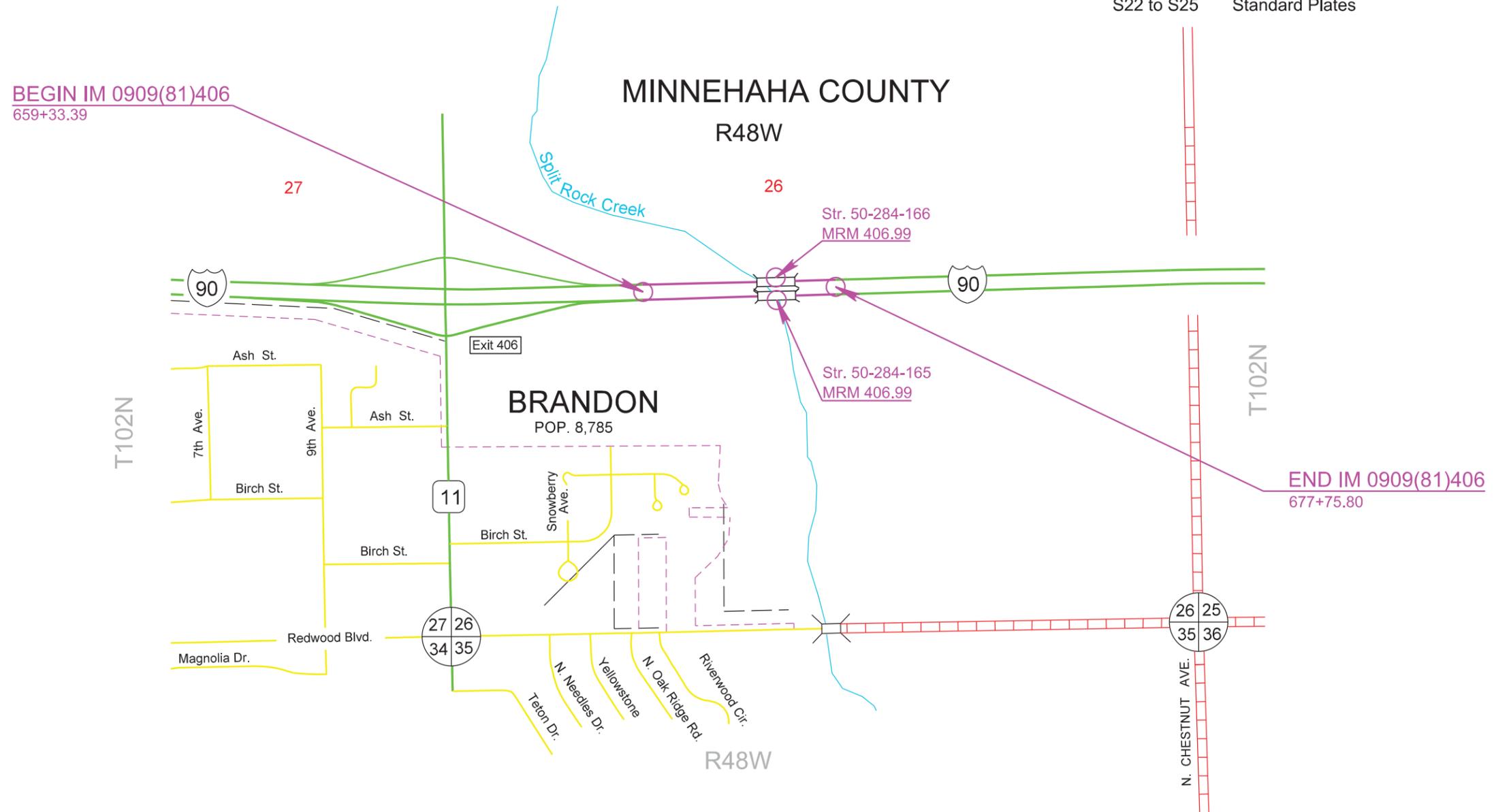


Section S: Permanent Signing Plans

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0909(81)406	S1	S25
Plotting Date: mmm-ddd-yyy		Revised	

INDEX OF SHEETS

S1	General Layout w/ Index
S2 to S4	Estimate with Permanent Signing Notes & Table
S5 to S6	Permanent Signing Layouts
S7	Sign Face Layout
S8	Sign Angle Details for Interstate Highway Signs
S9 to S10	Delineator Layout and Erection Details
S11 to S17	Erection Details for Breakaway Sign Supports
S18 to S19	Erection Details for Fixed Sign Supports
S20	Details for Erecting E1-5 Exit Number Panels Above Guide Signs
S21	Type 2 Object Pipe End Marker Installation Details
S22 to S25	Standard Plates



Plot Scale - \$\$scale\$\$

Plotted From - \$\$username\$\$

File - \$\$filename\$\$

SECTION S ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
110E0100	Remove Concrete Footing(s)	Lump Sum	LS
110E5010	Salvage Delineator	21	Each
110E5020	Salvage Traffic Sign	6	Each
110E5030	Salvage Extruded Panel Sign	1	Each
632E0010	1.25' Diameter Breakaway Support Concrete Footing	20.0	Ft
632E0060	2.5' Diameter Fixed Support Concrete Footing	14.0	Ft
632E1210	S3x5.7 Steel Post	11.0	Ft
632E1260	W8x31 Steel Post	49.2	Ft
632E1410	3" Diameter Steel Post, .216" Shell	25.0	Ft
632E1415	4" Diameter Steel Post, .237" Shell	58.1	Ft
632E2020	4"x4" White Delineator with 1.12 Lb/Ft Post	6	Each
632E2220	Guardrail Delineator	33	Each
632E2510	Type 2 Object Marker Back to Back	11	Each
632E3105	Extruded Aluminum Sign, Removable Copy Super/Very High Intensity	203.5	SqFt
632E3203	Flat Aluminum Sign, Nonremovable Copy High Intensity	57.5	SqFt
632E3205	Flat Aluminum Sign, Nonremovable Copy Super/Very High Intensity	48.0	SqFt

SCOPE OF PERMANENT SIGN WORK

The permanent sign work includes, but is not limited to, the following:

A. Items to be removed by the Contractor:

- Existing permanent signs, delineators and object markers.
- Existing fixed and breakaway sign posts and anchors.
- Fixed and breakaway concrete sign footings.

B. Items to be reset or furnished and installed by the Contractor:

- Breakaway and fixed steel post sign supports with concrete footings.
- Flat sheet aluminum signs.
- Delineators and object markers.

SIGN NUMBERING CONVENTION

All sign removals and new installations in these plans are numbered with prefixes that correspond to the following general locations:

I-90 Eastbound Signs and Stationing:
EB-1XX

I-90 Westbound Signs and Stationing:
WB-2XX

I-90 Sign Removals:
RM-3XX

REMOVAL AND SALVAGE OF EXISTING SIGNS

1. Removal and Salvage of Existing Signs:

The Contractor shall remove and salvage the existing signs listed in the Sign Removal Tables. Stationing shown is approximate. The signs are extruded aluminum signs with removable copy legend or a 0.063" aluminum overlay riveted to extruded aluminum panels, or flat aluminum signs with nonremovable copy.

Extruded Aluminum Panel Signs

The Contractor shall securely support the sign and remove the clips holding the extruded aluminum sign to the supports. The aluminum overlay and extruded aluminum panels shall be removed and handled as one unit. All salvaged signs that are not immediately relocated and reset shall be neatly stockpiled, so they are not damaged.

Flat Aluminum Signs

For single post sign assemblies, the Contractor may remove and salvage the flat aluminum sign(s), post, and footing (if present), as one unit. For multiple post assemblies, the Contractor shall remove the sign(s) first, and remove the posts and footings (if present), separate.

2. Miscellaneous Sign Related Items:

The existing footings for fixed base sign posts shall be removed entirely or broken down a minimum of 1 foot below the surface of the final grade at topsoil elevation.

The Contractor shall separate signs from supports prior to stockpiling. Salvaged signs and supports shall be neatly stockpiled at a site designated by the Project Engineer. Salvaged galvanized steel posts shall be adequately labeled with the Station from which they were removed, and neatly stockpiled. Salvaged mounting hardware shall be returned to the SDDOT.

Salvaged posts, signs, sign materials, and overlays shall be returned to the SDDOT Maintenance Yard at the junction of I-29 and I-229, or the Sioux Falls SD Dept. of Transportation Maintenance Complex, 5316 W. 60th St. N., Sioux Falls, SD 57107.

Stockpiling of salvaged material shall be coordinated with the Engineer and Lead Highway Sign Maintenance Worker, at the SDDOT Maintenance Yard. The Lead Highway Sign Maintenance Worker may be contacted at (605)367-5680.

Salvaged delineators, object markers and supports shall become the property of the Contractor.

All nuts, bolts, and miscellaneous mounting hardware salvaged from existing signs shall not be reused.

REMOVAL AND SALVAGE OF EXISTING SIGNS (CONTINUED)

3. Payment for Sign Related Work:

The cost for removal and salvage of flat aluminum sign assemblies, including posts and footings, utility or light pole mounted signs, overhead mounted signs, miscellaneous hardware, landscaping and reseeding, shall be incidental to the contract unit price per each for Salvage Traffic Sign.

The cost for removal and salvage of extruded panel sign assemblies, including posts and footings, miscellaneous hardware, landscaping and reseeding, shall be incidental to the contract unit price per each for Salvage Extruded Panel Sign.

The cost for removal and salvage of delineators, object markers, mileage reference markers (MRMs), and posts shall be incidental to the contract unit price per each for Salvage Delineator. MRMs will be reset by the State upon project completion.

SIGN LEGEND, BORDER AND BACKGROUND

All sign materials shall comply with Section 982 of the Specifications. All flat aluminum signs shall be fabricated from 0.100" sheet aluminum.

Sheeting material on all extruded panel signs shall meet or exceed standards for ASTM D 4956 classified Type XI super/very high intensity sheeting.

Sheeting material on all yellow object markers and delineation, and warning signs designated DG shall be fluorescent yellow in color and meet or exceed standards for ASTM D 4956 classified Type XI super/very high intensity sheeting.

Adhesive copy applied directly to sheeted extruded aluminum sign panel background may be substituted for removable copy, if approved by the Engineer. Direct applied adhesive copy located on panel seams shall be neatly cut at the seams and securely adhered to the panels. Direct applied adhesive copy may not be substituted for removable copy on specific business logo panels with the two following exceptions:

- Exit number legend on combination service logo signs.
- Service type and exit number legend on non-combination service logo signs, including service legend on ramp signs.

Unless otherwise specified in the plans:

- All upper case letters, lower case letters and all numerals shall be Series "E" Modified.
- The border on all signs less than 4 feet in height shall be 1 inch wide. The border on all signs 4 feet or more in height shall be 2 inches wide.
- The corner radii on all signs 3 feet or less in height shall be 3 inches. The corner radii on all signs greater than 3 feet and less than 6 feet in height shall be 6 inches. The corner radii on all signs 6 feet or more in height shall be 12 inches. The sign height, sign width, legend height and symbol sizes are specified herein.

Side trim finish-coat color required on new Extruded Aluminum guide signs is interstate green. The finish-coat color required on new Extruded Aluminum motorist service (logo) signs is interstate blue.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0909(81)406	S3	S25

DATE DECALS

Date decals should be approximately 2" X 2" in size.



One date decal shall be placed in the extreme lower left corner of the front of each extruded aluminum panel sign, and as indicate in the Standard Specifications.

Costs to furnish and install date decals on new signs shall be incidental to the contract unit price per square foot for the various aluminum sign items.

SIGN AND SUPPORT SHOP DRAWINGS

The Contractor shall provide sign and support shop drawings to the Engineer for review by the Mitchell Region Traffic Office and Bridge Design Office, prior to fabrication. Adobe PDF electronic files are preferred.

CONCRETE FOOTINGS

The exposed portion of fixed base concrete footings shall be formed to provide a uniform diameter section and half-inch chamfer on the grout pad as shown on the footing details. The amount of exposed concrete footings on the up-slope side of the footing shall not be greater than 3 inches as shown on the footing details.

Footings for breakaway signs shall be below ground as shown on the footing details and need not be formed.

New concrete footings shall be installed a minimum of 10 ft from old footings greater than 4 ft in depth that have been completely removed, or 5 ft from old footings that have been broken down approximately 1 ft below ground level. New concrete footings may be installed a minimum of 5 ft from old footings 4 ft or less in depth that have been completely removed. The Contractor may adjust new footing locations to comply with the indicated minimum distances if lateral plan offset is maintained, with the approval of the Engineer.

Extreme care should be used to make certain that the footings are constructed in accordance with the plan sheets, and the finished ground line at all footings are per the details shown on the plan sheets. Disturbed areas within the grading project limits shall be seeded in accordance with Section D – Erosion Control Plans. Disturbed areas outside the grading project limits shall be seeded to the satisfaction of the Engineer. The cost of seeding outside the grading project limits shall be incidental to the contract unit price per foot for the various Concrete Footing items.

ACCEPTANCE OF SIGN INSTALLATIONS

Final acceptance of completed signs will be considered on a sign by sign basis in accordance with Section 5.16 of the Specifications.

PERMANENT SIGNING TABLE

SIGN DATA								POST DATA						FOOTING DATA			REMOVAL DATA			COMMENTS		
SIGN #	STATION	DESCRIPTION	SIGN CODE	SIGN SIZE (FT)	SIGN AREA (SQ FT)			OFFSET* RIGHT/LEFT OVERHEAD	POST LENGTHS		FIXED or BREAK- AWAY**	(N)EW or (R)EUSE POST	POST SIZES AND QUANTITIES (FT)			1'-3" DIA BRKWY (FT)	2'-6" DIA FIXED (FT)	FOOTING LENGTH(S)	SALVAGE DELIN & POST		SALVAGE SIGN & POST	SALVAGE EXTR SIGN
					EA	FA	DG		INSIDE	OUTSIDE			W8 X 31 I-BEAM	3" DIA STEEL	4" DIA STEEL							
I-90 Mainline Eastbound Lane																						
EB - 101	635+55 R		W4-1	4 X 4			16.0	16' R	13'-03"	S	N			13.3	4.0		4'-0"					INSTALL NEW SIGN, SUPPORT, AND FOOTING ASSEMBLY.
RM - 301	656+05 R		R1-2	3 X 3 X 3				14' R	10'-06"	S									1			REMOVE EXISTING SIGN, SUPPORT, AND FOOTING ASSEMBLY.
RM - 302	660+60 R		W8-13	4 X 4			16.0	16' R	14'-00"	S	N			14.0	4.0		4'-0"			1		REMOVE AND SALVAGE EXISTING HINGED SIGN AND WOOD SUPPORT. INSTALL NEW HINGED SIGN, SUPPORT, AND FOOTING ASSEMBLY.
EB - 102	663+90 R																					
RM - 303	671+45 R	MRM 406.99	D10-3a	0.25 X 1.75				10' R	4'-00"	A									1			REMOVE AND SALVAGE MRM SIGN, U-CHANNEL SUPPORT AND ANCHOR STUB POST.
RM - 304	672+00 R	MRM 407	D10-3a	1 X 4				16' R	9'-06"	A									1			REMOVE AND SALVAGE MRM SIGN, U-CHANNEL SUPPORT AND ANCHOR STUB POST.
RM - 305	663+90 R		M2-1	3 X 1.5		4.5		16' R	13'-02"	S	N		13.2	4.0		4'-0"			1			REMOVE AND SALVAGE EXISTING SIGNS, STEEL PIPE AND FOOTING SUPPORT ASSEMBLY. INSTALL NEW SIGNS, STEEL PIPE AND FOOTING SUPPORT ASSEMBLY.
EB - 103	681+50 R		M1-5	3 X 3		9.0																
EB - 104	686+50 R		R2-1	4 X 8		32.0		16' R	16'-09"	S	N			16.8						1		INSTALL NEW SIGN, SUPPORT, AND FOOTING ASSEMBLY.
RM - 306	674+25 R		R8-4	4 X 3		12.0		16' R	11'-09"	S	N		11.8	4.0		4'-0"			1			REMOVE AND SALVAGE EXISTING SIGN, STEEL PIPE AND FOOTING SUPPORT ASSEMBLY. INSTALL NEW SIGN, STEEL PIPE AND FOOTING SUPPORT ASSEMBLY.
EB - 105	691+50 R																					
I-90 Mainline Westbound Lane																						
WB - 206	678+75 L		W8-13	4 X 4			16.0	16' R	14'-00"	S	N			14.0	4.0		4'-0"			1		REMOVE AND SALVAGE EXISTING HINGED SIGN AND WOOD SUPPORT. INSTALL NEW HINGED SIGN, SUPPORT, AND FOOTING ASSEMBLY.
RM - 307																						
RM - 308	672+00 L	MRM 407	D10-3a	1 X 4				16' R	9'-06"	A									1			REMOVE AND SALVAGE MRM SIGN, U-CHANNEL SUPPORT AND ANCHOR STUB POST.
RM - 309	671+10 L	MRM 406.99	D10-3a	0.25 X 1.75				10' R	4'-00"	A									1			REMOVE AND SALVAGE MRM SIGN, U-CHANNEL SUPPORT AND ANCHOR STUB POST.
WB - 207	663+75 L		E5-1	11 X 2.5	27.5			55' R	24'-00"	F	N	N	49.2		14.0	7'-0"					1	REMOVE AND SALVAGE EXISTING SIGNS, STEEL I-BEAM AND FOOTING SUPPORT ASSEMBLIES. INSTALL NEW SIGNS, STEEL I-BEAM AND FOOTING SUPPORT ASSEMBLIES.
			EXIT	16 X 11	176.0																	
RM - 310	663+57 L		E5-1	9 X 2.5																		
			EXIT	8 X 12																		
			D9-18	7 X 2.5																		
TOTALS					203.5	57.5	48.0						49.2	25.0	58.1	20.0	14.0		4	6	1	

* - Distance from White or Yellow Edgeline, or Back of Curb, to Edge of Sign. EA = Extruded Aluminum Panel Signs w/Removable Copy FA = Flat Aluminum Signs w/Non-Removable Copy - High Intensity Sheeting
 ** - (F)ixed Base, or Breakaway (S)lip Base, (A)nchor Stub Post, (D)irect drive, or (W)ood Post. DG = Flat Aluminum Signs w/Nonremovable Copy - Fluorescent Super/Very High Intensity Sheeting

PERMANENT SIGNING

I-90 MAINLINE - EXIT 406

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0909(81)406	S5	S25



SCALE: 1" = 80'

EXIT 406



WB-607
663+75 L

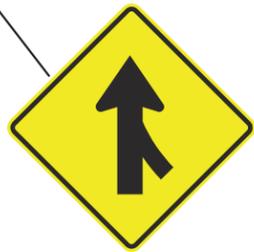
d
d



657+00

660+00

665+00



EB-101
655+35 R



EB-102
663+90 R

PLOT SCALE - \$\$SCALE\$\$

PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

FILE - \$\$FILENAME\$\$

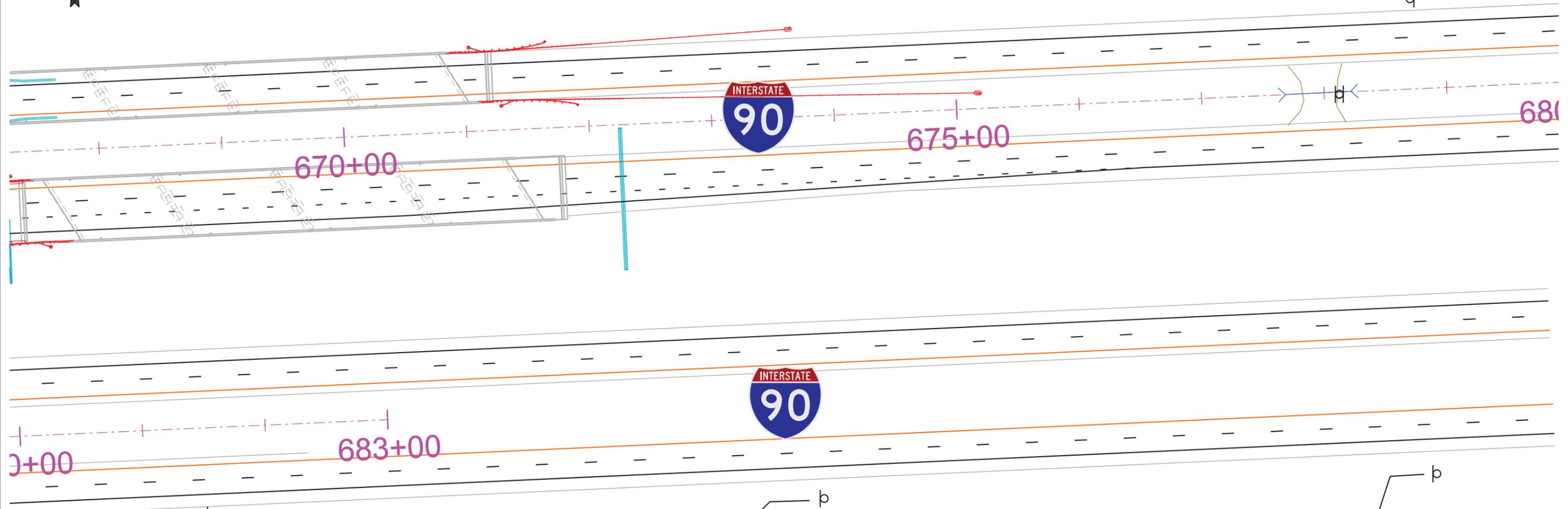
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0909(81)406	S6	S25

