

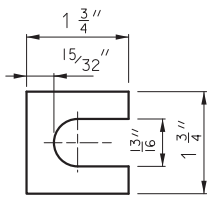
STRUCTURAL STEEL POST FOR GROUND MOUNTED SIGNS																
POST		BOLT			WASHER			BASE CONNECTION DATA TABLE (IN.)								
DES. NO.	NOM SIZE (IN. X LBS)	DIA IN.	LENGTH IN.	TORQUE IN./LB.	OD IN.	ID IN.	THICK IN.	A	B	C	D	E	F	G	W	R
1	W6x9															
2	W6x15	$\frac{5}{8}$	$2\frac{3}{4}$	345	$1\frac{5}{16}$	$\frac{11}{16}$	$\frac{1}{8}$	5	2	$1\frac{1}{4}$	$2\frac{3}{4}$	$1\frac{1}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$1\frac{1}{2}$
3	W8x18															
4	W10x22															
5	W10x26	$\frac{3}{4}$	$3\frac{1}{2}$	555	$1\frac{13}{32}$	$\frac{13}{16}$	$\frac{1}{8}$	6	$2\frac{1}{4}$	$1\frac{3}{8}$	$3\frac{1}{2}$	$1\frac{1}{4}$	1	$\frac{3}{4}$	$\frac{5}{16}$	$1\frac{1}{2}$
6	W12x35															

POST AND FOOTING DATA TABLE													
POST		FOOTING											
POST DES. NO.	NOM. SIZE	WEIGHT		STUB LENGTH	DIA.	LEVEL GROUND		6:1 GRADE		4:1 GRADE		3:1 OR 2:1 GRADE	
		LBS/FT	LBS/IN			DEPTH	C.Y.	DEPTH	C.Y.	DEPTH	C.Y.	DEPTH	C.Y.
1	W6	9.0	0.75	3'-0"	15"	3'-0"	0.14	3'-2"	0.15	3'-3"	0.16	3'-6"	0.17
2	W6	15.0	1.25	4'-0"	24"	4'-0"	0.47	4'-2"	0.50	4'-3"	0.51	4'-6"	0.54
3	W8	18.0	1.50	4'-6"	28"	4'-6"	0.71	4'-8"	0.73	4'-9"	0.74	5'-0"	0.78
4	W10	22.0	1.83	5'-0"	36"	5'-0"	1.31	5'-2"	1.36	5'-3"	1.39	5'-6"	1.45
5	W10	26.0	2.17	5'-0"	36"	5'-0"	1.31	5'-3"	1.37	5'-5"	1.43	5'-9"	1.52
6	W12	35.0	2.92	5'-6"	36"	5'-6"	1.44	5'-9"	1.52	5'-11"	1.56	6'-3"	1.65

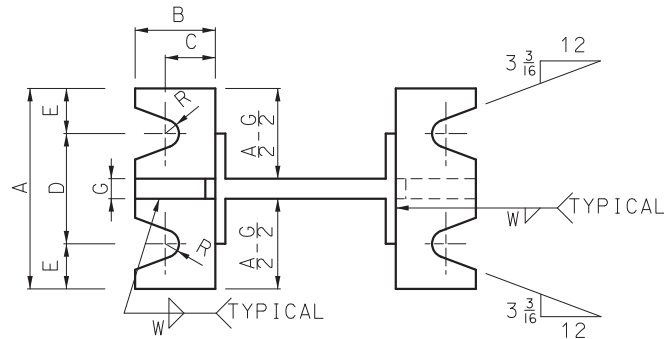
SHEET METAL BOLT RETAINER CUT FROM 30 GAGE GALVANIZED SHEET METAL. PLACE BETWEEN BASE PLATES. SIZE VARIES TO FIT PLATE. BOLT HOLES TO BE $\frac{1}{16}$ " LARGER THAN REQUIRED BOLT SIZE.



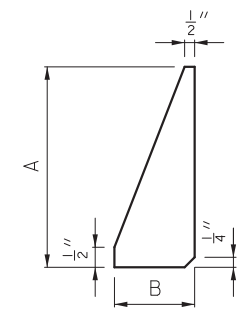
BOLT RETAINER



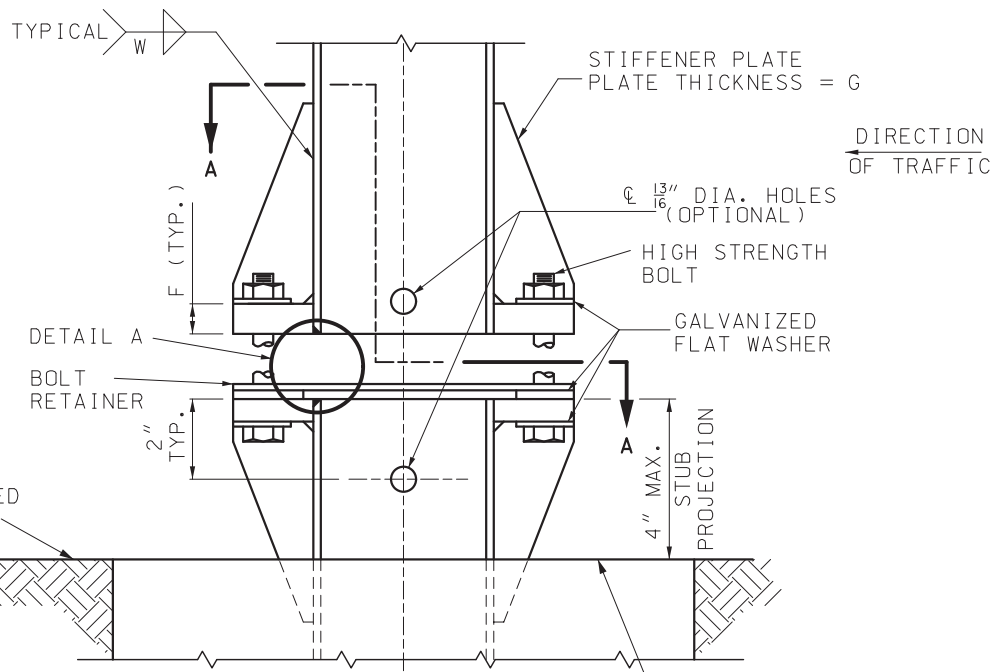
SHIM



SECTION A-A

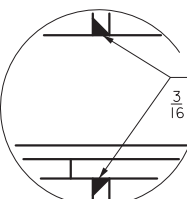


STIFFENER PLATE

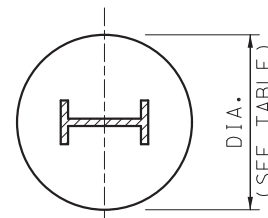


ELEVATION

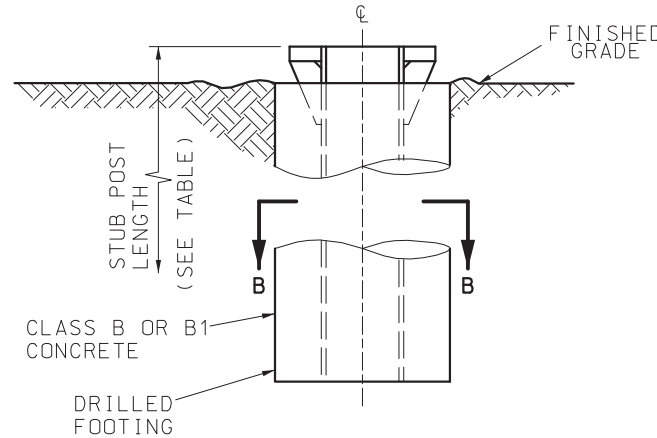
TOP OF FOOTING, FLUSH WITH FINISHED FLAT GRADE. SEE "FOOTING DETAIL" FOR FOOTINGS ON SLOPES.



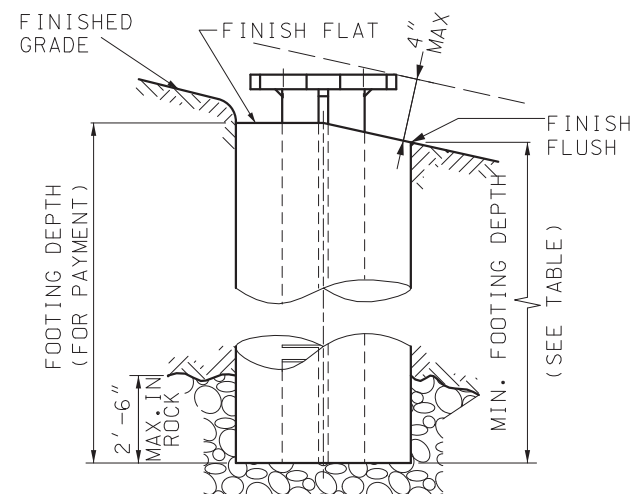
DETAIL A



SECTION B-B



STUB DETAIL



FOOTING DETAIL

GENERAL NOTES:

DESIGN SPECS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS - 1985 (EXCEPT 2001 AND LATEST INTERIMS FOR STRUCTURAL STEEL POSTS).

POSTS, PERFORATED FUSE PLATE AND SPLICE PLATE TO BE GALVANIZED AFTER FABRICATION.

METAL PROJECTING BEYOND THE PLANE OF THE PLATE FACE WILL NOT BE ALLOWED.

REMOVE ALL GALVANIZING RUNS OR BEADS IN THE WASHER AREA.

ALL STRUCTURAL STEEL STIFFENER PLATES AND BASE PLATES, FOR GROUND MOUNTED SIGNS SHALL MEET THE REQUIREMENTS OF ASTM A 36 OR AASHTO M 270 GRADE 50, MINIMUM YIELD 50,000 PSI.

