

	STATE	PROJECT NO.	PCN	SECTION NO.	SHEET NO.
	ND	BRI-5-094(173)084	24505	1	1

NORTH DAKOTA

DEPARTMENT OF TRANSPORTATION

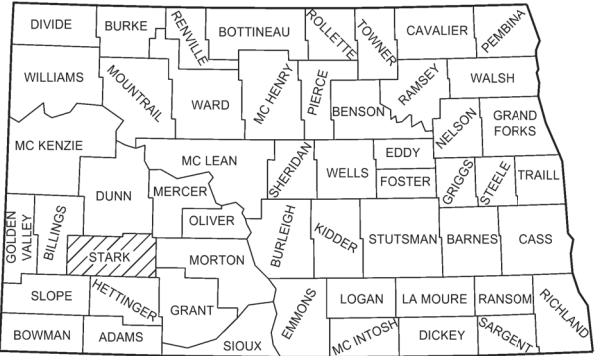
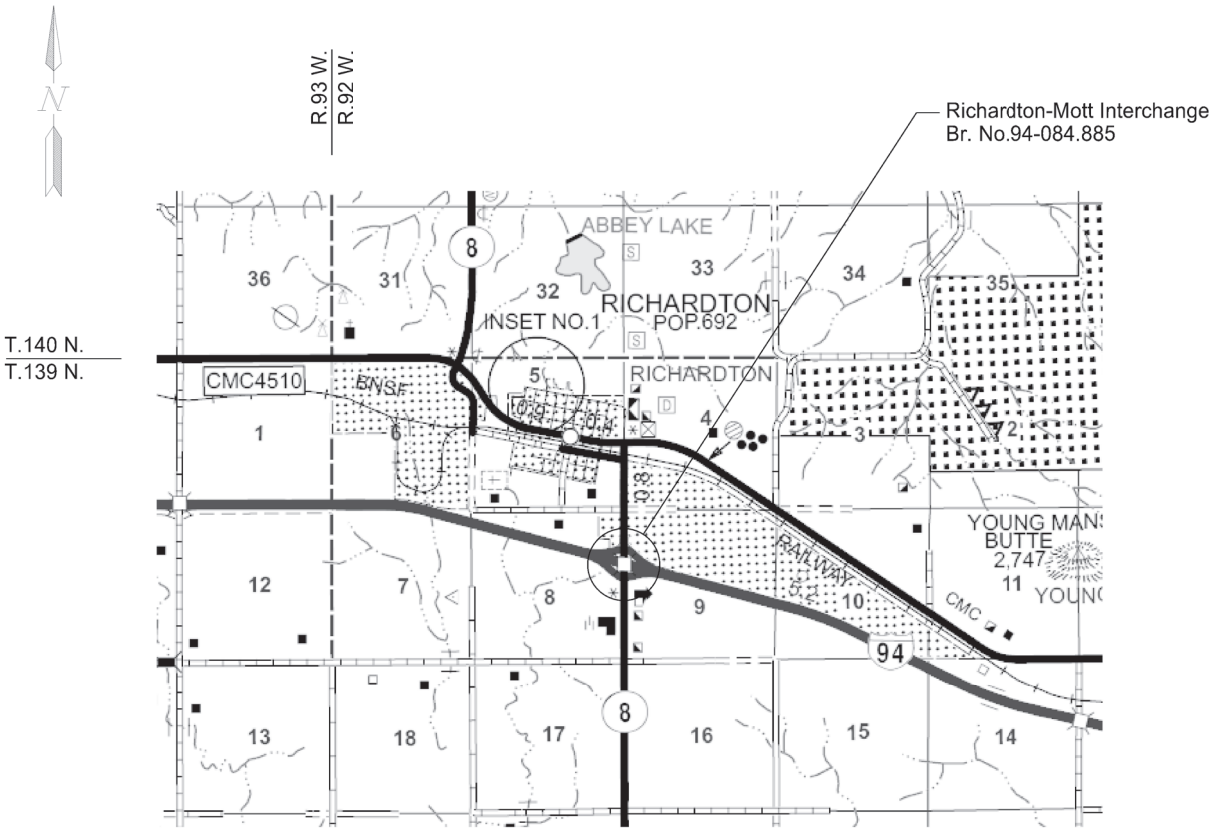
BRI-5-094(173)084

Stark County  
Richardton-Mott Interchange

Abutment Repairs, Erosion Repair, Concrete Spall Repairs

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

PROJECT NUMBER \ DESCRIPTION	NET MILES	GROSS MILES
BRI-5-094(173)084	N/A	N/A



STATE COUNTY MAP

ND DEPARTMENT OF TRANSPORTATION  
OFFICE OF PROJECT DEVELOPMENT

BRIDGE DIVISION

REGISTERED PROFESSIONAL ENGINEER  
JASON R. THORENSEN  
PE - 5048  
DATE 09/04/25  
NORTH DAKOTA

Jason Thorenson  
09/04/25

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			D-704-17	Sign Layout For One Lane Closure Two Lane Roadway					
			D-704-24	Shoulder Closures And Bridge Painting Layouts					
			D-704-50	Portable Sign Support Assembly					
SPECIAL PROVISIONS									
Number	Description								
SSP 2	Federal Migratory Bird Treaty Act								
SP 625(24)	Spall Repair								

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NOTES

704-P01 TEMPORARY TRAFFIC CONTROL: Provide traffic control consisting of a one lane closure with flagging or a shoulder closure. The traffic control device list has been developed using the layouts shown in the plans and the following layouts shown on the Standard Drawings. The Department will pay for all necessary deployed devices.

- D-704-17, for lane closure on Hwy 8
- D-704-24, Layout Type HH: Shoulder closure on I-94
- D-704024, Layout Type U: Shoulder closure on Hwy 8

704-P02 WORK ZONE TRAFFIC CONTROL PHASES: The device list and plan sheets have been developed based on the following phases:

Phase 1 – Lane closure:

A one lane closure has been provided for ND 8 to permit construction of the curb and spall repairs as well as deck crack sealing and silane application. Place signs and devices in accordance with Sec 100 Work Zone Traffic Control plan sheets based on D-704-17. Reduced speed and associated signs will remain up until all work on ND 8 is completed. Portable median barriers and attenuation devices are not required.

Provide one 12’ lane for traffic controlled by flaggers. During non-working hours, open to two lanes with a shoulder closure to protect curb and spall repairs.

Complete all work on one side of the structure before moving onto the other side.

Phase 2 – Shoulder closure:

A shoulder closure has been provided for the right shoulder of eastbound and westbound I-94 for erosion control work and pier maintenance. Place signs and devices in accordance with Sec 100 Work Zone Traffic Control plan sheets based on D-704-24 Type HH.

Phase 3 – Shoulder closure:

A shoulder closure has been provided for the inside shoulder of eastbound and westbound I-94 for center pier maintenance (special surface pier maintenance). Place signs and devices in accordance with Sec 100 Work Zone Traffic Control plan sheets based on D-704-24 Type U.



ESTIMATE OF QUANTITIES

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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SPEC	CODE	ITEM DESCRIPTION	UNIT	MAINLINE	TOTAL
-----	-----	-----	-----	-----	-----
103	0100	CONTRACT BOND	L SUM	1	1
203	0195	EMBANKMENT SPECIAL	L SUM	1	1
255	0201	TRM TYPE 1	SY	245	245
602	1250	PENETRATING WATER REPELLENT TREATMENT	SY	975	975
602	1260	BRIDGE DECK CRACK SEALING	LF	150	150
602	2105	CURB REPAIR	SF	4	4
602	7000	SPECIAL SURFACE FINISH	SF	1,650	1,650
624	3011	REMOVE & RESET DBL BOX BEAM RETROFIT - FREE STAND	LF	3	3
702	0100	MOBILIZATION	L SUM	1	1
704	0100	FLAGGING	MHR	200	200
704	1000	TRAFFIC CONTROL SIGNS	UNIT	2,607	2,607
704	1052	TYPE III BARRICADE	EA	4	4
704	1060	DELINEATOR DRUMS	EA	70	70
704	1067	TUBULAR MARKERS	EA	25	25
748	0540	CURB	LF	60	60
930	8644	SILICONE SEALANT	LF	19	19
930	9612	SPALL REPAIR	SF	39	39
930	9660	ABUTMENT REPAIR	L SUM	1	1
930	9665	BARRIER REPAIR	EA	3	3
950	9712	JOINT TREATMENT	LF	18	18



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
<b>ND</b>	<b>BRI-5-094(173)084</b>	<b>100</b>	<b>1</b>

SIGN NUMBER	SIGN SIZE	DESCRIPTION	AMOUNT REQUIRED				TOTAL AMOUNT REQUIRED	UNITS PER AMOUNT	UNITS SUB TOTAL
			BY PHASE NO.						
			1	2	3				
E5-1-48	48"x48"	EXIT GORE			1		1	35	35
G20-1-60	60"x24"	ROAD WORK NEXT __ MILES						28	
G20-1b-60	60"x24"	NO WORK IN PROGRESS (Sign and installation only)						18	
G20-2-48	48"x24"	END ROAD WORK	4	8	4		8	26	208
G20-4-36	36"x18"	PILOT CAR FOLLOW ME (Mounted to back of pilot car)						18	
G20-4b-36	36"x30"	WAIT FOR PILOT CAR						18	
G20-50a-72	72"x36"	ROAD WORK NEXT __ MILES RT & LT ARROWS						43	
G20-52a-72	72"x24"	ROAD WORK NEXT __ MILES RT or LT ARROW						36	
G20-55-96	96"x48"	SPEED LIMIT ENFORCED - MINIMUM FEE \$150 WHEN WORKERS PRESENT		8			8	59	472
M1-1-36	36"x36"	INTERSTATE ROUTE MARKER (Post and installation only)						11	
M1-4-24	24"x24"	U.S. ROUTE MARKER (Post and installation only)						10	
M1-5-24	24"x24"	STATE ROUTE MARKER (Post and installation only)						10	
M3-1-24	24"x12"	NORTH (Mounted on route marker post)						7	
M3-2-24	24"x12"	EAST (Mounted on route marker post)						7	
M3-3-24	24"x12"	SOUTH (Mounted on route marker post)						7	
M3-4-24	24"x12"	WEST (Mounted on route marker post)						7	
M4-8-24	24"x12"	DETOUR (Mounted on route marker post)						7	
M4-9-30	30"x24"	DETOUR ARROW RIGHT or LEFT/AHD AND RT or LT						15	
M4-10-48	48"x18"	DETOUR (INSIDE ARROW) RIGHT or LEFT (Mounted on barricade)						7	
M5-1-21	21"x15"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)						7	
M5-1-30	30"x21"	ADVANCE TURN ARROW RT or LT(Mounted on route marker post)						9	
M6-1-21	21"x15"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)						7	
M6-1-30	30"x21"	DIRECTIONAL ARROW RT or LT (Mounted on route marker post)						9	
M6-3-21	21"x15"	DIRECTIONAL ARROW UP (Mounted on route marker post)						7	
R1-1-48	48"x48"	STOP						32	
R1-2-60	60"x60"	YIELD						29	
R2-1-36	36"x48"	SPEED LIMIT __ (Portable only)	8		4		8	30	240
R2-1-48	48"x60"	SPEED LIMIT __		8			8	39	312
R2-1aP-24	24"x18"	MINIMUM FEE \$150 (Mounted on Speed Limit post)	4	4	2		4	10	40
R3-2-48	48"x48"	NO LEFT TURN						35	
R4-1-48	48"x60"	DO NOT PASS						39	
R4-7-48	48"x60"	KEEP RIGHT						39	
R5-1-48	48"x48"	DO NOT ENTER						35	
R6-1-54	54"x18"	ONE WAY RIGHT or LEFT (Mounted on STOP or DO NOT ENTER post)						14	
R7-1-12	12"x18"	NO PARKING ANY TIME						11	
R10-6-24	24"x36"	STOP HERE ON RED						16	
R11-2-48	48"x30"	ROAD CLOSED (Mounted on barricade)						12	
R11-2a-48	48"x30"	STREET CLOSED (Mounted on barricade)						12	
R11-3a-60	60"x30"	ROAD CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)						15	
R11-3c-60	60"x30"	STREET CLOSED __ MILES AHEAD LOCAL TRAFFIC ONLY (Mtd on barricade)						15	
R11-4a-60	60"x30"	STREET CLOSED TO THRU TRAFFIC (Mounted on barricade)						15	
W1-3-48	48"x48"	REVERSE TURN RIGHT or LEFT						35	
W1-4-48	48"x48"	REVERSE CURVE RIGHT or LEFT						35	
W1-4b-48	48"x48"	TWO LANE REVERSE CURVE RIGHT or LEFT						35	
W1-6-48	48"x24"	ONE DIRECTION LARGE ARROW						26	
W3-1-48	48"x48"	STOP AHEAD						35	
W3-3-48	48"x48"	SIGNAL AHEAD						35	
W3-4-48	48"x48"	BE PREPARED TO STOP						35	
W3-5-48	48"x48"	SPEED REDUCTION AHEAD	4	4	2		4	35	140
W4-2-48	48"x48"	LANE ENDS RIGHT or LEFT						35	
W5-1-48	48"x48"	ROAD NARROWS	4				4	35	140
W5-8-48	48"x48"	THRU TRAFFIC RIGHT LANE						35	
W5-9-48	48"x48"	ROAD WORK TRAFFIC ONLY DOWN & LT or RT ARROW						35	
W6-3-48	48"x48"	TWO WAY TRAFFIC						35	
W8-1-48	48"x48"	BUMP						35	
W8-3-48	48"x48"	PAVEMENT ENDS						35	
W8-7-48	48"x48"	LOOSE GRAVEL						35	
W8-11-48	48"x48"	UNEVEN LANES						35	
W8-12-48	48"x48"	NO CENTER LINE						35	
W8-17-48	48"x48"	SHOULDER DROP-OFF SYMBOL						35	
W8-53-48	48"x48"	TRUCKS ENTERING HIGHWAY						35	
W8-54-48	48"x48"	TRUCKS ENTERING AHEAD or __ FT or __ MILE						35	
W8-55-48	48"x48"	TRUCKS CROSSING AHEAD or __ FT or __ MILE						35	
W8-56-48	48"x48"	TRUCKS EXITING HIGHWAY						35	
W9-3a-48	48"x48"	CENTER LANE CLOSED SYMBOL						35	
W13-1P-30	30"x30"	__ MPH ADVISORY SPEED PLAQUE (Mounted on warning sign post)						14	
W14-3-64	64"x48"	NO PASSING ZONE						28	
W16-2P-30	30"x24"	__ FEET PLAQUE (Mounted on warning sign post)						10	
W20-1-48	48"x48"	ROAD WORK AHEAD or __ FT or __ MILE	4	8			8	35	280
W20-2-48	48"x48"	DETOUR AHEAD or __ FT or __ MILE						35	
W20-3-48	48"x48"	ROAD or STREET CLOSED AHEAD or __ FT or __ MILE						35	
W20-4-48	48"x48"	ONE LANE ROAD AHEAD or __ FT or __ MILE		8			8	35	280
W20-5-48	48"x48"	RIGHT or CENTER or LEFT LANE CLOSED AHEAD or __ FT or __ MILE						35	
W20-7-48	48"x48"	FLAGGER		8			8	35	280
W20-8-18	18"x18"	STOP - SLOW PADDLE Back to Back		8			8	5	40
W20-52P-54	54"x12"	NEXT __ MILES (Mounted on warning sign post)						12	
W21-1-48	48"x48"	WORKERS						35	
W21-2-48	48"x48"	FRESH OIL						35	
W21-3-48	48"x48"	ROAD MACHINERY AHEAD or __ FT or __ MILE						35	
W21-5-48	48"x48"	SHOULDER WORK						35	
W21-5a-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED						35	
W21-5b-48	48"x48"	RIGHT or LEFT SHOULDER CLOSED AHEAD or __ FT or __ MILE		2			2	35	70
				2			2	35	70

[illegible]

## SPECIAL SIGNS

### SPEC & CODE

704-1000	TRAFFIC CONTROL SIGNS	TOTAL UNITS	2607
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[illegible]