PERMANENT SIGNING

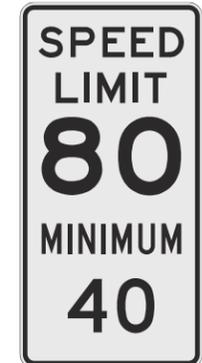
I-90 MAINLINE - EXIT 406



WB-206
678+75 L



EB-103
681+50 R



EB-104
686+50 R



EXISTING
686+78 R



EB-105
691+50 R

PLOT SCALE - \$\$SCALE\$\$

PLOTTED FROM - \$\$USERNAME\$\$

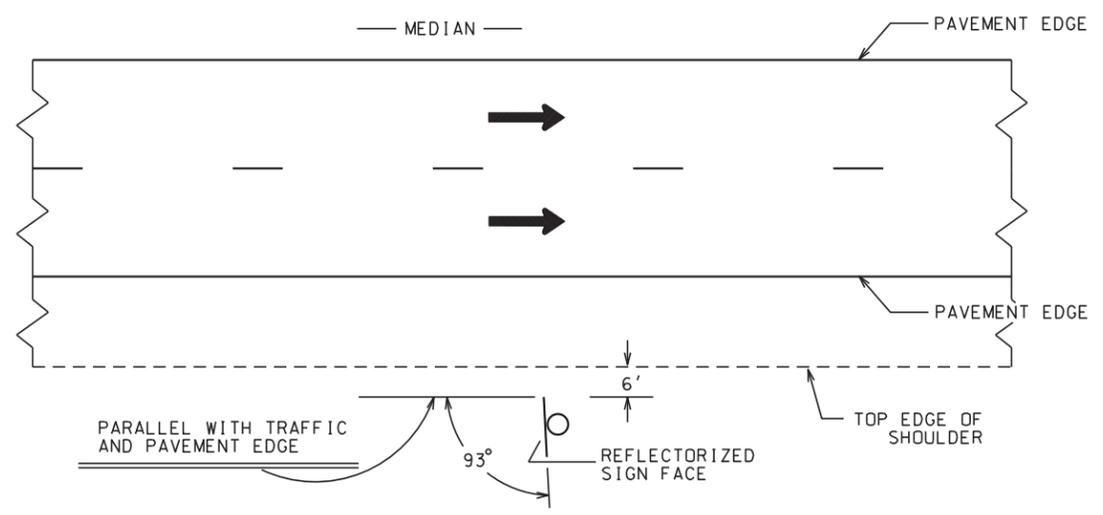
PLOT NAME - \$\$PLOTNAME\$\$

FILE - \$\$FILENAME\$\$

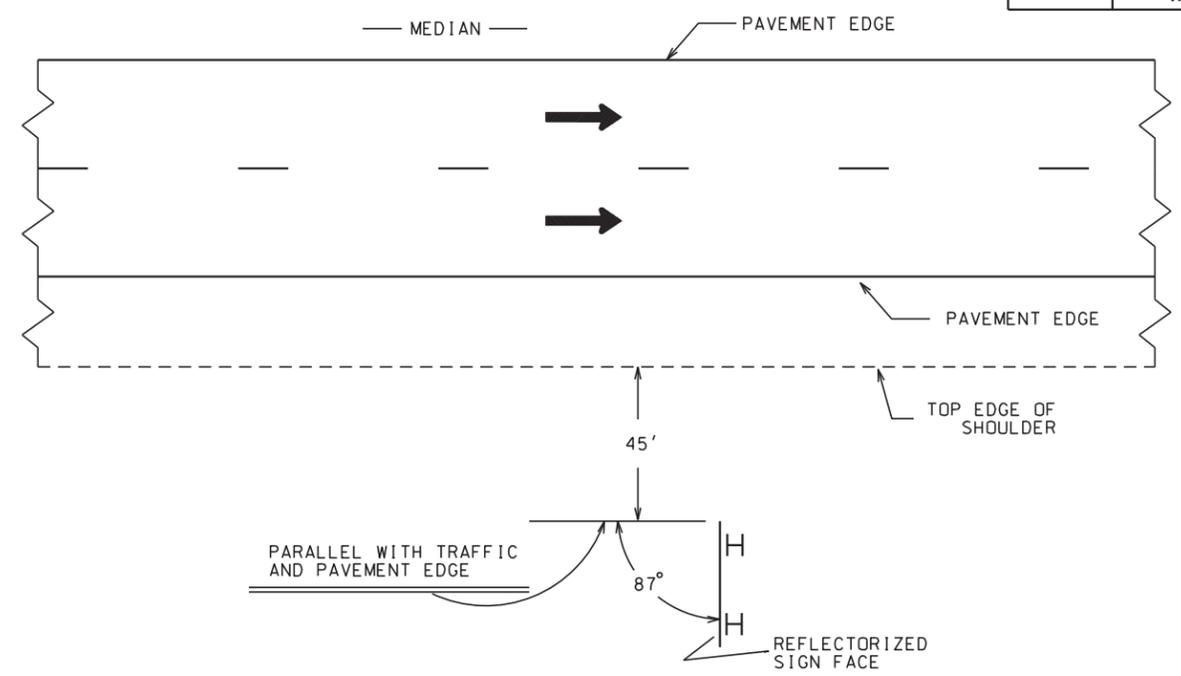
GUIDE SIGNS



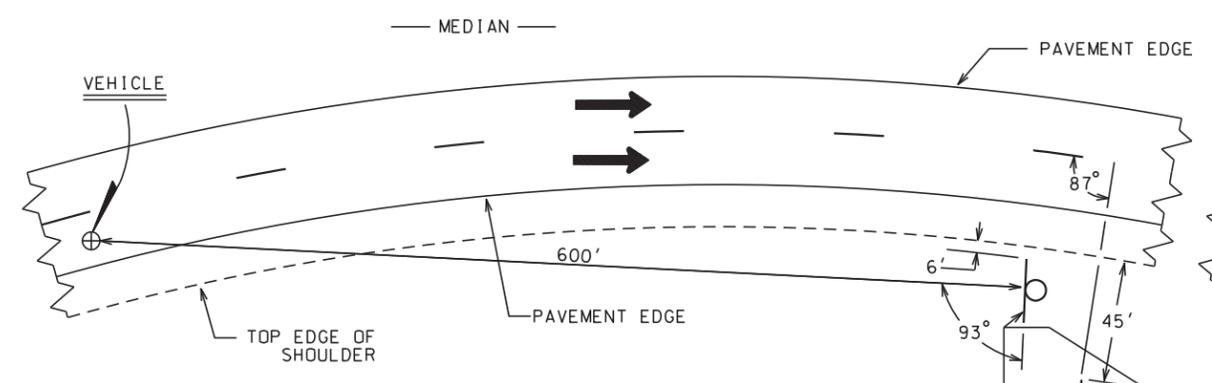
SIGN NUMBER	WB-207
WIDTH x HGHT.	11'-0" x 2'-6" / 16'-0" x 11'-0"
BORDER WIDTH	2"
CORNER RADIUS	6" / 12"
ARROWS	36"x 23" (45) Type A
MOUNTING	Ground
BACKGROUND	TYPE: Type XI Super/Very High Intensity COLOR: Green
LEGEND/BORDER	TYPE: Type XI Super/Very High Intensity COLOR: White



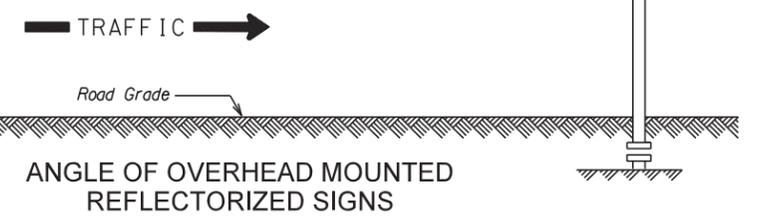
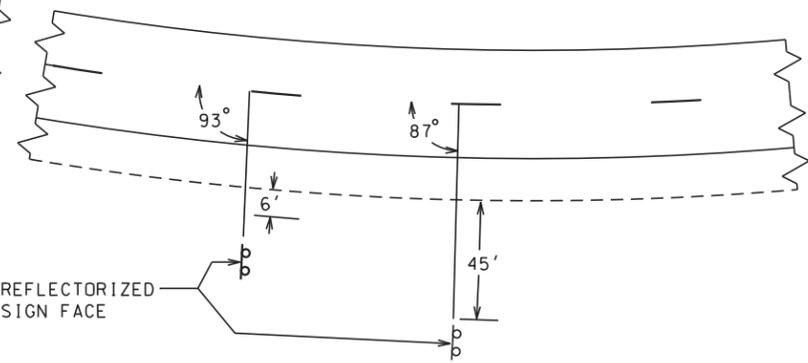
ANGLE OF SHOULDER MOUNTED REFLECTORIZED SIGNS TO APPROACHING TRAFFIC



ANGLE OF APPROACHING TRAFFIC TO REFLECTORIZED SIGNS ERECTED OUT 45 FEET FROM THE TOP EDGE OF ASPHALT SHOULDER



ANGLE OF MOUNTING REFLECTORIZED SIGNS TO APPROACHING TRAFFIC ON A CURVE



ANGLE OF OVERHEAD MOUNTED REFLECTORIZED SIGNS

NOTE:
Shoulder mounted signs shall be erected so the sign face is truly vertical and at 93° away from the center of the lane which the sign serves.

Signs mounted 45 feet from top edge of asphalt shoulder shall be erected so the sign face is truly vertical and at 87° to the roadway at the point of sign stationing shown on the plans.

At curved alignments, shoulder mounted signs (excluding signs mounted out 45' from edge of shoulder) shall be erected so the sign face is truly vertical and the horizontal axis is at an angle of 93° away from a straight line between the sign and a point 600 ft. in advance of the sign on the nearest driving lane.

NOTE:
Overhead signs shall be erected in accordance with the following requirements:

- Where the road grade approaching the sign is + 2.0 % or greater, position the sign so the vertical axis is parallel to a plumb line and the horizontal axis is at right angles to the road (see exception for bridge mounted signs).
- Where the road grade approaching the sign is less than + 2.0 %, position the sign so that the horizontal axis is at a right angle to the road (see exception) and the sign face vertical axis is inclined to face upward at a rate of 1/8 inch per foot of vertical sign surface for each one percent the road grade differs from + 2.0 %.

SIGN ANGLES FOR INTERSTATE HIGHWAY SIGNS SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

PLOT SCALE - \$\$SCALE\$\$

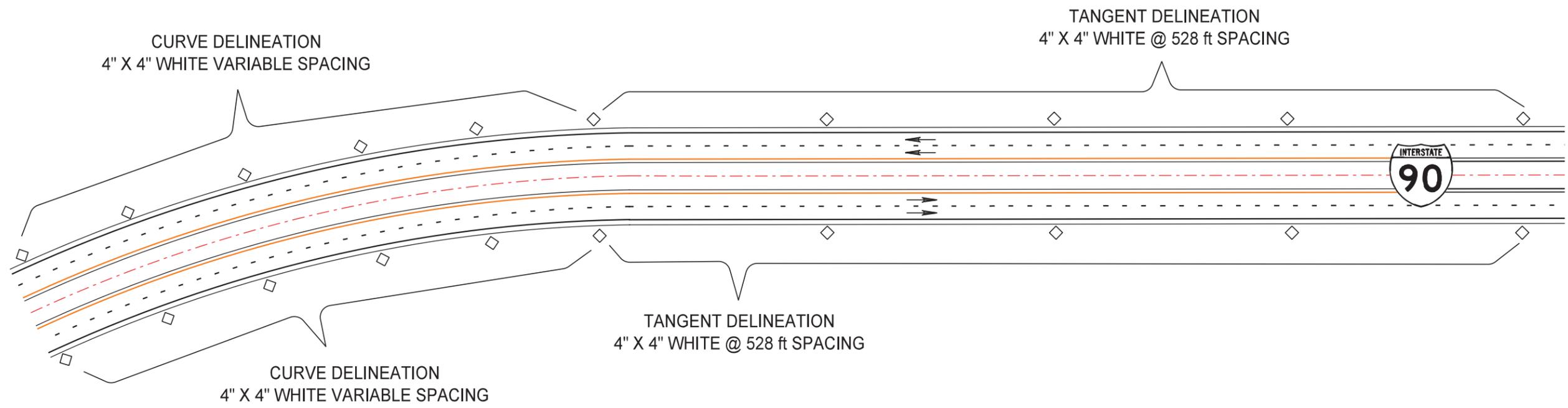
PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

FILE - \$\$FILENAME\$\$

DELINEATION LAYOUTS

INTERSTATE MAINLINE & PIPE ENDS (TYPICAL)



I-90 MAINLINE DELINEATION TABLE										
STATION	SPACING	QUANTITY (EACH)								
		4" X 4"	TYPE 2 OM PIPE END MARKER		TYPE 2 OM Bk-to-Bk (M) *	TERMINAL END MARKER (E) *	4" X 6" GUARDRAIL			
			6" X 12"				BEAM RAIL (B) *		CABLE RAIL (C) *	
			WHITE	YELLOW			WHITE	YELLOW	WHITE	YELLOW
		632E2020	632E2510		**	632E2220				
I-90 EASTBOUND LANES										
659+33 R to 677+76 R		528'	3							
662+70 R to 667+43 R		50'			1		1		9	
664+77 R to 667+74 R		50'			1		1	6		
662+80 R		PIPE END			2					
667+23 L		PIPE END			1					
671+40 R		PIPE END			1					
672+25 R		PIPE END			2					
I-90 WESTBOUND LANES										
659+33 L to 677+76 L		528'	3							
670+88 L to 673+69 L		50'			1		1	6		
671+12 L to 675+21 L		50'			1		1	6	8	
666+75 L		PIPE END			1					
TOTALS			6		11		0	33		

* - See Standard Plate 632.40 Sheet 1 of 4 for symbol definitions.
 ** - For Information Only.

PLOT SCALE - \$\$SCALE\$\$

PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

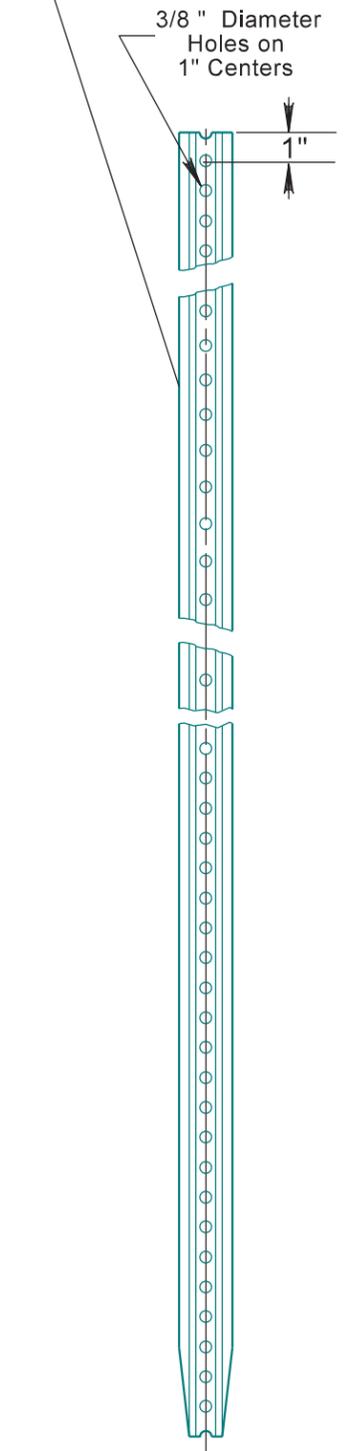
FILE - \$\$FILENAME\$\$

DELINEATOR ERECTION DETAILS

STATE OF SOUTH DAKOTA	PROJECT IM 0909(81)406	SHEET S10	TOTAL SHEETS S25
-----------------------	---------------------------	--------------	---------------------

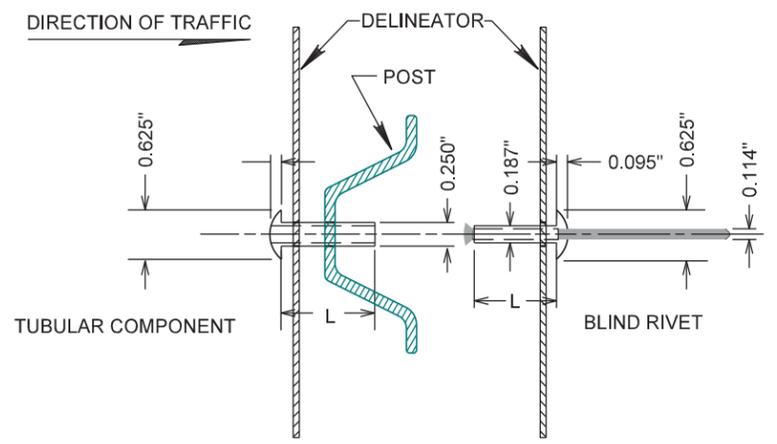
POST DETAIL

NHCRP350 compliant 1.12 Lbs/Ft flanged channel section post with baked on high quality green enamel paint



(TYPICAL)

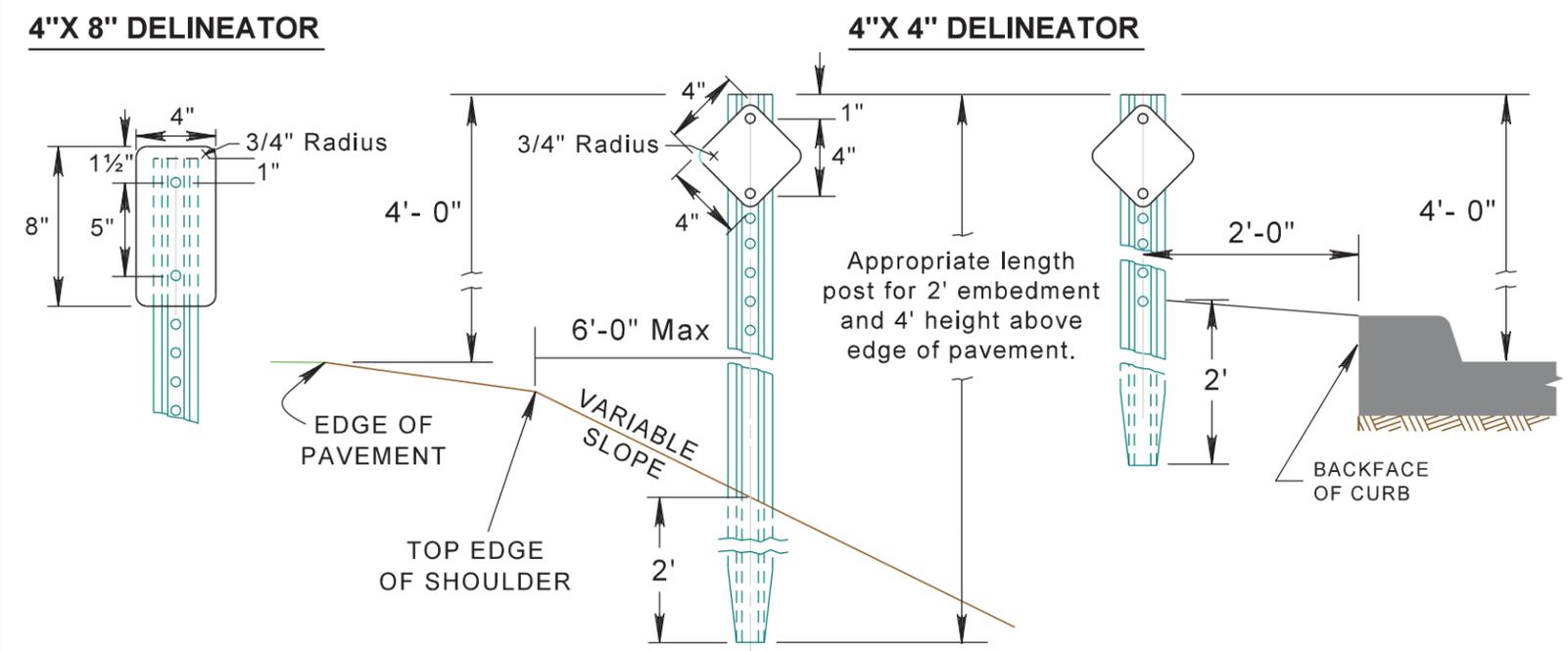
4" X 4" DELINEATORS MOUNTED BACK-TO-BACK



(L)ength varies with Grip Range of Rivet

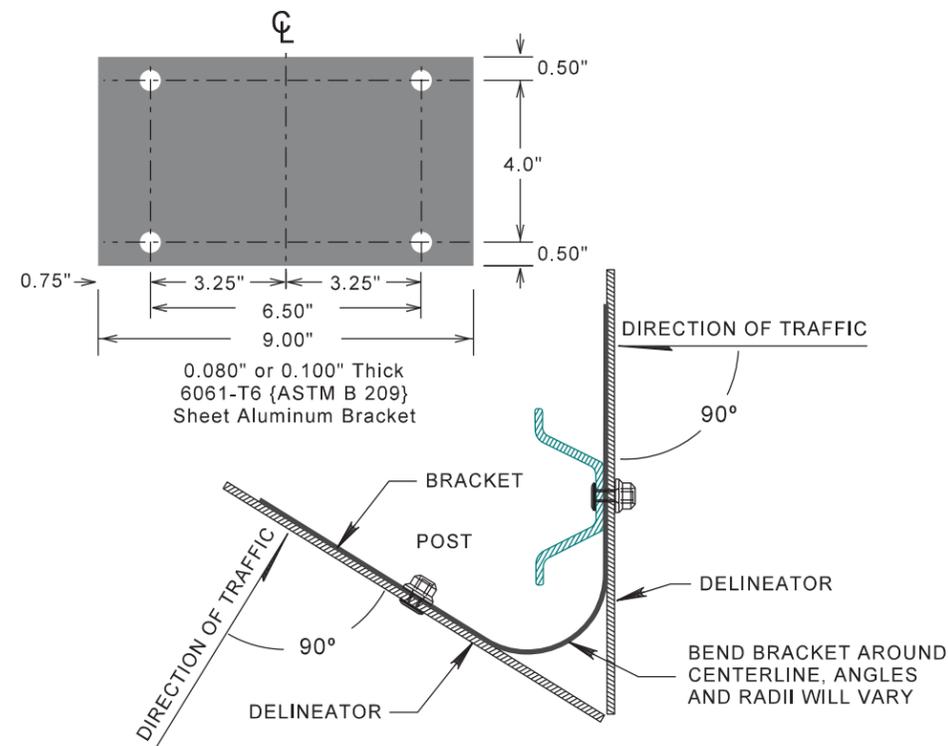
1/4" Two Piece Oval Head Blind Rivet with Aluminum Sleeve, Aluminum Mandrel, and Aluminum Tubular Component is shown. An alternative method of fastening, such as a two piece 3/16 rivet lock bolt, may be used if approved by the Engineer.