IN THE EVENT THE DISTANCE BETWEEN THE TOP OF THE FOOTING AND THE BOTTOM OF THE SIGN IS LESS THAN 7'-9", THE SIGN HEIGHT AND POST LENGTH IS TO BE INCREASED SUFFICIENTLY TO ACCOMMODATE THIS MINIMUM SPACING.

HINGE PLATES NOT REQUIRED ON SINGLE POST SIGNS OR ANY SIGNS USING PIPE POSTS.

NUTS ON HINGE PLATE BOLTS SHALL BE TIGHTENED TO THE REQUIRED MINIMUM BOLT TENSION VALUES SHOWN IN TABLE 1 SEC. 1080 OF THE STANDARD SPECIFICATIONS.

THE NUT SHALL BE FREE RUNNING. IF THE NUT WILL NOT SPIN ON THE BOLT BECAUSE OF GALVANIZING IRREGULARITIES, A LUBRICANT SHALL BE APPLIED.

ALL BREAKAWAY ASSEMBLY BOLTS SHALL BE TIGHTENED IN A SYSTEMATIC MANNER TO THE PRESCRIBED TORQUE SHOWN ON THIS DRAWING.

EACH BREAKAWAY ASSEMBLY BOLT SHALL BE LOOSENED AND RE-TIGHTENED TO THE REQUIRED TORQUE IN THE SAME ORDER AS THE INITIAL TIGHTENING.

THE THREADS SHALL BE BURRED AT THE NUT USING A CENTER PUNCH TO PREVENT NUT FROM LOOSENING.

POST LENGTH QUANTITY SHOWN ON PLANS INCLUDES STUB.

1" X 2 1/2" HIGH STRENGTH BOLTS FOR PIPE POSTS SHALL BE OF THE DESIGNATION AASHTO M 164 OR ASTM A 449. ALL OTHER HIGH STRENGTH BOLTS SHALL BE OF THE DESIGNATION ASTM F3125 GRADE A325.

FURNISH TWO .012" ± AND TWO .0032" ± THICK SHIMS PER POST FROM BRASS SHIM STOCK OR STRIP, DESIGNATION ASTM B 36. SHIM AS REQUIRED TO PLUMB POST.

HIGH STRENGTH BOLTS WITH HEX NUT AND THREE WASHERS WITH EACH BOLT ARE TO BE GALVANIZED.

OPTIONAL HOLES (13/16" ROUND FOR "1" SHAPE POSTS AND 9/16" ROUND FOR PIPE POST BASE PLATES) AS SHOWN IN "ELEVATIONS" ARE TO BE USED AS AID FOR GALVANIZING ONLY.

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

POST INSTALLATION DETAILS

POST AND FOOTING DETAILS

WIDE FLANGE (WF) POSTS

JONATHAN A. NELSON - CIVIL
MO-PE-2008019578

DATE EFFECTIVE: 1/1/2025

DATE PREPARED: 8/29/2024

903.03BS

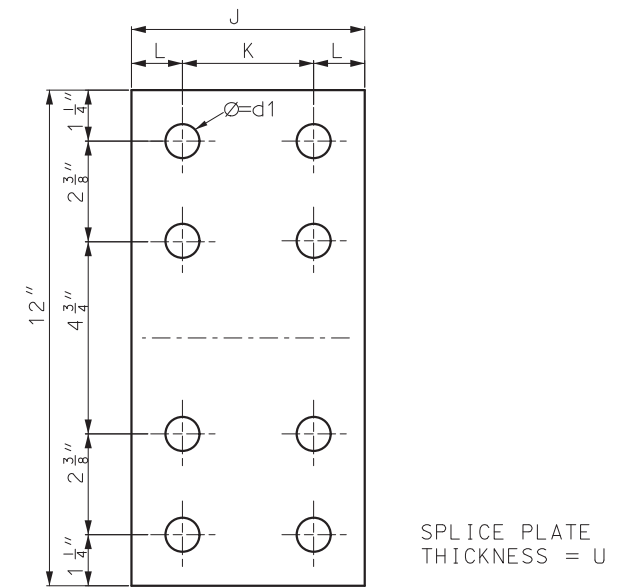
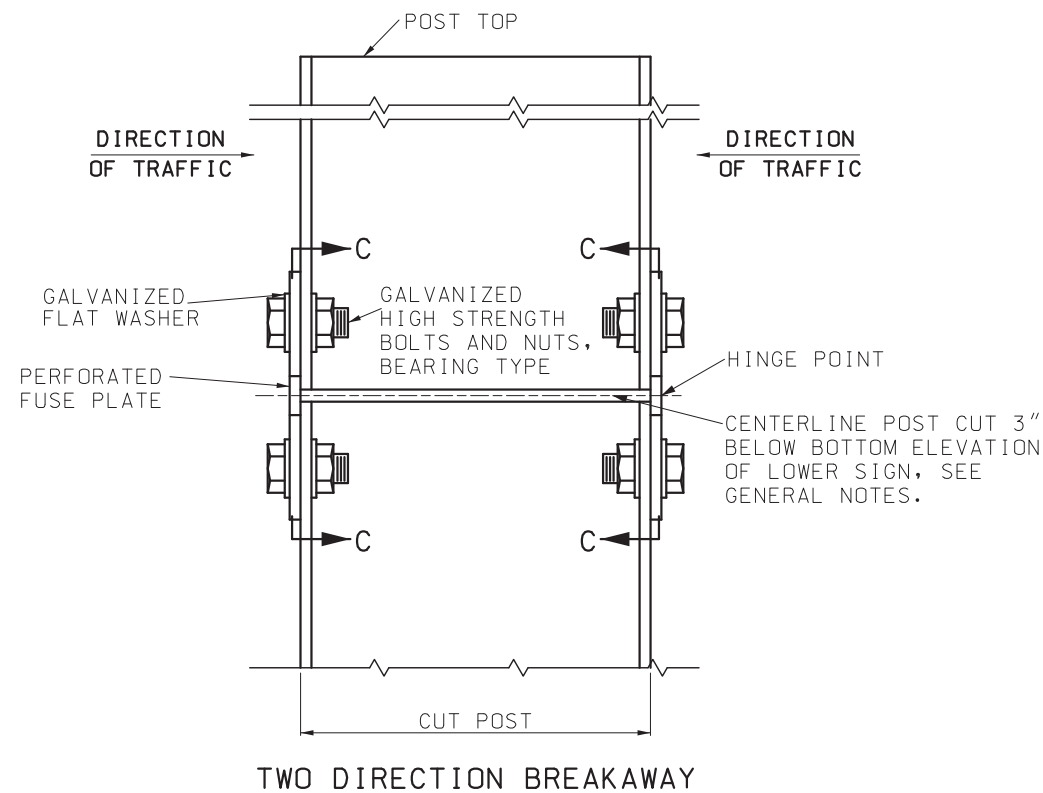
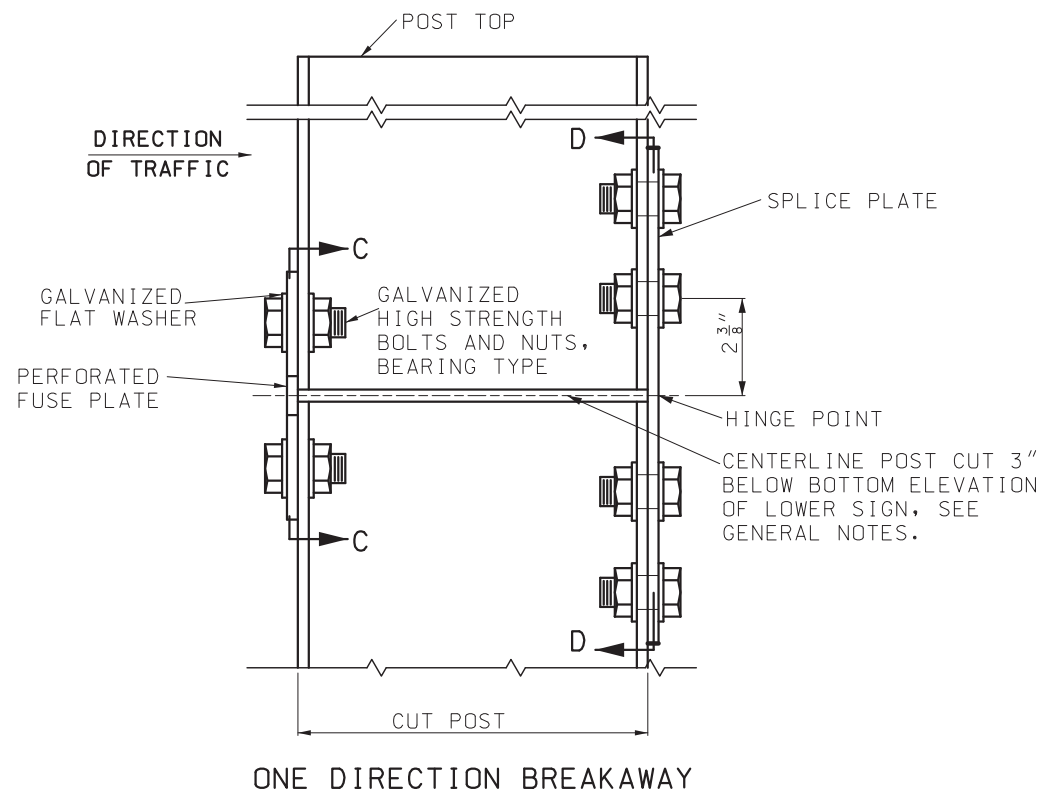
SHEET NO.
1 OF 16