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



# Traffic Control Devices List

W5-1-48

RIGHT  
SHOULDER  
CLOSED

N

W3-5-48

SPEED  
LIMIT

55

W21-5bR-48

RIGHT  
SHOULDER  
CLOSED  
AHEAD

W20-1-48

ROAD  
WORK  
AHEAD

N

NOTE: See standard drawing D704-24 Type HH for device and sign spacing

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Work Zone Traffic Control

Abutment Repair

I-94/Mott-Richardton

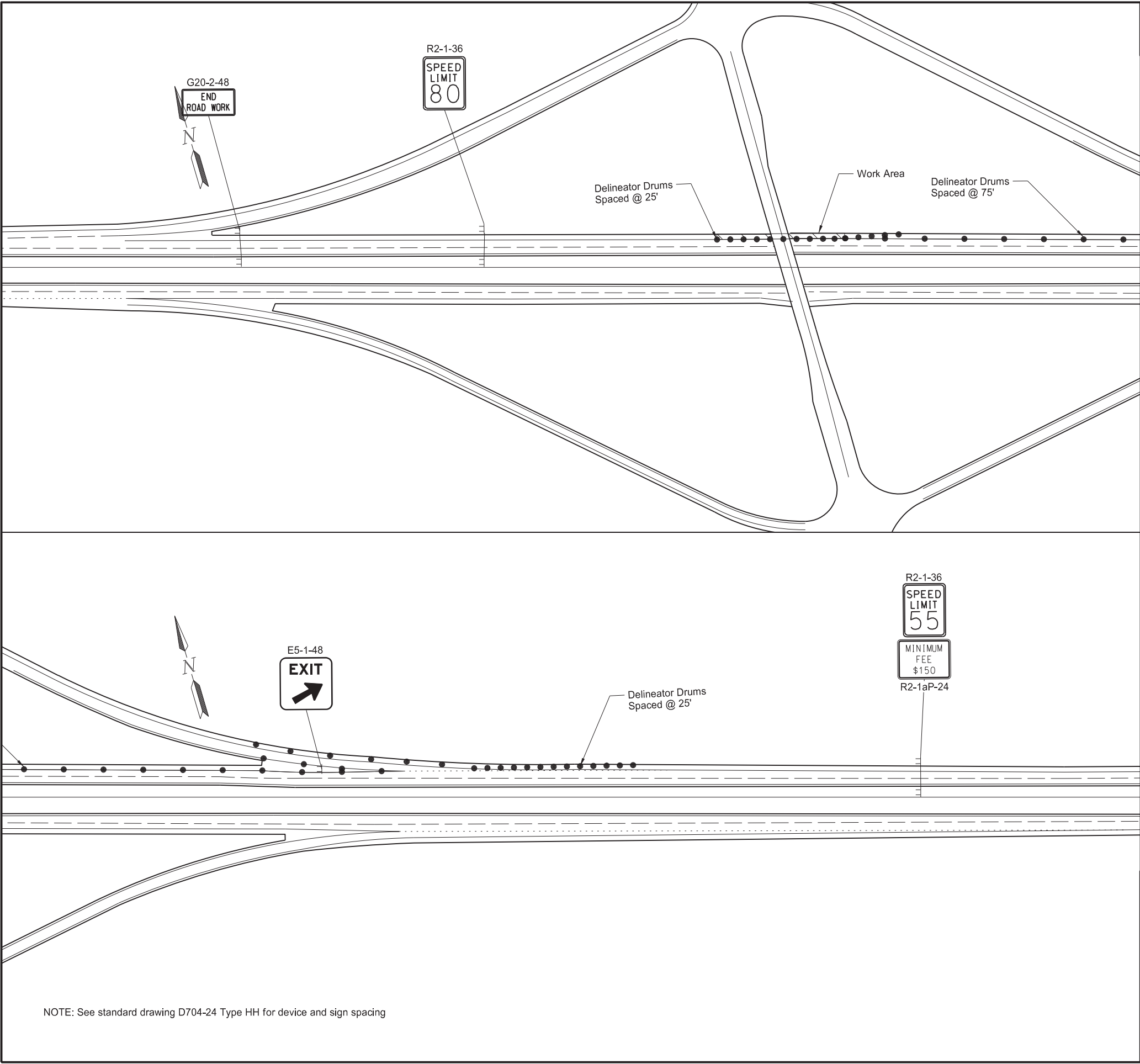
REGISTERED PROFESSIONAL ENGINEER

SARA A. CAHLIN

PE-8397

DATE 08/19/25

NORTH DAKOTA



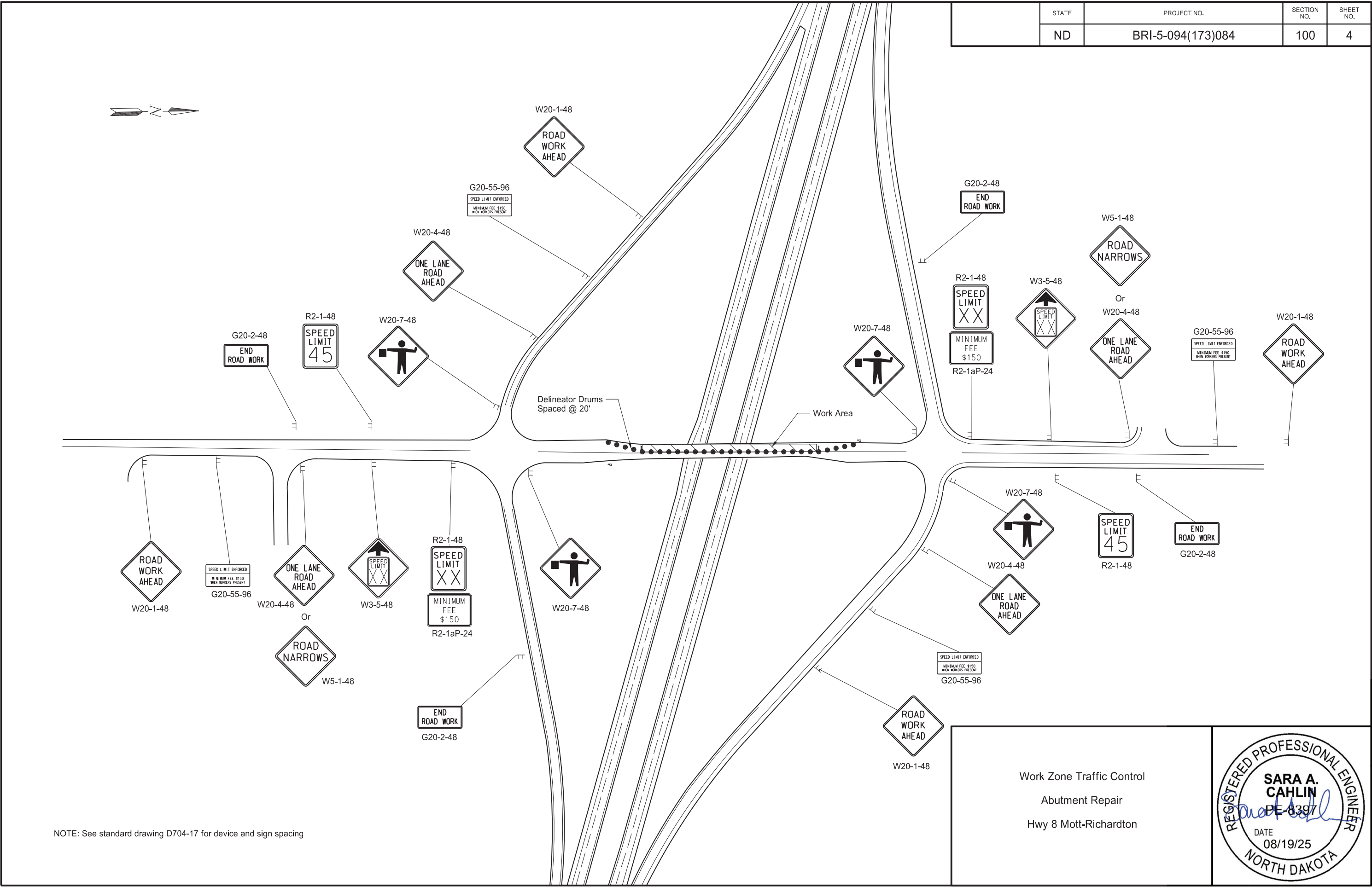
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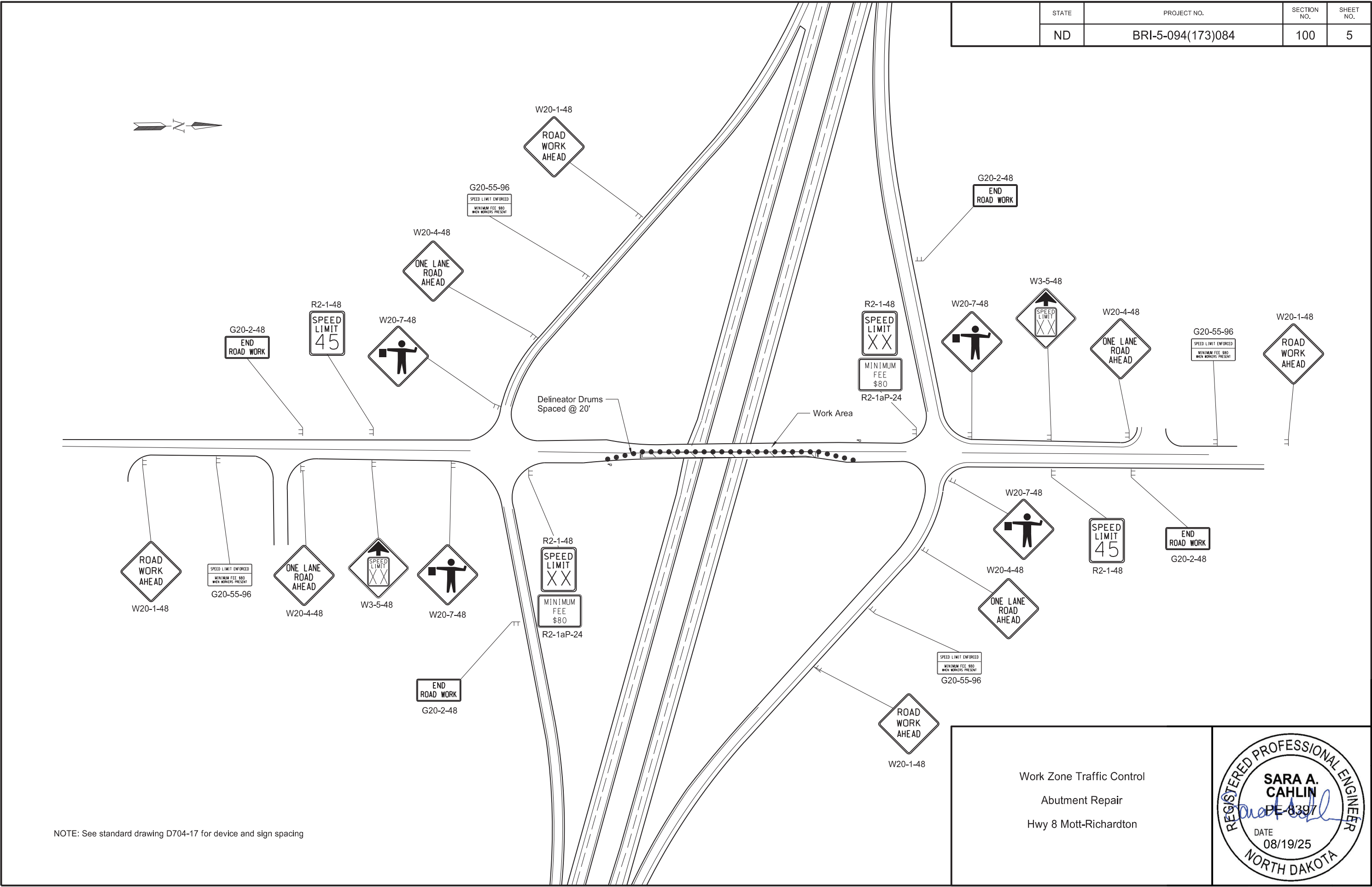
Work Zone Traffic Control

Abutment Repair

I-94/Mott-Richardton

REGISTERED PROFESSIONAL ENGINEER  
**SARA A. CAHLIN**  
PE-8397  
DATE 08/19/25  
NORTH DAKOTA





Work Zone Traffic Control

Abutment Repair

Hwy 8 Mott-Richardton

REGISTERED PROFESSIONAL ENGINEER

SARA A. CAHLIN

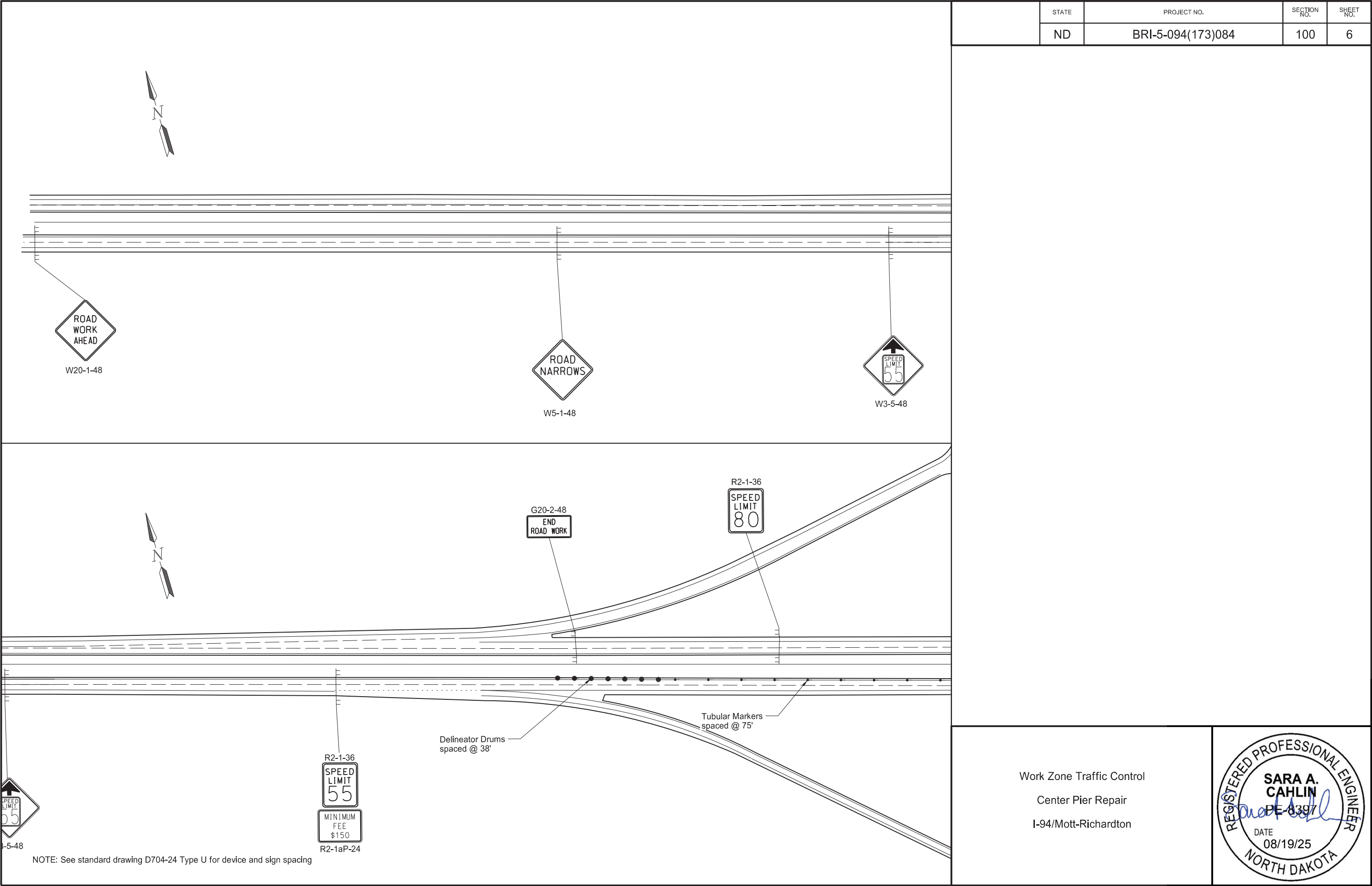
PE-8397

DATE

08/19/25

NORTH DAKOTA





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Work Zone Traffic Control

Center Pier Repair

I-94/Mott-Richardton

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRI-5-094(173)084	100	8



W20-1-48

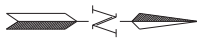


NOTE: See standard drawing D704-24 Type U for device and sign spacing

Work Zone Traffic Control  
Center Pier Repair  
I-94/Mott-Richardton

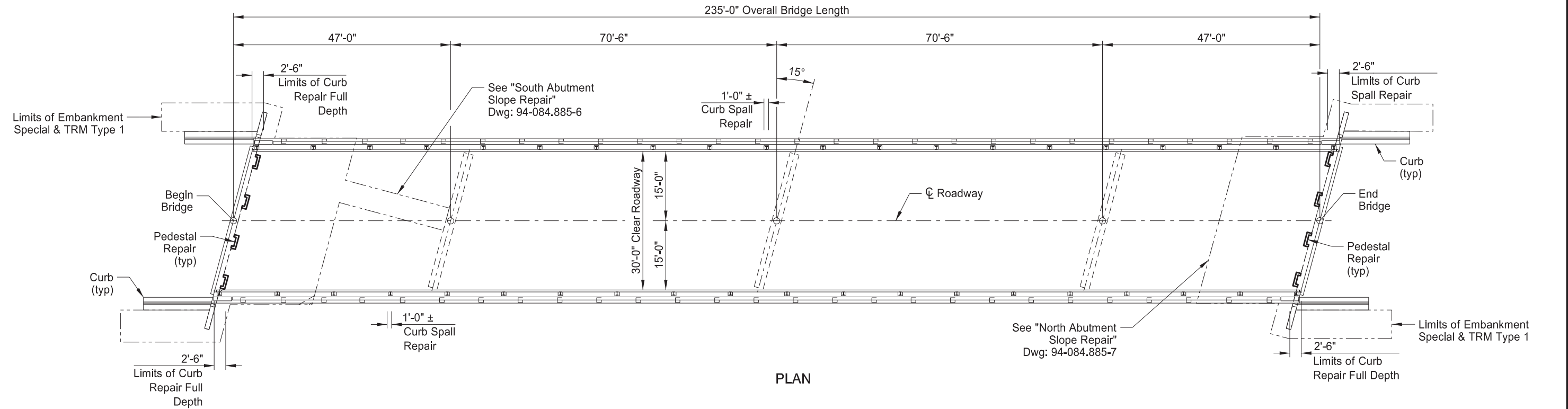






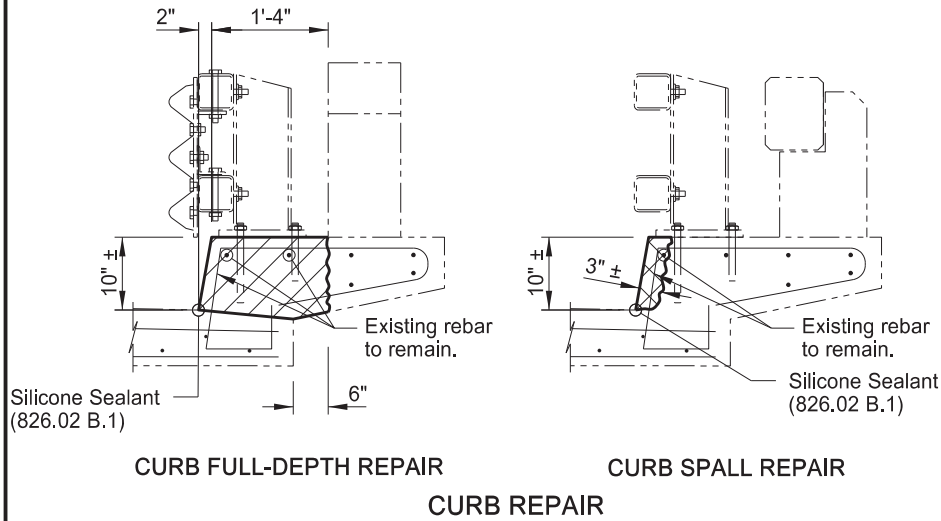
23 U.S.C. § 407 Documents  
NDDOT Reserves All Objections

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 Hatched area indicate concrete curb full depth repair limits.

