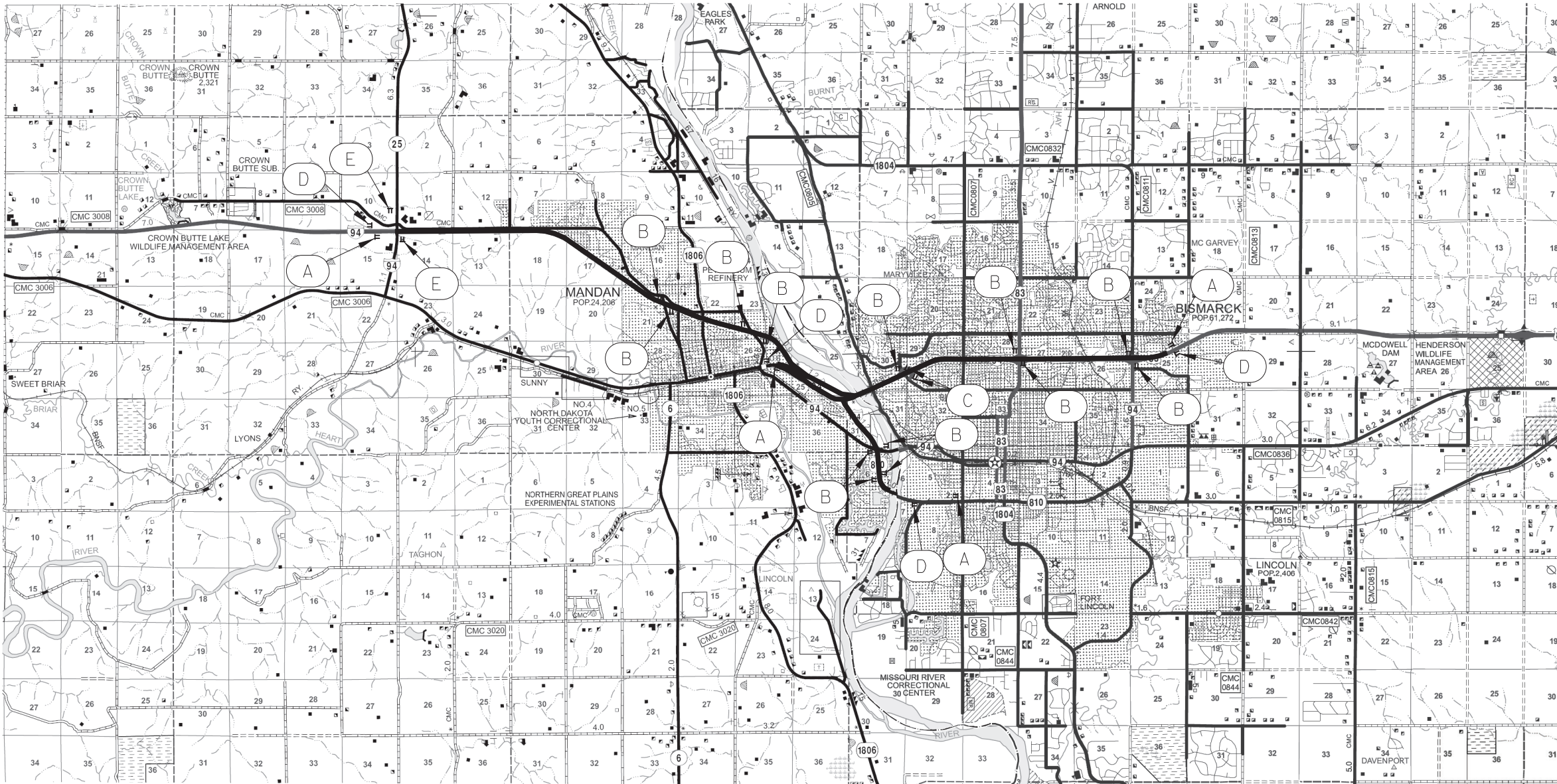
IM-1-094(009)147

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100

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2



Terminal Sign Layout

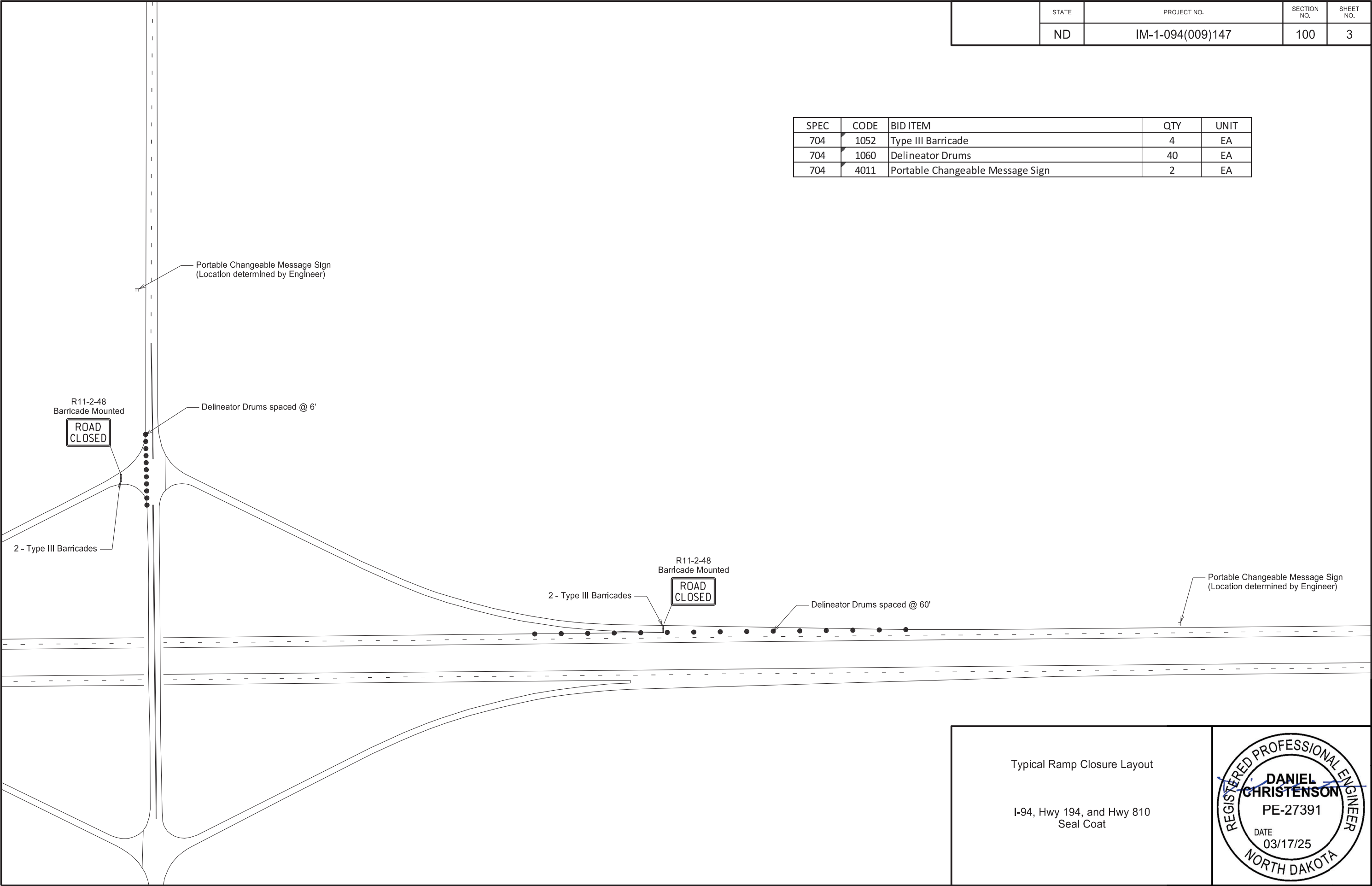
I-94, Hwy 194, and Hwy 810  
Seal Coat





	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	IM-1-094(009)147	100	3

SPEC	CODE	BID ITEM	QTY	UNIT
704	1052	Type III Barricade	4	EA
704	1060	Delineator Drums	40	EA
704	4011	Portable Changeable Message Sign	2	EA





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 $\varnothing$	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	FI	flange
ADA	Americans with Disabilities Act	Ch Ch	channel change	Desc	description	FIRD	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 $\varnothing$	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				
BF	back face	Coord	coordinate	Ea	each		
Balc	balcony	Cor	corner	Esmt	easement		
B Wire	barbed wire	Corr	corrected	E	East		
Barr	barricade	CAES	corrugated aluminum end section	EB	Eastbound		
Btry	battery	CAP	corrugated aluminum pipe	Elast	elastomeric		
BI	beehive inlet	CMES	corrugated metal end section	EL	electric locker		
Beg	begin	CMP	corrugated metal pipe	E Mtr	electric meter		
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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09-20-18	General Revisions
12-10-20	General Revisions
08-16-22	General Revisions



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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	MC	meander corner	PL	pipeline	Rev	reverse
HBP	hot bituminous pavement	Meas	measure	Pl	place	Rt	right
HMA	hot mix asphalt	Mdn	median	P&P	plan & profile	R/W	right of way
Hyd	hydrant	MD	median drain	PL	plastic limit	Riv	river
Ph	hydrogen ion content	MC	medium curing	Pl or P <sub>L</sub>	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	North East	Prop Ln	property line		
		NW	North West	Ppsd	proposed		
		NB	Northbound	PB	pull box		
		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	South East	TERO	tribal employment rights ordinance
SW	South West	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 preparation	WB	westbound
Ss	subsoil	Wrng	wiring
SS	supplement specification	W/	with
Supp	supplemental	W/o	without
Surf	surfacing	WC	witness corner
Surv	survey		
Sym	symmetrical		

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MEASUREMENTS

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

T	tesla
T/mi	tons per mile
V	volt
W	watt
Wb	weber

SURVEY DESCRIPTIONS

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

SOIL TYPES

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

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



12 18 2020



NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

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

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REVISIONS	
DATE	CHANGE
04-23-18	General Revisions
09-20-18	General Revisions
12-10-20	General Revisions
08-16-22	General Revisions

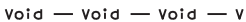





























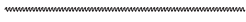
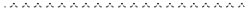







08/16/22

LINE STYLES



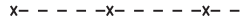





D-101-20

Existing Topography









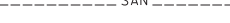













	Existing Ground Void
	Existing Cemetary Boundary
	Existing Box Culvert Bridge
	Existing Concrete Surface
	Existing Drainage Structure
	Existing Gravel Surface
	Existing Riprap
	Existing Dirt Surface
	Existing Asphalt Surface
	Existing Tie Point Line
	Existing Railroad Centerline
	Existing Guardrail Cable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

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




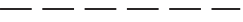
Proposed Topography

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










Existing Utilities

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




Proposed Utilities

	24 Inch Pipe
	Reinforced Concrete Pipe
	Under Drain
	Edge Drain

Traffic Utilities

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

Sign Structures

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

NORTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

07-01-14

REVISIONS

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

KIRK J. HOFF

REGISTERED

PROFESSIONAL

PE-4683

ENGINEER

NORTH DAKOTA






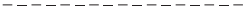







12 18 2020







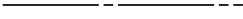




LINE STYLES

D-101-21



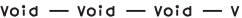





Right Of Way

	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







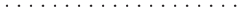
Boundary Control

	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




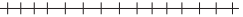
Profile

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


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





































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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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12 18 2020



SYMBOLS

D-101-33

			Existing Manhole (Electrical, Gas, Telephone)		Cap or Stub Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water
			Water Manhole (Exst, Exst with Valve)		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

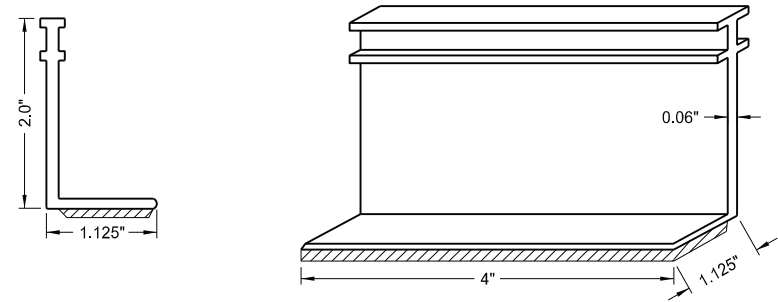
12 18 2020

LANE MARKERS  
(Spotting Tab for Seal Projects only)

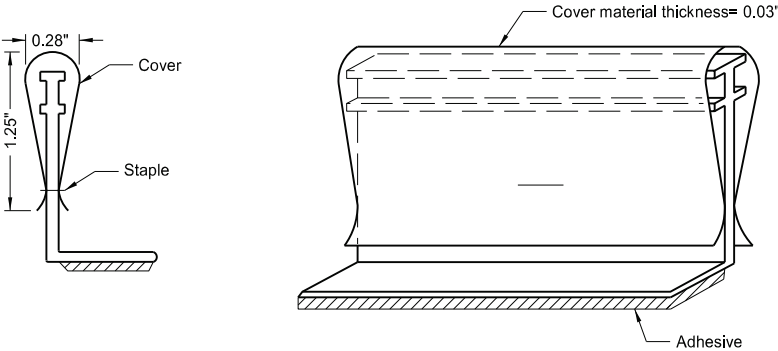
D-704-3

Notes:

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



Marker Body

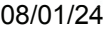


Marker Body with Protective Cover

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



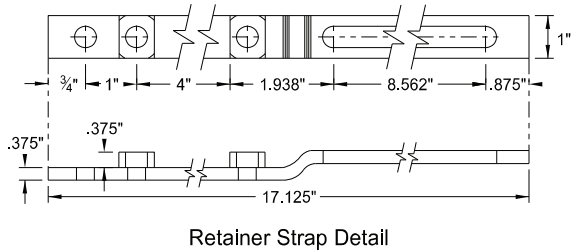
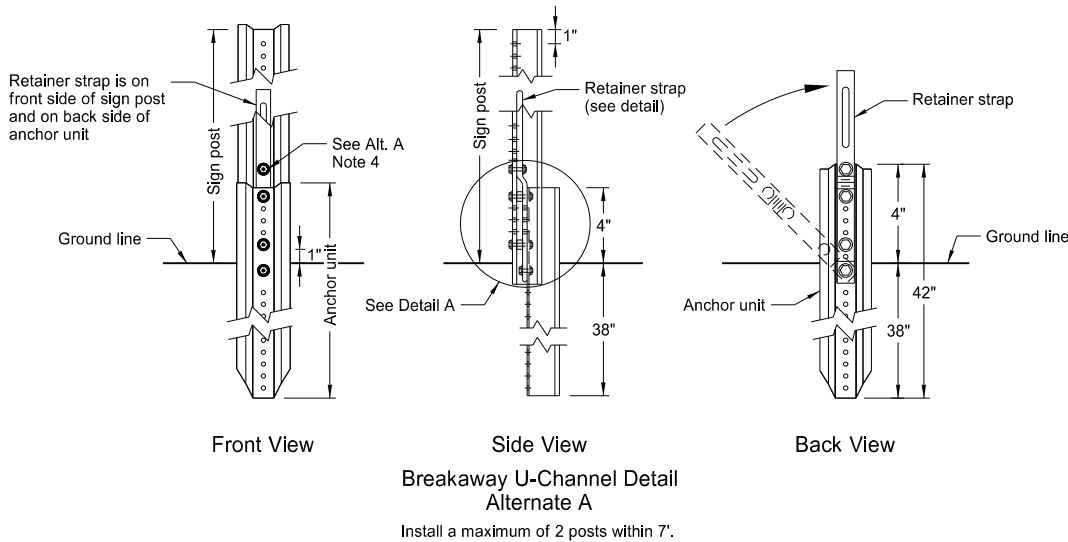
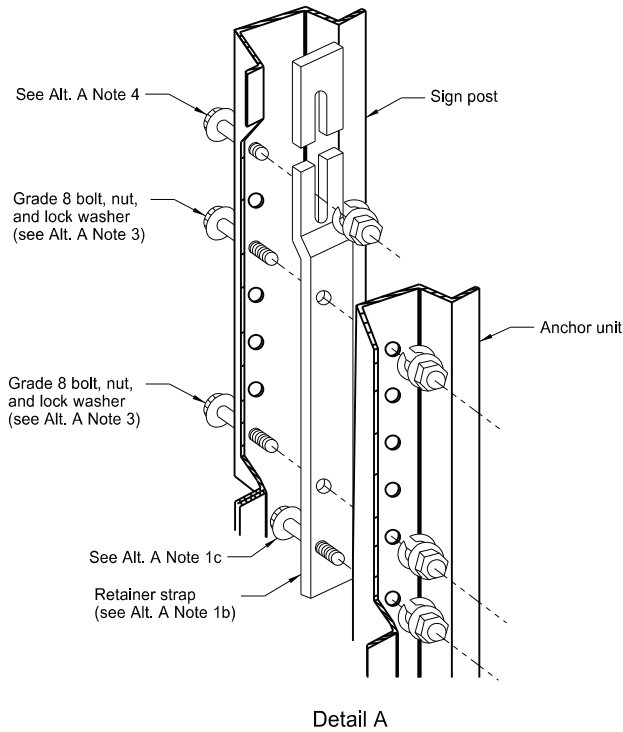
08/01/24



BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

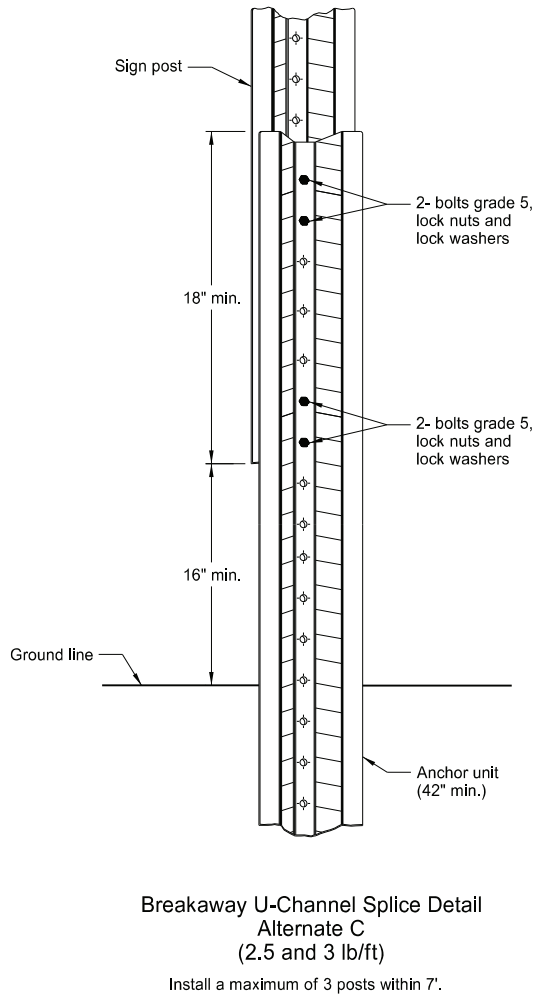
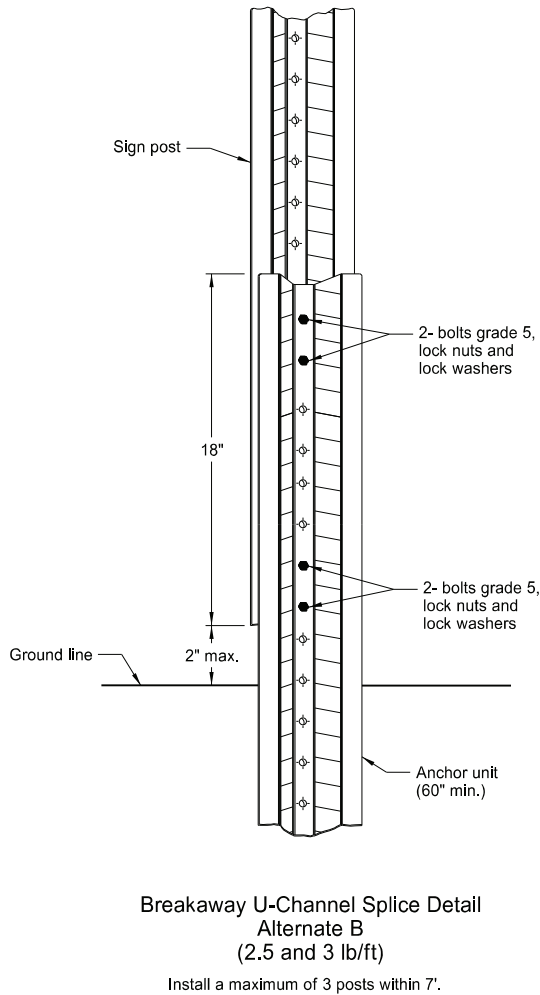
D-704-8

U-Channel Post



Alternate A Steps of Installation:

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



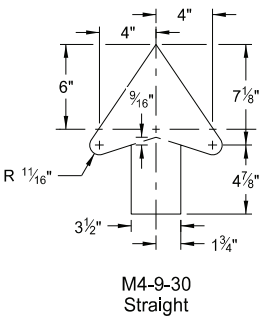
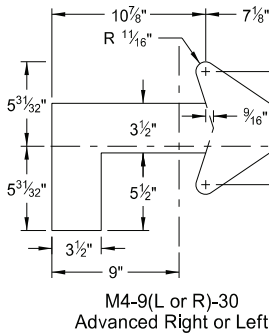
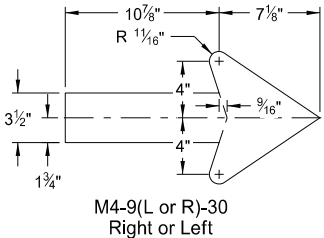
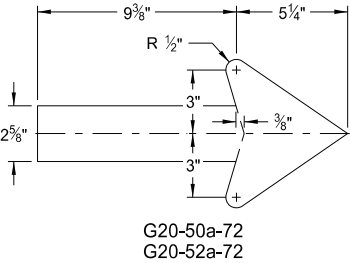
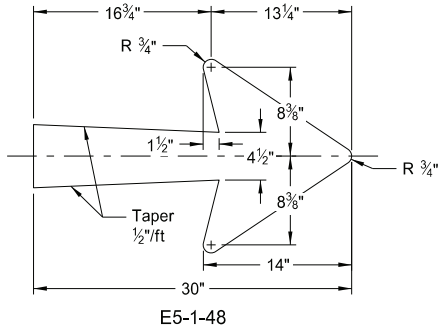
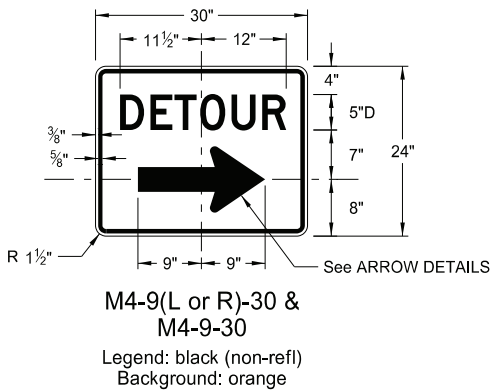
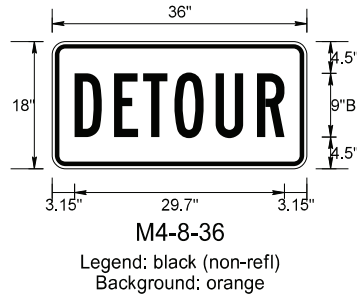
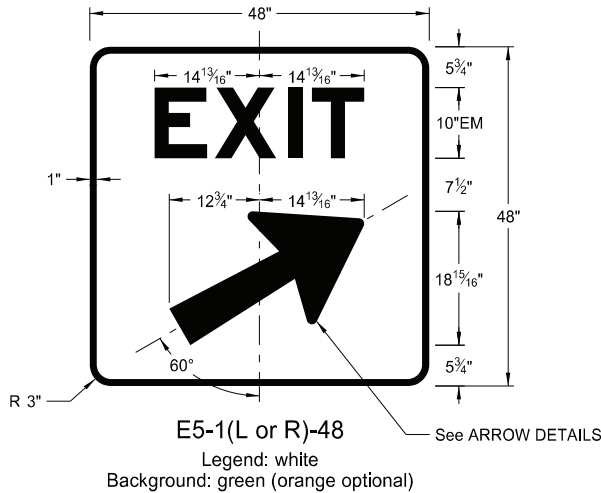
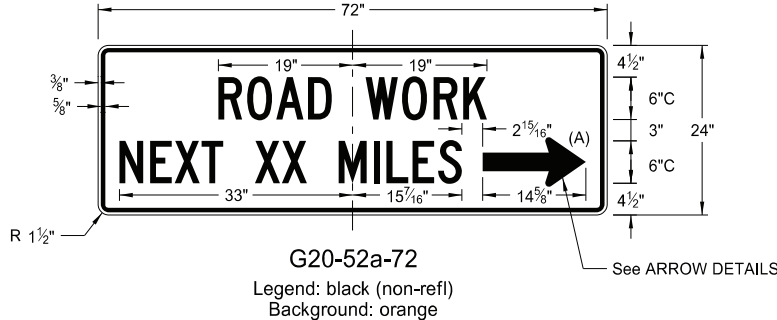
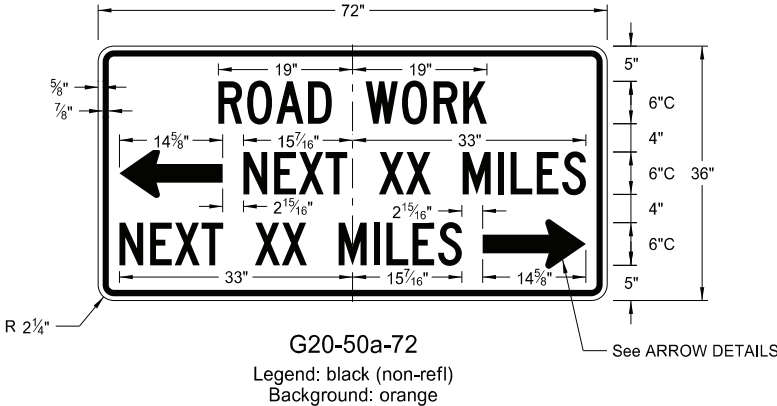
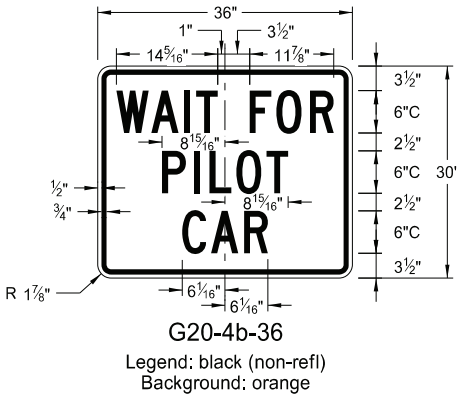
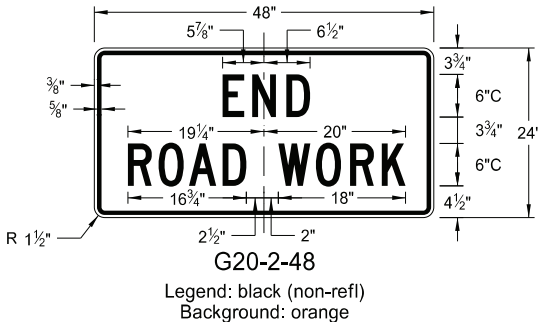
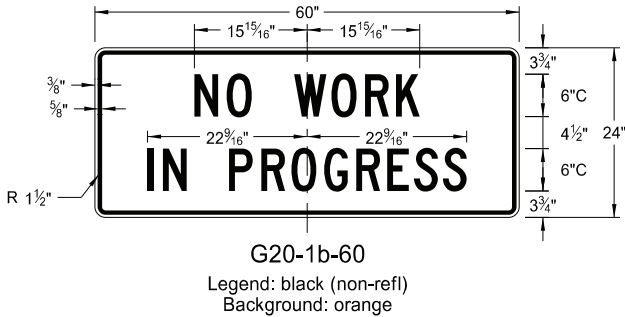
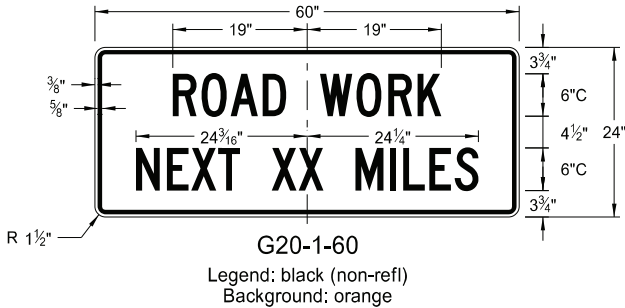
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
10-03-19	New Design Engr PE Stamp
8-01-24	Electronic Stamp/Signature



08/01/24



CONSTRUCTION SIGN DETAILS  
TERMINAL AND GUIDE SIGNS



ARROW DETAILS

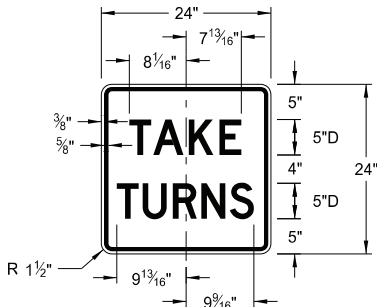
- NOTES:
- (A) Arrow may be right or left of the legend to indicate construction to the right or left.

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

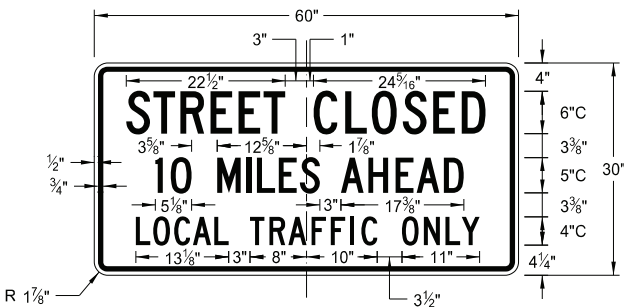


08/01/24

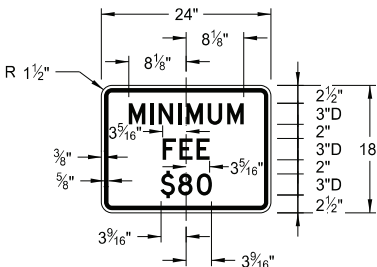
CONSTRUCTION SIGN DETAILS  
REGULATORY SIGNS



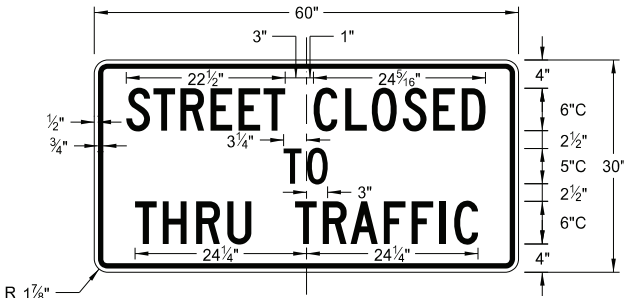
R1-50P-24  
Legend: black (non-refl)  
Background: white



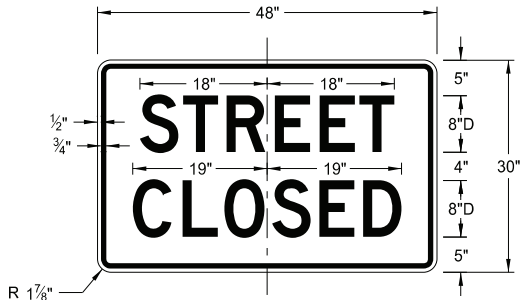
R11-3c-60  
Legend: black (non-refl)  
Background: white



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



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



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

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

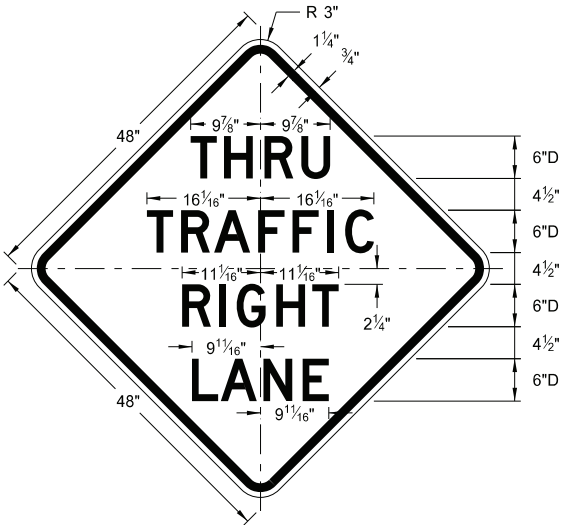


08/01/24

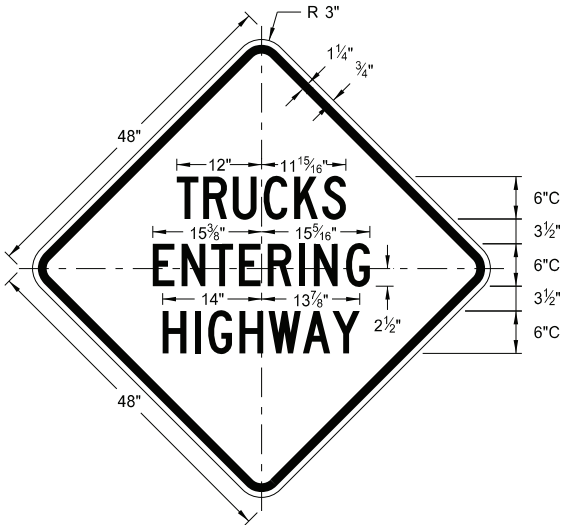
CONSTRUCTION SIGN DETAILS  
WARNING SIGNS

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

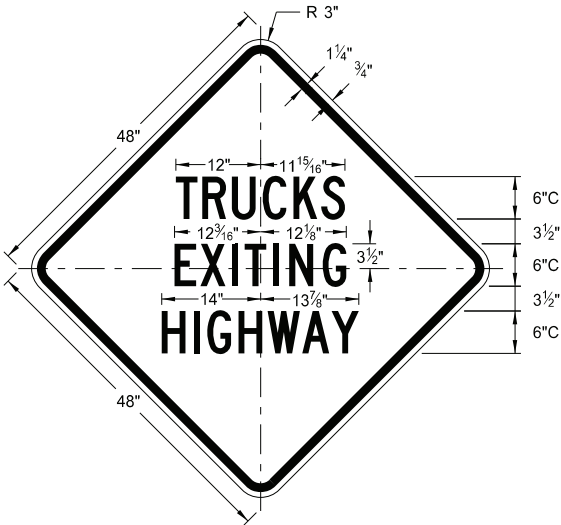
\* DISTANCE MESSAGES



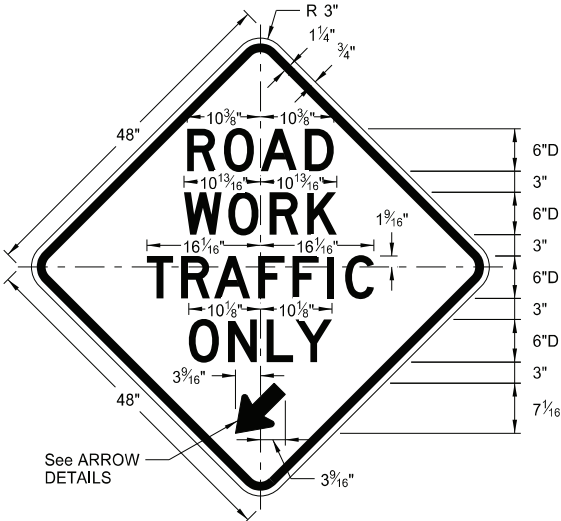
W5-8-48  
Legend: black (non-refl)  
Background: orange



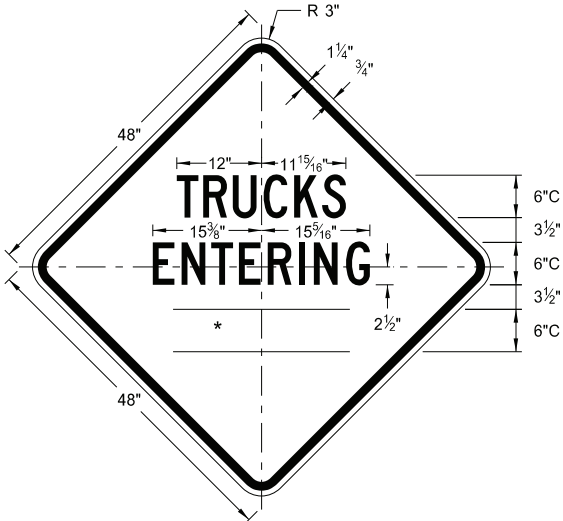
W8-53-48  
Legend: black (non-refl)  
Background: orange



