

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	000I-289	1	11

Plotting Date: 06/23/2022

INDEX OF SHEETS

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Sheet 2 and 3	Estimate of Quantities and Notes
Sheet 4	Sign Table
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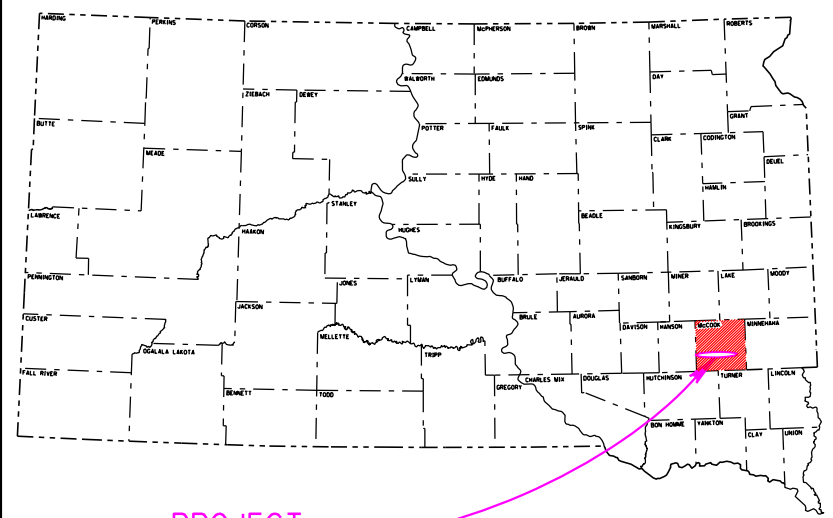
STATE OF SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED **PROJECT 000I-289**

INTERSTATE 90 MCCOOK COUNTY

SIGN REPAIR
PCN 16VD

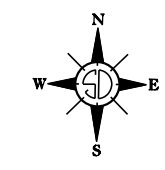
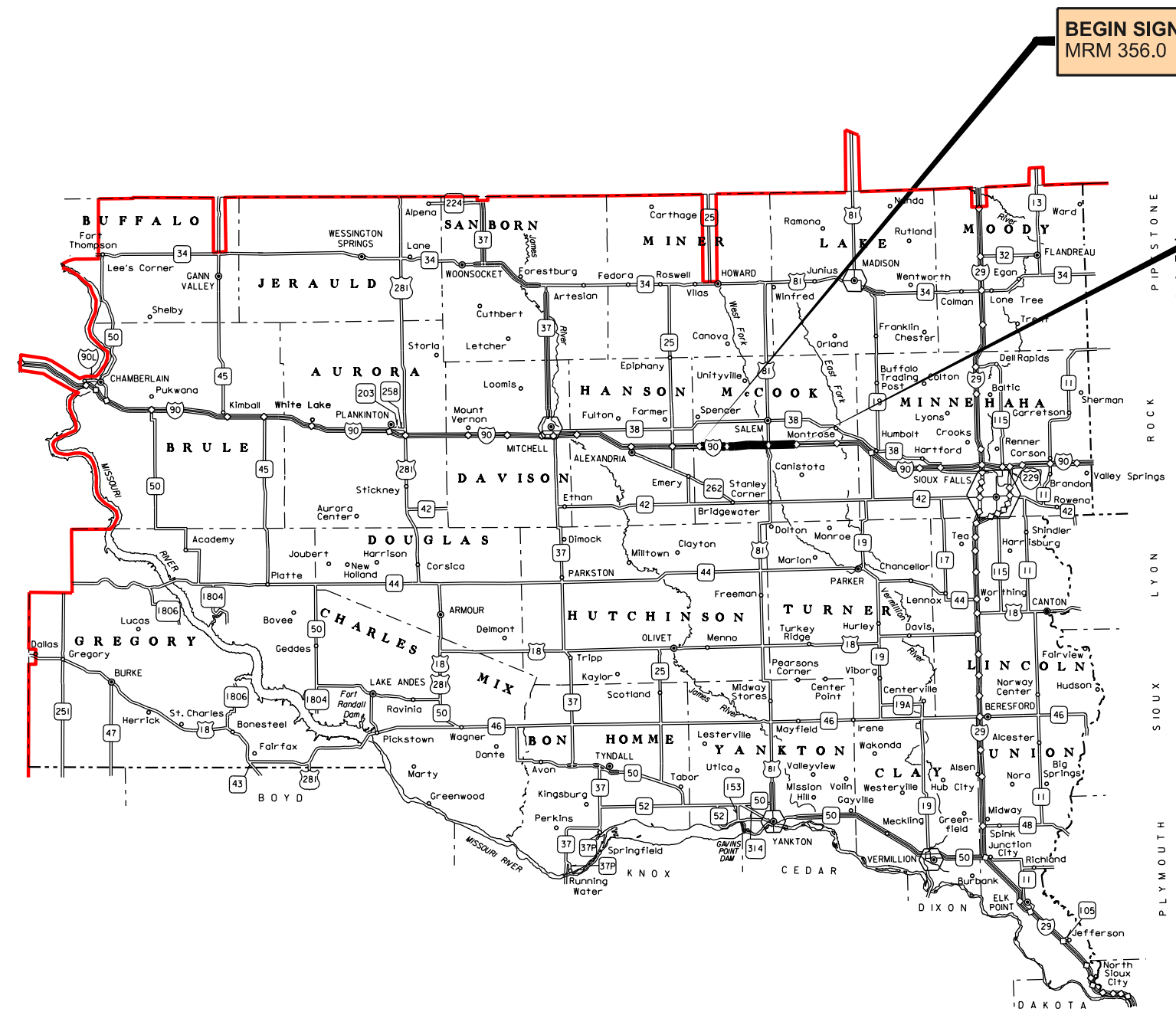
PLOT SCALE - 1"=200'



PROJECT

I-90 (MRM 356.0- 367.0) - **ADT's** 12,136

STORM WATER PERMIT
(None Required)



PLOTTED FROM - TRM111119

PLOT NAME - I
FILE - ... \EMERGENCY REPAIR\TITLE.DGN

ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E0100	Remove Concrete Footing(s)	Lump Sum	LS
110E0130	Remove Traffic Sign	6	Each
110E7150	Remove Sign for Reset	2	Each
632E0014	1.75' Diameter Breakaway Support Concrete Footing	12.0	Ft
632E0018	2.5' Diameter Breakaway Support Concrete Footing	34.0	Ft
632E0058	2.25' Diameter Fixed Support Concrete Footing	65.0	Ft
632E1235	W6x20 Steel Post	185.0	Ft
632E3113	Extruded Aluminum Sign, Nonremovable Copy High Intensity	234.3	SqFt
632E3115	Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity	865.5	SqFt
632E3500	Reset Sign	2	Each
634E0110	Traffic Control Signs	32.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
634E0420	Type C Advance Warning Arrow Board	1	Each

GENERAL TRAFFIC CONTROL

Existing guide, route, informational logo, regulatory, and warning signs will be temporarily reset and maintained during construction. Removing, relocating, covering, salvaging, and resetting of existing traffic control devices, including delineation, will be the responsibility of the Contractor. Cost for this work will be incidental to the contract unit prices for the various items unless otherwise specified in the plans. Any delineators and signs damaged or lost will be replaced by the Contractor at no cost to the State.

All temporary traffic control sign locations will be set in the field by the Contractor and verified by the Engineer prior to installation.

All construction operations will be conducted in the general direction of traffic movement.

If there is a discrepancy between the traffic control plans, standard plates, and the MUTCD, whichever is more stringent will be used, as determined by the Engineer.

Unless otherwise stated in these plans, work will not be allowed during hours of darkness.

Fixed location signing placed more than 4 calendar days prior to the start of construction will be covered or laid down until the time of construction. The covers must be approved by the Engineer prior to installation. The cost of materials, labor, and equipment necessary to complete this work will be incidental to other contract items. No separate payment will be made.

All fixed location signs, sign posts, and breakaway bases will be removed within 7 calendar days following pavement marking

GENERAL PERMANENT SIGNING

New sign installations will be staked in the field by the Contractor and checked by the Engineer. The Contractor will give the Engineer a minimum of one week to check staked locations prior to signpost installation. Lateral offset of signs will be as shown in the plans or as directed by the Engineer.

The Contractor will be responsible for contacting South Dakota One Call to locate the utilities at the staked sign installation locations.

Prior to ordering signs, the Contractor will verify dimensions, background, border, and legend of the signs.

Prior to use, the Contractor will provide documentation for the sign support devices showing they meet the applicable NCHRP 350 or MASH requirements.

REMOVE CONCRETE FOOTINGS

Concrete footings that are to be removed will be removed by the Contractor to a minimum of two feet below the ground level. Restoration of the disturbed area will be to the satisfaction of the Engineer.

All costs for removing the concrete footings will be incidental to the contract lump sum price for Remove Concrete Footing(s).

REMOVE TRAFFIC SIGN

Existing signs that are shown as being removed in the Permanent Signing Table will become the property of the Contractor. Existing signposts and bases will be removed in their entirety. All existing signs, posts, and/or hardware removed will not be reused.

All costs associated with the removal of existing signs, posts, hardware, and backfilled holes will be incidental to the contract unit price per each for Remove Traffic Sign. Quantities will be per assembly at the contract unit price per each.

REMOVE SIGN FOR RESET AND RESET SIGN

Signs that are scheduled for reset will be dismantled and reassembled to the extent needed by the Contractor to properly reset the sign. Signs will be handled with care so that the existing signs, posts, and bases are not damaged during the relocation process. The Contractor will replace and pay for any reset signs damaged in their care. The Contractor will remove and dispose of any existing posts for all reset signs that require use of new posts as shown in the Table of Permanent Signing.

All costs for removing, dismantling, and disposing of any existing posts will be incidental to the contract unit price per each for "Remove Sign for Reset". All costs for resetting the existing signs will be incidental to the contract unit price per each for "Reset Sign". All quantities for Remove Sign for Reset and Reset Sign will be per assembly at the contract unit price per each.

NEW PERMANENT SIGNING

All signs will be manufactured in accordance with the sheeting manufacturer's recommendations utilizing a matched component system, including inks, electronic cuttable films, and protective overlay films.

All costs associated with furnishing and installing the new permanent signs, and with furnishing and installing stiffeners and hardware will be incidental to the contract unit price per square foot for Extruded Aluminum Sign, Nonremovable Copy High Intensity or Extruded Aluminum Sign, Nonremovable Copy Super/Very High Intensity.

LOGO SIGNS

The Contractor will remove and reset the existing logos to match the existing signs.

All costs associated with removing and resetting existing logos will be incidental to the contract unit price per square foot for "Extruded Aluminum Sign, Nonremovable Copy High Intensity".

ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

SIGN CODE	SIGN DESCRIPTION	EXPRESSWAY / INTERSTATE			
		NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
W20-1	ROAD WORK AHEAD	2	48" x 48"	16.0	32.0
		EXPRESSWAY / INTERSTATE TRAFFIC CONTROL SIGNS SQFT			32.0

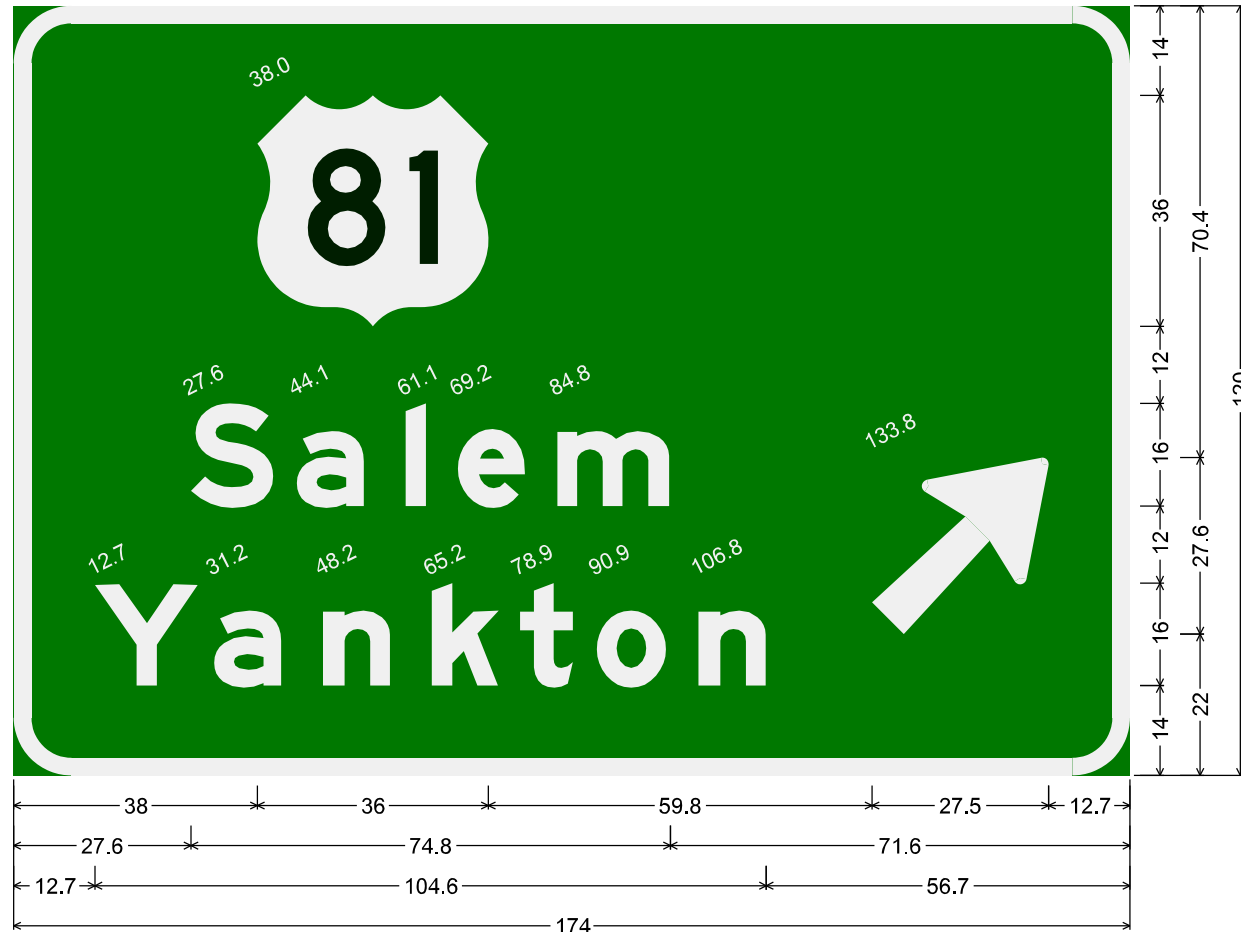
SIGN TABLE

MRM	Distance from Edgeline	Description	Sign Code	Width (Inches)	Height (Inches)	632E3113	632E3115	632E1235	632E0014	632E0058	632E0018	110E0130	110E7150	632E3500	110E0100	Direction Sign Faces	Current Type of Post	Remarks	DOT USE		
						Extruded Aluminum Sign, Nonremovable Copy High Intensity (SQFT)	Ext. Aluminum Sign, Nonremovable Copy Super/Very High Intensity (SQFT)	W6x20 Steel Post	1.75' Diameter Breakaway Support Concrete Footing (Ft)	2.25' Diameter Fixed Support Concrete Footing (Ft)	2.5' Diameter Fixed Support Concrete Footing (Ft)	Remove Traffic Sign (Each)	Remove Sign For Reset (Each)	Reset Sign (Each)	Remove Concrete Footing						
190 EB																					
356.00+0.589	55'	EXIT 357	E1-5P	132	30		27.5			12.0'		1				WEST	2x Breakaway Steel W6x28	Reuse existing sign supports on new footings. Install new signs on new structure.			
		Bridgewater Canova	SPEC.	186	96		124.0														
		1 MILE																			
357.00+0.601	55'	EXIT 357	E1-5P	132	30		27.5	35.7			16.0'	1		2		WEST	2x Breakaway Steel W6x31	New inside post is 19.3 ft. and outside post is 16.4 ft..			
		Bridgewater Canova	SPEC.	228	72		114.0														
		Up-Diag. Arrow																			
359.00+0.946	55'	REST AREA	D5-1	132	60	55.0		34.7	12.0'			1		2		WEST	2x Breakaway Steel W6x15	New inside post is 16.5 ft. and outside post is 18.2 ft..			
		2 MILES																			
363.48+0.024	55'	EXIT 364	SPEC.	156	132	143.0		47.9	10.0'			1		2		WEST	2x Breakaway Steel W12x22	New inside post is 23.3 ft. and outside post is 24.6 ft..			
		GAS [LOGO Panel]																			
363.48+.117	55'	EXIT 364	E1-5P	132	30		27.5	39.0	12.0'			1		2		WEST	2x Breakaway Steel W6x15	New inside post is 19.5 ft. and outside post is 19.5 ft..			
		US81	SPEC.	174	120		145.0														
		Salem / Yankton																			
		Up-Diag. Arrow																			
		Gas/ Food/ Lodging/ Camper	SPEC.	174	30	36.3															
366.06+0.605	55'	EXIT 368	SPEC.							15.0'			1	1		WEST	2x Breakaway Steel W8x18	Reset existing signs and existing I-Beam supports on new footings.			
		Canistota	SPEC.																		
		1 MILE																			
		Gas/ Food/ Lodging	SPEC.																		
190 WB																					
358.30+0.084	55'	EXIT 357	E1-5P	132	30		27.5	27.7			18.0'	1		2		EAST	2x Breakaway Steel W8x28	New inside post is 16.3 ft. and outside post is 11.4 ft..			
		Bridgewater Canova	SPEC.	228	72		190.0														
		Up-Diag. Arrow																			
359.00+0.395	55'	EXIT 357	E1-5P	132	30		27.5			16.0'			1	1	2	EAST	2x Breakaway Steel W8x31	Reuse existing sign supports on new footings. Install new signs on new structure.			
		Bridgewater Canova	SPEC.	186	96		155.0														
		1 MILE																			
					TOTAL	234.3	865.5	185.0	12.0'	65.0'	34.0'	6	2	2	12						

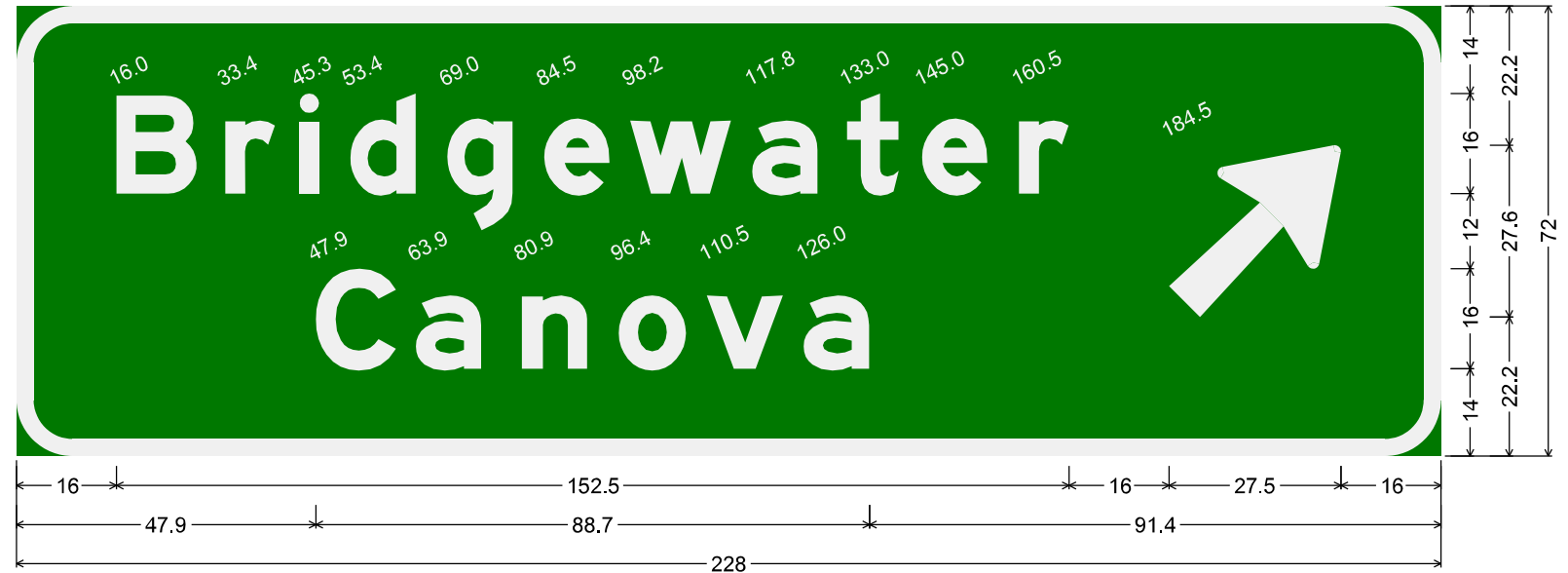
STATE OF SOUTH DAKOTA	PROJECT 0001-289	SHEET 5	TOTAL SHEETS 11
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Plotting Date: 06/24/2022