 Hatched area indicate concrete curb spall repair.



BRIDGE BID ITEMS				UNIT	QUANTITY
SPEC	CODE	ITEM DESCRIPTION			
203	0195	EMBANKMENT SPECIAL		L SUM	1
255	0201	TRM TYPE I		SY	245
602	1250	PENETRATING WATER REPELLENT TREATMENT		SY	975
602	1260	BRIDGE DECK CRACK SEALING		LF	150
602	2105	CURB REPAIR		SF	4
602	7000	SPECIAL SURFACE FINISH		SF	1,650
624	3011	REMOVE & RESET DBL BOX BEAM RETROFIT - FREE STAND		LF	3
748	0540	CURB		LF	60
930	8644	SILICONE SEALANT		LF	19
930	9612	SPALL REPAIR		SF	39
930	9660	ABUTMENT REPAIR		L SUM	1
930	9665	BARRIER REPAIR		EA	3
950	9712	JOINT TREATMENT		LF	18



SPECIAL PROVISIONS	
SSP 2	MIGRATORY BIRD TREATY ACT
SP 625(24)	SPALL REPAIR
STANDARD DRAWINGS	
D-255-2, D-764-10	
RICHARDTON-MOTT INTERCHANGE	
BRIDGE LAYOUT	
ND DEPARTMENT OF TRANSPORTATION BRIDGE DIVISION	
 Jason Thorenson 09/08/25	
DRAWING NO.	94-084.885-1

23 U.S.C. § 407  
NDDOT Reserves All Objections

STATE

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2

NOTES

100

SCOPE OF WORK: Work at this site consists of the following:

- Abutment pedestal repairs
- Abutment spall repairs
- Curb spall repairs
- Curb full depth repairs
- Special Surface Finish of piers
- Miscellaneous joint sealing
- Bridge deck and curb crack sealing
- Erosion Repairs

203

EMBANKMENT SPECIAL: Place imported topsoil meeting Section 203.04 D.3 to repair areas of erosion and unvegetated soil around the bridge abutments.

Place and compact topsoil in lifts not exceeding 12 inches in areas of deeper channelized erosion. In the remaining unvegetated areas, distribute and grade a maximum of 6 inches of topsoil to facilitate vegetation establishment. It is anticipated that this work will require no more than 50 CY of imported topsoil.

The extents shown in the plans are approximations, the actual extents will be determined by the Engineer in the field.

Include all labor, equipment, and material to repair the embankment as described in the bid item “Embankment Special.”

255

TRM TYPE 1: After placing imported topsoil at the abutments, seed the topsoil with Class II seed mixture meeting Section 251.03 D. Prior to seeding, loosen the soil by means of a hand rake or drag. Place seed by broadcasting the area at a rate of 0.06 pounds per SY. After seeding, rake the area loosely to cover the seed. Install TRM Type 1 over the repaired embankment. The extents shown in the plans are approximations, the actual extents will be determined by the Engineer in the field. Include all labor, equipment, and material to seed and install the TRM in the bid item “TRM TYPE 1.”

602

WATER-WASHING EQUIPMENT: In addition to the water-washing equipment listed in Section 602.02 D., a cold water pressure washer that provides a minimum nozzle pressure of 3,000 psi may be used.

602

PENETRATING WATER REPELLENT TREATMENT: Apply penetrating water repellent to the driving surface of the bridge deck prior to crack sealing. Do not allow traffic on the driving surfaces until the solution has completely penetrated and the entire driving surface is dry. Additionally, apply penetrating water repellent to the front face and top surfaces of existing curbs after repairs have been made. The 21-day waiting period does not apply.

602

CRACK SEALING: After the penetrating water repellent has been applied and is dry, the Engineer will perform a visual inspection of the bridge deck and curbs to determine the need for crack sealing. Mark and repair all visible cracks on the top surface measuring 0.012" or greater in width at the widest segment or as directed by the Engineer.

Immediately before applying the sealer, clean the cracks by removing all dust and debris with compressed air. Seal the cracks with a two-part epoxy in accordance with the manufacturer’s recommendations. Chase crack with the sealant application to the limits of the crack, including those portions that are narrower than 0.012" wide. Use Paulco TE-2501 (Viking Paints, Inc.), Dural 50 LM (Euclid Chemical Co.), TK-9000 or TK-2110 (TK Products), or an approved equal epoxy sealer.

Include all work and materials associated with the bridge deck and curb crack sealing in the bid item “Bridge Deck Crack Sealing.”

602

SPECIAL SURFACE FINISH: Remove any hardware attached to the surfaces to receive the special surface finish, or protect it in place during cleaning and coating. Reset any removed hardware after coating is complete.

Clean the surfaces that are to receive the Tex-Cote surface finish using sandblasting, shot blasting, or water-washing equipment to remove all dirt, grease, oil, efflorescence, and laitance. Ensure that all surfaces receiving the Tex-Cote surface finish are properly prepared by removing any curing compounds, release agents, existing coatings, contaminants, or other materials that may interfere with adhesion.

Apply Tex-Cote XL 70 Bridge Cote with Silane to the areas listed below. Apply the surface finish in accordance with the manufacturer’s recommended application procedures to attain a dry film thickness of 15 mils.

- All exposed pier surfaces, including the top of the pier caps.

Finish the surface with a uniform texture, color, and appearance free from fins, projections, cavities, and porous areas. Use a sand textured finish matching the color of the existing surface finish.

602

CURB SPALL REPAIR: The bridge barrier curb has areas of spalled and deteriorated concrete, as indicated in the table below. Actual repair limits will be determined and marked by the Engineer.

Repair the areas marked for curb repair in accordance with the Special Provision for Spall Repairs. After the repairs are completed, seal the curb flow line in the areas of repair with silicone sealant meeting 826.02 B.1.

Include all labor, equipment, and materials required to perform the work as specified in the bid item “Curb Repair.” A minimum of 1 SF will be paid at each location.

CURB SPALL REPAIR				
LOCATION	PICTURE	DIMENSIONS (FT)		TOTAL (SF)
		LENGTH	WIDTH	
Post 4 (East)	1	1	1	1
Post 10 (West)	2	1	1	1
NW Bridge Corner	3	2.5	0.83	2

REGISTERED PROFESSIONAL ENGINEER

DUSTIN WING

PE-7128

DATE 09/04/25

NORTH DAKOTA

9/4/2025 8:49:31 AM

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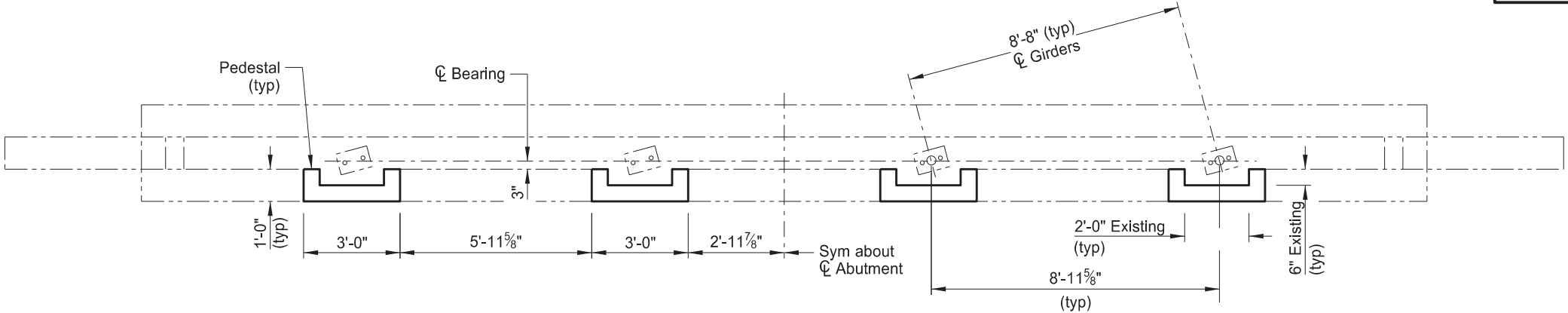
		23 U.S.C. § 407 NDDOT Reserves All Objections	STATE	PROJECT NO.	SECTION NO.	SHEET NO.
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<div>NOTES</div>						
624	<p>REMOVE &amp; RESET RETROFIT: Prior to performing the Curb Full-Depth Repairs, remove the existing double box beam retrofit as needed, along with one thrie beam rail section, including associated blocks and hardware, to access the repair areas. The existing guardrail posts will remain in place. After completing the repairs, reset the double box beam retrofit including new anchor bolts in accordance with Section 624 and the thrie beam in accordance with Section 764 and D-764-10.</p> <p>A quantity of 1 LF of remove and reset will be paid per repair location, regardless of the actual length of rail removed.</p> <p>Include all labor, equipment, and materials required to perform the work as specified in the bid item “Remove &amp; Reset Double Box Beam Retrofit – Free Stand.”</p>					
748	<p>CURB FULL-DEPTH REPAIR: The existing concrete curb is damaged at three corners of the bridge ends. The length of this full-depth curb repair is limited to 2’-6” along the curb.</p> <p>Prior to beginning full-depth repairs, remove the existing double box beam retrofit as outlined in the “Remove &amp; Reset Retrofit” note to provide adequate access to the repair areas.</p> <p>Sawcut the concrete a minimum depth of 1” around the removal perimeter as shown in the plans. Remove the concrete in a manner that prevents any damage to the parts of the structure to remain. Use Class AAE-3 or AAE-5 concrete in accordance with Section 602 to restore the curb to its original dimensions. After the repairs are completed, seal the curb flow line in the areas of repair with silicone sealant meeting 826.02 B.1. Include all labor, equipment, and materials required to perform the work as specified in the bid item “Barrier Repair.”</p>					
748	<p>CURB: Construct concrete curb on top of existing HMA pavement as shown in the plans to direct runoff away from the bridge ends. The existing HMA pavement is covered in approximately 3” of gravel and road debris. Prior to constructing the curb, remove the gravel and road debris and clean the exposed HMA with waster washing equipment.</p> <p>Use Class AE-3 concrete in accordance with Section 602 and Grade 60 reinforcing steel in accordance with Section 612.</p> <p>Drill ½” hole through the existing HMA for installation of the vertical #4 x 2’–0” reinforcing bars through the pavement. Drive the vertical bars through the pavement and base until 4” remains above the existing HMA pavement. Anchor the #4 longitudinal bar into the backside of the abutment according to manufacturer’s instructions with a high strength adhesive specifically intended for concrete anchorage and that meets the requirements of Section 806.02. Embed the longitudinal bars 9” into the abutment.</p> <p>Include all costs for curb installation in the unit price bid for “Curb.”</p>					
930	<p>SPALL REPAIR: The structure has areas of spalled and deteriorated concrete as shown in the plans. The limits shown are approximations. Actual limits will be determined and marked by the Engineer. Spall repairs that affect the existing 1” joint between the endbeam and the abutment, as shown in the original plan detail, must restore the original joint using 1”x3” preformed expansion joint material in accordance with Section 826.02 C. Repair the areas marked for spall repair in accordance with the Special Provision for Spall Repairs.</p>					
930	<p>SILICONE SEALANT: Seal the joints between the median pier protection and the median pier columns. Clean the joints of all foreign material before the new backer rod and silicone sealant, in accordance with Sec 826.02 B, are installed. Include all materials, labor, and equipment required to clean the joint and install the silicone sealant in the bid item “Silicone Sealant.”</p>					
930	<p>ABUTMENT PEDESTAL REPAIR: The concrete pedestals have varying levels of cracking and spalling. This work involves removing damaged concrete and reinforcing the concrete bearing pedestals as shown in the plans.</p> <p>Remove all loose and unsound concrete. Use care during the removal of concrete to ensure no damage is done to the remaining structure. The extent of the removal is to be determined by the Engineer in the field.</p> <p>Install the “5BH800” bars into the abutment according to manufacturer’s instructions with a high strength adhesive specifically intended for concrete anchorage and that meets the requirements of Section 806.02. Embed the “5BH800” 9” into the abutment.</p> <p>Use Class AE-3 concrete in accordance with Section 602 and Grade 60 reinforcing steel in accordance with Section 612.</p> <p>Include all labor equipment and materials needed to repair the pedestals in the lump sum bid item “Abutment Repair.”</p>					
950	<p>JOINT TREATMENT: This work involves waterproofing the vertical joints between the abutment wingwalls and the bridge end backwall.</p> <p>Excavate and install a 18” wide waterproof membrane, in accordance with Sec 602.03 C, centered on the back side of the joint. Ensure the membrane extends to a minimum of 6 inches below the bottom of the joint. If expansive foam is encountered on the backside of the joint, cut the foam flush with the concrete surfaces before attaching the membrane.</p> <p>After installing the membrane, backfill in lifts not exceeding 6 inches (loose thickness). Compact each lift using a jumping jack compactor to match the original conditions.</p> <p>Include all labor, materials, and equipment required to install the neoprene membrane in the price bid for “Joint Treatment.”</p>					



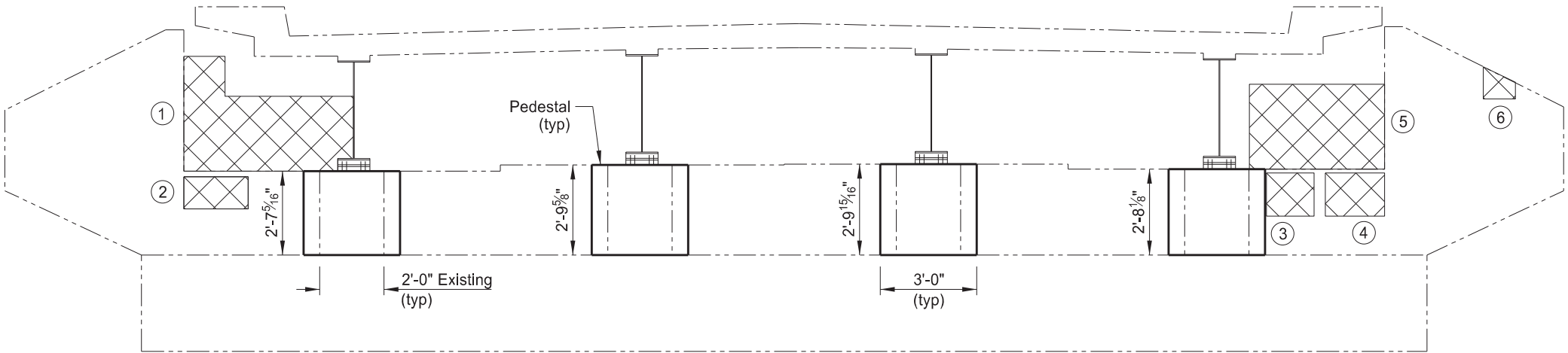
23 U.S.C. § 407 Documents  
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRI-5-094(173)084	170	4

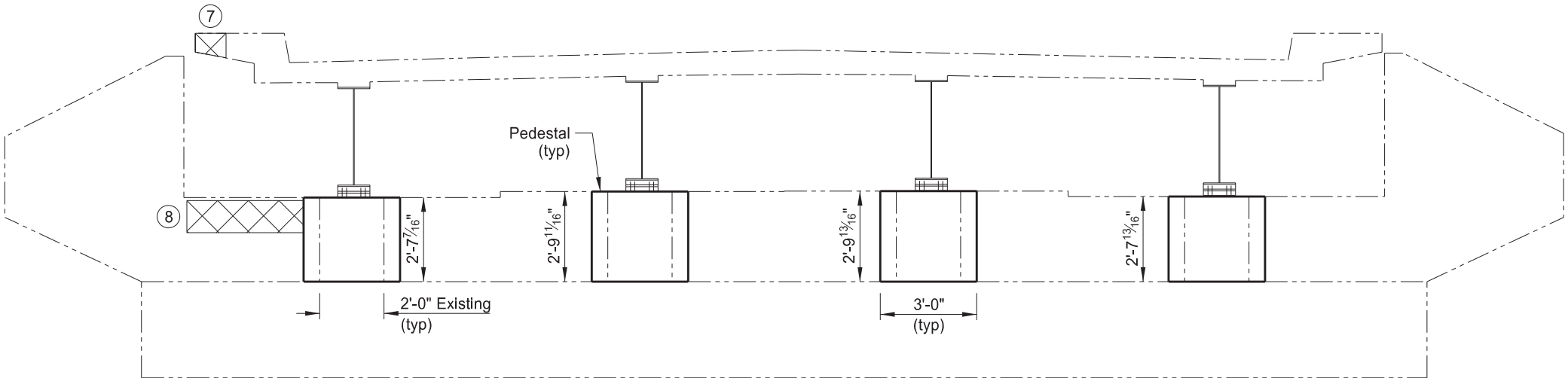
SPALL REPAIR	
LOCATION	QUANTITY (SF)
1 - NW Abutment Backwall	14
2 - NW Abutment	2
3 - NE Abutment	3
4 - NE Abutment	2
5 - NE Abutment Backwall	12
6 - NE Wingwall	1
7 - SE End of Bridge Curb	1
8 - SE Abutment	4



NORTH ABUTMENT PLAN

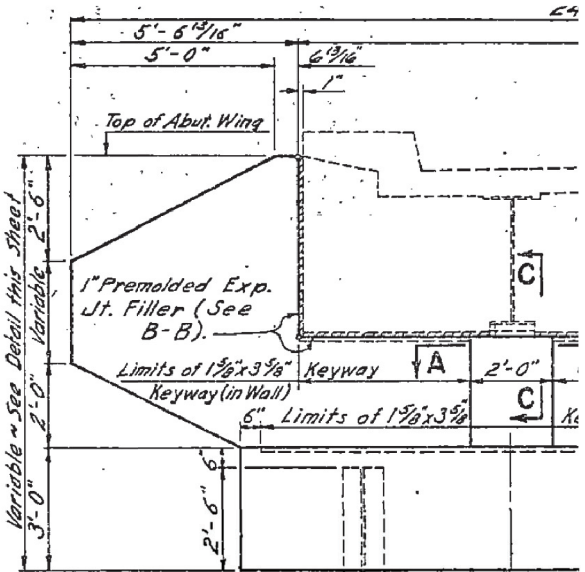


(FACING NORTH)  
NORTH ABUTMENT ELEVATION



(FACING SOUTH)  
SOUTH ABUTMENT ELEVATION

Hatched areas indicate spall repair.