WIDE FLANGE STRUCTURAL STEEL POSTS DESIGN DATA							
POST DES. NO.	NOM. SIZE (IN.)	WEIGHT		DEPTH (IN.)	FLANGE		WEB THICK (IN.)
		LB/FT	LB/IN		WIDTH (IN.)	THICK (IN.)	
1	W6	9	0.75	5 7/8	4	3/16	3/16
2	W6	15	1.25	6	6	1/4	1/4
3	W8	18	1.50	8 1/8	5 1/4	5/16	1/4
4	W10	22	1.83	10 1/8	5 3/4	3/8	1/4
5	W10	26	2.17	10 3/8	5 3/4	7/16	1/4
6	W12	35	2.92	12 1/2	6 1/2	1/2	5/16

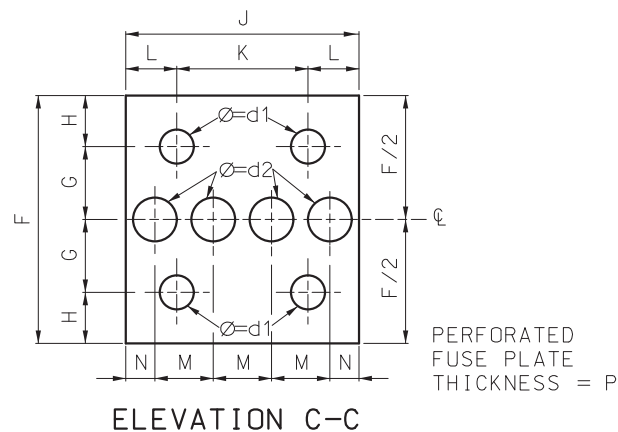
PERFORATED FUSE PLATE DATA TABLE															
POST DESIGN NO.	F (IN.)	G (IN.)	H (IN.)	J (IN.)	K (IN.)	L (IN.)	M (IN.)	N (IN.)	d1 (IN.)	d2 (IN.)	P (IN.)	BOLT DIA. (IN.)	WT. (E.A.) (LBS.)		
1	4 1/4	1	1 1/8	4	2 1/4	7/8	1	1/2	9/16	3/4	3/16	1/2	0.76		
2	5	1 1/4	1 1/4	6	3 1/2	1 1/4	1 1/2	3/4	11/16	1 1/4	1/4	5/8	1.67		
3	5	1 1/4	1 1/4	5 1/4	2 3/4	1 1/4	1 1/4	3/4	11/16	1 1/16	1/4	5/8	1.51		
4	6	1 1/2	1 1/2	5 3/4	2 3/4	1 1/2	1 3/8	13/16	13/16	1 1/8	5/16	3/4	2.52		
5	6	1 1/2	1 1/2	5 3/4	2 3/4	1 1/2	1 3/8	13/16	13/16	1 1/8	5/16	3/4	2.52		
6	6	1 1/2	1 1/2	6 1/2	3 1/2	1 1/2	1 5/8	13/16	13/16	1 5/16	3/8	3/4	3.35		

SPLICE PLATE DATA TABLE															
POST DESIGN NO.	J (IN.)	K (IN.)	L (IN.)	U (IN.)	d1 (IN.)	BOLT DIA. (IN.)	WT. (E.A.) (LBS.)	WASHER							
								OD IN.	ID IN.	THICK IN.					
1	4	2 1/4	7/8	3/16	9/16	1/2	2.45	1 3/16	5/8	1/8					
2	6	3 1/2	1 1/4	1/4	11/16	5/8	4.89	1 5/16	11/16	1/8					
3	5 1/4	2 3/4	1 1/4	5/16	11/16	5/8	5.32	1 5/16	11/16	1/8					
4	5 3/4	2 3/4	1 1/2	5/16	13/16	3/4	5.75	1 15/16	13/16	1/8					
5	5 3/4	2 3/4	1 1/2	7/16	13/16	3/4	8.04	1 15/16	13/16	1/8					
6	6 1/2	3 1/2	1 1/2	1/2	13/16	3/4	10.47	1 15/16	13/16	1/8					

THE WEIGHT OF STRUCTURAL STEEL POSTS SHOWN IN THE CONTRACT HAS BEEN COMPUTED USING THE WEIGHTS SHOWN.



PERFORATED FUSE PLATE AND SPLICE PLATE DETAIL



ALL HOLES SHALL BE DRILLED. ALL PLATE CUTS SHALL PREFERABLY BE SAW CUTS. HOWEVER: FLAME CUTTING WILL BE PERMITTED PROVIDED ALL EDGES ARE GROUND.

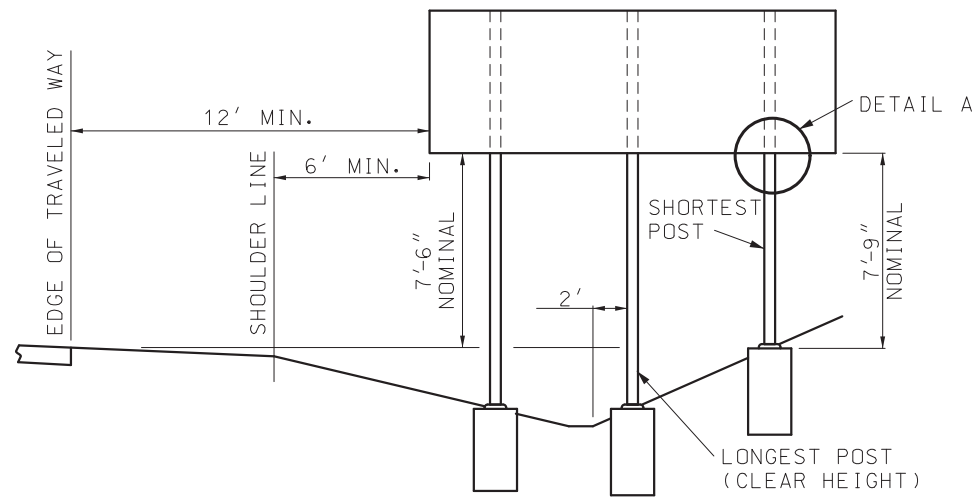
PERFORATED FUSE PLATE AND SPLICE PLATE SHALL BE FABRICATED FROM ASTM A 36 STRUCTURAL STEEL.

NOTES:

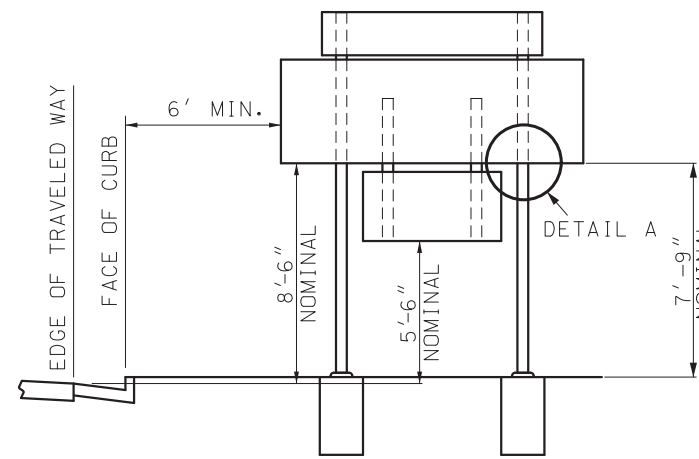
FOR GENERAL NOTES, SEE SHEET 1 OF 16.

FOR ROADWAYS WHERE TRAFFIC MAY STRIKE THE BACKSIDE OF THE POST, PERFORATED FUSE PLATES SHALL BE INSTALLED ON BOTH SIDES OF THE POST.

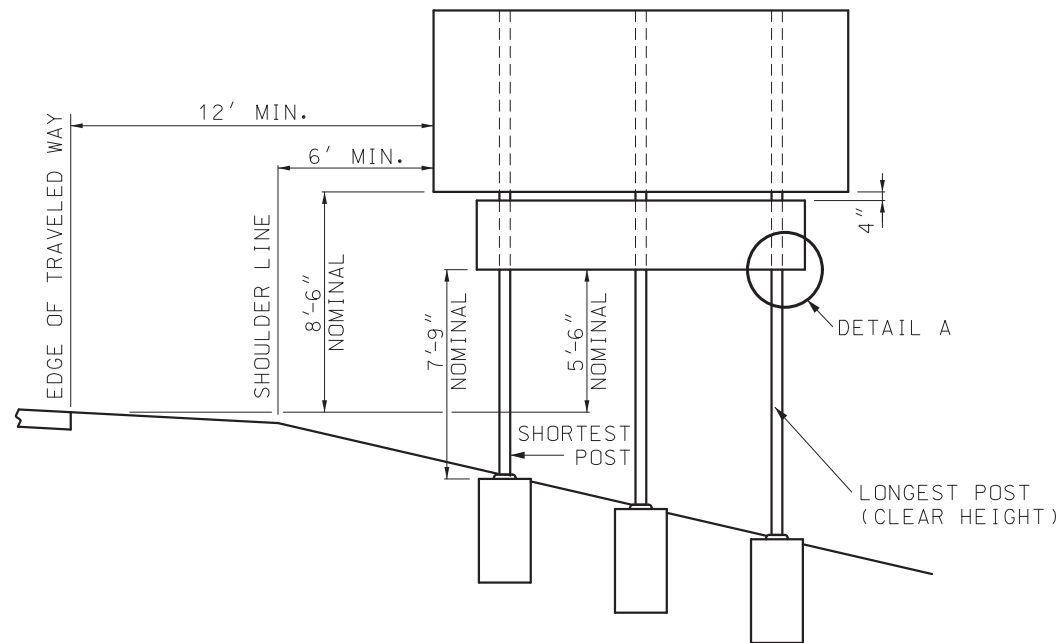
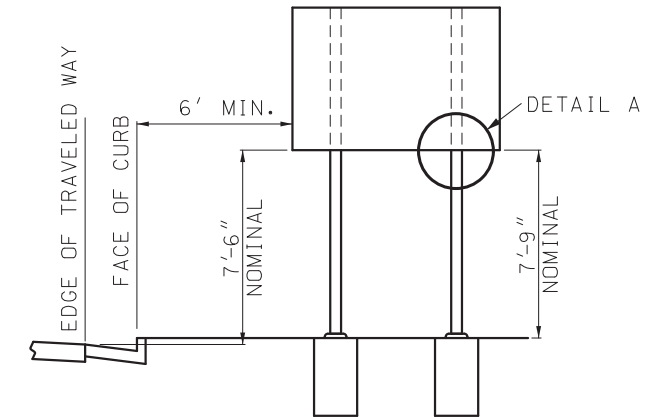
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	POST INSTALLATION DETAILS HINGE DETAILS WIDE FLANGE (WF) POSTS	
	DATE EFFECTIVE: 1/1/2025 DATE PREPARED: 8/29/2024	SHEET NO. 903.03BS 2 OF 16



