

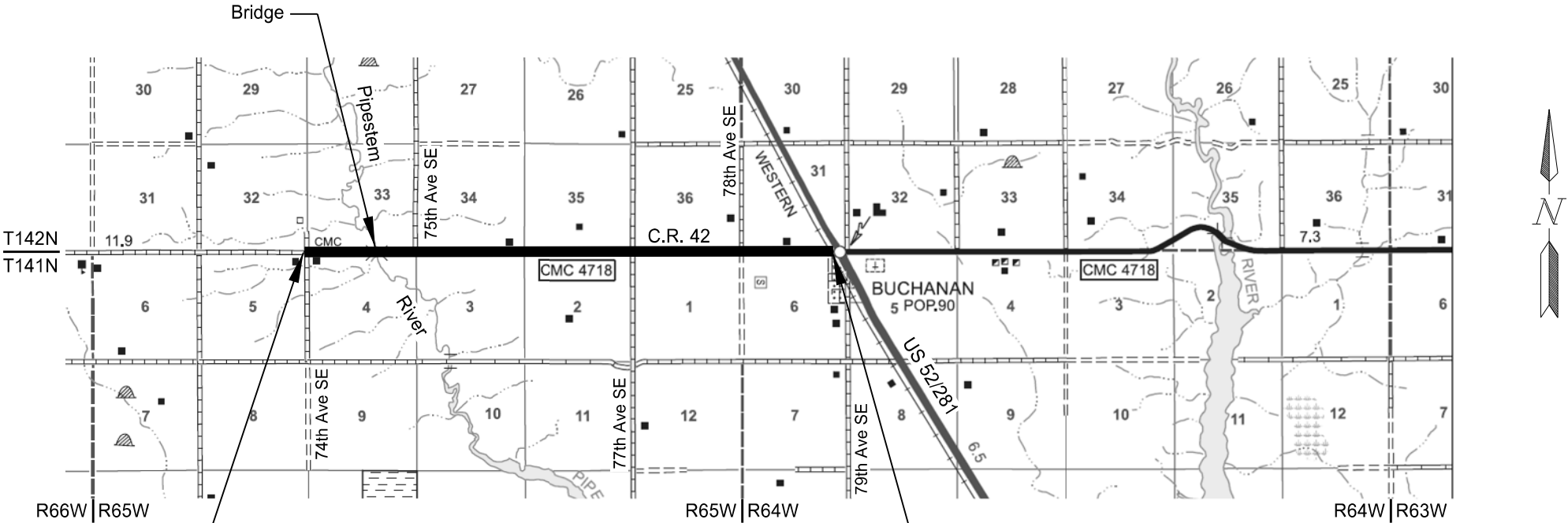
DESIGN DATA				
Traffic	Average Daily			
Current 2016	Pass:	Trucks:	Total: 135	
Forecast	Pass:	Trucks:	Total:	
Clear Zone Distance: 18'		Design Speed: 55		
Minimum Sight Dist. for Stopping: 495'		Bridges:		
Sight Dist. for No Passing Zone: 900'				
Pavement Design Life 20 (years)				
Design Accumulated ESALs: 270,000				

JOB # 7  
NORTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

Federal Aid Project  
SC-4718(060)  
Stutsman County  
County Road 42  
CMC 4718, from Buchanan West 5 Miles  
Full Depth Reclamation - Cement Stabilized  
Milling, Hot Bituminous Paving, Chip Seal, Fog Seal & Striping

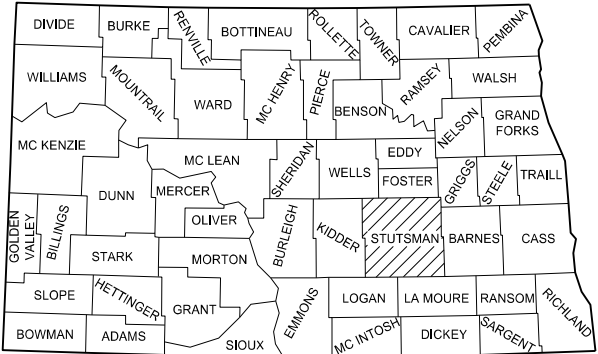
	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	22240	1	1

GOVERNING SPECIFICATIONS: 2014 Standard Specifications adopted by the North Dakota Department of Transportation and the Supplemental Specifications effective on the date the project is advertised.		
PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
SC-4718(060)	4.902	4.902



Begin Project SC-4718(060)  
Station 9+39, approximately  
61' west of the northeast corner  
Section 5, T141N, R65W, the  
point where pavement begins.

End Project SC-4718(060)  
Station 268+26, approximately  
105' east of the centerline of  
Red River Valley and Western  
Railroad tracks, and approximately  
473' west of the northeast corner  
of Section 6, T141N, R64W.



STATE COUNTY MAP

DESIGNERS
Benjamin B. Aaseth, PE
Paul Sharp
Mike May

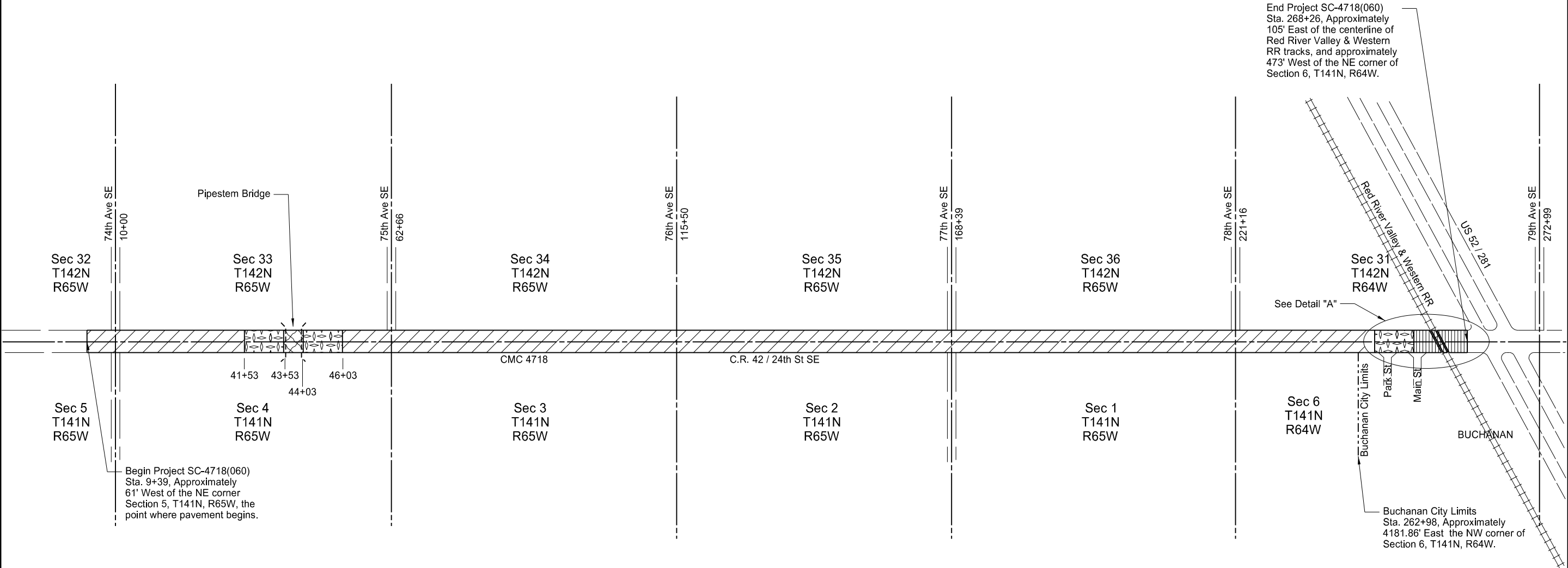
I hereby certify that the attached plans were prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of ND.	This document was originally issued and sealed by Benjamin B. Aaseth, Registration Number PE-10085, on 08/16/18 and the original document is stored at the Stutsman County Highway Department
APPROVED DATE 08/16/2018	
Benjamin B. Aaseth /s/ Interstate Engineering, Inc.	

TABLE OF CONTENTS

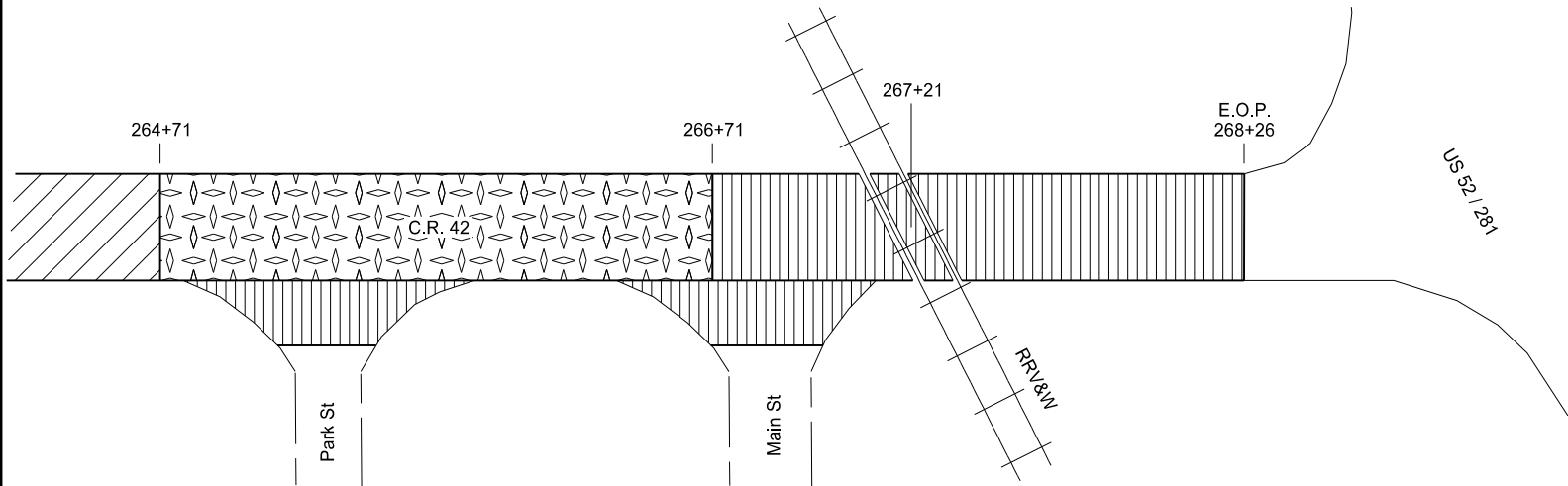
PLAN SECTIONS		
Section	Page(s)	Description
1	1	Title Sheet
2	1	Table of Contents
4	1	Scope of Work
6	1 - 2	Notes
8	1	Quantities
10	1	Basis of Estimate
20	1 - 3	General Details
30	1	Typical Sections
100	1 - 3	Work Zone Traffic Control
120	1	Pavement Marking
190	1 - 2	Haul Road Restrictions

LIST OF STANDARD DRAWINGS	
Number	Description
D-101-1, 2, & 3	NDDOT Abbreviations
D-101-10	NDDOT Utility Company and Organization Abbreviations
D-101-20, & 21	Line Styles
D-101-30, 31, & 32	Symbols
D-704-2	Traffic Control For Coring Of Hot Bituminous Pavement
D-704-8	Breakaway Systems For Construction Zone Signs - U-Channel Post
D-704-9	Construction Sign Details - Terminal And Guide Signs
D-704-10	Construction Sign Details - Regulatory Signs
D-704-11	Construction Sign Details - Warning Signs
D-704-13	Barricade And Channelizing Device Details
D-704-14	Construction Sign Punching And Mounting Details
D-704-15	Road Closure Layouts
D-704-19	Road Closure And Lane Closure On A Two Way Road Layouts
D-704-20	Terminal And Seal Coat Sign Layouts
D-704-21	Detour And Roadway Diversion Sign Layouts
D-704-22	Construction Truck And Temporary Detour Layouts
D-704-26	Miscellaneous Sign Layouts
D-704-27	Traffic Control Plan For Moving Operations
D-704-50	Portable Sign Support Assembly
D-706-1	Bituminous Laboratory
D-762-1	Pavement Marking Message Details
D-762-4	Pavement Marking
D-762-11	Short-Term Pavement Marking
D-766-1	Mailbox Location Details

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	4	1

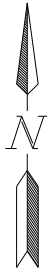


\*RRVW may update this crossing after final plans.  
Which would elinate the need to mill between the tracks.



Detail "A"

- 7" Full Depth Reclamation, 4" Hot Bituminous Paving, Chip Seal
- 0" to 4" Milling Transition, 7" Full Depth Reclamation, 4" Hot Bituminous Paving, Chip Seal
- 4" Milling, 4" Hot Bituminous Paving, Chip Seal
- 2" Milling, 2" Hot Bituminous Paving, Chip Seal



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SCOPE OF WORK  
Co. Rd. 42  
Buchanan West Approximately 5 Miles  
Stutsman County, North Dakota

Notes			STATE	PROJECT NO.	SECTION NO.	SHEET NO.			
			ND	SC-4718(060)	6	1			
107-114	<p><b>RAILROAD PROTECTIVE LIABILITY INSURANCE:</b> This project crosses the Red River Valley and Western Railroad Company at RP 0012.47. The type of work that will be performed within the railroad right of way is Paving, Milling, Chip Seal, and Fog Seal. Direct inquiries regarding protective liability insurance to:</p> <p>Mr. Dan Zink, Director of Administration Red River Valley and Western Railroad Company P.O. Box 608 Wahpeton, ND 58074 701-642-8257</p> <p>Obtain information regarding crossing number 080623C from the Federal Railroad Administration website: <a href="http://safetydata.fra.dot.gov/Officeofsafety/">http://safetydata.fra.dot.gov/Officeofsafety/</a>.</p>			216-P01			<p><b>WATER:</b> The basis of estimate is 50 M GAL per mile. Include the water for haul road dust control and detour route during the paving operation in the bid item “WATER”. Any water used prior to the paving operation including but not limited to dust control during material crushing shall be the Contractor’s responsibility. All water used for full depth reclamation, reshaping aggregate base course, cement stabilization, and curing shall be included in the price bid for “Full Depth Reclamation – Cement Stabilized”.</p>		
107-P01	<p><b>RAILROAD TEMPORARY OCCUPANCY PERMIT:</b> This project crosses the Red River Valley and Western Railroad Company at RP 0012.47. The type of work that will be performed within the railroad right of way is Paving, Milling, Chip Seal, and Fog Sea. Inquiries for railroad temporary occupancy permit should be directed to:</p> <p>Jill Kvidera Red River Valley &amp; Western Railroad 209 Dakota Ave Wahpeton, ND 58075 1-701-642-8257</p> <p>Contact Cal Gruebele as soon as the project is awarded to coordinate construction. 1-701-640-0841 (Cell) 1-218-643-1532 (Office)</p> <p>The costs of coordinating with the railroad shall be included in the contract unit price of the contract items.</p>			302-P01			<p><b>AGGREGATE BASE COURSE LIMITATIONS:</b> There is no limit to the maximum amount of roadway being worked on. This applies to full depth reclamation and reshaping aggregate base course.</p>		
107-P02	<p><b>LOAD LIMITS:</b> Stutsman County axle limits are posted and updated periodically on their web site at: <a href="http://www.co.stutsman.nd.us/files/stutsman_co_road_restrictions.pdf">http://www.co.stutsman.nd.us/files/stutsman_co_road_restrictions.pdf</a> Contact the County Road Department at (701) 252-9040 for the most recent information on County load limits.</p> <p>Stutsman County does not grant overload permits for anything other than non-divisible construction equipment loads. The entire haul cycle, loaded and empty, will be considered for haul routes. Obtain written approval from the local government agency or agencies prior to the pre-job and approved by the Engineer.</p> <p>For Township and other local governmental agency roads the Contractor is referred to Section 39-12-05.3 of the North Dakota Century Code that pertains to weight limits. A portion of Paragraph # 2 of this section of the code reads: “.... the gross weight may not exceed eighty thousand pounds (36,287.39 kilograms) unless designated by local authorities for highways under their jurisdiction...”</p> <p>Contact the individual Township or other local governmental agency officials for the most recent road restrictions for each township. Contact information for townships can be located at:</p> <p><a href="http://www.co.stutsman.nd.us/files/township_officers.pdf">http://www.co.stutsman.nd.us/files/township_officers.pdf</a></p>			302-P02			<p><b>AGGREGATE BASE COURSE CL3:</b> Approximately 2112 tons of Aggregate Base Course CL 3 has been provided for in the plans for approaches, spot filling, and detour maintenance. Millings will be allowed as a substitute for CL 3 with a maximum particle size of 1.5”. All costs associated with hauling, placing, spreading, and compacting shall be included in the price bid for “Aggregate Base Course CL 3.”</p>		
107-P03	<p><b>SPEED LIMITS:</b> The speed limit for all trucks on Stutsman County highways is 55 miles per hour or unless signed different.</p>			306-P01			<p><b>FULL DEPTH RECLAMATION – CEMENT STABILIZED:</b></p> <ol style="list-style-type: none"><li>Follow specifications according to Section 306. Full depth reclaim the existing road to a depth of 7”. Produce a blended material that meets the gradations in Section 306. All costs associated with this work including the water shall be included the unit price bid for “Full Depth Reclamation – Cement Stabilized”</li><li>Following the first pass of full depth reclamation, reshape the blended material to a cross section as shown in the plans. Utilize a motor grader to shape the blended material to a crown that is shown in the typical section. No compaction of this will be required as it shall take place prior to the cement treating. All labor, equipment and materials required to complete the work as described above in accordance with Section 302 of the Standard Specifications shall be included in the price bid for “Reshape Aggregate Base Course”.</li><li>After the roadway has been brought up to the final grade and cross section, blend the material to be treated with cement to the dimensions shown on the typical section. Spread the cement using spreaders that give a precise measurement of cement needed for the area being covered. The spreaders shall be close to the surface and shrouded so as to minimize cement loss due to wind. Reclaim the cement into the subgrade to the desired depth with a reclaimer along with a water truck which gauges the precise amount of water needed to achieve the necessary moisture content. Compact the subgrade to the necessary density following the reclaimer with a roller.</li><li>Use the prepared mix design located in the bidding documents. The compressive strengths require a minimum of 125 pounds per square inch (psi) at seven (7) days cure and no more than 225 psi at seven days.</li><li>Blend the treated compacted material to a minimum of 95% of the maximum dry density as determined by AASHTO T-99. Compressive strength samples are taken at a rate of two per lane mile. Three (cylinders) shall be cast per sample for two (2) seven day breaks and one (1) spare. Traffic is to remain off of the newly treated blended material for a period of 36 hours prior to applying the prime. All costs associated with this work including the water shall be included the unit price bid for “Full Depth Reclamation – Cement Stabilized”. The Portland cement utilized will be paid for separately per ton as per note #11.</li><li>As compaction nears completion, shape the surface of the Stabilized Full Depth Reclaimed (SFDR) to the specified lines, grades, and cross sections. Continue compaction until</li></ol>		
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Notes

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	6	2

uniform and adequate density is obtained. Keep the surface moist by means of fog-type sprayers during the finishing process. Produce a dense surface, free of compaction planes, cracks, ridges, or loose material while compacting and finishing. Complete all finishing operations within 4 hours from start of mixing.

7. The Portland cement shall comply with AASHTO M 85. Keep the water free from substances deleterious to the hardening of the Cement material.

8. Protect finished portions of SFDR surface in such a manner as to prevent equipment and traffic from marring, permanently deforming, or damaging completed work. Cure the surface after completion of final finishing, keep the curing the application continuously moist for a period of seven days with a fog-type water spray that will not erode the surface of the SFDR or until the prime coat is applied.

9. Maintain the SFDR material in good condition until all work is completed and accepted. Such maintenance shall be done by the contractor at their own expense. Maintenance shall include immediate repairs of any defects that may occur. If it is necessary to replace any processed material, the replacement shall be for the full depth, with vertical cuts, using fresh cement-treated material. No skin patches will be permitted.

10. Testing frequencies of the SFDR will be as follows:

a. Density and Moisture content at a rate of one test per 1,500 feet of lane mile.

b. Compressive strength samples taken at a rate of two (2) per lane mile. Three (3) cylinders shall be cast per sample for two (2) seven day breaks and one (1) spare. Average of the two, or three if needed, will be the resultant compressive strength.

c. Contractor shall be responsible for all SFDR mix designs, testing and sampling. All CSS testing and sampling shall be included in the bid price for “Full Depth Reclamation – Cement Stabilized”.

d. All testing procedures shall follow ASTM 1633 and AASHTO T134.

11. Cement will be based upon delivery truck manifests with deductions for material already in the cement silos and checks being made to assure consistency. Water will be incidental to unit price. The cement shall comply with note #7 and be paid for by the ton as “Cement – Soil Drying Agent”.

12. Before applying the bituminous curing material (MC-70), the SFDR surface shall be dense, free of all loose and extraneous materials, and shall contain sufficient moisture to prevent excessive penetration of the bituminous material. The bituminous material shall be uniformly applied to the surface of the completed SFDR. The exact rate and temperature of application for complete coverage, without undue runoff, shall be adjusted in the field to determine proper coverage. Should it be necessary for traffic to use the bituminous covered surface before the bituminous material has dried sufficiently to prevent pickup, sufficient sand blotter cover shall be applied before such use.

704-P01

**TRAFFIC CONTROL:** After the project has started, maintain traffic at all times. The Traffic Control Devices List has been developed using the following layouts on the Standard Drawings and plan sheets for the traffic control:

D-704-7, 8, 9, 10, 11, 13 and 14 are applicable

D-704-15 Layout Type A: with a pilot car for a one lane closure for seal coat operations

D-704-19 Layout Type E: road closure with detour for FDR and paving operations.

D-704-20 Layout Type G: the basis for the Construction Signing Sheet for seal coat operations. When installing layout G from Standard D-704-20, move sign W3-5-48 and the sign assembly containing signs R2-1-48 and R2-1a-24 with the work area as it progresses through the construction zone. Place the R2-1-48 assembly a minimum of 500 feet in advance of flagging signs.

D-704-21 Layout I: for road closure and detour

D-704-22 Layouts K and L: for construction trucks hauling material

D-704-26 Layouts BB, CC, EE, FF, and GG: where the conditions exist

D-704-27 For pavement marking operations the required traffic control signs and devices are included in the “Traffic Control Devices List” and will be measured and paid at the Contract Unit Price for each device. Additional devices required to accommodate the Contractor’s operation shall be the Contractor’s responsibility.

704-P02

**TRAFFIC CONTROL ROAD CLOSURE:** During the process of the cement stabilization and curing process the contractor must maintain one lane of traffic accessible to adjacent property owners, emergency vehicles, and for the contractor to maintain and cure the cement stabilization. Use a Type III barricade at each intersection or approach of possible access to mark the closed lane on each side of the road.

704-P03

**TRAFFIC CONTROL:** Remove the road closure upon completion of the hot bituminous paving. Utilize flagging and pilot car operations for the chip seal, fog seal and striping portions of the project. Flagging and pilot car is incidental as per 420.04F.

704-P04

**SIGN ANCHORS:** If the Contractor has sign anchors in the ground without a sign attached to them, they will be required to place a 24” tall, or taller, reflective marker, over the top of the anchor. The cost of the marker shall be included in the bid price for the signs. If the Contractor does not place tubular markers over the anchors within 24 hours after notification from the Engineer a contract price reduction will be issued for \$1000 per location per day until the anchors have either been covered, had a sign attached to them, or been removed. As per the NDDOT spec book.

766-P01

**MAILBOXES:** All mailbox supports located along the highway must be adjusted to match the new pavement elevation. The current mailbox or a new box supplied by the Owner of the box will be mounted on the support. Any portions of the support or box damaged shall be replaced at the Contractor’s expense. The bid item for “Mailbox – All Types” shall include mounting hardware as specified in Standard Drawing D 766-1.

Station	Size	Number
22+78 RT	2	1
108+90 RT	1A	1
141+43 RT	1A	2
141+47 RT	1A	1
245+84 LT	1A	1

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Estimated Quantities

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	8	1

SPEC	CODE	ITEM DESCRIPTION	UNIT	Mainline: SC-4718(060)
103	100	CONTRACT BOND	L SUM	1
107	100	RAILWAY PROTECTION INSURANCE	L SUM	1
216	100	WATER	M GAL	600
230	125	SHOULDER PREPARATION	MILE	10
234	103	CEMENT-SOIL DRYING AGENT	TON	1006
302	113	AGGREGATE BASE COURSE CL 3	TON	2112
302	407	RESHAPE AGGREGATE BASE COURSE	STA	257
306	500	FULL-DEPTH RECLAMATION-CEMENT STABILIZED	SY	80055
401	50	TACK COAT	GAL	4055
401	60	PRIME COAT	GAL	20014
401	70	FOG SEAL	GAL	4055
401	160	BLOTTER MATERIAL CL 44	TON	603
411	105	MILLING PAVEMENT SURFACE	SY	2754
420	111	CRS2P EMULSIFIED ASPHALT	GAL	27613
420	127	COVER COAT MATERIAL CL 41-M	TON	863
430	43	SUPERPAVE FAA 43	TON	16700
430	1000	CORED SAMPLE	EA	104
430	5803	PG 58S-28 ASPHALT CEMENT	TON	1085
702	100	MOBILIZATION	L SUM	1
704	1000	TRAFFIC CONTROL SIGNS	UNIT	2423
704	1052	TYPE III BARRICADE	EA	64
704	1060	DELINEATOR DRUMS	EA	20
706	550	BITUMINOUS LABORATORY	EA	1
706	600	CONTRACTOR'S LABORATORY	EA	1
762	103	PVMT MK PAINTED-MESSAGE	SF	157
762	430	SHORT TERM 4IN LINE-TYPE NR	LF	26866
762	1104	PVMT MK PAINTED 4IN LINE	LF	13433
766	100	MAILBOX-ALL TYPES	EA	6

Basis of Estimate

Water

- 50 MGal / Mile Dust Palliative (Detour & Haul Route)

Full Depth Reclamation – Cement Stabilized

- 7” Full Depth Reclamation with Cement Stabilization, 28’ width Portland Cement @ 3.8%25 Lbs / SY

Aggregate Base Course CL 3

- Approaches165 Tons
- To fill in potholes before FDR50 Tons/Mile
- To correct steep areas off the highway sloughs200 Tons
- Haul Road Repair1500 Tons

Prime Coat

- Over Stabilized Full Depth Reclamation, 28’ Wide @ 0.25 Gal / SY
- Blotter Material CL-44, @ 15 Lbs / SY

Superpave FAA 43

- Paving over SFDR4” Depth, 24’ Top, 2.0’ sloughs. 8.67 SF @ 2.0 Tons / CY =3,390 Tons/Mile
- Approaches159 Tons
- PG 58S-28 Asphalt Cement: @ 6.5% / Ton of HBP
- Tack Coat
  - @ 0.05 Gal / SY

Seal Coat

- CRS2P Emulsified Asphalt24’ Wide @ 0.40 Gal / SY5,632 Gal / Mile
- Cover Coat Material CL 4124’ Wide @ 25 lbs / SY176 Tons / Mile