This detail from original plans is included for informational purposes only.

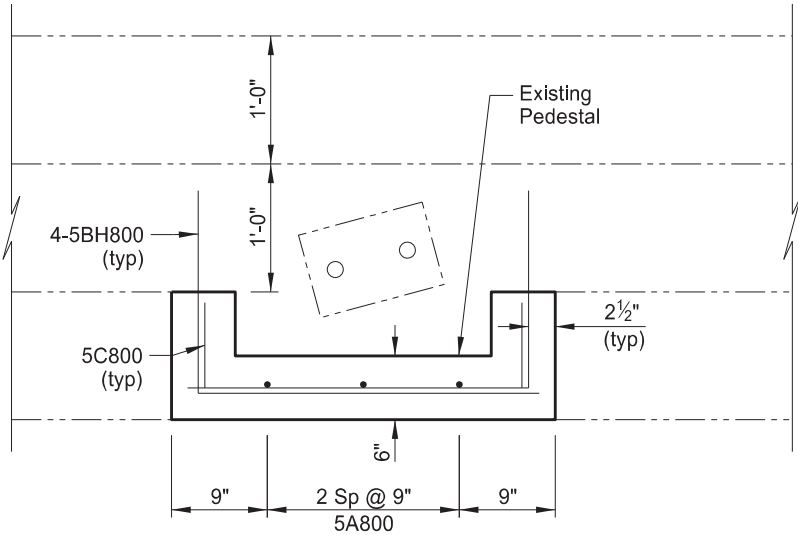


QUANTITIES	
SEE DWG 94-084.885-5	
RICHARDTON-MOTT INTERCHANGE	
ABUTMENT PEDESTAL REPAIR	
DRAWING NO.	94-084.885-4

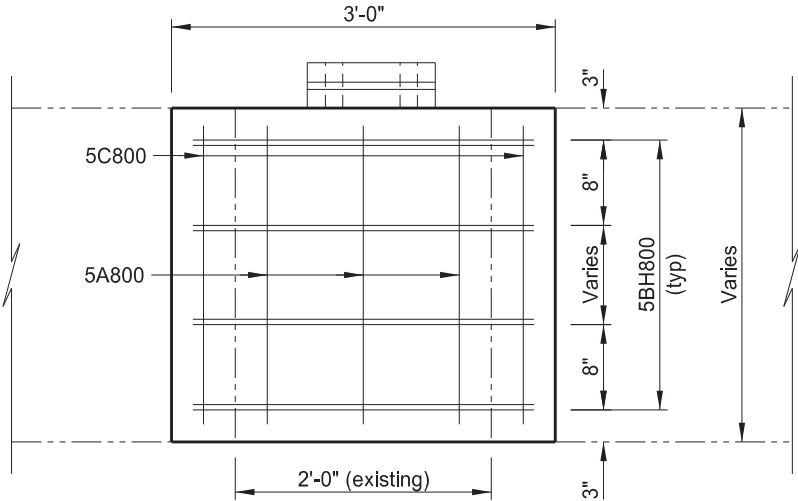


23 U.S.C. § 407 Documents  
NDDOT Reserves All Objections

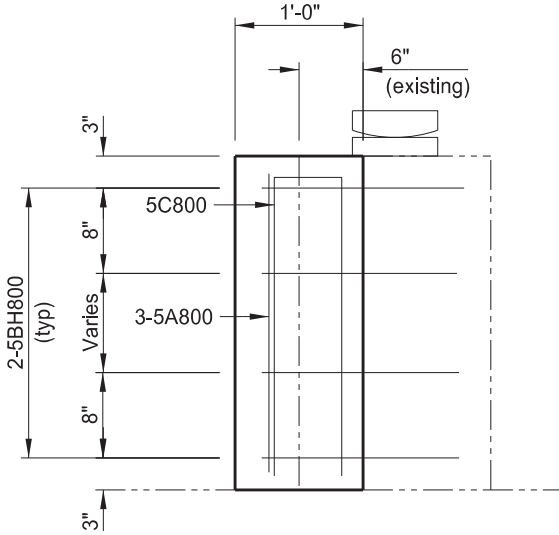
STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRI-5-094(173)084	170	5



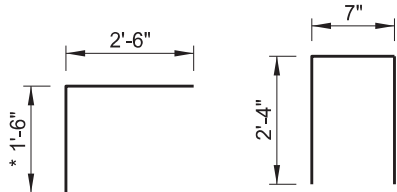
PEDESTAL PLAN



PEDESTAL ELEVATION



PEDESTAL SIDE VIEW



BH800      \*\*C800

BENT BAR DETAILS

\* Embed 9" with Epoxy Resin Adhesive meeting Section 806.02.  
\*\* Place open end down.

BAR LIST ~ ONE PEDESTAL

SIZE	MARK	NO.	LENGTH
5	A800	3	2'-6"
5	C800	2	5'-3"
5	BH800	8	4'-0"

ESTIMATED MATERIAL QUANTITIES

REINFORCING STEEL (LBS)	CONCRETE (CY)
53	0.2



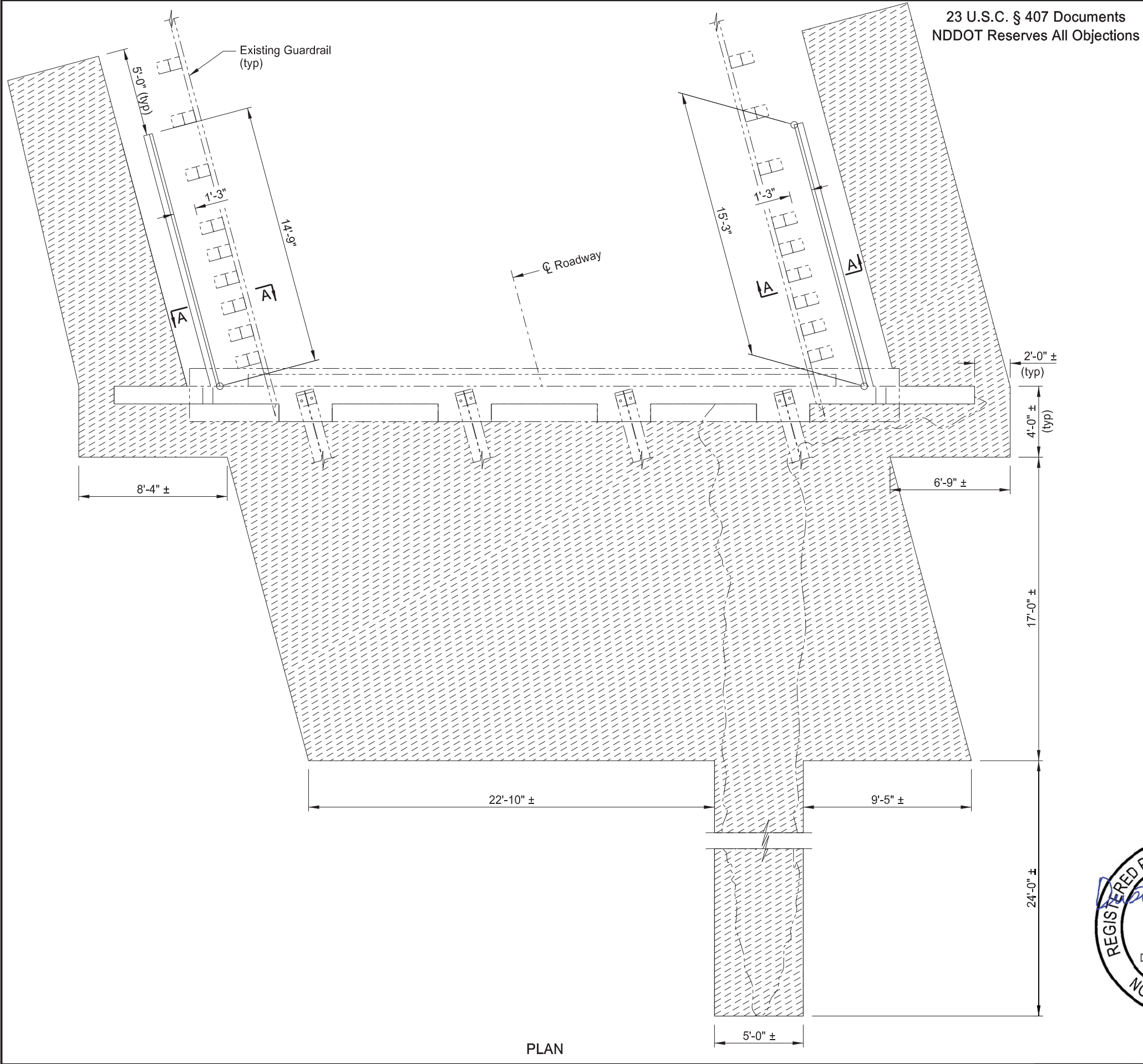
QUANTITIES

SPALL REPAIR	39 SF
ABUTMENT REPAIR	1 L SUM

RICHARDTON-MOTT INTERCHANGE

ABUTMENT PEDESTAL REPAIR

DRAWING NO.	94-084.885-5
-------------	--------------



STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRI-5-094(173)084	170	6

Guardrail Post

1'-3"

6"

2" R

2"

Concrete Curb

Existing Ground

#4 Bar Placed as Shown  
(2'-0" Lap Splice, if Required)

#4 x 2' - 0" Long  
Spaced @ 2'-0" Center to Center

(NEW CONCRETE CURB)  
A-A

Embankment Special & TRM Type 1

QUANTITIES	
EMBANKMENT SPECIAL	0.65 LS
TRM TYPE 1	130 SY
CURB	30 LF

RICHARDTON-MOTT INTERCHANGE

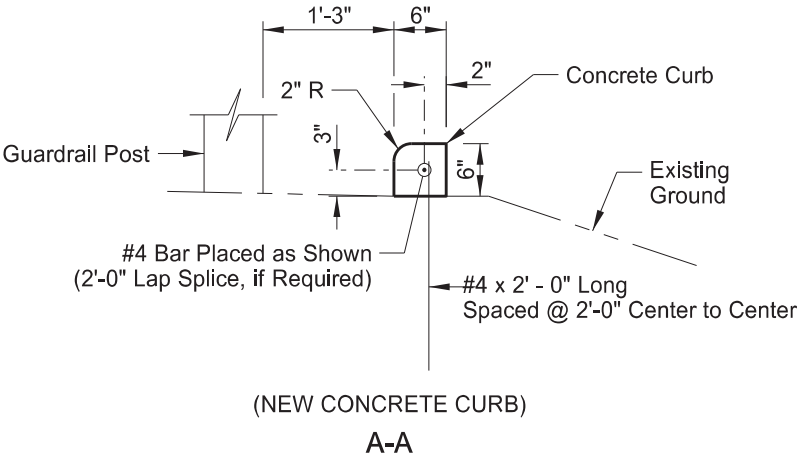
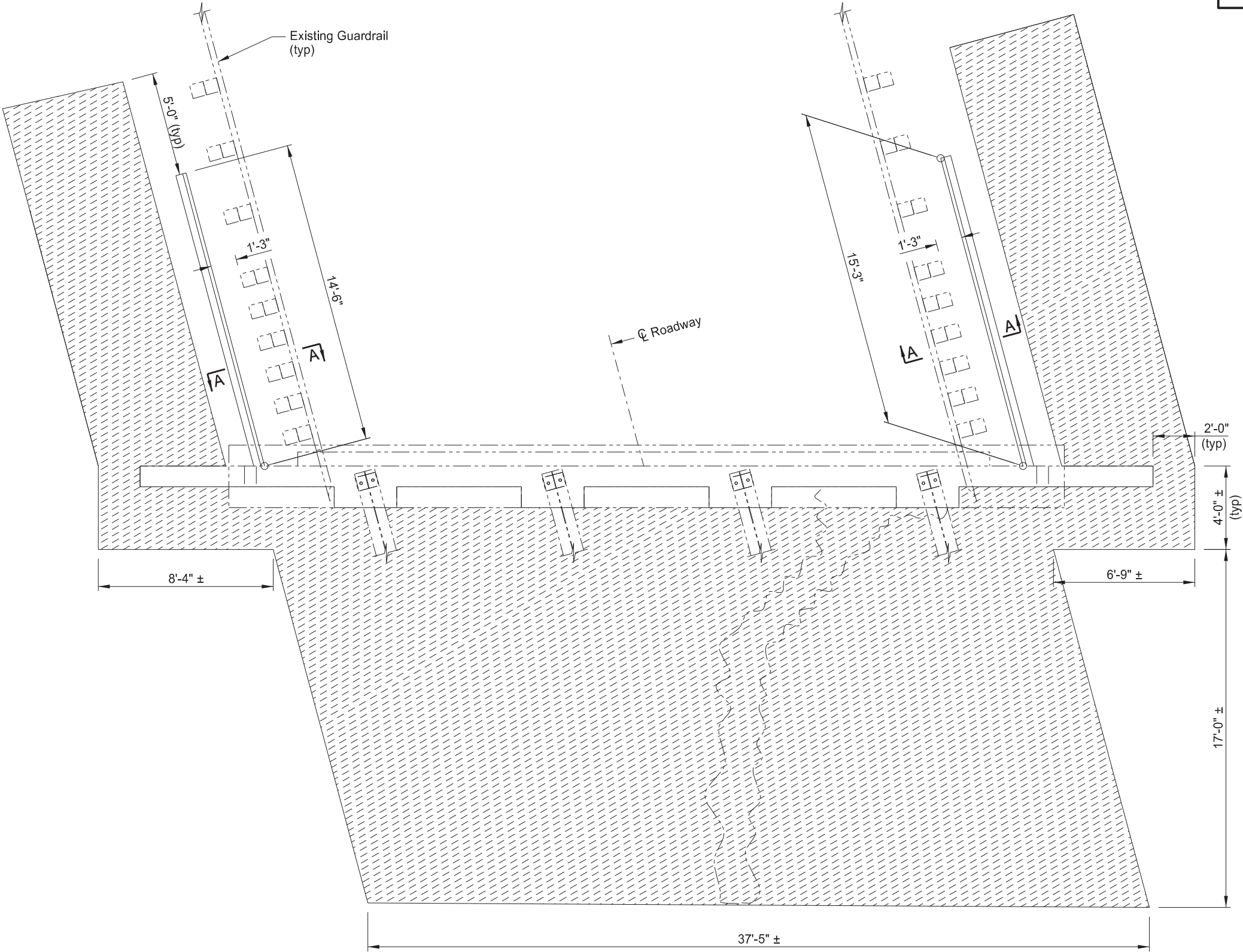
SOUTH ABUTMENT SLOPE REPAIR

DRAWING NO. 94-084.885-6

REGISTERED PROFESSIONAL ENGINEER  
DUSTIN WING  
PE-7128  
DATE 09/04/25  
NORTH DAKOTA

23 U.S.C. § 407 Documents  
NDDOT Reserves All Objections

STATE	PROJECT NO.	SECTION NO.	SHEET NO.
ND	BRI-5-094(173)084	170	7



Embankment Special &  
TRM Type 1

QUANTITIES	
EMBANKMENT SPECIAL	0.35 LS
TRM TYPE 1	115 SY
CURB	30 LF
RICHARDTON-MOTT INTERCHANGE	
NORTH ABUTMENT SLOPE REPAIR	
DRAWING NO.	94-084.885-7

NDDOT ABBREVIATIONS

D-101-1

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

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12-18-20	General Revisions
08-16-22	General Revisions
04-14-25	General Revisions





NDDOT ABBREVIATIONS

D-101-2

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

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08-16-22	General Revisions
04-14-25	General Revisions



NDDOT ABBREVIATIONS

D-101-3

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

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NDDOT ABBREVIATIONS

D-101-4

MEASUREMENTS

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

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

SURVEY DESCRIPTIONS

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

SOIL TYPES

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

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NDDOT UTILITY COMPANY AND ORGANIZATION ABBREVIATIONS

D-101-10

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

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

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

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

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

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

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





LINE STYLES

D-101-20

Existing Topography

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

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

Proposed Topography

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

Existing Utilities

	E	Existing Electrical
	FO	Existing Fiber Optic Line
	FO	Existing TV Fiber Optic
	G	Existing Gas Pipe
	OH	Existing Overhead Utility Line
	P	Existing Power
	PL	Existing Fuel Pipeline
	PL	Existing Undefined Above Ground Pipe Line
	SAN	Existing Sanitary Sewer
	SAN FM	Existing Sanitary Force Main
	SD	Existing Storm Drain
	SD FM	Existing Storm Drain Force Main
		Existing Culvert
	T	Existing Telephone Line
	TV	Existing TV Line
	W	Existing Water or Steam Line
		Existing Under Drain
		Existing Slotted Drain
		Existing Conduit
		Existing Conductor
		Existing Down Guy Wire Down Guy
		Existing Underground Vault or Lift Station

Proposed Utilities

	24 Inch Pipe
	Reinforced Concrete Pipe
	Under Drain
	Edge Drain

Traffic Utilities

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

Sign Structures






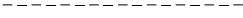







	Existing Overhead Sign Structure
	Existing Overhead Sign Structure Cantilever
	Overhead Sign Structure Cantilever