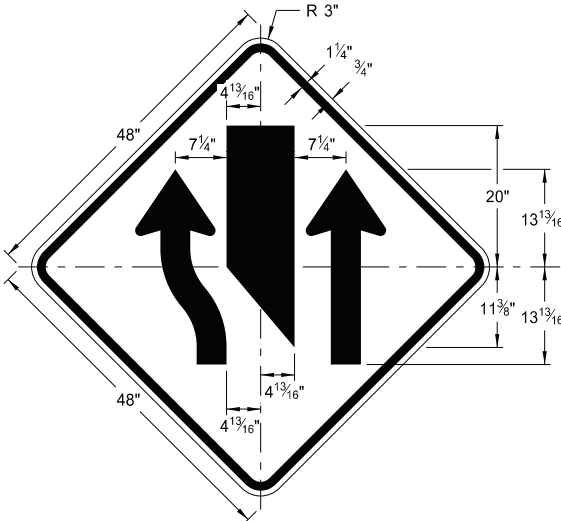
W8-56-48  
Legend: black (non-refl)  
Background: orange



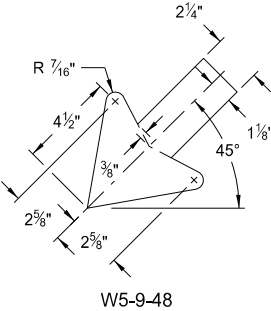
W5-9-48  
Legend: black (non-refl)  
Background: orange



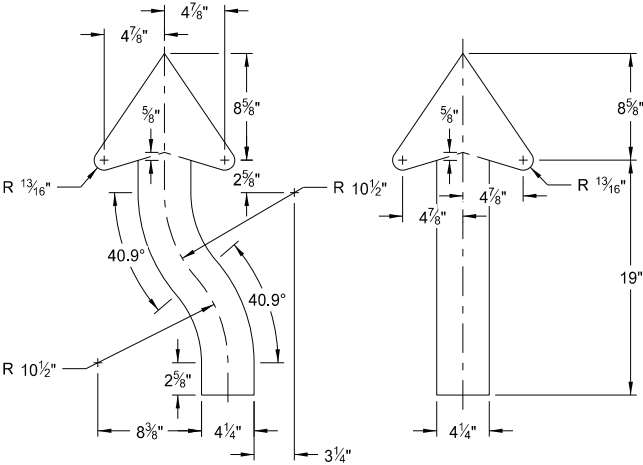
W8-54-48  
Legend: black (non-refl)  
Background: orange



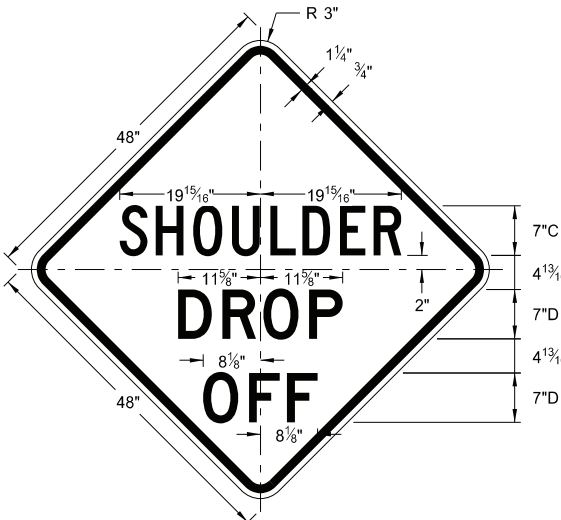
W9-3a-48  
Legend: black (non-refl)  
Background: orange



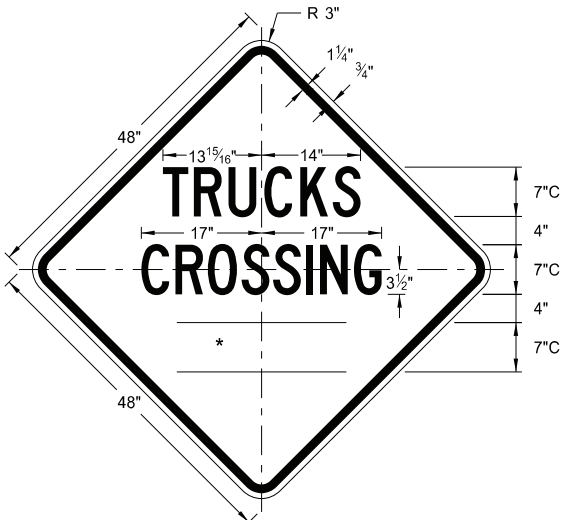
W5-9-48



W9-3a-48



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



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

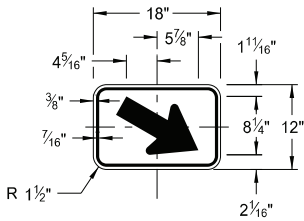
ARROW DETAILS

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

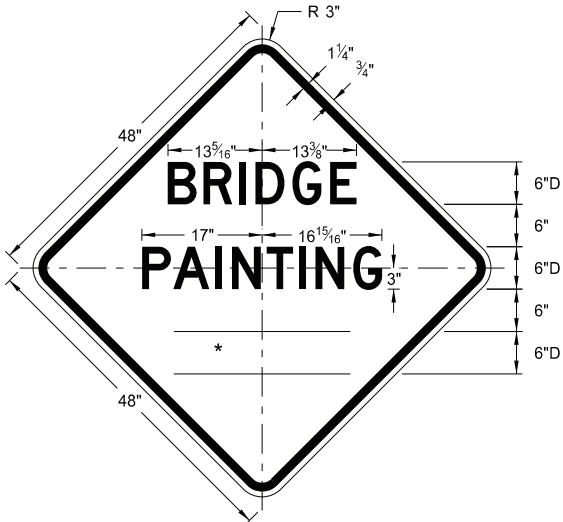


08/01/24

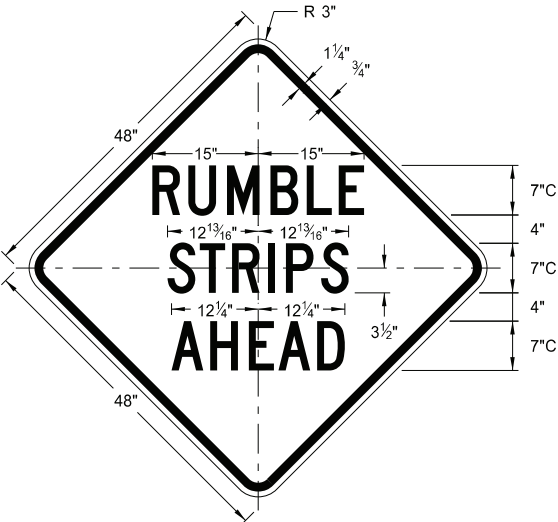
CONSTRUCTION SIGN DETAILS  
WARNING SIGNS



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



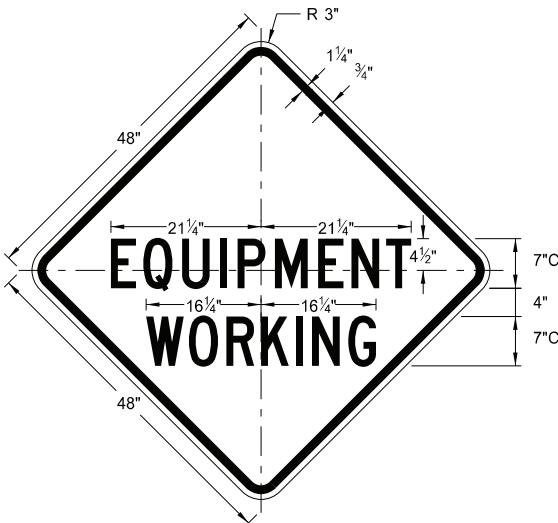
W21-50-48  
Legend: black (non-refl)  
Background: orange



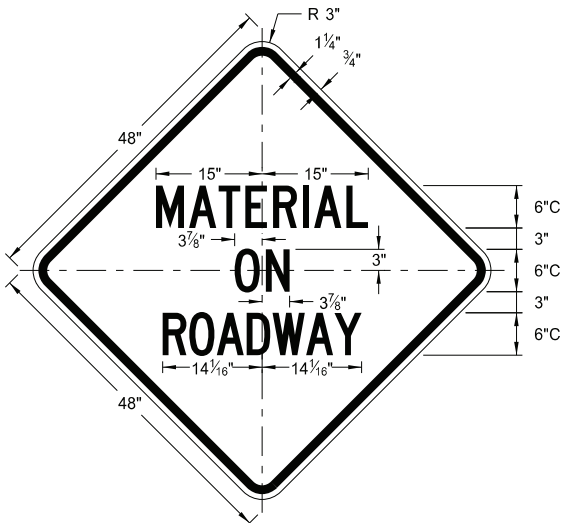
W21-53-48  
Legend: black (non-refl)  
Background: orange

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

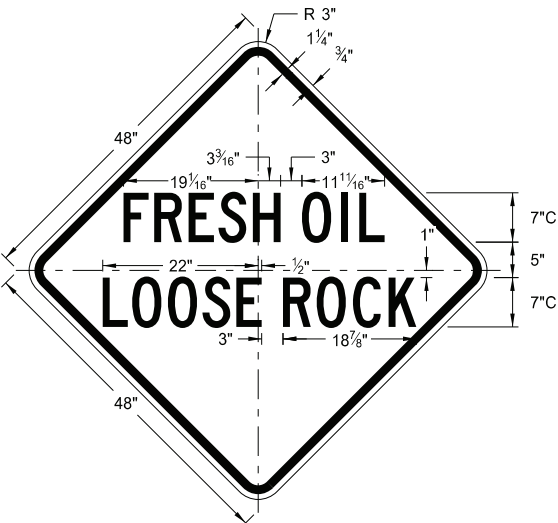
\* DISTANCE MESSAGES



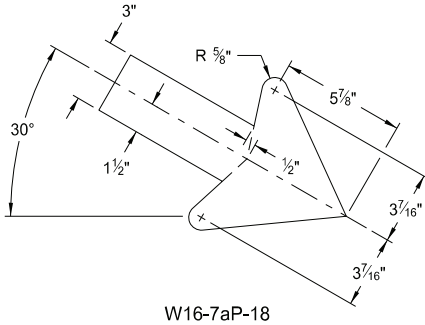
W20-51-48  
Legend: black (non-refl)  
Background: orange



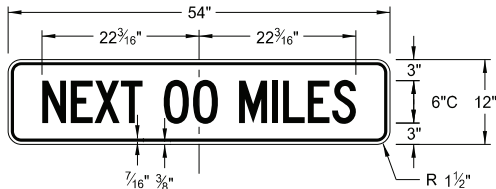
W21-51-48  
Legend: black (non-refl)  
Background: orange



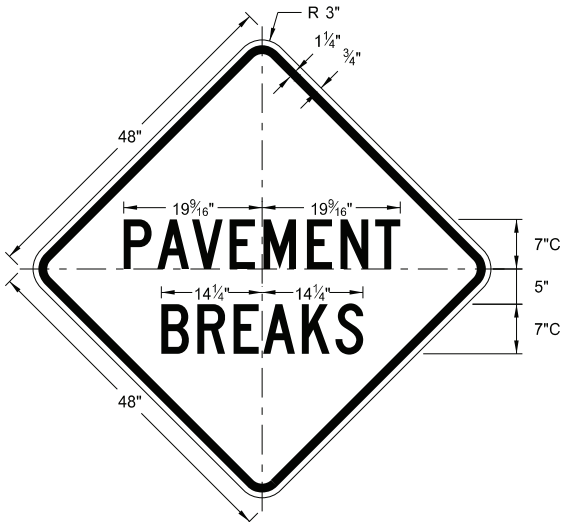
W22-8-48  
Legend: black (non-refl)  
Background: orange



W16-7aP-18



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



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

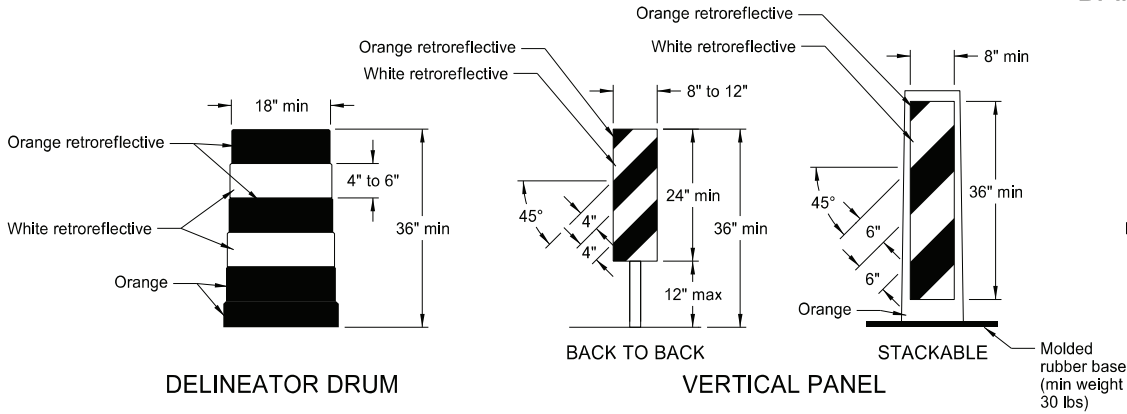
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
5-31-18	
REVISIONS	
DATE	CHANGE
11-01-19	Added details for sign W16-7aP-18.
8-01-24	Electronic Stamp/Signature.



08/01/24

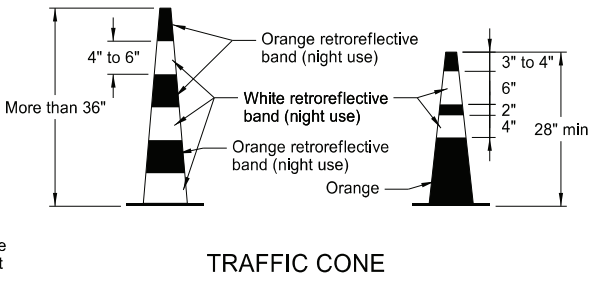


BARRICADE AND CHANNELIZING DEVICE DETAILS

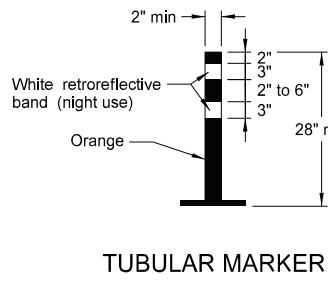


Provide horizontal, circumferential, alternating orange and white retroreflective stripes 4" to 6" wide for drum markings. Use a minimum of two orange and two white stripes with the top stripe being orange for each drum. Do not exceed 3" nonretroreflectORIZED spaces between the horizontal orange and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

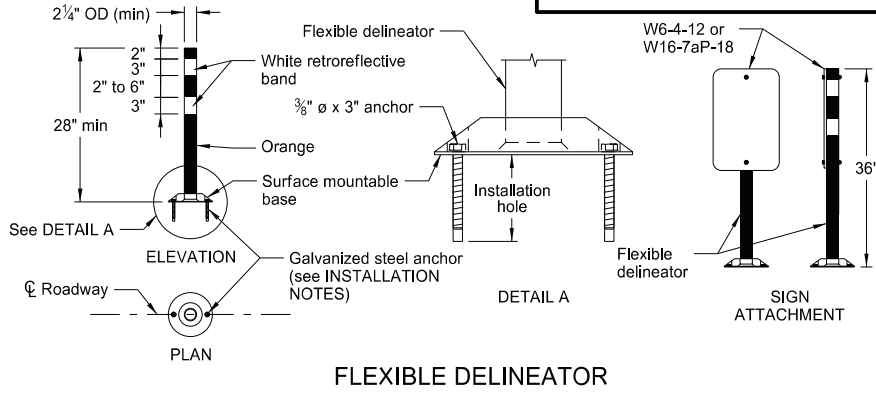
Provide alternating orange and white retroreflective stripes, sloping downward in direction vehicular traffic is to pass. Place retroreflective sheeting on both sides of panel with a minimum of 270 square inches of retroreflective area facing vehicular traffic. Where the height of the retroreflective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



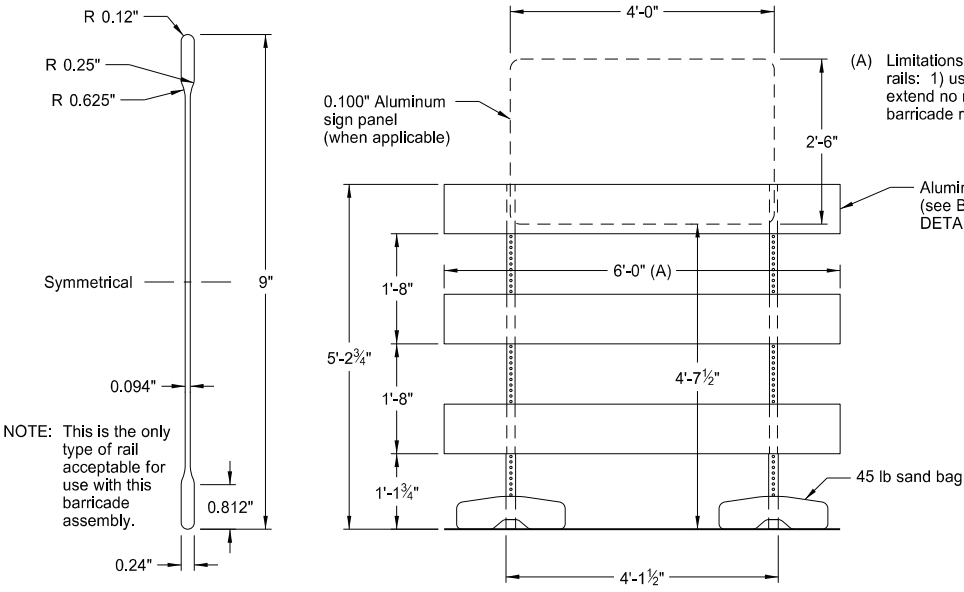
Provide retroreflectORIZATION of cones more than 36" in height by alternating orange and white retroreflective stripes. Use a minimum of two orange and two white stripes for each cone with the top stripe being orange. Use maximum 3" nonretroreflectORIZED space between the orange and white stripes.



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.