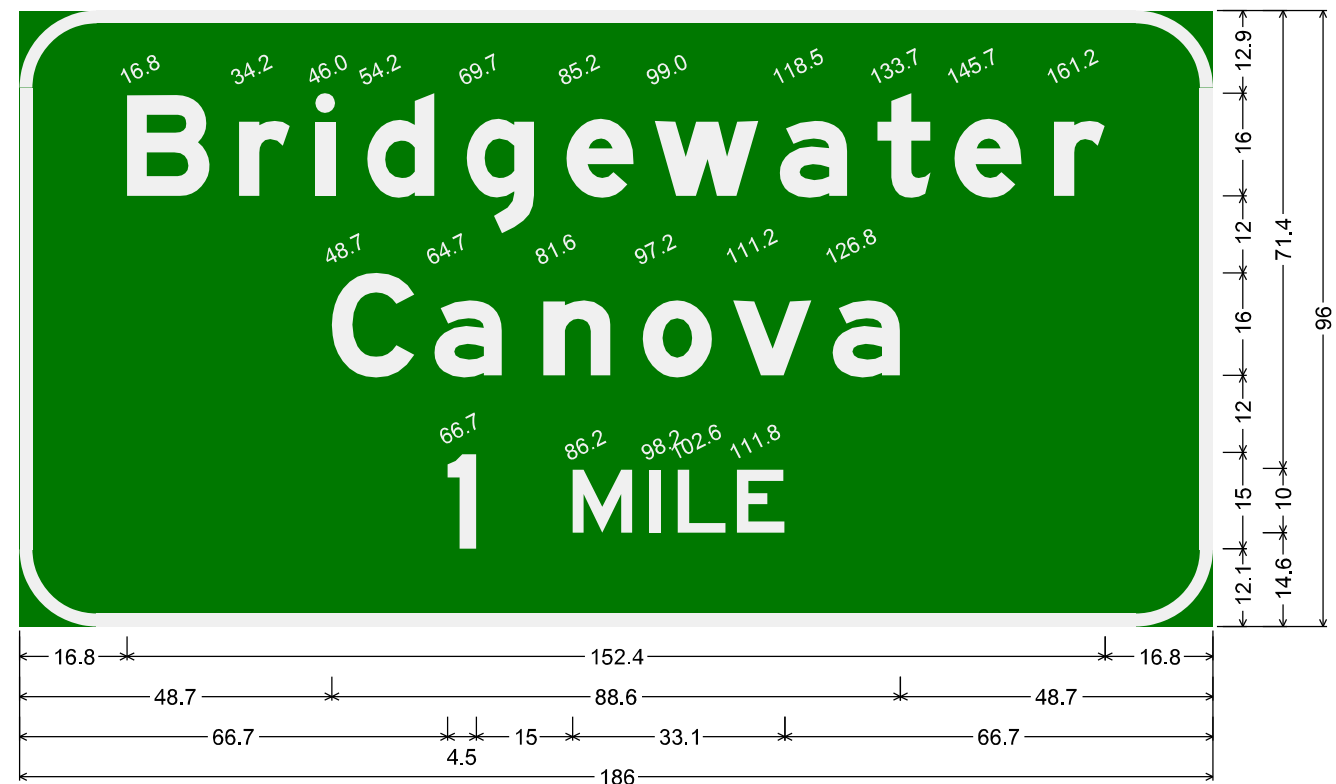
SIGN DETAILS



9.0" Radius, 2.8" Border, White on, Green;
 "Salem", E Mod 2K; "Yankton", E Mod 2K; Arrow 160 - 35.0" 45';



9.0" Radius, 2.8" Border, White on, Green;
 "Bridgewater", E Mod 2K; "Canova", E Mod 2K; Arrow 160 - 35.0" 45';



12.0" Radius, 2.0" Border, White on, Green;
 "Bridgewater", E Mod 2K; "Canova", E Mod 2K; "1", E 2K; "MILE", E 2K;

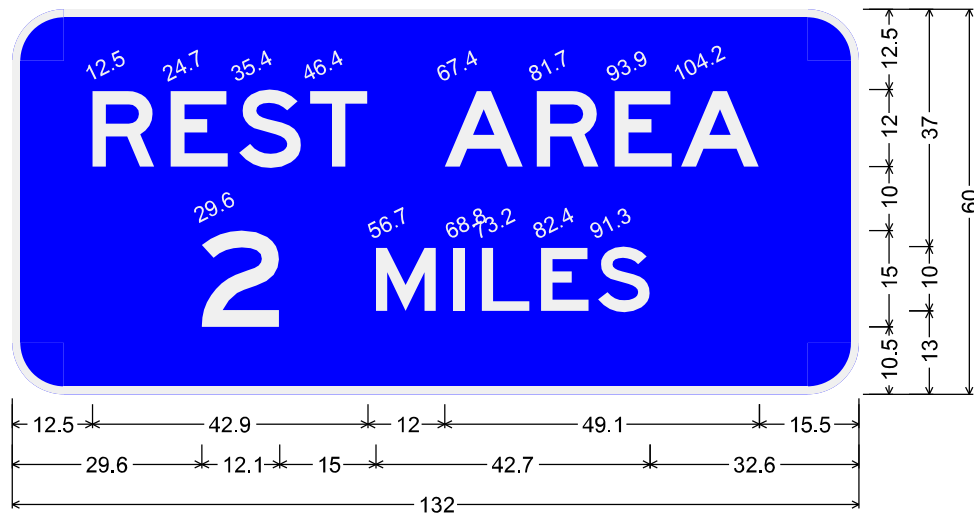
PLOT SCALE - 1:10.722

PLOTTED FROM - TRM111119

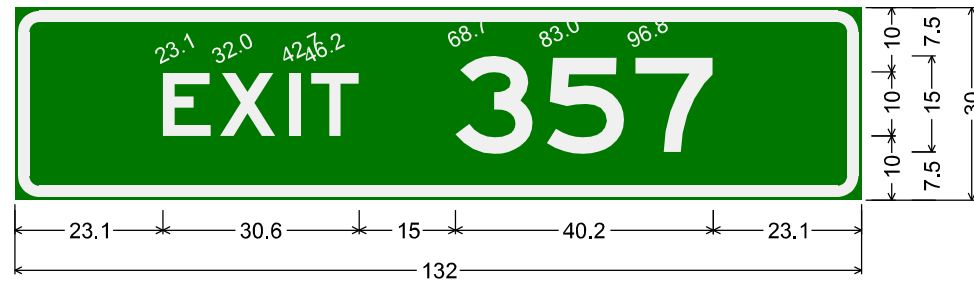
PLOT NAME - 2

FILE - ... \SIGN DETAILS.DGN

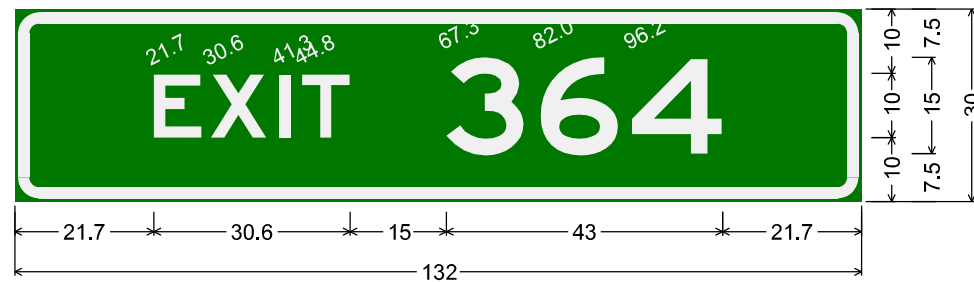
SIGN DETAILS



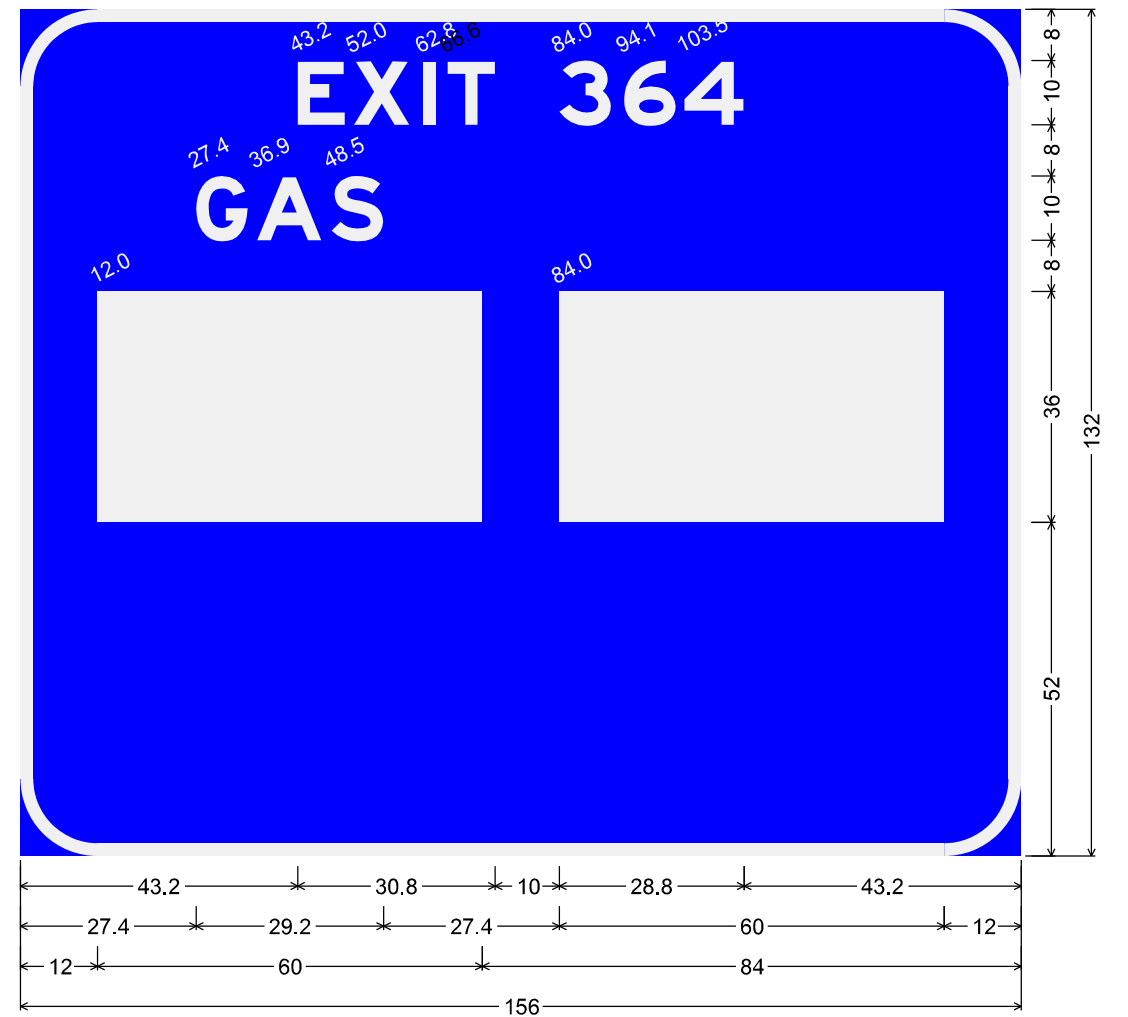
8.0" Radius, 1.3" Border, White on, Blue;
"REST AREA", E 2K 102% spacing; "2 MILES", E 2K 102% spacing;



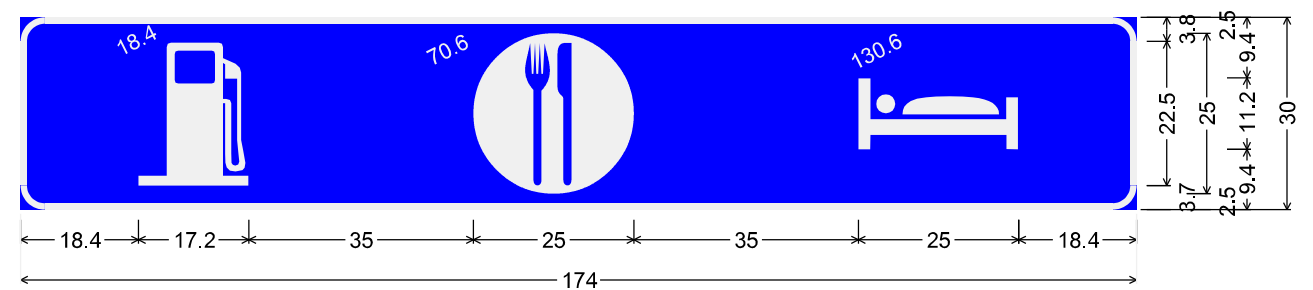
3.8" Radius, 1.8" Border, 0.5" Indent, White on, Green;
"EXIT", E 2K; "357", E 2K;