Fog Seal

- Fog Shoulders and pavement top width @ 0.05 Gal / SY

PVMT MK Painted 4IN Line

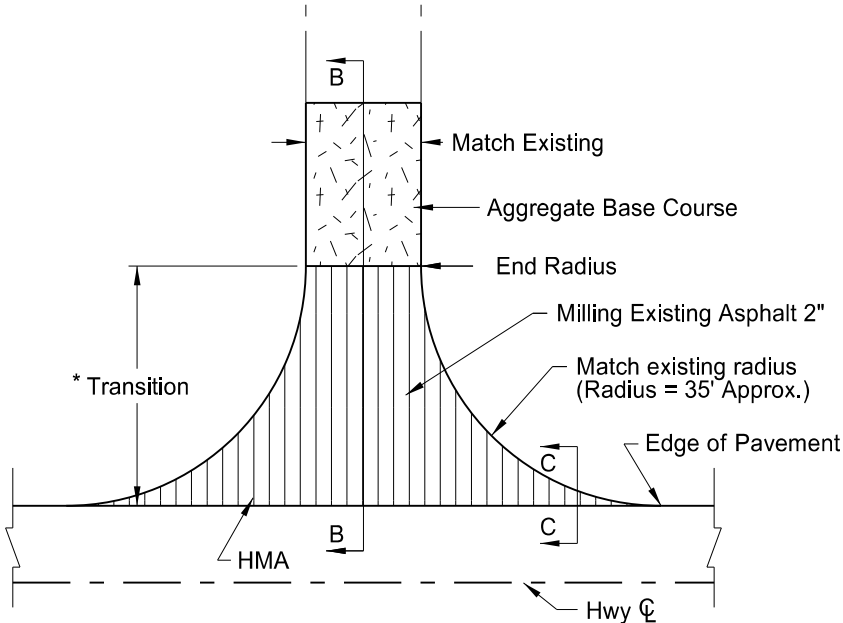
10’ Line, 30’ Skip = 1320 LF / Mile + No Passing Zones

HBP Cored Samples

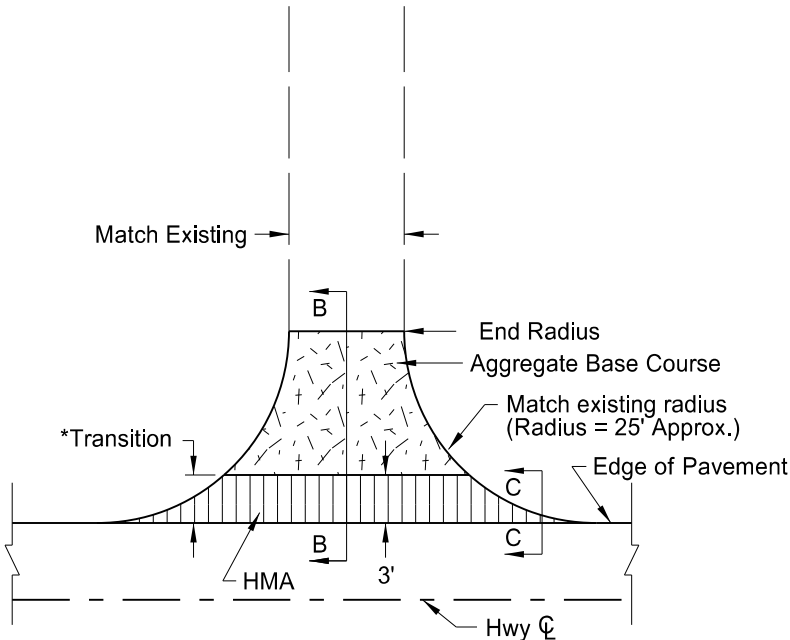
	A	B	C	D		
Specification Section	Distance (Ft) / 2000	Lanes	Lifts	Sublots (A x B x C)	Quantity (D x 2)	Unit
430.04 I.2.b(1)	13	2	2	52	104	EA

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	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	20	1

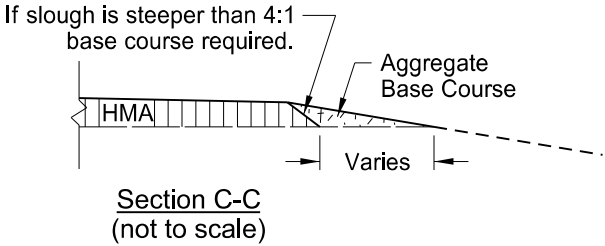
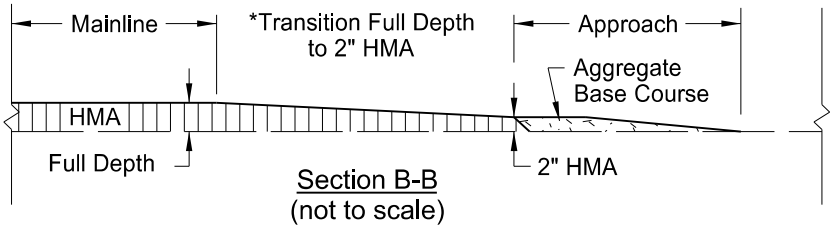


(1) Gravel Street Approach  
(Sta. 265+35 Rt, 266+76 Rt)



(2) Gravel Field Drive, Section Line Approach

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



\*\*NOTE: Gravel field drive and section line approach quantities based on an average length of 75 LF. Lengths vary from 40' to 110'

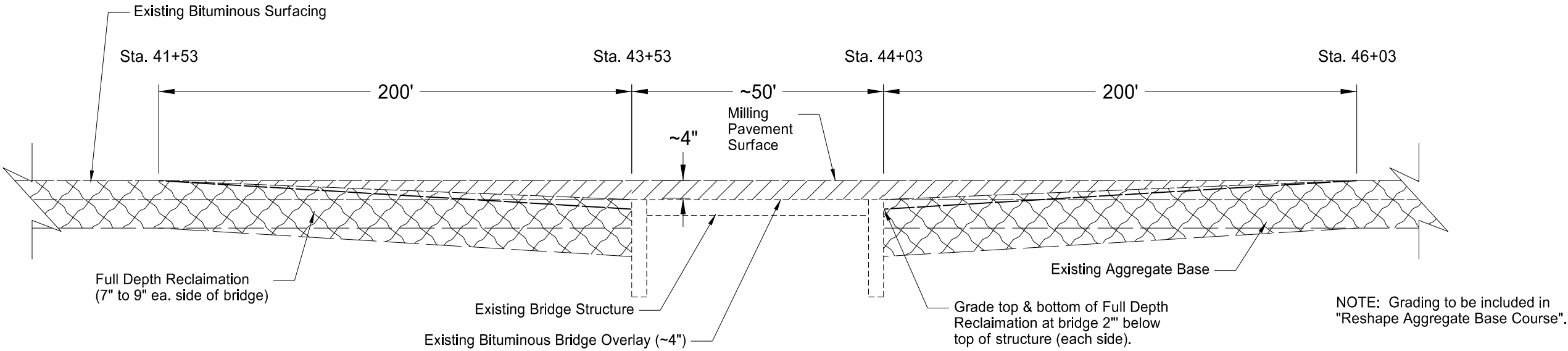
BASIS OF ESTIMATE		(1)	(2)	TOTALS
ITEM	UNIT	Gravel Street	Field Drive **	
Number of Locations		2	29	31
Milling Pavement Surface	SY	125	0	250
Aggregate Base Course CL 3	TON	10	5	165
Tack Coat	GAL	13	1	55
Superpave FAA 43	TON	36	3	159
PG 58S-28 Asphalt Cement	TON	2.3	0.2	11

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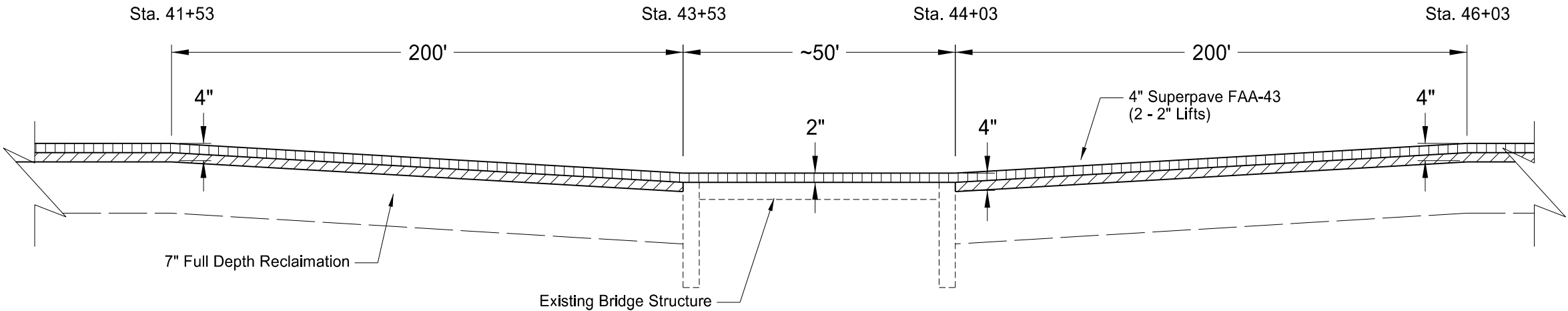
APPROACH DETAILS  
Co. Rd. 42  
Buchanan West Approximately 5 Miles  
Stutsman County, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	20	2

Hot Bituminous Pavement - Surfacing Transition at Bridge



F.D.R. Transition



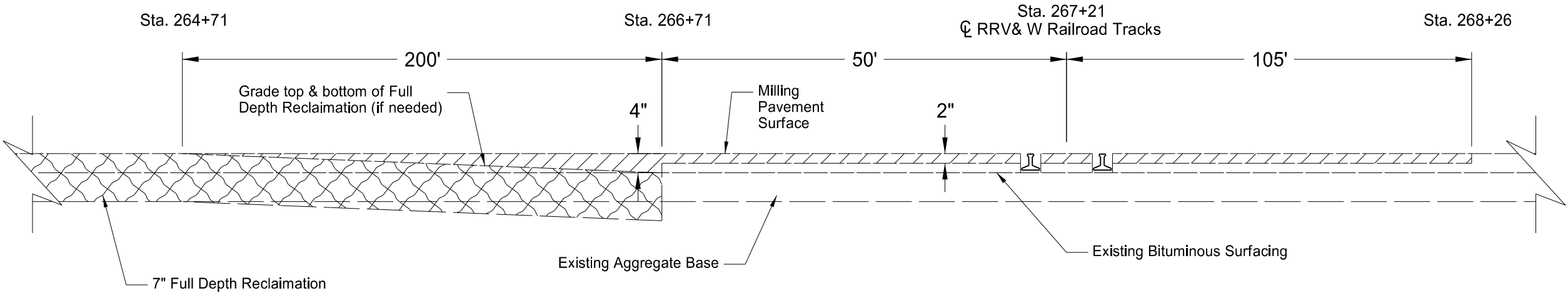
Paving Transition

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MILLING TRANSITION AT BRIDGE  
Co. Rd. 42  
Buchanan West Approximately 5 Miles  
Stutsman County, North Dakota

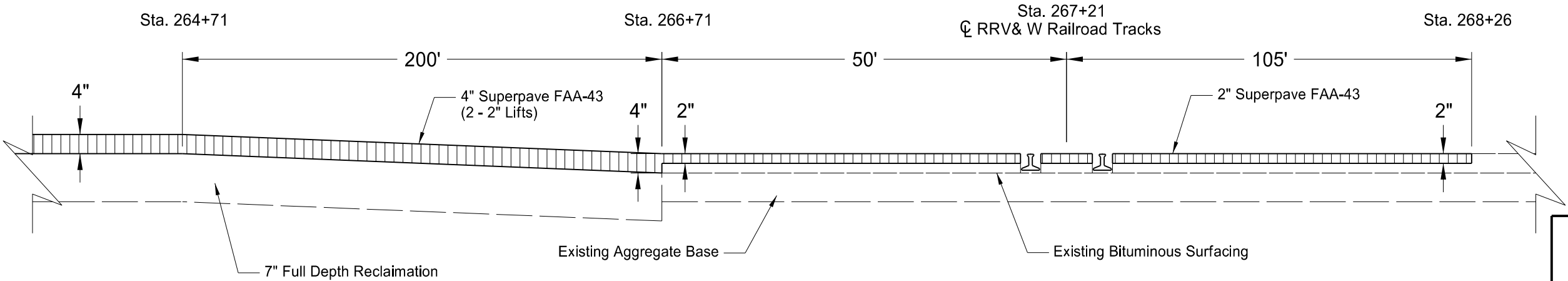
	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	20	3

Surfacing Transition at End of Project



F.D.R. & Milling Transition

NOTE: Grading to be included in "Reshape Aggregate Base Course".  
\*Updating of the crossing may be completed by Others.



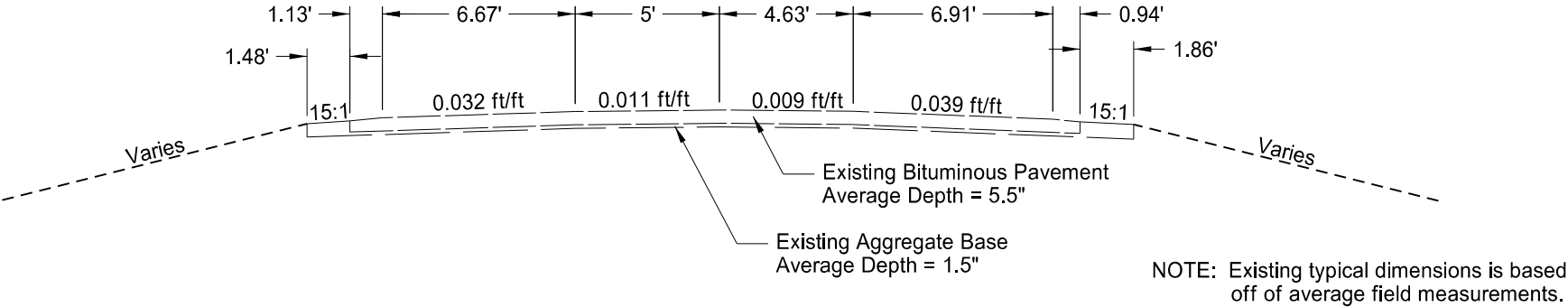
Paving Transition

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MILLING & PAVING TRANSITION DETAIL

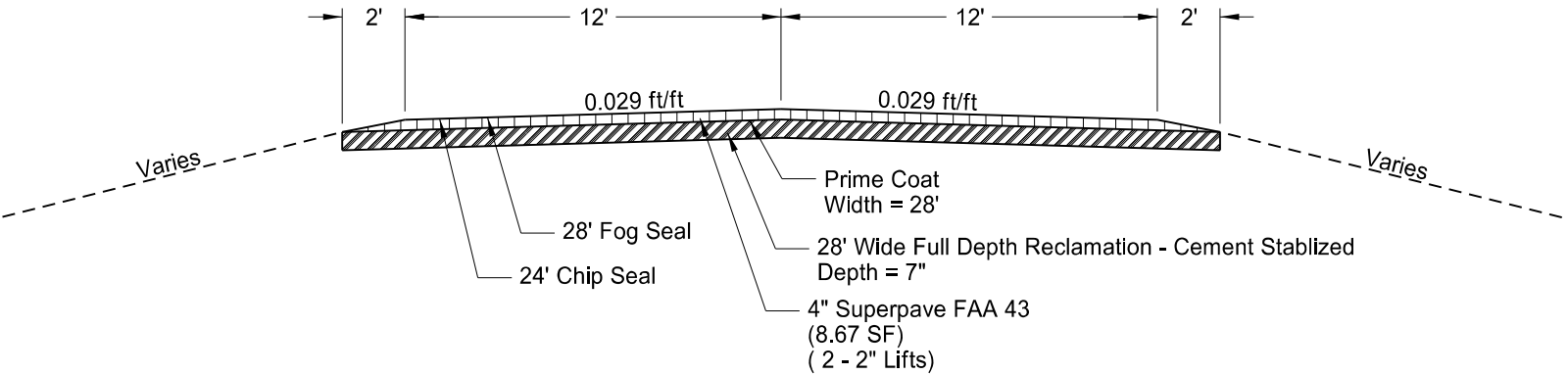
Co. Rd. 42  
Buchanan West Approximately 5 Miles  
Stutsman County, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	30	1



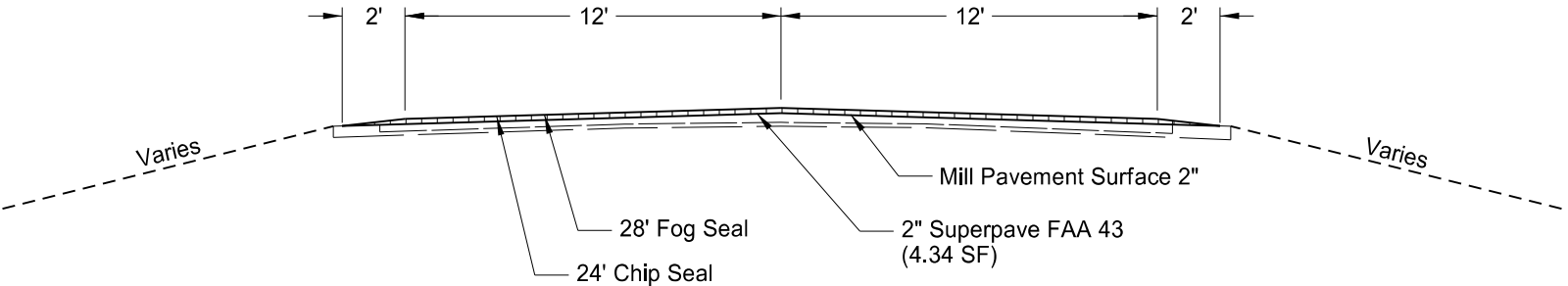
**Existing Typical Section**

Sta. 9+39 to Sta. 268+26



**Proposed Typical Section**

Sta. 9+39 to Sta. 266+71



**Proposed Typical Section**

Sta. 266+71 to Sta. 268+26

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PROPOSED TYPICAL SECTION

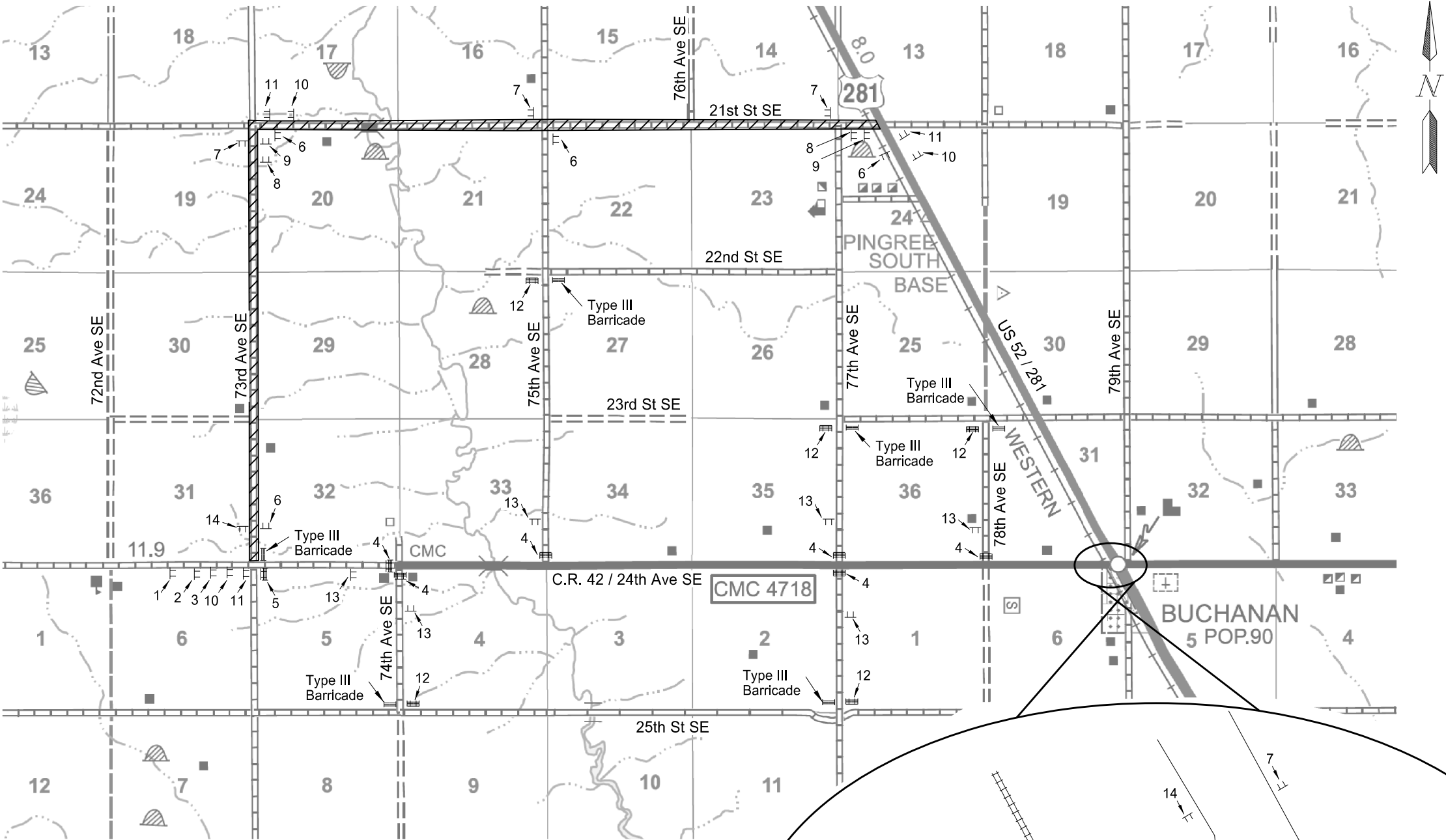
Co. Rd. 42  
Buchanan West Approximately 5 Miles

Stutsman County, North Dakota

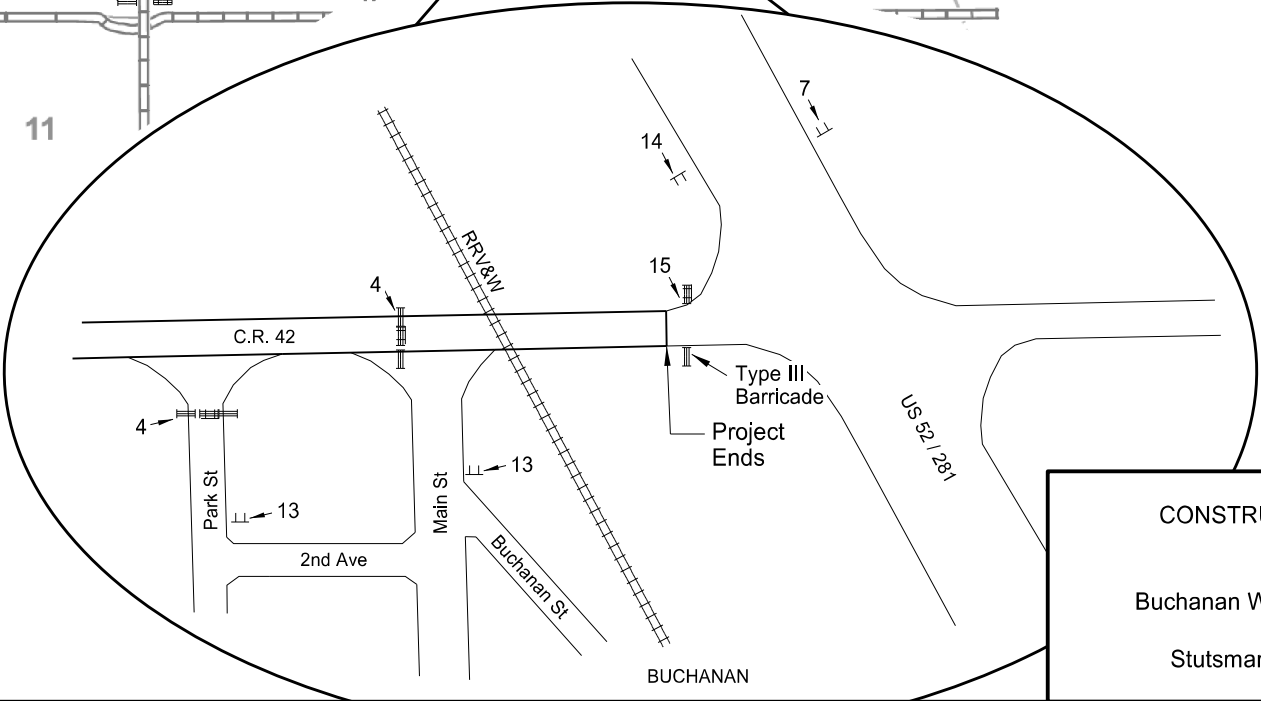




	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	100	2



NOTE:  
Refer to Section 100, Sheet 3 of the  
plans for Detour Sign assemblies.