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION		
07-01-14 REVISIONS		
DATE	CHANGE	
09-23-16 12-18-20	Added and Revised Items, Organized by Functional Groups General Revisions	



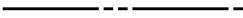
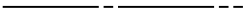
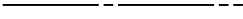




LINE STYLES

D-101-21

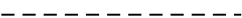
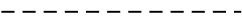
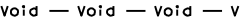





Right Of Way

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







Boundary Control


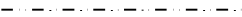
	Existing City Corporate Limits or Reservation Boundary
	Existing State or International Line
	Existing Township
	Existing County
	Existing Section Line
	Existing Quarter Section Line
	Existing Sixteenth Section Line
	Existing Centerline
	Tangent Line

Cross Sections and Typicals



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

Geotechnical



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

	Subgrade Reinforcement
	Failure Line







Countours

	Depression Contours
	Supplemental Contour


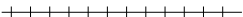

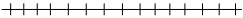
Profile

	Subgrade, Subcut or Ditch Grade
	Topsoil Profile










Striping

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








Pavement Joints

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




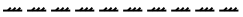
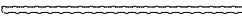
Bridge Details

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

Erosion Control

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

Environmental

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

NORTH DAKOTA  
DEPARTMENT OF TRANSPORTATION

07-01-14

REVISIONS

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

KIRK J. HOFF

REGISTERED

PROFESSIONAL

PE-4683

ENGINEER

NORTH DAKOTA

12 18 2020


SYMBOLS

D-101-30


 North Arrow (Half Scale)


 Alignment Data Point

 Alignment Monument


 Spot Elevation

 Existing Miscellaneous Spot

 Existing Access Control Arrow

 Existing Benchmark

 Reset USGS Marker

 Iron Monument Found

 Iron Pin R/W Monument

 Property Corner

 Iron Pin Reference Monument


   Right of Way Marker (Exst, Ppsd, Reset)


 Existing Federal Reference Corner

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


 Existing Witness Corner


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


 Existing Traverse PI Aerial Panel


 Existing Reference Marker Point NGS

 Existing EFB Misc

 Existing Bush or Shrub


 Existing Large Evergreen Tree

 Existing Small Evergreen Tree

 Existing Large Tree

 Existing Small Tree

 Existing Tree Trunk

 Cairn or Stone Circle


 Existing Artifact


 Existing Satellite Dish

 Existing Weather Station

 Existing Windmill or Tower


 Reinforced Pavement


 Continuous Split Barrel Sample

 Flight Auger Sample

 Split Barrel Sample

 Thinwall Tube Sample

 Standard Penetration Test

 Inclinometer Tube

 Excavation Unit

 Existing Ground Water Well Bore Hole

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

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REGISTERED

PROFESSIONAL

PE-4683

ENGINEER

NORTH DAKOTA


12 18 2020

## SYMBOLS

D-101-31

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

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



















































































12 18 2020




SYMBOLS


D-101-32

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

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



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



12 18 2020

SYMBOLS

D-101-33

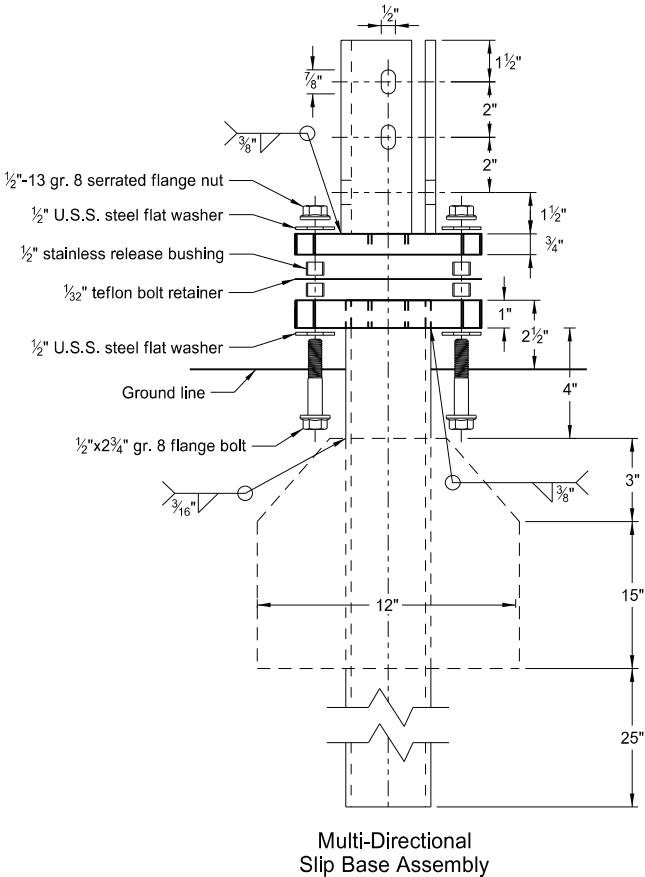
			Existing Manhole (Electrical, Gas, Telephone)		Cap or Stub Exst Gas, Exst Sanitary, Exst Storm Drain, Ppsd Storm Drain, Exst Water
			Water Manhole (Exst, Exst with Valve)		Existing Pedestal Electrical, Telephone, Fiber Optic Telephone, TV, Fiber Optic TV, Undefined
			Sanitary Sewer Manhole (Exst, Ppsd,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

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

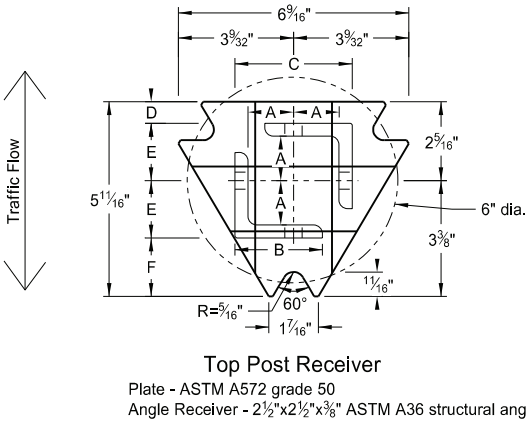
KIRK J. HOFF  
REGISTERED  
PROFESSIONAL  
PE-4683  
ENGINEER  
NORTH DAKOTA  
12 18 2020

BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-7



Perforated Tube



Notes:

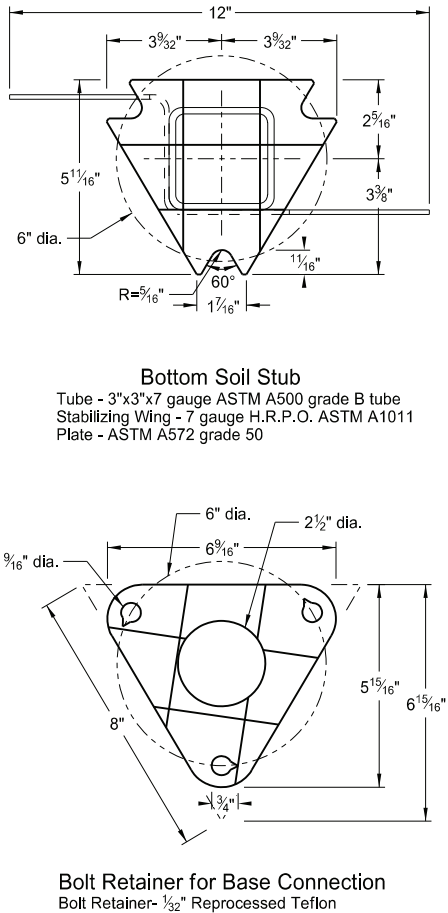
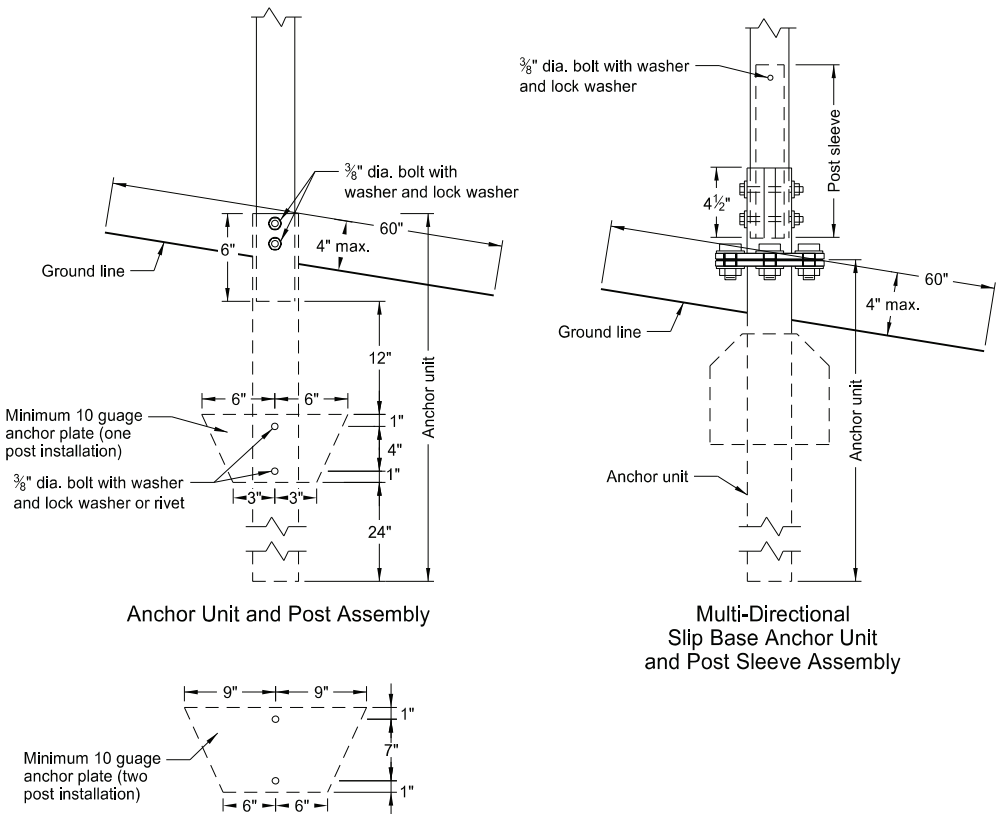
1. Torque slip base bolts as specified by manufacturer.
2. Use anchor with 43.9 KSI yield strength and 59.3 KSI tensile strength.
3. Provide 4" vertical clearance for anchor or breakaway base. Measure the 4"x60" measurement above and below post location and back and ahead of post.
4. In concrete sidewalk,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

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

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

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

- (A) Use breakaway base when support is placed in weak soils. Engineer determines if soils are weak.
- (B) For additional wind load, insert the 2 3/16"x10 ga. into 2 1/2"x10 ga.



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

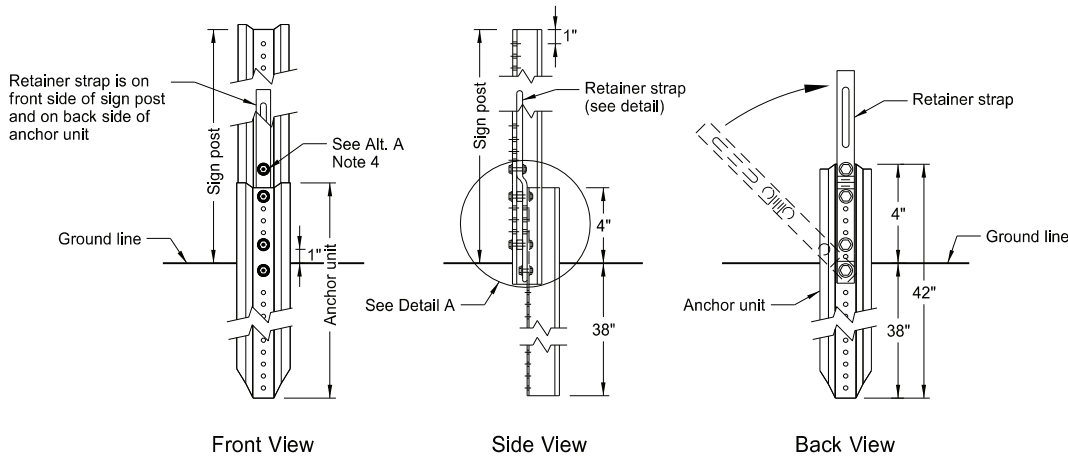
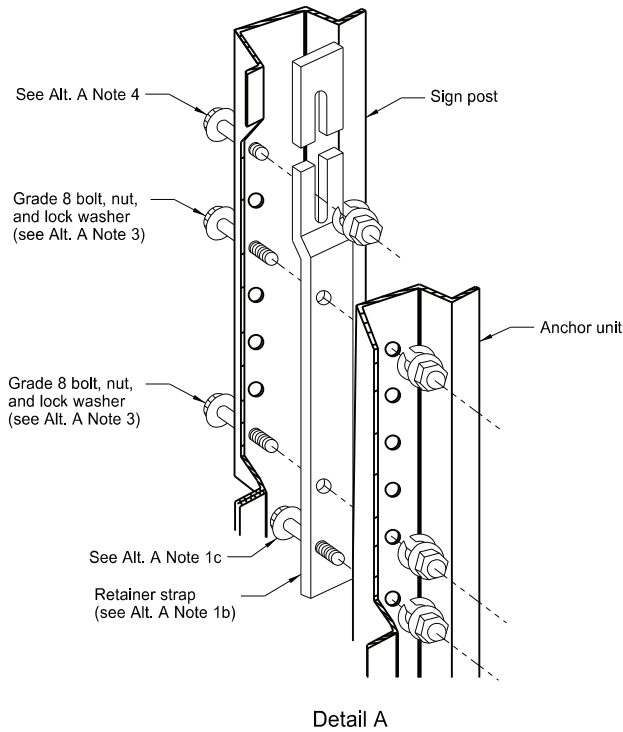


08/01/24

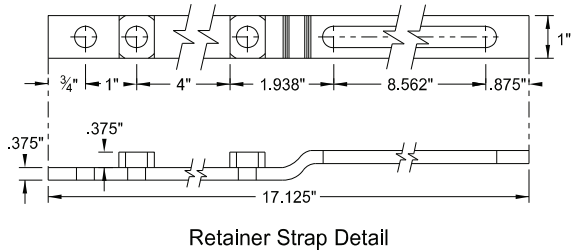
BREAKAWAY SYSTEMS FOR CONSTRUCTION ZONE SIGNS

D-704-8

U-Channel Post

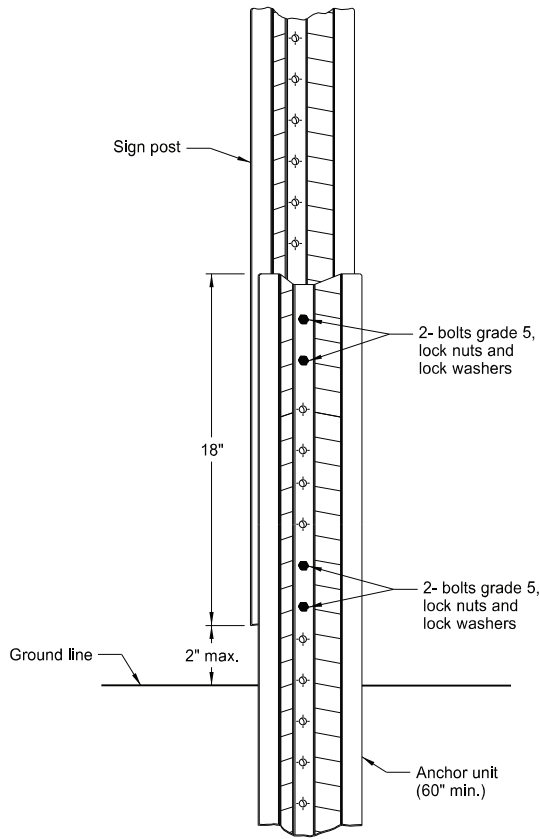


Breakaway U-Channel Detail  
Alternate A  
Install a maximum of 2 posts within 7'.