4"X 4" and 4"X 8" DELINEATORS



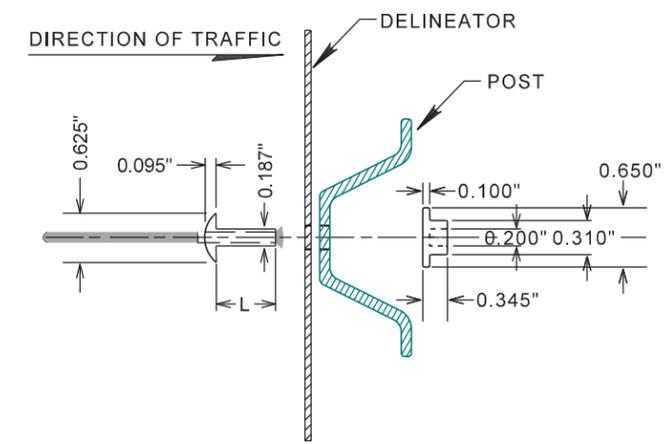
1/4" Diameter Mounting Holes in all Delineators

4" X 4" DELINEATORS MOUNTED ON BRACKET



BEND BRACKET AROUND CENTERLINE, ANGLES AND RADII WILL VARY

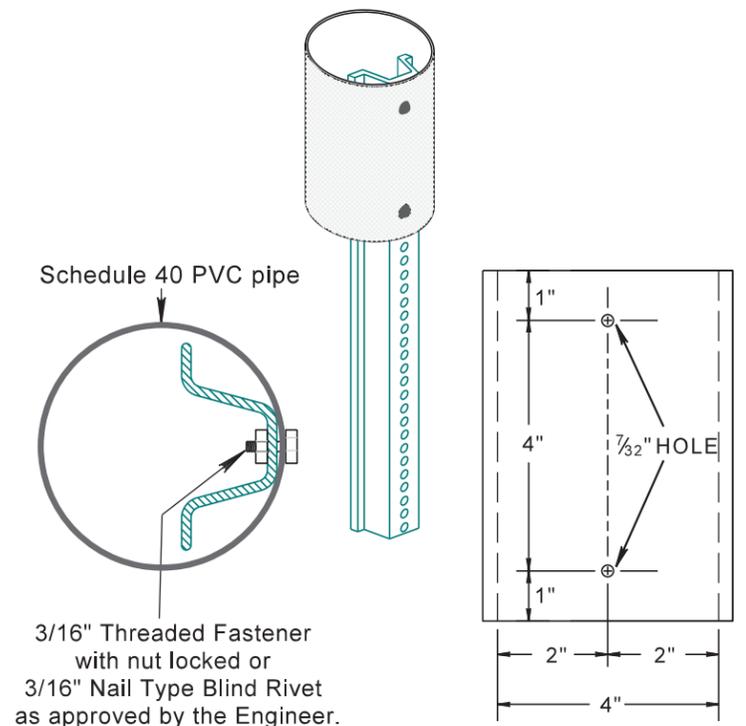
SINGLE 4"X 4" DELINEATOR MOUNTED ON POST



(L)ength varies with Grip Range of Rivet

3/16" Nail Type Blind Rivet with Large Flange Aluminum Rivet and Aluminum Mandrel is shown. An alternative method of fastening, such as two piece 3/16 rivet lock bolt, may be approved by the Engineer.

4" TUBULAR DELINEATOR MOUNTED ON POST



3/16" Threaded Fastener with nut locked or 3/16" Nail Type Blind Rivet as approved by the Engineer.

PLOT SCALE - \$\$SCALE\$\$

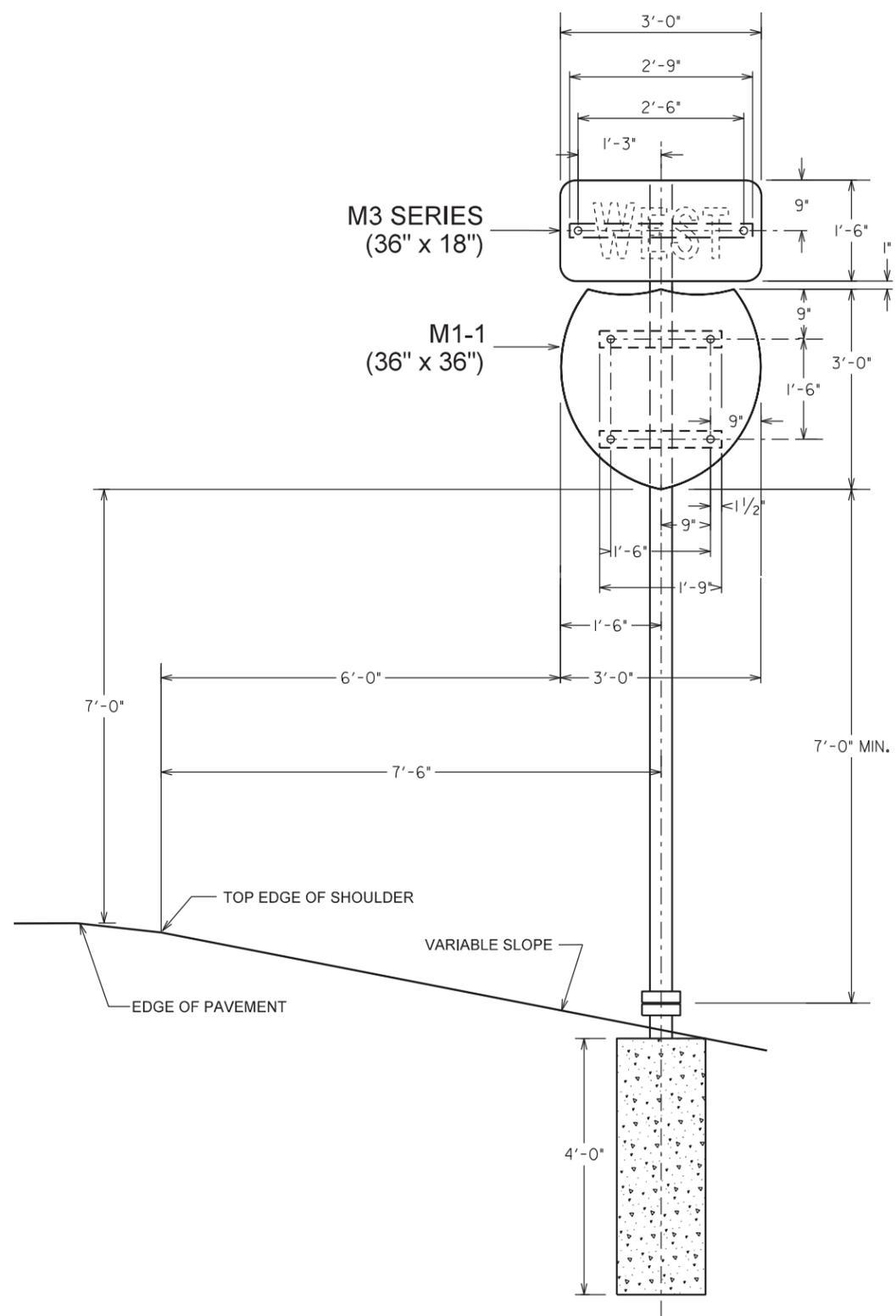
PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

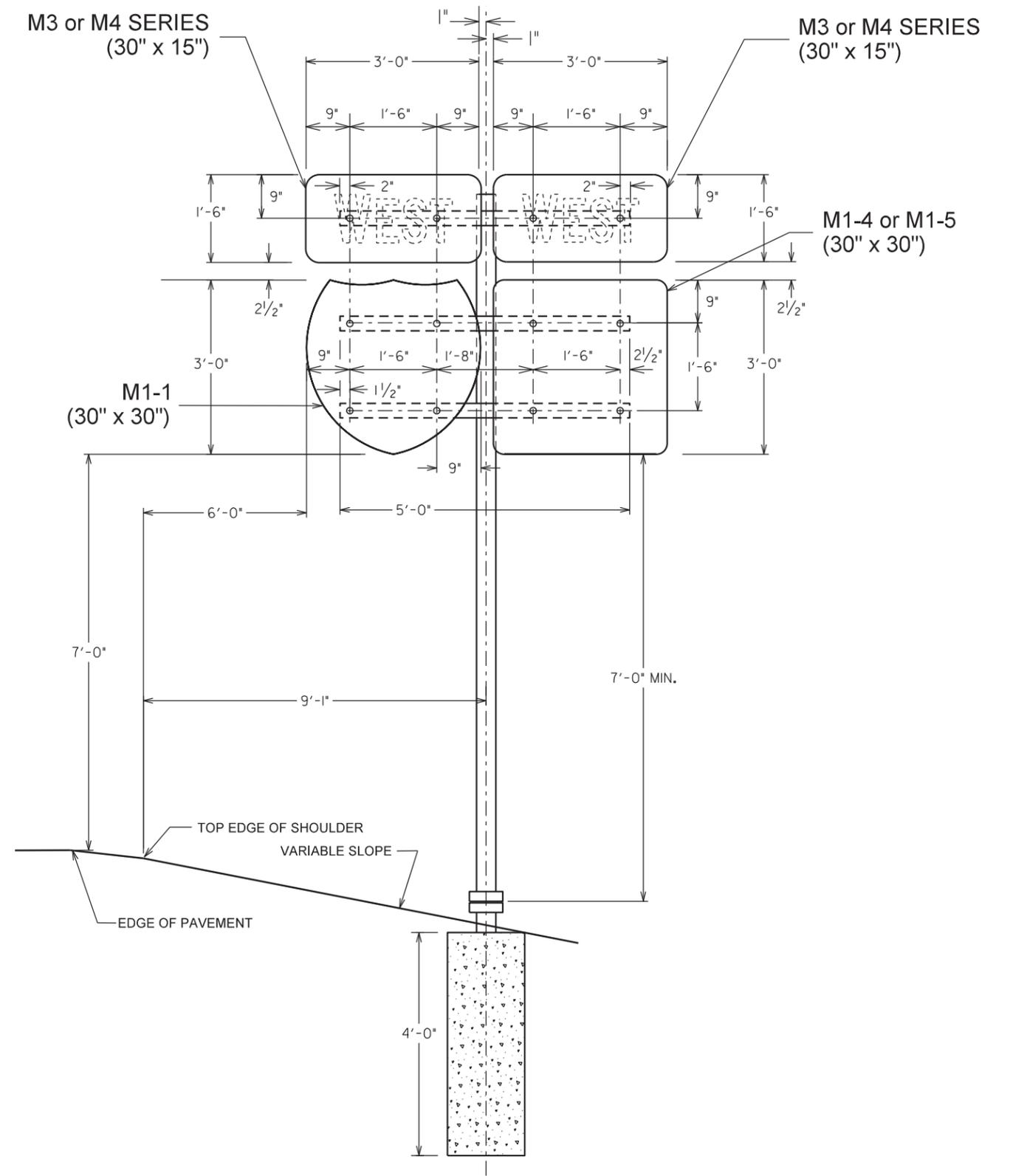
FILE - \$\$FILENAME\$\$

ERECTION DETAILS FOR INTERSTATE HIGHWAY SIGNS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0909(81)406	S11	S25



CARDINAL DIRECTION INTERSTATE
ROUTE MARKER ASSEMBLY



INTERSTATE MAINLINE COMBINATION
ROUTE MARKER ASSEMBLY

PLOT SCALE - \$\$SCALE\$\$

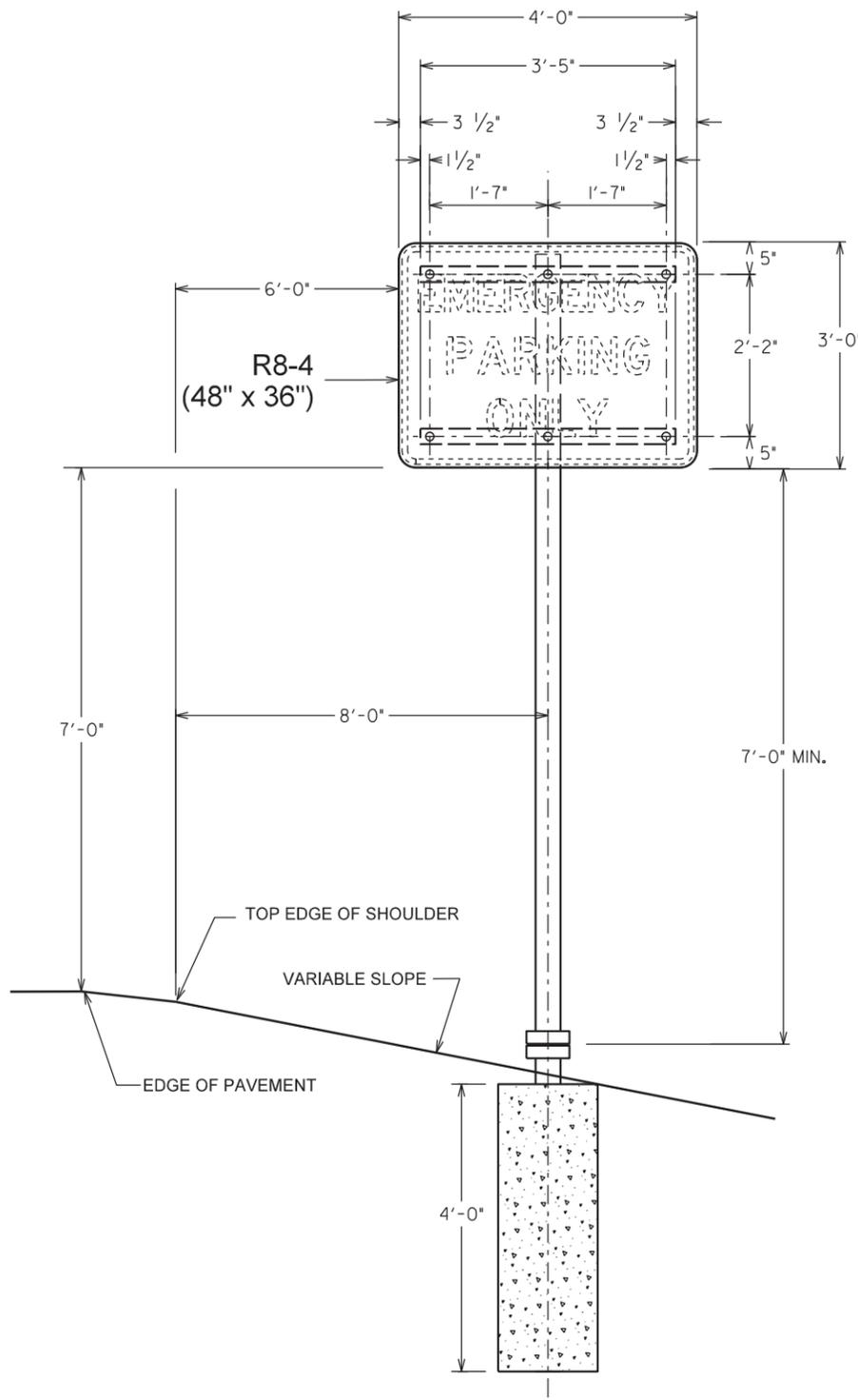
PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

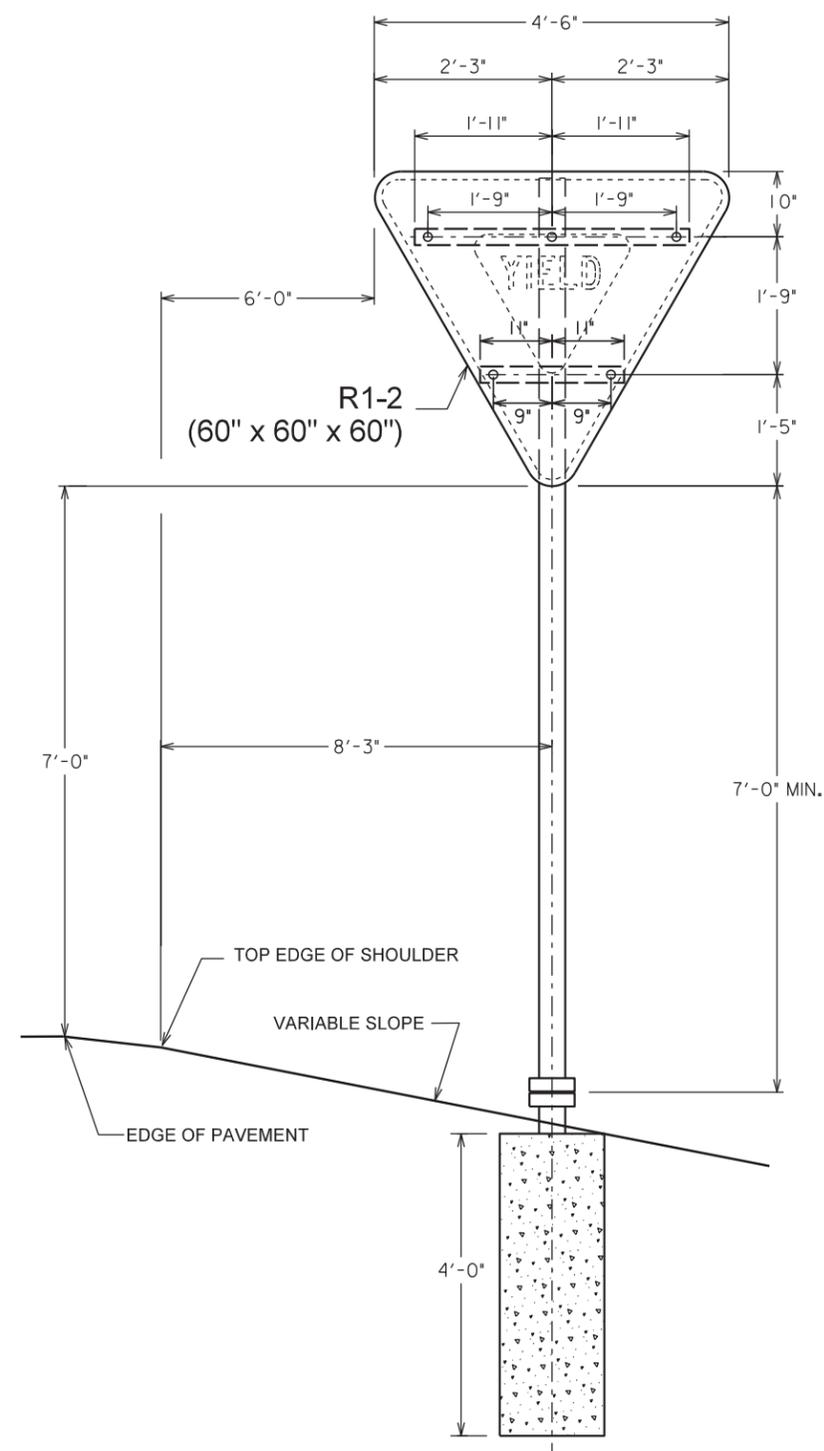
FILE - \$\$FILENAME\$\$

ERECTION DETAILS FOR INTERSTATE HIGHWAY SIGNS

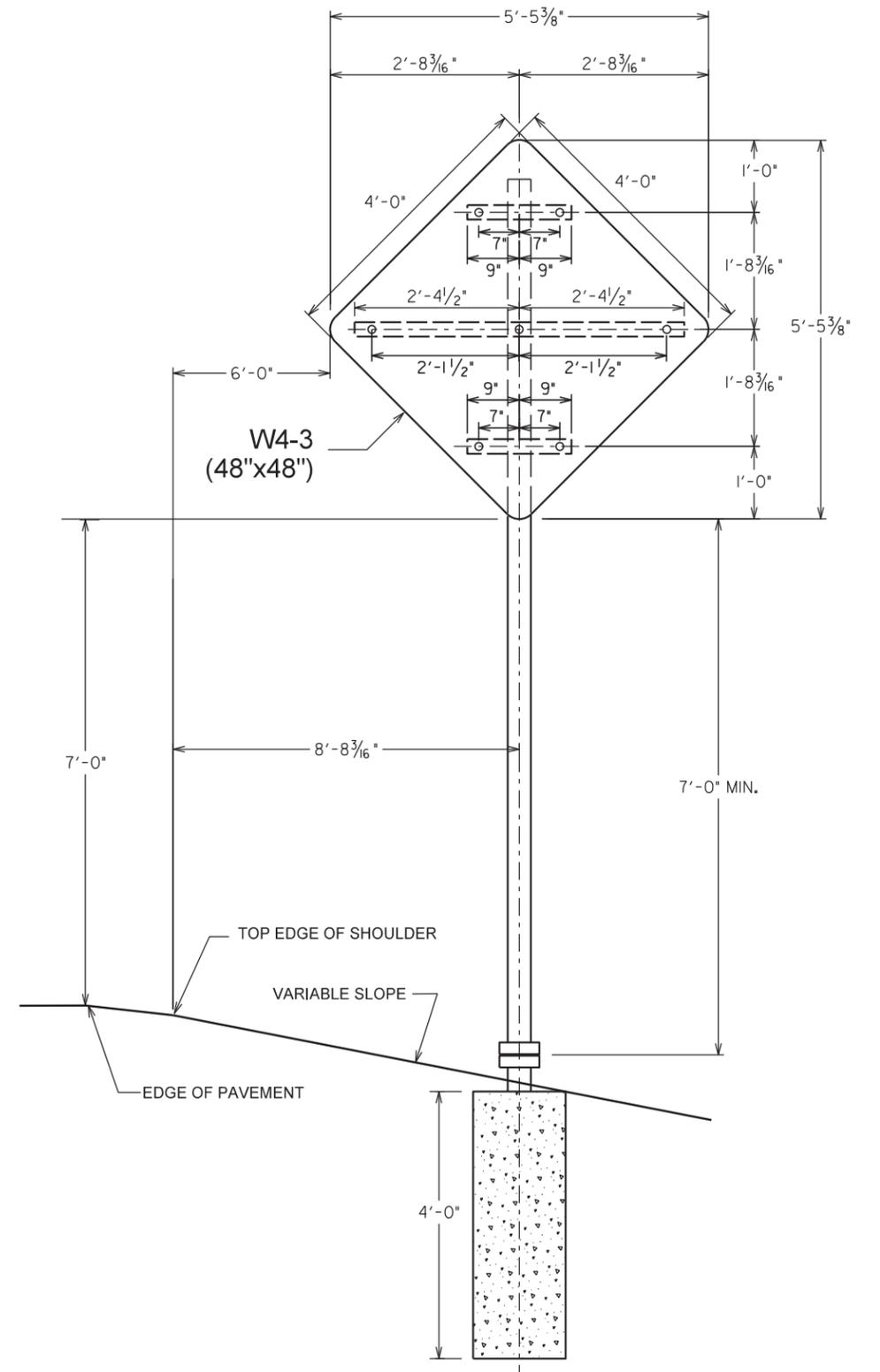
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0909(81)406	S12	S25