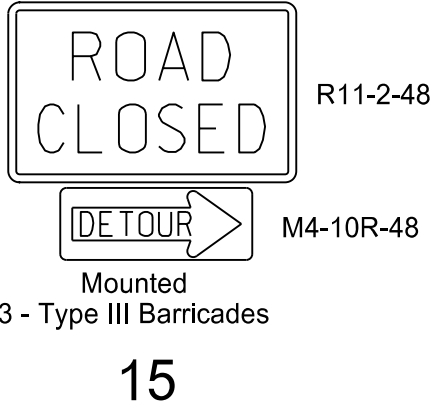
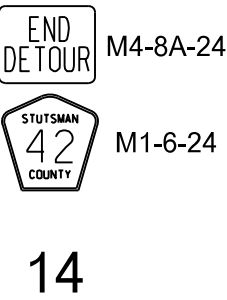
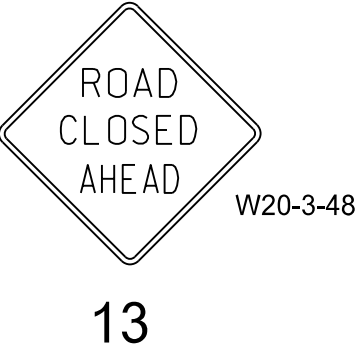
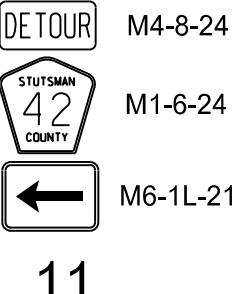
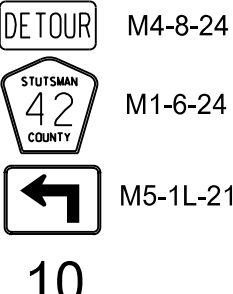
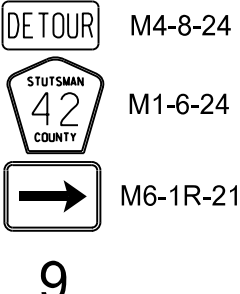
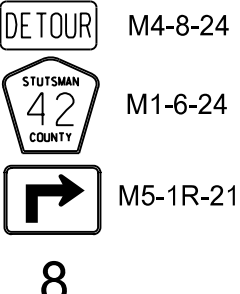
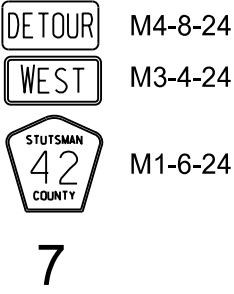
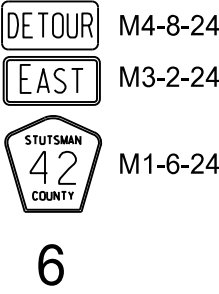
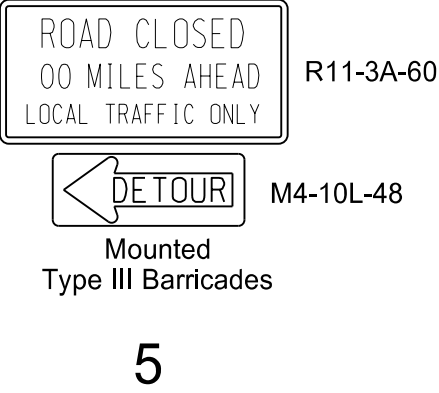
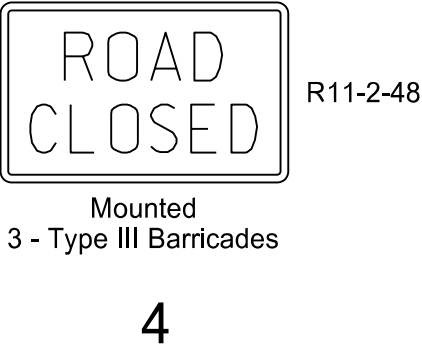
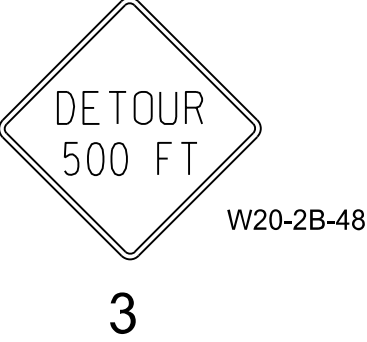
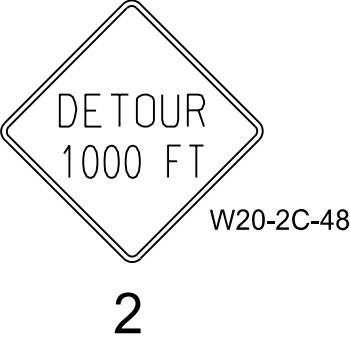


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CONSTRUCTION SIGN LAYOUT  
Co. Rd. 42  
Buchanan West Approximately 5 Miles  
Stutsman County, North Dakota

Detour Route

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	100	3



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CONSTRUCTION SIGNING ASSEMBLIES  
Co. Rd. 42  
Buchanan West Approximately 5 Miles  
Stutsman County, North Dakota

Permanent Markings - No Passing Zones			
Station	Station	Length	Direction
16+84	22+48	564	EB
23+24	33+74	1050	WB
39+68	44+59	491	EB
42+94	47+44	450	WB
53+29	62+82	953	EB
64+66	71+68	702	WB
177+02	184+99	797	EB
189+16	199+32	1016	WB
260+48	268+26	778	EB
265+02	268+26	324	WB

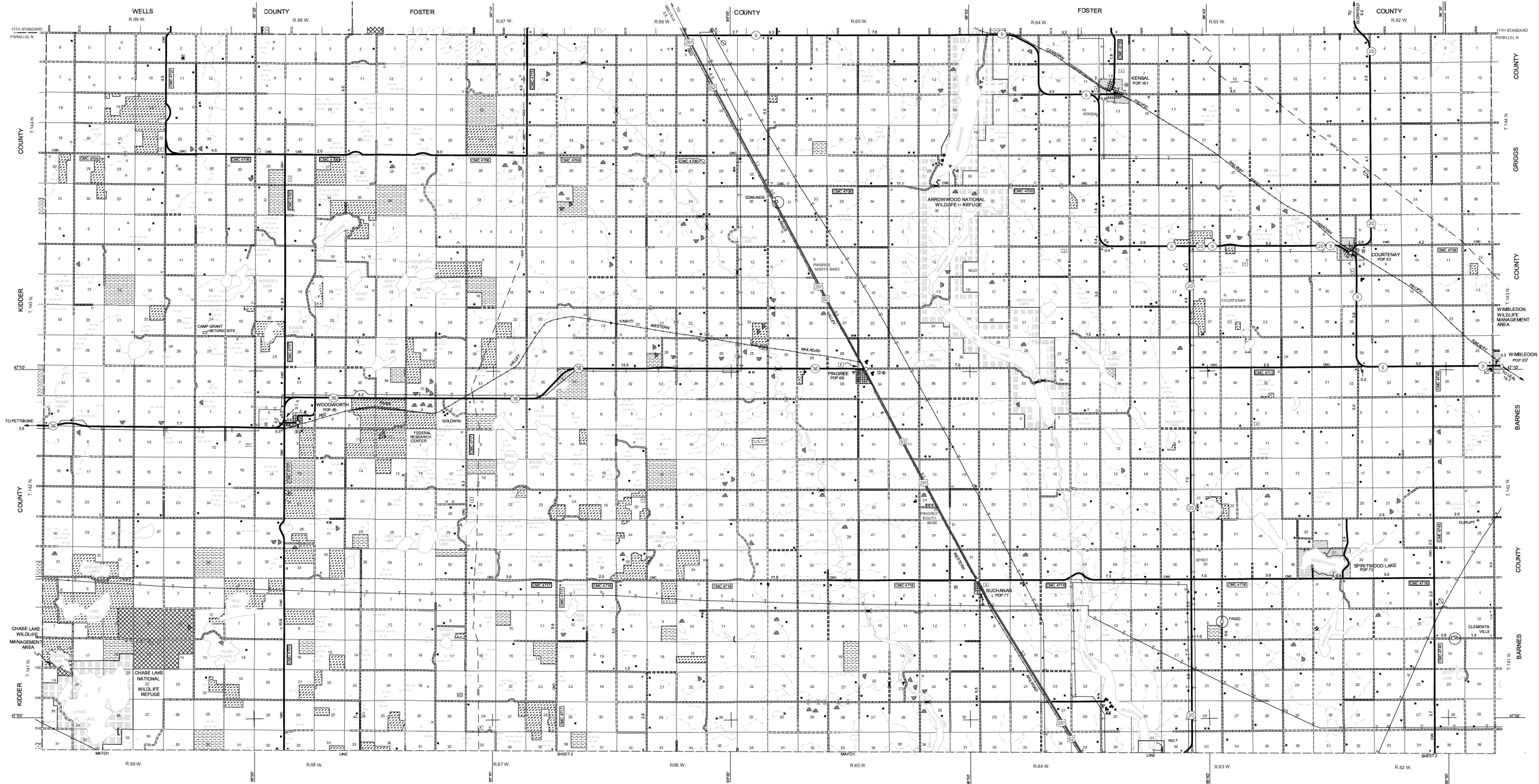
Short Term Markings		
Station	Station	Application
16+84	268+26	Top Lift & Chip Seal

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PAVEMENT MARKINGS  
  
Co. Rd. 42  
Buchanan West Approximately 5 Miles  
  
Stutsman County, North Dakota

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	190	1

NO HAUL ROADS  
STUTSMAN COUNTY  
(North Half)

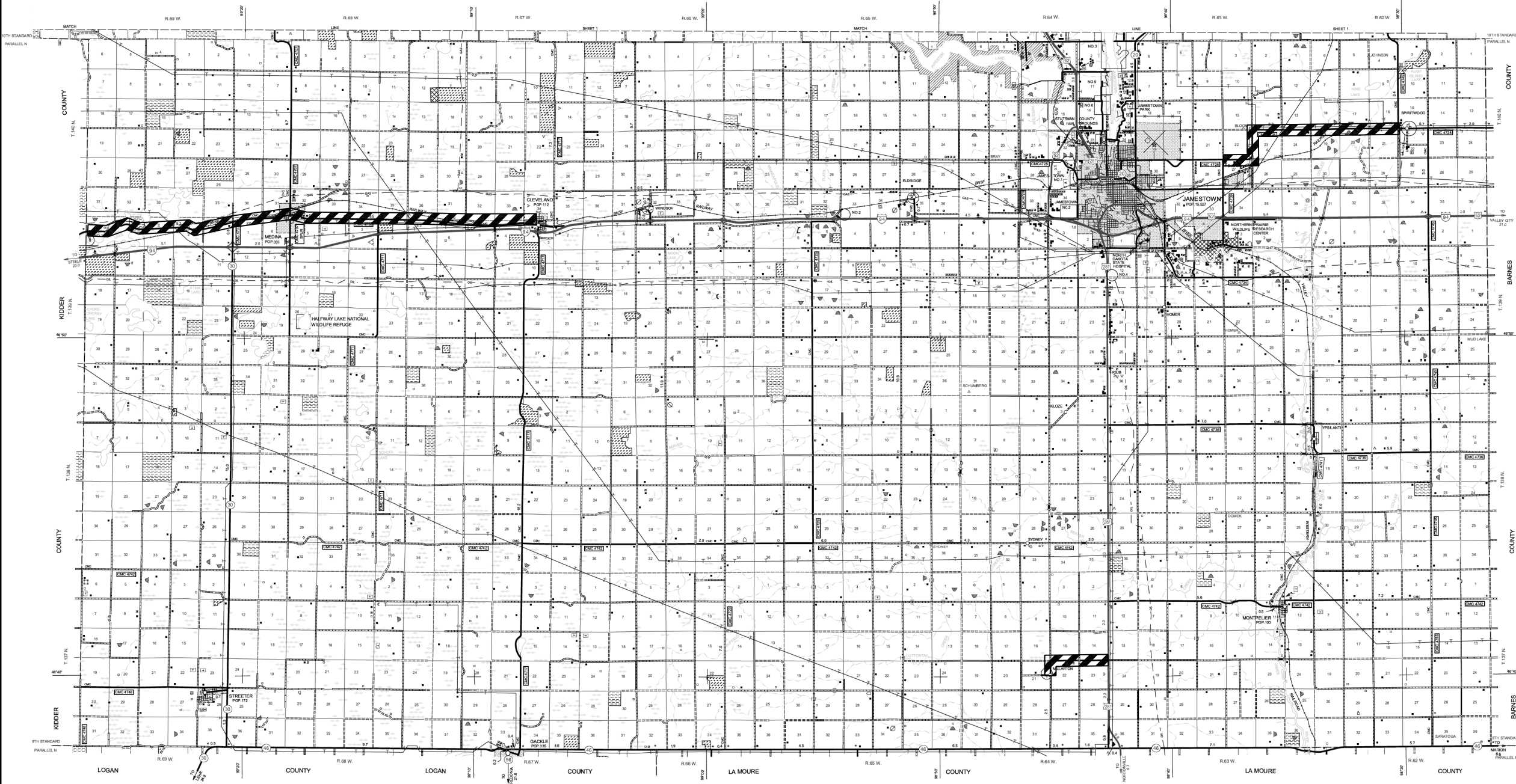


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NO HAUL ROADS  
Co. Rd. 42  
Buchanan West Approximately 5 Miles  
Stutsman County, North Dakota

NO HAUL ROADS  
STUTSMAN COUNTY  
(South Half)

	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
	ND	SC-4718(060)	190	2



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NO HAUL ROADS  
Co. Rd. 42  
Buchanan West Approximately 5 Miles  
Stutsman County, North Dakota

?	This is a special text character used in the labeling of existing features. It indicates a feature that has an unknown characteristic, potentially based on: lack of description, location accuracy or purpose.		
Abn	abandoned	BV	butterfly valve
Abut	abutment	Byp	bypass
Ac	acres	C Gdrl	cable guardrail
Adj	adjusted	Calc	calculate
Aggr	aggregate	Cd	candela
Ahd	ahead	CIP	cast iron pipe
ARV	air release valve	CB	catch basin
Align	alignment	CRS	cationic rapid setting
Al	alley	C Gd	cattle guard
Alt	alternate	C To C	center to center
Alum	aluminum	Cl or $\text{C}_L$	centerline
ADA	Americans with Disabilities Act	Cm	centimeter
A	ampere	Ch	chain
&	and	Chnlk	chain-link
Appr	approach	Ch Blk	channel block
Approx	approximate	Ch Ch	channel change
ACP	asbestos cement pipe	Chk	check
Asph	asphalt	Chsld	chiseled
AC	asphalt cement	Cir	circle
Assmd	assumed	Cl	class
@	at	Cl	clay
Atten	attenuation	Cl F	clay fill
ATR	automatic traffic recorder	Cl Hvy	clay heavy
Ave	Avenue	Cl Lm	clay loam
Avg	average	Clnt	clean-out
ADT	average daily traffic	Clr	clear
Az	azimuth	Cl&gr	clearing & grubbing
Bk	back	Co S	coal slack
BF	back face	Comb.	combination
Bs	backsight	Coml	commercial
Balc	balcony	Compr	compression
B Wire	barbed wire	CADD	computer aided drafting & design
Barr	barricade	Conc	concrete
Btry	battery	Cond	conductor
Brg	bearing	Const	construction
BI	beehive inlet	Cont	continuous
Beg	begin	CSB	continuous split barrel sample
BM	bench mark	Contr	contraction
Bkwy	bikeway	Contr	contractor
Bit	bituminous	CP	control point
Blk	block	Coord	coordinate
Bd Ft	board feet	Cor	corner
BH	bore hole	Corr	corrected
BS	both sides	CAES	corrugated aluminum end section
Bot	bottom	CAP	corrugated aluminum pipe
Blvd	Boulevard	CMES	corrugated metal end section
Bndry	boundary	CMP	corrugated metal pipe
BC	brass cap	CPVCP	corrugated poly-vinyl chloride pipe
Brkwy	breakaway	CSES	corrugated steel end section
Br	bridge	CSP	corrugated steel pipe
Bldg	building	CSP	corrugated steel pipe
		C	coulomb
		Co	County
		Crse	course
		C Gr	course gravel
		CS	course sand
		Ct	Court
		Xarm	cross arm
		Xbuck	cross buck
		Xsec	cross sections
		Xing	crossing
		Xrd	Crossroad
		Crn	crown
		CF	cubic feet
		M3	cubic meter
		M3/s	cubic meters per second
		CY	cubic yard
		Cy/mi	cubic yards per mile
		Culv	culvert
		C&G	curb & gutter
		CI	curb inlet
		CR	curb ramp
		CS	curve to spiral
		C	cut
		Dd Ld	dead load
		Defl	deflection
		Defm	deformed
		Deg or D	degree
		DInt	delineate
		DIntr	delineator
		Depr	depression
		Desc	description
		Det	detail
		DWP	detectable warning panel
		Dtr	detour
		Dia	diameter
		Dir	direction
		Dist	distance
		DM	disturbed material
		DB	ditch block
		DG	ditch grade
		Dbl	double
		Dn	down
		Dwg	drawing
		Dr	drive
		Drwy	driveway
		DI	drop inlet
		D	dry density
		Ea	each
		Esmt	easement
		E	East
		EB	Eastbound
		Elast	elastomeric
		EL	electric locker
		E Mtr	electric meter
		Elec	electric/al
		EDM	electronic distance meter
		Elev or EI	elevation
		Ellipt	elliptical
		Emb	embankment
		Emuls	emulsion/emulsified
		ES	end section
		Engr	engineer
		ESS	environmental sensor station
		Eq	equal
		Eq	equation
		Evgr	evergreen
		Exc	excavation
		Exst	existing
		Exp	expansion
		Expy	Expressway
		E	external of curve
		Extru	extruded
		FOS	factor of safety
		F	Fahrenheit
		FS	far side
		F	farad
		Fed	Federal
		FP	feed point
		Ft	feet/foot
		Fn	fence
		Fn P	fence post
		FO	fiber optic
		FB	field book
		FD	field drive
		F	fill
		FAA	fine aggregate angularity
		FS	fine sand
		FH	fire hydrant
		FI	flange
		Flrd	flared
		FES	flared end section
		F Bcn	flashing beacon
		FA	flight auger sample
		FL	flow line
		Ftg	footing
		FM	force main
		Fs	foresight
		Fnd	found
		Fdn	foundation
		Frac	fractional
		Frwy	freeway
		Frt	front
		FF	front face
		F Disp	fuel dispenser

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

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NDDOT ABBREVIATIONS

D-101-2

FFP	fuel filler pipes	IPn	Iron Pin	MC	medium curing	Ped	pedestal
FLS	fuel leak sensor	IP	Iron Pipe	M	mega	Ped	pedestrian
Furn	furnish/ed	Jt	joint	Mer	meridian	PPP	pedestrian pushbutton post
Gal	gallon	J	joule	M	meter	Pen.	penetration
Galv	galvanized	Jct	junction	M/s	meters per second	Perf	perforated
Gar	garage	K	kelvin	M	mid ordinate of curve	Per.	perimeter
Gs L	gas line	Kn	kilo newton	Mi	mile	PL	pipeline
G Reg	gas line regulator	Kpa	kilo pascal	MM	mile marker	PI	place
GMV	gas main valve	Kg	kilogram	MP	mile post	P&P	plan & profile
G Mtr	gas meter	Kg/m3	kilogram per cubic meter	MI	milliliter	PL	plastic limit
GSV	gas service valve	Km	kilometer	Mm	millimeter	PI	plate
GVP	gas vent pipe	K	Kip(s)	Mm/hr	millimeters per hour	Pt	point
GV	gate valve	LS	Land Surveyor (licensed)	Min	minimum	PCC	point of compound curve
Ga	gauge	LSIT	Land Surveyor In Training	Misc	miscellaneous	PC	point of curve
Geod	geodetic	Ln	lane	Mon	monument	PI	point of intersection
GIS	Geographical Information System	Lg	large	Mnd	mound	PRC	point of reverse curvature
G	giga	Lat	latitude	Mtbl	mountable	PT	point of tangent
GPS	Global Positioning System	Lt	left	Mtd	mounted	POC	point on curve
Gov	government	L	length of curve	Mtg	mounting	POT	point on tangent
Grd	graded/grade	Lens	lenses	Mk	muck	PE	polyethylene
Gr	gravel	Lvl	level	Mun	municipal	PVC	polyvinyl chloride
Grnd	ground	LB	level book	N	nano	PCC	Portland Cement concrete
GWM	ground water monitor	Lvlng	leveling	NGS	National Geodetic Survey	Lb or #	pounds
Gdrl	guardrail	Lht	light	NS	near side	PP	power pole
Gtr	gutter	LP	light pole	Neop	neoprene	Preempt	preemption
H Plg	H piling	Ltg	lighting	Ntwk	network	Prefab	prefabricated
Hdwl	headwall	Lig Co	lignite coal	N	newton	Prfmd	preformed
Ha	hectare	Lig Sl	lignite slack	N	North	Prep	preperation
Ht	height	LF	linear foot	NE	North East	Press.	pressure
HI	height of instrument	Liq	liquid	NW	North West	PRV	pressure relief valve
Hel	helical	LL	liquid limit	NB	Northbound	Prestr	prestressed
H	henry	L	litre	No. or #	number	Pvt	private
Hz	hertz	Lm	loam	Obsc	obscure(d)	PD	private drive
HDPE	high density polyethylene	Loc	location	Obsn	observation	Prod.	production/produce
HM	high mast	LC	long chord	Ocpd	occupied	Prog	programmed
HP	high pressure	Long.	longitude	Ocpy	occupy	Prop.	property
HPS	high pressure sodium	Lp	loop	Off Loc	office location	Prop Ln	property line
Hwy	highway	LD	loop detector	O/s	offset	Ppsd	proposed
Hor	horizontal	Lm	lumen	OC	on center	PB	pull box
HBP	hot bituminous pavement	Lum	luminaire	C	one dimensional consolidation		
HMA	hot mix asphalt	L Sum	lump sum	OC	organic content		
Hr	hour(s)	Lx	lux	Orig	original		
Hyd	hydrant	ML	main line	O To O	out to out		
Ph	hydrogen ion content	M Hr	man hour	OD	outside diameter		
Id	identification	MH	manhole	OH	overhead		
In or "	inch	Mkd	marked	PMT	pad mounted transformer		
Incl	inclinometer tube	Mkr	marker	Pg	pages		
IMH	inlet manhole	Mkg	marking	Pntd	painted		
ID	inside diameter	MA	mast arm	Pr	pair		
Inst	instrument	Matl	material	Pnl	panel		
Intchg	interchange	Max	maximum	Pk	park		
Intmdt	intermediate	MC	meander corner	PK	Parker-Kalon nail		
Intscn	intersection	Meas	measure	Pa	pascal		
Inv	invert	Mdn	median	PSD	passing sight distance		
IM	iron monument	MD	median drain	Pvmt	pavement		

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
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08-03-15	General Revisions

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NDDOT ABBREVIATIONS

D-101-3

Qty	quantity	SN	sign number	Tan	tangent	Wb	weber
Qtr	quarter	Sig	signal	T	tangent (semi)	WIM	weigh in motion
Rad or R	radius	Si Cl	silt clay	TS	tangent to spiral	W	west
RR	railroad	Si Cl Lm	silty clay loam	Tel	telephone	WB	westbound
Rlwy	railway	Si Lm	silty loam	Tel B	Telephone Booth	Wrng	wiring
Rsd	raised	Sgl	single	Tel P	telephone pole	W/	with
RTP	random traverse point	SC	slow curing	Tv	television	W/o	without
Rge or R	range	SS	slow setting	Temp	temperature	WC	witness corner
RC	rapid curing	Sm	small	Temp	temporary	WGS	world geodetic system
Rec	record	S	South	TBM	temporary bench mark	Z	zenith
Rcy	recycle	SE	South East	T	tesla		
RAP	recycled asphalt pavement	SW	South West	T	thinwall tube sample		
RPCC	recycled portland cement concrete	SB	Southbound	T/mi	tons per mile		
Ref	reference	Sp	spaces	Ts	topsoil		
R Mkr	reference marker	Spcl	special	Twp or T	township		
RM	reference monument	SA	special assembly	Traf	traffic		
Refl	reflectorized	SP	special provisions	TSCB	traffic signal control box		
RCB	reinforced concrete box	G	specific gravity	Tr	trail		
RCES	reinforced concrete end section	Spk	spike	Transf	transformer		
RCP	reinforced concrete pipe	SC	spiral to curve	TB	transit book		
RCPS	reinforced concrete pipe sewer	ST	spiral to tangent	Trans	transition		
Reinf	reinforcement	SB	split barrel sample	TT	transmission tower		
Res	reservation	SH	sprinkler head	Trans	transverse		
Ret	retaining	SV	sprinkler valve	Trav	traverse		
Rev	reverse	Sq	square	TP	traverse point		
Rt	right	SF	square feet	Trtd	treated		
R/W	right of way	Km2	square kilometer	Trmt	treatment		
Riv	river	M2	square meter	Qc	triaxial compression		
Rd	road	SY	square yard	TERO	tribal employment rights ordinance		
Rdbd	road bed	Stk	stake	Tpl	triple		
Rdwy	roadway	Std	standard	TP	turning point		
RWIS	roadway weather information system	N	standard penetration test	Typ	typical		
Rk	rock	Std Specs	standard specifications	Qu	unconfined compressive strength		
Rt	route	Sta	station	Ugrnd	underground		
Salv	salvage(d)	Sta Yd	station yards	USC&G	US Coast & Geodetic Survey		
Sd	sand	Stm L	steam line	USGS	US Geologic Survey		
Sdy Cl	sandy clay	SEC	steel encased concrete	Util	utility		
Sdy Cl Lm	sandy clay loam	SMA	stone matrix asphalt	VG	valley gutter		
Sdy Fl	sandy fill	SSD	stopping sight distance	Vap	vapor		
Sdy Lm	sandy loam	SD	storm drain	Vert	vertical		
San	sanitary sewer line	St	street	VC	vertical curve		
Sc	scoria	SPP	structural plate pipe	VCP	vitrified clay pipe		
Sec	seconds	SPPA	structural plate pipe arch	V	volt		
Sec	section	Str	structure	Vol	volume		
SL	section line	Subd	subdivision	Wkwy	walkway		
Sep	separation	Sub	subgrade	W	water content		
Seq	sequence	Sub Prep	subgrade preperation	WGV	water gate valve		
Serv	service	Ss	subsoil	WL	water line		
Sh	shale	SE	superelevation	WM	water main		
Sht	sheet	SS	supplement specification	WMV	water main valve		
Shtng	sheeting	Supp	supplemental	W Mtr	water meter		
Shldr	shoulder	Surf	surfacing	WSV	water service valve		
Sw	sidewalk	Surv	survey	WW	water well		
S	siemens	Sym	symmetrical	W	watt		
SD	sight distance	SI	systems international	Wrng	wearing		

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

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

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

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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
07-01-14	
REVISIONS	
DATE	CHANGE

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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

Proposed Topography

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







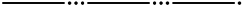






	Existing Overhead Sign Structure
	Existing Overhead Sign Structure Cantilever
	Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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09-23-16	Added and Revised Items, Organized by Functional Groups

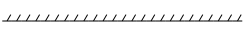








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Line Styles


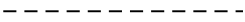
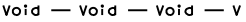
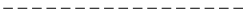




Right Of Way

	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


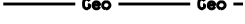




Boundary Control



	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


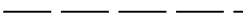
	D	Geotextile Fabric Type D
	Geo	Geogrid
	R	Geotextile Fabric Type R
	R	Geotextile Fabric Type R1
	RR	Geotextile Fabric Type RR
	S	Geotextile Fabric Type S

	Subgrade Reinforcement
	Failure Line







Countours

	Depression Contours
	Supplemental Contour



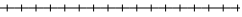

Profile

	Subgrade, Subcut or Ditch Grade
	Topsoil Profile







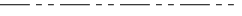


Striping

	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





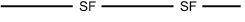

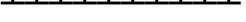
Pavement Joints

	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



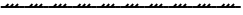
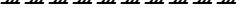
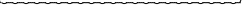
Bridge Details

	Hidden Object
	Small Hidden Object
	Large Hidden Object
	Phantom Object
	Centerline Main
	Centerline
	Existing Ground (Details)
	Existing Conditions
	Sheet Piling

Erosion Control

	Limits of Const Transition Line
	Bale Check
	Rock Check
	S Floating Silt Curtain
	SF Silt Fence
	Excavation Limits
	Fiber Rolls

Environmental

	Wetland Mitigation
	Existing Wetland Easement USFWS
	Existing Wetland Jurisdictional
	Existing Wetland
	Tree Row

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
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
















































































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Symbols

	North Arrow (Half Scale)		Attenuation Device		Existing Railroad Battery Box		Existing Delineator Type E										
	Truck Mounted Attenuator		Diamond Grade Delineator Type A		Existing Bush or Shrub		Existing EFB Misc										
	Type I Barricade		Diamond Grade Delineator Type B		Existing Gas Cap or Stub		Existing Flashing Beacon										
	Type II Barricade		Diamond Grade Delineator Type C		Existing Sanitary Cap or Stub		Existing Pipe Mounted Flasher										
	Type III Barricade		Diamond Grade Delineator Type D		Existing Storm Drain Cap or Stub		Existing Pad Mounted Feed Point										
	Catch Basin		Diamond Grade Delineator Type E		Existing Water Cap or Stub		Existing Pipe Mounted Feed Point with Pad										
	Cairn or Stone Circle		Flexible Delineator		Existing Sanitary Cleanout		Existing Pole Mounted Feed Point										
	Video Detection Camera		Flexible Delineator Type A		Existing Concrete Foundation		Existing Railroad Frog										
	Storm Drain Cap or Stub		Flexible Delineator Type B		Existing Traffic Signal Controller		Existing Snow Gate 18										
	Corrugated Metal End Section 18 Inch		Flexible Delineator Type C		Existing Pad Mounted Signal Controller		Existing Snow Gate 28										
	Corrugated Metal End Section 24 Inch		Flexible Delineator Type D		Existing Sixteenth Section Corner		Existing Snow Gate 40										
	Corrugated Metal End Section 30 Inch		Flexible Delineator Type E		Existing Quarter Section Corner		Existing Headwall										
	Corrugated Metal End Section 36 Inch		Delineator Type A		Existing Section Corner		Existing Pedestrian Head with Number										
	Corrugated Metal End Section 42 Inch		Delineator Type A Reset		Existing Railroad Crossbuck		Existing Signal Head										
	Corrugated Metal End Section 48 Inch		Delineator Type B		Existing Satellite Dish		Existing Sprinkler Head										
	Concrete Foundation		Delineator Type B Reset		Existing Fuel Dispensers		Existing Fire Hydrant										
	Ground Connection Conductor		Delineator Type C		Existing Flexible Delineator Type A		Existing Catch Basin Drop Inlet										
	Neutral Connection Conductor		Delineator Type D		Existing Flexible Delineator Type B		Existing Curb Inlet										
	Phase 1 Connection Conductor		Delineator Type E		Existing Flexible Delineator Type C		Existing Manhole Inlet										
	Phase 2 Connection Conductor		Delineator Drums		Existing Flexible Delineator Type D		Existing Junction Box										
	Traffic Cone		Spot Elevation		Existing Flexible Delineator Type E	<table><tr><th colspan="2">NORTH DAKOTA DEPARTMENT OF TRANSPORTATION</th></tr><tr><th colspan="2">07-01-14</th></tr><tr><th colspan="2">REVISIONS</th></tr><tr><th>DATE</th><th>CHANGE</th></tr><tr><td></td><td></td></tr></table>		NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		07-01-14		REVISIONS		DATE	CHANGE		
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION																	
07-01-14																	
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DATE	CHANGE																
	Signal Controller		Existing Access Control Arrow		Existing Delineator Type A												
	Pad Mounted Signal Controller		Existing Artifact		Existing Delineator Type B												
	Alignment Data Point		Existing Flashing Beacon		Existing Delineator Type C												
	Emergency Vehicle Detector		Existing Benchmark		Existing Delineator Type D												