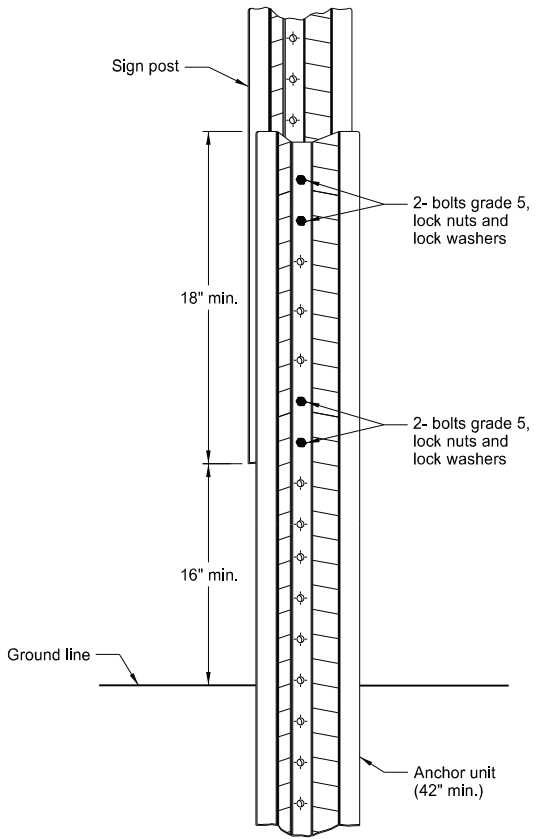


Alternate A Steps of Installation:

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



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



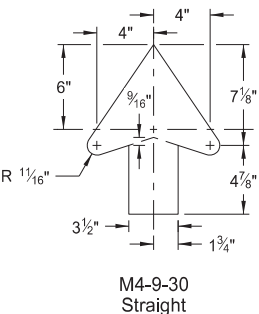
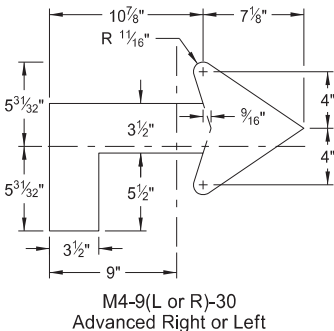
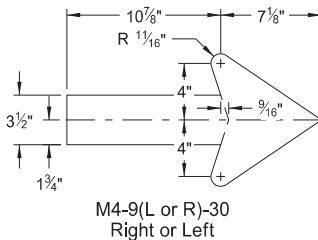
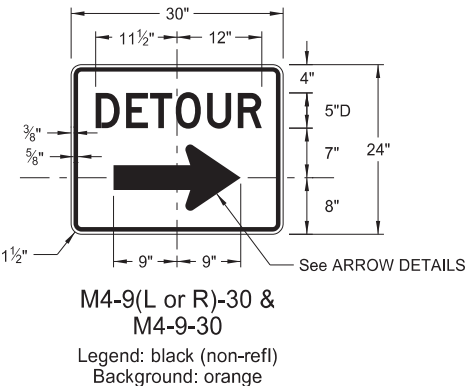
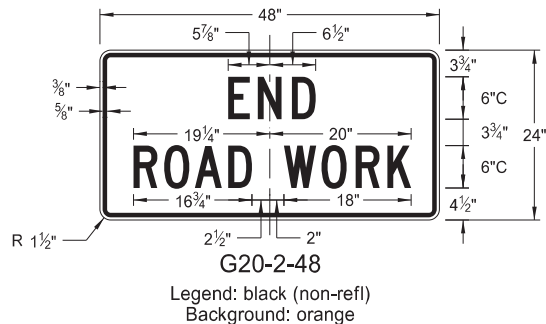
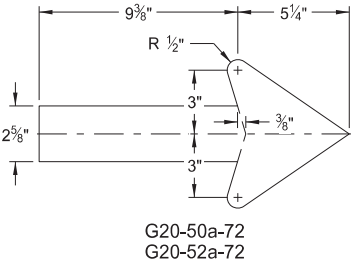
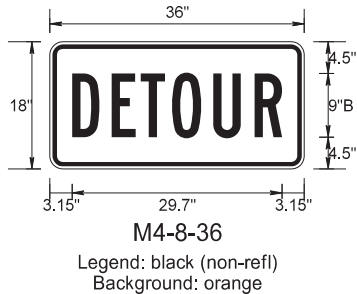
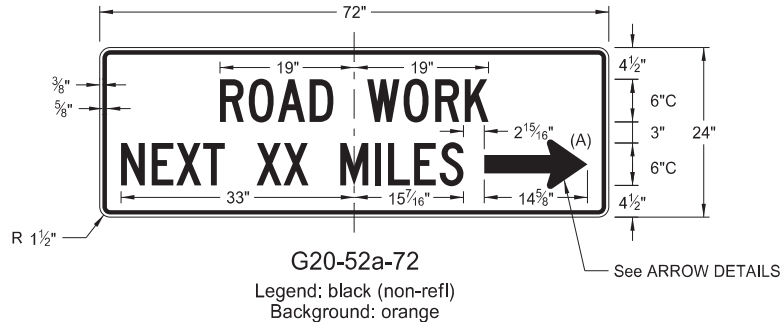
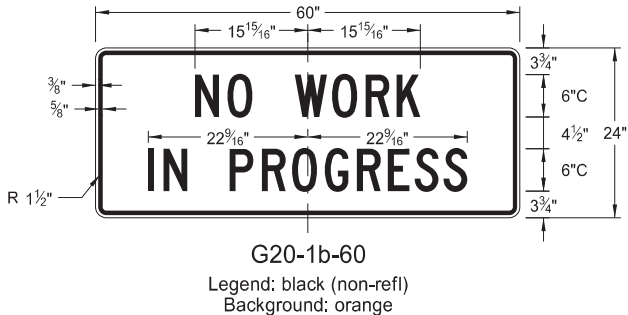
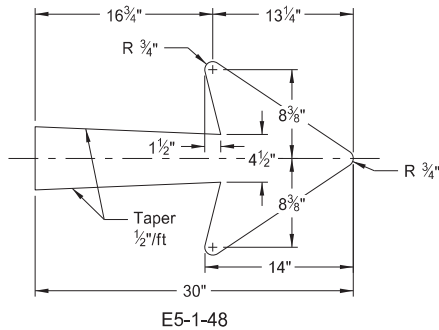
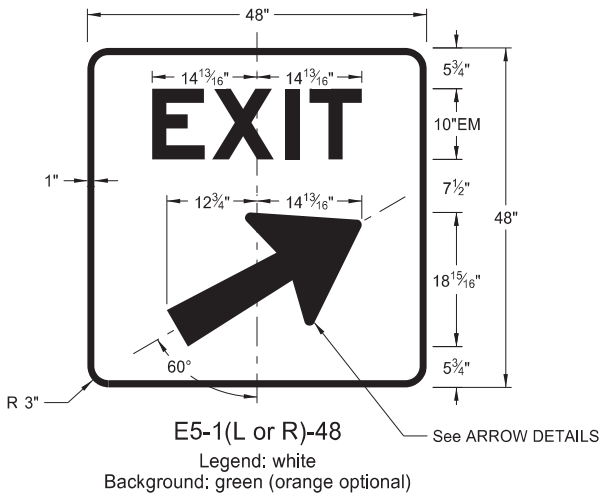
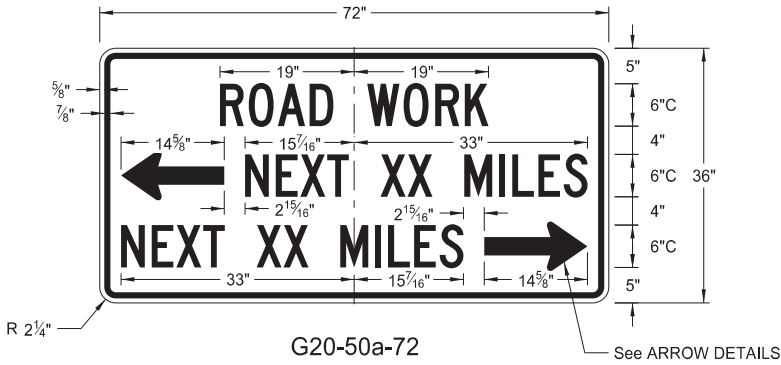
Breakaway U-Channel Splice Detail  
Alternate C  
(2.5 and 3 lb/ft)  
Install a maximum of 3 posts within 7'.

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



08/01/24

CONSTRUCTION SIGN DETAILS  
TERMINAL AND GUIDE SIGNS



ARROW DETAILS

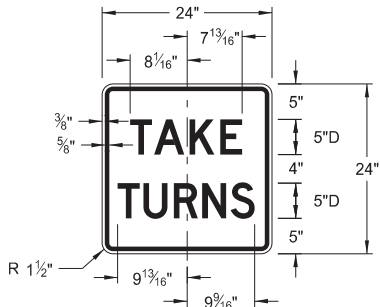
- NOTES:
- (A) Arrow may be right or left of the legend to indicate construction to the right or left.

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

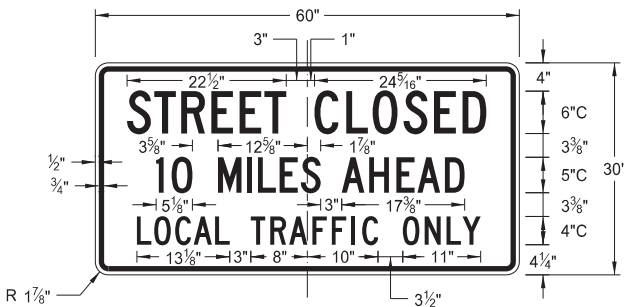


CONSTRUCTION SIGN DETAILS  
REGULATORY SIGNS

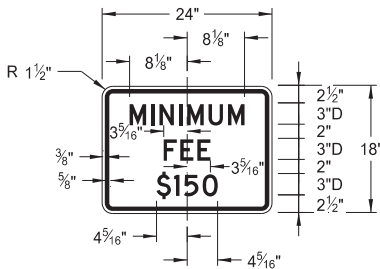
D-704-10



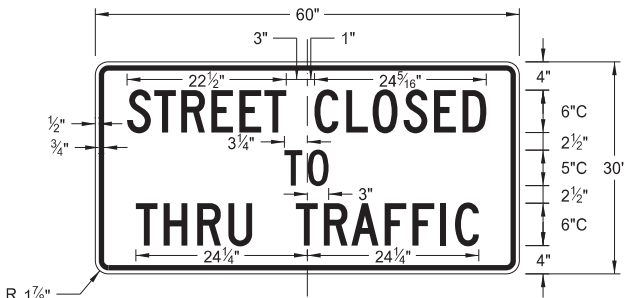
R1-50P-24  
Legend: black (non-refl)  
Background: white



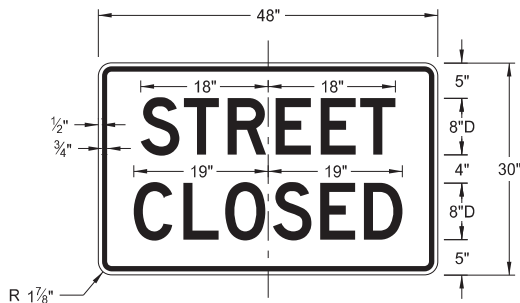
R11-3c-60  
Legend: black (non-refl)  
Background: white



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



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



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

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

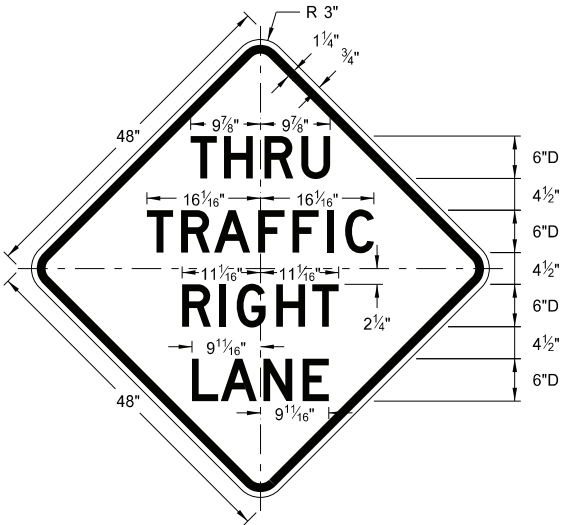




CONSTRUCTION SIGN DETAILS  
WARNING SIGNS

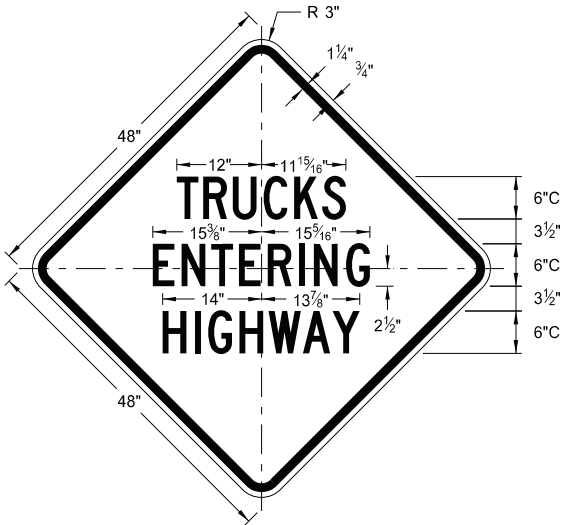
WORD	LETTER SPACING
AHEAD	Standard
200 FT	Standard
350 FT	Standard
500 FT	Standard
1000 FT	Reduce 40%
1500 FT	Reduce 40%
½ MILE	Reduce 50%
1 MILE	Standard

\* DISTANCE MESSAGES



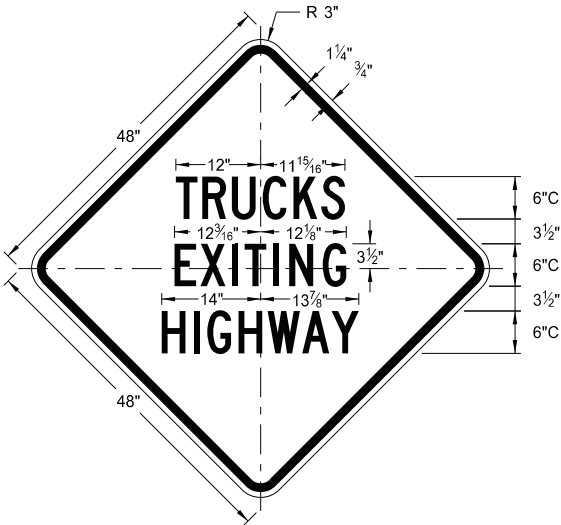
W5-8-48

Legend: black (non-refl)  
Background: orange



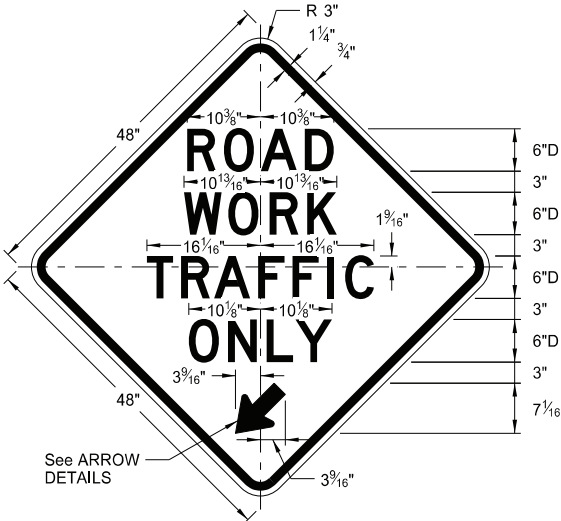
W8-53-48

Legend: black (non-refl)  
Background: orange



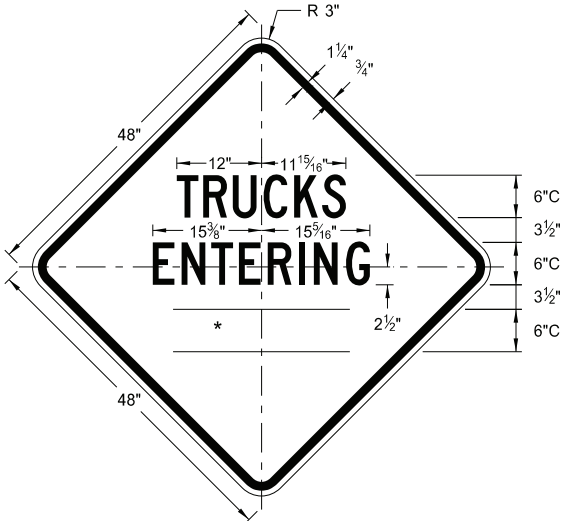
W8-56-48

Legend: black (non-refl)  
Background: orange



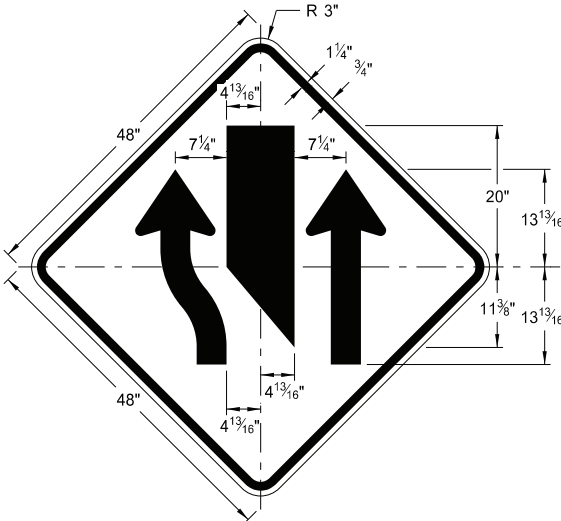
W5-9-48

Legend: black (non-refl)  
Background: orange



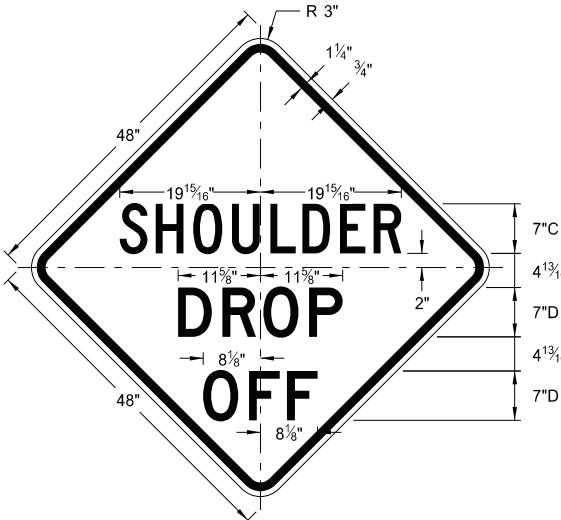
W8-54-48

Legend: black (non-refl)  
Background: orange



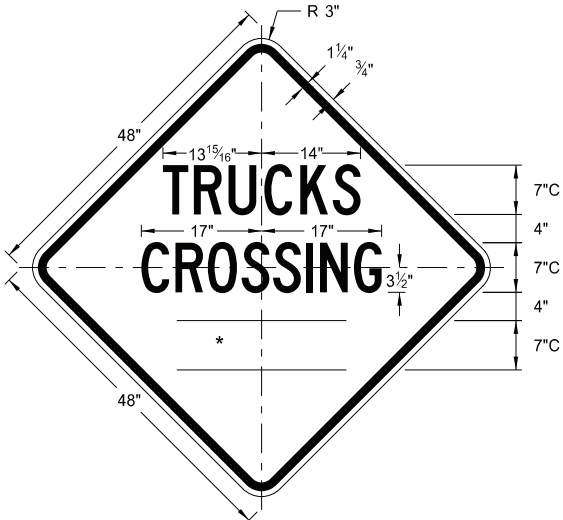
W9-3a-48

Legend: black (non-refl)  
Background: orange



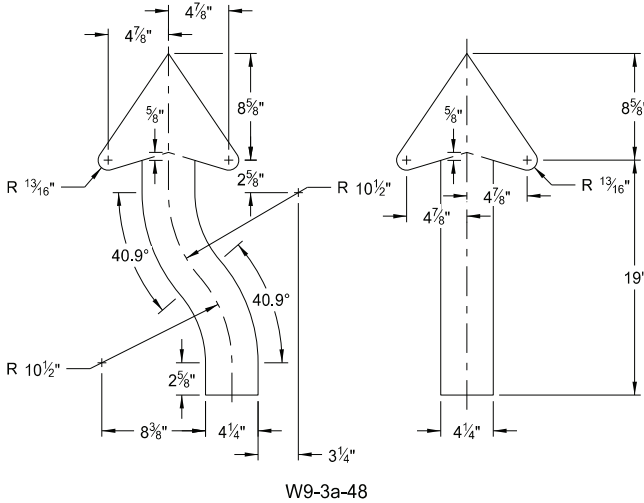
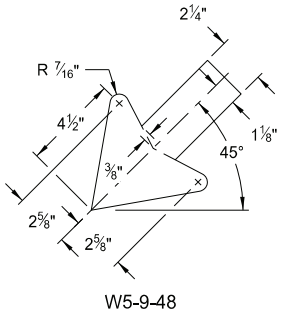
W8-9a-48