**R8-4 EMERGENCY PARKING ONLY
SIGN ASSEMBLY**



**R1-2 YIELD
SIGN ASSEMBLY**



**TYPICAL WARNING
SIGN ASSEMBLY**

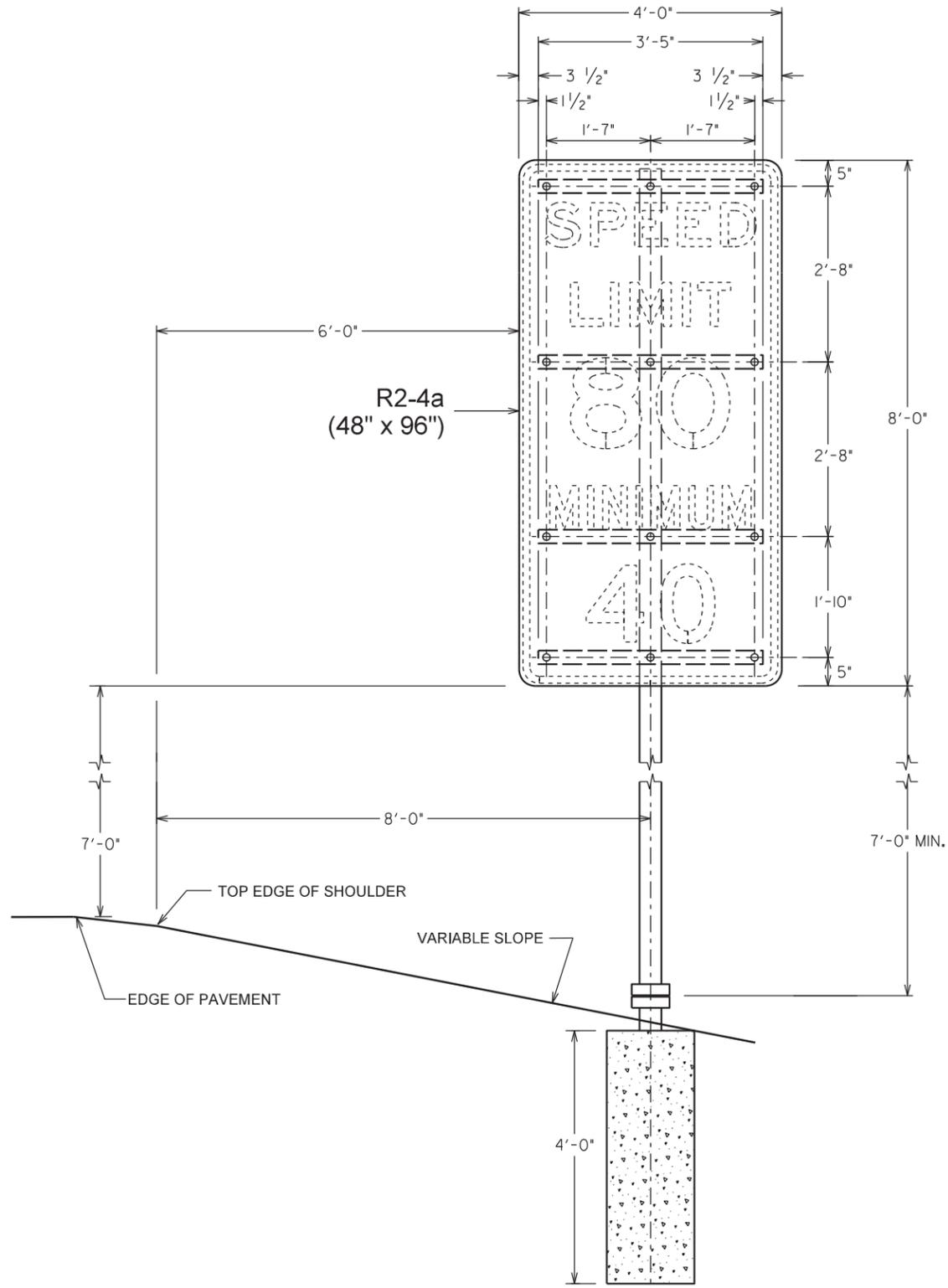
PLOT SCALE - \$\$SCALE\$\$

PLOT NAME - \$\$PLOTNAME\$\$

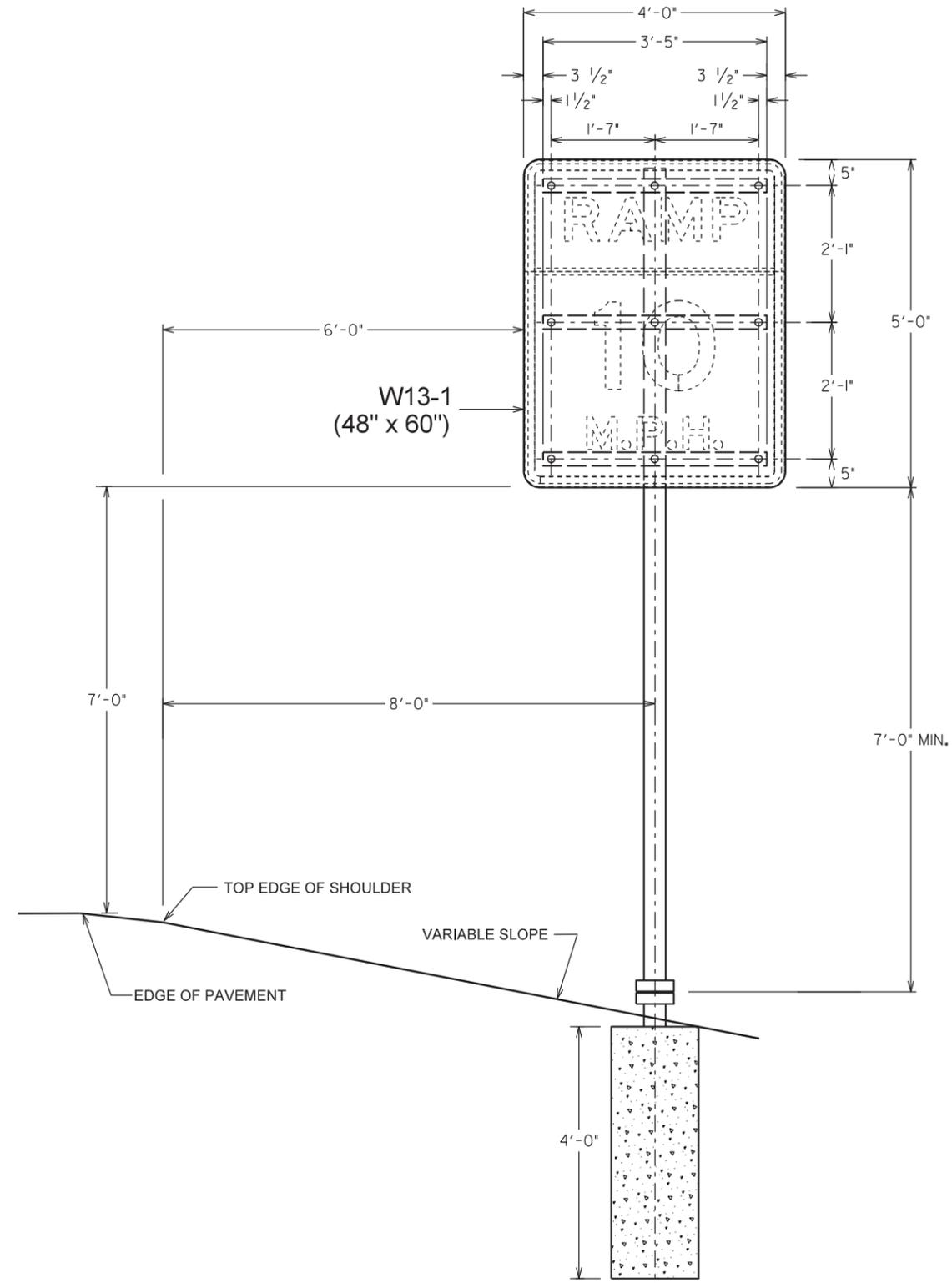
FILE - \$\$FILENAME\$\$

ERECTION DETAILS FOR INTERSTATE HIGHWAY SIGNS

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0909(81)406	S13	S25



R2-4a SPEED LIMIT
SIGN ASSEMBLY



TYPICAL 4' X 5'
SIGN ASSEMBLY

PLOT SCALE - \$\$SCALE\$\$

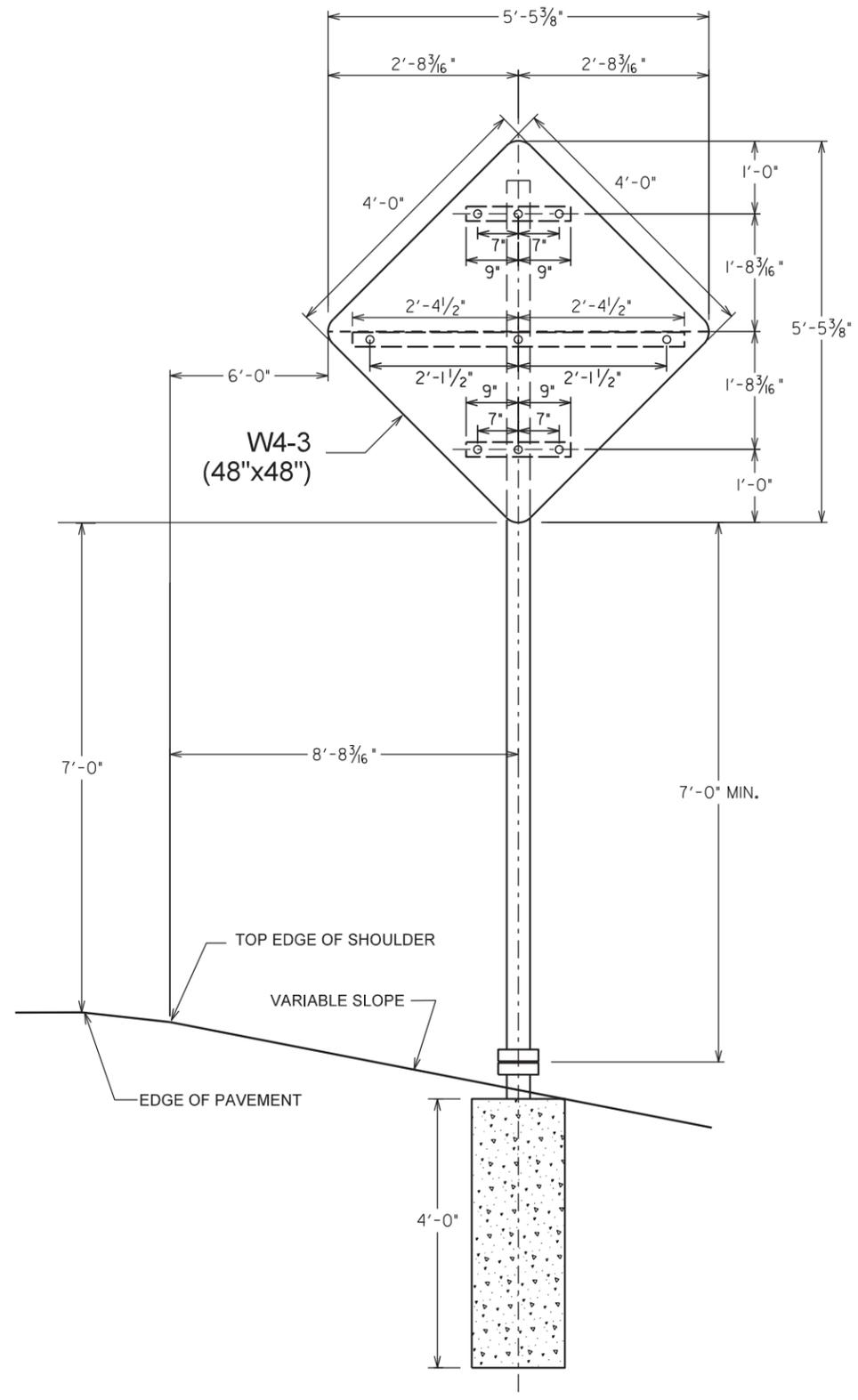
PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

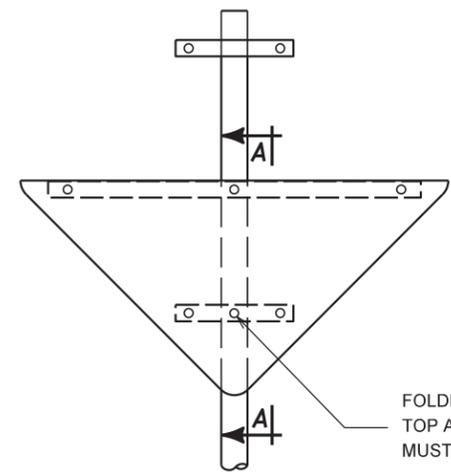
FILE - \$\$FILENAME\$\$

ERECTION DETAILS FOR INTERSTATE HIGHWAY SIGNS

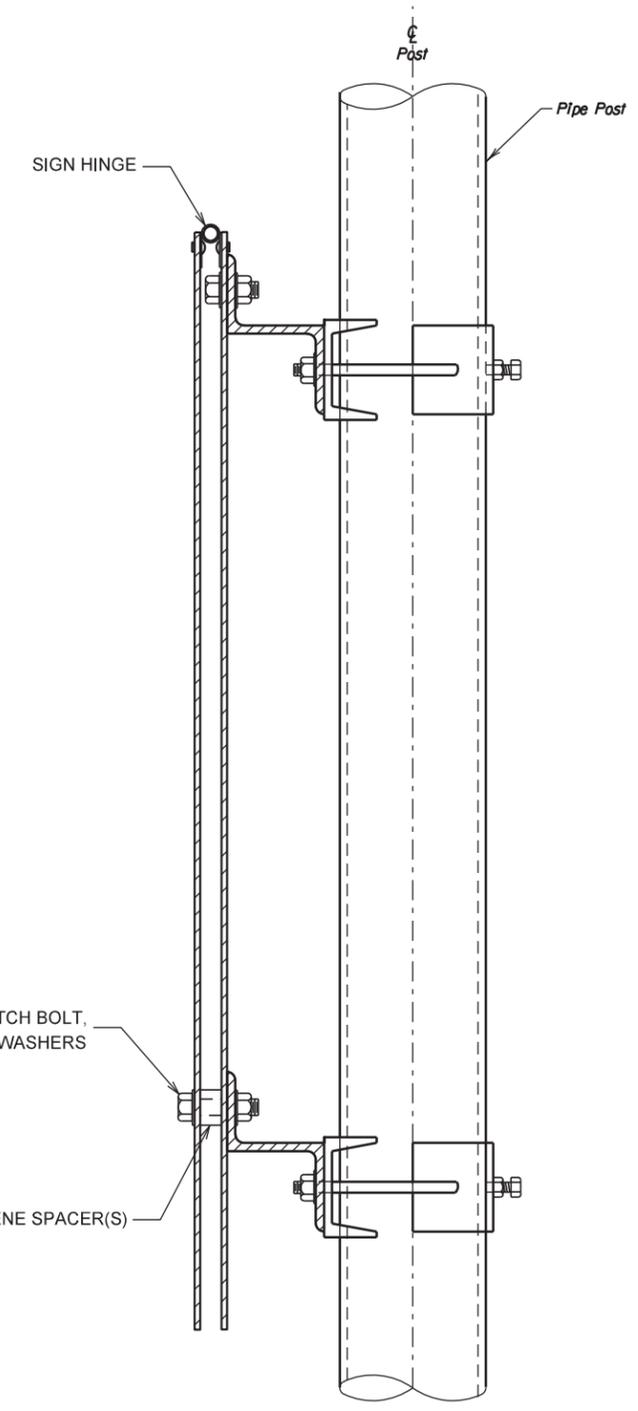
STATE OF SOUTH DAKOTA	PROJECT IM 0909(81)406	SHEET S14	TOTAL SHEETS S25
-----------------------	---------------------------	--------------	---------------------



HINGED WARNING SIGN ASSEMBLY



SIGN FOLDED POSITION



SECTION A-A *

* - See ERECTION DETAILS FOR SHEET ALUMINUM SIGNS for mounting hardware details

PLOT SCALE - \$\$SCALE\$\$

PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

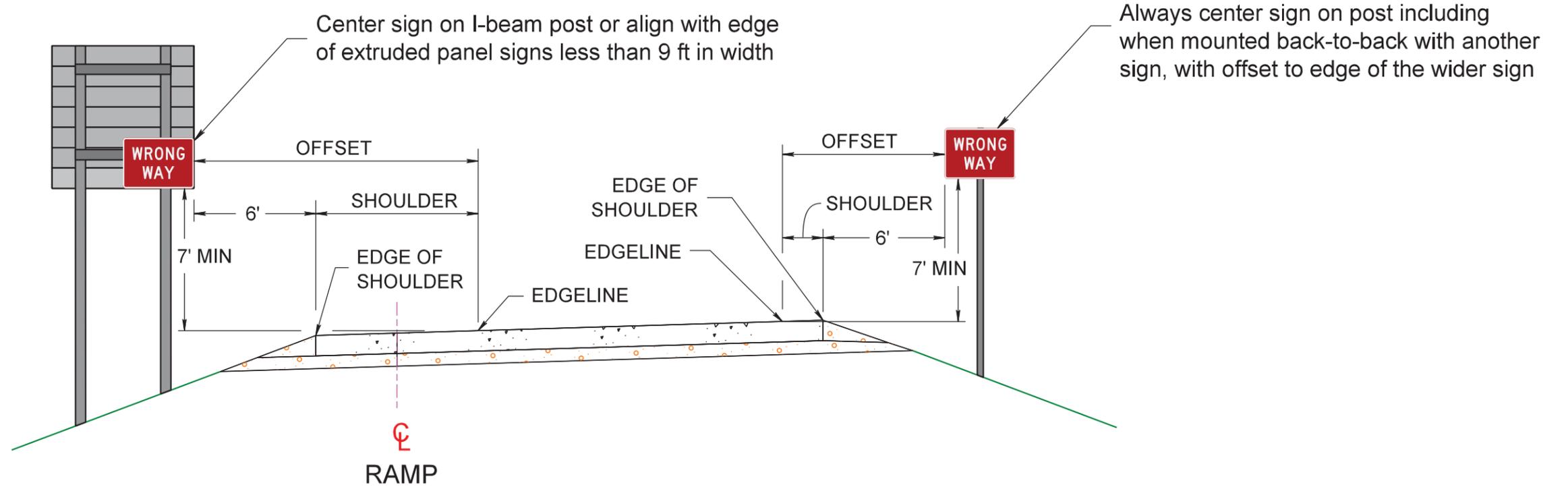
FILE - \$\$FILENAME\$\$

SPECIAL SIGN SUPPORT DETAILS

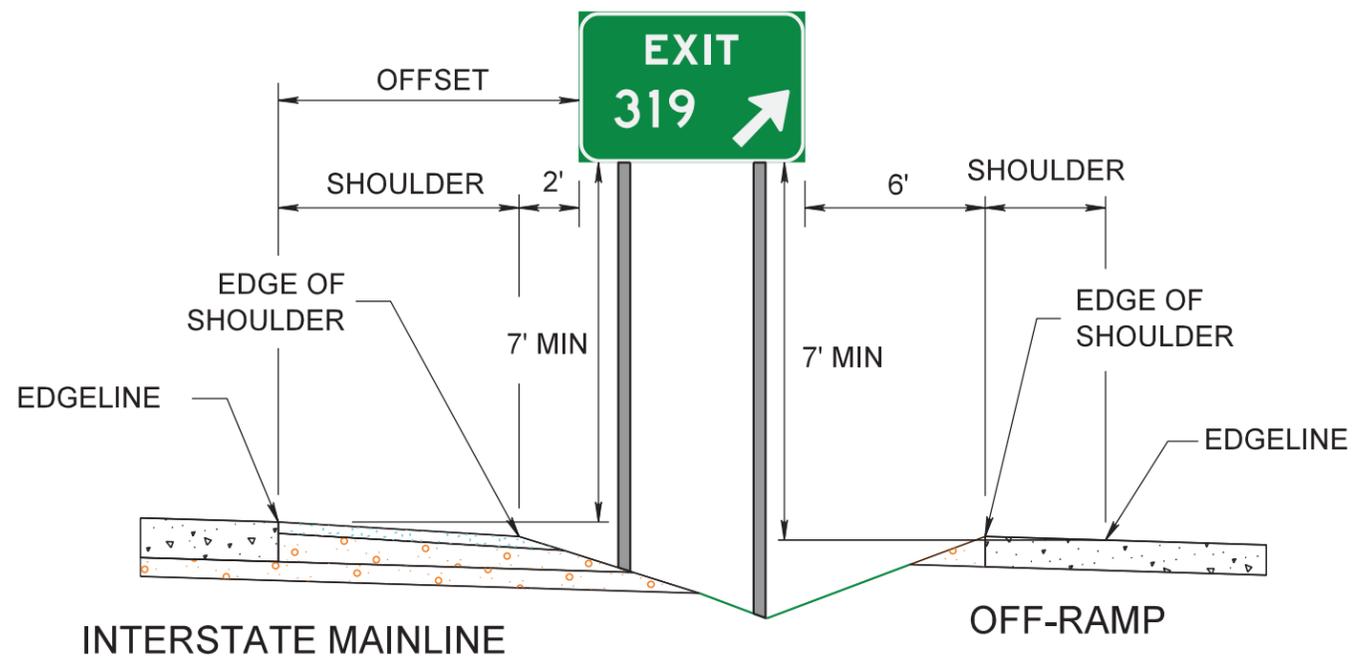
(TYPICAL)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	IM 0909(81)406	S15	S25