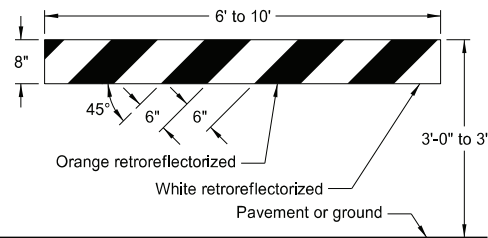


BARRICADE BLADE DETAIL

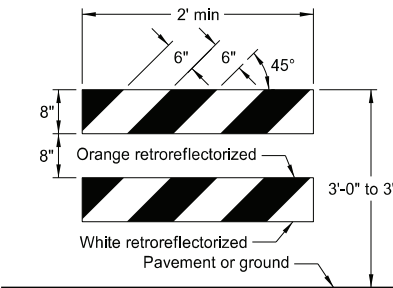
ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL  
(Aluminum Barricade Rails)

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

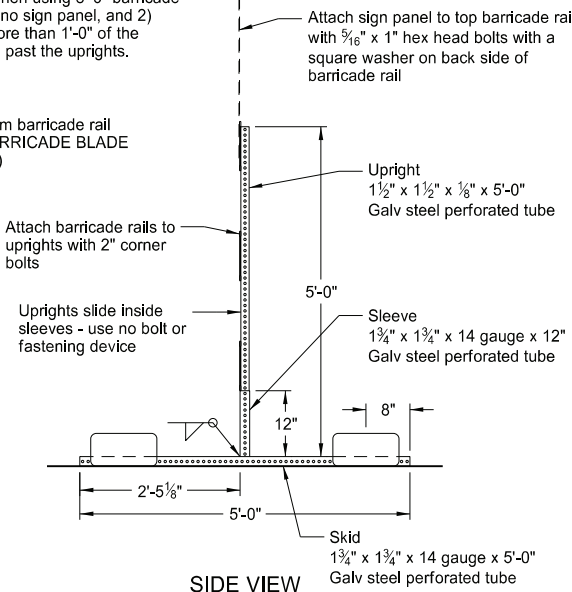


TYPE I BARRICADE



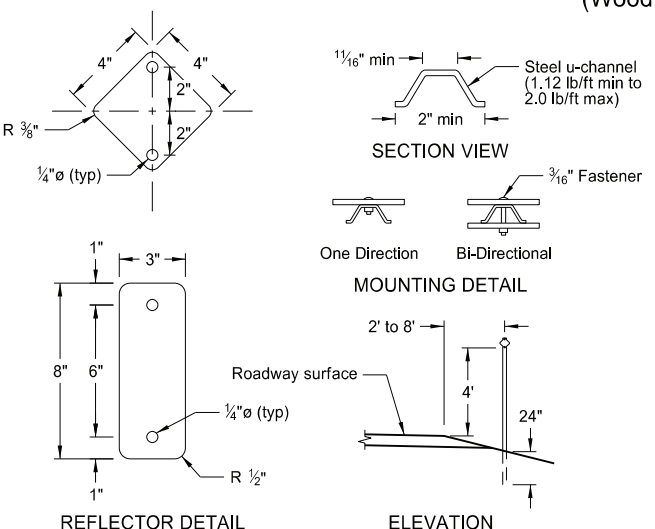
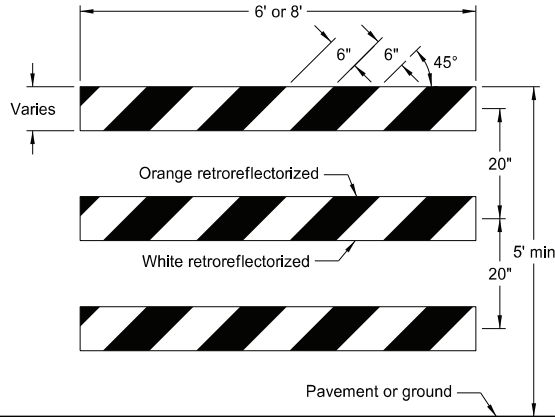
TYPE II BARRICADE

BARRICADE RAIL DETAILS

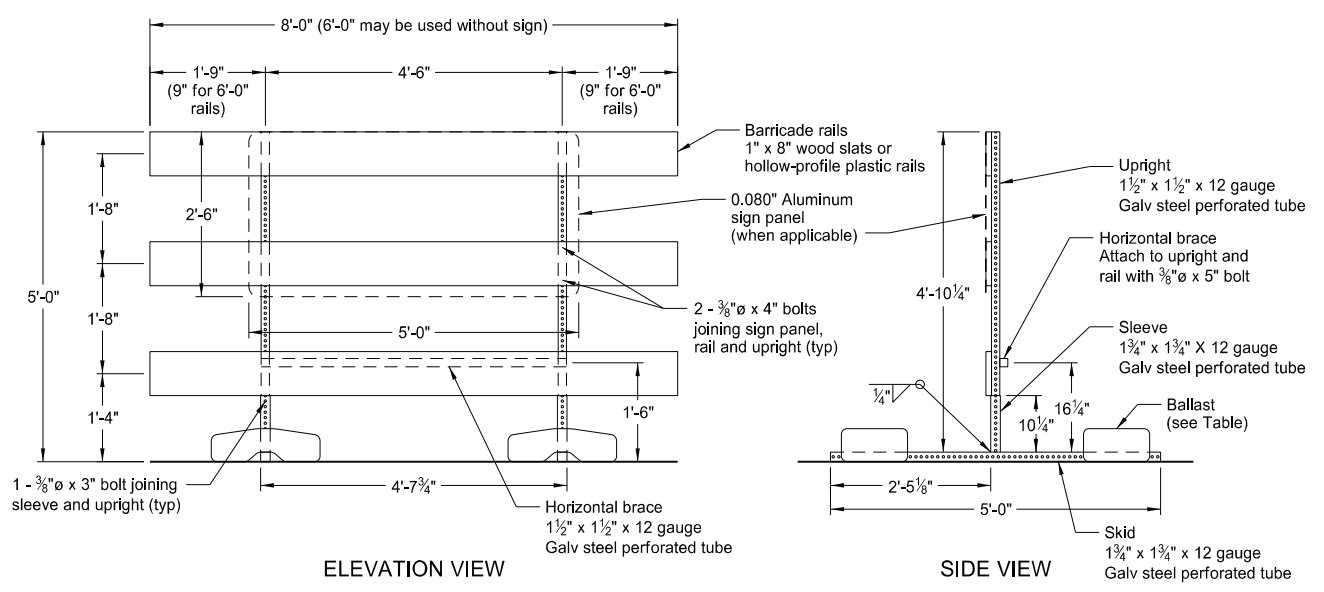


SIDE VIEW

TYPE III BARRICADE



DELINEATORS



ELEVATION VIEW

BARRICADE ASSEMBLY DETAIL  
(Wood or Plastic Rails)

SIDE VIEW

MINIMUM BALLAST  
(For each side of barricade support)

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

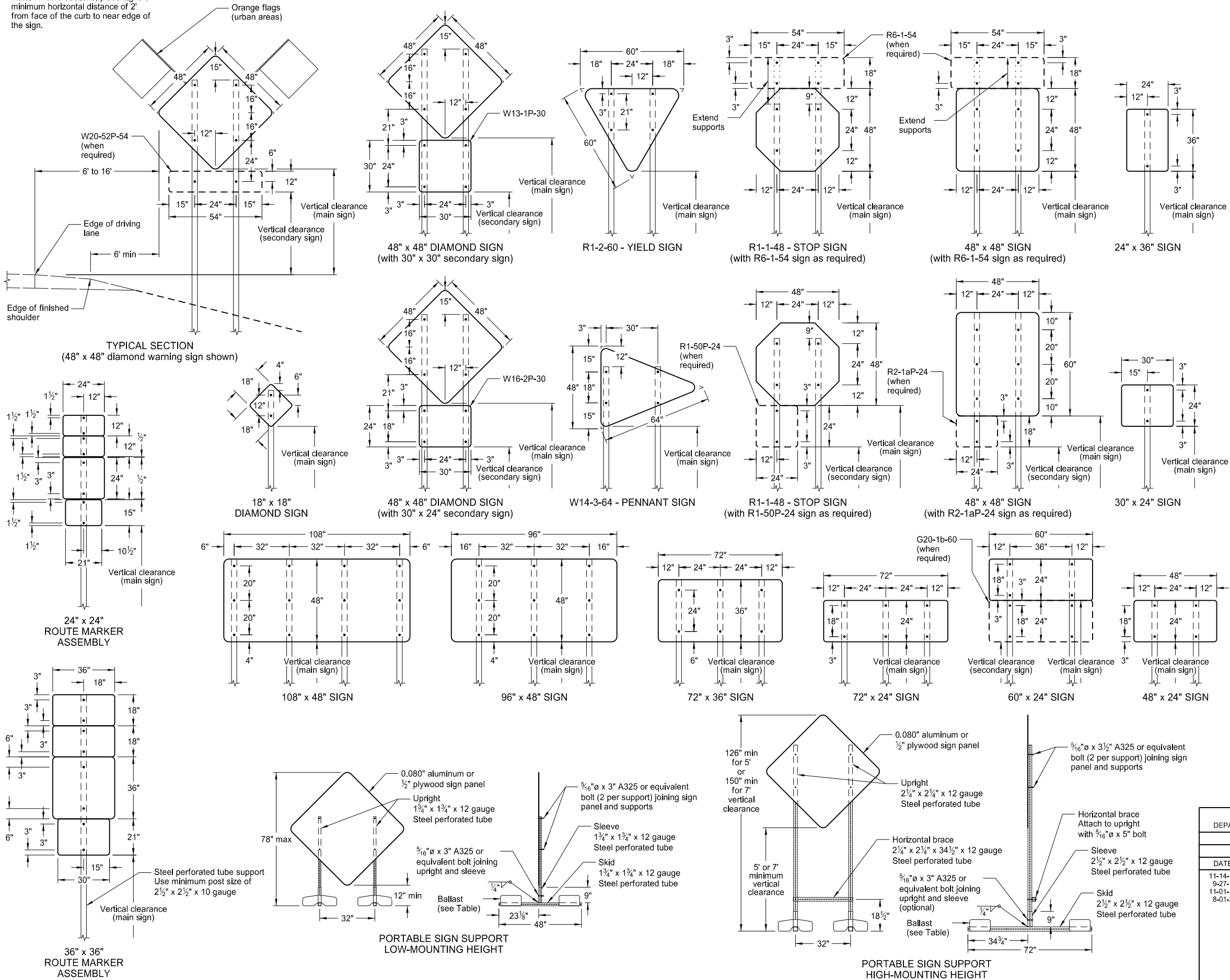
Note: Number of sandbags based on a wind speed of 55 MPH. Sandbags assumed to be placed at or near the ends of the skids.

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



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 skids.

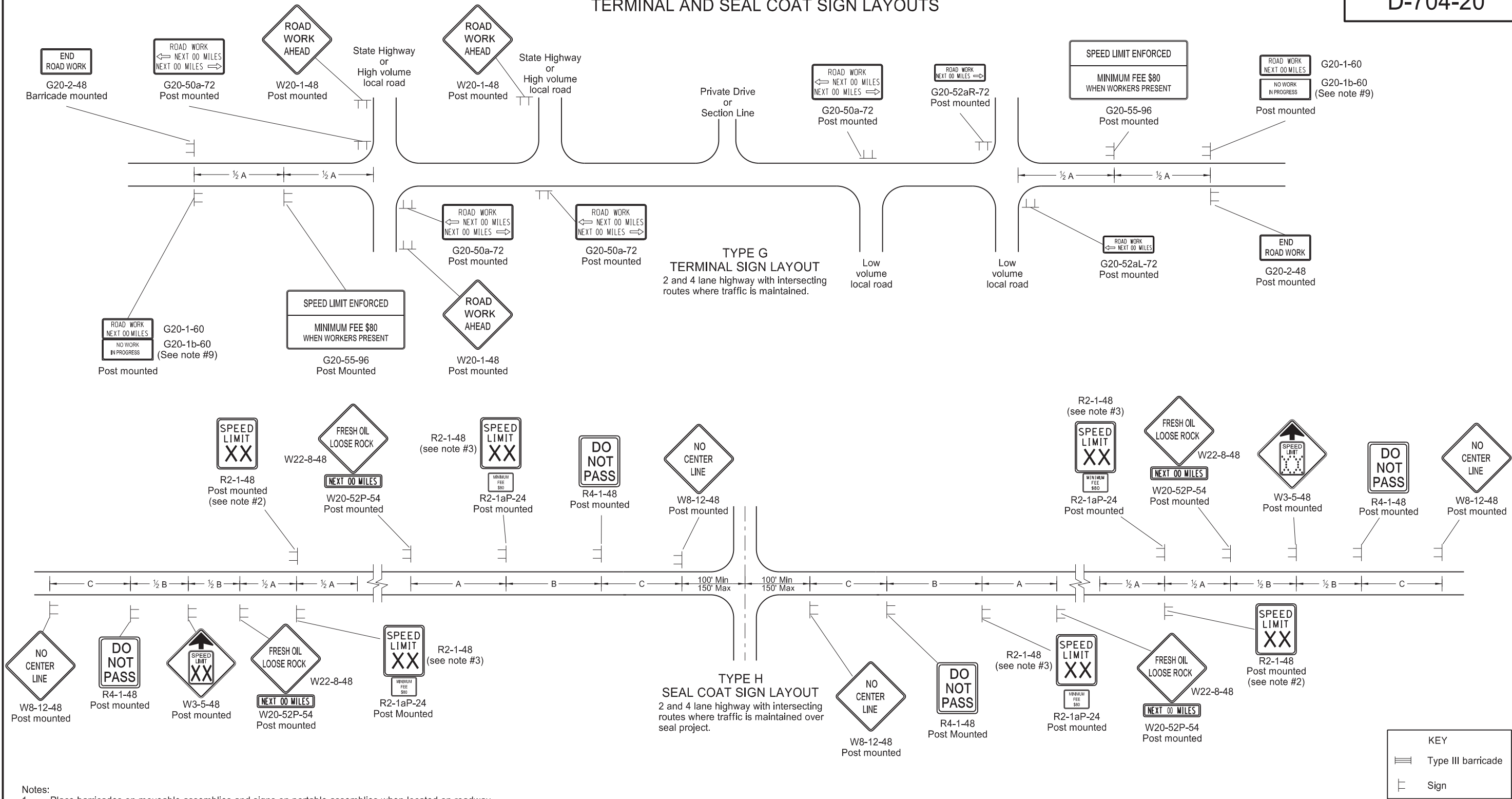
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
REVISIONS	
DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail
8-01-24	Electronic Stamp/Signature



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

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

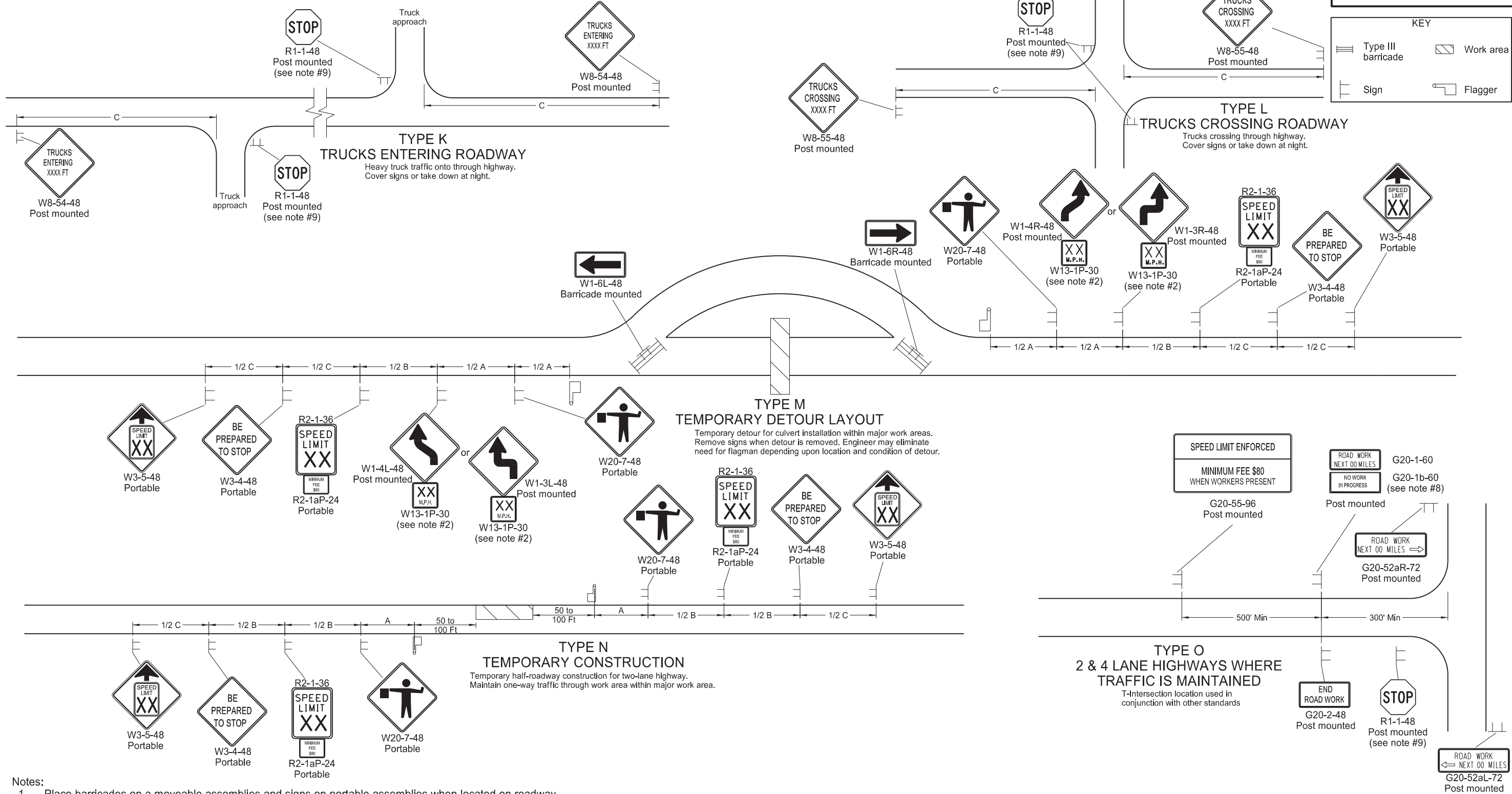


11/29/22



CONSTRUCTION TRUCK AND TEMPORARY DETOUR LAYOUTS

D-704-22



Notes:

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

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

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

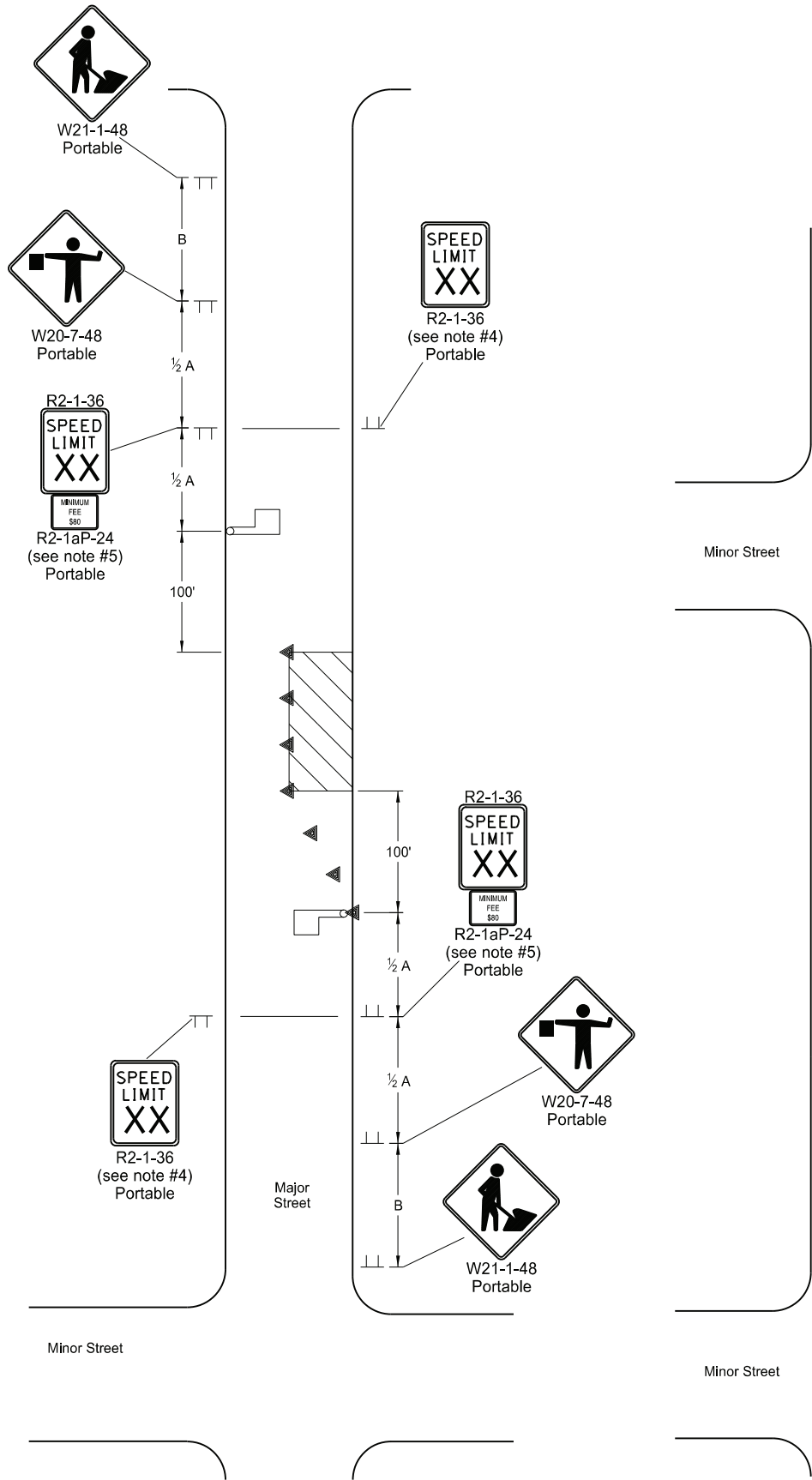


11/29/22



LANE CLOSURES ON URBAN STREETS LAYOUTS

D-704-25

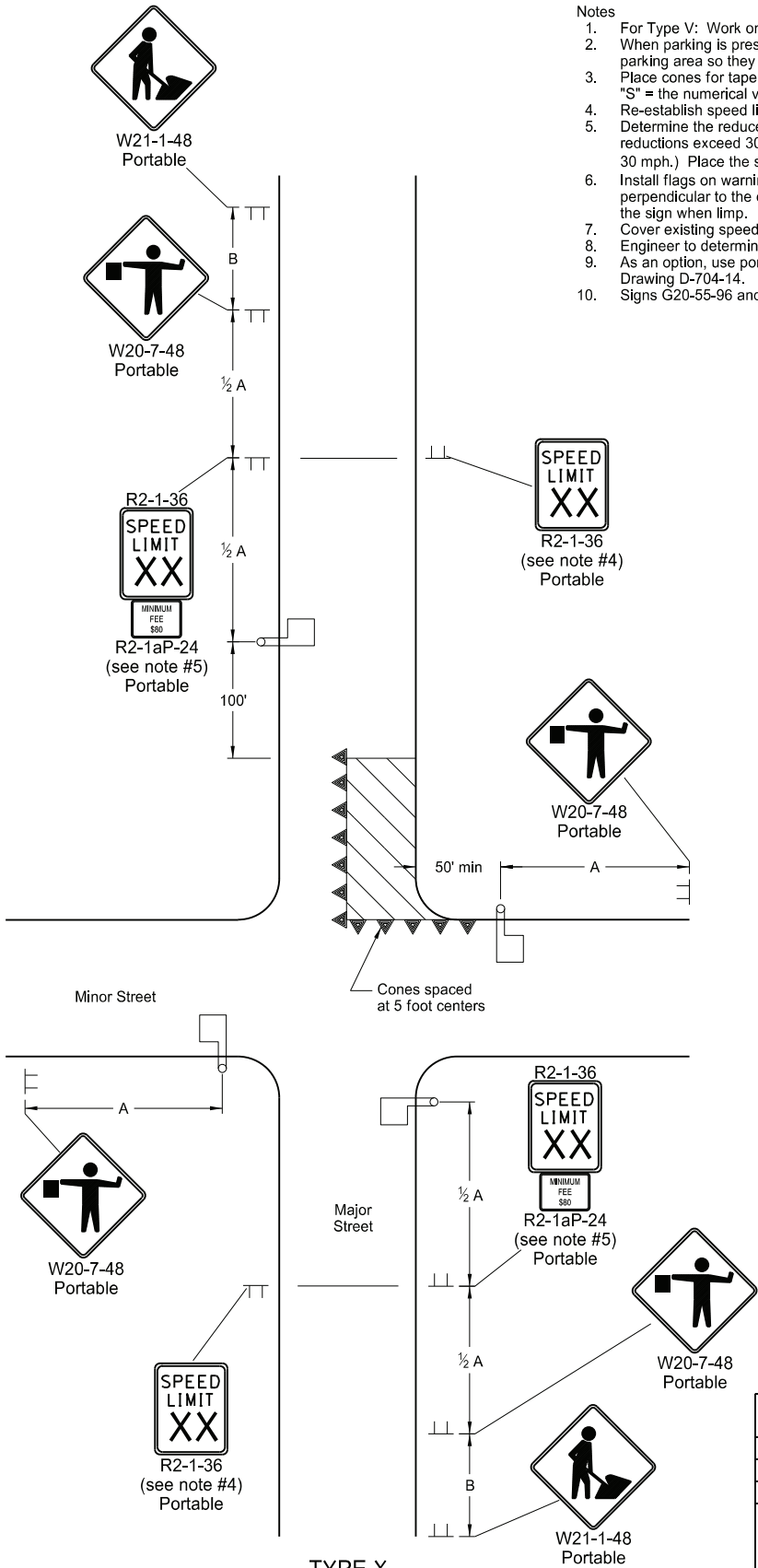
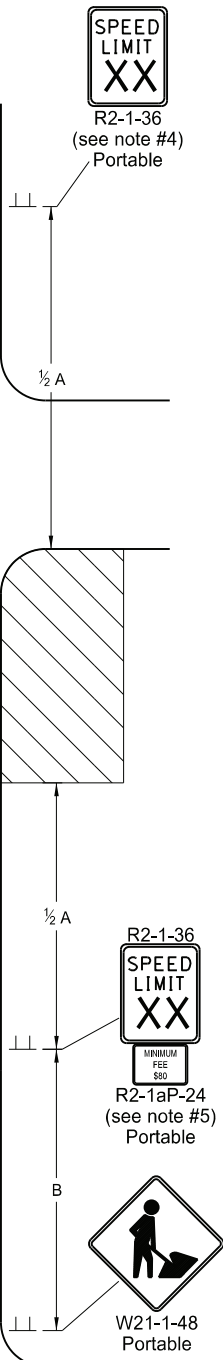


TYPE V  
LANE CLOSURE ON URBAN STREET

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

TYPE W  
WORK BEYOND CURB ON URBAN STREET

Work area outside driving lane and no closure necessary.



TYPE X  
LANE CLOSURE NEAR INTERSECTION ON URBAN STREET

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

- Notes
- For Type V: Work on one side of roadway at a time so as not to block off more than one lane of traffic.
  - When parking is present, place signs so they are entirely visible above parked vehicles or at the edge of the parking area so they are visible to oncoming traffic. Place signs on portable mounts when located on roadway.
  - Place cones for tapering traffic at 3 equal spaces and cones for tangents at dimension "S". "S" = the numerical value of speed limit.
  - Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
  - Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
  - Install flags on warning signs in urban areas when signs are not portable. Mount 24 inches square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
  - Cover existing speed limit signs within reduced speed zones.
  - Engineer to determine safe speed, when necessary.
  - As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
  - Signs G20-55-96 and R2-1aP-24 are not required for urban projects.

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

KEY	
	Sign
	Cones
	Work area
	Flagger

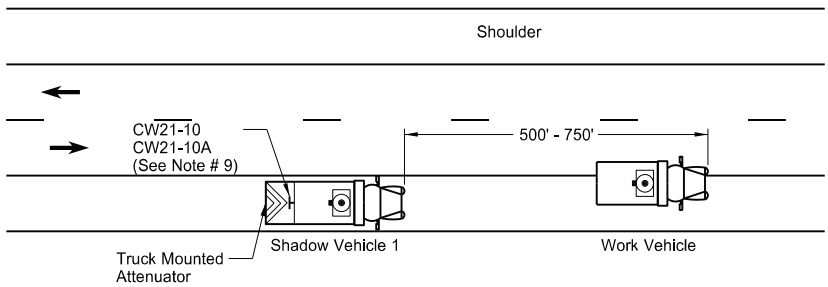
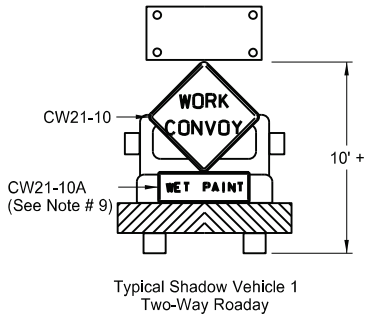
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated notes & removed signs
11-01-19	Revised note & added Min Fee sign
8-01-24	Electronic Stamp/Signature



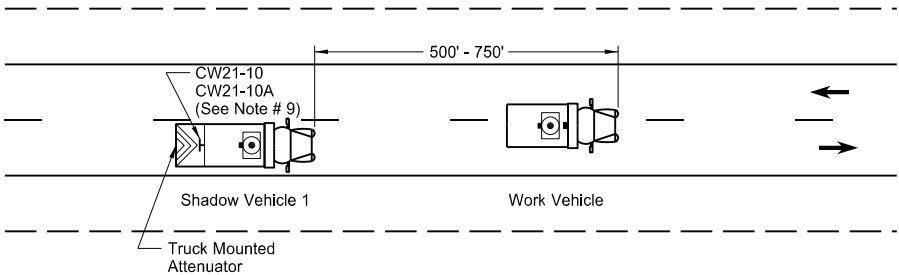
08/01/24

MOBILE OPERATION  
(PAVEMENT MARKING)

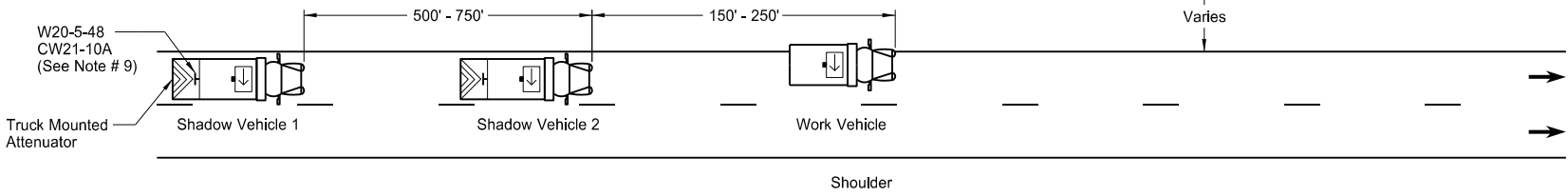
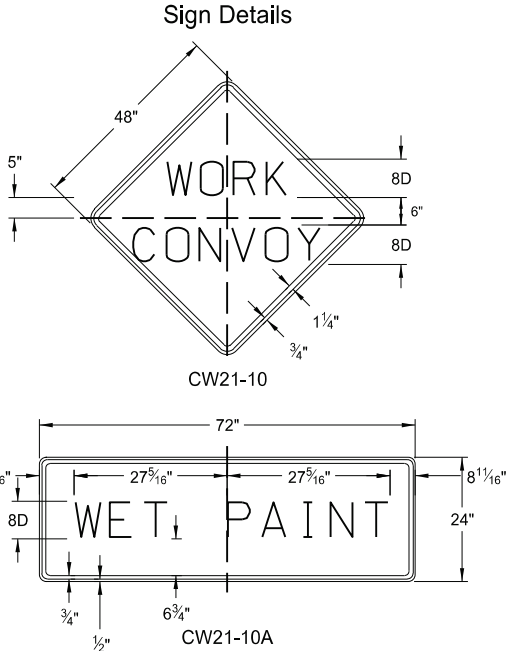
D-704-27



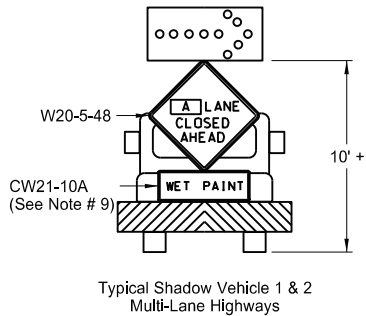
Two-Way Roadway with Paved Shoulders



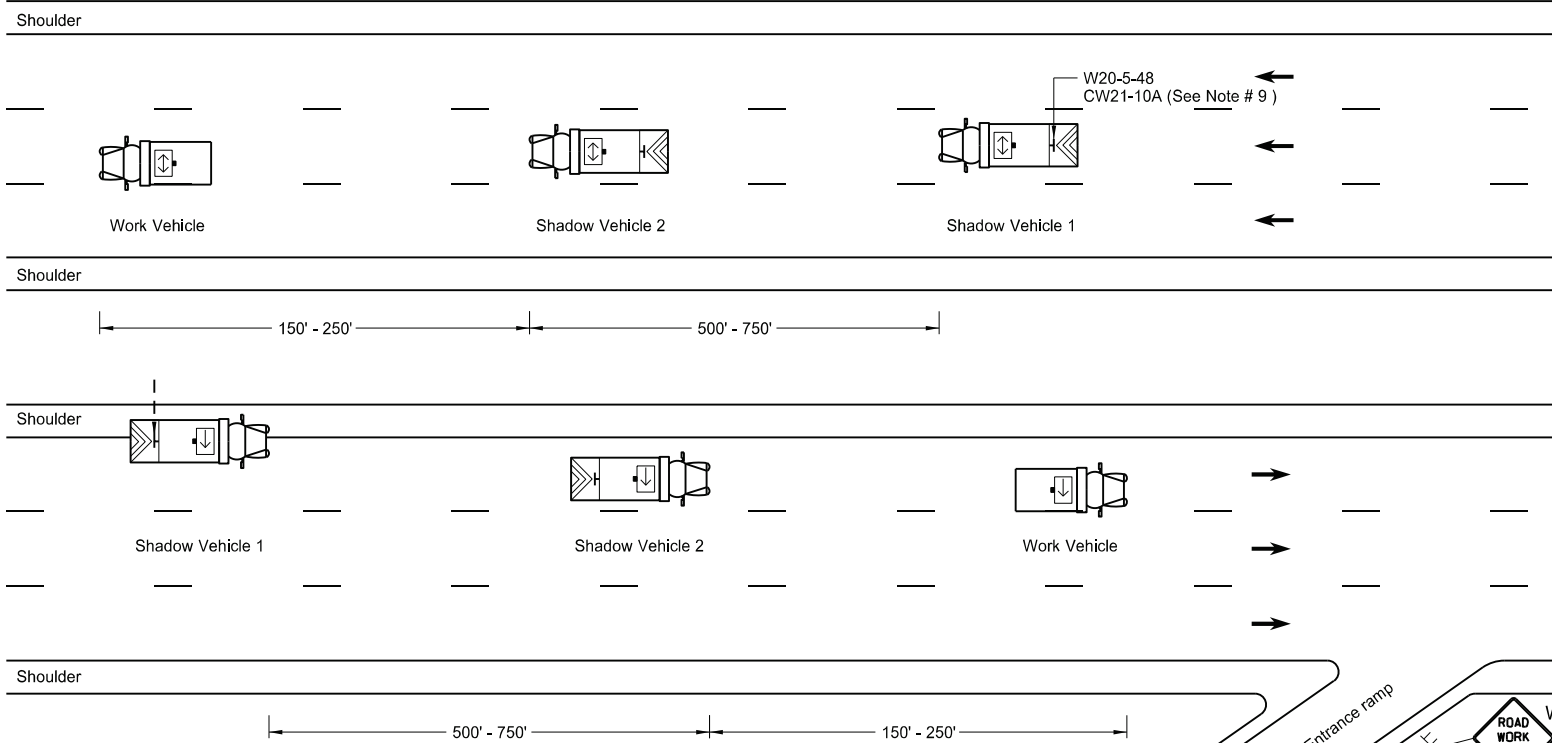
Two-Way Roadway without Paved Shoulders



Undivided Multi-Lane Roadway

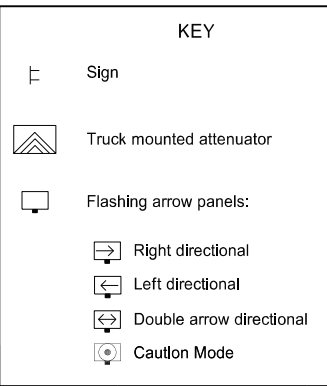


A = ☐ Left ☐ Right ☐ Center



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.