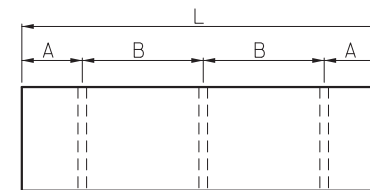
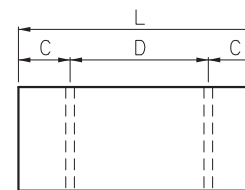
DITCH SECTION



BARRIER CURB SECTIONS



FILL SECTION



$$A = 1/6(L) \quad C = 1/5(L)$$

$$B = 1/3(L) \quad D = 3/5(L)$$

POST SPACING

FOR POST DESIGNS NUMBERS 3, 4, 5 AND 6 HAVING WEIGHTS GREATER THAN 18LBS./FT., POSTS SHALL BE SPACED AT LEAST 7' APART.

FOR POST DESIGNS NUMBERS 1 AND 2, POSTS MAY BE SPACED LESS THAN 7' APART.

DO NOT USE THREE NUMBER 1 OR 2 POSTS FOR L LESS THAN 11'.

FOR L GREATER THAN 11' AND LESS THAN 17', 3 POSTS MAY BE USED DEPENDING ON SOIL CONDITIONS.

FOR L OF 6' TO 17' TYPICALLY USE 2 POSTS.

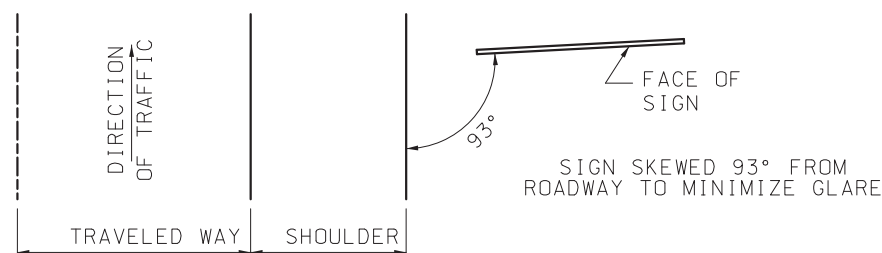
FOR L GREATER THAN 17' TYPICALLY USE 3 POSTS.

GENERAL NOTES:

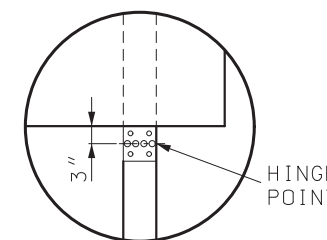
FOR GENERAL NOTES, SEE SHEET 1 OF 16.

VERTICAL CLEARANCE FROM THE ROADWAY SHALL BE MET AND INCREASED ONLY TO MEET THE 7'9" MINIMUM VERTICAL CLEARANCE FROM THE GROUND.

POST SIZE IS DETERMINED USING SIGN HEIGHT, SIGN WIDTH AND CLEAR HEIGHT. THE CLEAR HEIGHT IS EQUAL TO THE LENGTH OF THE LONGEST POST MEASURED FROM THE GROUND TO THE BOTTOM OF THE SIGN.



SIGN ORIENTATION



DETAIL A

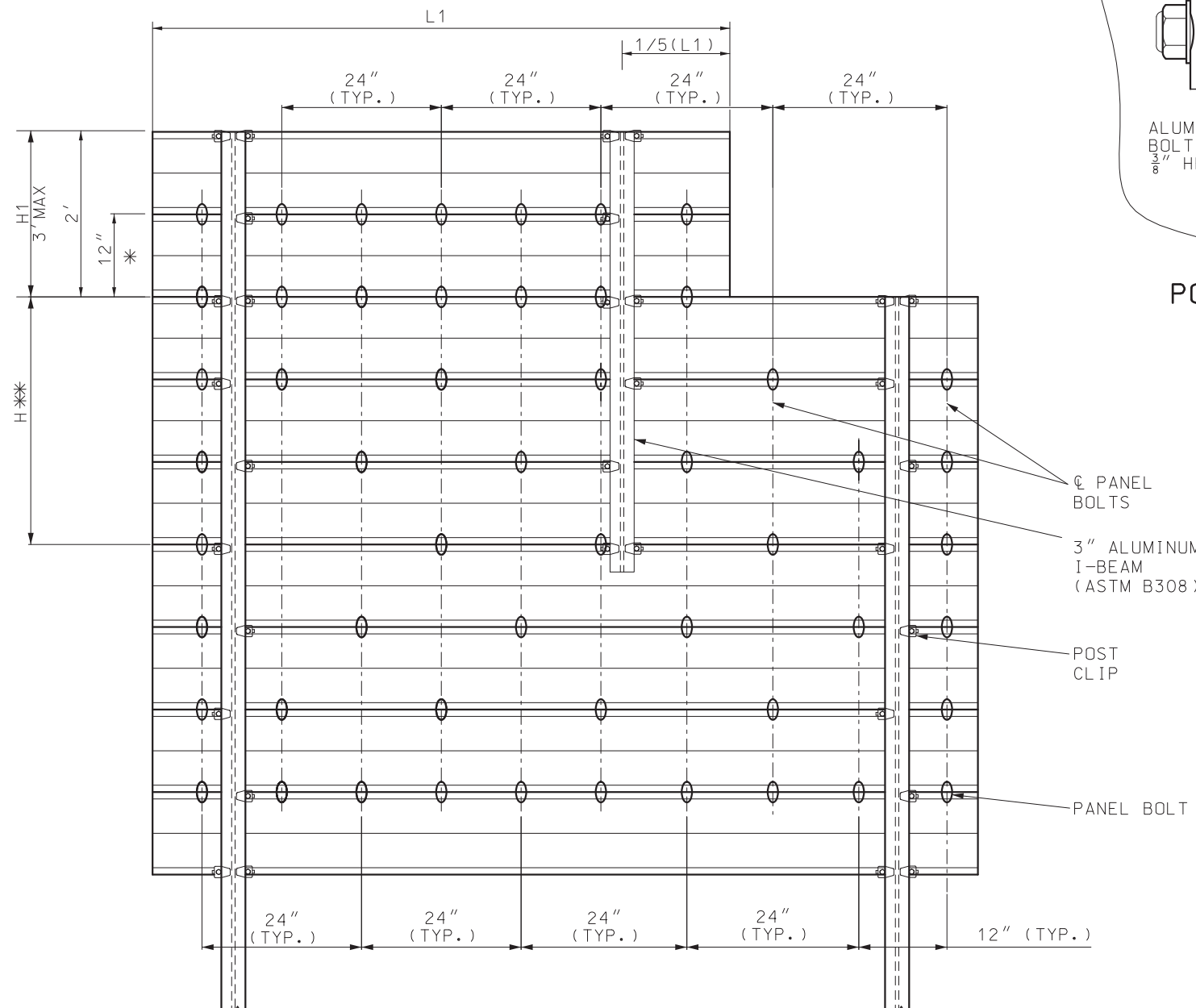
NOTE: SEE SHEET 2 FOR FUSE PLATE DETAILS.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL JEFFERSON CITY, MO 65102
 1-888-ASK-MODOT (1-888-275-6636)

STATE OF MISSOURI
 JONATHAN A. NELSON
 NUMBER PE-2008019578
 PROFESSIONAL ENGINEER
 Jonathan A. Nelson
 JONATHAN A. NELSON - CIVIL
 MO-PE-2008019578

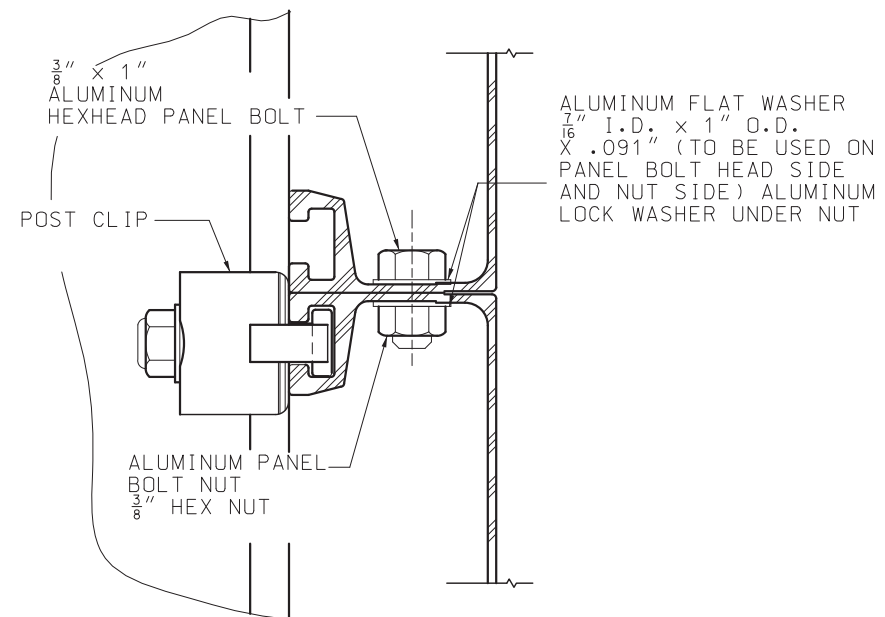
POST INSTALLATION DETAILS
 TYPICAL SECTION, MOUNTING HEIGHT AND POST SPACING WIDE FLANGE (WF) POSTS