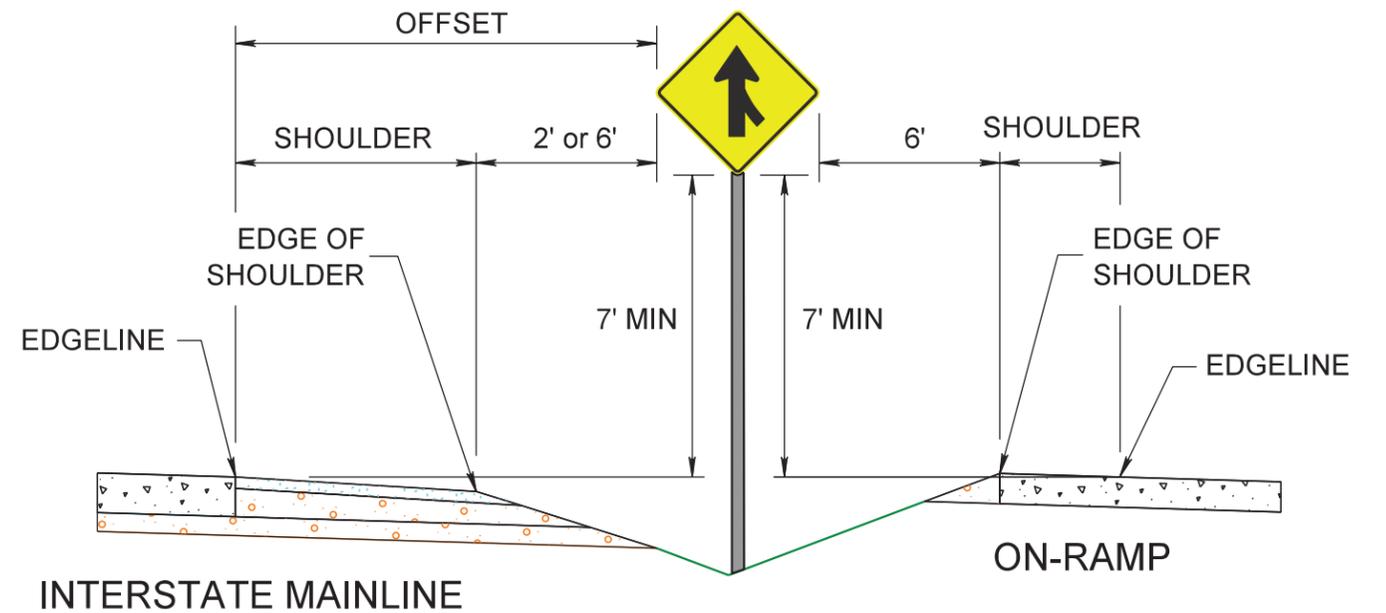
OFF-RAMP WRONG WAY SIGNING



EXIT GORE SIGN INSTALLATION



MERGE / ADDED LANE SIGN INSTALLATION

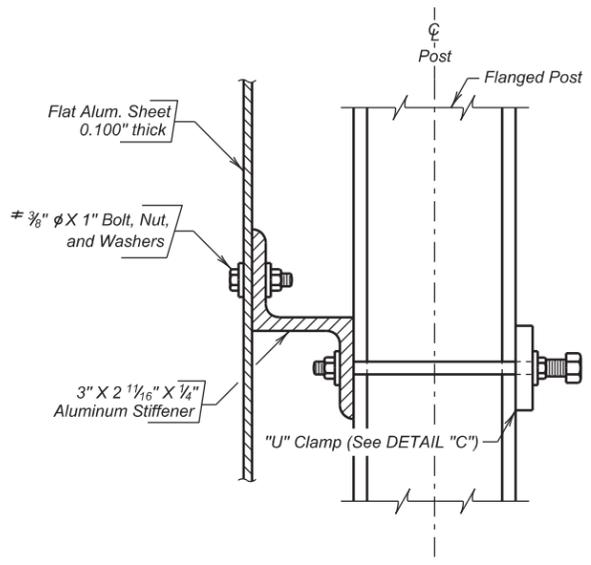
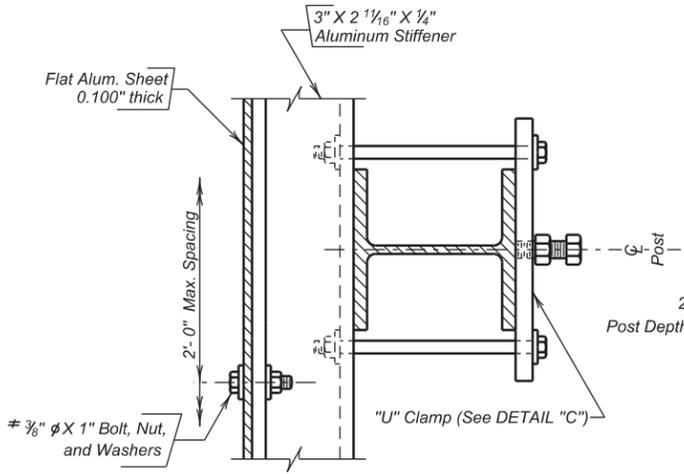


PLOTTED FROM - \$\$SCALE\$\$

PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

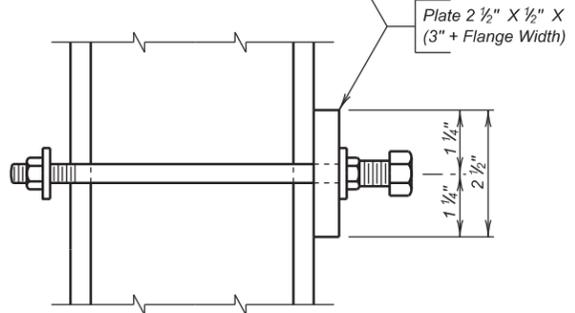
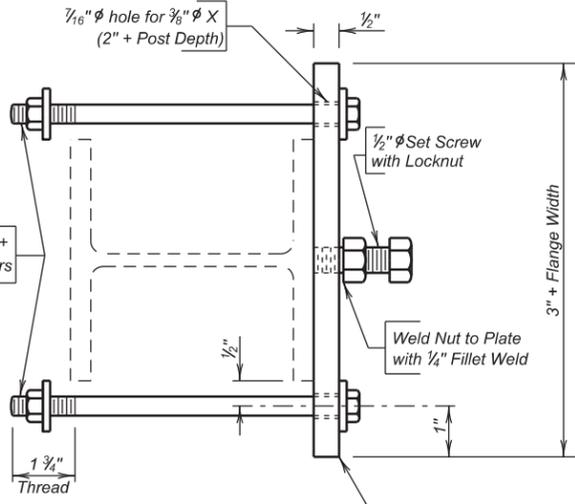
FILE - \$\$FILENAME\$\$



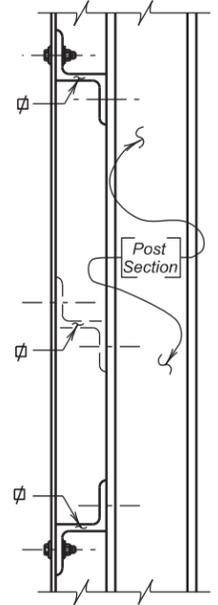
DETAILS FOR MOUNTING SHEET ALUMINUM SIGNS ON STEEL FLANGED POSTS

STIFFENER NOTES-

- Stiffeners must always be used on multiple post breakaway signs regardless of type of sign face employed.
- Number of stiffeners used, N, shall be as follows:
 If $H < 2'-0"$ then $N = 1$
 If $2'-0" < H < 8'-0"$ then $N = 2$
 If $8'-0" < H < 15'-0"$ then $N = 3$
 where H equals the vertical dimension of the sign panel of sign cluster.
- All stiffener Bolts and Nuts shall conform to ASTM A307. Washers shall conform to ASTM F436. All hardware shall be galvanized in accordance with ASTM F2329.

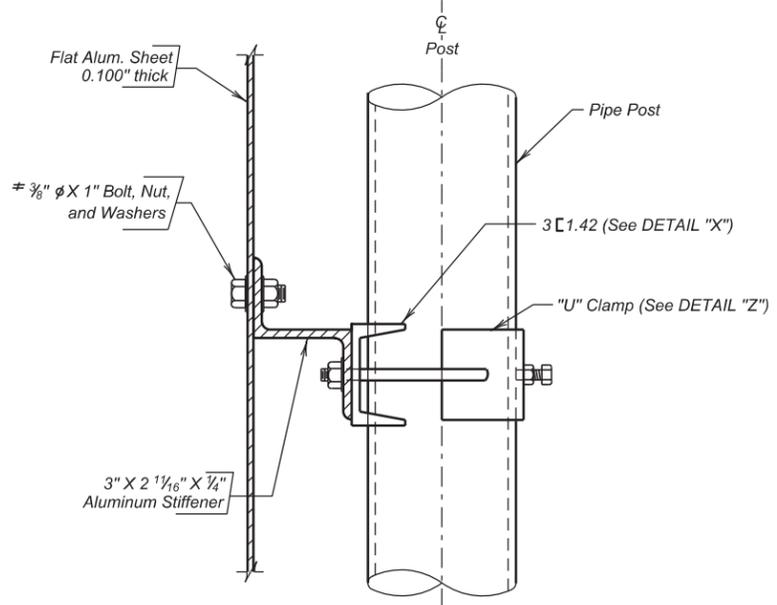
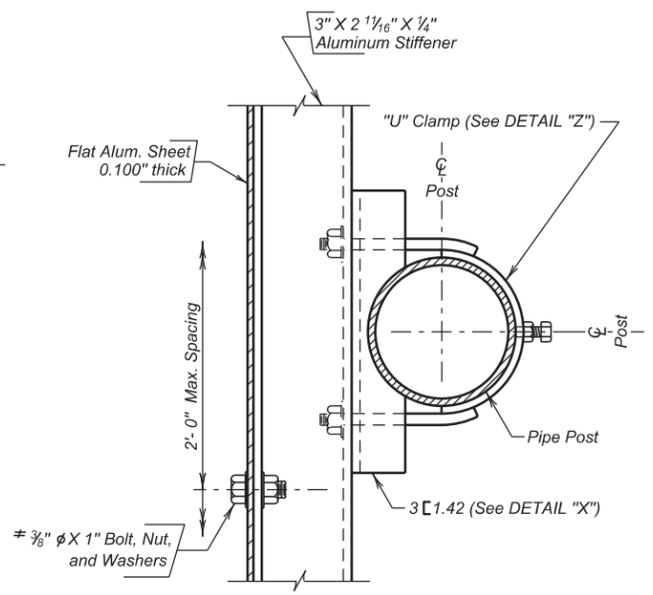


DETAIL "C"

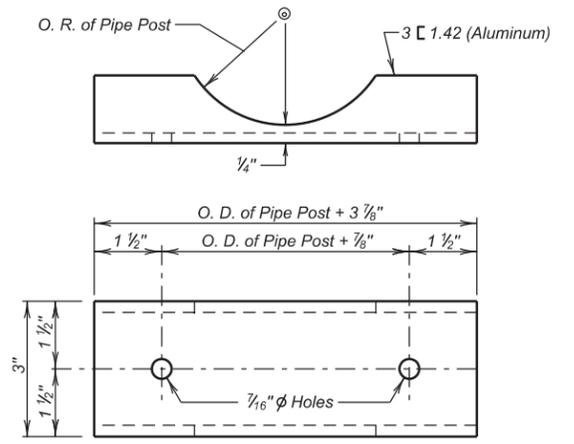


POSITIONING OF TOP AND BOTTOM STIFFENERS

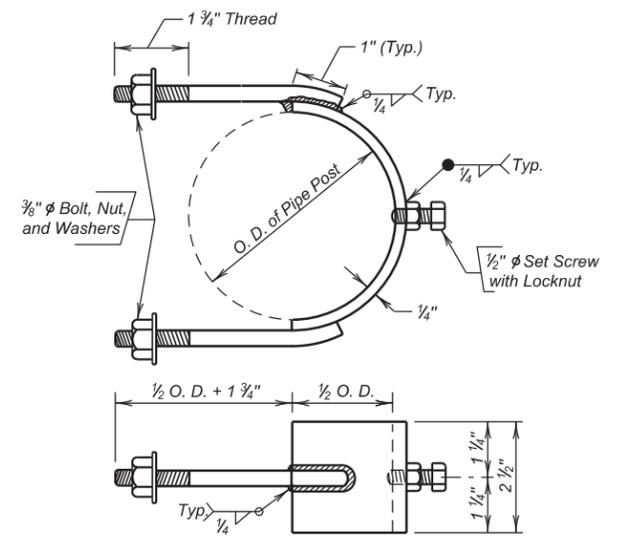
* A plastic washer, as recommended by the sheeting manufacturer, shall be installed between the sign face and the metal washer shown.



DETAILS FOR MOUNTING SHEET ALUMINUM SIGNS ON STEEL PIPE POSTS



DETAIL "X"



DETAIL "Z"

ERECTION DETAILS FOR SHEET ALUMINUM SIGNS (ON FLANGED AND PIPE POSTS)
 S. D. DEPT. OF TRANSPORTATION
 DECEMBER 1994

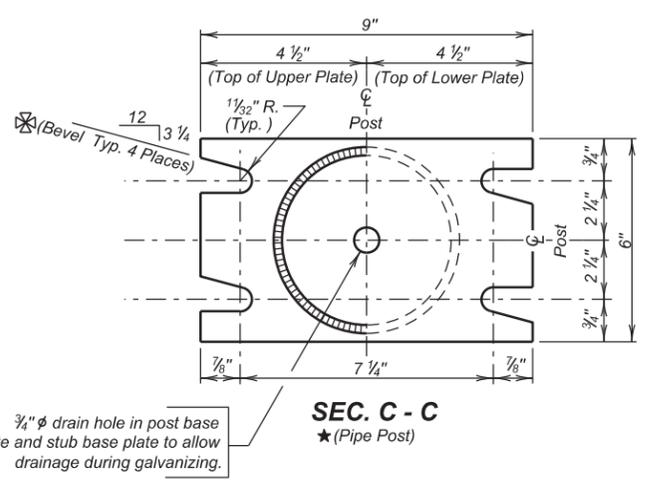
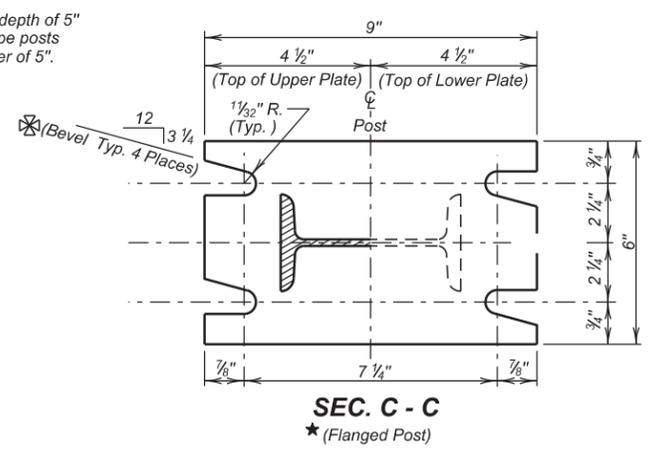
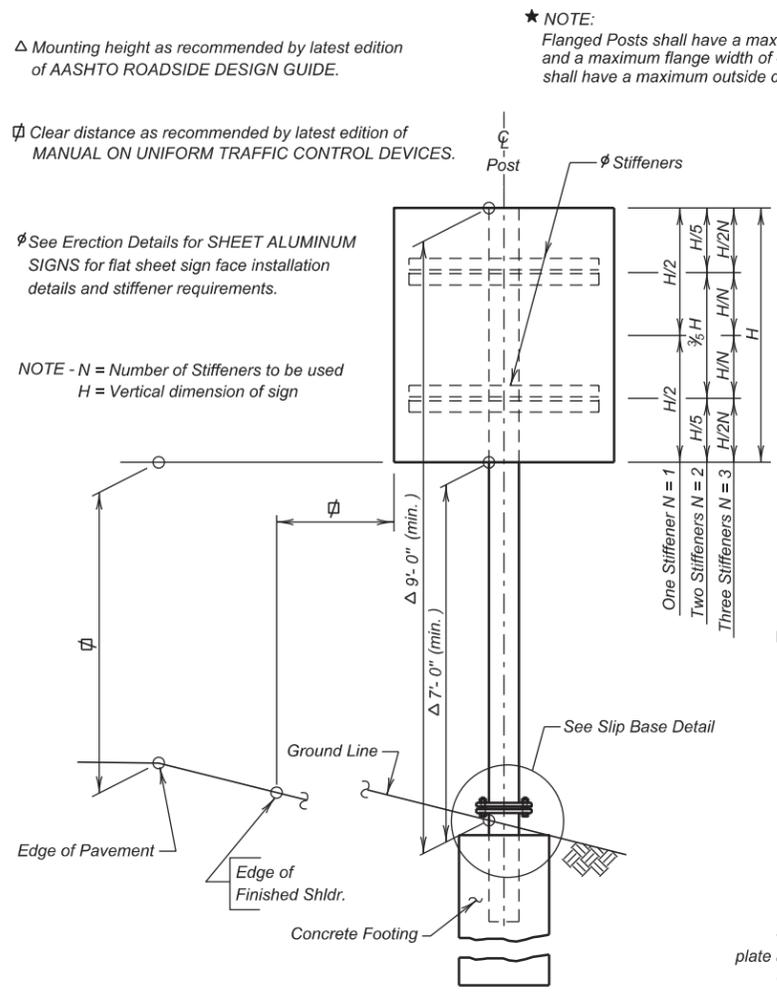
MK	REVISION	DATED	BY
DESIGNED BY RH/DM CNTYPCNX	DRAWN BY RH/TB PCNXDSPG	CHECKED BY RH/DM BSTDSAS1	Kevin N. Coeden BRIDGE ENGINEER

PLOTTED FROM - \$\$SCALE\$\$

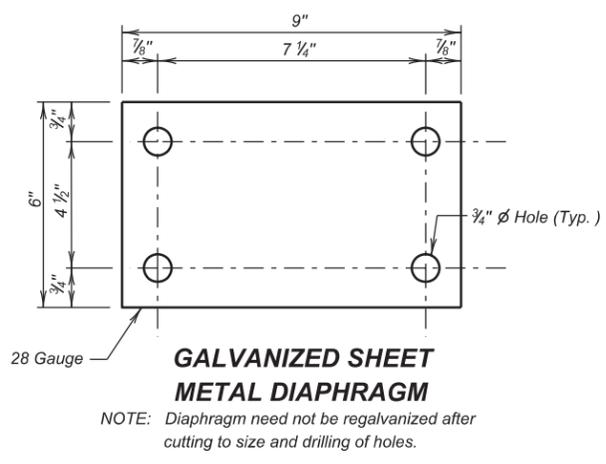
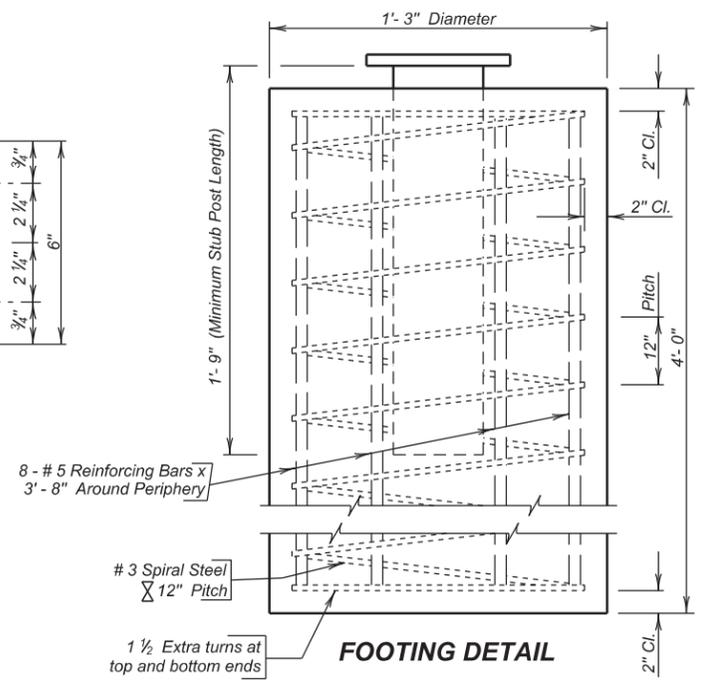
PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

FILE - \$\$FILENAME\$\$



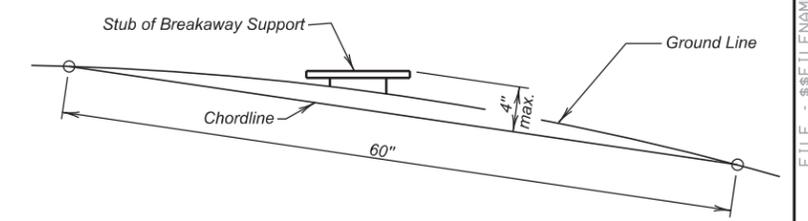
NOTE:
 Above Bevel is for sign on right shoulder. Plate Bevels are opposite hand for sign on left shoulder.



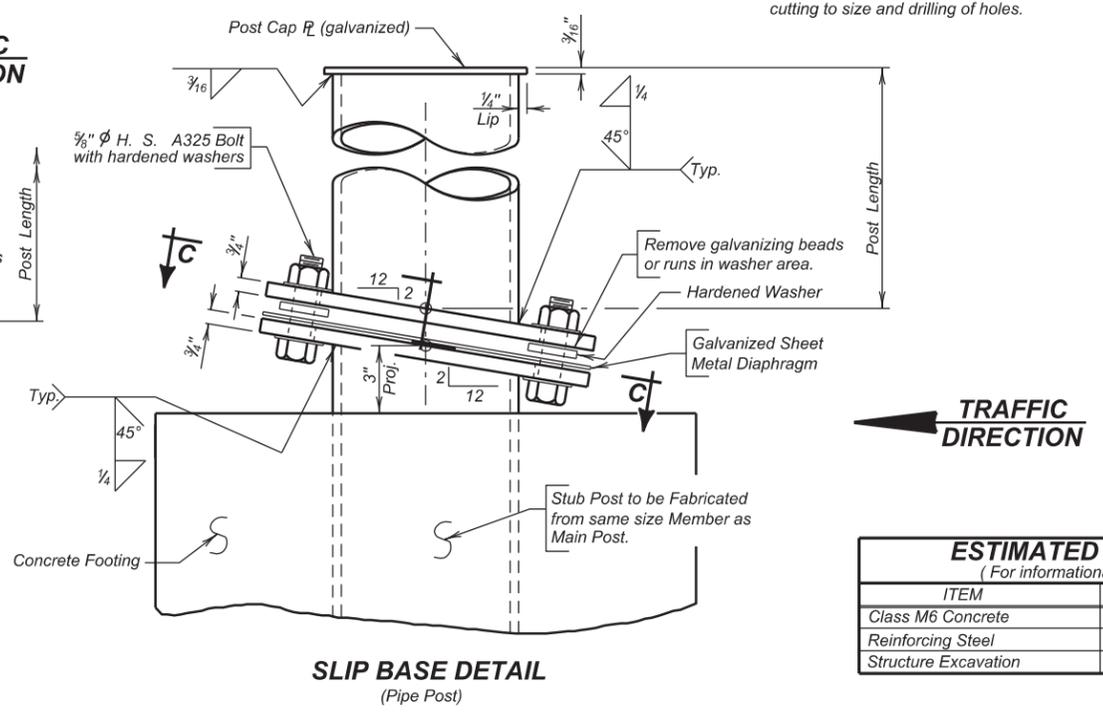
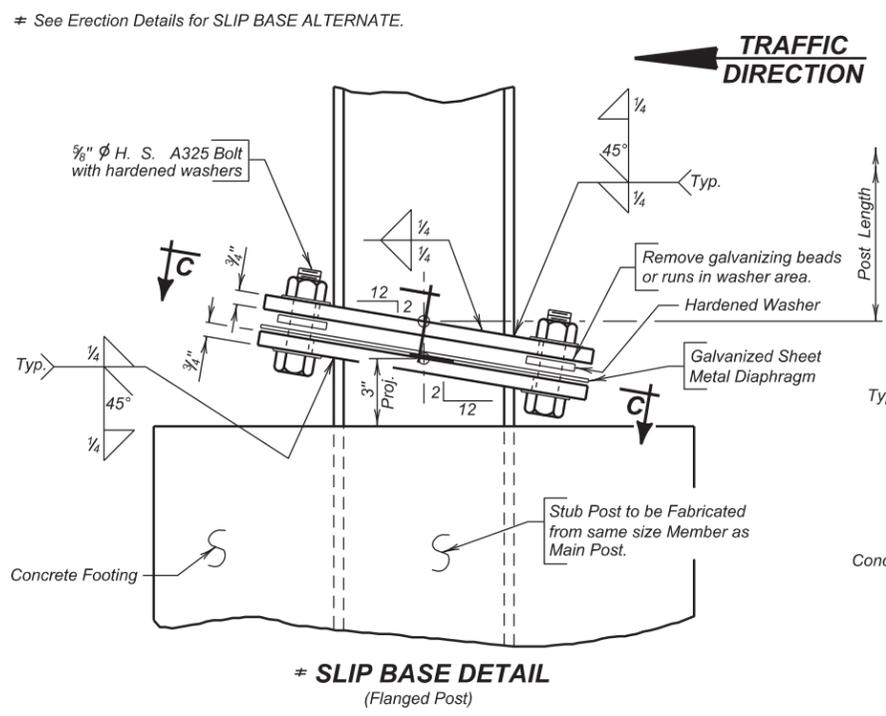
- NOTES-**
- Design Specification: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 2001 Edition with 2003 Interims.
 - Concrete Footings shall be Class M6 - fc = 4000 p. s. i.
 - Structural Steel, except Pipe Posts, shall conform to ASTM A36. Pipe Posts shall conform to ASTM A53 Grade B or ASTM A501 and shall be standard weight posts (Schedule No. 40).
 - All Reinforcing Steel, except spirals, shall conform to ASTM 615 Grade 60.
 - Spiral Reinforcing Steel may be fabricated from cold drawn wire ASTM A82, 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. Washers shall conform to ASTM F436. All hardware shall be galvanized in accordance with ASTM F2329.
 - All 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 a torque not exceeding 345 in-lb. DO NOT OVERTIGHTEN. Check torque on each bolt after entire sign has been erected.