3.8" Radius, 1.8" Border, 0.5" Indent, White on, Green;
"EXIT", E 2K; "364", E 2K;



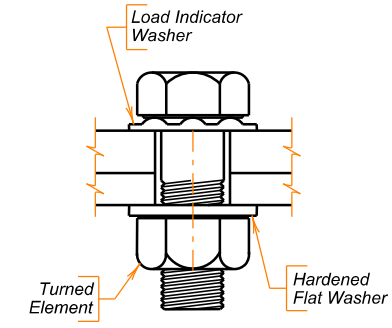
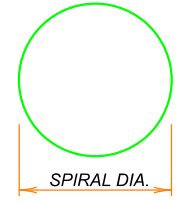
12.0" Radius, 2.0" Border, White on, Blue;
"EXIT 364", E Mod 2K; "GAS", E Mod 2K; Rectangle Blue;



3.8" Radius, 1.0" Border, White on, Blue;
Symbol RM060; Food; Symbol RM090;

Plotting Date: 06/23/2022

MRM	SIGN DESCRIPTION	SITE LOCATION	POST SIZE	FOOTING DIMENSIONS		STUB POST LENGTH	LONGITUDINAL STEEL QUANTITIES			# SPIRAL STEEL QUANTITIES	
				DIA.	DEPTH		NO	SIZE	LENGTH	DIA.	LENGTH
359.00+0.946	REST AREA 2 MILES	I90 EB EXIT 357	W 6 x 20	1' - 6"	6' - 0"	2' - 3"	8	#6 Bars	5' - 8"	1' - 5"	37.75'

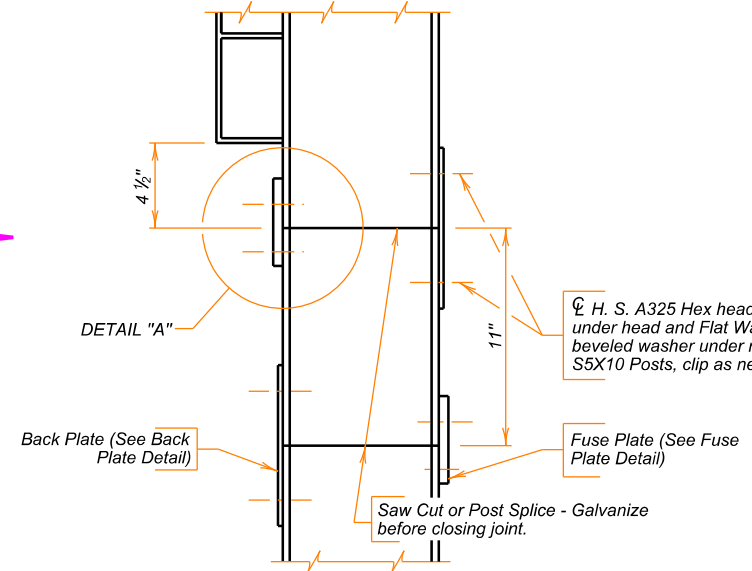


LOAD INDICATOR WASHER DETAIL

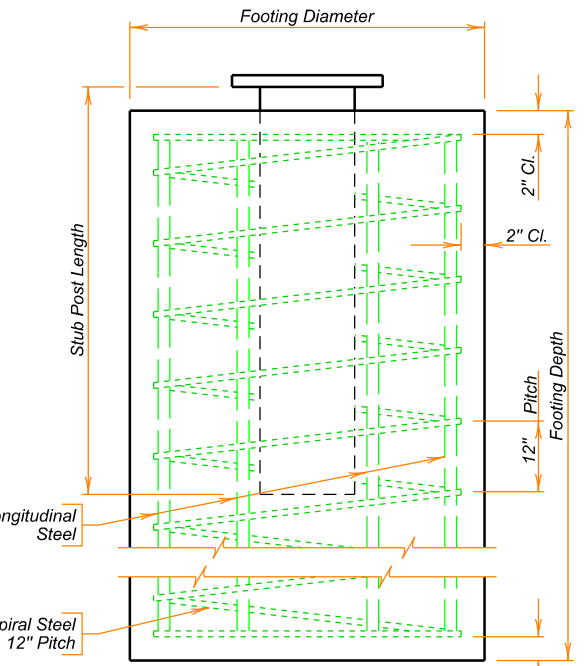
Spirals - Use 12" pitch and 1 1/2 extra turns at each end. Use 1 1/2 turns for lap at splice as required, or weld as approved by the Office of Bridge Design. Spirals may be smooth bars, Bar length shown does not include Splices. Dimensions are out to out of bars.

NOTE:
The above is a Site Specific data entry table and the inserted information is the responsibility of the Region Traffic Engineer.

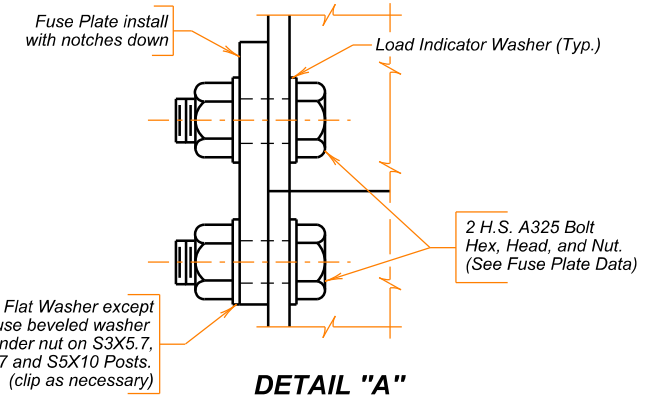
TRAFFIC DIRECTION



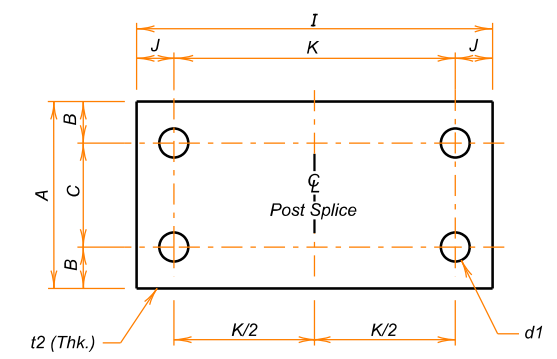
FUSE & BACK PLATE INSTALLATION



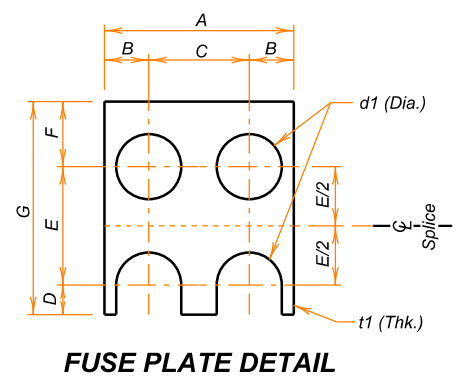
FOOTING DETAIL



DETAIL "A"



BACK PLATE DETAIL



FUSE PLATE DETAIL

Post Size	A	B	C	D	E	F	G	d1	t1	Bolt Size
S3X5.7	2 5/8"	3/16"	1 1/2"	1/2"	1 1/2"	1 1/8"	3 3/8"	5/8" φ	1/4"	1/2" φ
S4X7.7	2 5/8"	3/16"	1 1/2"	1/2"	1 1/2"	1 1/8"	3 3/8"	5/8" φ	1/4"	1/2" φ
S5X10	3"	1 1/16"	1 5/8"	5/8"	2 1/4"	1 1/8"	4"	3/4" φ	3/8"	5/8" φ
W6X12	4"	1 5/16"	2 1/8"	5/8"	2 1/2"	1 3/8"	4 1/2"	3/4" φ	3/8"	5/8" φ
W6X15	6"	1 3/8"	3 1/4"	5/8"	2 1/2"	1 3/8"	4 1/2"	3/4" φ	3/8"	5/8" φ
W6X20	6"	1 3/8"	3 1/4"	5/8"	2 1/2"	1 3/8"	4 1/2"	3/4" φ	3/8"	5/8" φ
W8X18	5 1/4"	1 3/16"	2 5/8"	3/4"	2 1/2"	1 3/8"	4 3/8"	7/8" φ	1/2"	3/4" φ
W8X21	5 1/4"	1 3/16"	2 5/8"	3/4"	2 1/2"	1 3/8"	4 3/8"	7/8" φ	1/2"	3/4" φ
W8X24	6 1/2"	1 1/2"	3 1/2"	7/8"	3"	1 3/8"	5 1/2"	1" φ	5/16"	7/8" φ
W8X28	6 1/2"	1 3/16"	3 3/8"	7/8"	3"	1 3/4"	5 5/8"	1" φ	5/16"	7/8" φ
W8X31	8"	1 3/8"	4 3/4"	1"	3"	2"	6 1/2"	1 1/8" φ	3/8"	1" φ
W10X33	8"	1 3/8"	4 3/4"	1 1/8"	4 1/2"	2 1/4"	7 3/8"	1 1/4" φ	3/4"	1 1/8" φ

Post Size	A	B	C	J	K	I	d1	t2	Bolt Size
S3X5.7	2 5/8"	3/16"	1 1/2"	1 1/4"	4 1/2"	7"	5/8" φ	1/4"	1/2" φ
S4X7.7	2 5/8"	3/16"	1 1/2"	1 1/4"	4 1/2"	7"	5/8" φ	1/4"	1/2" φ
S5X10	3"	1 1/16"	1 5/8"	1 1/4"	4 3/4"	7 1/4"	3/4" φ	1/4"	5/8" φ
W6X12	4"	1 5/16"	2 1/8"	1 1/4"	4 3/4"	7 1/4"	3/4" φ	1/4"	5/8" φ
W6X15	6"	1 3/8"	3 1/4"	1 1/4"	5 1/4"	7 3/4"	3/4" φ	1/4"	5/8" φ
W6X20	6"	1 3/8"	3 1/4"	1 1/4"	5 1/4"	7 3/4"	3/4" φ	1/4"	5/8" φ
W8X18	5 1/4"	1 3/16"	2 5/8"	1 3/8"	5 3/4"	8 1/2"	7/8" φ	1/4"	3/4" φ
W8X21	5 1/4"	1 3/16"	2 5/8"	1 3/8"	5 3/4"	8 1/2"	7/8" φ	1/4"	3/4" φ
W8X24	6 1/2"	1 1/2"	3 1/2"	1 3/8"	6"	9 1/4"	1" φ	5/16"	7/8" φ
W8X28	6 1/2"	1 3/16"	3 3/8"	1 3/4"	6"	9 1/2"	1" φ	3/8"	7/8" φ
W8X31	8"	1 3/8"	4 3/4"	2"	6 1/2"	10 1/2"	1 1/8" φ	3/8"	1" φ
W10X33	8"	1 3/8"	4 3/4"	2 1/2"	7"	1' - 0"	1 1/4" φ	3/4"	1 1/8" φ

- NOTES**
- Design Specification: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 2001 Edition with 2003 Interims.
 - Concrete Footings shall be Class M6 - fc = 4000 p. s. i.
 - Structural Steel shall conform to ASTM A36.
 - All Reinforcing Steel, except spirals, shall conform to ASTM 615 Grade 60.
 - Spiral Reinforcing Steel may be fabricated from cold drawn wire ASTM A1064, or hot rolled plain or deformed bars conforming to the strength requirements of ASTM A615, Grade 60.
 - All Bolts and Nuts shall conform to ASTM A325 except that 1/2" diameter bolts may conform to either ASTM A325 or ASTM A449. Washers shall conform to ASTM F436. All hardware shall be galvanized in accordance with ASTM F2329.
 - All structural steel including Posts and Post Stubs shall be galvanized in accordance with ASTM A123.
 - All Bolt Holes shall be drilled. All plate cuts shall preferably be saw cuts. However, Flame Cutting will be permitted providing all edges are ground smooth (metal projecting beyond the plane of the plate face will NOT be allowed).
 - All welding and weld inspection shall be in accordance with the latest edition of AWS D 1.5 Structural Welding Code.