DATE EFFECTIVE: 1/1/2025	903.03BS	SHEET NO. 3 OF 16
DATE PREPARED: 8/29/2024		

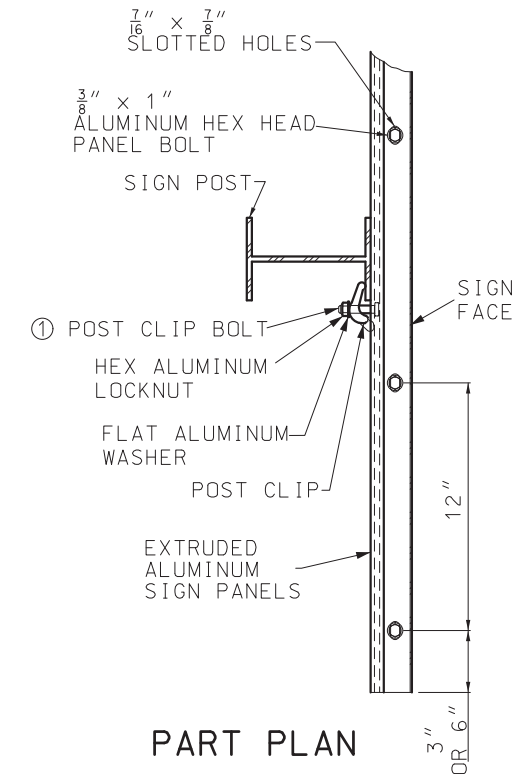


PANEL BOLT LOCATION

* EXTRUDED ALUMINUM PANEL.
 ** H = H1 + 12". H APPLIES TO SIGNS SUSPENDED ABOVE OR BELOW THE PRIMARY SIGN IF SECONDARY SIGN IS NOT ATTACHED TO THE MAIN SIGN POSTS.



POST CLIP DETAIL



PART PLAN

① SIGNS SHALL BE FIELD ATTACHED TO POSTS WITH POST CLIPS AND BOLTS, SEE POST CLIP DETAIL. THE SHANK OF THE POST CLIP BOLT SHALL FIT TIGHTLY AGAINST THE POST FLANGE AFTER THE LOCKNUTS ARE TORQUED. LOCKNUTS ON THE POST CLIP BOLTS SHALL BE TORQUED TO 225 INCH-POUNDS WHEN USING DRY, CLEAN, UNLUBRICATED THREADS.

NOTES:

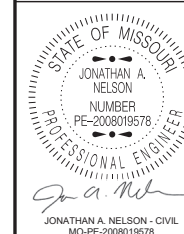
FOR GENERAL NOTES, SEE SHEET 1 OF 16.

FOR EXTRUDED ALUMINUM PANEL AND POST CLIP DETAILS, SEE STANDARD PLAN 903.02.



MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION

105 WEST CAPITOL
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DATE EFFECTIVE: 1/1/2025
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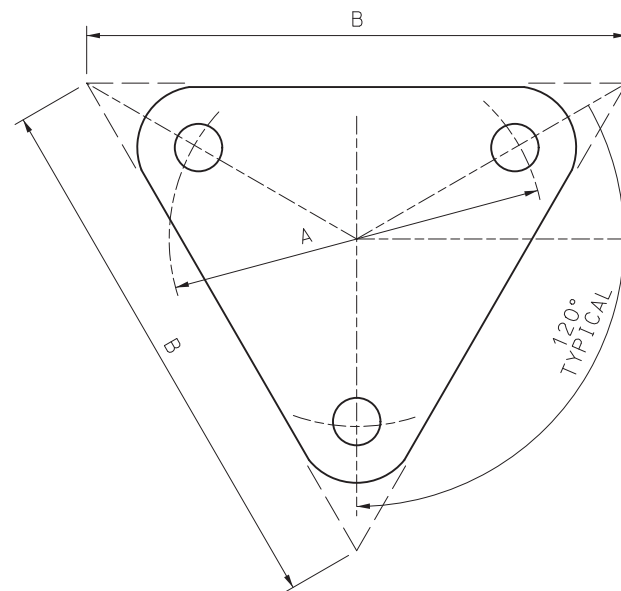
SIGN MOUNTING DETAILS
 WIDE FLANGE (WF) POSTS

903.03BS

SHEET NO.
 4 OF 16

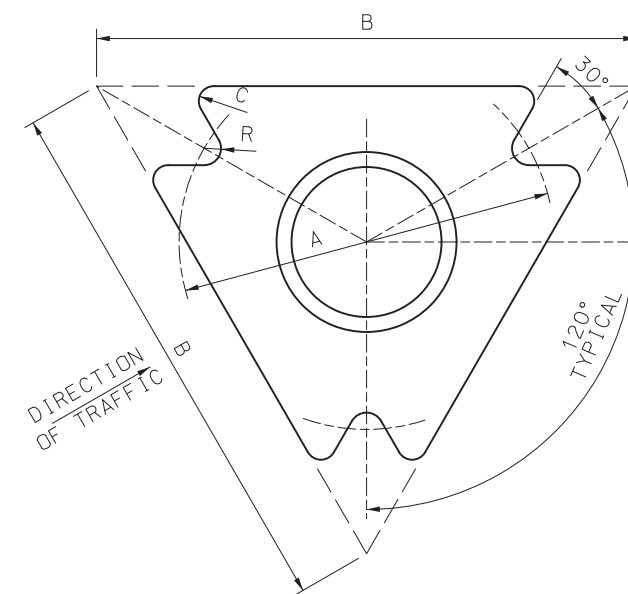
ROUND PIPE POST FOR GROUND MOUNTED SIGNS												
POST NOM SIZE (IN. - ID)	BOLT			WASHER			BASE CONNECTION DATA TABLE (IN.)					
	DIA IN.	LENGTH IN.	TORQUE IN./LB.	OD IN.	ID IN.	THICK IN.	A	B	C	R	T	W
2 1/2	1/2	3 1/2	140	1 1/16	1 7/32	1/8	6 1/4	9	1/4	9/32	1	1/4
4	5/8	3 3/4	345	1 5/16	1 1/16	1/8	7 3/16	10	1/4	3/8	1	5/16

ROUND PIPE POST AND FOOTING DATA TABLE						
NOM. SIZE (IN.)	WEIGHT		STUB LENGTH	FOOTING		CONCRETE C.Y.
	LBS/FT	LBS/IN		DIA.	DEPTH	
2 1/2	5.79	0.48	4' - 3 1/2"	12"	4'-6"	0.13
4	10.79	0.90	5' - 3 1/2"	18"	5'-6"	0.36

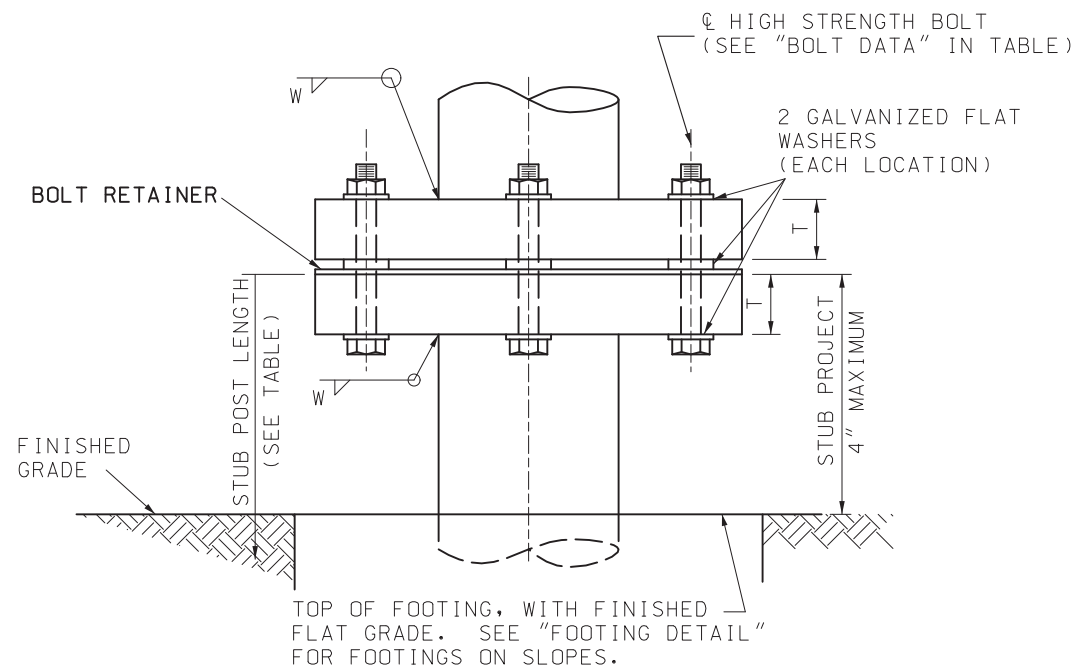


BOLT RETAINER

SHEET METAL BOLT RETAINER CUT FROM 30 GAUGE GALVANIZED SHEET METAL. PLACE BETWEEN BASE PLATES. SIZE VARIES TO FIT PLATE. BOLT HOLES SHALL BE 1/16" LARGER THAN REQUIRED BOLT SIZE.