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.



NOTE:
 The stub post and lower slip plate shall NOT extend more than 4" max. above the chordline within a 60" chord.



ERECTION DETAILS FOR SINGLE POST BREAKAWAY SIGN SUPPORTS (FLANGED AND PIPE POSTS)
 S. D. DEPT. OF TRANSPORTATION
 DECEMBER 1994

ESTIMATED QUANTITIES
 (For informational purposes only)

ITEM	UNIT	QUANTITY
Class M6 Concrete	Cu. Yd.	0.182
Reinforcing Steel	Lb.	41
Structure Excavation	Cu. Yd.	0.182

DESIGNED BY RH/DM	DRAWN BY RH/TB	CHECKED BY RH/DM	 BRIDGE ENGINEER
CNTYPCNX	PCNXDSPG	BSTDBS1	
MK REVISION		DATED	BY

PLOT SCALE - \$\$SCALE\$\$

PLOT NAME - \$\$FILENAME\$\$

SITE LOCATION	POST SIZE	FOOTING DIMENSIONS		POST BASE PLATE DIMENSIONS			ANCHOR BOLT SIZE *MINIMUM			LONGITUDINAL STEEL		SPIRAL STEEL	
		DIA.	DEPTH	A	E	THICK	DIA.	LENGTH	EMBEDMENT	QTY-SIZE	LENGTH	DIA.	LENGTH
663+75 L	W 8 x 31	2' - 6"	7' - 0"	18 x 18	3"	1 1/8"	1 1/2"	3' - 9"	2' - 6"	12 - #7 Bars	6' - 8"	2' - 2"	64'

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.

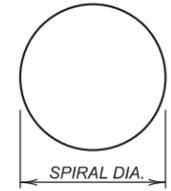
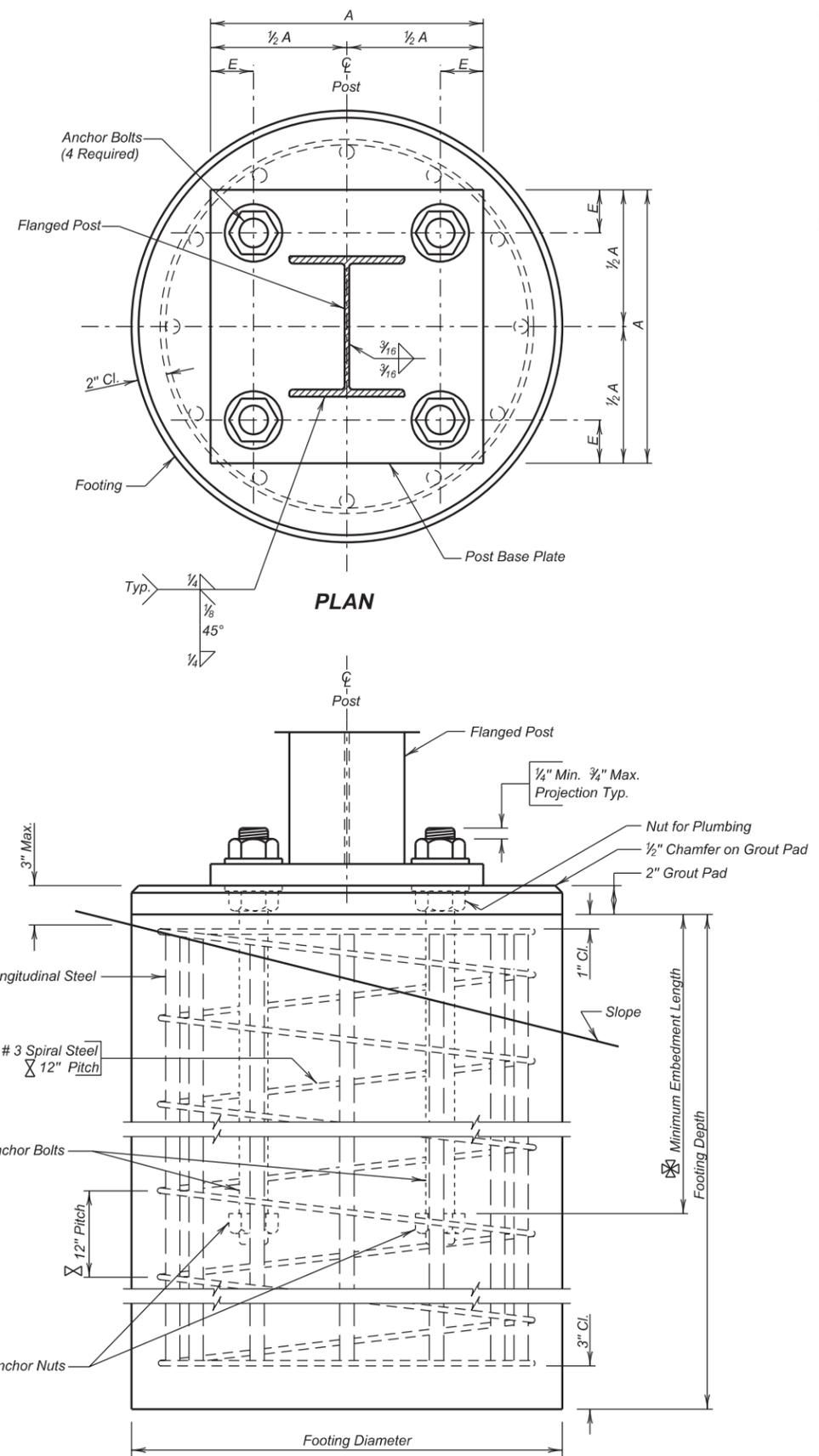
⊗ See Footing Detail
Dimensions are out to out of bars.

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 - fc = 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 1994

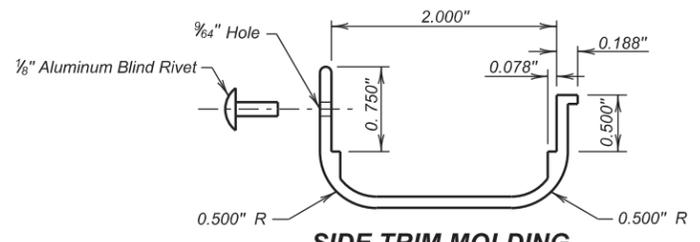
DESIGNED BY RH/DM CNTYPCNX	DRAWN BY RH/TB PCNXDSPG	CHECKED BY RH/DM BSTDFSSA	 BRIDGE ENGINEER
⊗ Pitch Correction	3/24/11	DM	
⊗ Specification Update	7/11/05	AV	
MK	REVISION	DATED	BY

PLOT SCALE - \$SCALE\$\$

PLOTTED FROM - \$USERNAME\$\$

PLOT NAME - \$PLOTNAME\$\$

FILE - \$FILENAME\$\$



SIDE TRIM MOLDING

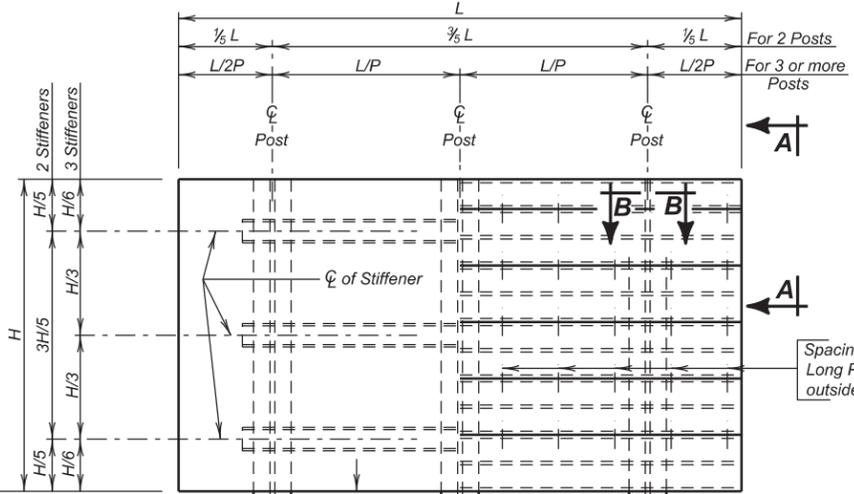
Side Trim Molding is required on all vertical edges of extruded panels. They shall be fastened at a minimum of one (1) rivet per panel.

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

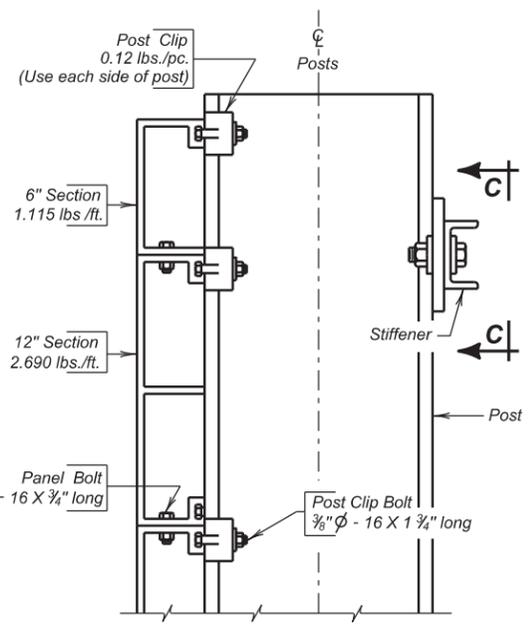
NOTE- 2 stiffeners are required when H is 8'-0" or less.
3 stiffeners are required when H is more than 8'-0".

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

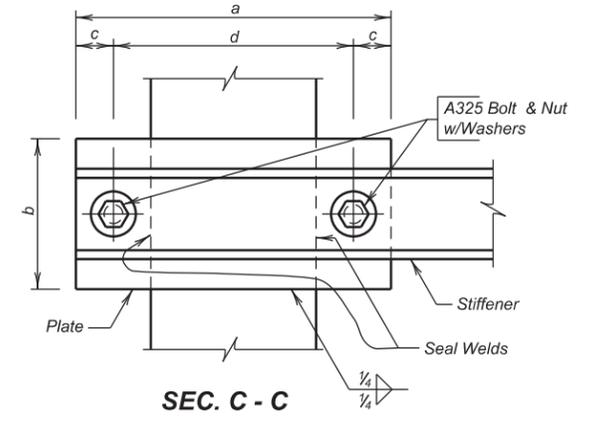
Φ Mounting height as recommended by latest edition of MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.



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



SEC. A - A

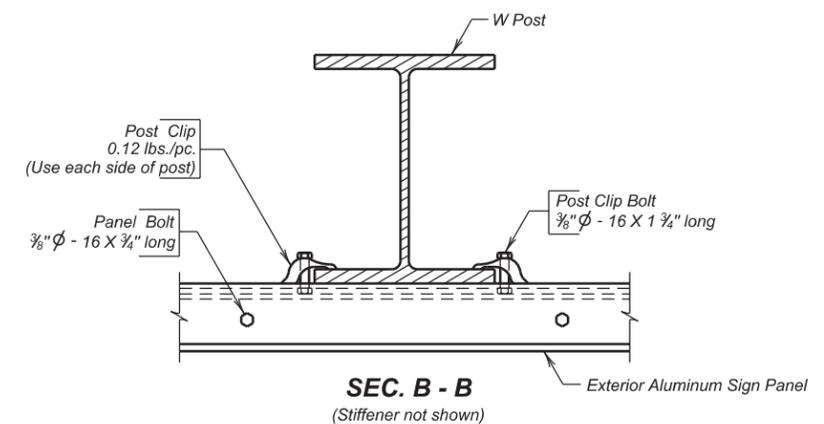


SEC. C - C

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 5/16"
W8X24 thru W10X45	C5X6.7	13 1/2"	6"	1 1/2"	10 1/2"	7/8" φ 3/8"

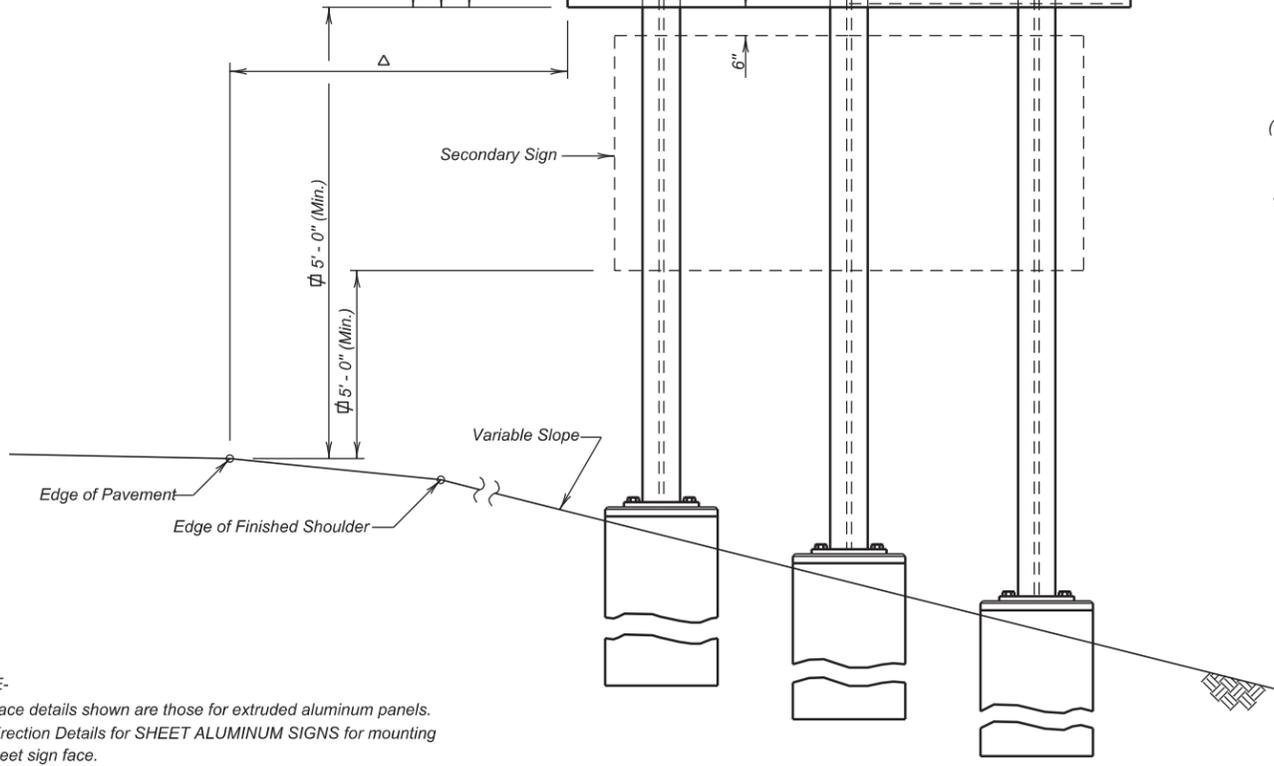
STIFFENER BOLTING PROCEDURE-

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



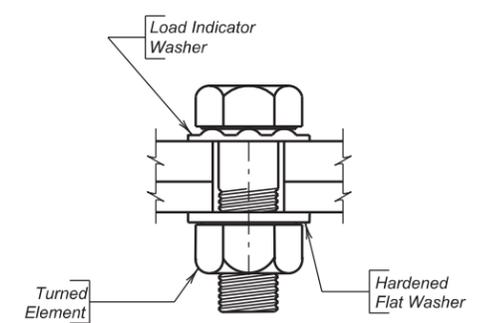
SEC. B - B

(Stiffener not shown)



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.



LOAD INDICATOR WASHER DETAIL

ERECTION DETAILS
FOR
FIXED SIGN SUPPORTS
S. D. DEPT. OF TRANSPORTATION
DECEMBER 1994

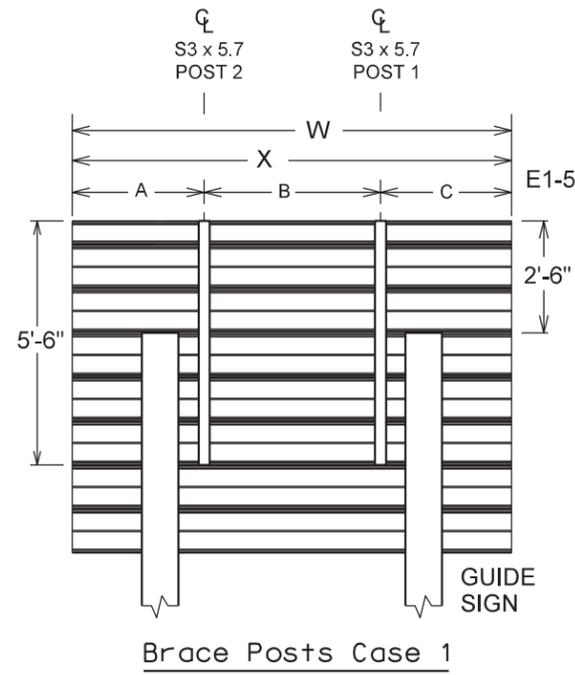
DESIGNED BY RH/DM CNTYPCNX	DRAWN BY RH/TB PCNXDSPG	CHECKED BY RH/DM BSTDFSSB	Kevin N. Goeden BRIDGE ENGINEER
----------------------------------	-------------------------------	---------------------------------	------------------------------------

PLOTTED FROM - \$\$SCALE\$\$

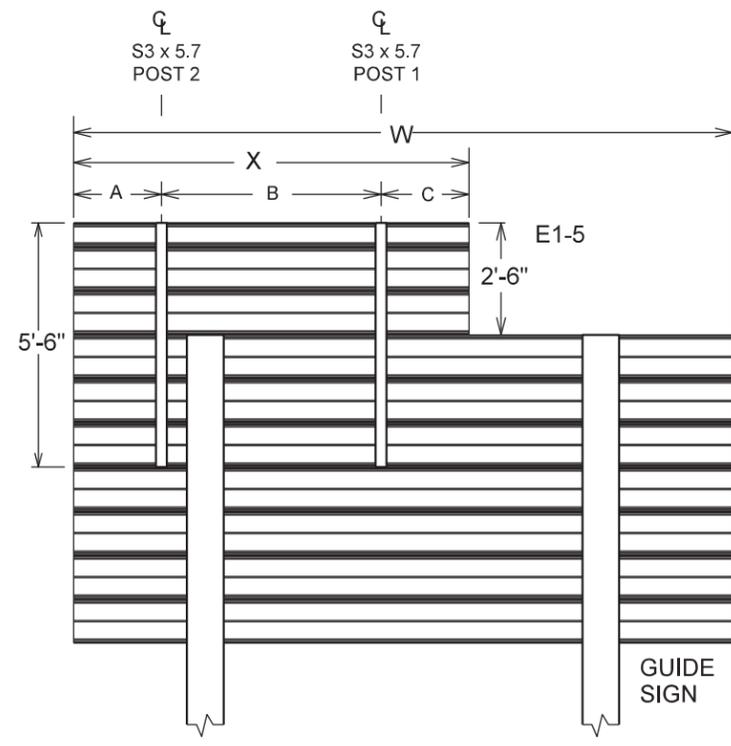
PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