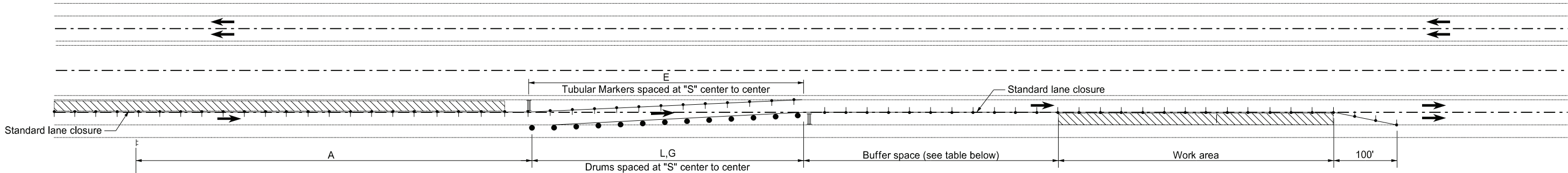


08/02/24



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
	Type III barricade
	Traffic Direction
	Delineator drum
	Tublar markers
	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 \$80" 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

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

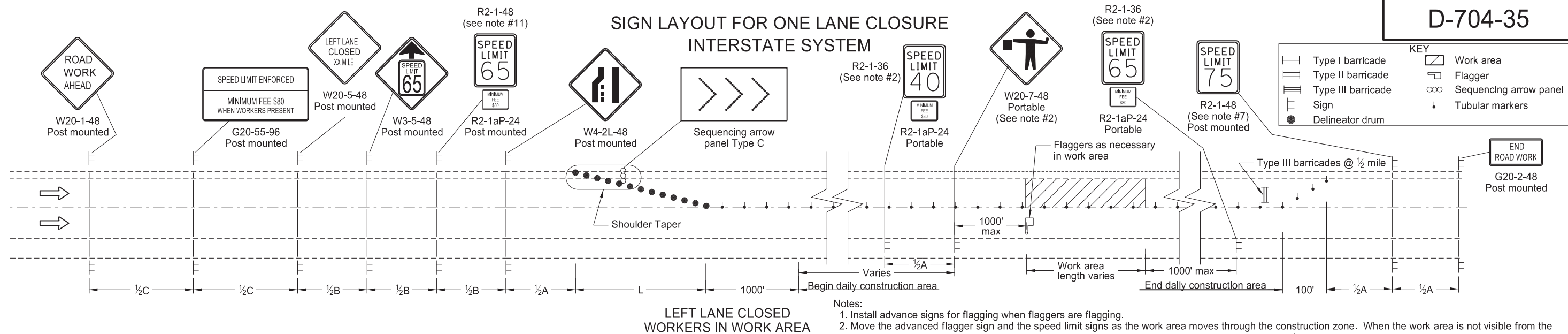
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-26-2012	
REVISIONS	
DATE	CHANGE
9-27-17	Updated to active voice
11-01-19	Clarified work zone
8-02-24	Electronic Stamp/Signature



08/02/24

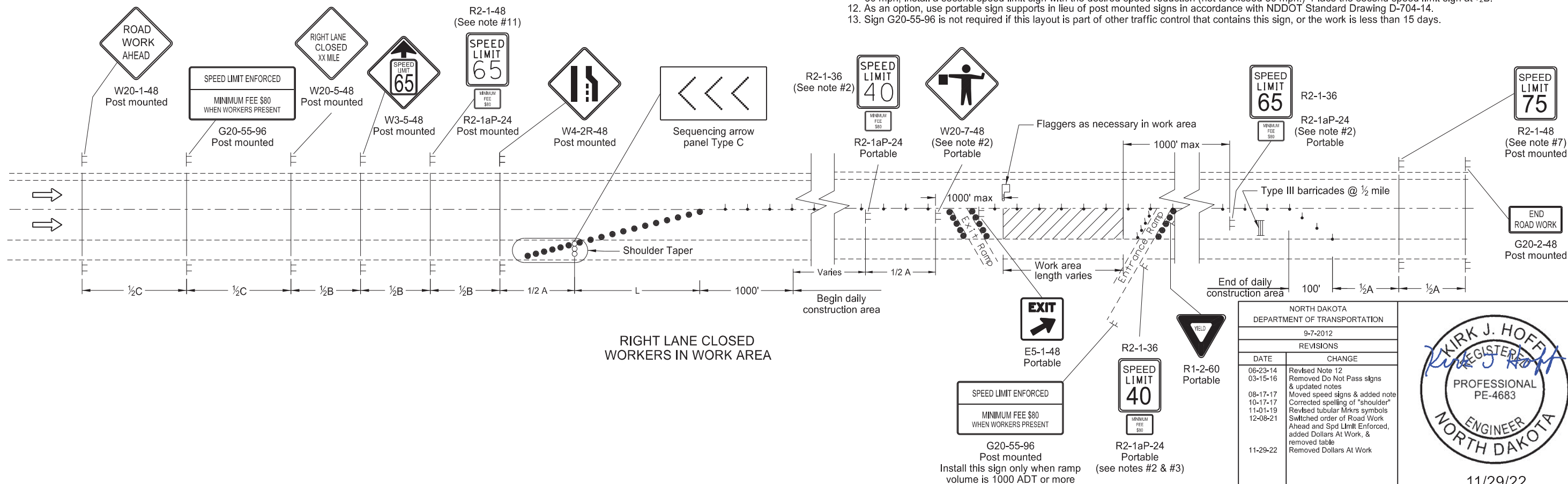




## Notes:

1. Install advance signs for flagging when flaggers are flagging.
2. Move the advanced flagger sign and the speed limit signs as the work area moves through the construction zone. When the work area is not visible from the flagger, move the flagger station so the work area is visible. Space the 40 mph speed limit sign at  $\frac{1}{2}A$  in advance of the flagger sign and move the 65 mph speed limit sign. Cover or remove the 40 mph speed limit and Minimum Fee \$80 signs and the 65 mph speed limit sign upon completion of the work day or when workers are not present.
3. RAMPs: When the work area encompasses an entrance ramp, install a 40 mph speed limit sign on the ramp and cover any existing yield sign. Install new yield sign as necessary. Remove the ramp speed limit sign when the main line 40 mph speed zone is moved past the ramp.
4. Variables:
  - S=Numerical value of speed limit or 85th percentile
  - W=The width of taper.
  - L=Minimum length of taper, or  $S \times W$  for freeways, expressways, and all other roads with speeds of 45 mph or greater, or  $W \times S \times 60$  for urban, residential, and other streets with speeds of 40 mph or less.
5. Space delineator drums for tapering traffic at the dimension "S". Space tubular markers used for tangents at 2 times dimension "S".
6. Place sequencing arrow panels at the beginning of the taper when possible. Where shoulder width does not provide sufficient room, move the panel closer to the work area and place on the roadway surface.
- Use Type C on roadways with high traffic speeds and volumes (over 40 mph or 5000 ADT or greater).
7. Re-establish the speed limit. Determine the exact speed limit in the field, dependent on location and conditions.
8. Cover existing speed limit signs within a reduced speed zone.
9. Upon approval, the Engineer will measure obliterated or covered pavement marking as Obliteration of Pavement Marking.
10. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the diamond sign, and at such a distance above the edge that the flag does not touch the sign when limp.
11. Determine the reduced speed limit dependent on the in place speed limit before construction. When speed limits are to be reduced more than 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at  $\frac{1}{2}B$ .
12. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
13. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or the work is less than 15 days.

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



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-7-2012	
REVISIONS	
DATE	CHANGE
06-23-14	Revised Note 12
03-15-16	Removed Do Not Pass signs & updated notes
08-17-17	Moved speed signs & added note
10-17-17	Corrected spelling of "shoulder"
11-01-19	Revised tubular Mkrs symbols
12-08-21	Switched order of Road Work Ahead and Spd Limit Enforced, added Dollars At Work, & removed table
11-29-22	Removed Dollars At Work

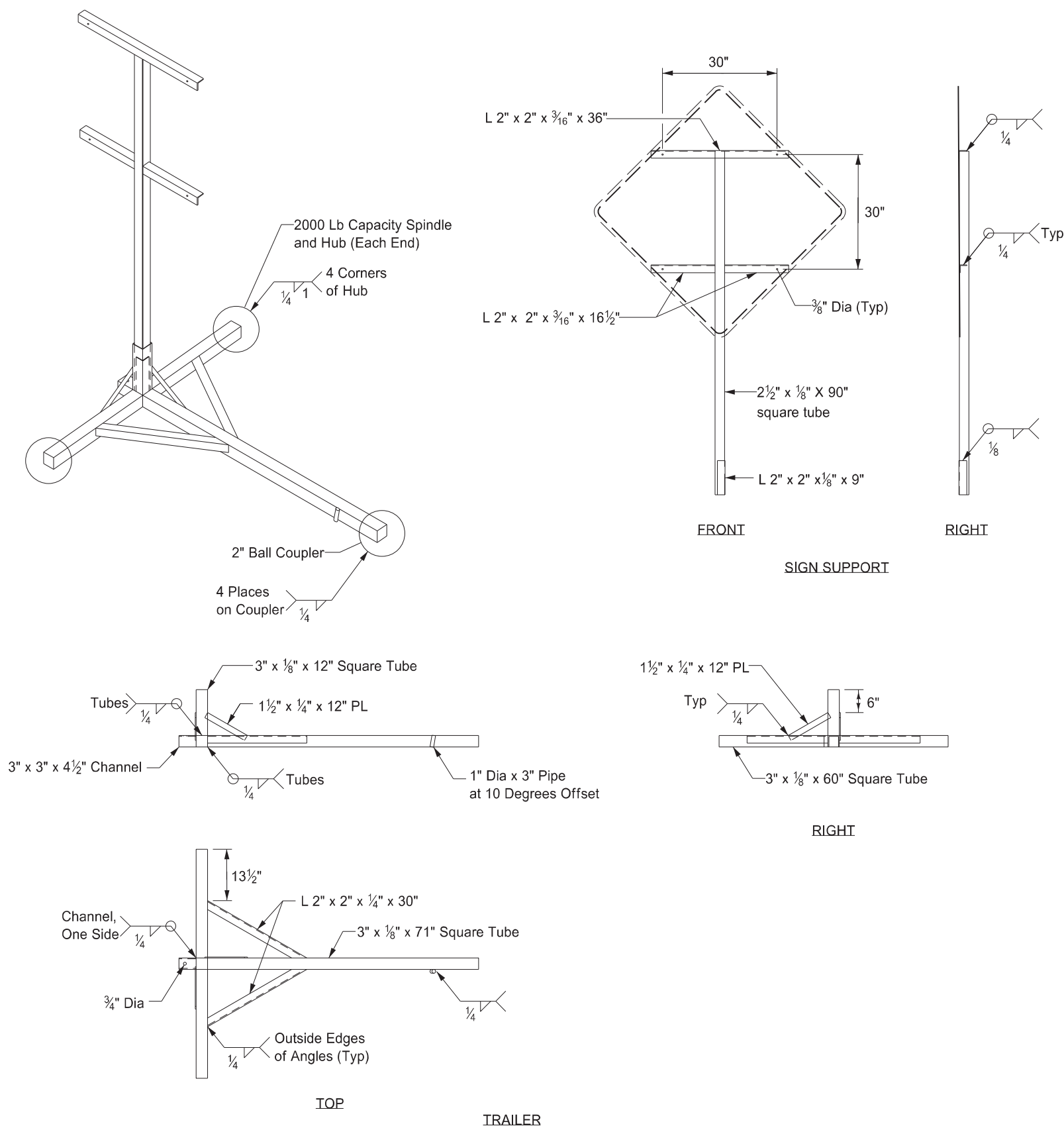


11/29/22



PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



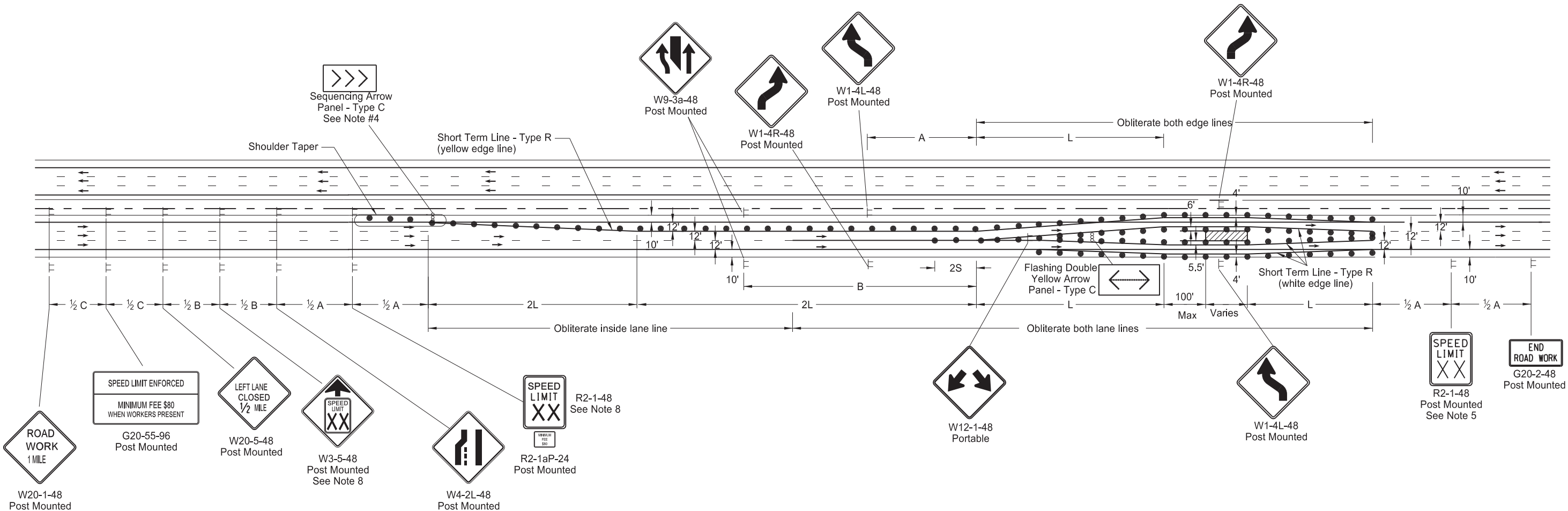
- Notes:
- 1. Maximum 250 pound weight of assembly.
  - 2. Use a 14" wheel and tire.
  - 3. Use no automotive and equipment axle assemblies for trailer-mounted sign supports.
  - 4. Other NCHRP 350 or MASH crash tested assemblies are acceptable.

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



INTERIOR LANE CLOSURE ON 6 LANE INTERSTATE

D-704-60



Notes:

1. Install a ramp speed limit sign when the work area encompasses a ramp. Remove the ramp speed limit sign when the main line speed zone moves past the ramp.
2. Variables:  
S = Numerical value of speed limit or 85th percentile.  
W = The width of taper.  
L = Minimum length of taper,  $S \times W$  for freeways, expressways, and all other roads with speeds of 45 mph or greater, or  $W \times S^2 / 60$  for urban, residential, and other streets with speeds of 40 mph or less.
3. Space delineator drums and tubular markers at dimension "S" for tapering traffic. Space tubular markers for tangents 2 times dimension "S".
4. Sequencing and Flashing Arrow Panels:  
Place 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 so it is placed on the roadway surface. See shoulder closure standard drawing.
5. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
6. Cover existing speed limit signs within a reduced speed zone.
7. Determine the reduced speed based on the in place speed limit before construction. Where speed reductions exceed 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
8. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
9. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
10. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign.

KEY	
	Work Area
	Sign
	Sequencing Arrow Panel
	Delineator Drum

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

\* 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 - Hlgh Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and Freeway (55 mph to 60 mph)	850	1350	2200
Rural Expressway and Freeway (70 mph to 75 mph)	1000	1500	2640
Interstate/4-Lane Divided (Maintenance and Surveying)	750	1000	1500

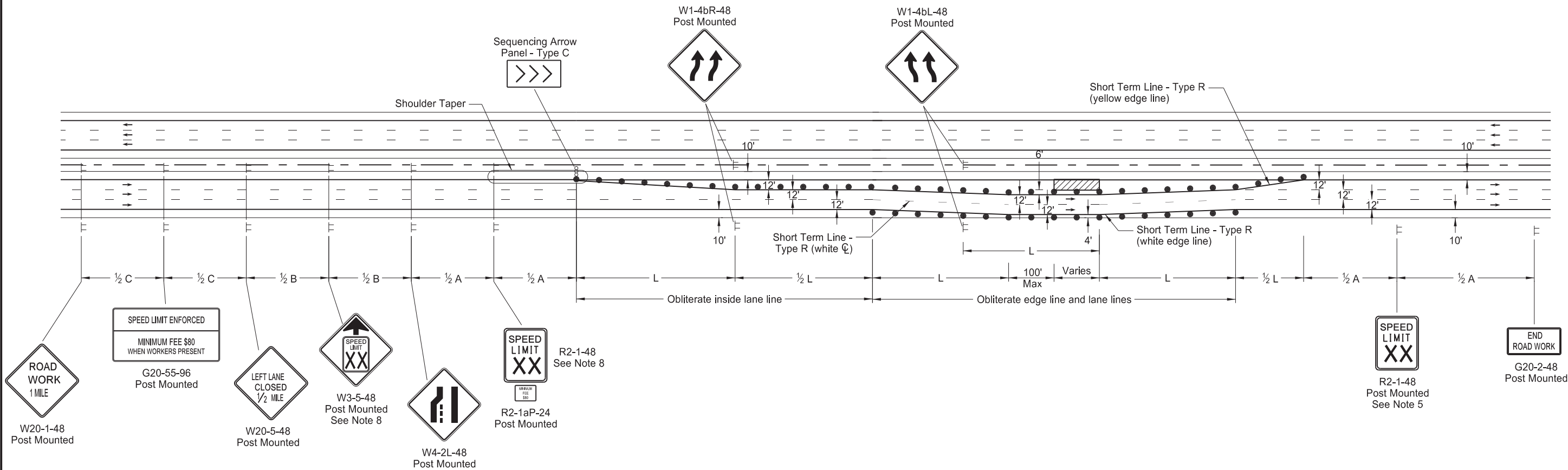
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-15-12	
REVISIONS	
DATE	CHANGE
08-17-17	Updated notes & sign numbers.
11-01-19	Added shldr taper, revised note 8.
12-08-21	Switched order of Road Work 1 Mile and Spd Limit Enforced & added Dollars At Work.
11-29-22	Removed Dollars At Work.
10-11-24	Removed Pmnt Mkg Width.



10/11/24

LEFT LANE CLOSURE ON 6 LANE INTERSTATE

D-704-61



Notes:

- Ramps: When the work area encompasses a ramp, install a speed limit sign. When the main line speed zone is moved past the ramp, remove the ramp speed limit sign.
- Variables
  - S = Numerical value of speed limit or 85th percentile.
  - W = The width of taper.
  - L = Minimum length of taper, or  $S \times W$  for freeways, expressways, and all other roads with speeds of 45 mph or greater, or  $W \times S^2 / 60$  for urban, residential, and other streets with speeds of 40 mph or less.
- Space delineator drums, and tubular markers for tapering traffic at dimension "S". Space tubular markers for tangents at 2 times dimension "S".
- Sequencing and Flashing Arrow Panels:
  - Place panels at the beginning of the taper, when possible. Where shoulder width does not provide sufficient room, move the panel closer to work area and place it on the roadway surface.
  - Use Type A on roadways with slow moving traffic speeds and low volume (25 mph or less & 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).
- Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
- Cover existing speed limit signs within reduced speed zones.
- Determine reduced speed limit dependent on the in place speed limit before construction. When speed limits are to be reduced more than 30 mph, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
- As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Drawing D-704-14.
- Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
- Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign.