Symbols

D-101-31

	Existing Light Standard		Existing Manhole with Valve Water		Existing Telephone Pole		Existing Undefined Manhole
	Existing High Mast Light Standard 10 Luminaire		Existing Water Manhole		Existing Wood Pole		Existing Undefined Pull Box
	Existing High Mast Light Standard 3 Luminaire		Existing Mile Post Type A		Existing Post		Existing Undefined Pedestal
	Existing High Mast Light Standard 4 Luminaire		Existing Mile Post Type B		Existing Pedestrian Push Button Post		Existing Undefined Valve
	Existing High Mast Light Standard 5 Luminaire		Existing Mile Post Type C		Existing Control Point CP		Existing Undefined Pipe Vent
	Existing High Mast Light Standard 6 Luminaire		Existing Reference Marker		Existing Control Point GPS-RTK		Existing Gas Valve
	Existing High Mast Light Standard 7 Luminaire		Existing RW Marker		Existing Control Point TRI		Existing Water Valve
	Existing High Mast Light Standard 8 Luminaire		Existing Utility Marker		Existing Reference Marker Point NGS		Existing Fuel Pipe Vent
	Existing High Mast Light Standard 9 Luminaire		Iron Monument Found		Existing Pull Box		Existing Gas Pipe Vent
	Existing Overhead Sign Structure Load Center		Iron Pin R/W Monument		Existing Intelligent Transportation Pull Box		Existing Sanitary Pipe Vent
	Existing Luminaire		Existing Object Marker Type I		Existing Water Pump		Existing Storm Drain Pipe Vent
	Existing Light Standard Luminaire		Existing Object Marker Type II		Existing Slotted Reinforced Concrete Pipe		Existing Water Pipe Vent
	Existing Federal Mailbox		Existing Object Marker Type III		Existing RR Profile Spot		Existing Weather Station
	Existing Private Mailbox		Existing Electrical Pedestal		Existing Fuel Leak Sensors		Existing Ground Water Well Bore Hole
	Existing Meander Section Corner		Existing Telephone Pedestal		Existing Highway Sign		Existing Windmill or Tower
	Existing Meter		Existing Fiber Optic Telephone Pedestal		Existing Miscellaneous Spot		Existing Witness Corner
	Existing Electrical Manhole		Existing TV Pedestal		Existing Lighting Standard Pole		Flashing Beacon
	Existing Gas Manhole		Existing Fiber Optic TV Pedestal		Existing Traffic Signal Standard		Flagger
	Existing Sanitary Manhole		Existing Fuel Filler Pipes		Existing Transformer		Pipe Mounted Flasher
	Existing Sanitary Force Main Manhole		Existing Traverse PI Aerial Panel		Existing Large Evergreen Tree		Sanitary Force Main with Valve
	Existing Sanitary Manhole with Valve		Existing Pole		Existing Small Evergreen Tree		
	Existing Storm Drain Manhole		Existing Power Pole		Existing Large Tree		
	Existing Force Main Storm Drain Manhole		Existing Power Pole with Transformer		Existing Small Tree		
	Existing Force Main Storm Drain Manhole with Valve				Existing Tree Trunk		
	Existing Telephone Manhole				Existing Pad Mounted Traffic Signal Control Box		

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Symbols



Pad Mounted Feed Point



Pipe Mounted Feed Point with Pad



Pole Mounted Feed Point



Headwall



Double Headwall with Vegetation Barrier



Single Headwall with Vegetation Barrier



Pole Mounted Head



Sprinkler Head



Fire Hydrant



Inlet Type 1



Inlet Type 2



Double Inlet Type 2



Inlet Grate Type 2



Junction Box



High Mast Light Standard 10 Luminaire



High Mast Light Standard 3 Luminaire



High Mast Light Standard 4 Luminaire



High Mast Light Standard 5 Luminaire



High Mast Light Standard 6 Luminaire



High Mast Light Standard 7 Luminaire



High Mast Light Standard 8 Luminaire



High Mast Light Standard 9 Luminaire



Relocate Light Standard



Overhead Sign Structure Load Center



Light Standard 100 Watt High Pressure Sodium Vapor Luminaire



Light Standard 1000 Watt High Pressure Sodium Vapor Luminaire



Light Standard 150 Watt High Pressure Sodium Vapor Luminaire



Light Standard 175 Watt High Pressure Sodium Vapor Luminaire



Light Standard 200 Watt High Pressure Sodium Vapor Luminaire



Light Standard 250 Watt High Pressure Sodium Vapor Luminaire



Light Standard 310 Watt High Pressure Sodium Vapor Luminaire



Light Standard 35 Watt High Pressure Sodium Vapor Luminaire



Light Standard 400 Watt High Pressure Sodium Vapor Luminaire



Light Standard 50 Watt High Pressure Sodium Vapor Luminaire



Light Standard 70 Watt High Pressure Sodium Vapor Luminaire



Light Standard 700 Watt High Pressure Sodium Vapor Luminaire



Manhole



Manhole 48 Inch



Sanitary Force Main Manhole



Sanitary Sewer Manhole



Storm Drain Manhole



Storm Drain Manhole with Inlet



Reset Mile Post



Mile Post Type A



Mile Post Type B



Mile Post Type C



Right of Way Marker



Tubular Marker



Alignment Monument



Iron Pin Reference Monument



Object Marker Type I



Object Marker Type II



Object Marker Type III



Caution Mode Arrow Panel



Back to Back Vertical Panel Sign



Double Direction Arrow Panel



Left Directional Arrow Panel



Right Directional Arrow Panel



Sequencing Arrow Panel



Truck Mounted Arrow Panel



Power Pole



Wood Pole



Pedestrian Push Button Post



Property Corner



Pull Box



Intelligent Transportation Pull Box



Sanitary Pump



Storm Drain Pump



Reinforced Pavement



Reinforced Concrete End Section 15 Inch



Reinforced Concrete End Section 18 Inch



Reinforced Concrete End Section 24 Inch



Reinforced Concrete End Section 30 Inch



Reinforced Concrete End Section 36 Inch



Reinforced Concrete End Section 42 Inch



Reinforced Concrete End Section 48 Inch



Reinforced Concrete End Section 54 Inch



Reset Right of Way Marker



Reset USGS Marker



Right of Way Markers



Riser 30 Inch



Continuous Split Barrel Sample



Flight Auger Sample



Split Barrel Sample



Thinwall Tube Sample



Highway Sign



SNOW GATE 18 FT



SNOW GATE 28 FT



SNOW GATE 40 FT



Standard Penetration Test



Transformer



Inclinometer Tube



Underdrain Cleanout



Excavation Unit

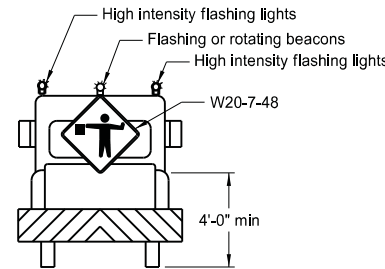
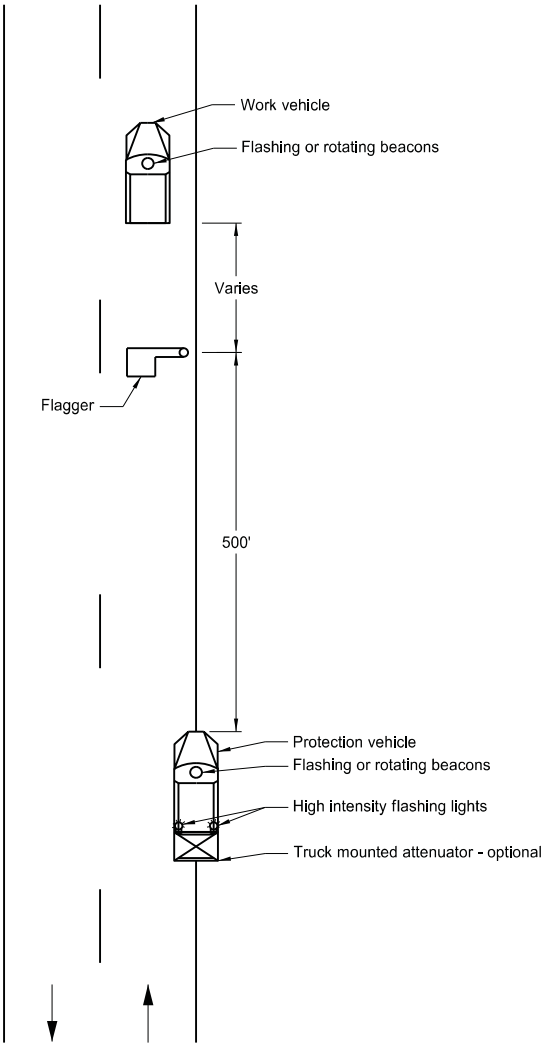


Water Valve

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07-01-14	
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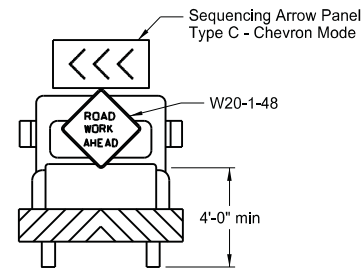
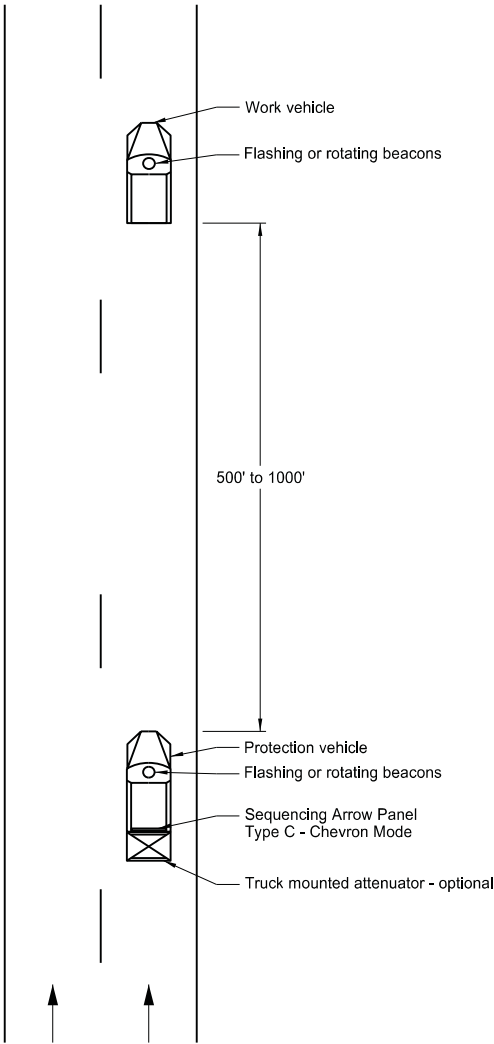
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Two Lane, Two Way Roadways



Typical Protection Vehicle

Multilane Roadways



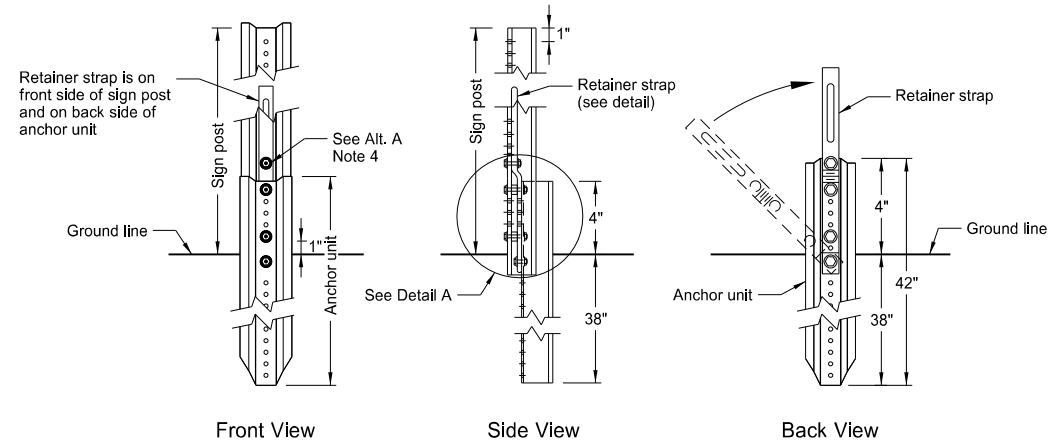
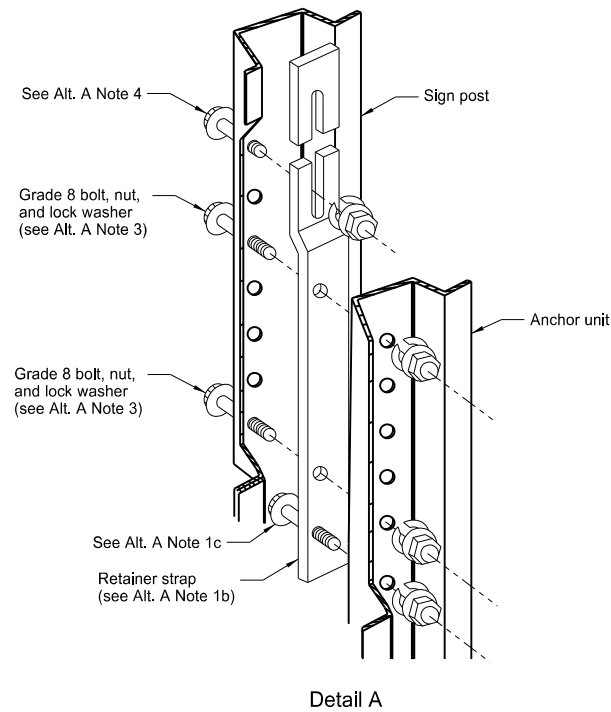
Typical Protection Vehicle

- Notes:
- 1. The working vehicle shall display a 360 degree rotating, flashing, oscillating or strobe light.
  - 2. The shadow vehicle shall display a 360 degree rotating, flashing, oscillating or strobe light. The shadow vehicle for Multilane Roadway shall also have a sequencing arrow panel Type C operated in the chevron mode.
  - 3. This application is for use during daylight hours and in areas of good visibility only.
  - 4. Two lane, two way roadway, a flagger shall be used to protect the work area and warn oncoming traffic.

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9-25-12	
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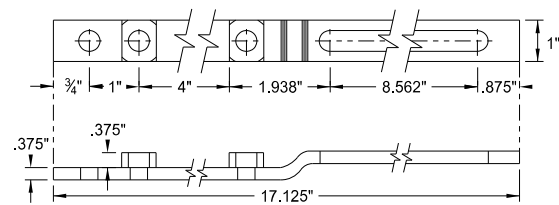
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U-Channel Post

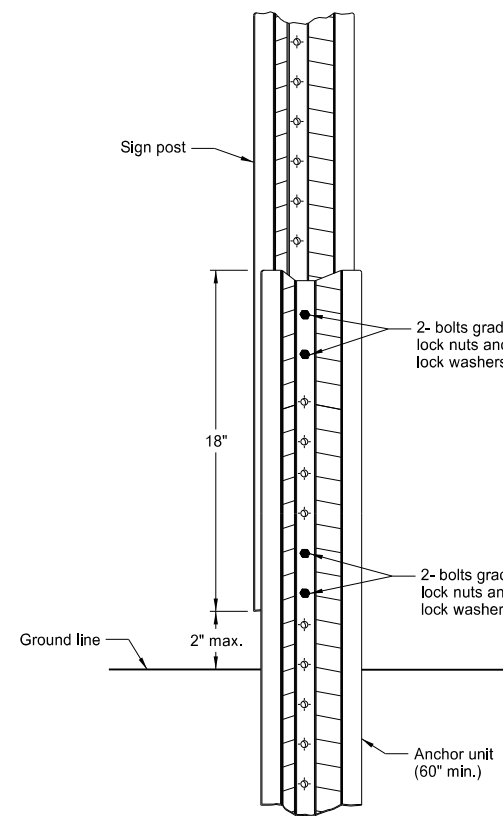


Breakaway U-Channel Detail Alternate A

A maximum of 2 posts shall be installed within 7'.

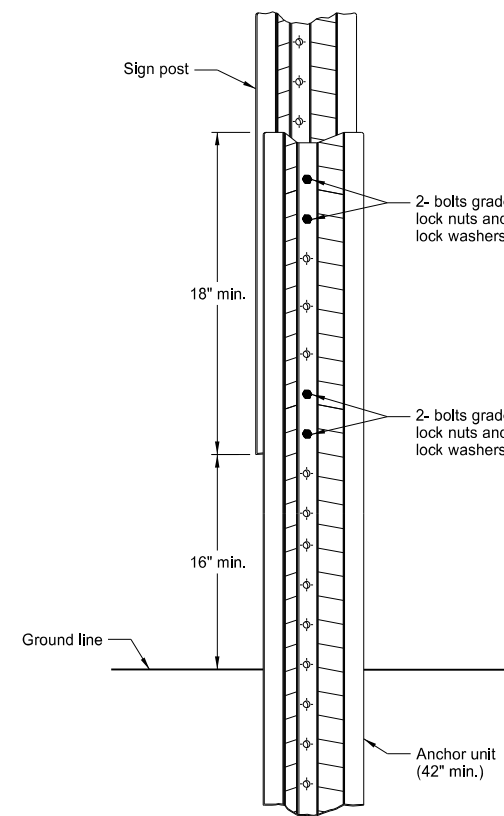


Retainer Strap Detail



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

A maximum of 3 posts shall be installed within 7'.



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

A maximum of 3 posts shall be installed within 7'.

Alternate A Steps of Installation:

- a) Drive anchor unit to within 12" of ground level.  
b) Proper assembly established by lining up the bottom hole of retainer strap with the 6th hole from the top of the anchor unit.  
c) Assemble strap to back of anchor unit using 5/16"x2" bolt, lock washer and nut.  
d) Rotate strap 90° to left.
- a) Drive anchor unit to 4" above ground.  
b) Rotate strap to vertical position.
- a) Place 5/16"x2" bolt, lock washer and nut in bottom of sign post to facilitate alignment of sign post with proper hole in anchor unit.  
b) Alternately tighten two connector bolts.
- Complete assembly by tightening 5/16"x2" bolt (this fastens sign post to retainer strap).
- The base post, strap and sign post shall be properly nested. 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.

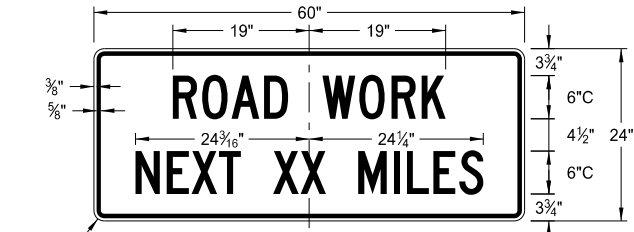
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
2-28-14	
REVISIONS	
DATE	CHANGE

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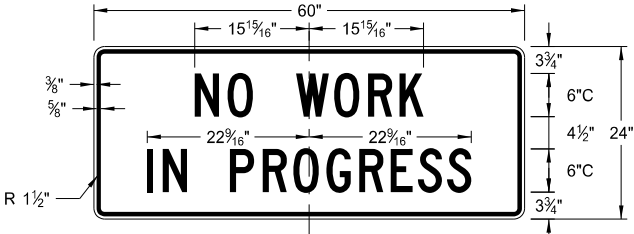


CONSTRUCTION SIGN DETAILS  
TERMINAL AND GUIDE SIGNS

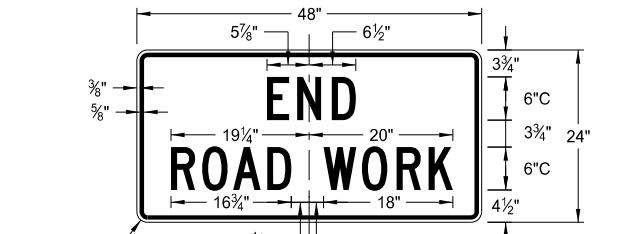
D-704-9



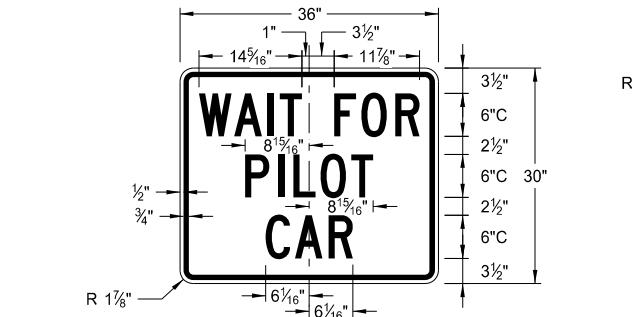
G20-1-60  
Legend: black (non-refl)  
Background: orange



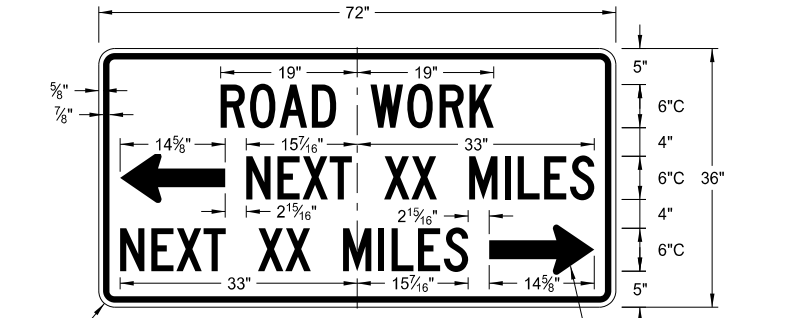
G20-1b-60  
Legend: black (non-refl)  
Background: orange



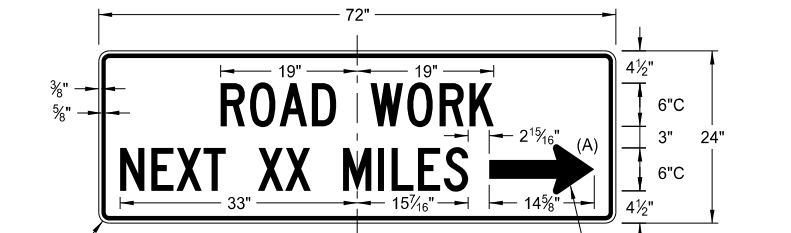
G20-2-48  
Legend: black (non-refl)  
Background: orange



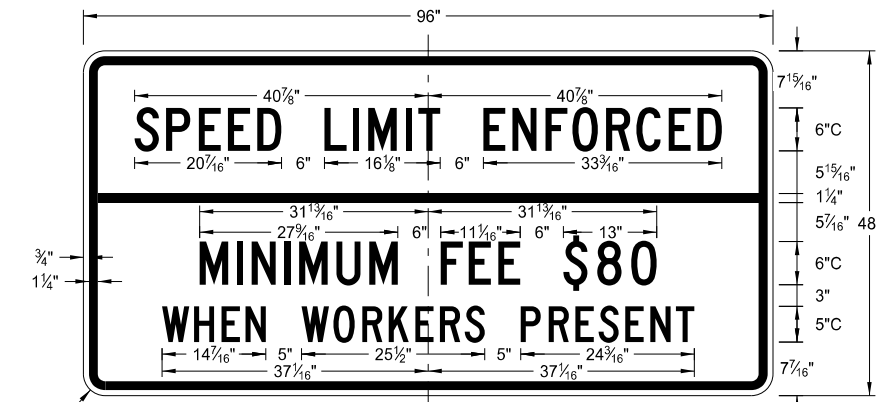
G20-4b-36  
Legend: black (non-refl)  
Background: orange



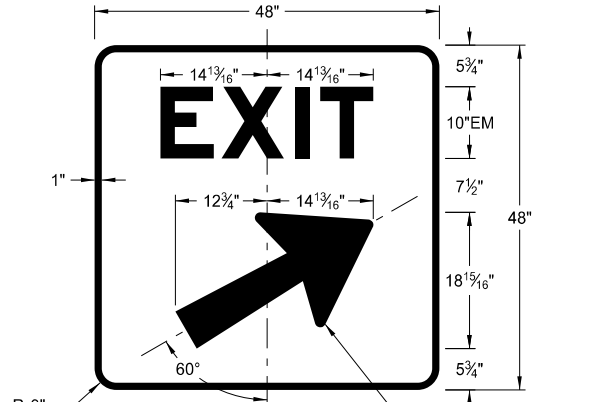
G20-50a-72  
Legend: black (non-refl)  
Background: orange



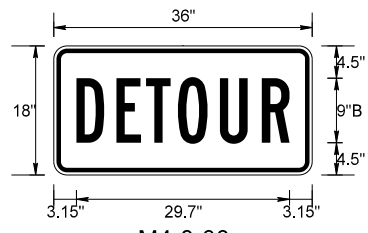
G20-52a-72  
Legend: black (non-refl)  
Background: orange



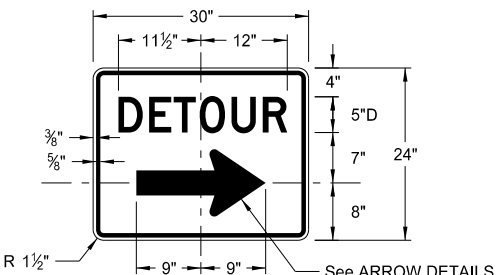
G20-55-96  
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Background: orange



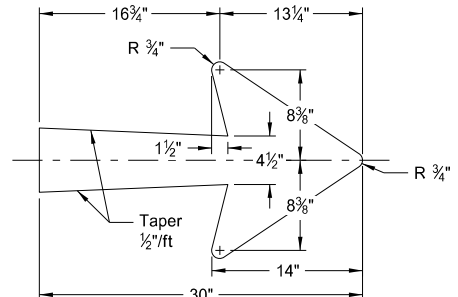
E5-1(L or R)-48  
Legend: white  
Background: green (orange optional)



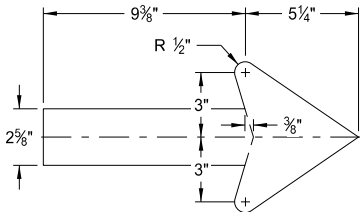
M4-8-36  
Legend: black (non-refl)  
Background: orange



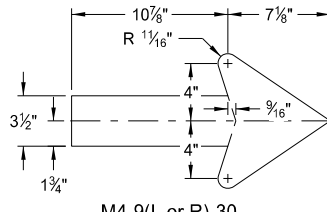
M4-9(L or R)-30 &  
M4-9-30  
Legend: black (non-refl)  
Background: orange



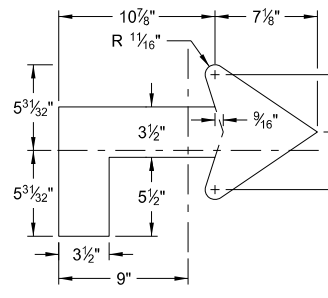
E5-1-48



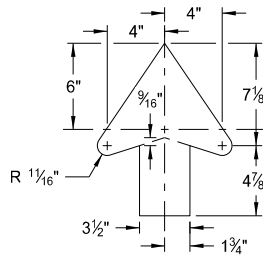
G20-50a-72  
G20-52a-72



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



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



M4-9-30  
Straight

ARROW DETAILS

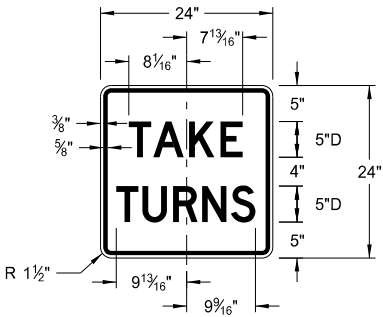
NOTES:  
(A) Arrow may be right or left of the legend to indicate construction to the right or left.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Added sign & background color

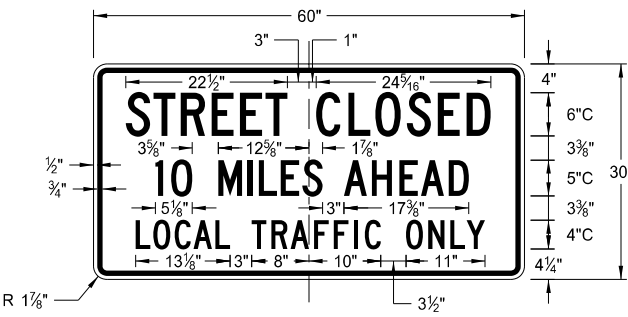
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CONSTRUCTION SIGN DETAILS  
REGULATORY SIGNS