FILE - \$\$FILENAME\$\$



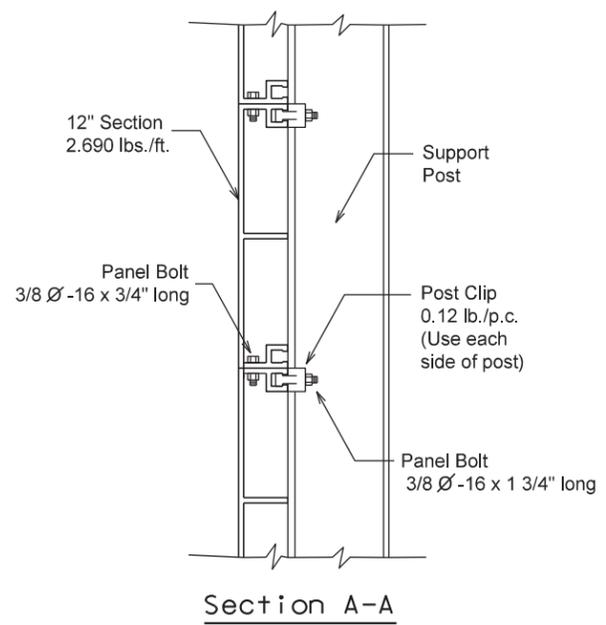
Brace Posts Case 1



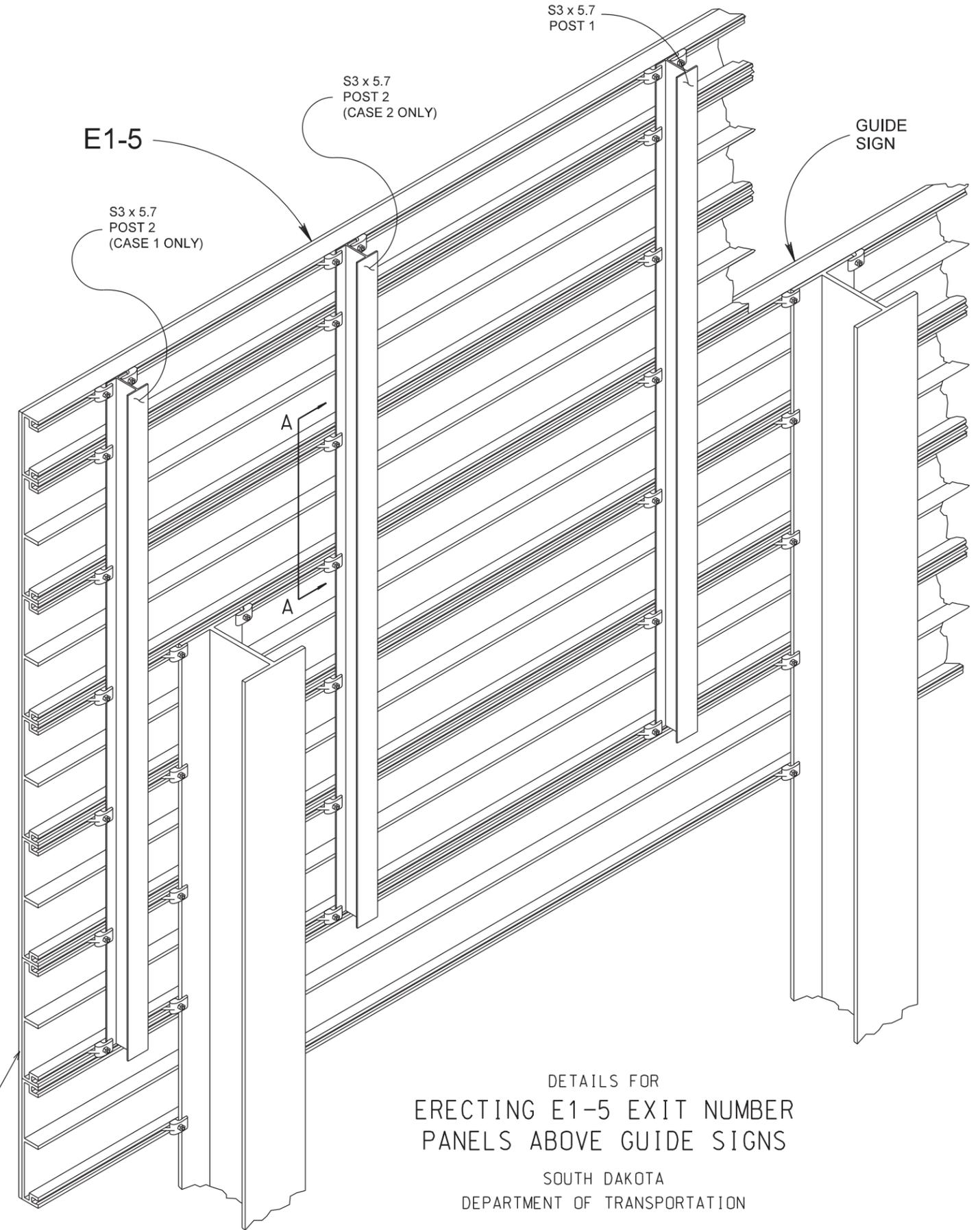
Brace Posts Case 2

	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"
		13'-0" and up	2'-0"	7'-0"	2'-0"

* The brace posts may be omitted if the sign posts extend to the top of the E1-5 sign, if specified in the plans.
 ** The A dimension may be adjusted (1" max.) to allow room for post clips.



Section A-A



DETAILS FOR
 ERECTING E1-5 EXIT NUMBER
 PANELS ABOVE GUIDE SIGNS

SOUTH DAKOTA
 DEPARTMENT OF TRANSPORTATION

PLOT SCALE - \$\$SCALE\$\$

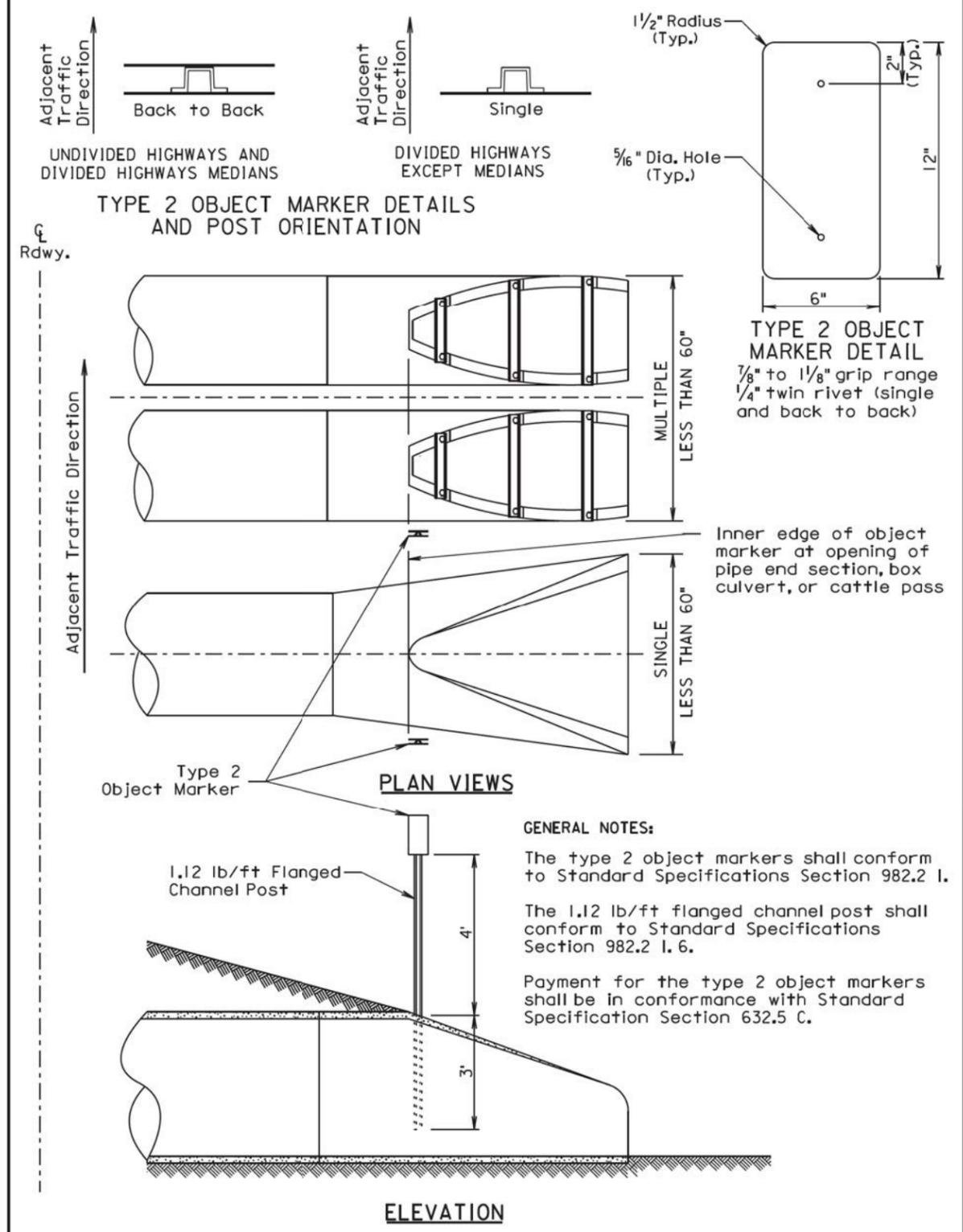
PLOTTED FROM - \$\$USERNAME\$\$

PLOT NAME - \$\$PLOTNAME\$\$

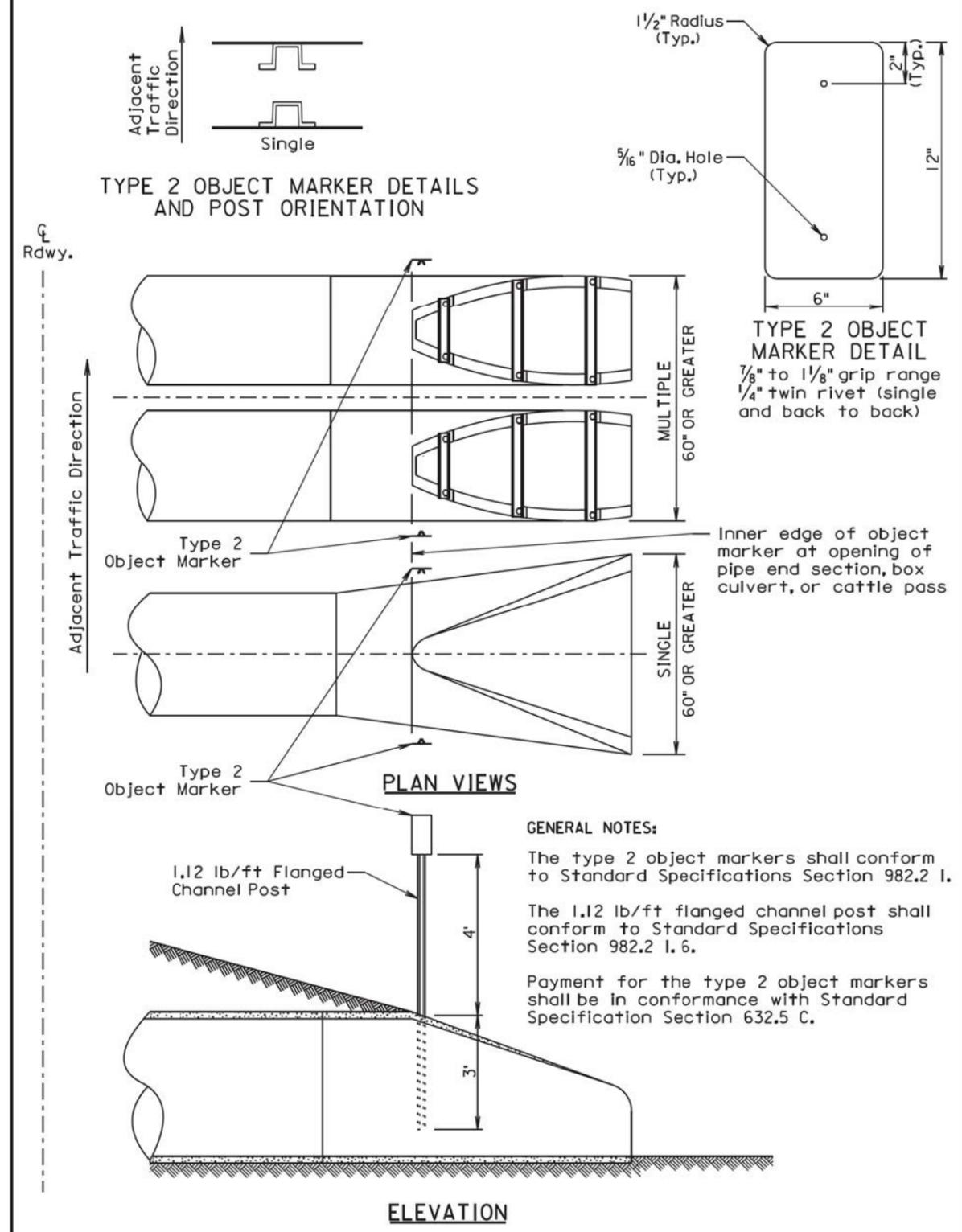
FILE - \$\$FILENAME\$\$

SIGN #	DESCRIPTION	STATION	LOCATION	LANE	EXIT #	FLANGED POST S3 X 5.7
WB - 207	SD 11/Brandon Corson (Arrow)	663+75 L	I-90	WBL	406	5.5 X 2 = 11
						TOTAL = 11.0

TYPE 2 OBJECT MARKER INSTALLATION AT PIPE CULVERTS, BOX CULVERTS, & CATTLE PASSES – LESS THAN 60" WIDTH



TYPE 2 OBJECT MARKER INSTALLATION AT PIPE CULVERTS, BOX CULVERTS, & CATTLE PASSES – 60" OR GREATER WIDTH

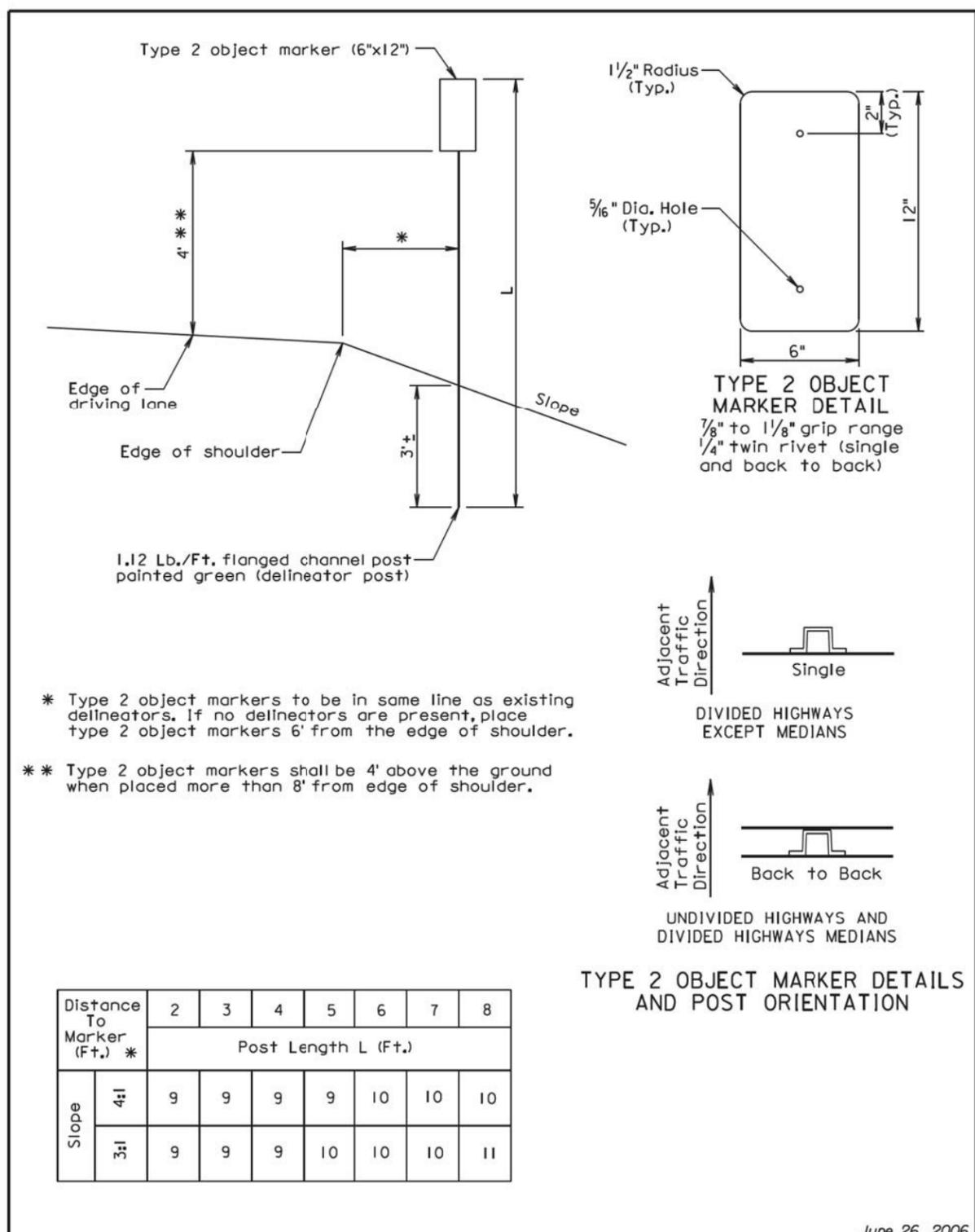


Plot Scale - 1/8" = 1'-0"

Plotted From -

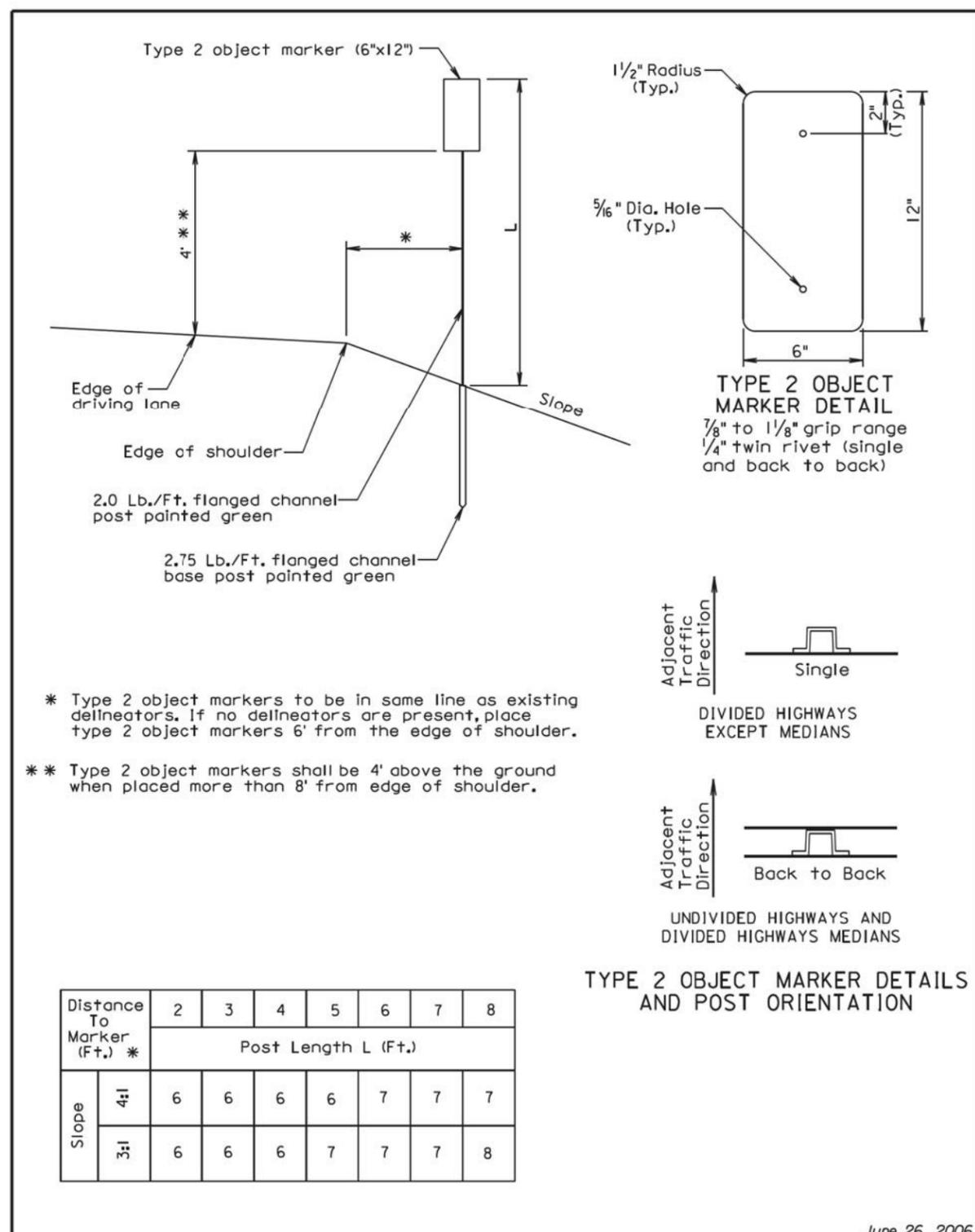
File -

Plot Scale - \$\$\$scale\$\$\$
Plotted From - \$\$\$username\$\$\$



S D D O T	TYPE 2 OBJECT MARKER (DIRECT DRIVE)	PLATE NUMBER 632.01
		Sheet 1 of 1

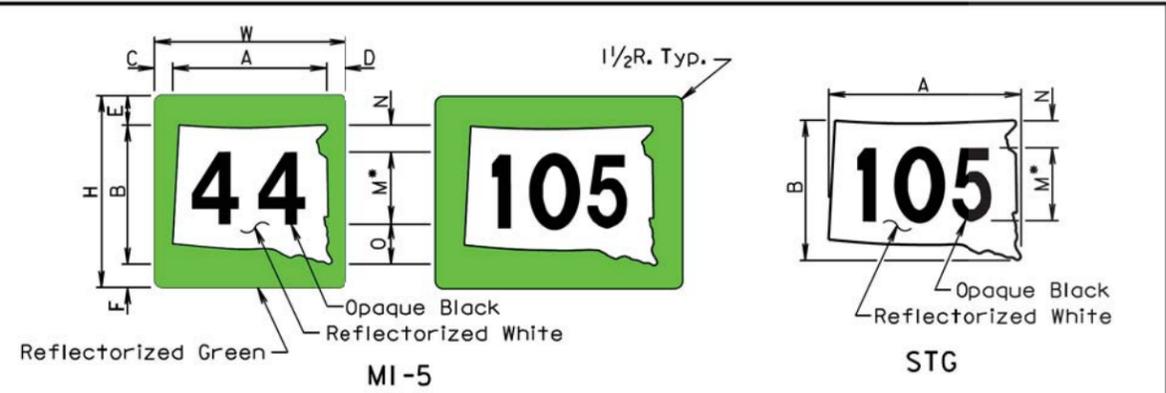
Published Date: 2nd Qtr. 2016



S D D O T	TYPE 2 OBJECT MARKER (BREAKAWAY SIGN SUPPORT)	PLATE NUMBER 632.02
		Sheet 1 of 1

Published Date: 2nd Qtr. 2016

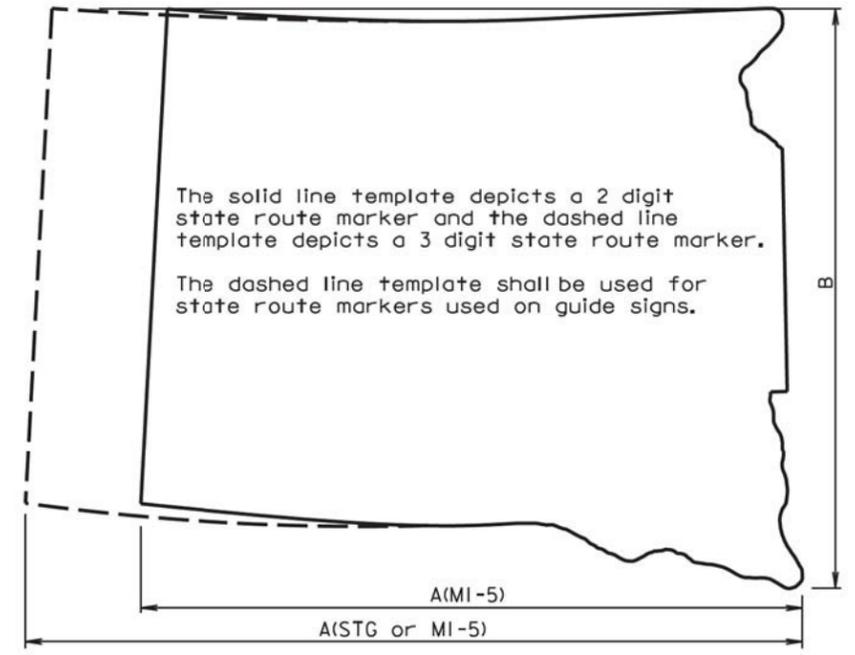
File - \$\$\$filename\$\$\$



SIGN CODE	WxH	A	B	C	D	E	F	M*	N	O
MI-5	24x24	20 1/2	18	2	1 1/2	3 1/2	2 1/2	12D	2	4
MI-5**	30x24	24	18	2 1/4	1 3/4	3 1/2	2 1/2	12D	2	4
MI-5	30x30	25 5/8	22 1/2	2 1/2	1 7/8	4 3/8	3 1/8	15D	2 1/2	5
MI-5	36x36	30 3/4	27	3	2 1/4	5 1/4	3 3/4	18D	3	6

SIGN CODE	AxB	M*	N
STG-24	24x18	10D	4
STG-32	32x24	12D	4 3/4
STG-48	48x36	18D	7
STG-64	64x48	24D	9 1/2

*In the few cases where there is not enough space for the numerals, the standard "D" series font may be replaced with "C" series font if approved by the Engineer.
 ** 3 Digits



TEMPLATE FOR STATE ROUTE MARKER

GENERAL NOTES:
 The unit for all dimensions shown is inches.
 Numerals shall be "D" series font for all state route markers except as noted above.