- PROCEDURE FOR ASSEMBLING SLIP BASE**
- Place galvanized Sheet Metal Diaphragms on top of the lower slip plate.
 - Connect main post to Stub Post with clean unlubricated bolts and nuts with one Hardened Washer on each bolt between slip plates.
 - Plumb post by adding shims between slip plates.
 - Tighten bolts to a practical maximum, using a 12" - 15" wrench in order to bed surfaces and clean threads. DO NOT TIGHTEN TO PROOF LOAD.
 - Loosen all bolts and retighten in increments, using a systematic order, until each bolt has been tightened to the specified torque corresponding to the post size used (See Slip Base Plate Data). Tighten bolts only to the torque specified. DO NOT OVERTIGHTEN. Check torque on each bolt after entire sign has been erected.

ASSEMBLY OF FRICTION FUSE PLATES, BACK PLATES AND STIFFENERS
High strength bolts shall be tightened so as to obtain a residual tension by the use of load indicator washers.

SHOP PLANS
The fabricator shall submit shop plans in accordance with the Specifications or in Adobe PDF format. Shop plan submittals shall be sent to the Office of Bridge Design. Include design and check design, if applicable, with initial submittal.

ERECTION DETAILS
FOR
**TWO-POST TWO-DIRECTION
BREAKAWAY SIGN SUPPORTS**
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2016

PLOT SCALE - 1" = 0.169082

PLOTTED FROM - TRMI11119

PLOT NAME - 4

FILE - ... \INSTALLATIONDETAILS.DGN

PLOT SCALE - 1" = 0' 1.69082

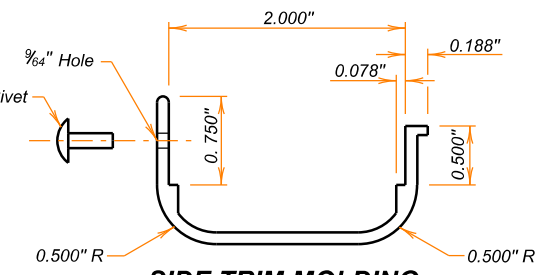
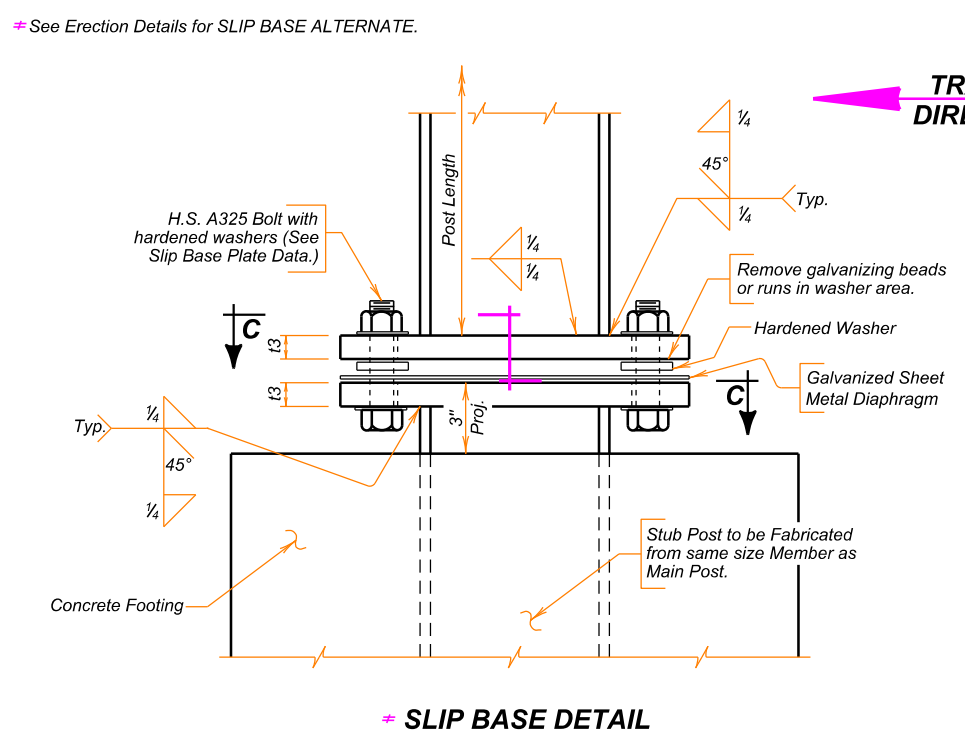
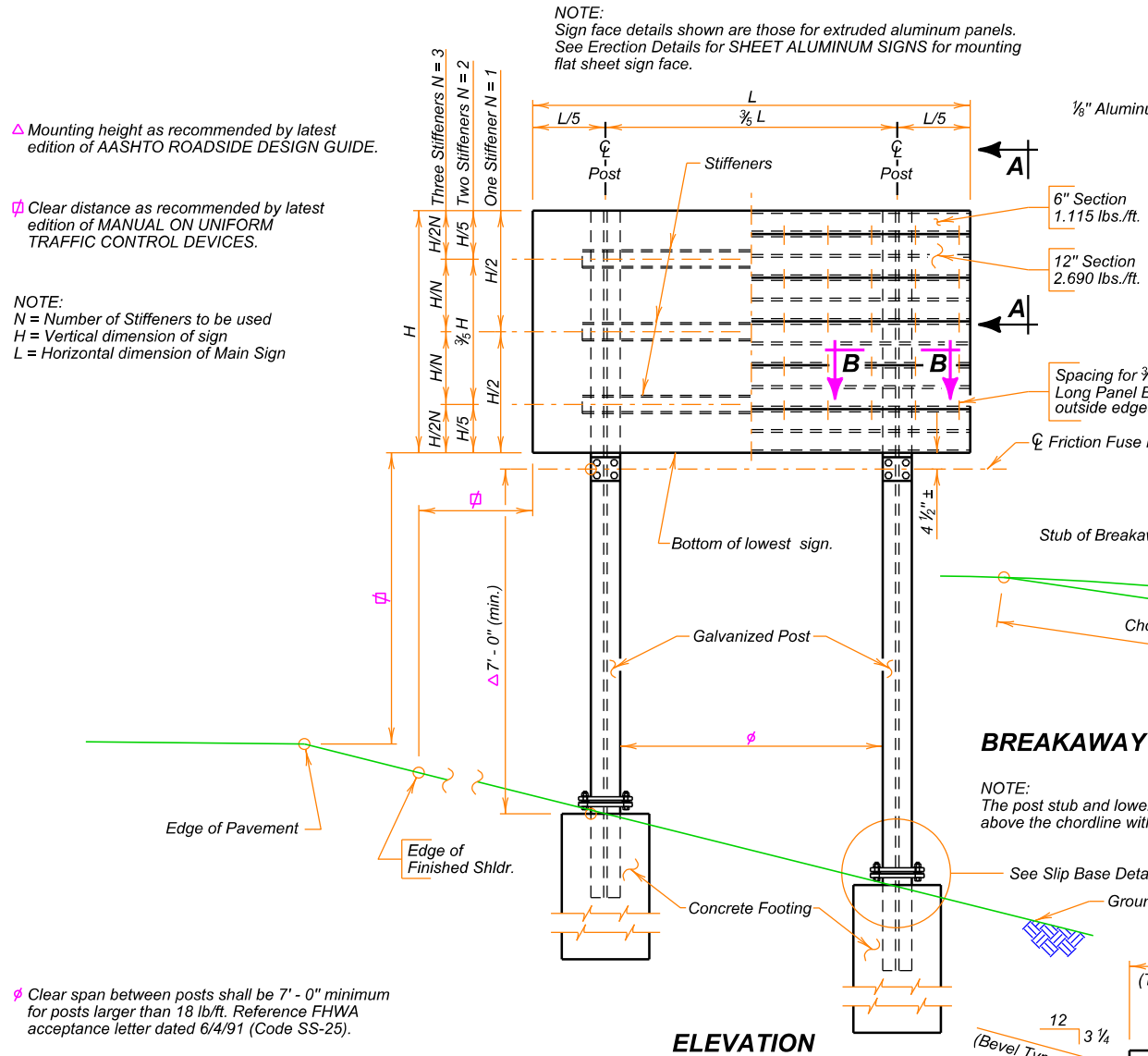
PLOTTED FROM - TRM111119

PLOT NAME - 5

FILE - ... \INSTALLATIONDETAILS.DGN

STATE OF SOUTH DAKOTA	PROJECT 0001-289	SHEET 8	TOTAL SHEETS 11
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Plotting Date: 06/23/2022



STIFFENER DATA

Post	Stiffener	a	b	c	d	Bolt (A325)	Plate Thk.
S3X5.7 thru W8X21	C3X5	10 1/2"	5"	1 1/4"	8"	3/8" φ	3/16"
W8X24 thru W10X45	C5X6.7	13 1/2"	6"	1 1/2"	10 1/2"	7/8" φ	3/8"

- STIFFENER NOTES**
- Stiffeners must always be used on Two Post Breakaway signs regardless of type of sign face employed.
 - Number of stiffeners used, N, shall be as follows:
if $H \leq 2' - 0"$ then $N = 1$
if $2' - 0" < H \leq 8' - 0"$ then $N = 2$
if $8' - 0" < H \leq 15' - 0"$ then $N = 3$