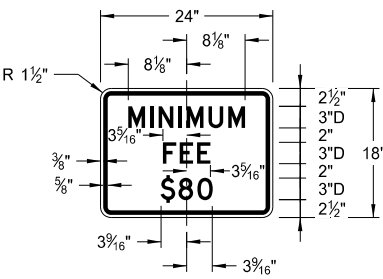
D-704-10



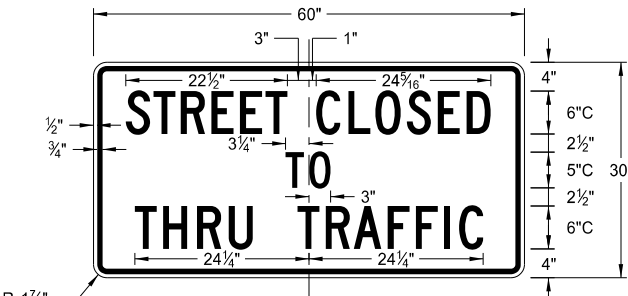
R1-50P-24  
Legend: black (non-refl)  
Background: white



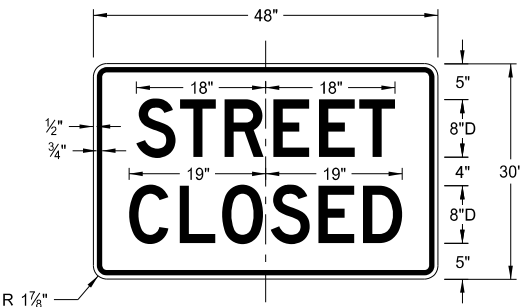
R11-3c-60  
Legend: black (non-refl)  
Background: white



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



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

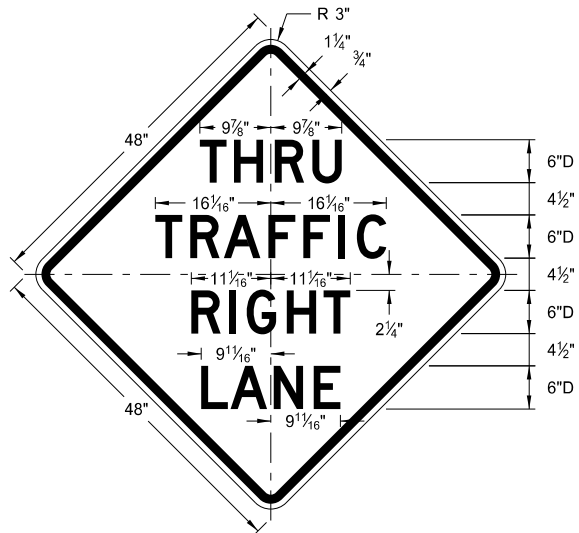


R11-2a-48  
Legend: black (non-refl)  
Background: white

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8-13-13		
REVISIONS		
DATE	CHANGE	
8-17-17	Revised sign number	

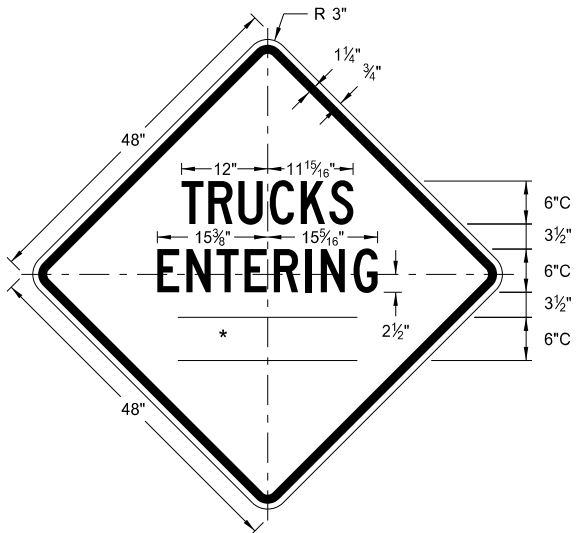
CONSTRUCTION SIGN DETAILS  
WARNING SIGNS

D-704-11



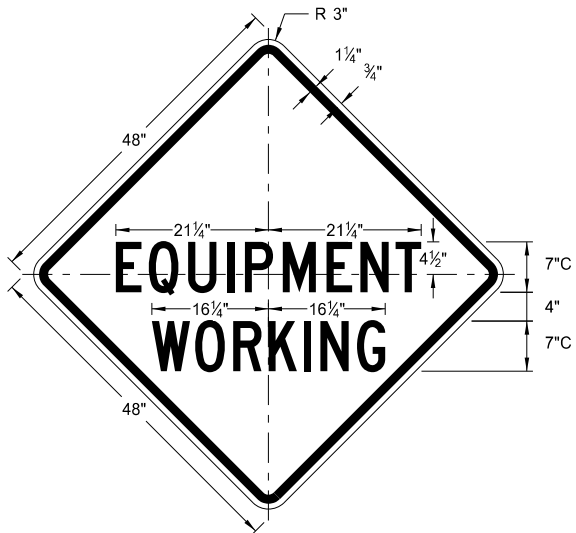
W5-8-48

Legend: black (non-refl)  
Background: orange



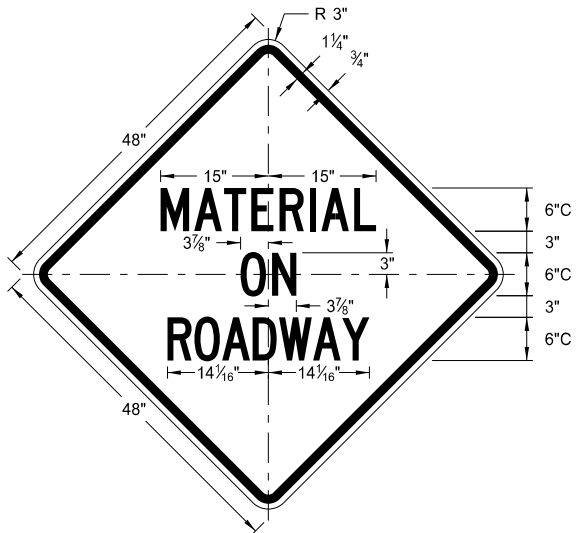
W8-54-48

Legend: black (non-refl)  
Background: orange



W20-51-48

Legend: black (non-refl)  
Background: orange

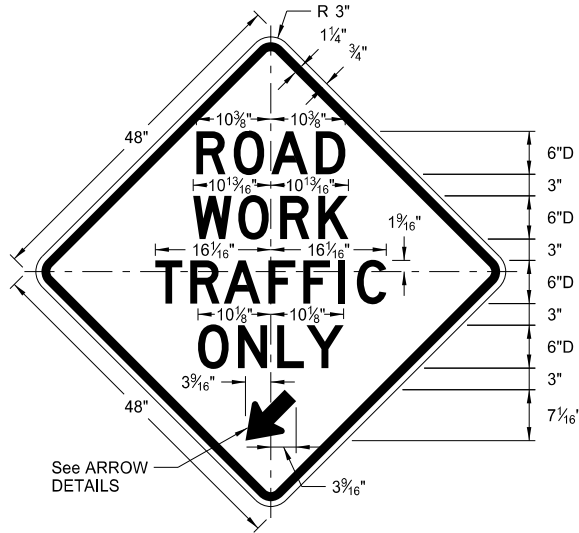


W21-51-48

Legend: black (non-refl)  
Background: orange

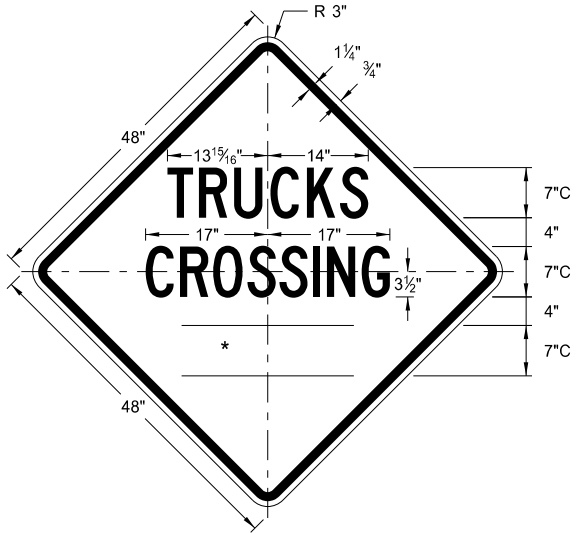
WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
1/2 MILE	Reduce 50%
1 MILE	Standard

\* DISTANCE MESSAGES



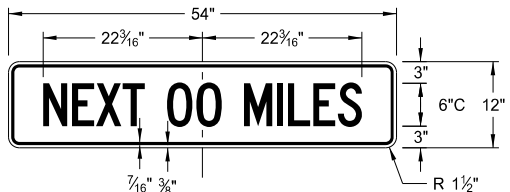
W5-9-48

Legend: black (non-refl)  
Background: orange



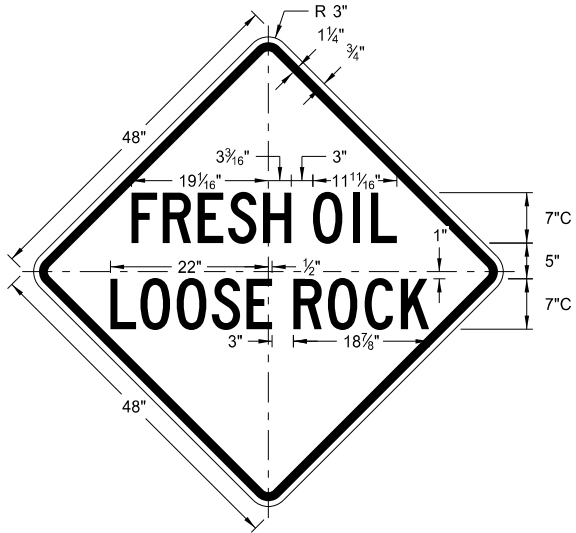
W8-55-48

Legend: black (non-refl)  
Background: orange



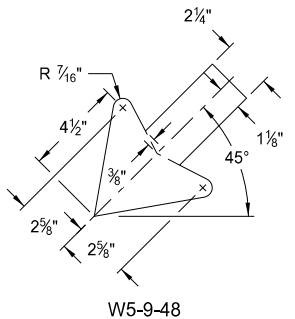
W20-52P-54

Legend: black (non-refl)  
Background: orange

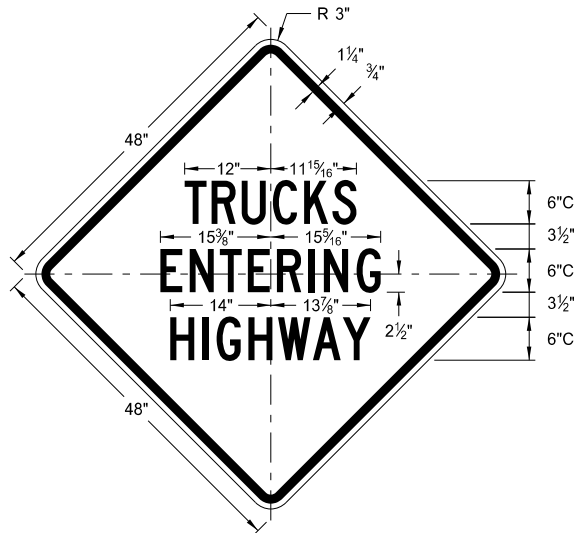


W22-8-48

Legend: black (non-refl)  
Background: orange

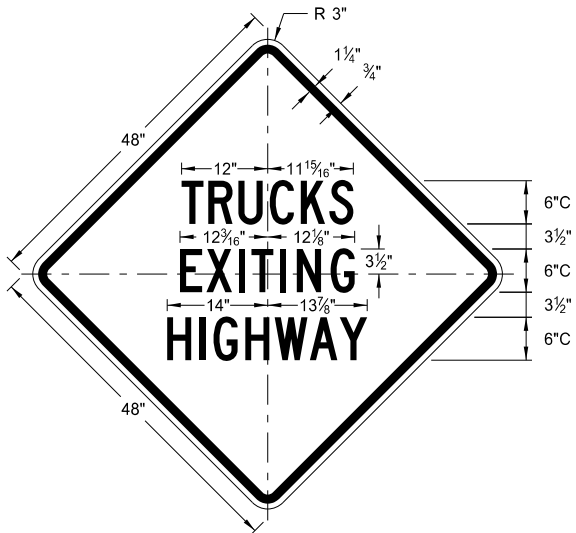


ARROW DETAILS



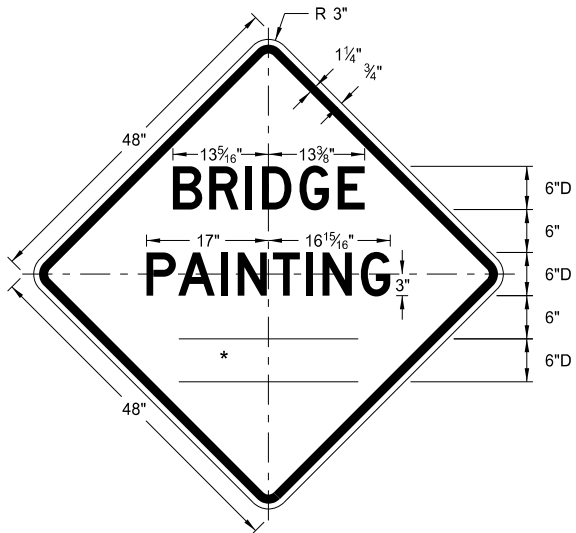
W8-53-48

Legend: black (non-refl)  
Background: orange



W8-56-48

Legend: black (non-refl)  
Background: orange



W21-50-48

Legend: black (non-refl)  
Background: orange

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
8-13-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated sign number

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Roger Weigel,  
Registration Number  
PE- 2930,  
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North Dakota Department  
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CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

NOTES:

1. Sign Supports: Supports shall be galvanized or painted. 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, the minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes are based on a wind speed of 55 MPH.

Signs over 50 square feet should be installed on 2½" x 2½" perforated tube supports as a minimum.

Guy wires shall not be attached to sign supports. Wind beams may be attached to u-posts behind the sign panels.

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

3. Alternate Messages: The signs that have alternate messages may have these alternate messages placed on a reflectorized plate (without a border) and installed and removed as required. (i.e. "Left" and "Right" message on a 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 as stated above.

Large signs having an area exceeding 50 square feet shall have a minimum clearance of 7'-0" from the ground at the post.

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

When portable signs are used for 5 days or less, low-mounting height (minimum 12" vertical clearance) sign supports may be used 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. The R9-8 through R9-11a series, W1-6 through W1-8 series, M4-10, and E5-1 may be used for longer than 5 days.

Signs mounted to the portable sign supports shown in the LOW-MOUNTING HEIGHT and HIGH-MOUNTING HEIGHT Details shall have a maximum surface area of 16 square feet.

MINIMUM BALLAST  
(For each side of sign support base)

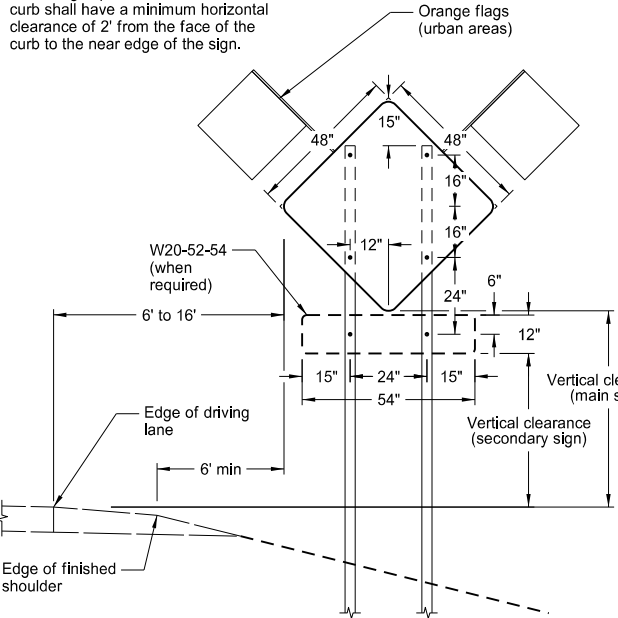
Sign Panel Mounting Height (ft)	Number of 25 lb sandbags for 4' x 4' sign panel
1'	6
5'	8
7'	10

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

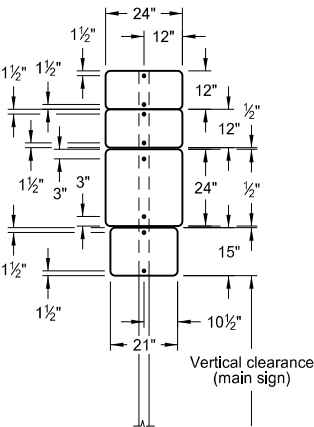
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
REVISIONS	
DATE	CHANGE
11-14-13	Revised Note 6.

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Roger Weigel,  
Registration Number  
PE-2930,  
on 11/14/13 and the original document is stored at the  
North Dakota Department  
of Transportation

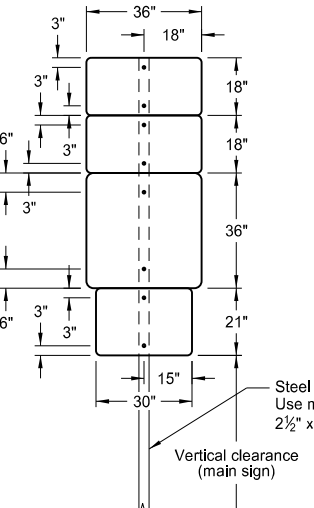
Note: Signs placed in sections with curb shall have a minimum horizontal clearance of 2' from the face of the curb to the near edge of the sign.



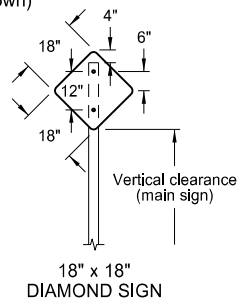
TYPICAL SECTION  
(48" x 48" diamond warning sign shown)



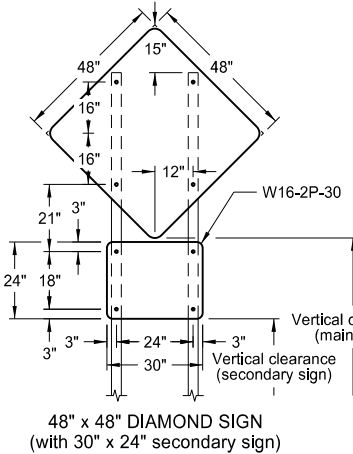
24" x 24" ROUTE MARKER ASSEMBLY



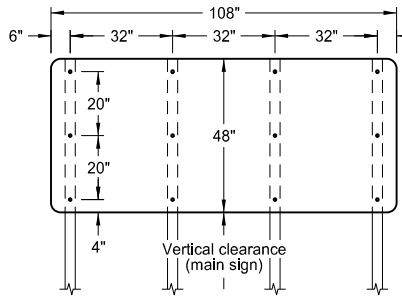
36" x 36" ROUTE MARKER ASSEMBLY



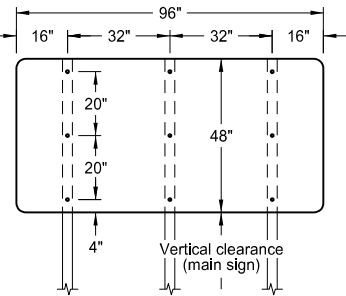
18" x 18" DIAMOND SIGN



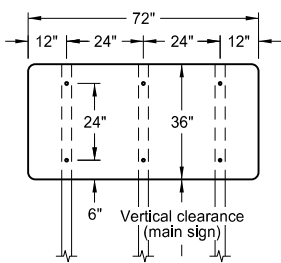
48" x 48" DIAMOND SIGN  
(with 30" x 24" secondary sign)



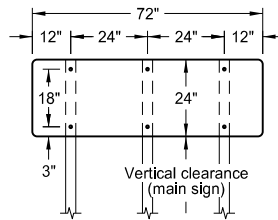
108" x 48" SIGN



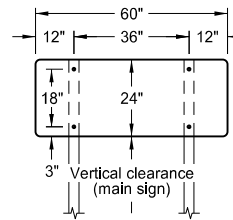
96" x 48" SIGN



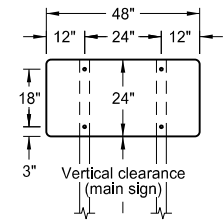
72" x 36" SIGN



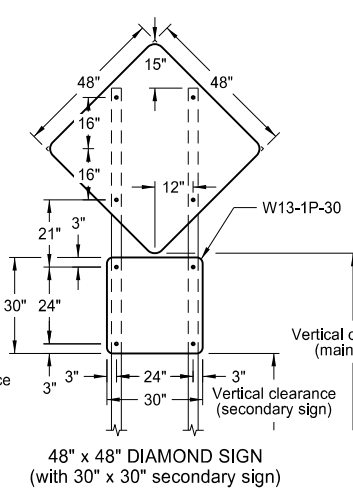
72" x 24" SIGN



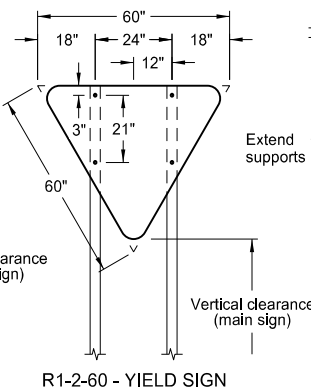
60" x 24" SIGN



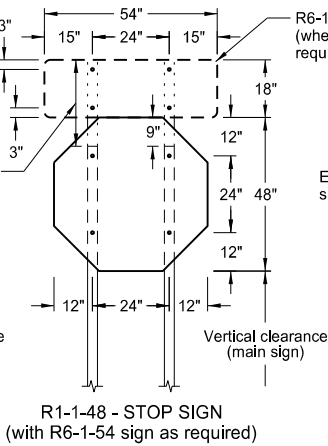
48" x 24" SIGN



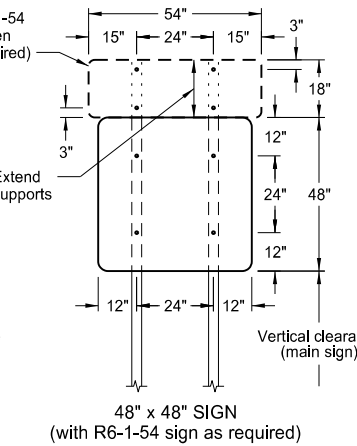
48" x 48" DIAMOND SIGN  
(with 30" x 30" secondary sign)



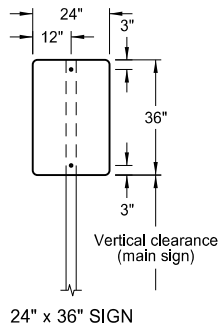
R1-2-60 - YIELD SIGN



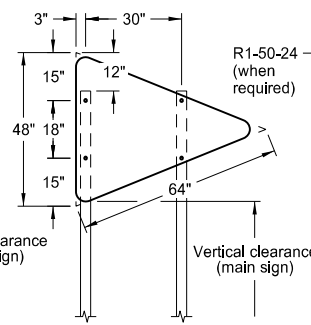
R1-1-48 - STOP SIGN  
(with R6-1-54 sign as required)



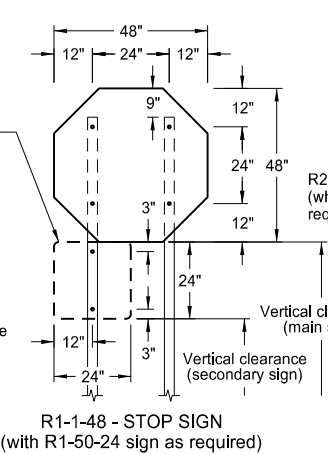
48" x 48" SIGN  
(with R6-1-54 sign as required)



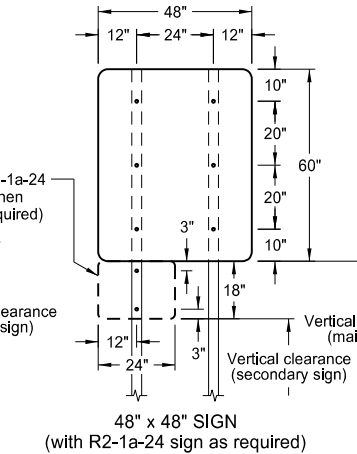
24" x 36" SIGN



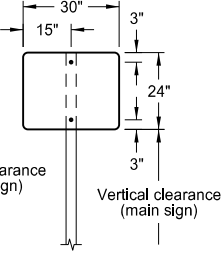
W14-3-64 - PENNANT SIGN



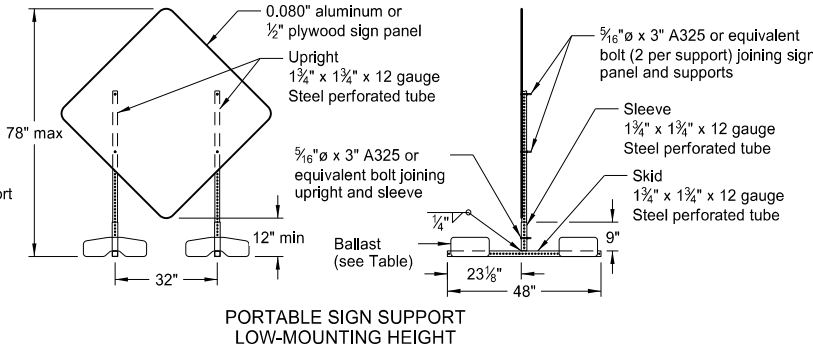
R1-1-48 - STOP SIGN  
(with R1-50-24 sign as required)



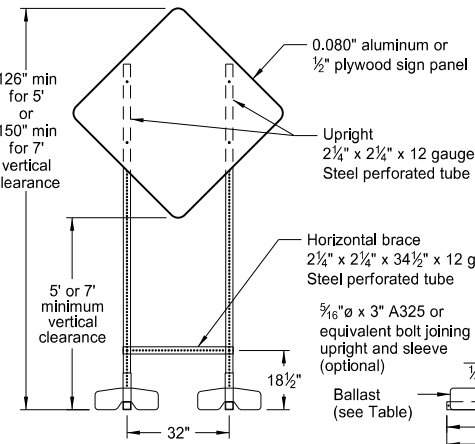
48" x 48" SIGN  
(with R2-1a-24 sign as required)