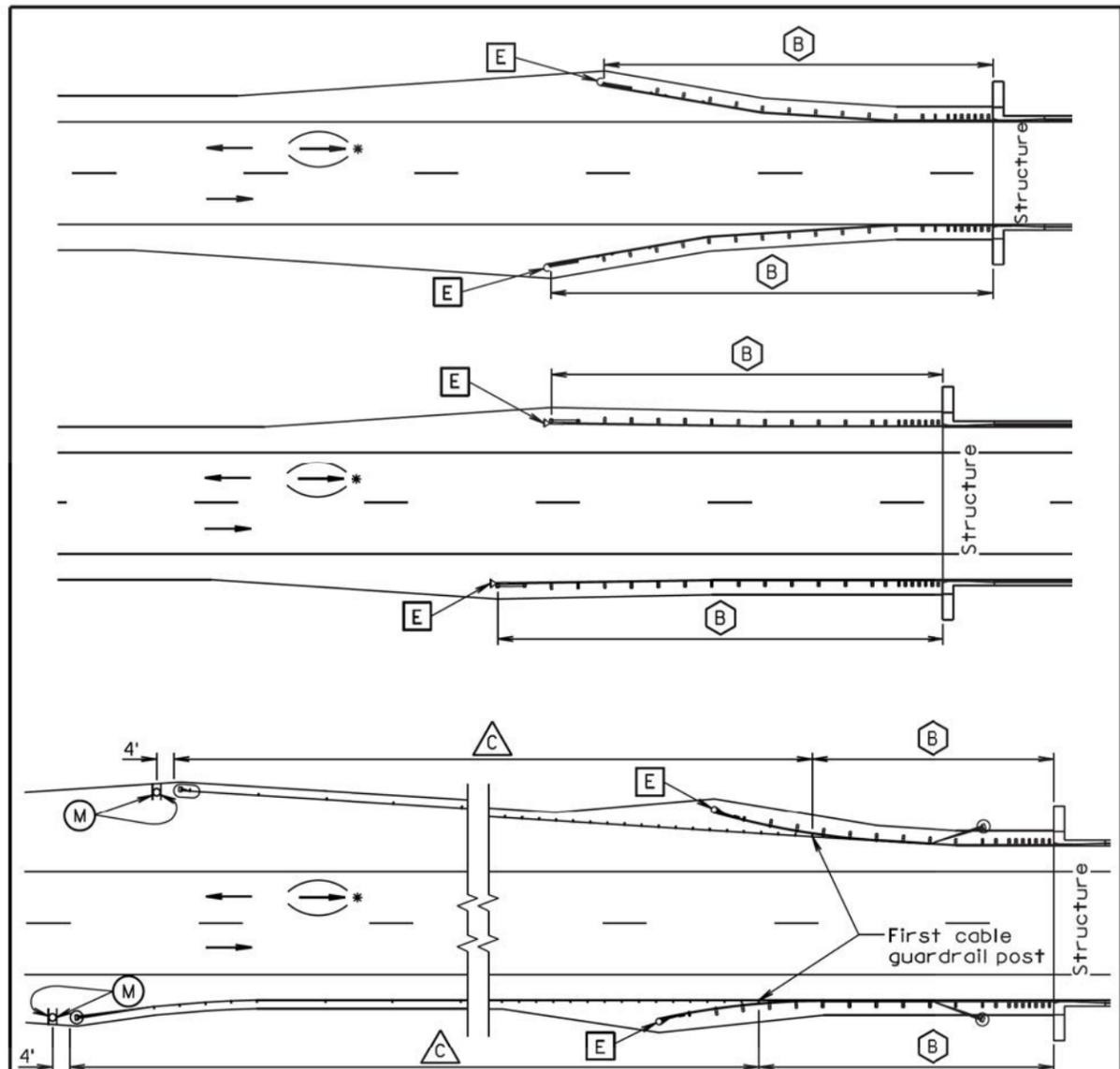
December 23, 2003

Published Date: 2nd Qtr. 2016	S D D O T	STATE ROUTE MARKERS	PLATE NUMBER 632.20
			Sheet 1 of 1

Plot Scale - \$\$scale\$\$

Plotted From - \$\$username\$\$

File - \$\$filename\$\$



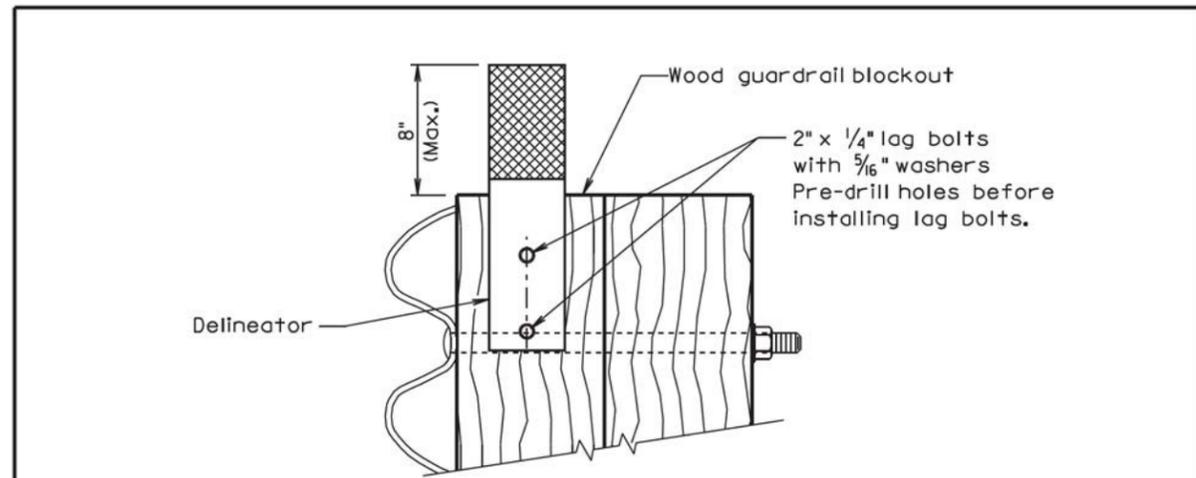
TYPICAL GUARDRAIL LAYOUTS

- (B) Steel Beam Guardrail Delineation
- (E) Guardrail Terminal End Object Marker
- (C) 3 Cable Guardrail Delineation
- (M) Type 2 Object Marker

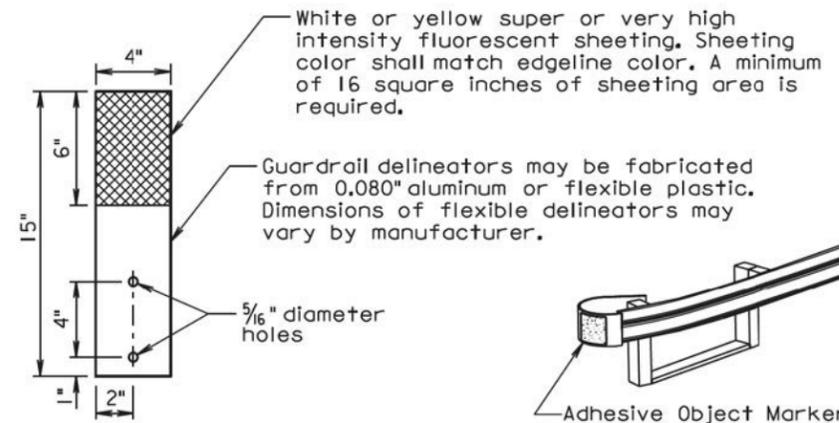
*For two-way traffic, install delineation at the opposite end of structure the same as shown. Back-to-back delineation is required for two-way traffic, single-sided delineation for one-way traffic.

June 26, 2011

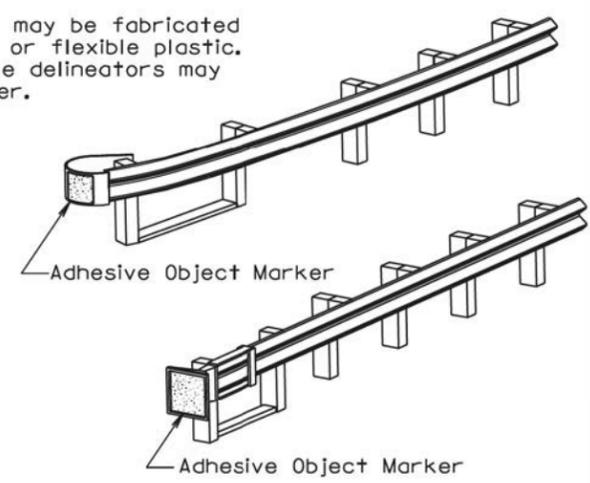
S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
	Published Date: 2nd Qtr. 2016	Sheet 1 of 4



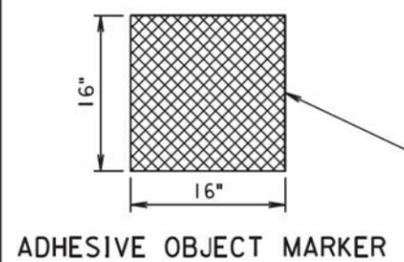
(B) STEEL BEAM GUARDRAIL DELINEATION



DELINEATOR
(For Steel Beam Guardrail)



(E) GUARDRAIL TERMINAL END OBJECT MARKER

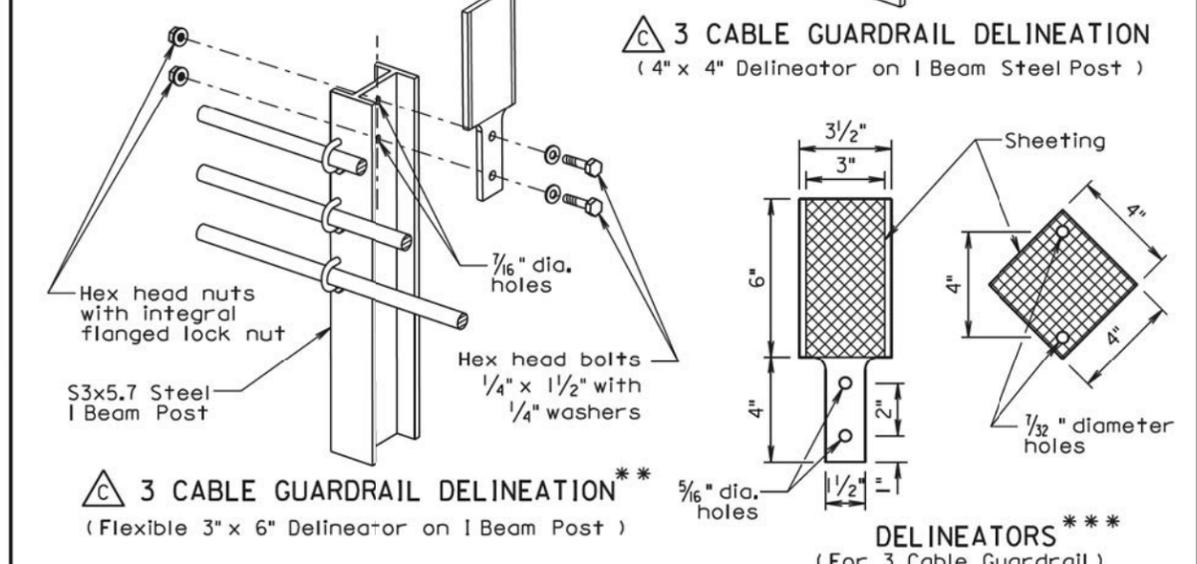
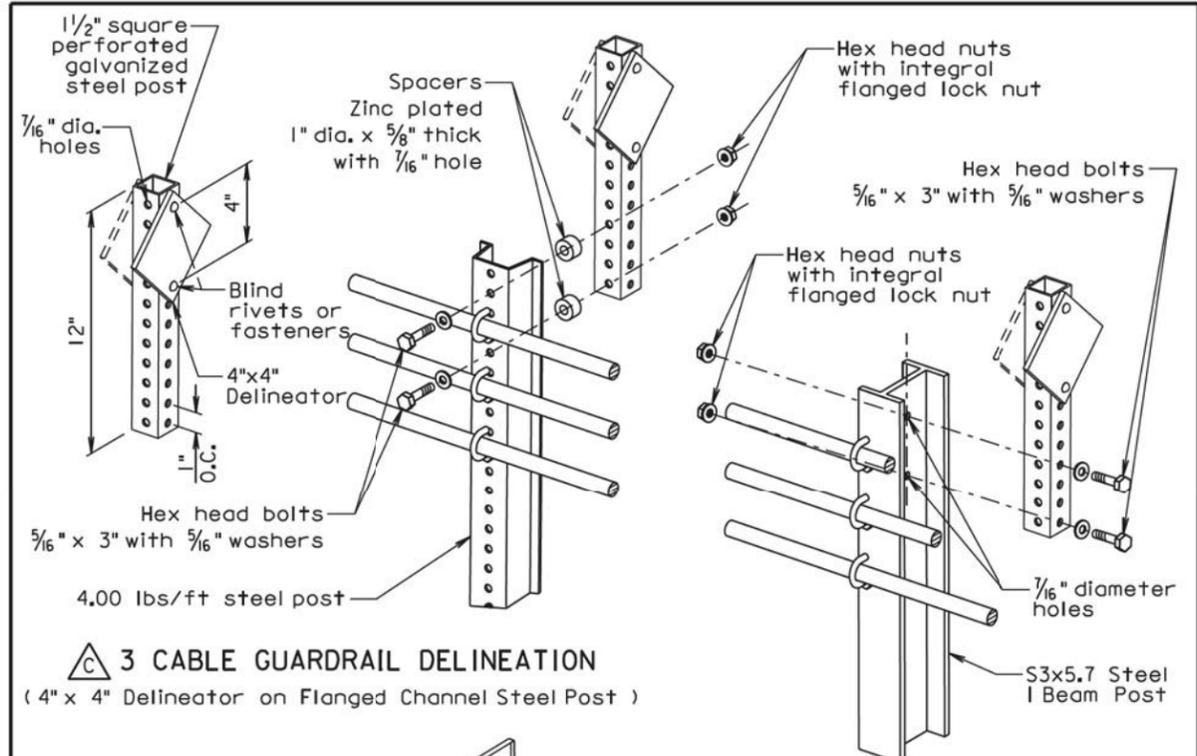


ADHESIVE OBJECT MARKER

Adhesive object marker dimensions may vary due to shape of terminal end. A minimum of 256 square inches of object marker sheeting area is required. The sheeting shall be fluorescent yellow super or very high intensity.

June 26, 2011

S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
	Published Date: 2nd Qtr. 2016	Sheet 2 of 4

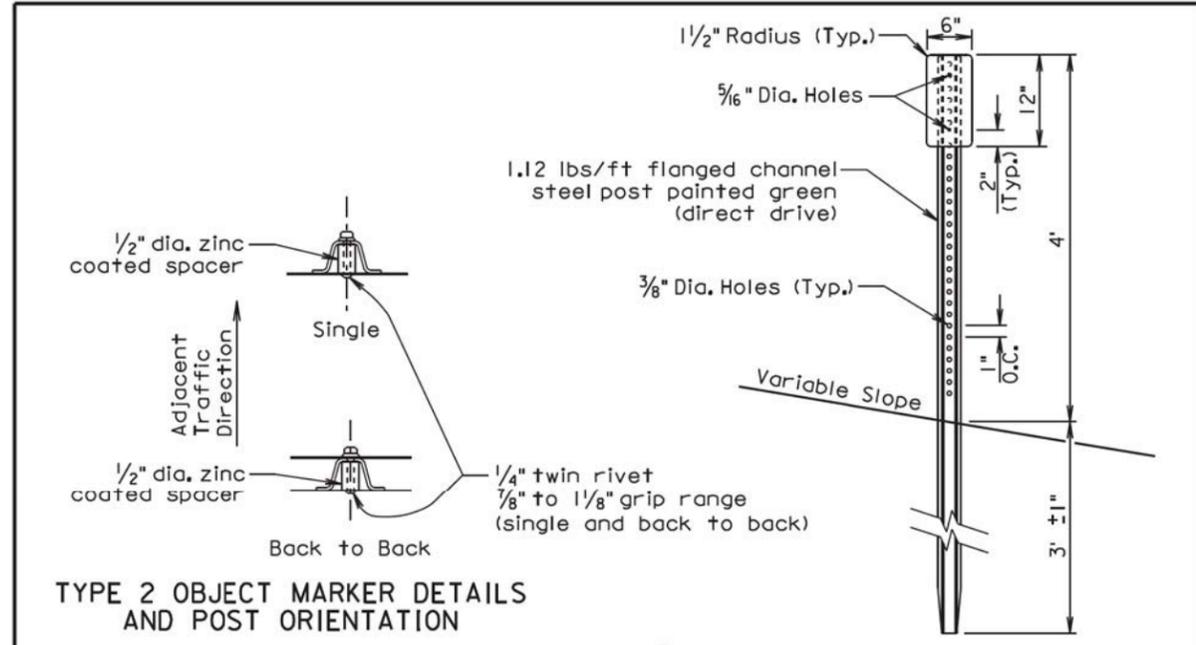


** Flexible delineators may be attached to post with manufacturer approved adhesive instead of bolts.

*** Dimensions of flexible delineators may vary by manufacturer. A minimum of 16 square inches of sheeting area is required. The sheeting shall be white or yellow super or very high intensity fluorescent sheeting. The sheeting color shall match the edgeline color.

June 26, 2011

S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
	Published Date: 2nd Qtr. 2016	Sheet 3 of 4



GENERAL NOTES:

The delineators shall be covered with a minimum of 16 square inches of reflective sheeting. The reflective sheeting shall be of either very high intensity or super high intensity material. For bridges along two-way roadways the sheeting shall be on both sides of the delineator and shall be white in color. For one-way roadways the sheeting will only be required on the side facing traffic and the color will be the same as the nearest pavement marking, yellow on the left side of the roadway and white on the right side.

The first delineator shall be attached to the post nearest the bridge with additional delineators spaced in advance of the bridge at approximately 50 foot intervals. At bridges with short lengths of guardrail, less than 200 feet, a minimum of 4 delineators shall be placed in addition to the yellow object marker. The spacing between the delineators shall be approximately one third of the length of the guardrail. This will provide for a shorter spacing. At bridges with longer lengths of guardrail, greater than 200 feet, including bridges that have cable guardrail transitioning into the steel beam guardrail, the delineators will be placed at a spacing of approximately 50 feet. Delineation shall extend throughout the length of the guardrail system.

All costs for furnishing and installing single or back to back guardrail delineation shall be included in the contract unit price per each for "Guardrail Delineator".

An adhesive object marker shall be placed on the end of the W beam guardrail end terminal. The adhesive object marker dimensions may vary due to the shape of the terminal end. A minimum of 256 square inches of object marker reflective sheeting area is required. The reflective sheeting shall be fluorescent yellow super or very high intensity. All costs for furnishing and installing the adhesive object marker shall be incidental to various contract items.

A type 2 object marker shall be placed adjacent to the 3 cable guardrail anchor at the location noted on sheet 1 of this standard plate. The type 2 object marker (6" x 12") shall have a fluorescent yellow very high or super high intensity reflective sheeting. All costs for furnishing and installing the type 2 object marker including the steel post, 6" x 12" reflective panel, and hardware shall be included in the contract unit price per each for "Type 2 Object Marker" for single-sided and "Type 2 Object Marker Back to Back" for back to back type 2 object markers.

June 26, 2011

S D D O T	DELINEATION OF GUARDRAIL AT BRIDGES	PLATE NUMBER 632.40
	Published Date: 2nd Qtr. 2016	Sheet 4 of 4