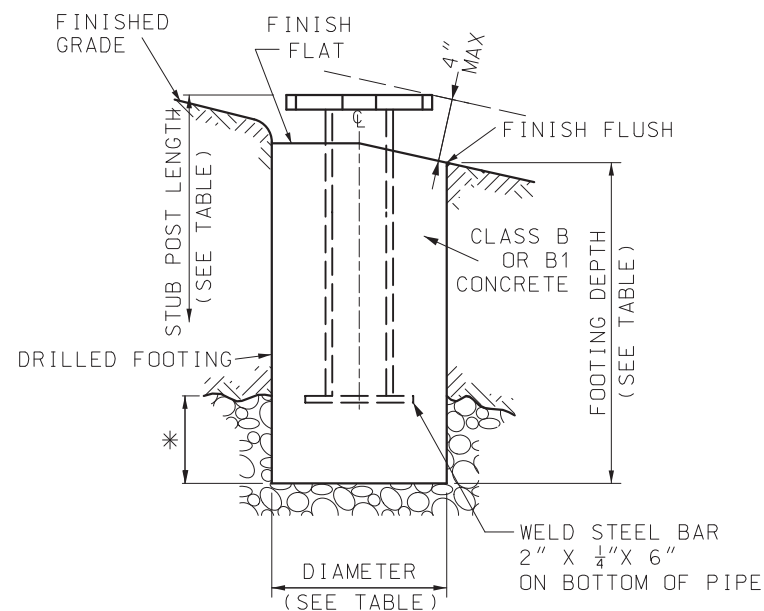


PLAN VIEW



ELEVATION
(STEEL PIPE POST BASE CONNECTION)

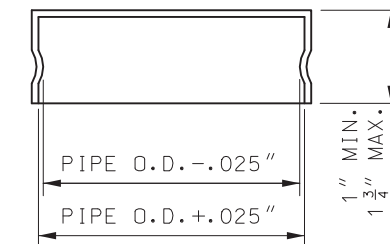
MULTI-DIRECTION SLIP BASE



* 2' MAXIMUM IN ROCK FOR 2" DIA. PIPE;
3' MAXIMUM IN ROCK FOR 4" DIA. PIPE.

FOOTING DETAIL

ROLLED CRIMP TO ENGAGE PIPE O.D.



FRICION CAP

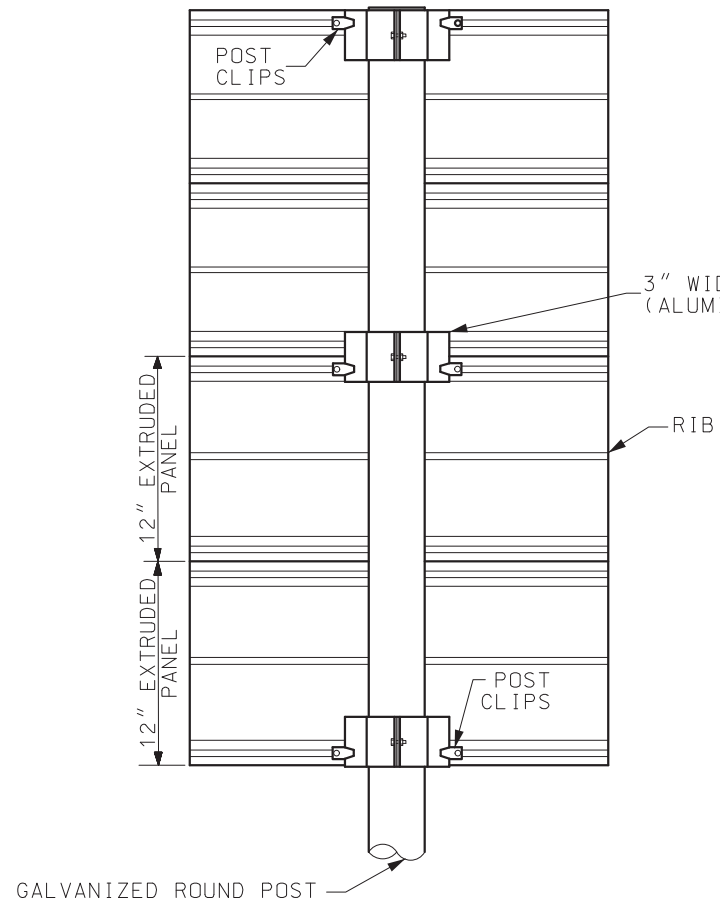
NOTE:

FOR GENERAL NOTES, SEE SHEET 1 OF 16.

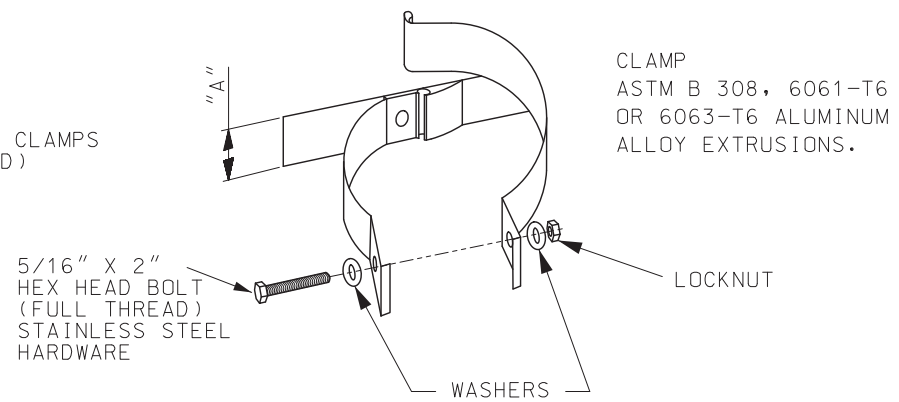
FOR MOUNTING HEIGHT AND OFFSET DETAILS, SEE SHEET 10 OF 16.

	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
		POST INSTALLATION DETAILS PIPE POST

DATE EFFECTIVE:	1/1/2025	903.03BS	SHEET NO. 5 OF 16
DATE PREPARED:	8/29/2024		

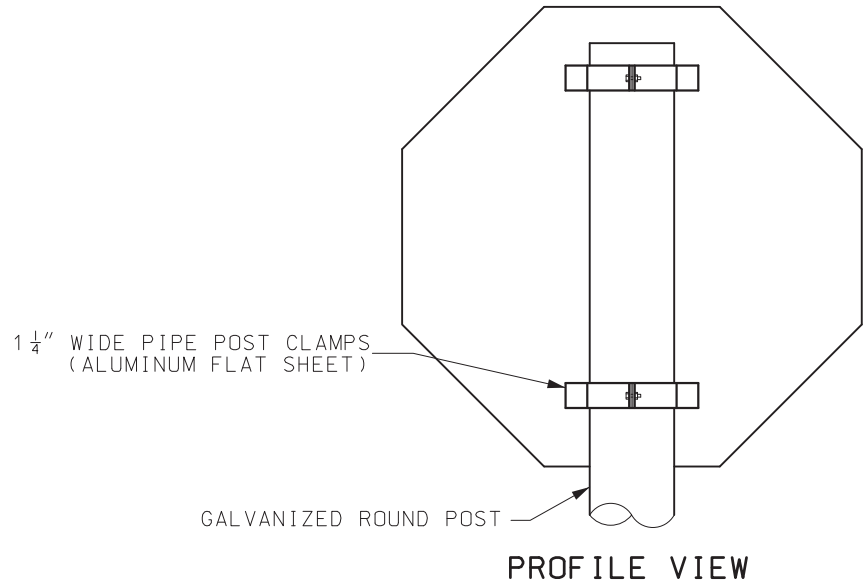


PROFILE VIEW

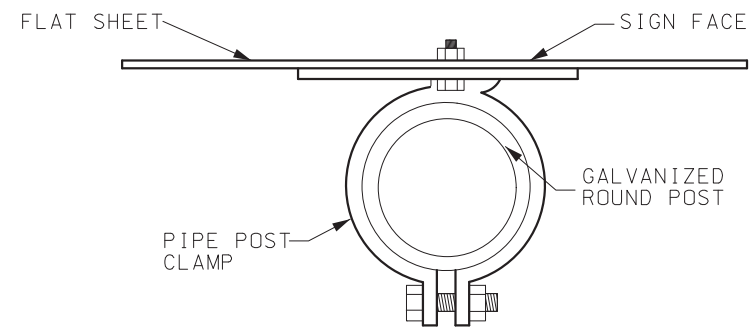


CLAMP TYPE SIGN SUPPORT FOR PIPE POST

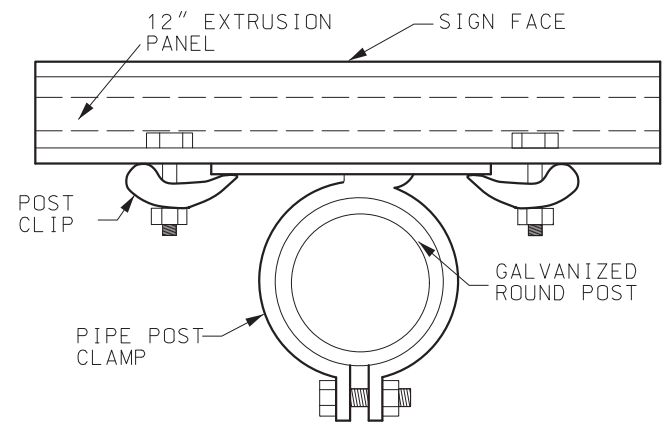
WIDTH OF PIPE POST CLAMP	
SIGN TYPE	MINIMUM "A"
FLAT	1 1/4"
STRUCTURAL	3"