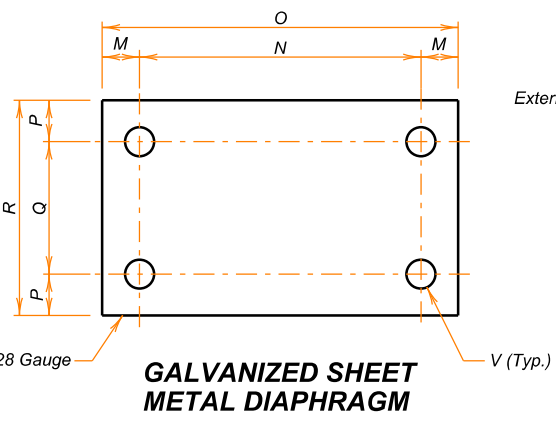
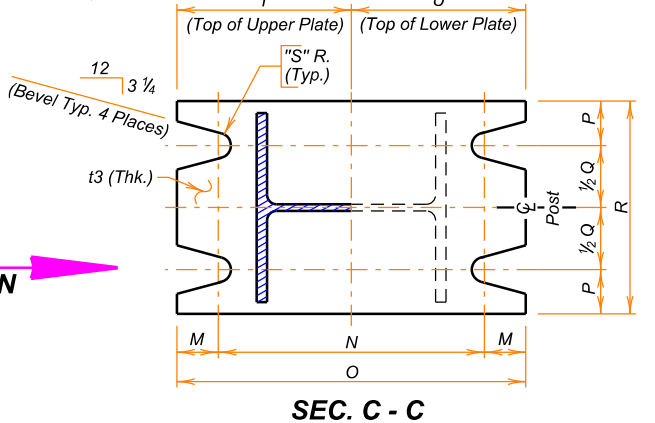
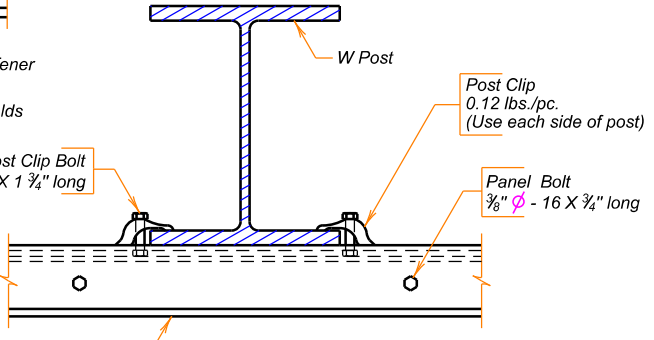
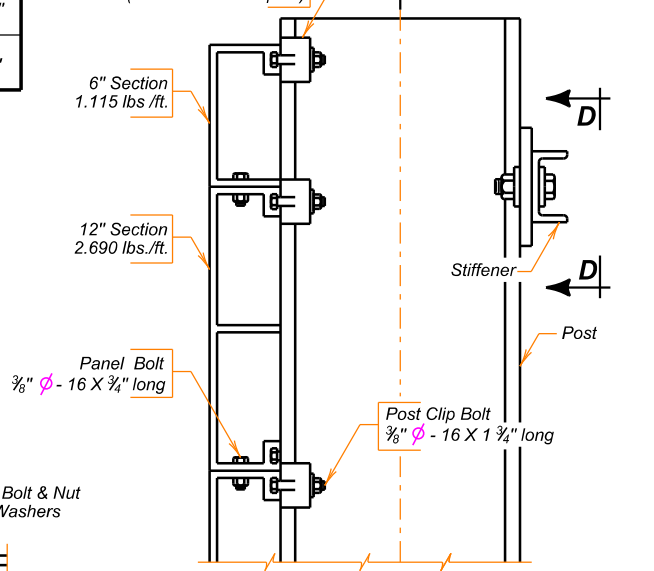
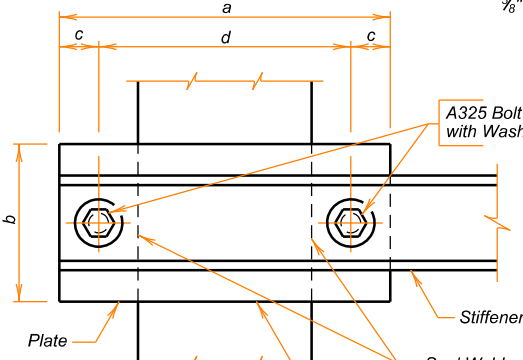
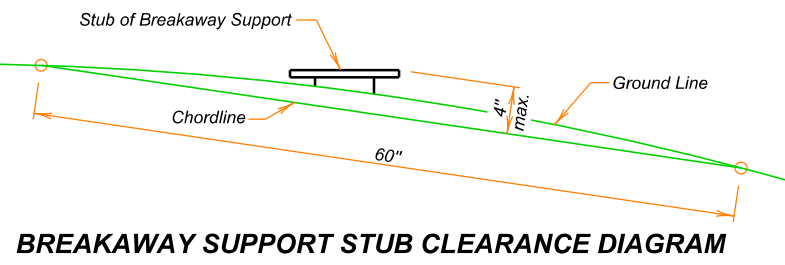


TABLE 3 - SHEET METAL DIAPHRAGM DATA

Post Size	M	N	O	P	Q	R	V
S3X5.7	3/4"	6"	7 1/2"	3/4"	1 1/2"	3"	5/8"
S4X7.7	3/4"	6"	7 1/2"	3/4"	1 1/2"	3"	5/8"
S5X10	7/8"	7 1/4"	9"	3/4"	2"	3 1/2"	3/4"
W6X12	7/8"	8 1/4"	10"	7/8"	2 3/4"	4 1/2"	3/4"
W6X15	1 1/8"	8 1/2"	10 3/4"	1 1/4"	4"	6 1/2"	7/8"
W6X20	1 1/8"	10"	1' - 0 1/4"	1 1/4"	4"	6 1/2"	7/8"
W8X18	1 1/8"	10 1/2"	1' - 0 3/4"	1 1/4"	3 1/2"	6"	7/8"
W8X21	1 1/2"	11 1/4"	1' - 1 3/4"	1 1/4"	3 1/2"	6"	1"
W8X24	1 1/2"	11"	1' - 2"	1 5/8"	4 1/4"	7 1/2"	1"
W8X28	1 5/8"	11 1/4"	1' - 2 1/2"	1 5/8"	4 1/4"	7 1/2"	1 1/8"
W8X31	1 3/4"	11 1/4"	1' - 2 3/4"	1 7/8"	5 1/4"	9"	1 1/8"
W10X33	1 3/4"	1' - 2"	1' - 5 1/2"	1 7/8"	5 1/4"	9"	1 1/8"

TABLE 4 - SLIP BASE PLATE DATA

Post Size	M	N	O	P	Q	R	S	T	U	t3	Bolt Size	Bolt Torque
S3X5.7	3/4"	6"	7 1/2"	3/4"	1 1/2"	3"	3/32"	3 3/4"	3 3/4"	5/8"	1/2" φ	142" - #
S4X7.7	3/4"	6"	7 1/2"	3/4"	1 1/2"	3"	3/32"	3 3/4"	3 3/4"	5/8"	1/2" φ	142" - #
S5X10	7/8"	7 1/4"	9"	3/4"	2"	3 1/2"	1/32"	4 1/2"	4 1/2"	7/8"	5/8" φ	345" - #
W6X12	7/8"	8 1/4"	10"	7/8"	2 3/4"	4 1/2"	1/32"	5"	5"	7/8"	5/8" φ	345" - #
W6X15	1 1/8"	8 1/2"	10 3/4"	1 1/4"	4"	6 1/2"	1/32"	5 3/8"	5 3/8"	1"	3/4" φ	554" - #
W6X20	1 1/8"	10"	1' - 0 1/4"	1 1/4"	4"	6 1/2"	1/32"	6 1/8"	6 1/8"	1"	3/4" φ	554" - #
W8X18	1 1/8"	10 1/2"	1' - 0 3/4"	1 1/4"	3 1/2"	6"	1/32"	6 3/8"	6 3/8"	1"	3/4" φ	554" - #
W8X21	1 1/4"	11 1/4"	1' - 1 3/4"	1 1/4"	3 1/2"	6"	1/32"	6 7/8"	6 7/8"	1"	7/8" φ	645" - #
W8X24	1 1/2"	11"	1' - 2"	1 5/8"	4 1/4"	7 1/2"	1/32"	7"	7"	1"	7/8" φ	645" - #
W8X28	1 5/8"	11 1/4"	1' - 2 1/2"	1 5/8"	4 1/4"	7 1/2"	1/32"	7 1/4"	7 1/4"	1 1/8"	1" φ	735" - #
W8X31	1 3/4"	11 1/4"	1' - 2 3/4"	1 7/8"	5 1/4"	9"	1/32"	7 3/8"	7 3/8"	1 1/8"	1" φ	735" - #
W10X33	1 3/4"	1' - 2"	1' - 5 1/2"	1 7/8"	5 1/4"	9"	1/32"	8 3/4"	8 3/4"	1 1/4"	1" φ	735" - #

NOTE: Diaphragm need not be regalvanized after cutting to size and drilling of holes.