30" x 24" SIGN



PORTABLE SIGN SUPPORT  
LOW-MOUNTING HEIGHT



PORTABLE SIGN SUPPORT  
HIGH-MOUNTING HEIGHT

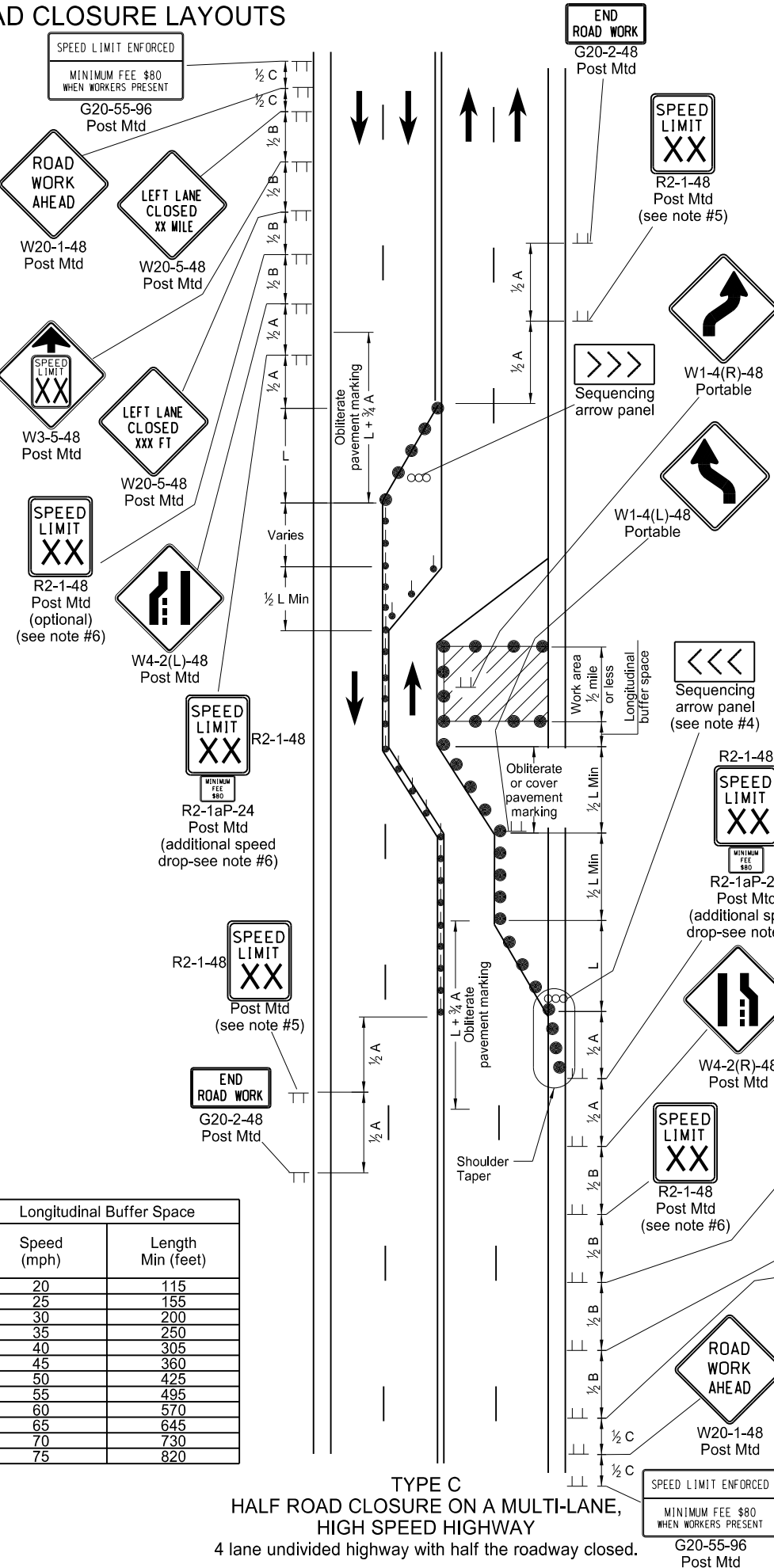
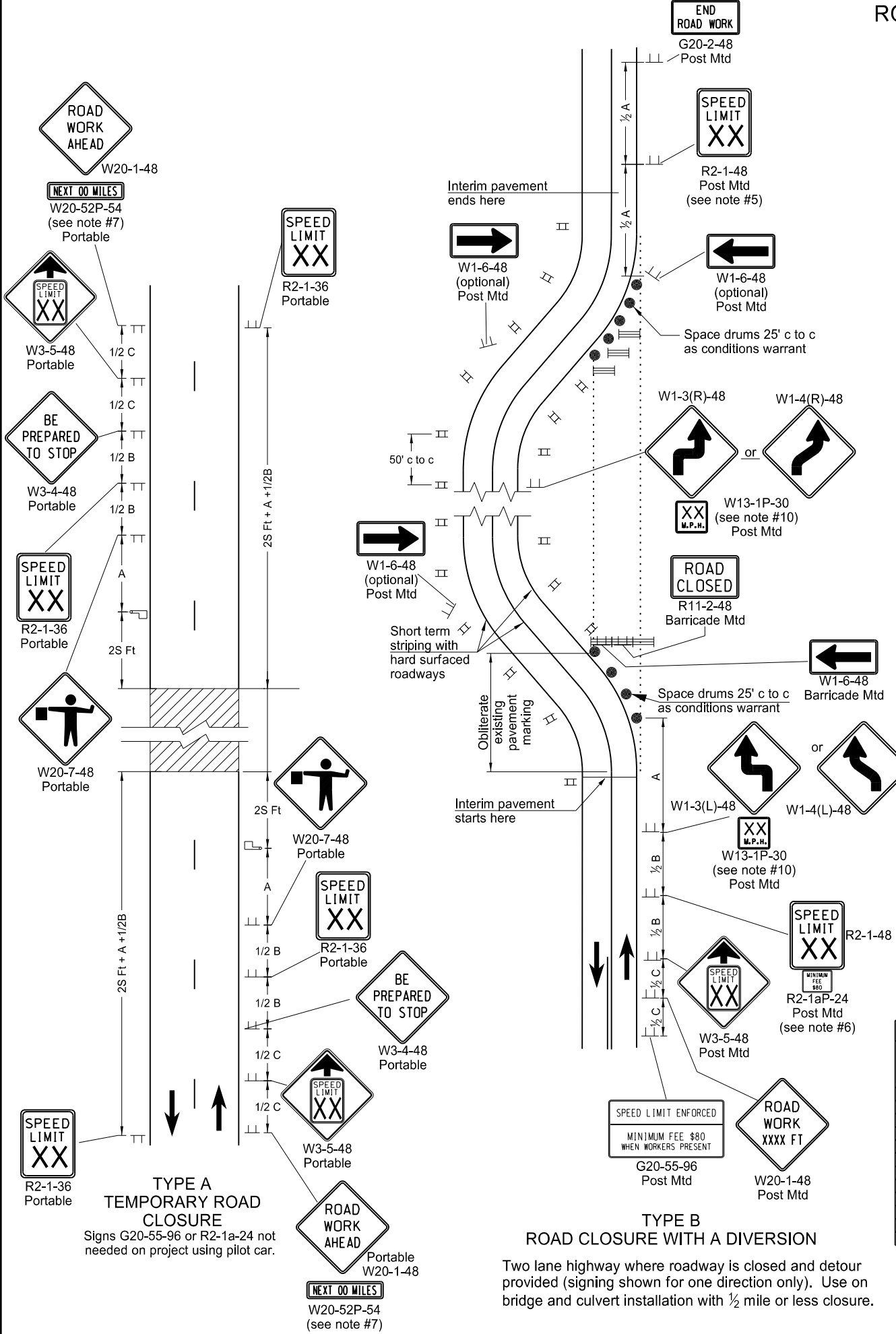
ROAD CLOSURE LAYOUTS

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

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

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

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



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated notes & Speed Limit signs

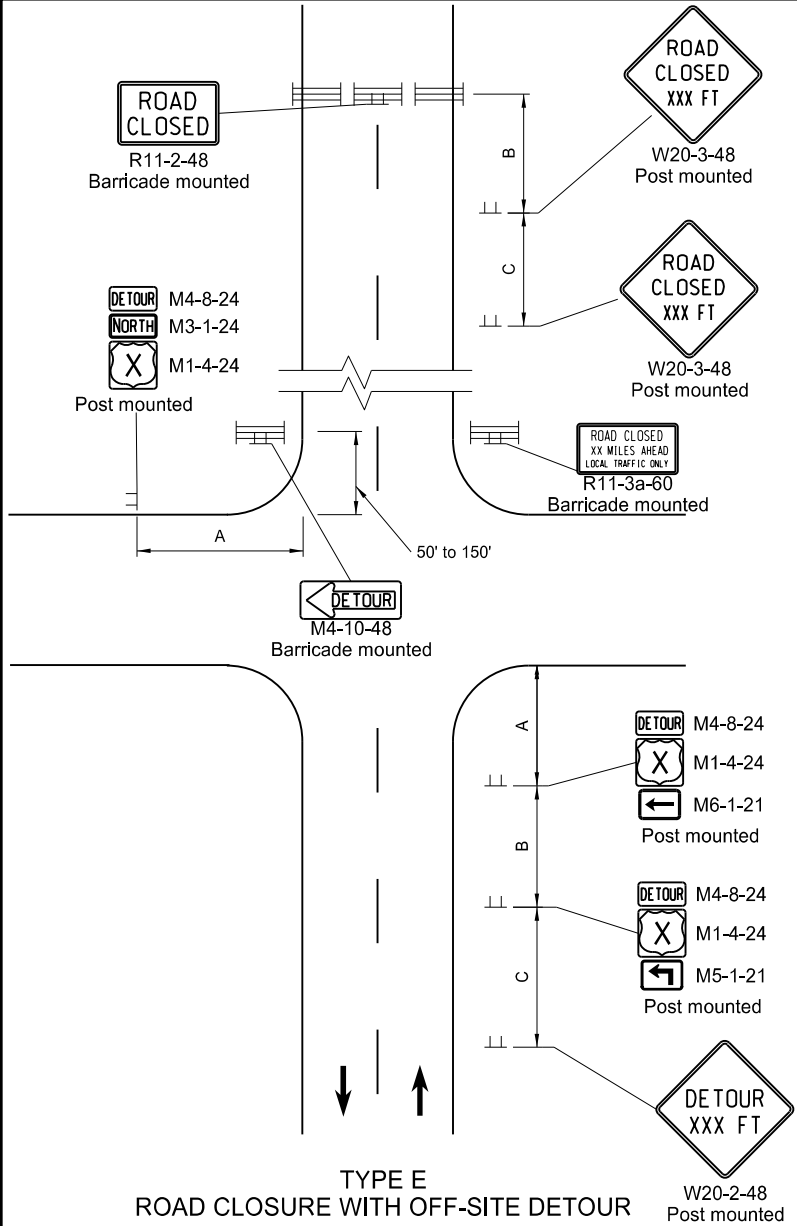
This document was originally issued and sealed by

Roger Weigel

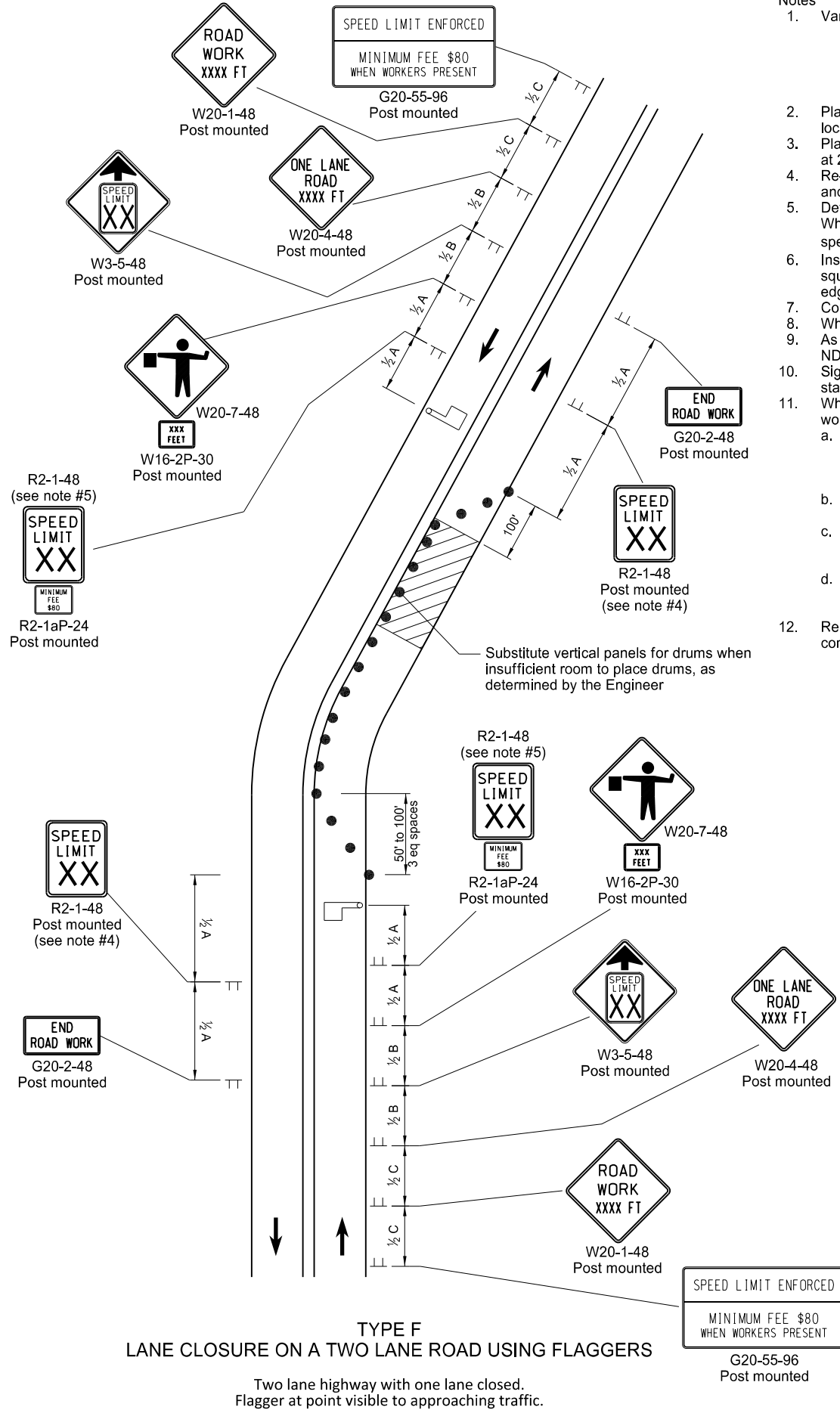
Registration Number PE-2930,

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ROAD CLOSURE AND LANE CLOSURE ON A TWO WAY ROAD LAYOUTS



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



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

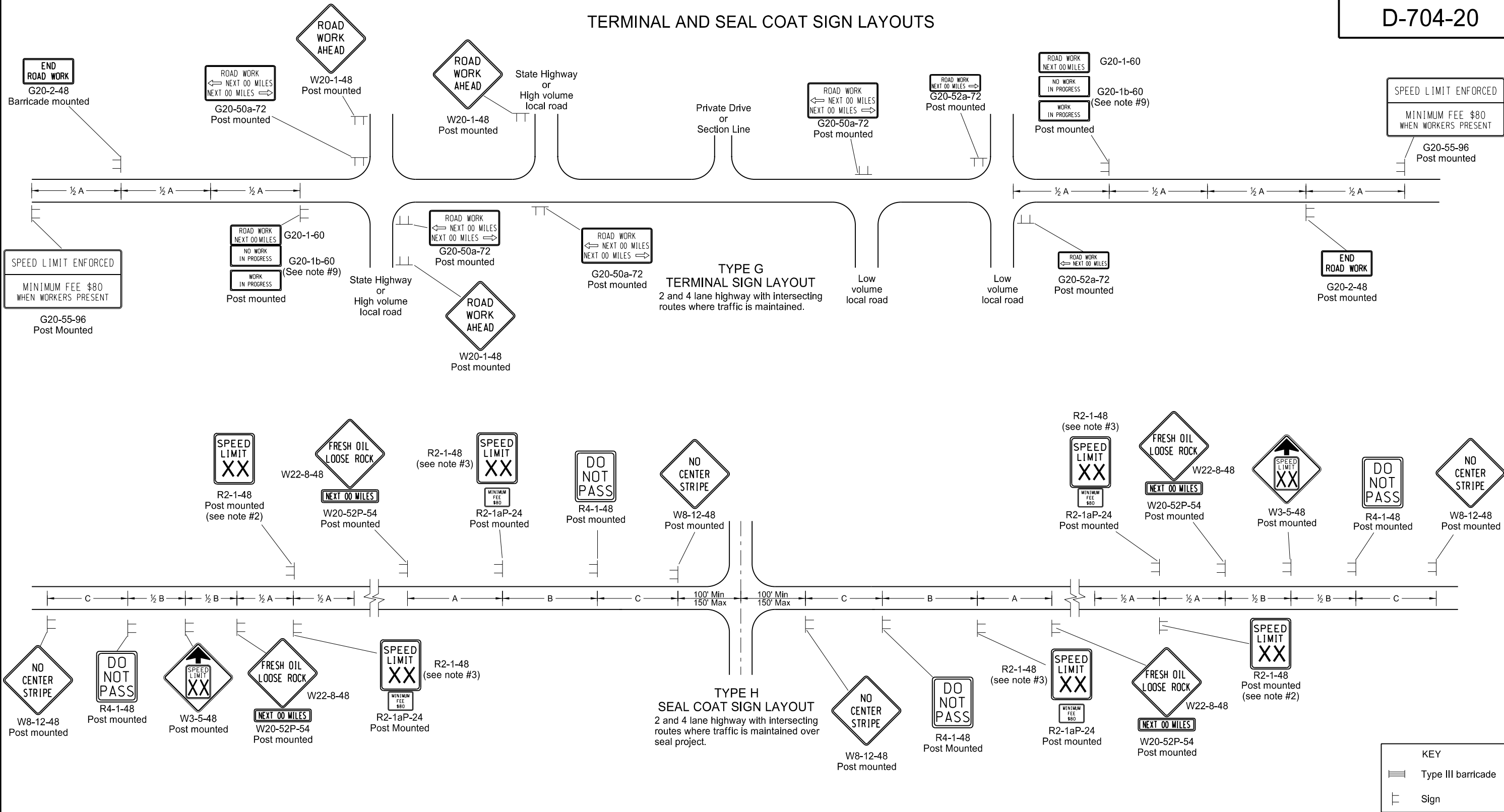
KEY		
Delineator Drum	Type III Barricade	Flagger
Sign	Work/Hazard Area	

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
3-13-14	Revised Sign Call "ROAD WORK XXX FT"
8-17-17	Update notes & sign numbers

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TERMINAL AND SEAL COAT SIGN LAYOUTS

D-704-20



1. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.  
 2. Determine the exact speed limit in the field, based on location and conditions.  
 3. Determine the reduced speed limit based on the in place speed limit before construction. Where speed limit reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 MPH.) Place the second speed limit sign at 1/2 B.  
 4. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.  
 5. Cover existing speed limit signs within a reduced speed zone.  
 6. On seal coat projects, place signs R2-1-48, R2-1aP-24, R4-1-48, W22-8-48 and W20-52P-54 after all important intersections and at five mile intervals. Place sign W8-12-48 after all important intersections and at 2 mile intervals until short term center line pavement marking is placed.  
 7. As an option, use portable sign supports in lieu of post mounted signs in accordance with the NDDOT Standard Specifications.  
 8. Cover or remove speed limit signs from layout Type H when loose aggregate is removed.  
 9. Install sign G20-1b-60 when work is suspended for winter.  
 10. Use other traffic control layouts in immediate work areas. Place sign R2-1aP-24 below speed limit signs in reduced speed limit work areas.  
 11. Sign G20-55-96 is not required if work is less than 15 days.  
 12. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

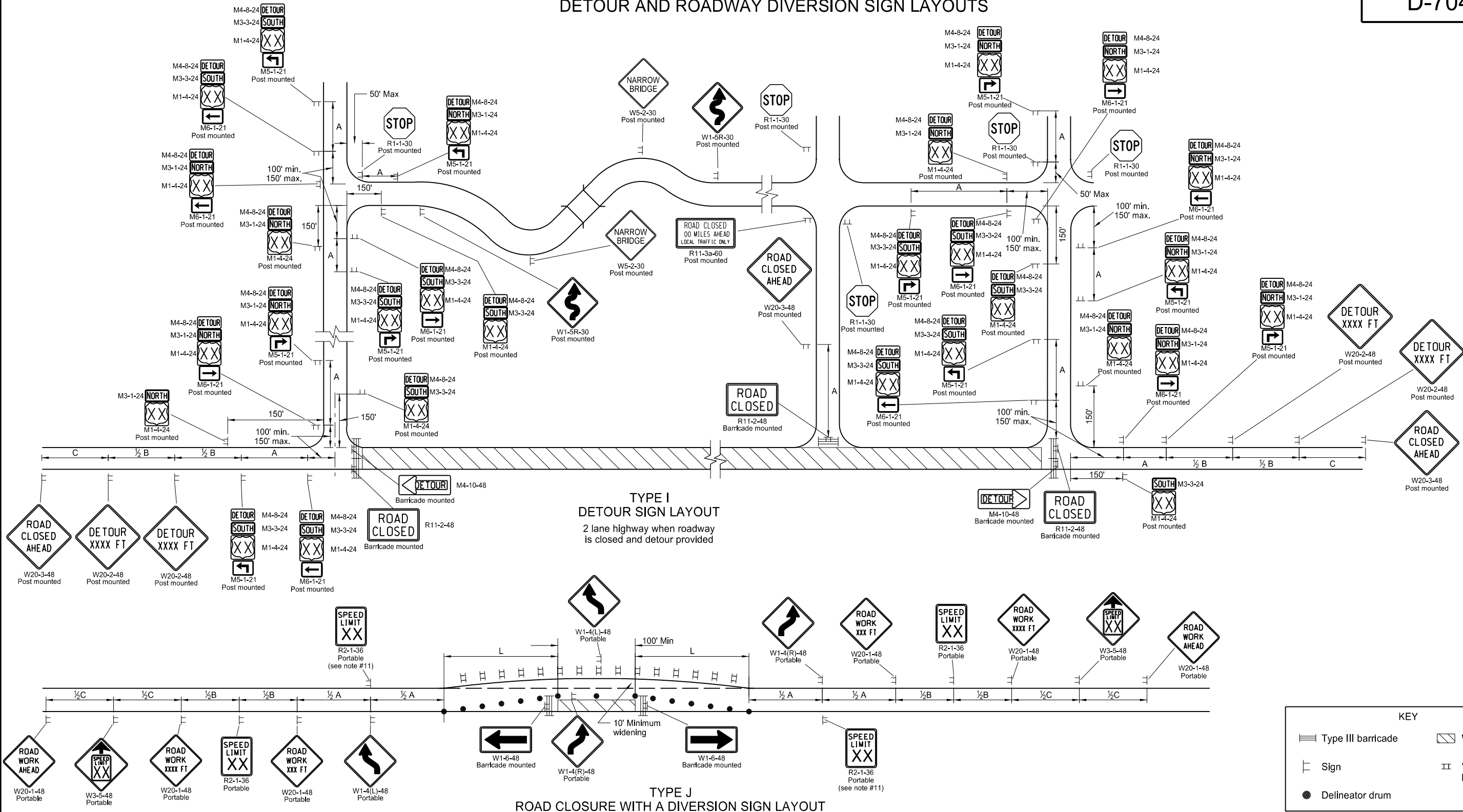
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
8-17-17	Updated notes & sign numbers

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DETOUR AND ROADWAY DIVERSION SIGN LAYOUTS



- Notes
- 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.
  - Place barricades on moveable assemblies and signs on portable assemblies when on roadway.
  - Space delineator drums and vertical panels at dimension "S" for tapering traffic. Space delineator drums, tubular markers and vertical panels at 2 times "S" for tangents.
  - Determine the reduced speed limit based on the in place speed limit before construction. Where speed limits exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at  $\frac{1}{2} B$ .
  - Install flags on warning signs in urban areas when signs are not portable. Mount 24 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 a reduced speed limit zone.
  - Covered (when approved by engineer) or obliterated payment 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 Specifications.
  - If the tangent between tapers is less than 600', as an option, use sign W24-1-48 in place of double reverse curve signs.
  - Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.
  - Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.

Use layout when work is less than 5 days or is within a project.

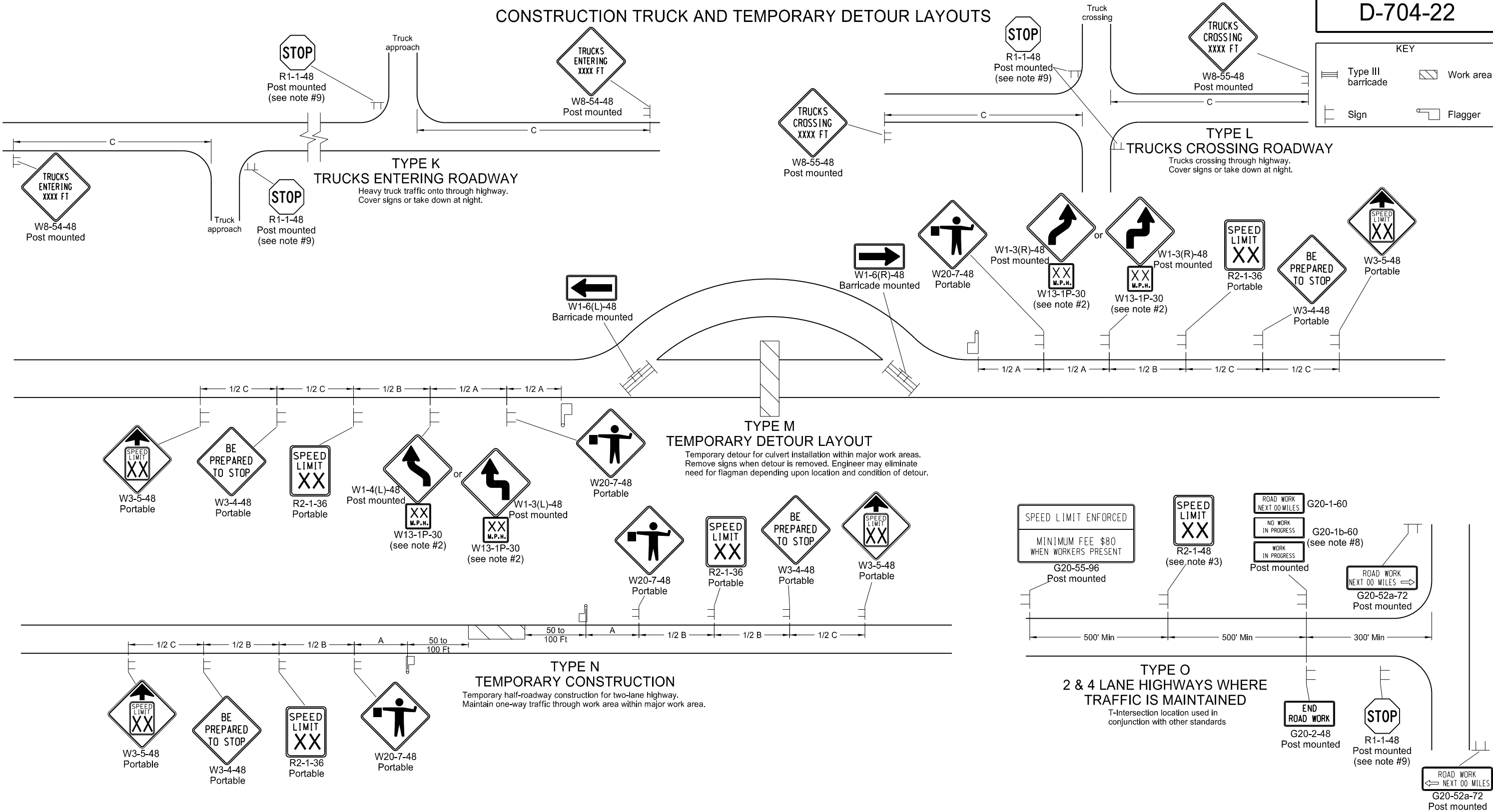
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and 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
8-17-17	Updated notes. Added speed limit.