PROFILE VIEW

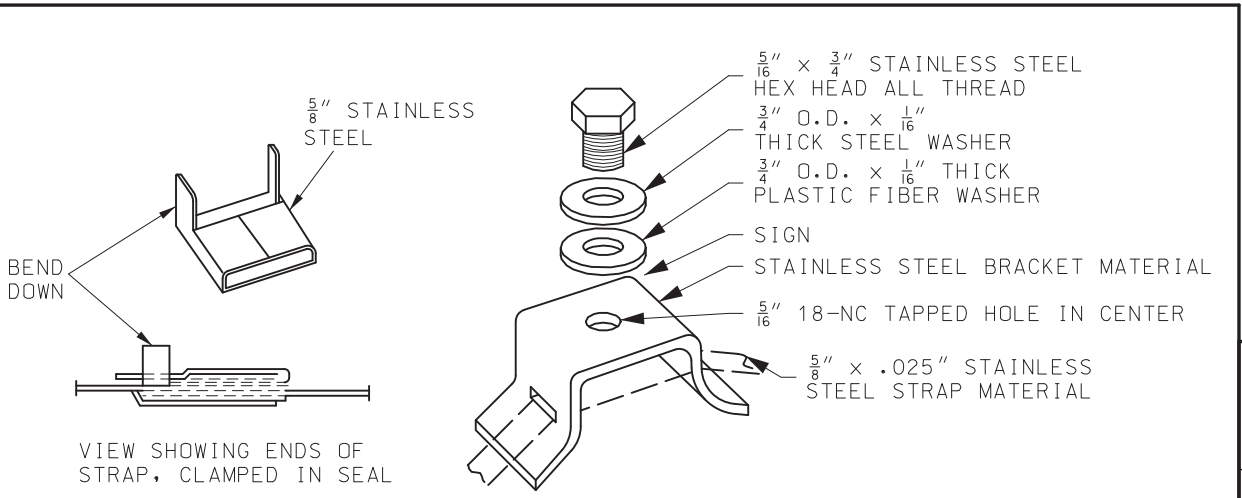


PLAN VIEW



PLAN VIEW

MOUNTING DETAILS FOR EXTRUDED PANELS ON PIPE POST



STRAP SEAL

FLARED LEG SIGN BRACKET

MOUNTING DETAILS FOR FLAT SHEET SIGNS ON ROUND STRUCTURES >4" PIPE POST

MOUNTING DETAILS FOR FLAT SHEET ON PIPE POST

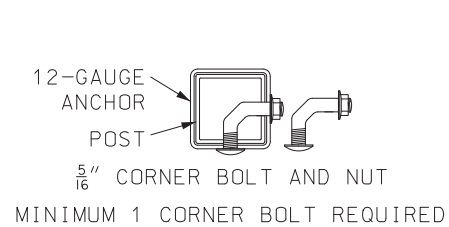
NOTES:
 FOR GENERAL NOTES, SHEET 1 OF 16.
 FOR MOUNTING HEIGHT AND OFFSET DETAILS, SEE SHEET 10 OF 16.
 FOR DETAILS OF EXTRUDED ALUMINUM PANEL AND POST CLIP DETAILS, SEE STANDARD PLAN 903.02.

MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
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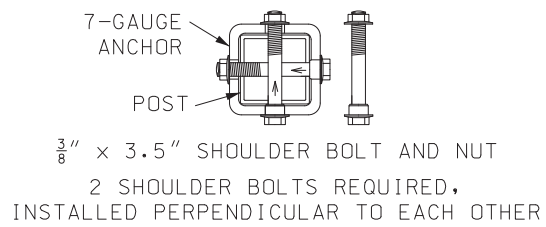
STATE OF MISSOURI
 JONATHAN A. NELSON
 NUMBER PE-2008019578
 PROFESSIONAL ENGINEER
 Jonathan A. Nelson
 JONATHAN A. NELSON - CIVIL
 MO-PE-2008019578

SIGN MOUNTING DETAILS PIPE POST

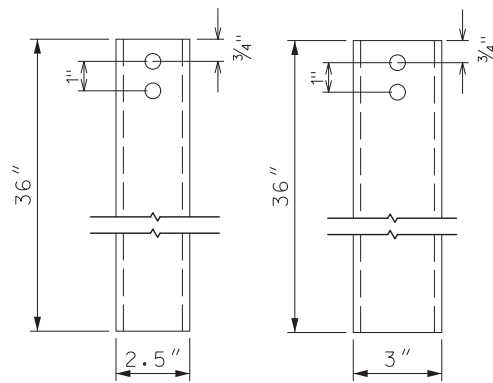
DATE EFFECTIVE: 1/1/2025	903.03BS	SHEET NO. 6 OF 16
DATE PREPARED: 8/29/2024		



12-GAUGE ANCHOR
ANCHOR BOLT DETAIL



7-GAUGE ANCHOR



FOR 2" POST FOR 2.5" POST

BOLT HOLE DIAMETER - 17/32"
2 PER SIDE ON ALL 4 SIDES

7-GAUGE ANCHOR
FABRICATION DETAIL

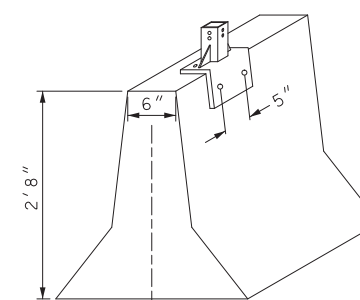
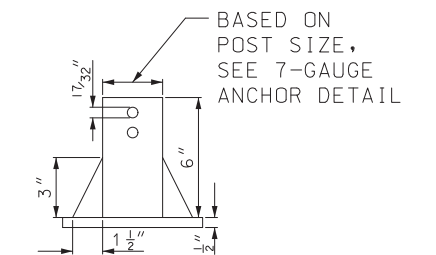
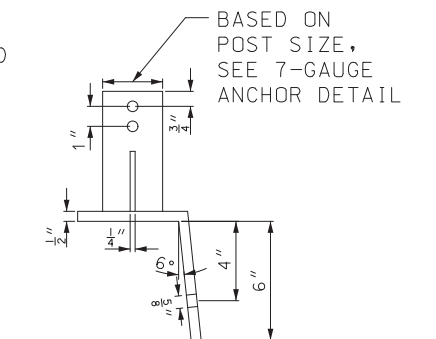
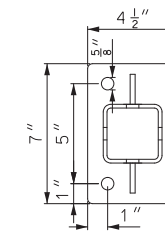
ANCHOR TUBE SHALL BE 7-GAUGE

1/2" X 4 1/2" GALVANIZED MECHANICAL FASTENERS SHALL BE USED TO ATTACH ANCHOR TO BARRIER WALL

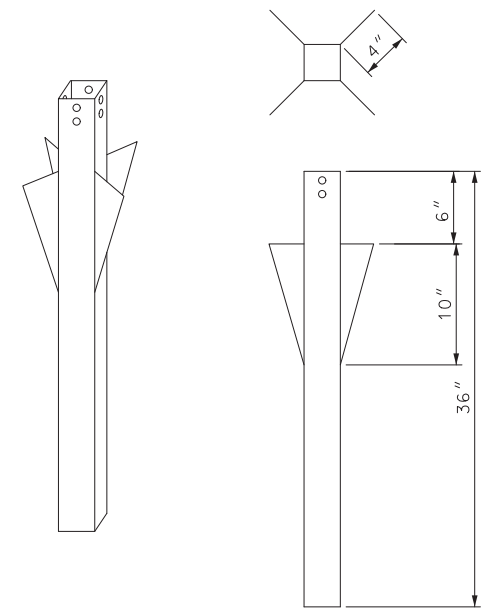
SHOULDER BOLTS SHALL BE USED TO ATTACH PSST POST TO ANCHOR (SEE ANCHOR BOLT DETAIL)