ERECTION DETAILS FOR TWO-POST TWO-DIRECTION BREAKAWAY SIGN SUPPORTS

S. D. DEPT. OF TRANSPORTATION

DECEMBER 2016

2 OF 2

DESIGNED BY RH/DM CNTYPCNX	DRAWN BY TB/MDG PCNXDSPG	CHECKED BY RH/DM/PW BSTDBS2D	Steve A. Johnson BRIDGE ENGINEER
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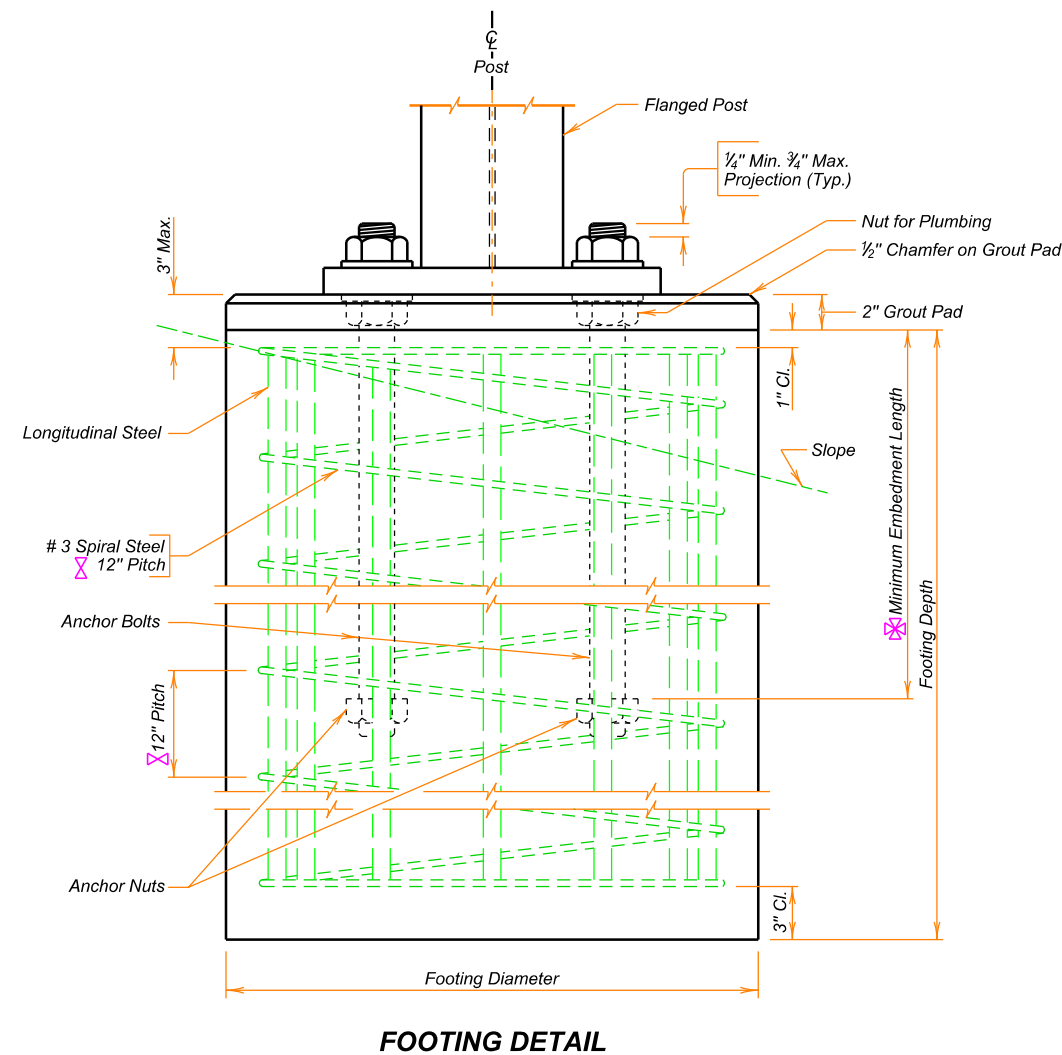
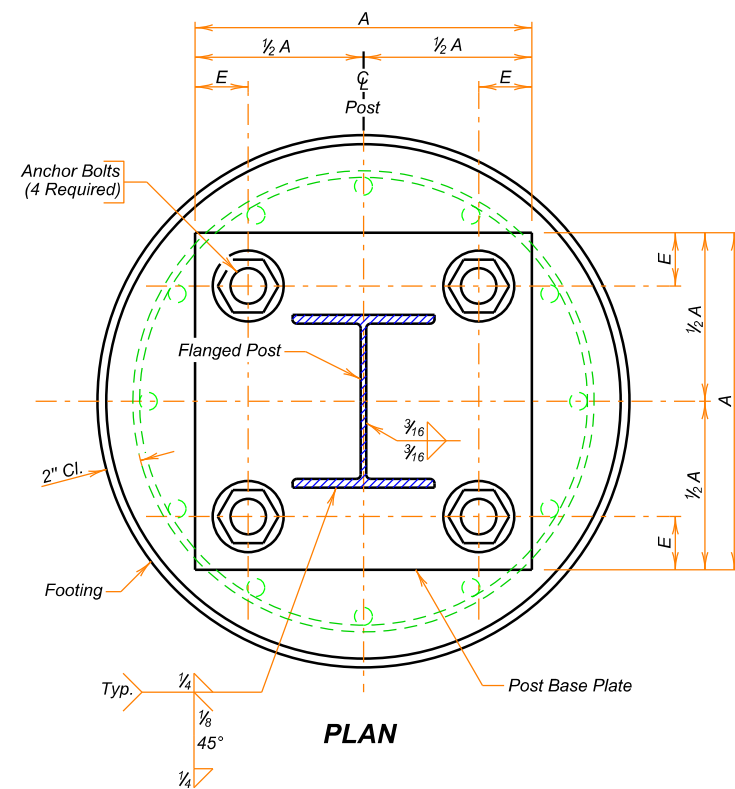
Plotting Date: 06/23/2022

MRM	SIGN DESCRIPTION	SITE LOCATION	POST SIZE	FOOTING DIMENSIONS		POST BASE PLATE DIMENSIONS (in.)			ANCHOR BOLT SIZE DIMENSIONS			LONGITUDINAL STEEL QUANTITIES			# SPIRAL STEEL QUANTITIES	
				DIA.	DEPTH	A x A	E	THICK	DIA. (in.)	LENGTH	MINIMUM EMBEDMENT	NO	SIZE	LENGTH	DIA.	LENGTH
356.00+0.589	EXIT 357 / Bridgewater / Canova 1 MI	I90 EB MAINLINE	W 8 x 28	2' - 3"	8' - 0"	17 x 17	3.00	3/4	1 1/4	39"	25"	8 - #8 Bars	7' - 8"	1' - 11"	63'	
357.00+0.601	EXIT 357 / Bridgewater / Canova Arr.	I90 EB MAINLINE	W 8 x 31	2' - 6"	8' - 0"	18 x 18	3.00	3/4	1 1/4	39"	25"	12 - #7 Bars	7' - 8"	2' - 2"	71'	
359.00+0.395	EXIT 357 / Bridgewater / Canova Arr.	I90 WB MAINLINE	W 8 x 31	2' - 6"	9' - 0"	18 x 18	3.00	5/8	1	36"	22"	12 - #7 Bars	8' - 8"	2' - 2"	78'	
358.30+0.084	EXIT 357 / Bridgewater / Canova Arr.	I90 WB MAINLINE	W 8 x 28	2' - 3"	8' - 0"	17 x 17	3.00	3/4	1 1/4	39"	25"	8 - #8 Bars	7' - 8"	2' - 2"	63'	
363.48+0.024	EXIT 364 / GAS/ [PANEL]	I90 EB MAINLINE	W 6 x 20	2' - 3"	5' - 0"	15 x 15	2.50	1	1 1/2	45"	30"	8 - #8 Bars	4' - 8"	2' - 2"	45'	
363.48+0.117	EXIT 364/ US81/ Salem/ Yankton A.	I90 EB MAINLINE	W 6 x 20	2' - 3"	6' - 0"	15 x 15	2.50	1	1 1/2	45"	30"	8 - #8 Bars	5' - 8"	1' - 11"	51'	
366.06+0.605	EXIT 368 / Canistota / 1 MILE/ GAS...	I90 EB MAINLINE	W 8 x 18	2' - 3"	6' - 0"	15 x 15	2.50	5/8	1 1/4	39"	25"	8 - #8 Bars	5' - 8"	2' - 2"	51'	

NOTE:
The above is a Site Specific data entry table and the inserted information is the responsibility of the Region Traffic Engineer.

Spirals - Use 12" pitch and 1 1/2 extra turns at each end. Use 1 1/2 turns for lap at splice as required, or weld as approved by the Office of Bridge Design. Spirals may be smooth bars, Bar length shown does not include Splices.

Dimensions are out to out of bars.



NOTES

- Design Specification: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 2001 Edition with 2003 Interims.
- Concrete Footings shall be Class M6 - $f_c = 4000$ p.s.i.
- Structural Steel shall conform to ASTM A36.
- All Reinforcing Steel, except spirals, shall conform to ASTM A615 Grade 60.
- Spiral Reinforcing Steel may be fabricated from cold drawn wire ASTM A1064, or hot rolled plain or deformed bars conforming to the strength requirements of ASTM A615, Grade 60.
- All Anchor Rods shall conform to ASTM F1554, Grade 36 having a minimum yield stress of 36000 p.s.i. Anchor Bolts shall be cleaned to remove any oil from the threading process before galvanizing.
- Anchor Rods shall have 7" thread length on both ends.
- All nuts shall conform to ASTM A563, DH. All nuts shall be heavy hex. All washers shall conform to ASTM F436.
- All structural steel including the Steel Posts shall be galvanized according to ASTM A123. The Nuts, Washers and 10" of one end of the Anchor Rods shall be galvanized according to ASTM F2329.
- All Rod Holes shall be drilled. All plate cuts shall preferably be Saw Cuts, however, Flame Cutting will be permitted providing all edges are ground smooth (metal projecting beyond the plane of the plate face will NOT be allowed).
- All welding and weld inspection shall be in accordance with the latest edition of AWS D 1.5 Structural Welding Code.

SHOP PLANS

The fabricator shall submit shop plans in accordance with the Specifications or in Adobe PDF format. Shop plan submittals shall be sent to the Office of Bridge Design. Include design and check design, if applicable, with initial submittal.

ERECTION DETAILS

FOR

FIXED SIGN SUPPORTS

S. D. DEPT. OF TRANSPORTATION

DECEMBER 2016

1 OF 2

DESIGNED BY RH/DM CNTYPCNX	DRAWN BY RH/TB/MDG PCNXDSPG	CHECKED BY RH/DM/PW BSTDFSSA	Steve A. Johnson BRIDGE ENGINEER
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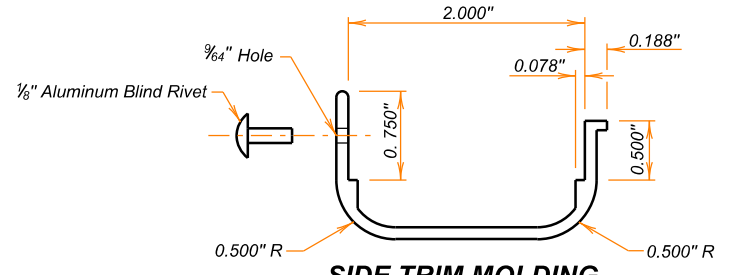
Plotting Date: 06/23/2022

PLOT SCALE - 1:0.169082

PLOT NAME - 7

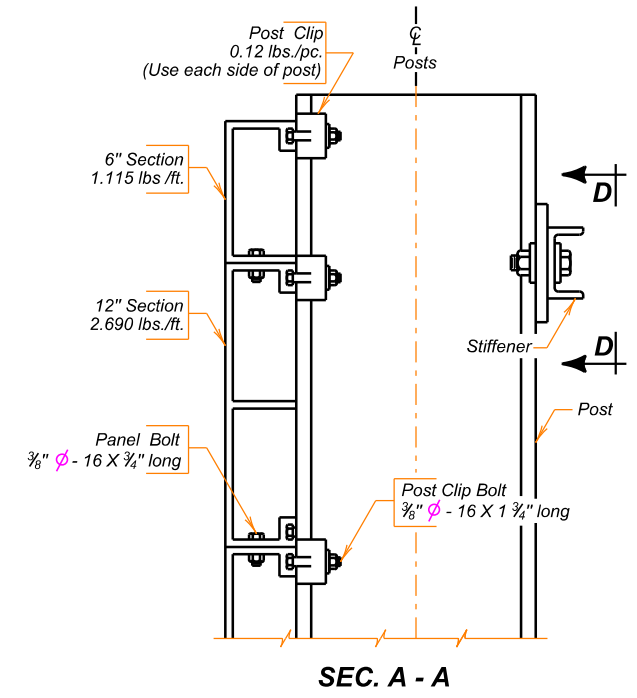
NOTE:
P = Number of Posts to be used
H = Vertical dimension of sign
L = Horizontal dimension of Main Sign

NOTE:
2 stiffeners are required when H is 8' - 0" or less
3 stiffeners are required when H is more than 8' - 0"