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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 Specifications.
- 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 or if work is less than 15 days.
- Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

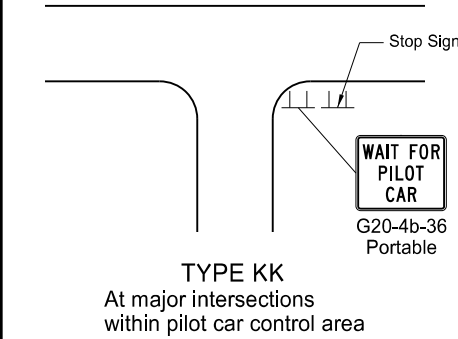
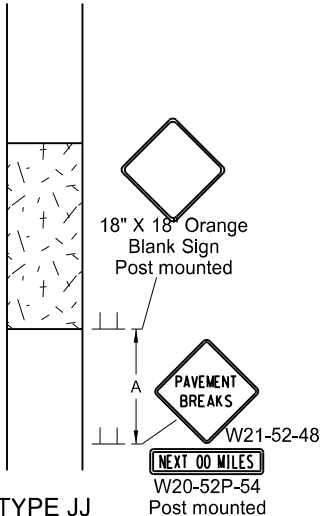
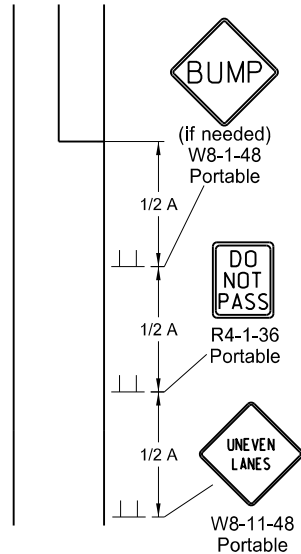
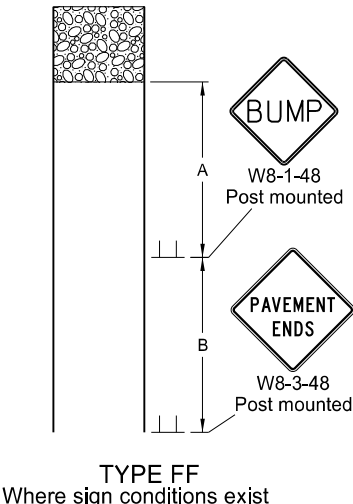
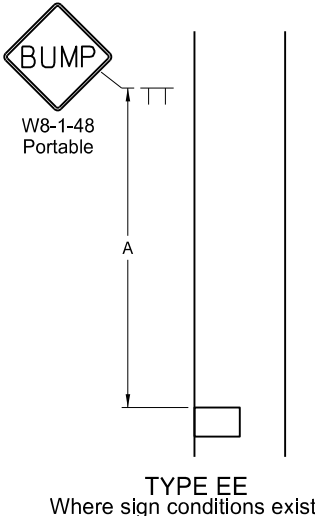
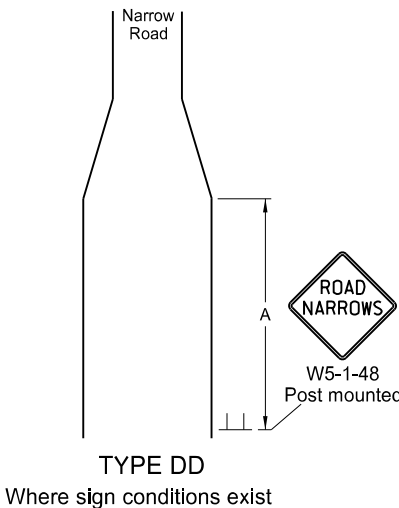
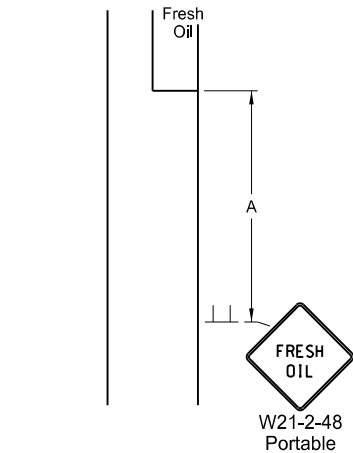
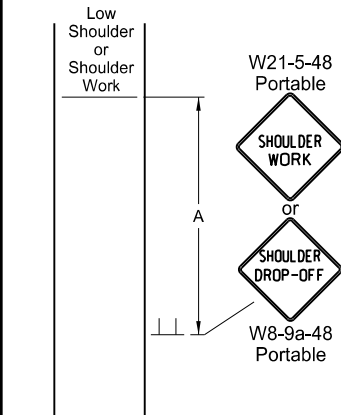
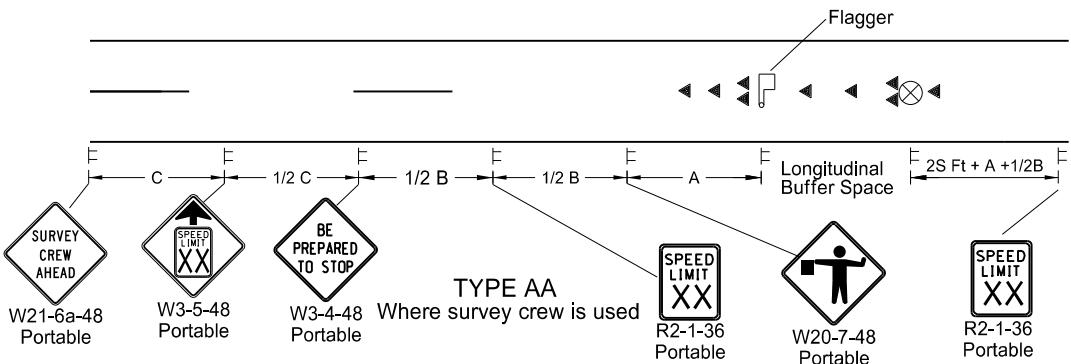
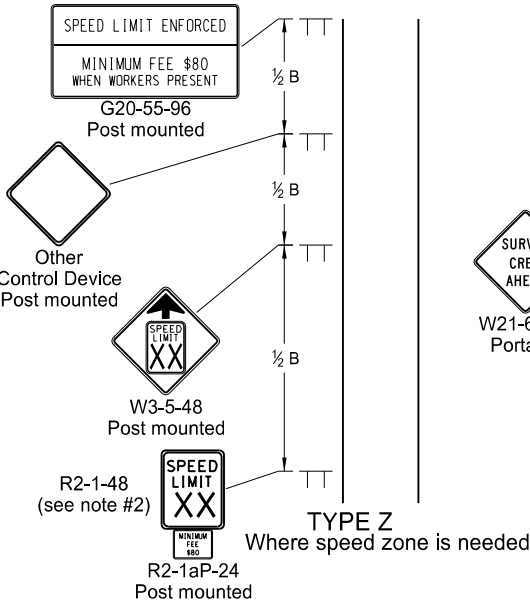
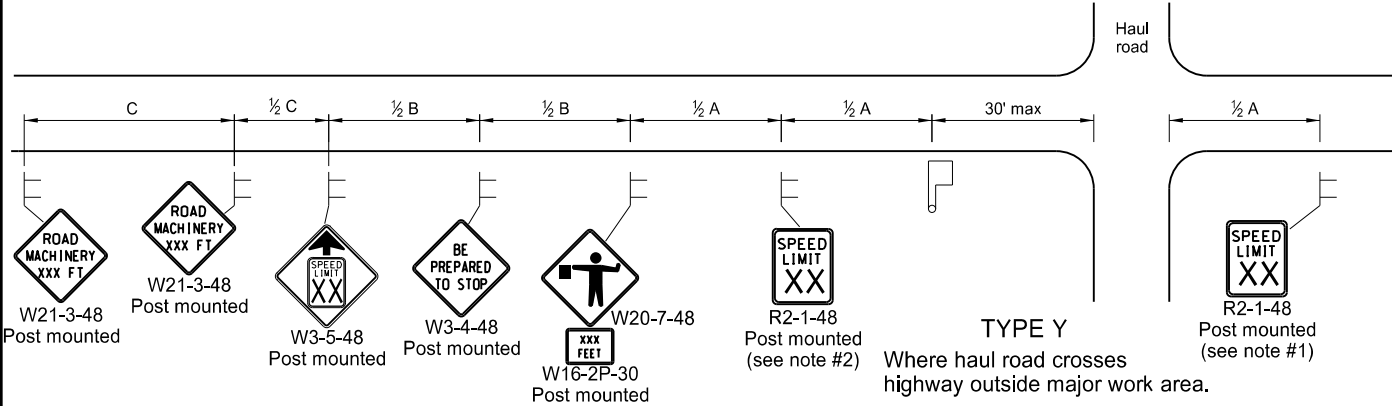
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway and 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
8-17-17	Update notes & sign numbers

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MISCELLANEOUS SIGN LAYOUTS

D-704-26



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

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

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

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

KEY

Sign      Flagger      Cones

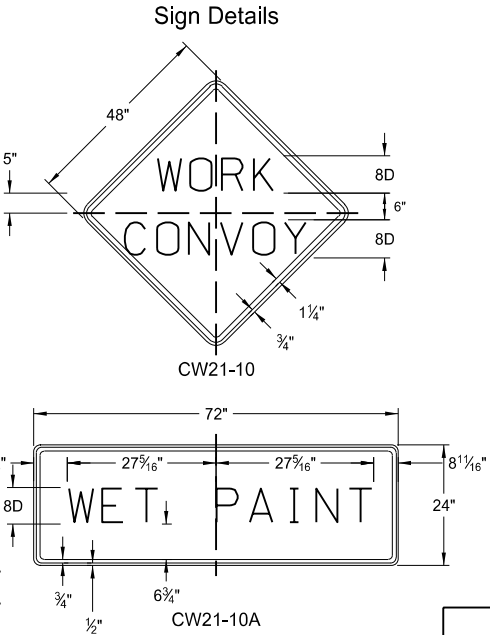
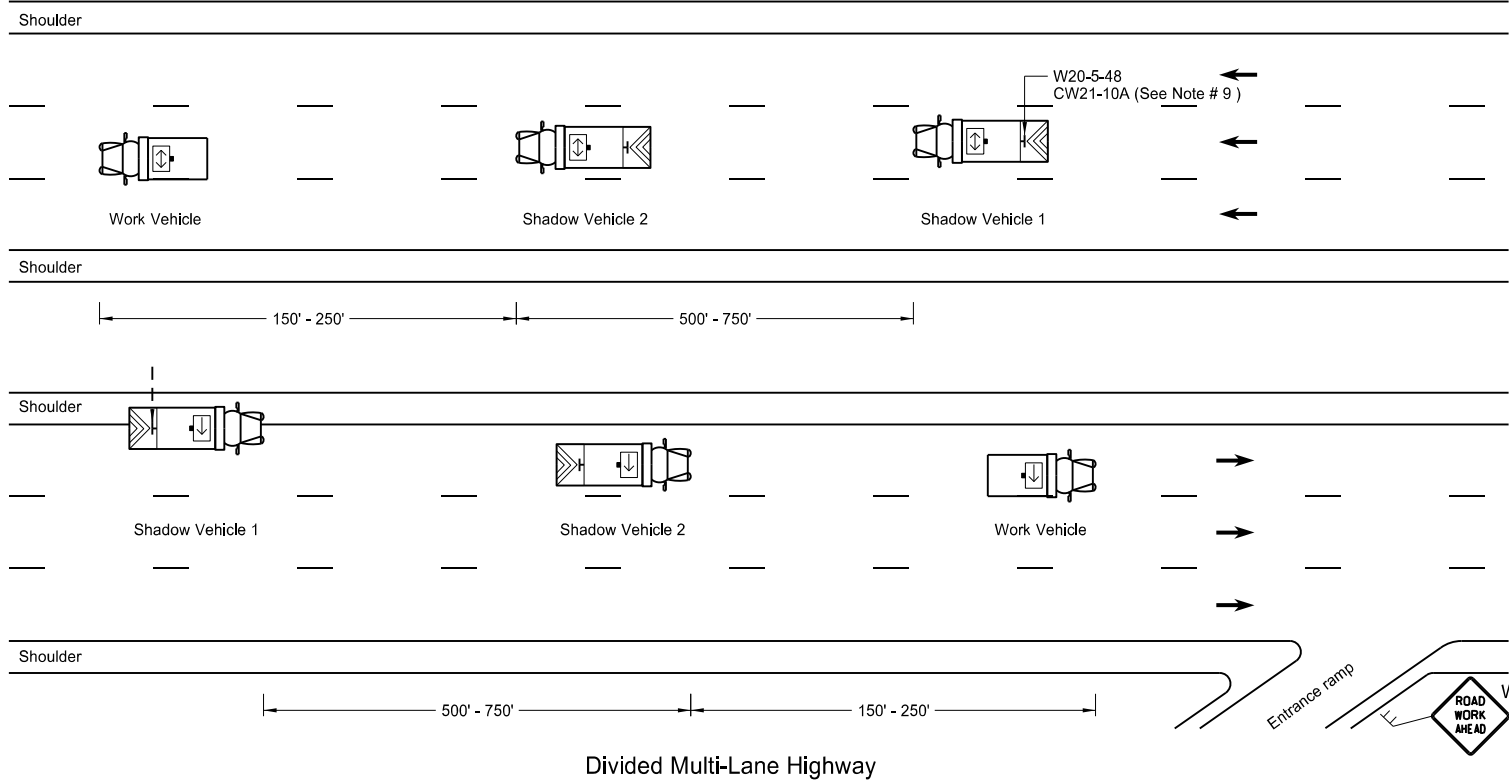
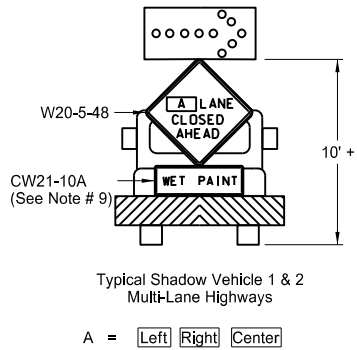
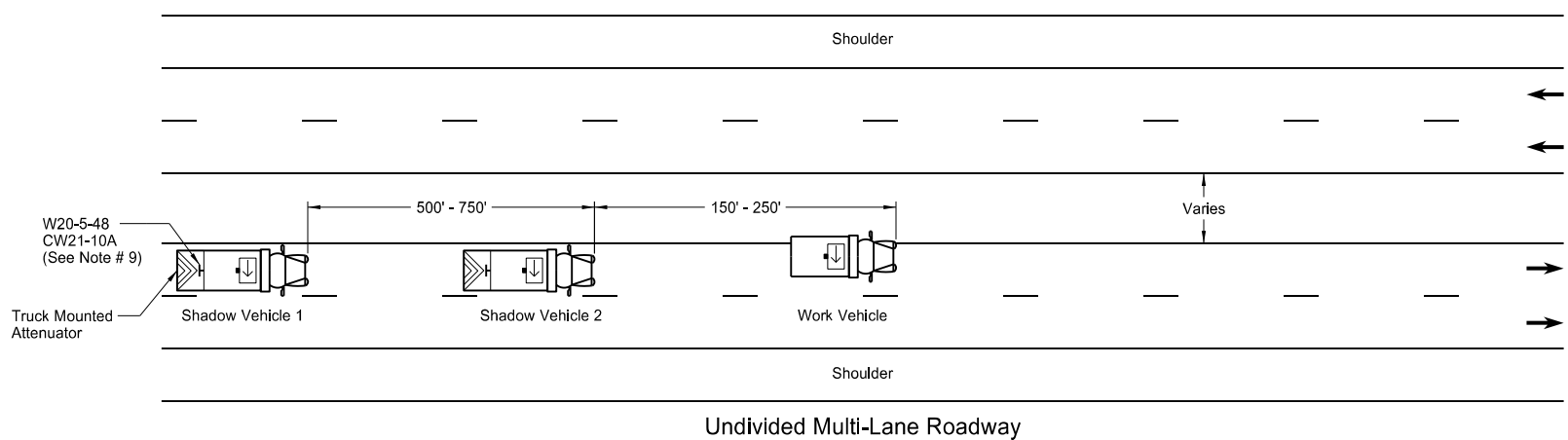
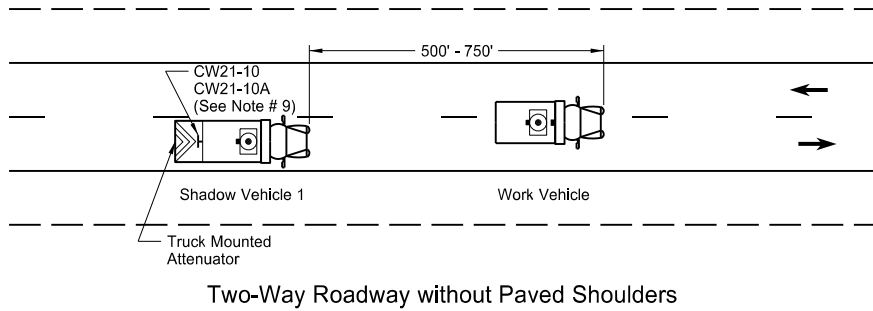
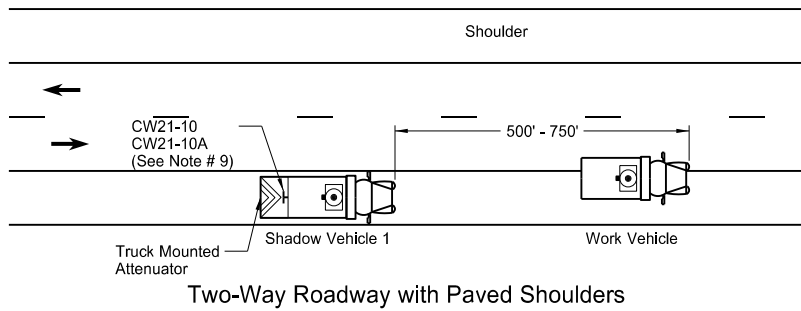
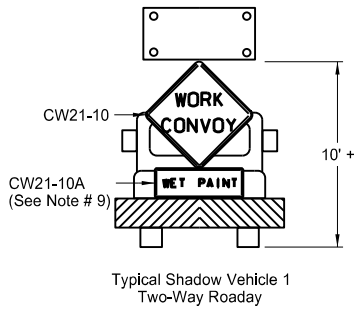
S = Numerical value of speed limit or 85th percentile.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
8-17-17	Added speed limit signs. Updated notes & sign numbers

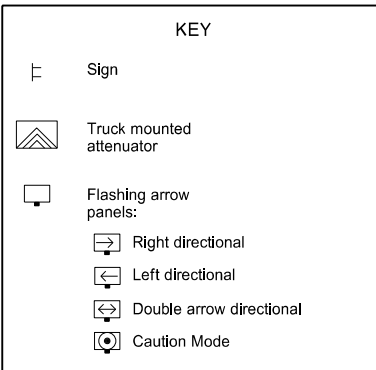
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TRAFFIC CONTROL PLAN FOR MOVING OPERATIONS

D-704-27



- Notes
1. If the contractor chooses to place more vehicles in the convoy than are shown, these vehicles shall have the truck mounted attenuator and shall be at the contractor's expense.
  2. Shadow and work vehicles shall display yellow rotating beacons or strobe lights unless otherwise stated elsewhere in the plans.
  3. Flashing arrow panels shall be Type B or Type C. The panel operation shall be controlled from inside the vehicle.
  4. Each vehicle shall have two-way electronic communication capability.
  5. When work convoys must change lanes, shadow vehicle 1 should change lanes first to shadow other convoy vehicles.
  6. Vehicle spacing between the shadow vehicle 1 and shadow vehicle 2 will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the trail vehicle in time to slow down and/or change lanes as they approach the shadow vehicle.
  7. Sign Colors  
Letters = Black  
Border = Black  
Background = Orange
  8. Shadow vehicle 2 may be used as the paint tender vehicle.
  9. Sign CW21-10A shall only be used during a painting operation.
  10. On two lane - two way roadways, the work and shadow vehicles should pull over periodically to allow motor vehicle traffic to pass.

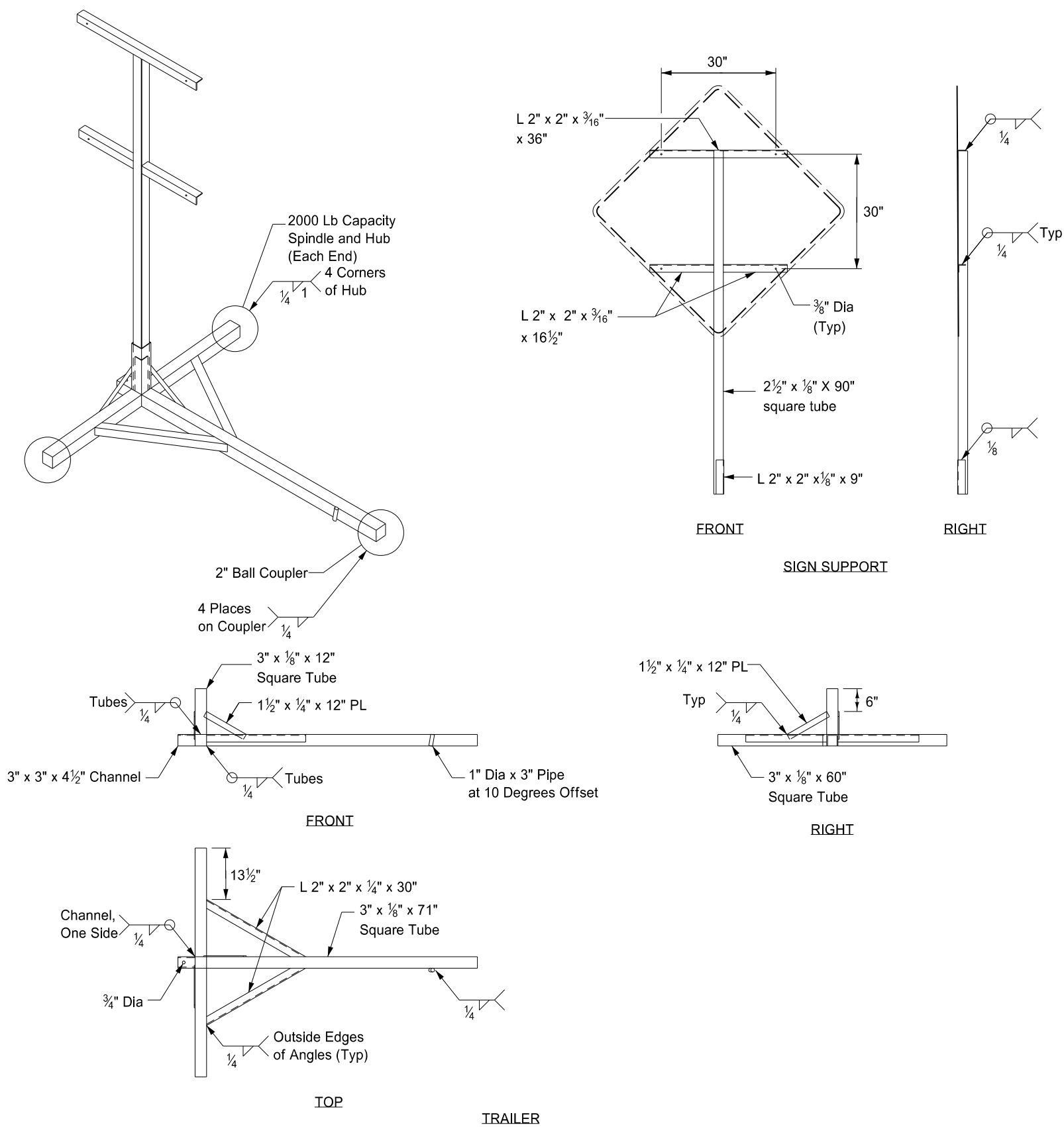


NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
6-18-14	Removed shadow vehicle 2 on two lane roadways

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PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



Notes:

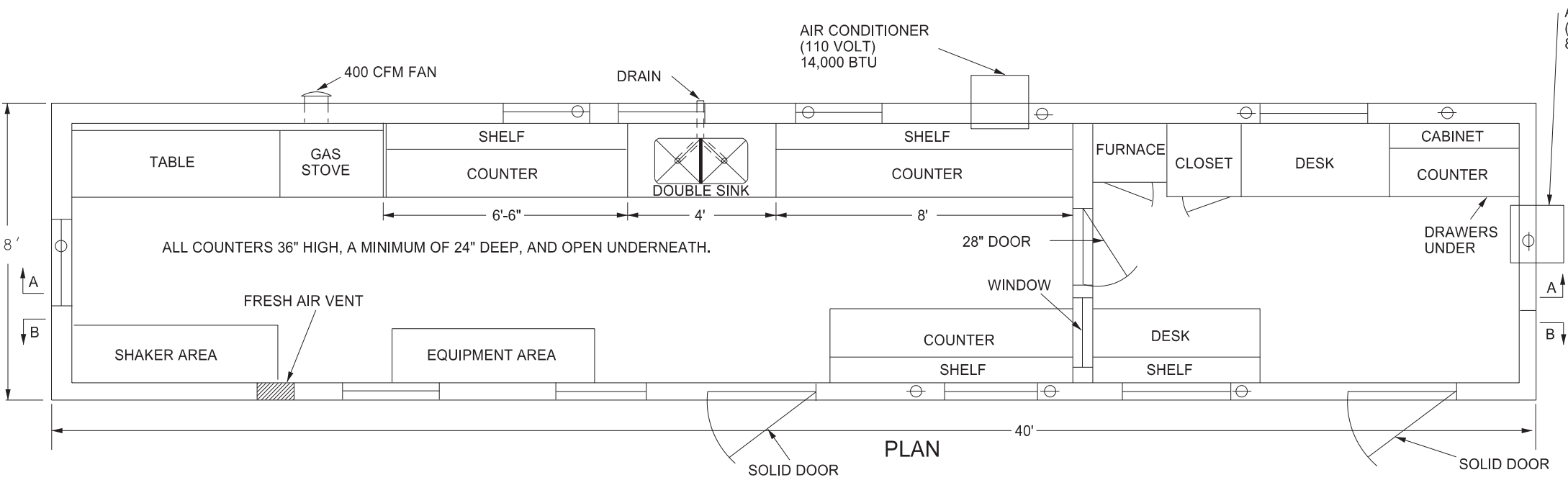
- ① The maximum weight of the assembly is 250 pounds.
- ② Use a 14" wheel and tire.
- ③ Automotive and equipment axle assemblies may not be used for trailer-mounted sign supports.
- ④ Other NCHRP 350 crash tested assemblies are acceptable.

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
11-23-10	
REVISIONS	
DATE	CHANGE

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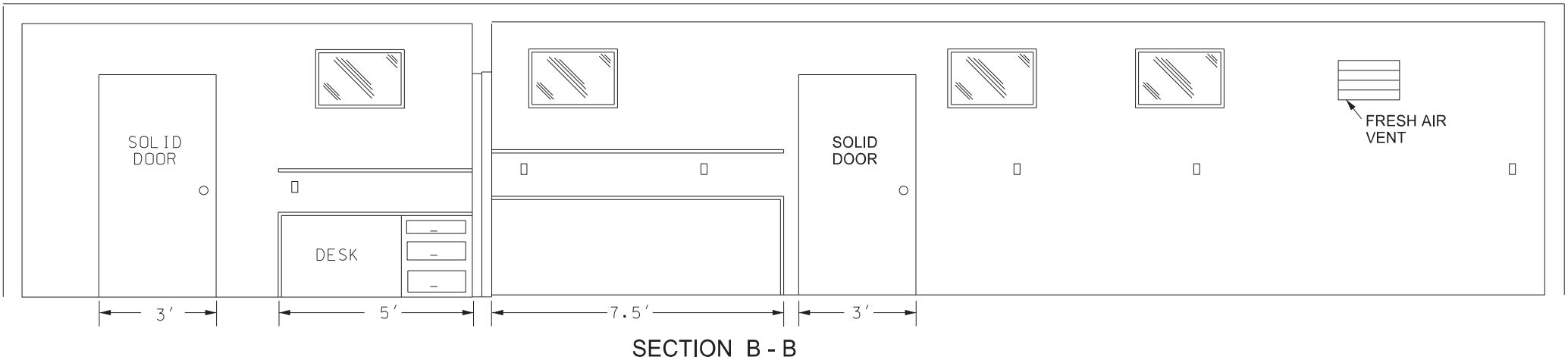
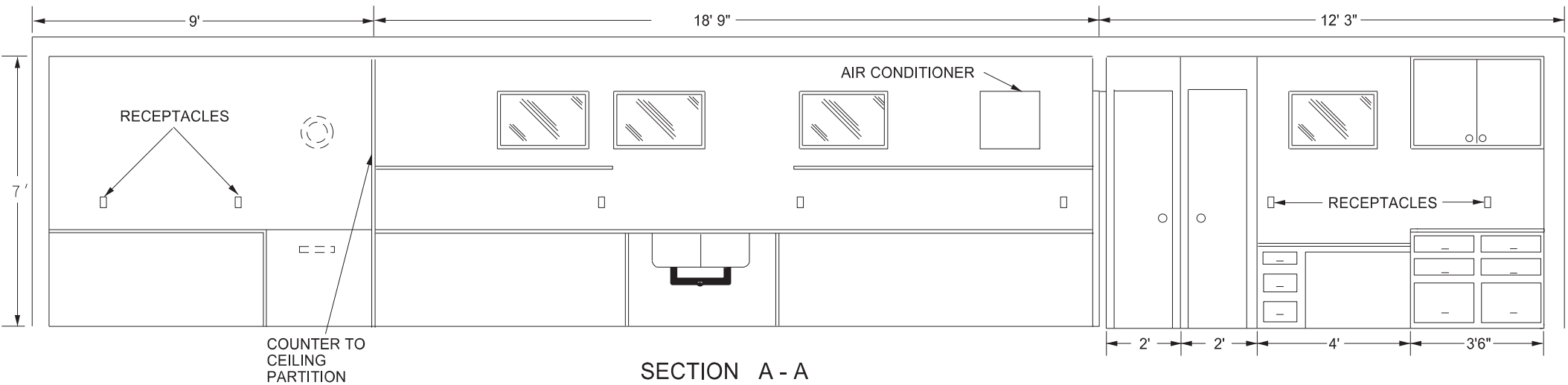
BITUMINOUS LABORATORY

D-706-1



Provide a laboratory with the following:

1. A 1'x1' shelf at 36" above the regular countertop.
2. Double compartment stainless steel sink, with each compartment a minimum of 16"x14"x10" deep. Provide water service lines made of copper or plastic and a diameter of ½ inch.
3. An exhaust fan capable of removing inside air at a rate of 400 CFM.
4. Fresh air vent hinged to open or close manually.
5. 24" x 48" table capable of holding a 200 lb masonry saw with a minimum clearance of 36" above the table.
6. A water supply tank with a capacity of 500 gallons and a 20 gallon capacity pressure tank on the pump.
7. Heavy duty type locks, latches, and hinges for doors made to withstand the intense use in service.
8. A wall between the office and the work area properly insulated to prevent the transmission of heat and noise.
9. The steel cable tie downs and ground anchors at each corner of the lab.
10. Electrical service entrance wired for 100 amps and separate circuits for air conditioners. Space convenience outlets in counter areas a minimum of four feet apart.



NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-03-13	
REVISIONS	
DATE	CHANGE
07-30-14	Changed standard's title and revised notes.
01-11-16	Revised notes.

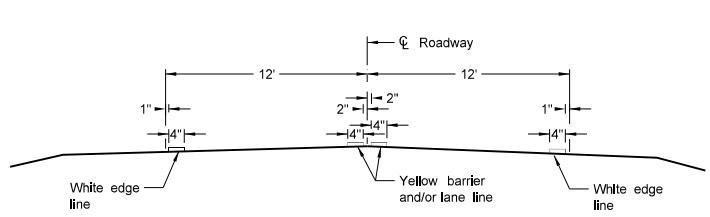
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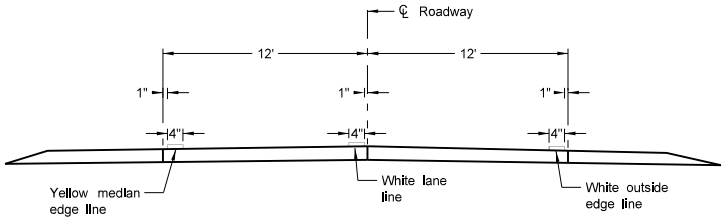
PAVEMENT MARKING

D-762-4

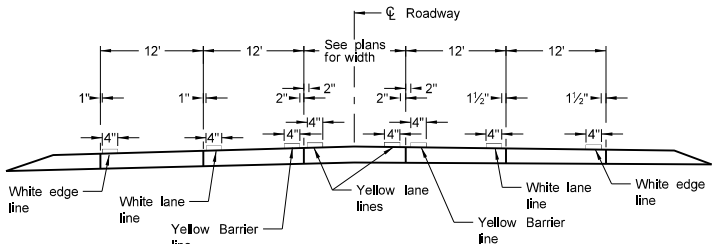
NOTES:  
1. Edge lines shall be continued through private drives and field drives and broken for intersections.



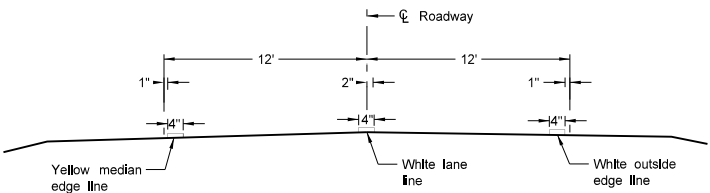
Two Lane Two Way  
RURAL ROADWAY



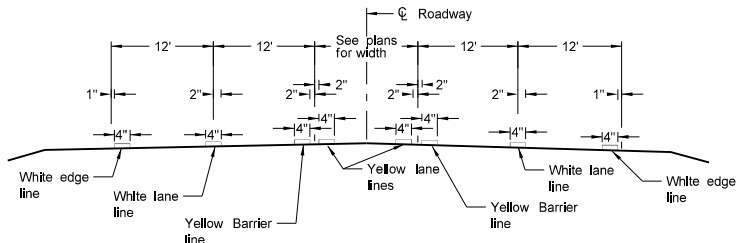
Two Lane Roadway  
INTERSTATE HIGHWAY  
Concrete Section



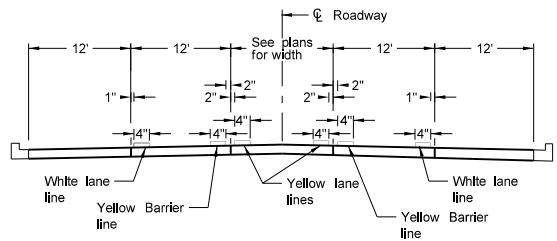
RURAL FIVE LANE ROADWAY  
Concrete Section



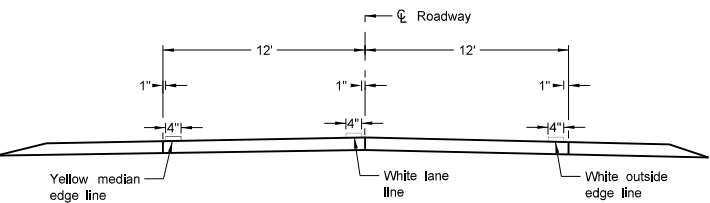
Two Lane Divided  
Rural Roadway  
PRIMARY HIGHWAY  
Asphalt Section



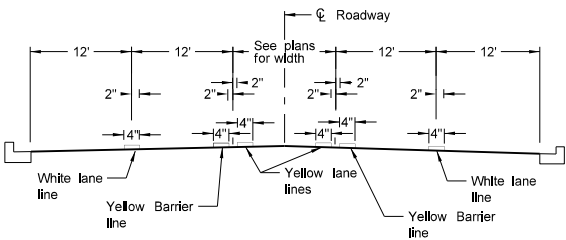
RURAL FIVE LANE ROADWAY  
Asphalt Section



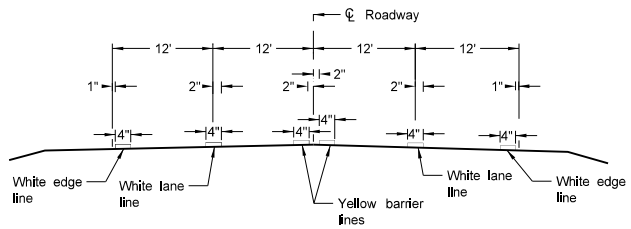
URBAN FIVE LANE SECTION  
Concrete Section



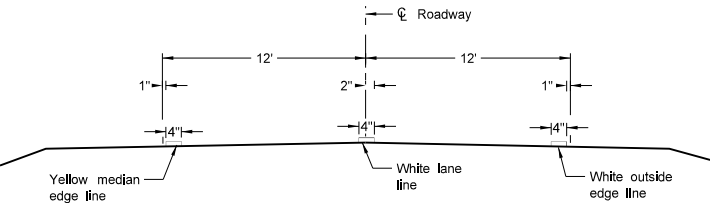
Two Lane Roadway  
PRIMARY HIGHWAY  
Concrete Section



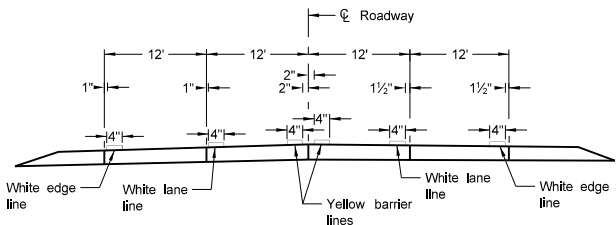
URBAN FIVE LANE SECTION  
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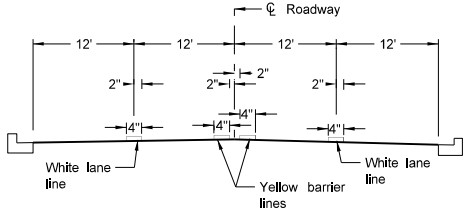
RURAL FOUR LANE ROADWAY  
Asphalt Section



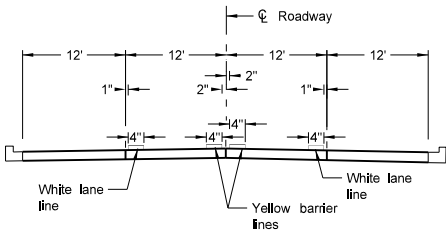
Two Lane Roadway  
INTERSTATE HIGHWAY  
Asphalt Section



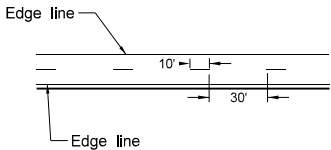
RURAL FOUR LANE ROADWAY  
Concrete Section



URBAN FOUR LANE SECTION  
Asphalt Section



URBAN FOUR LANE SECTION  
Concrete Section



CENTERLINE PAVEMENT MARKING SKIP SPACING DETAIL

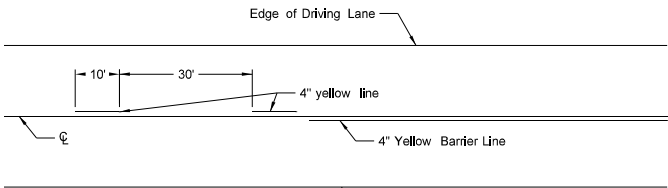
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
12-1-10	
REVISIONS	
DATE	CHANGE

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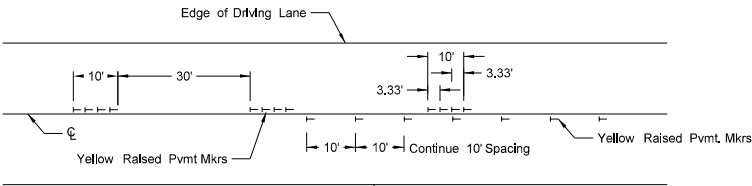


SHORT-TERM PAVEMENT MARKING

D-762-11

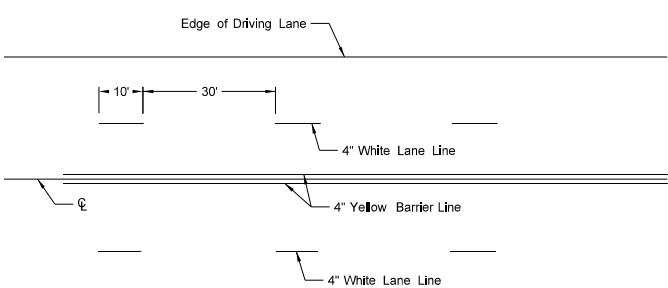


Painted or Tape Lines

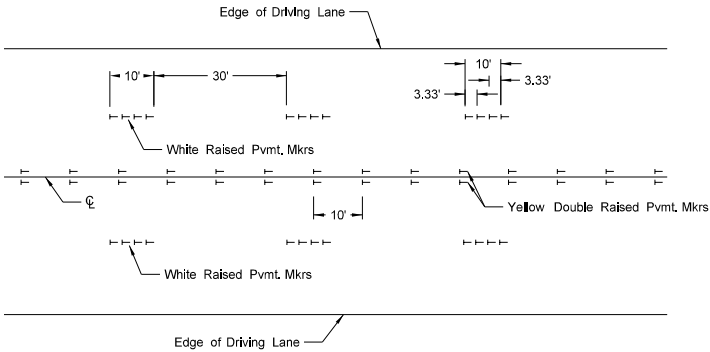


Raised Pavement Markers

TWO-LANE TWO-WAY ROADWAY

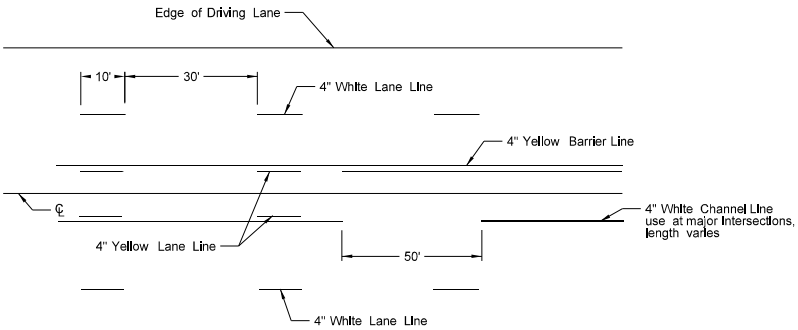


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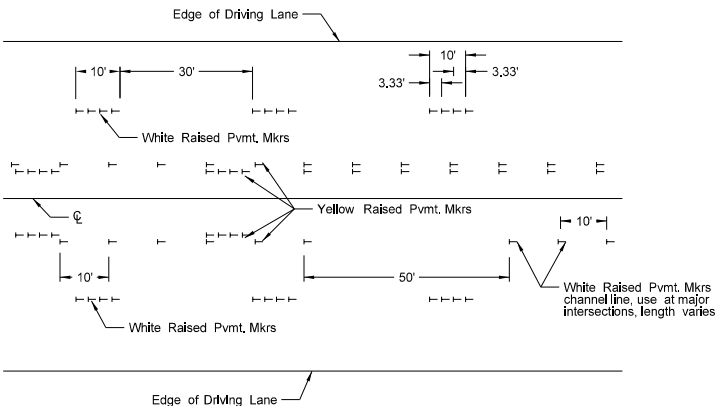


Raised Pavement Markers

FOUR LANE ROADWAY

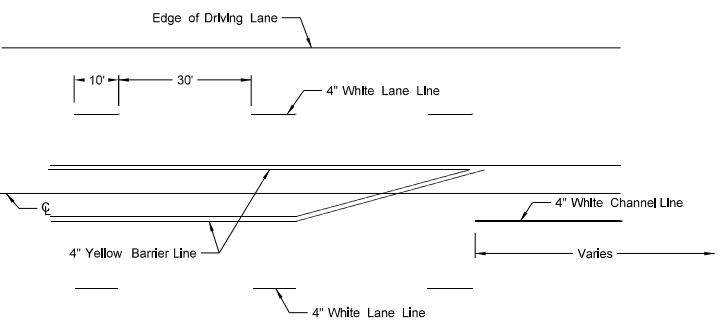


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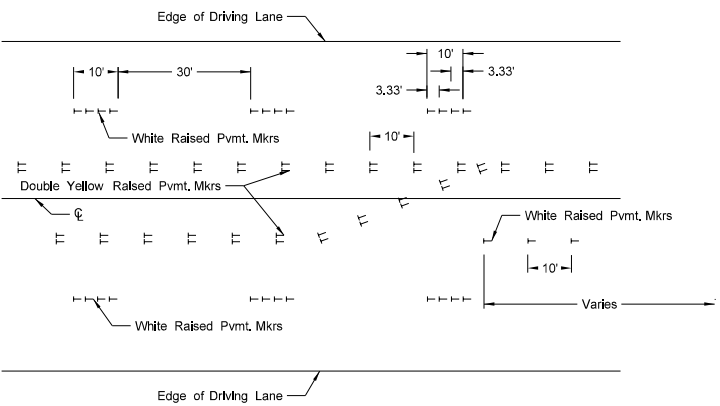


Raised Pavement Markers

FIVE LANE ROADWAY TWO WAY LEFT TURN



Painted or Tape Lines



Raised Pavement Markers

FIVE LANE ROADWAY WITH MARKED ISLANDS

- NOTES:
1. Two-lane two-way roadways shall have no passing zones placed as shown. No passing zone signs may be placed in lieu of short term no passing zone pavement markings. These signs will be allowed to remain in place for three days, at which time the short term no passing zone pavement marking shall be placed.
  2. Short term center line stripe (paint) on top lift shall be carefully placed with exact spacing so that the permanent stripe will match when applied.
  3. Raised markers and tape markings shall be removed after permanent pavement marking has been installed. Removed markings shall become the property of the contractor.

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)

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Roger Weigel,  
Registration Number  
PE- 2930 ,  
on 03/29/16 and the original document is stored at the  
North Dakota Department  
of Transportation

MAILBOX LOCATION DETAILS

D-766-1

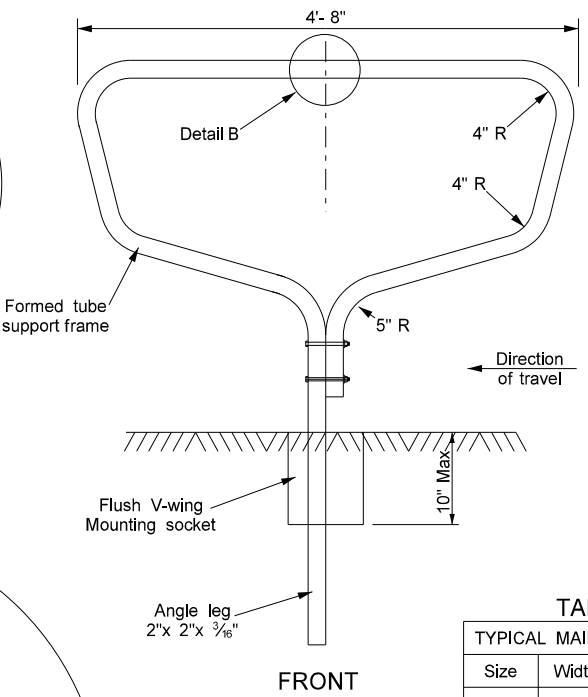
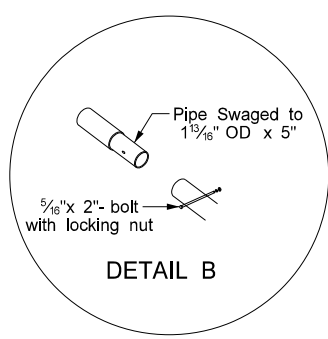
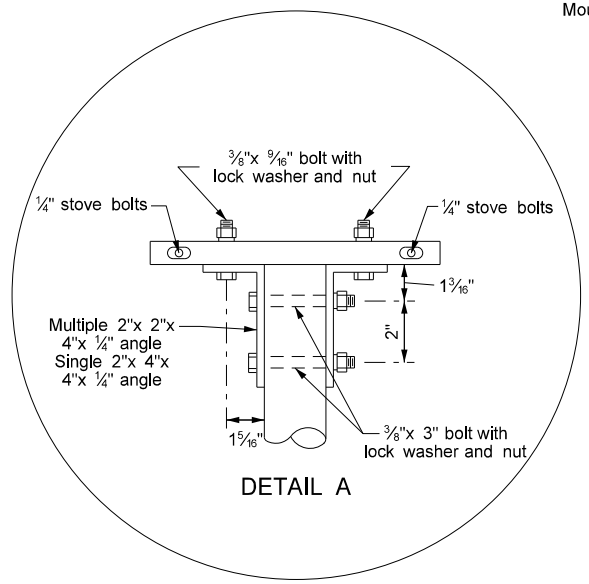
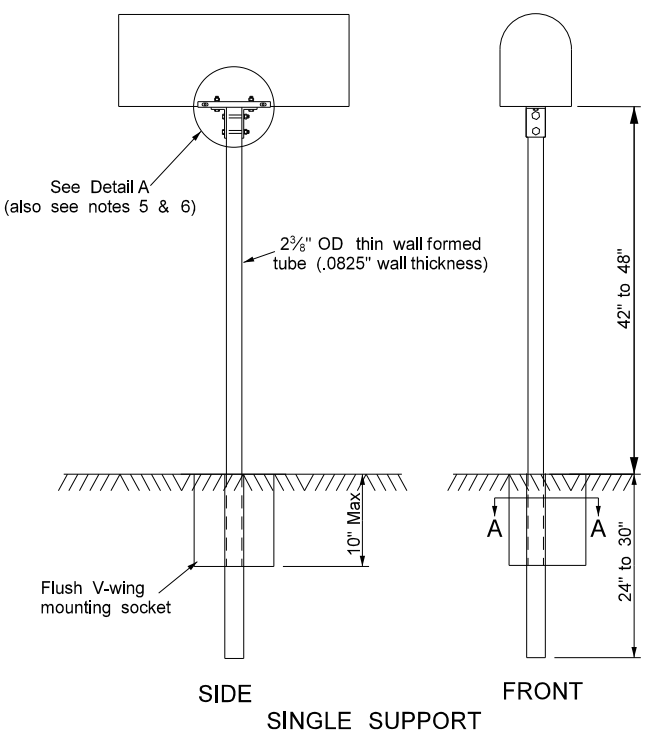
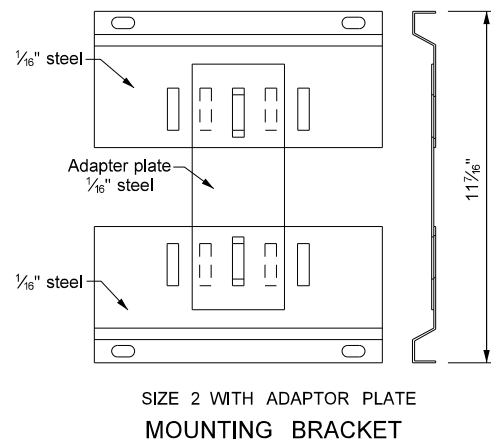
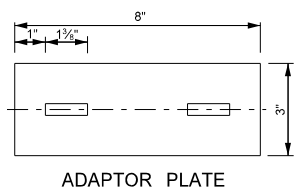
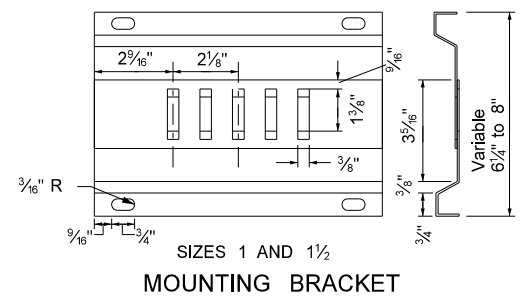
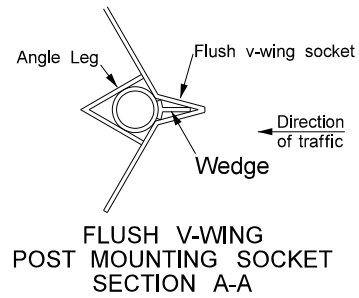
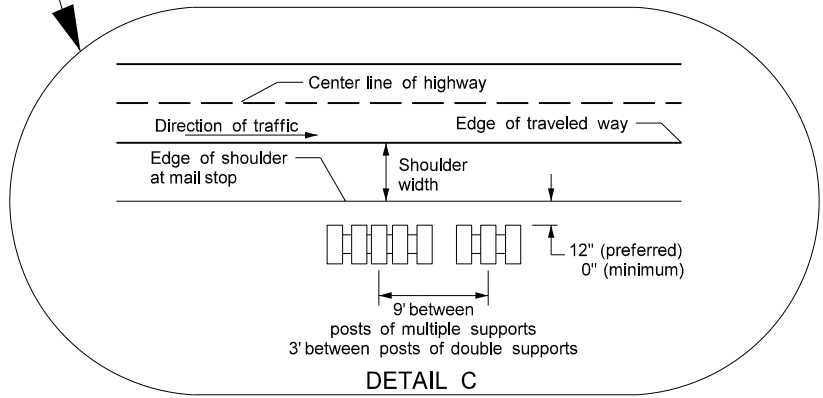
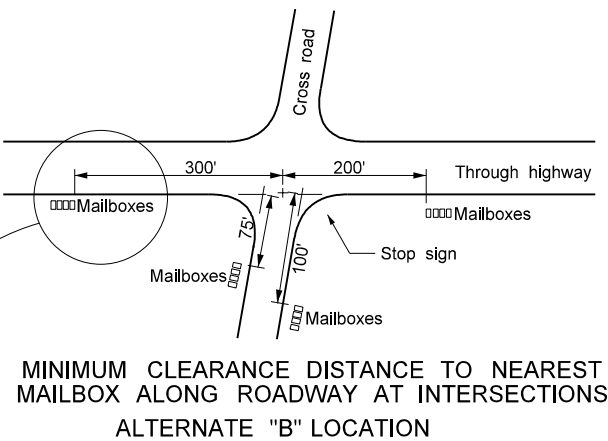
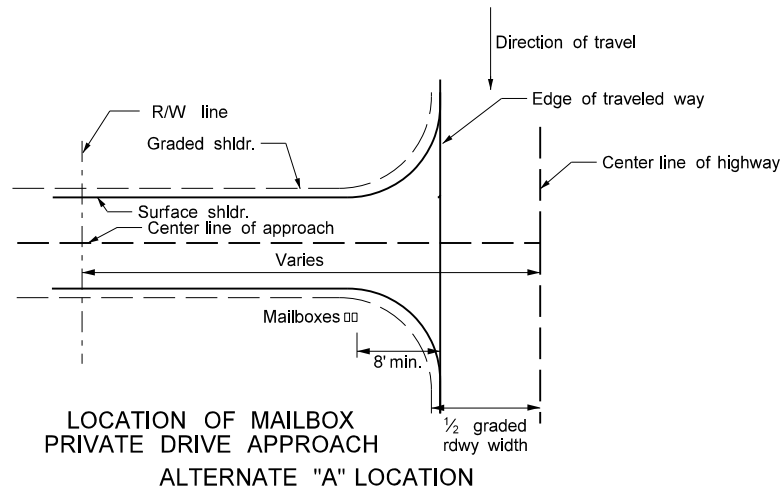


TABLE A TYPICAL MAILBOX DIMENSIONS			
Size	Width	Height	Length
1	6.5"	8.5"	19"
1A	8"	10.5"	21"
2	11.5"	13.5"	23.5"

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-15-2010	
REVISIONS	
DATE	CHANGE

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- Notes:
- The mailbox support and hardware details shall consist of the "V-Loc Mailbox Support System" manufactured by:  
  
Tapco  
Traffic & Parking Control Co. Inc.
  - Any other equal support system meeting the requirements of NCHRP Report 350, which has been crash tested, and approved by the Federal Highway Administration may be used. Approved alternate mailbox assemblies shall be installed in the manner and arrangement crash tested.
  - The preferred location for all mailboxes is the Alternate "A" location. However, the Engineer may approve the Alternate "B" location if warranted by existing field conditions.
  - Postal regulations require that mailboxes must be located on the right-hand side of the road in the direction traveled by the carrier. Therefore, the Engineer shall contact the local carrier or postmaster before installing new mailboxes to verify the direction of travel.
  - Mailboxes installed on private drive approaches must always be located on the downstream side of the approach.
  - Install angle connection parallel to traffic flow for size 2 mailbox mounted on single posts.
  - Size 2 mailbox mounted on multiple support requires 2 each, 3/8" by 3/16" bolts with lock washers and nuts to attach the adapter plate to mounting bracket. The unit will then require 4 angle connections to attach to the formed tube support frame. See Detail A.
  - Space multiple support frames a minimum of 4 feet apart. Space single support frames a minimum of 3 ft apart. Do not place more than five No. 1 mailboxes, three No. 2 mailboxes, or any combination of four No. 1-A and No. 2 mailboxes on multiple support frames.