Legend: black (non-refl)  
Background: orange



W8-55-48

Legend: black (non-refl)  
Background: orange



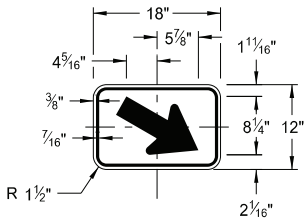
ARROW DETAILS

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

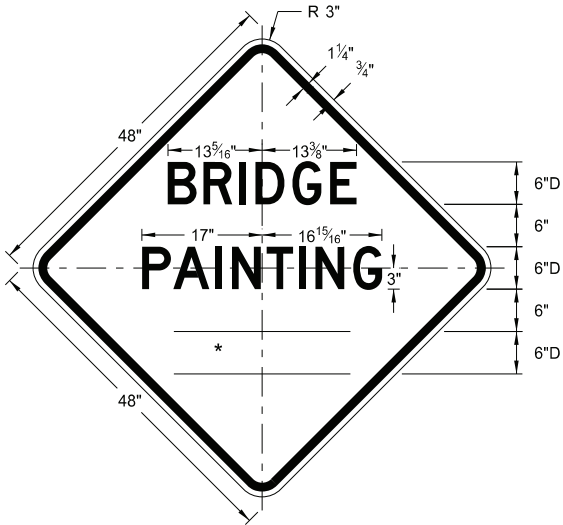


08/01/24

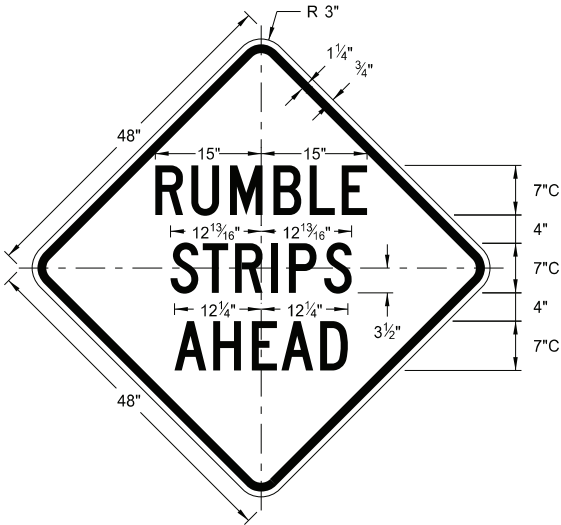
CONSTRUCTION SIGN DETAILS  
WARNING SIGNS



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



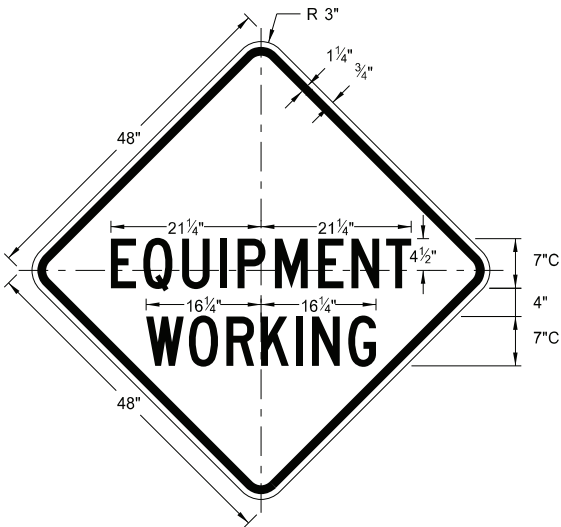
W21-50-48  
Legend: black (non-refl)  
Background: orange



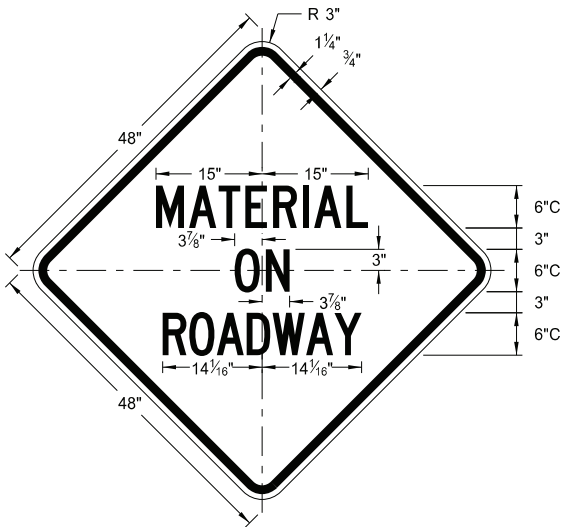
W21-53-48  
Legend: black (non-refl)  
Background: orange

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

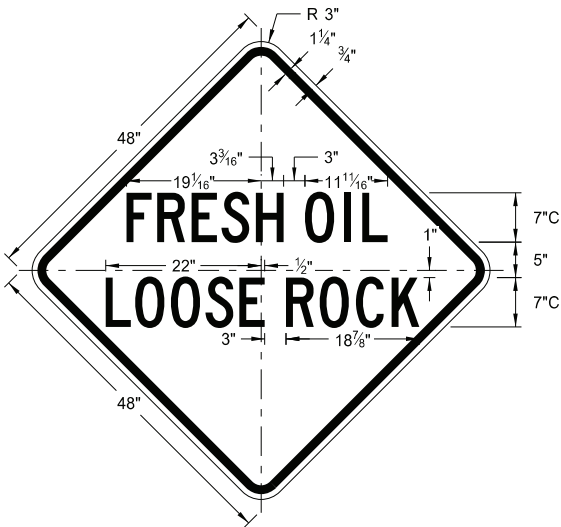
\* DISTANCE MESSAGES



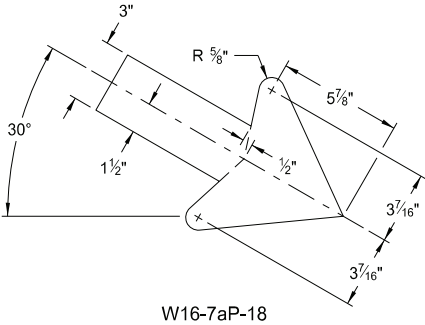
W20-51-48  
Legend: black (non-refl)  
Background: orange



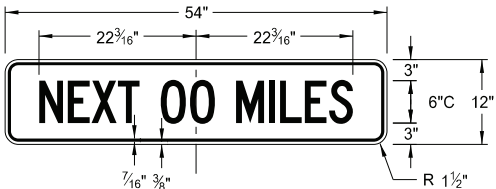
W21-51-48  
Legend: black (non-refl)  
Background: orange



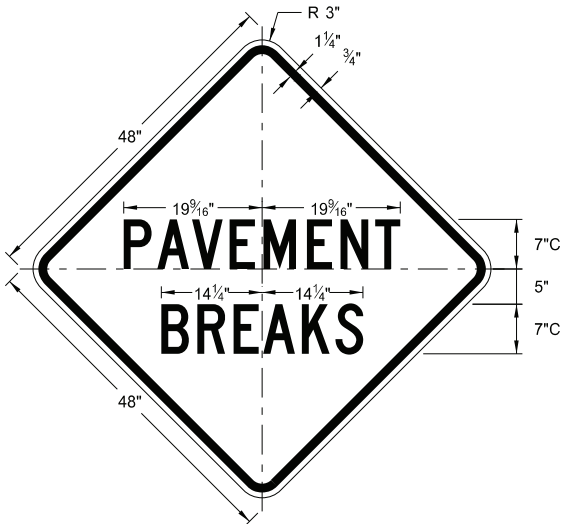
W22-8-48  
Legend: black (non-refl)  
Background: orange



W16-7aP-18



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



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

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

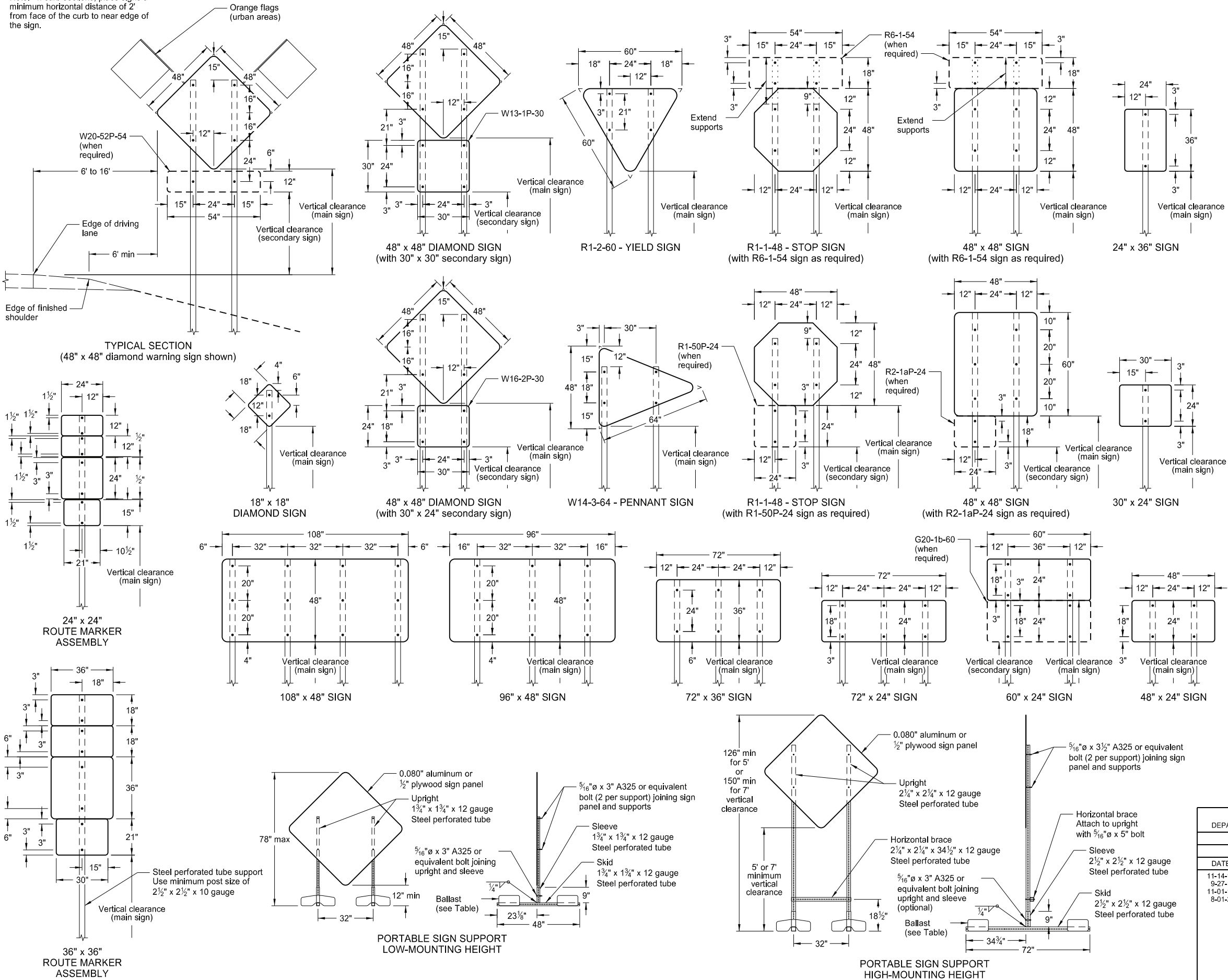


08/01/24



CONSTRUCTION SIGN PUNCHING AND MOUNTING DETAILS

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



NOTES:

1. Sign Supports: Galvanize or paint supports. Minimum post sizes are 2.5 lb/ft u-channel or 2" x 2" x 12 gauge steel perforated tube, except where noted. When installing signs on u-channel, minimum post size for assemblies containing a secondary sign is 3.0 lb/ft. Post sizes based on a wind speed of 55 MPH.  
  
Place signs over 50 square feet on 2½" x 2½" perforated tube supports as a minimum.  
  
Do not attach guy wires to sign supports. Attach wind beams behind sign panels when used with u-posts.
2. Sign Panels: Provide sign panels made of 0.100" aluminum, ½" plywood, or other approved material, except where noted. Punch all holes round for ⅜" bolts.
3. Alternate Messages: Install and remove alternate message signs on reflectorized plate (without borders) as required. (i.e. "Left" and "Right" message on lane closure sign)
4. Route Marker Auxiliary Signs: Provide route marker auxiliary signs, such as the cardinal direction and directional arrows, with a background and legend that match the route marker they are used with:

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

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

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

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

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

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

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

MINIMUM BALLAST  
(For each side of sign support base)

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

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

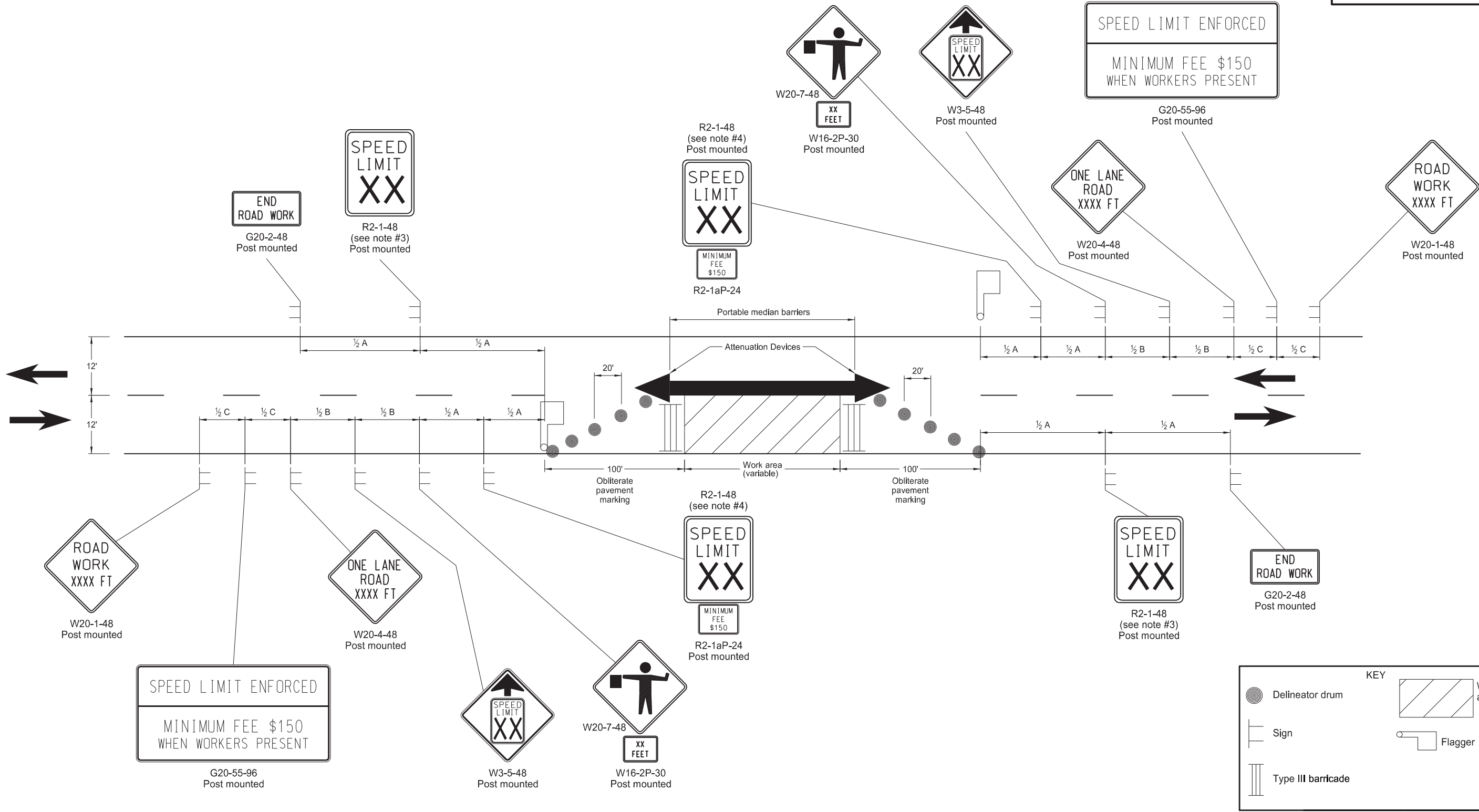
NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
10-4-13	
REVISIONS	
DATE	CHANGE
11-14-13	Revised Note 6
9-27-17	Updated to active voice
11-01-19	Revised 60"x24" sign detail
8-01-24	Electronic Stamp/Signature



08/01/24

SIGN LAYOUT FOR ONE LANE CLOSURE TWO LANE ROADWAY

D-704-17



Notes:

1. Place barricades on moveable assemblies and signs on portable assemblies when located on roadway.
2. Remove existing striping as required. Use back to back delineators when inslope is 4:1 or flatter and roadway alignment is visible to approaching vehicles. Place back to back vertical panels when roadways have steep slopes and alignment is not visible to approaching traffic.
3. Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
4. Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 MPH.) Place the second speed limit sign at 1/2B.
5. Install flags on warning signs in urban areas when signs are not portable. Mount 24 inch square flags perpendicular to the edges of the sign, and at such a distance above the edge that the flag does not touch the sign when limp.
6. As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
7. Cover existing speed limit signs within a reduced speed zone.
8. Sign G20-55-96 is not required if this layout is part of other traffic control that contains this sign, or if work is less than 15 days.
9. Recommend using 40 mph speed limit in vicinity of workers, unless location and conditions dictate otherwise.