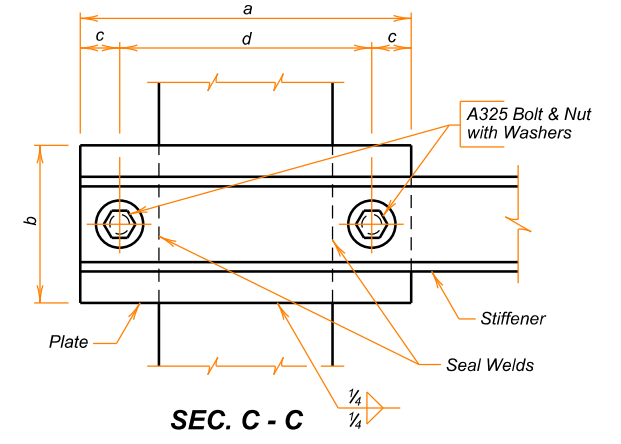


SIDE TRIM MOLDING

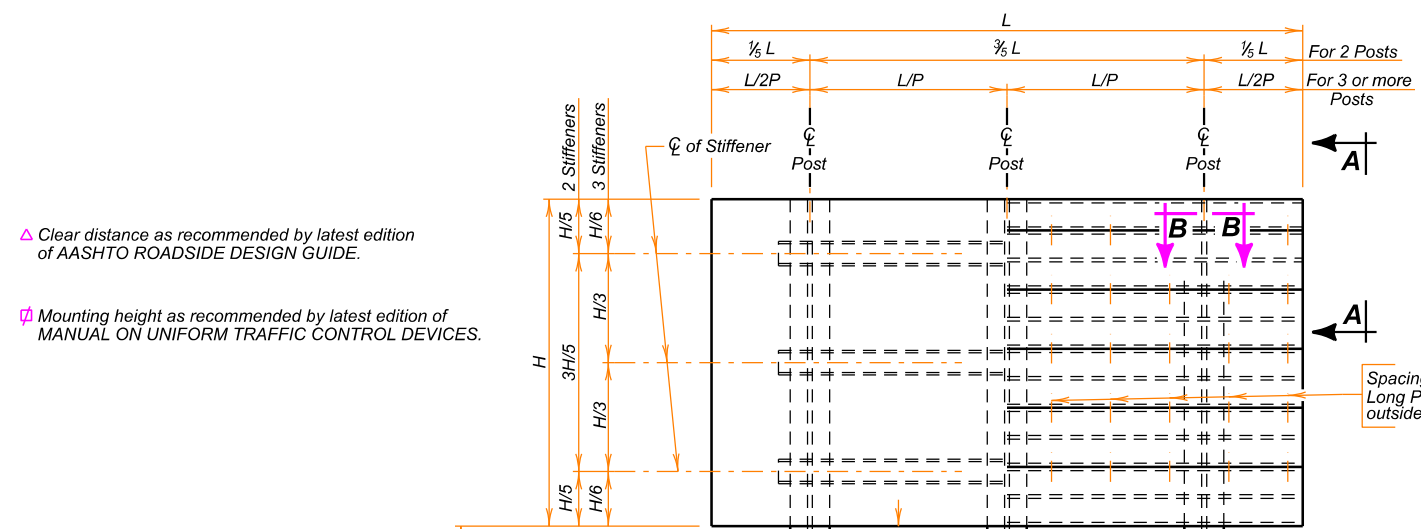
Side Trim Molding is required on all vertical edges of extruded panels. They shall be fastened at a minimum of one (1) rivet per panel.



SEC. A - A



SEC. C - C



△ Clear distance as recommended by latest edition of AASHTO ROADSIDE DESIGN GUIDE.

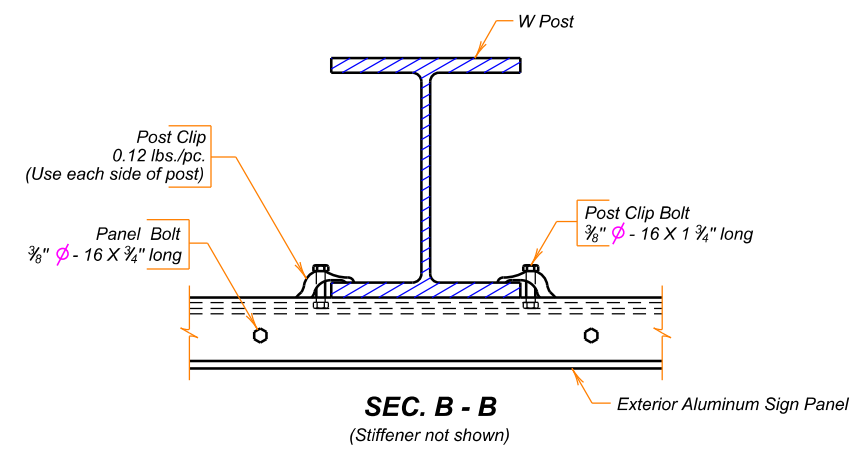
□ Mounting height as recommended by latest edition of MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

Spacing for 3/8" - phi 16 X 3/4" Long Panel Bolts (3" or 6" from outside edges and 1'-0" apart.)

STIFFENER DATA						
Post	Stiffener	a	b	c	d	Bolt (A325) Plate Thk.
S3X5.7 thru W8X21	C3X5	10 1/2"	5"	1 1/4"	8"	3/8" phi 3/16"
W8X24 thru W10X45	C5X6.7	13 1/2"	6"	1 1/2"	10 1/2"	7/8" phi 3/8"

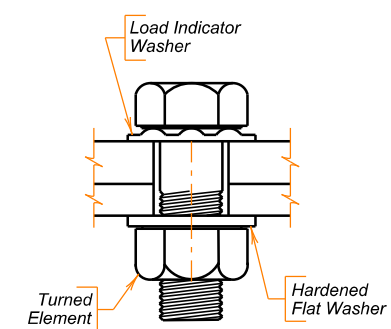
STIFFENER BOLTING PROCEDURE

High strength bolts shall be tightened so as to obtain a minimum residual tension by the use of load indicator washers.

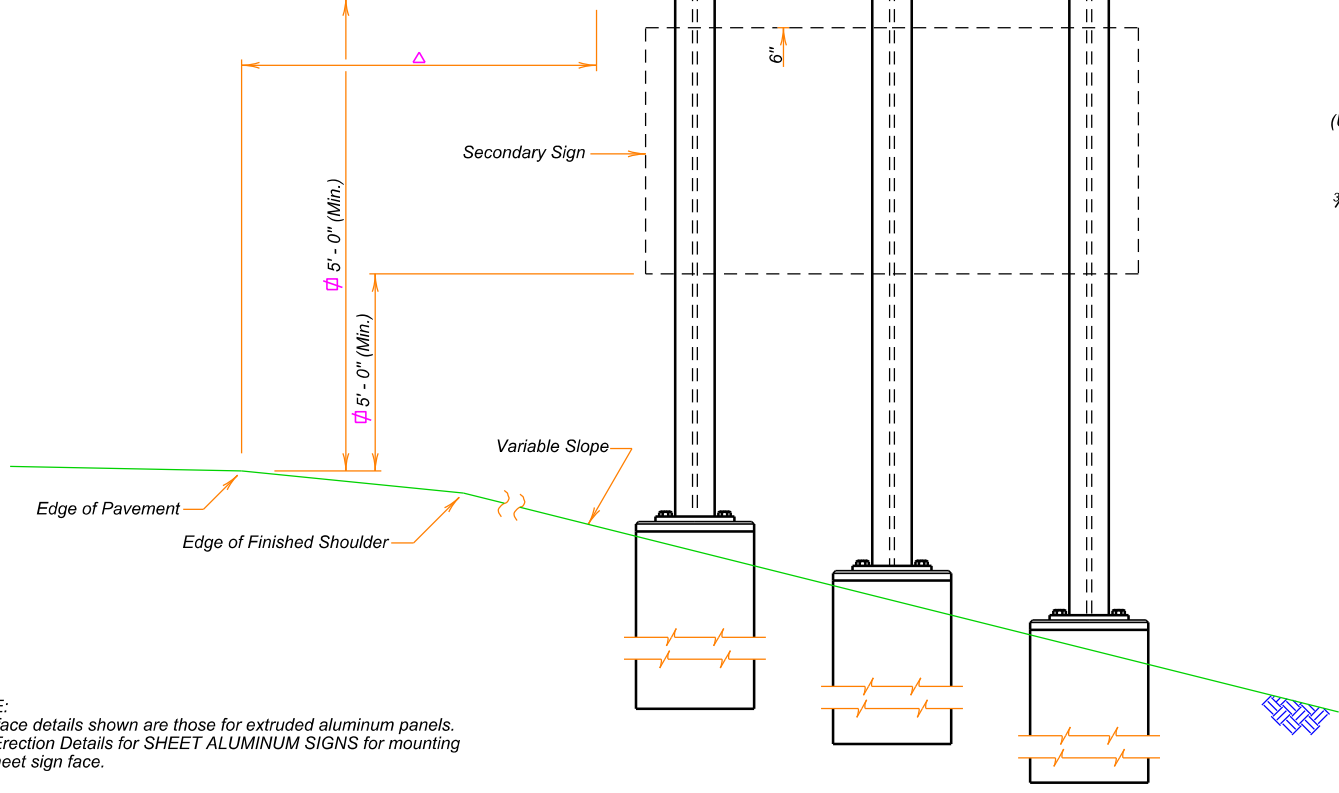


SEC. B - B

(Stiffener not shown)



LOAD INDICATOR WASHER DETAIL



ELEVATION

NOTE:
Sign face details shown are those for extruded aluminum panels. See Erection Details for SHEET ALUMINUM SIGNS for mounting flat sheet sign face.

ERECTION DETAILS
FOR
FIXED SIGN SUPPORTS
S. D. DEPT. OF TRANSPORTATION
DECEMBER 2016

DESIGNED BY RH/DM CNTYPCNX	DRAWN BY RH/TB/MDG PCNXDSPG	CHECKED BY RH/DM/PW BSTDFSSB	Steve A. Johnson BRIDGE ENGINEER
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PLOTTED FROM - TRM111119

FILE - ... \INSTALLATIONDETAILS.DGN

Brace Posts Case 1

Brace Posts Case 2

Section A-A

12" Section
2,690 Lbs./Ft.

Support Post

Panel Bolt
3/8" Ø -16 x 3/4" long

Post Clip
0.12 Lb./P.C.
(Use each side of post)

Panel Bolt
3/8" Ø -16 x 1 1/4" long

BRACE POST LOCATION TABLE

	E1-5 WIDTH (X)	SIGN WIDTH (W)	A**		
			B	C	
CASE 1*	9'-6"	9'-6"	2'-6"	4'-6"	2'-6"
		10'-0"	2'-9"	4'-6"	2'-3"
		11'-0"	2'-9"	4'-9"	2'-0"
CASE 2	9'-6"	12'-0" to 13'-0"	1'-9"	5'-9"	2'-0"
		14'-0" and up	2'-0"	5'-6"	2'-0"
	11'-0"	12'-0"	1'-9"	7'-0"	2'-3"
		13'-0" and up	2'-0"	7'-0"	2'-0"

November 19, 2020

ERECTING E1-5P EXIT NUMBER PLAQUES ABOVE GUIDE SIGNS

PLATE NUMBER
632.35

Published Date: 2nd Qtr. 2022

Sheet 1 of 1

The signs illustrated are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.

The signs illustrated will be used where there are distracting situations; such as: vehicles parked on shoulder, vehicles accessing the work site via the highway, and equipment traveling on or crossing the roadway to perform work operations.

The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.

* If the work space is on a divided highway, an advance warning sign should also be placed on the left side of the directional roadway.

For short term, short duration, or mobile operations, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet) (A)
0 - 30	200
35 - 40	350
45 - 50	500
55	750
60 - 80	1000

ROAD WORK AHEAD
W202.1

WORK SPACE

A

January 22, 2021

WORK BEYOND THE SHOULDER

PLATE NUMBER
634.01

Published Date: 2nd Qtr. 2022

Sheet 1 of 1