KEY			
	Sign		Work Area
	Delineator Drum		Sequencing Arrow Panel

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

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

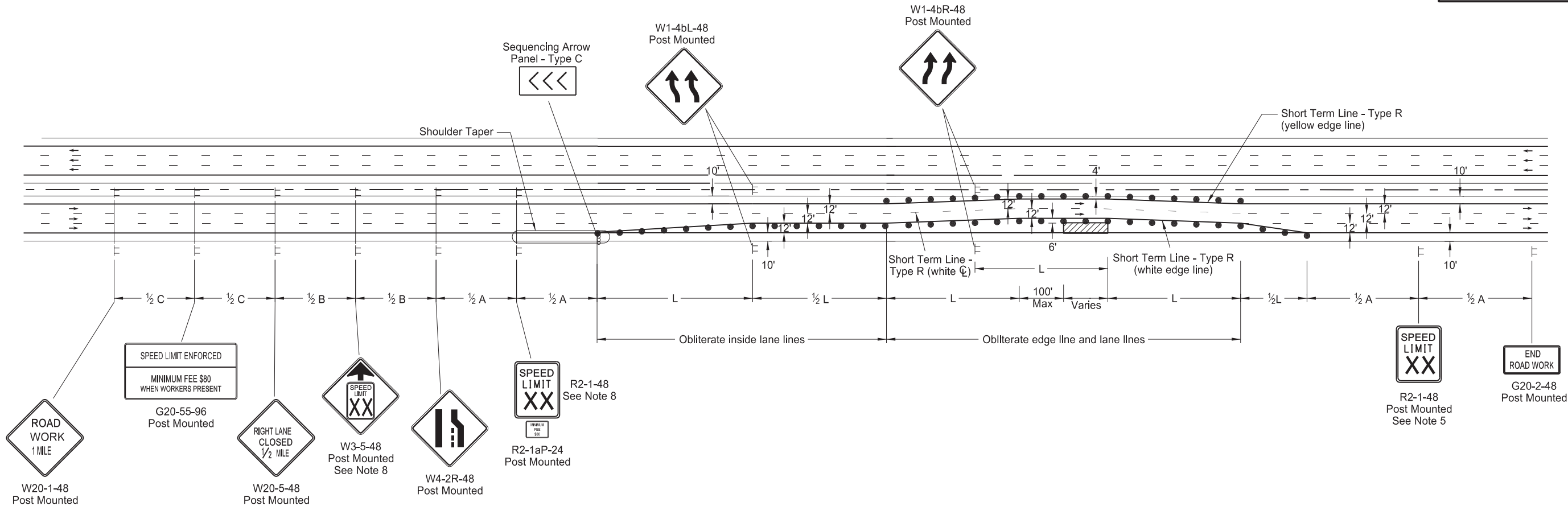
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-19-12	
REVISIONS	
DATE	CHANGE
09-27-17	Updated to active voice, added note #9, & sign #s.
11-01-19	Shldr taper and note #8.
12-08-21	Switched order of Road Work 1 Mile and Spd Limit Enforced & added Dollars At Work.
11-29-22	Removed Dollars At Work.
10-11-24	Removed Pmnt Mkg Widths.



10/11/24

RIGHT LANE CLOSURE ON 6 LANE INTERSTATE

D-704-62



Notes:

- Ramps: When the work area encompasses a ramp, install a speed limit sign. When the main line speed zone moves past the ramp, remove the ramp speed limit sign.
- Variables
  - S = Numerical value of speed limit or 85th percentile.
  - W = The width of taper.
  - L = Minimum length of taper, or  $S \times W$  for freeways, expressways, and all other roads with speeds of 45 mph or greater, or  $W \times S^2 / 60$  for urban, residential, and other streets with speeds of 40 mph or less.
- Space delineator drums, and tubular markers for tapering traffic at the dimension "S". Space tubular markers for tangents at 2 times dimension "S".
- Sequencing and Flashing Arrow Panels:
  - Place panels at beginning of taper, when possible. Where shoulder width does not provide sufficient room, move panel closer to 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 & 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).
- Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
- Cover existing speed limit signs within reduced speed zones.
- Determine reduced speed limit based on the in place speed limit before construction. When 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.
- As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Drawing D-704-14.
- Recommend 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
- Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign.

KEY			
	Sign		Work Area
	Delineator Drum		Sequencing Arrow Panel

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

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

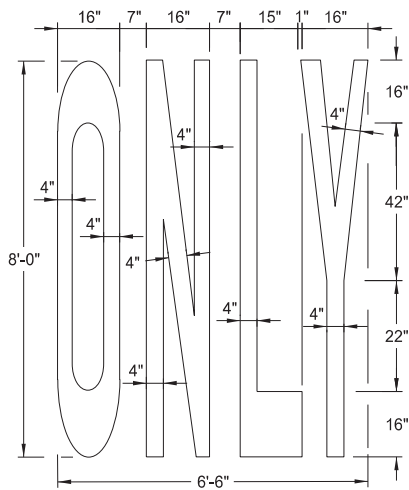
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-15-12	
REVISIONS	
DATE	CHANGE
09-27-17	Updated to active voice, added note #9, & sign #s
11-01-19	Shldr taper, sign, note 8
12-08-21	Switched order of Road Work 1 Mile and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work, Removed Pmnt Mkg Width,
10-11-24	



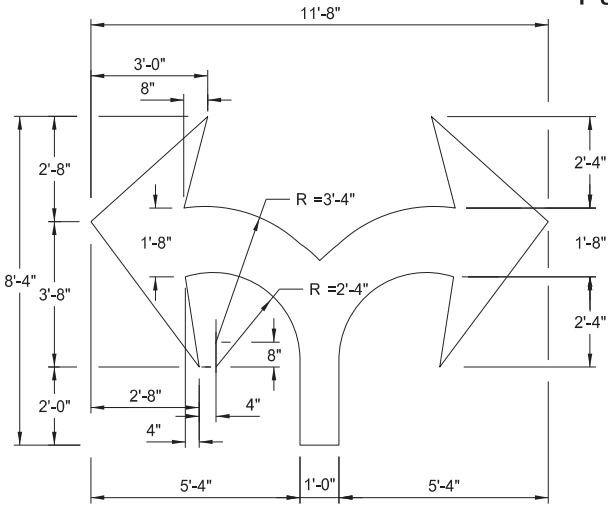


## Pavement Marking Message Details

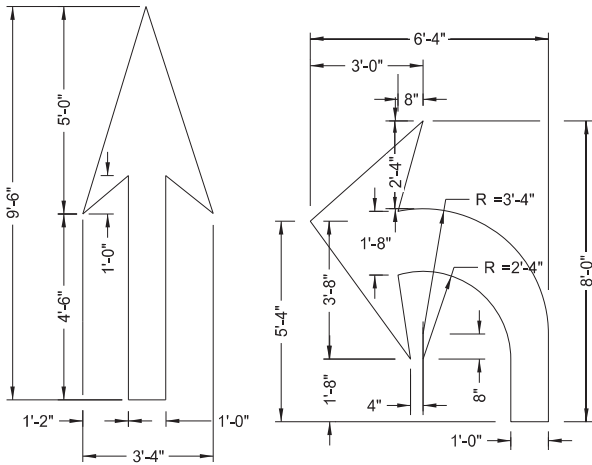
D-762-1



22 S. F.

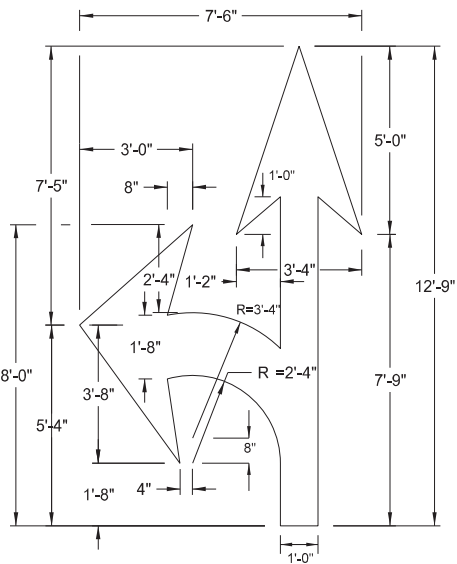


29 S. F.

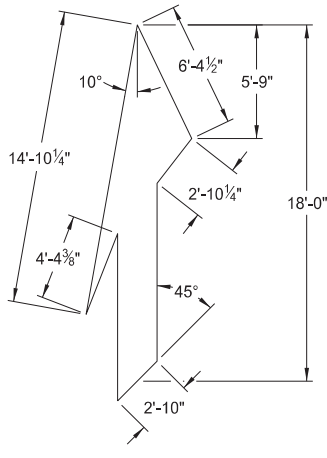


12 S. F.

16 S. F.



27 S. F.

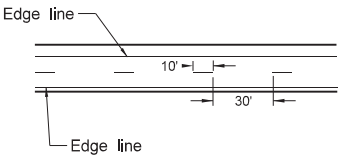


41 S. F.

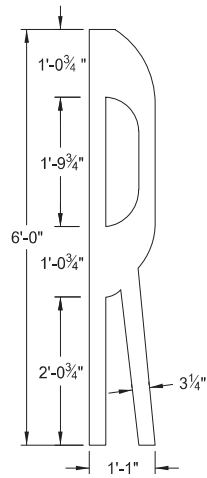
Note: Rotate merge arrow  
20° from edge of roadway.

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'

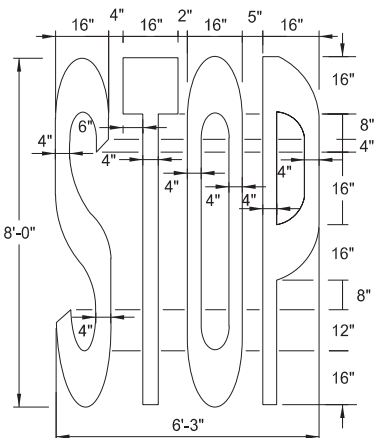
## Chevron Crosshatching Table



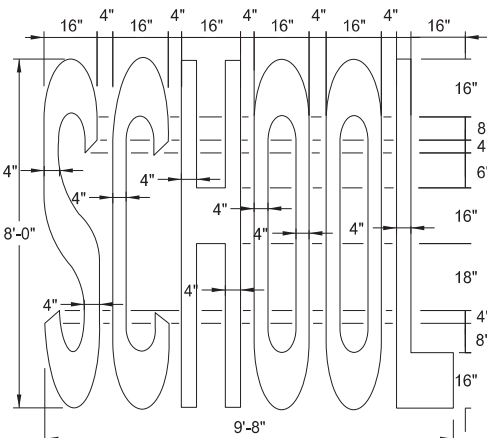
### Centerline Pavement Marking Skip Spacing Detail



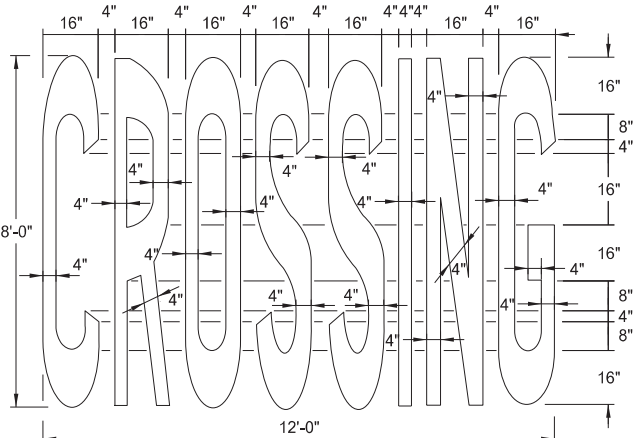
4 S. F.



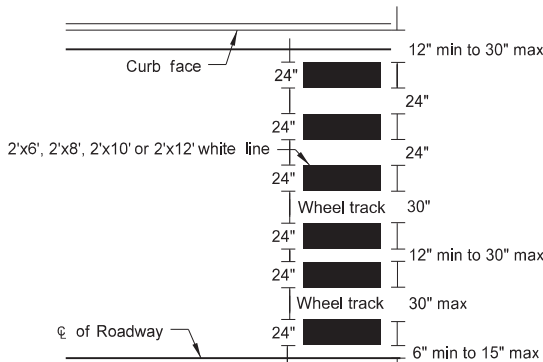
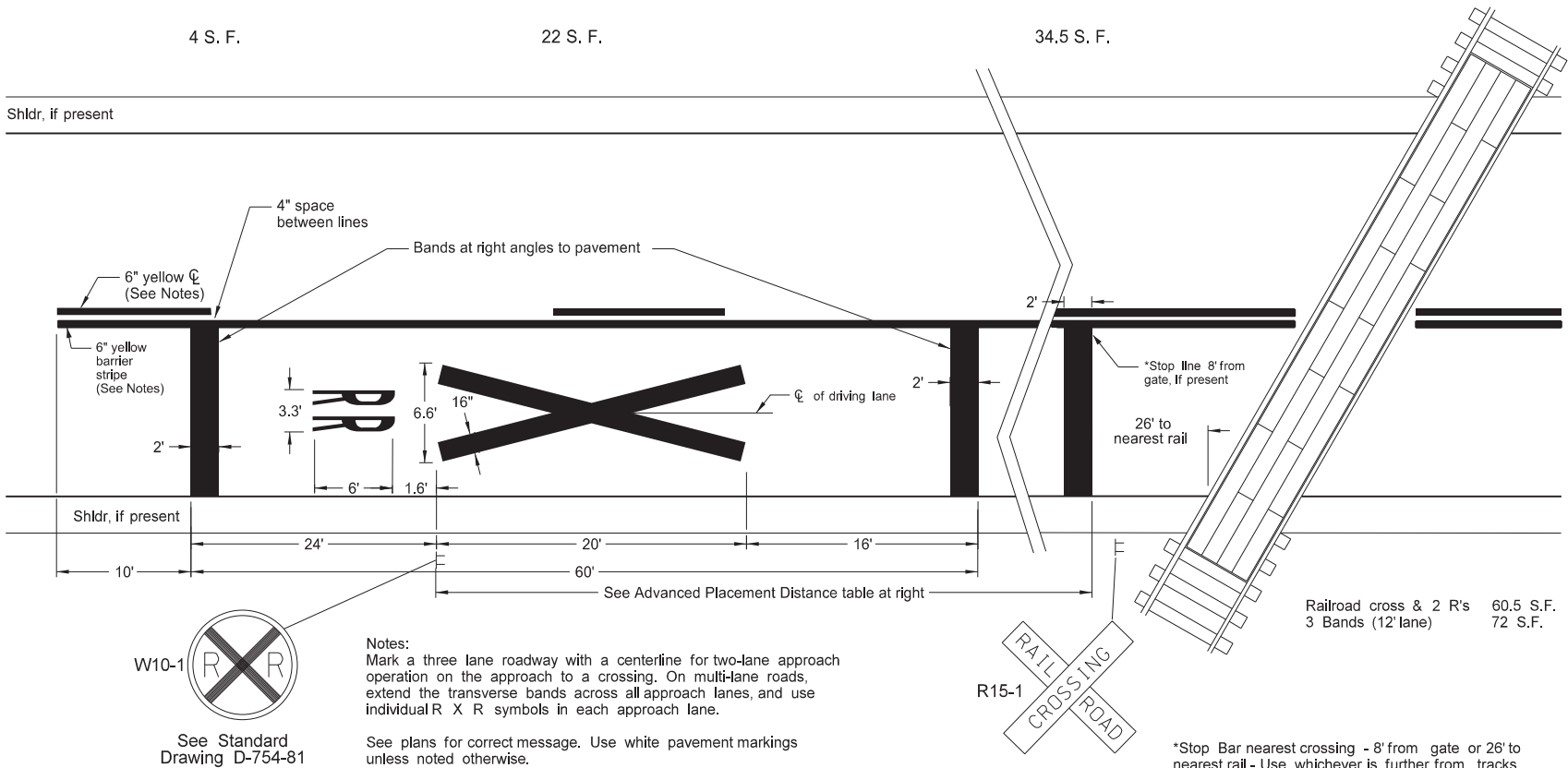
22 S. F.



34.5 S. F.



46 S. F.



### Continental Crosswalk Detail

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

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

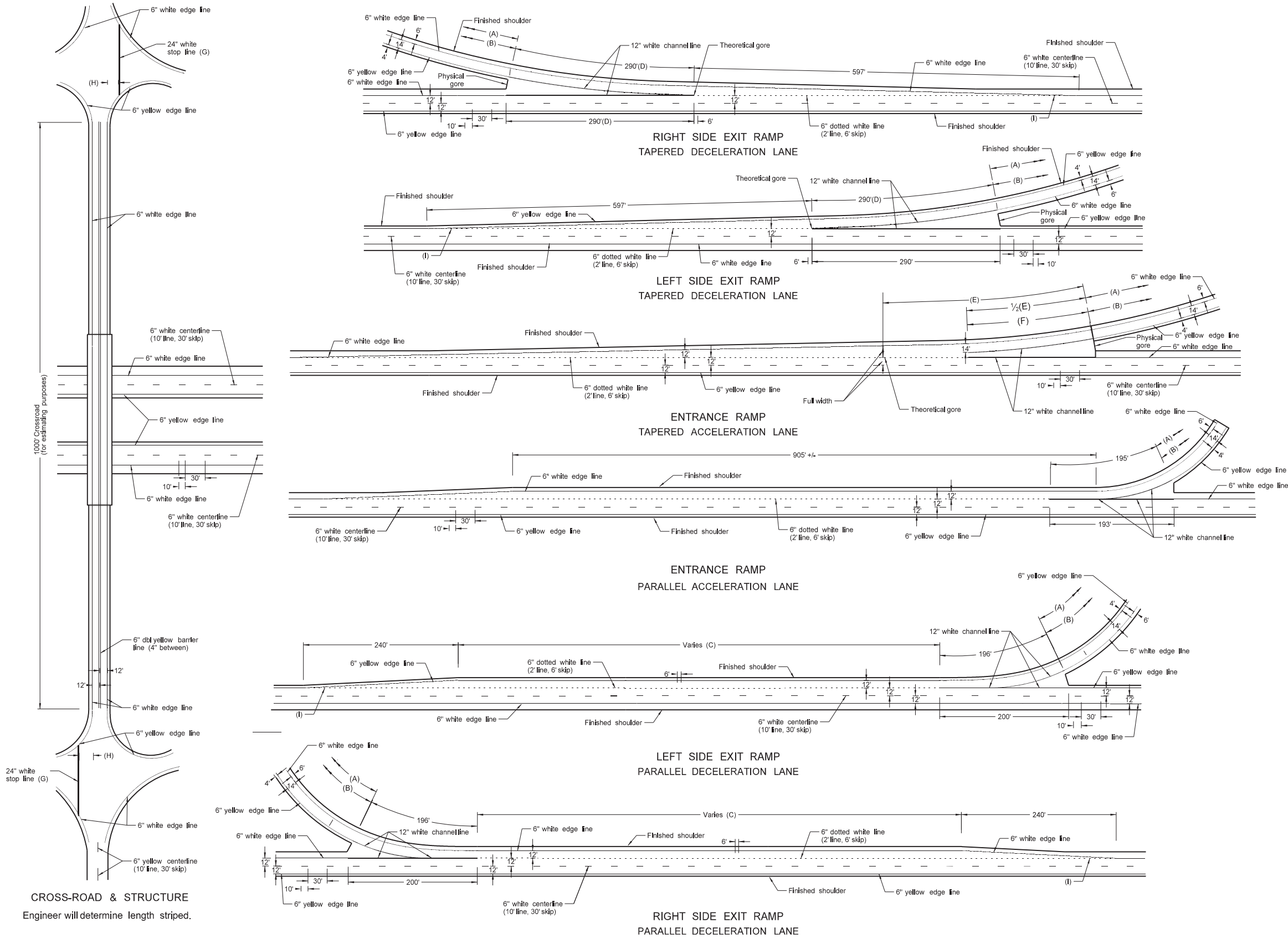
NORTH DAKOTA	
DEPARTMENT OF TRANSPORTATION	
12-6-11	
REVISIONS	
DATE	CHANGE
10-17-17	Updated to active voice.
08-27-19	New Design Engineer PE Stamp.
01-28-2020	Revised min Stop Bar distance to rail.
11-22-2023	Revised pavement marking widths.