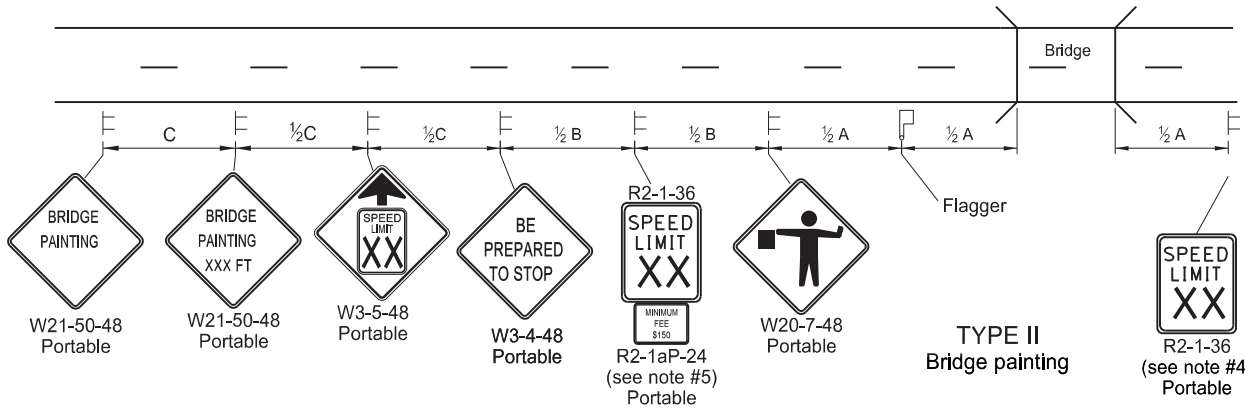
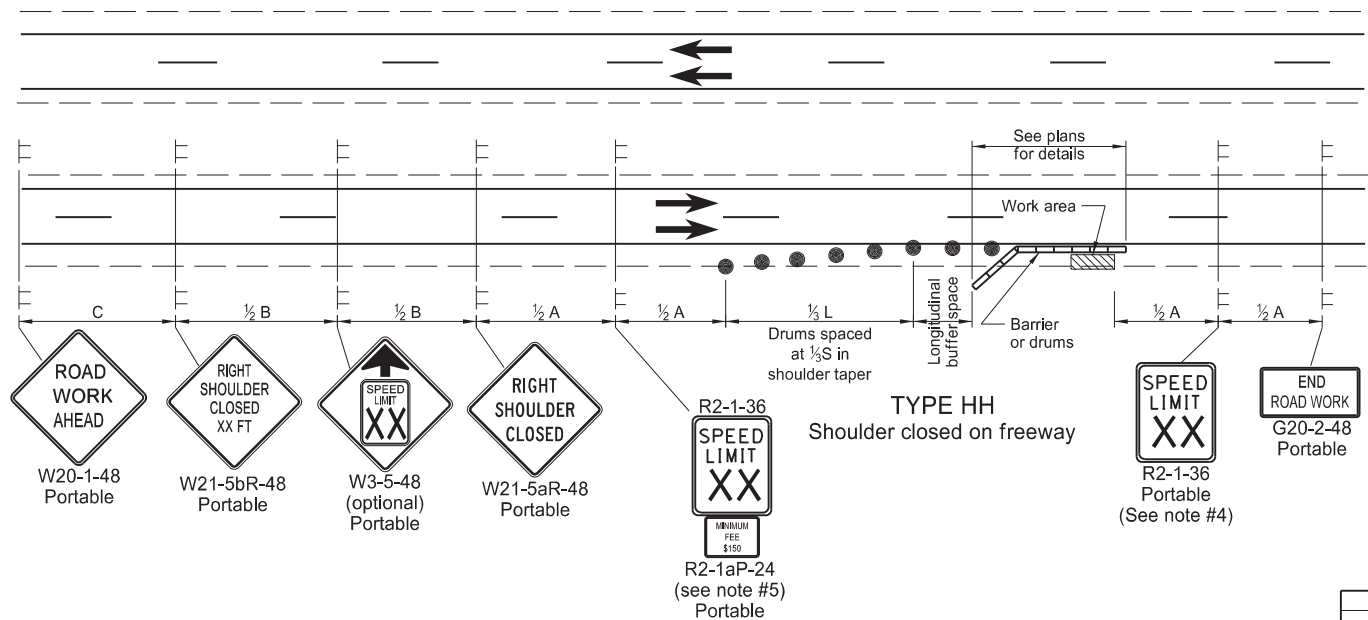
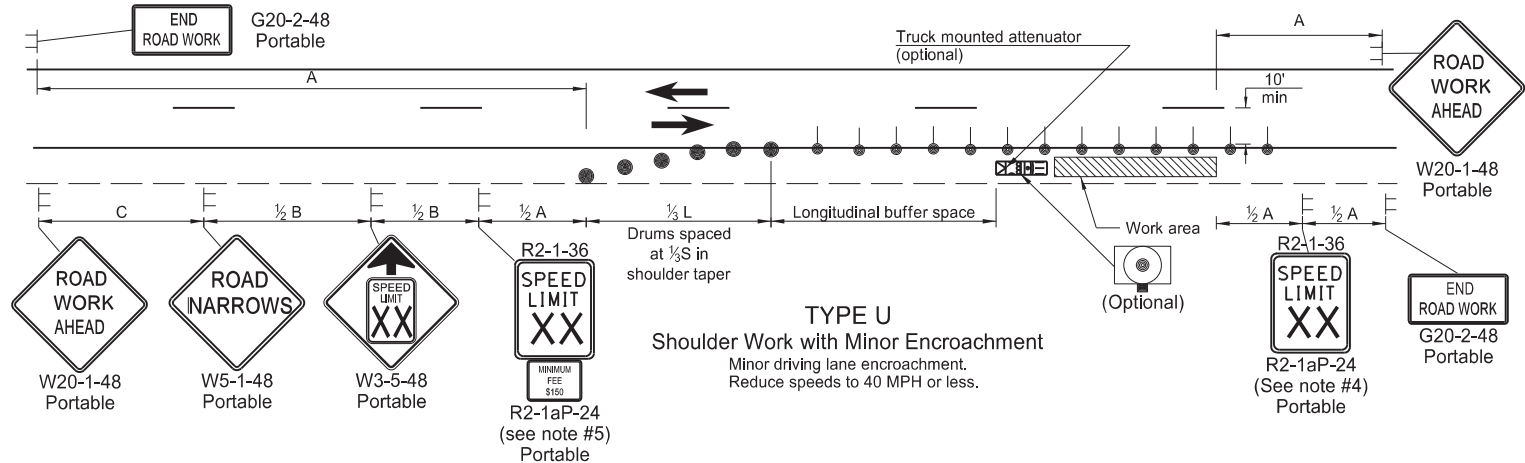
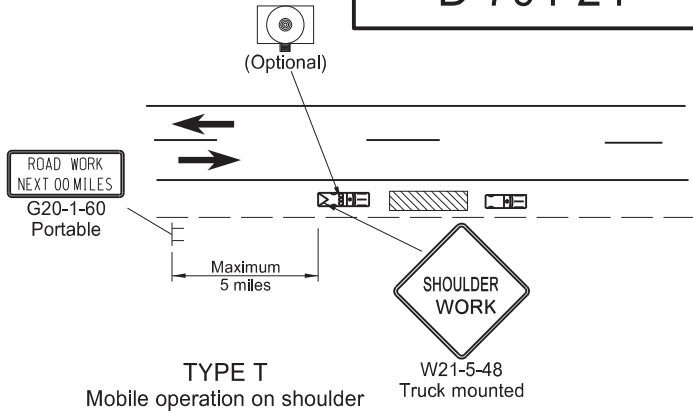
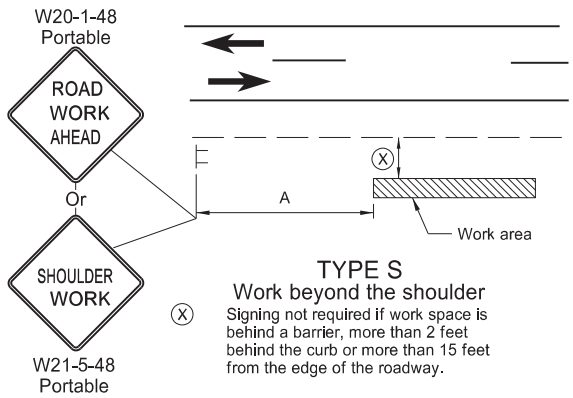
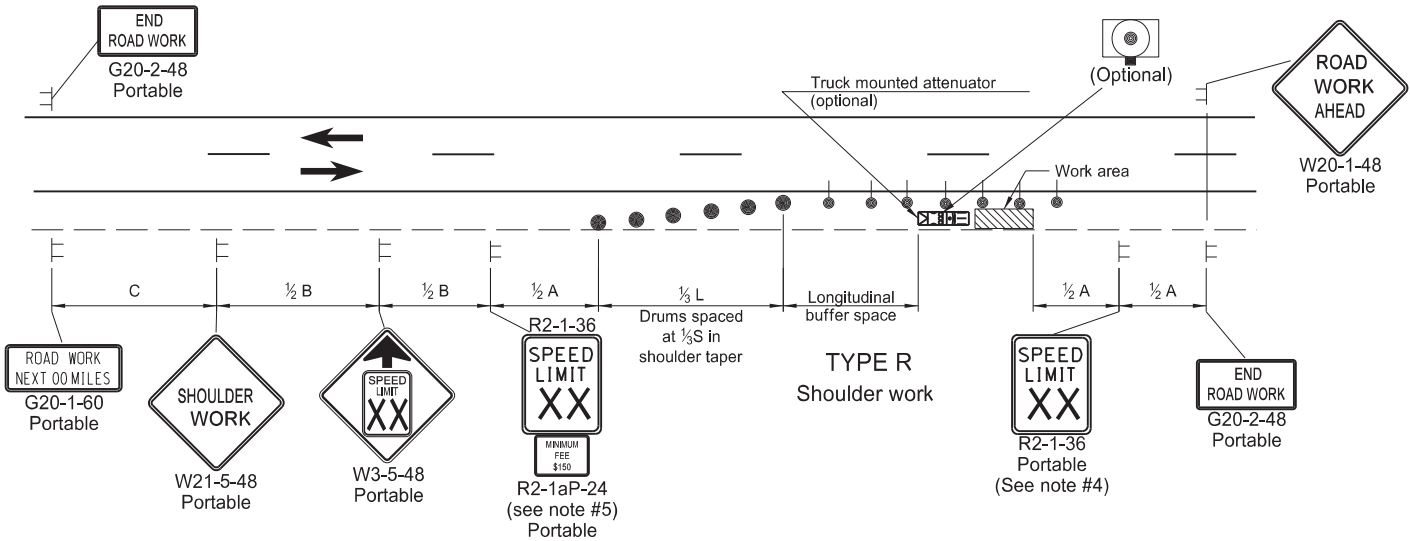
ADVANCE WARNING SIGN SPACING			
Road Type	Distance Between Signs Min. (ft)		
	A	B	C
Urban - Low Speed (30 mph or less)	150	150	150
Urban - Low Speed (over 30 to 40 mph)	280	280	280
Urban - High Speed (over 40 mph to 50 mph)	360	360	360
Rural - High Speed (over 50 mph to 65 mph)	720	720	720
Urban Expressway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

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Note update & sign numbers
11-01-19	Removed signs & revised note
12-08-21	Switched order of Road Work XXXX and Spd Limit Enforced & added Dollars At Work
11-29-22	Removed Dollars At Work
08-21-24	Pvmt Mkg Width & Med Barter
06-30-25	Legislative Changes



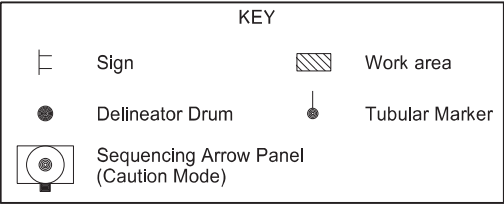
SHOULDER CLOSURES AND BRIDGE PAINTING LAYOUTS

D-704-24



Notes

- Variables  
S = Numerical value of speed limit or 85th percentile.  
W = The width of the taper in feet.  
L = Minimum length of taper, S x W for freeways, expressways, and all other roads with speeds of 45 mph or greater, or W x S<sup>2</sup> / 60 for urban, residential, and other streets with speeds of 40 mph or less.
- Space delineator drums for tapering traffic at dimension "S". Space delineator drums or tubular markers for tangents at 2 times "S".
- Sequencing Arrow Panels  
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).
- Re-establish speed limit. Determine exact speed limit in the field, dependent on location and conditions.
- Determine the reduced speed limit based on the in-place speed limit before construction. Where speed reductions exceed 30 MPH, install a second speed limit sign with the desired speed reduction (not to exceed 30 mph.) Place the second speed limit sign at 1/2 B.
- Install flags on warning signs in urban areas when signs are not portable. Mount 24 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.
- As an option, use portable sign supports in lieu of post mounted signs in accordance with NDDOT Standard Drawing D-704-14.
- 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)		
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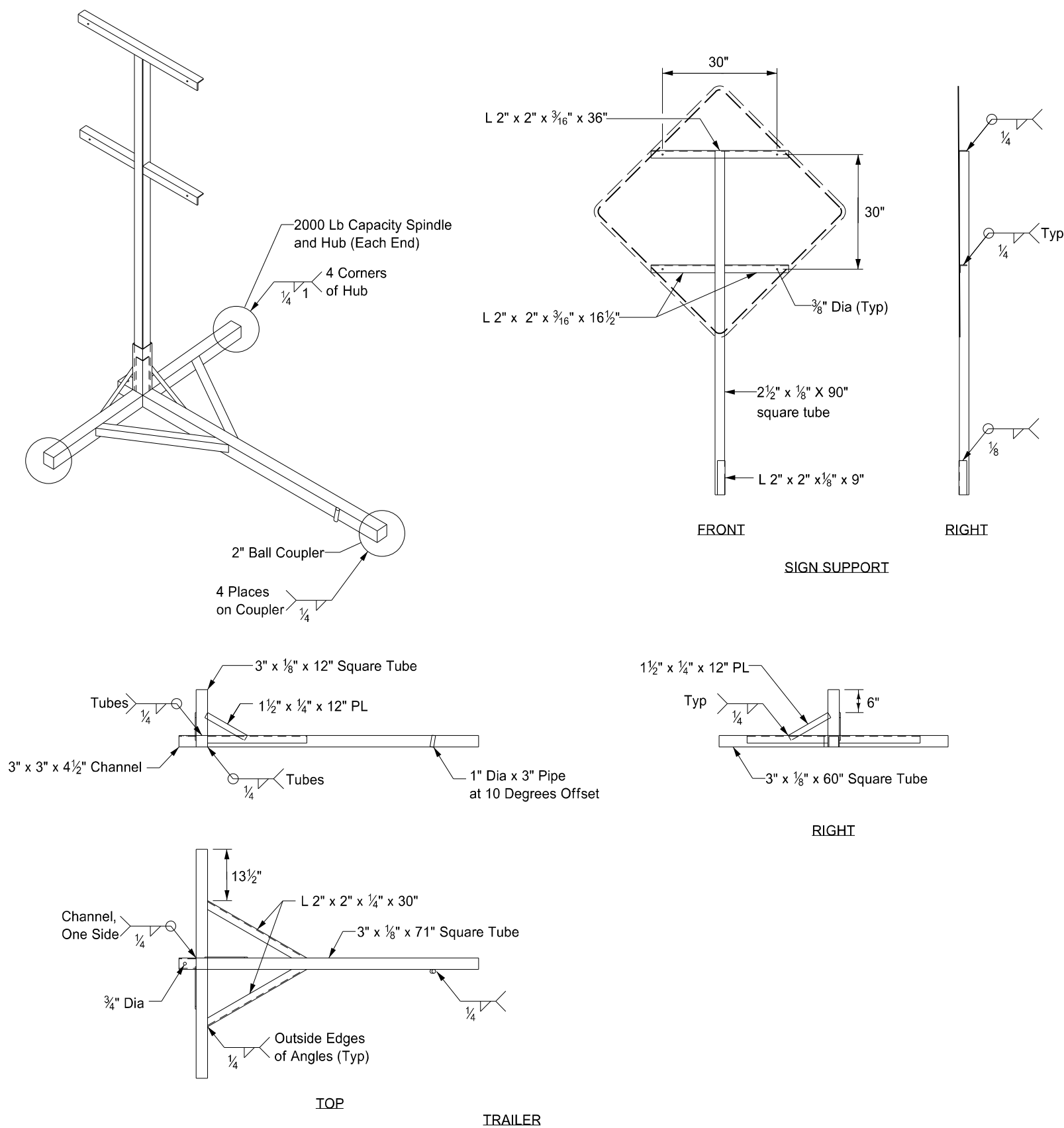
Longitudinal Buffer Space	
Speed (mph)	Length Min (feet)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION	
9-27-13	
REVISIONS	
DATE	CHANGE
08-17-17	Updated notes & revised signs
11-01-19	Revised drum spacing & signs nos
08-01-24	Electronic Stamp/Signature
06-30-25	Legislative Changes



PORTABLE SIGN SUPPORT ASSEMBLY

D-704-50



Notes:

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

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

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