INTERSTATE PAVEMENT MARKING  
4 LANE DIVIDED HIGHWAY

- NOTE:
- (A) Normal width white edge line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
- Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.
- (B) Normal width yellow edge line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
- Use 4 or 6 inch wide pavement marking for all other roadways with speed limits ≤ 40 mph.
- (C) Assume "varies" equals 790' for purpose of estimate. Place pavement marking from beginning of taper to the 12" line.
- (D) Beginning of physical gore to theoretical gore.
- (E) If the distance is less than 350' extend the 12" channel line to the theoretical gore, otherwise use 195'.
- (F) Use 195' for estimating purposes.
- (G) Not required for gravel surface crossroad approaches.
- (H) 4' minimum, 15' maximum from nearest edge of intersection traveled way.
- (I) Extend dotted line until it touches the edgeline.



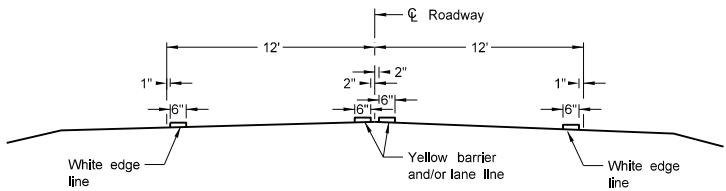
BASIS OF ESTIMATE		
LOCATION	ITEM	
Right or Left Side Exit Ramp TAPERED	12" White channel line	580 LF
	24" White stop line	60 LF
	6" White dotted line	148 LF
	6" White edge line	1115 LF
	6" Yellow edge line	1075 LF
Entrance Ramp TAPERED	12" White channel line	390 LF
	6" White dotted line	258 LF
	6" White edge line	1270 LF
Right or Left Side Exit Ramp PARALLEL	6" Yellow edge line	1075 LF
	12" White channel line	398 LF
	24" White stop line	60 LF
	6" White dotted line (C)	258 LF
	6" White edge line	1115 LF
Entrance Ramp PARALLEL	6" Yellow edge line	1075 LF
	12" White channel line	388 LF
	6" White dotted line	283 LF
	6" White edge line	1275 LF
Main Line (Both Roadways)	6" Yellow edge line	1075 LF
	6" White lane line, 10' line, 30' skip	2640 LF/MI
	6" White edge line	10,560 LF/MI
Cross Road	6" Yellow edge line	10,560 LF/MI
	6" White edge line	2000 LF
	6" Dbl yellow barrier line (4" between)	2000 LF

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

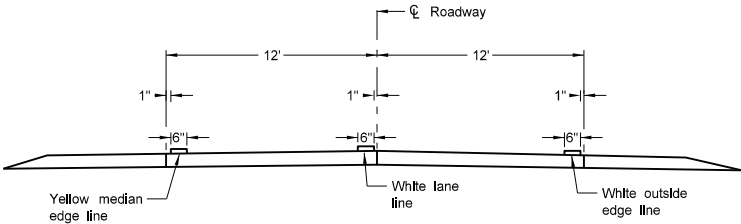


PAVEMENT MARKING

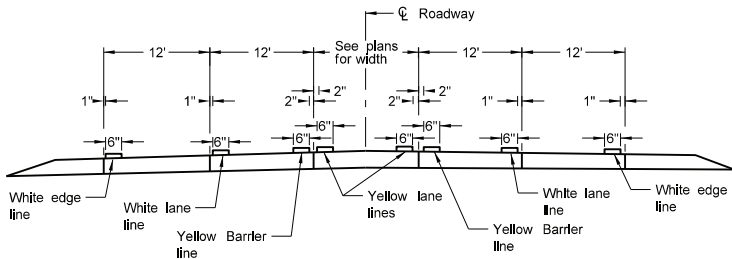
D-762-4



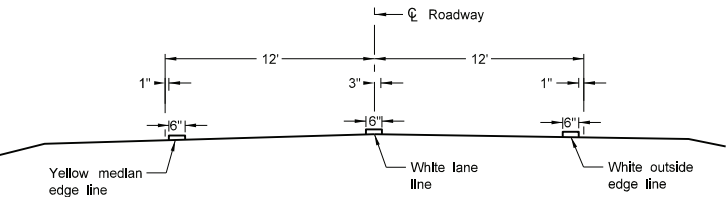
Two Lane Two Way  
RURAL ROADWAY



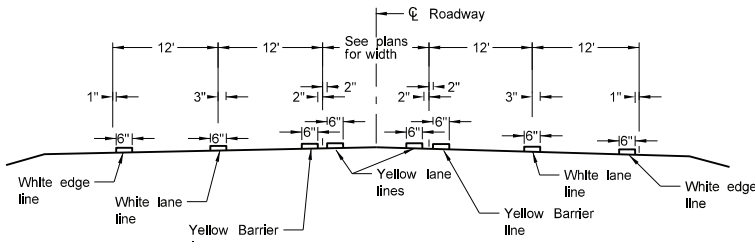
Two Lane Roadway  
INTERSTATE HIGHWAY  
Concrete Section



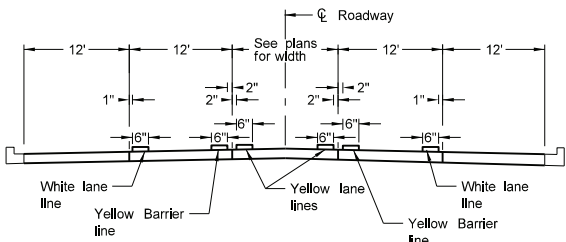
RURAL FIVE LANE ROADWAY  
Concrete Section



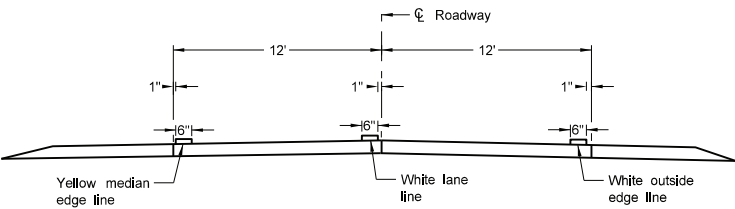
Two Lane Divided  
Rural Roadway  
PRIMARY HIGHWAY  
Asphalt Section



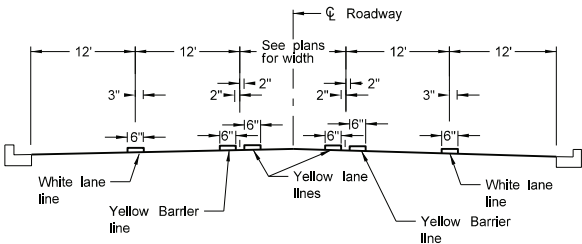
RURAL FIVE LANE ROADWAY  
Asphalt Section



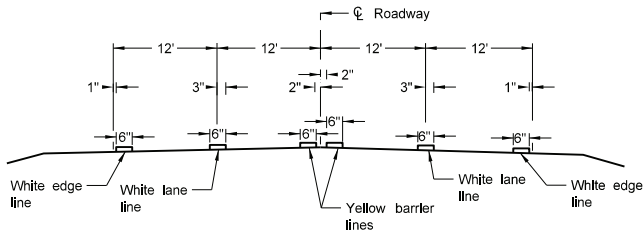
URBAN FIVE LANE SECTION  
Concrete Section



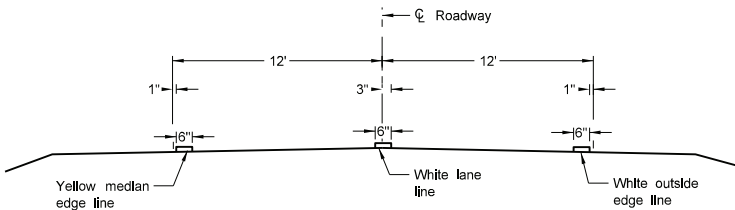
Two Lane Divided  
Rural Roadway  
PRIMARY HIGHWAY  
Concrete Section



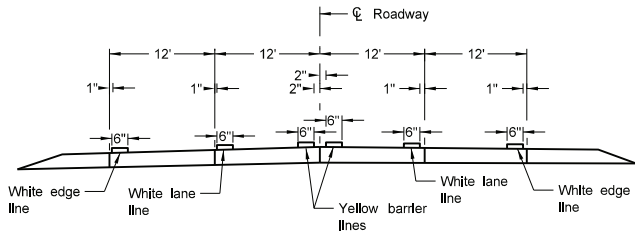
URBAN FIVE LANE SECTION  
Asphalt Section



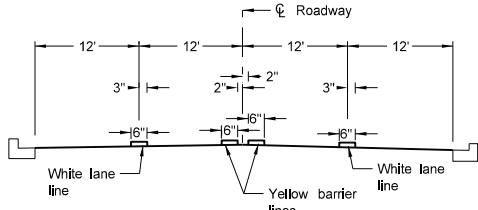
RURAL FOUR LANE ROADWAY  
Asphalt Section



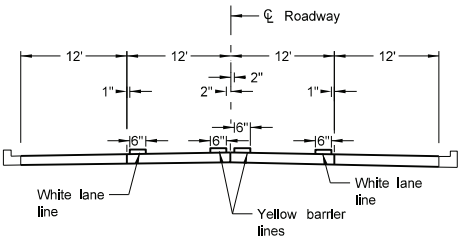
Two Lane Roadway  
INTERSTATE HIGHWAY  
Asphalt Section



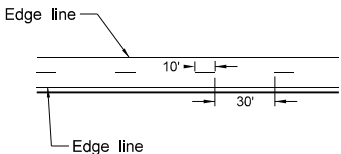
RURAL FOUR LANE ROADWAY  
Concrete Section



URBAN FOUR LANE SECTION  
Asphalt Section



URBAN FOUR LANE SECTION  
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

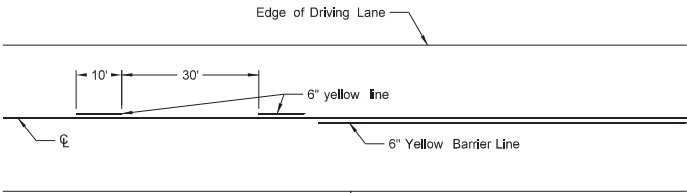
- NOTES:
1. Continue edge lines through private drives and field drives. Break edge lines for intersections.  
  
For section lines, county roads, and street approaches, stripe the radii and edge lines of the paved surface within the right of way except where curb and gutter is present.
  2. Normal width line - 6 inches wide for freeways, expressways, and ramps; 6 inches for all other roadways with speed limits > 40 mph.
  3. Use 4 or 6 inch wide pavement marking for all other roadways with speed limits < 40 mph.

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

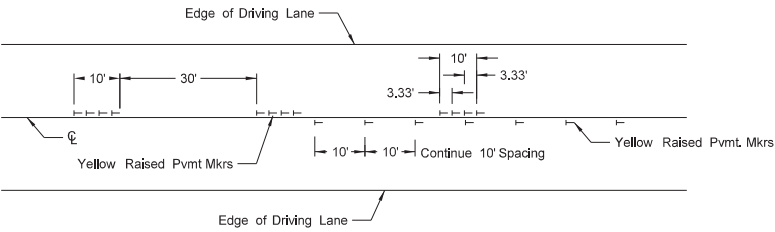


SHORT-TERM PAVEMENT MARKING

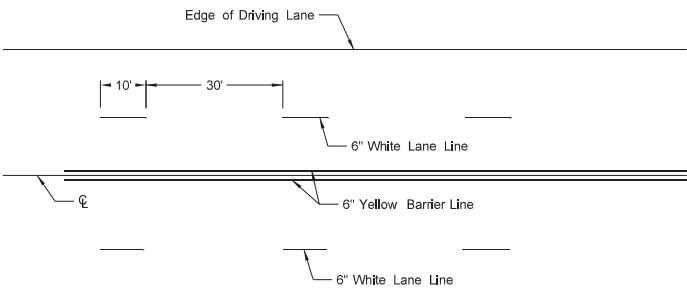
D-762-11



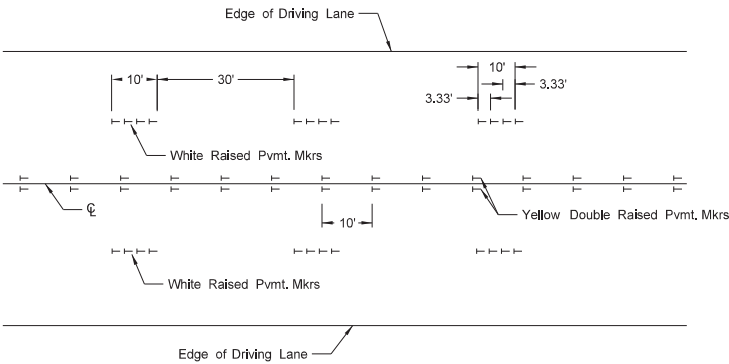
Painted or Tape Lines



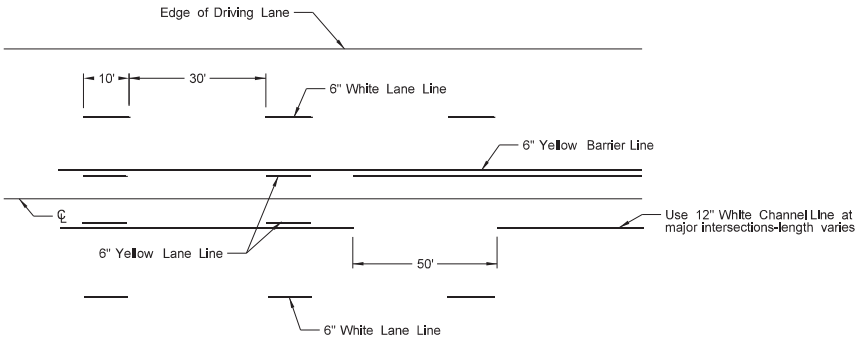
Raised Pavement Markers  
TWO-LANE TWO-WAY ROADWAY



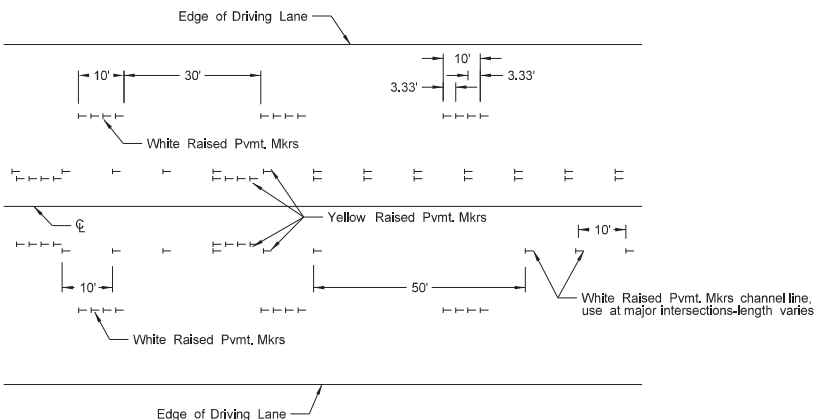
Painted or Tape Lines



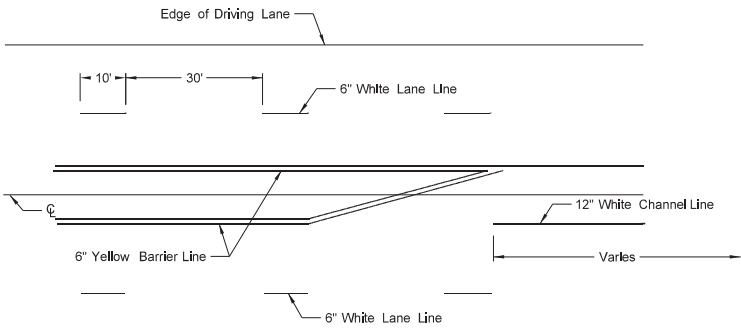
Raised Pavement Markers  
FOUR LANE ROADWAY



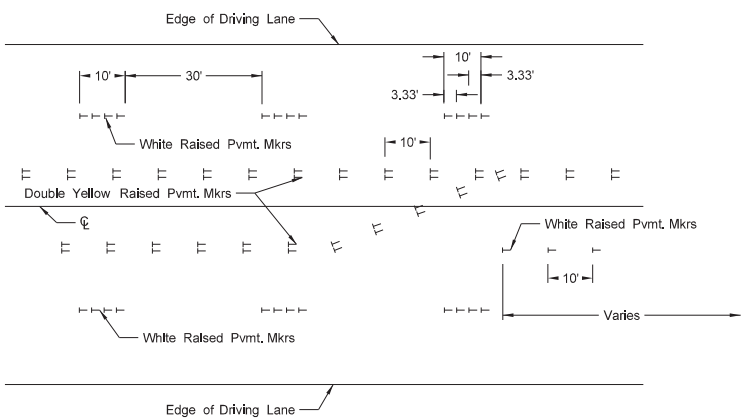
Painted or Tape Lines



Raised Pavement Markers  
FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers  
FIVE LANE ROADWAY WITH MARKED ISLANDS

NOTES:

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

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