ANCHOR SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER SECTION 1080

FURNISHING AND INSTALLATION OF BARRIER WALL POST ANCHOR FOR PSST SHALL BE PAID PER EACH AS CONCRETE POST ANCHOR

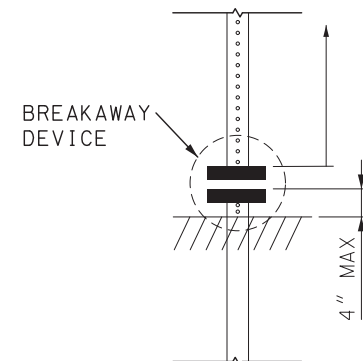


BARRIER WALL MOUNTING DETAIL



12-GAUGE (NOT SHOWN) OR 7-GAUGE

OMNIDIRECTIONAL/STABILIZED
DRIVEN ANCHOR DETAIL

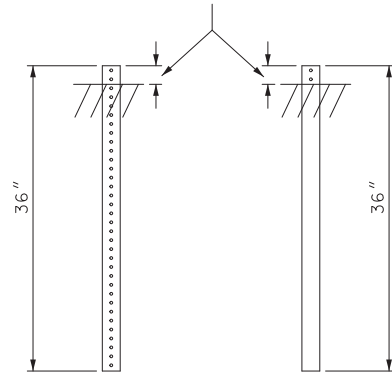


2.5" + 2.25" POST COMPRISED OF 2.5" PSST WITH 6-FT INSERT OF 2.25" PSST THAT RUNS UP FROM THE BREAKAWAY DEVICE

THE BREAKAWAY DEVICE PORTION FIXED TO THE GROUND ANCHOR SHALL BE NO HIGHER THAN 4" ABOVE THE FINISHED GRADE

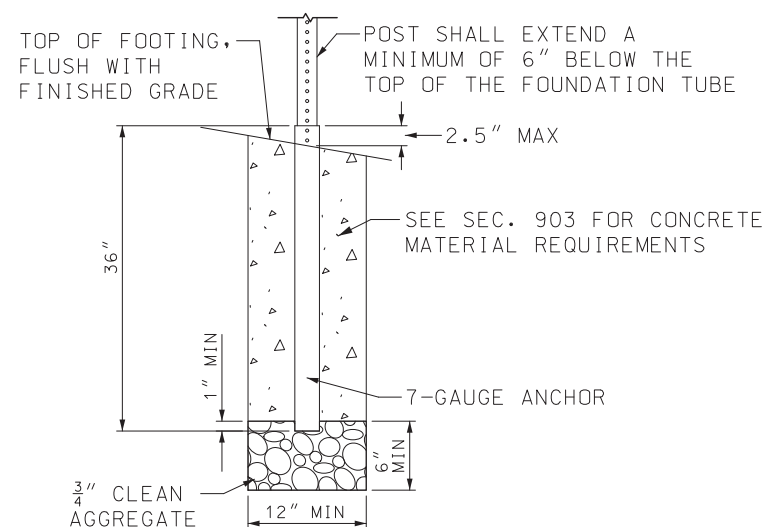
BREAKAWAY AND 2.5" + 2.25" POST DETAIL

THE ANCHOR SHOULD BE A MAXIMUM OF 2.5" ABOVE THE GROUND LEVEL

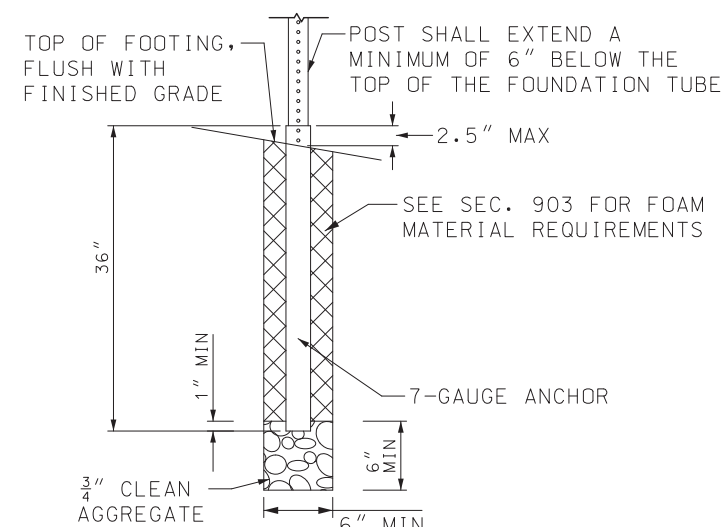


12-GAUGE 7-GAUGE

DRIVEN ANCHOR
INSTALLATION DETAIL



CONCRETE FOOTING DETAIL



POLYURETHANE FOAM FOOTING DETAIL

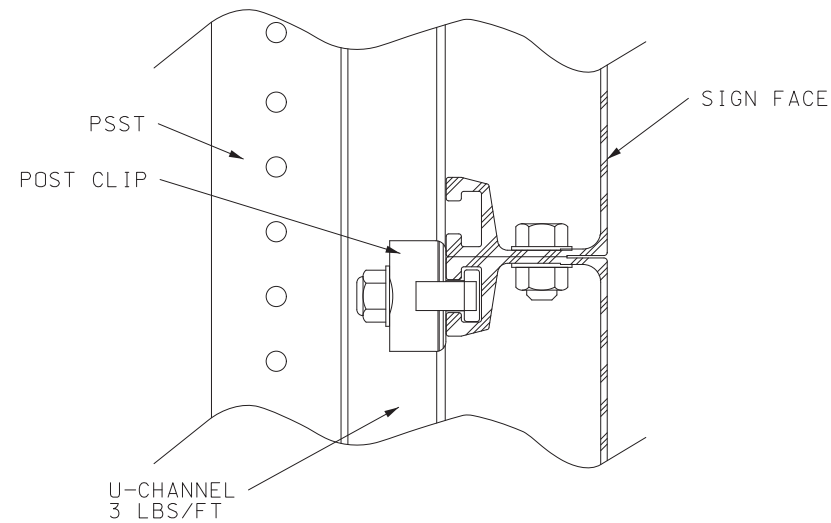
NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 16.

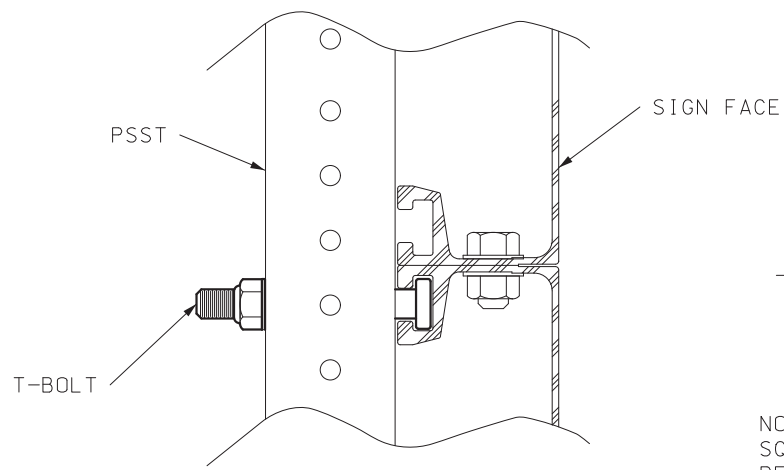
FOR MOUNTING HEIGHT AND OFFSET DETAILS, SEE SHEET 10 OF 16.

ALL BREAKAWAY DEVICES USED ON AN INSTALLATION SHALL BE CERTIFIED NCHRP 350 COMPLIANT.

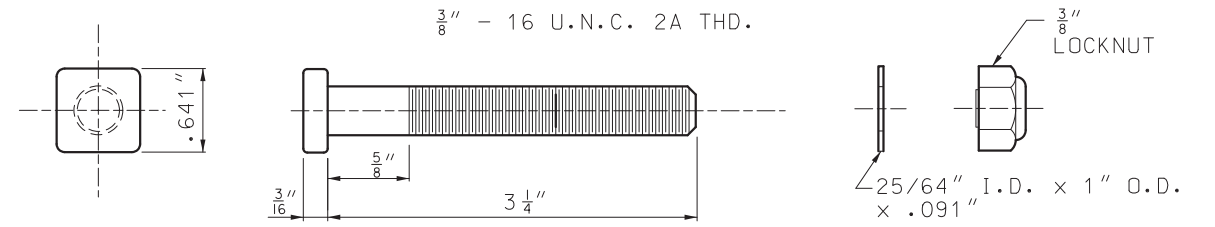
<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	
<p>JONATHAN A. NELSON - CIVIL MO-PE-2008019578</p>	<p>POST INSTALLATION DETAILS</p> <p>PERFORATED SQUARE STEEL TUBE (PSST)</p>
<p>DATE EFFECTIVE: 1/1/2025</p> <p>DATE PREPARED: 8/29/2024</p>	<p>903.03BS</p> <p>SHEET NO. 7 OF 16</p>



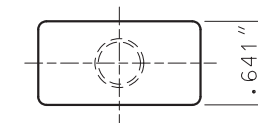
PROFILE



PROFILE



NOTE:
SQUARE BOLT HEAD SHOWN MAY BE REPLACED WITH
RECTANGULAR BOLT HEAD WITH THE NARROW DIMENSION
EQUAL TO .641".



T-BOLT DETAIL

BOLT - 1 3/4" x ALUMINUM
BOLT - 3 1/4" x ALUMINUM
HEX LOCKNUT - 3/8" ALUMINUM
WASHER - ALUMINUM

NOTES:
- ALUMINUM BOLTS SHALL BE ASTM B 211, 2024-T4 OR 6061-T6
- ALUMINUM FLAT WASHERS SHALL BE ASTM B 209, ALCLAD 2024-T4 OR 2024-T4
- ALUMINUM LOCK NUTS (NYLON INSERT) SHALL BE ASTM B 211 OR 2017-T4

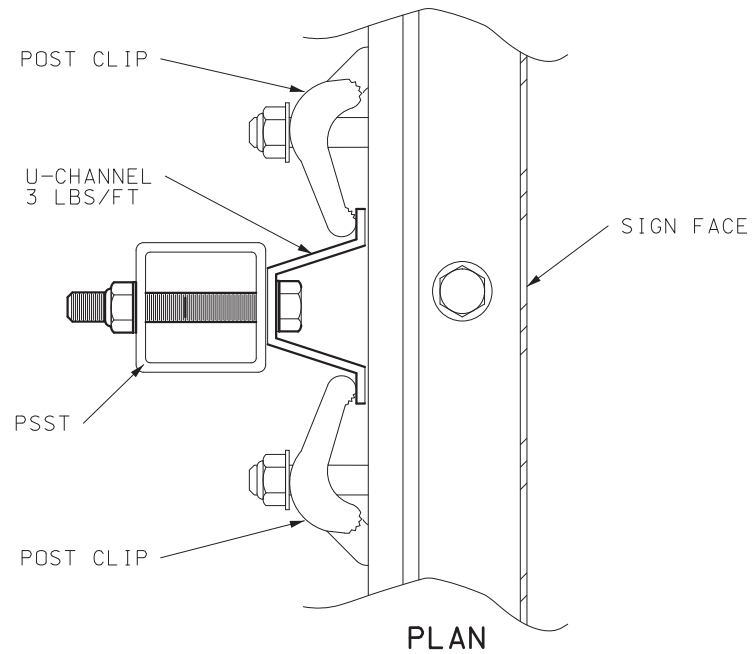
NOTES:

FOR THE GENERAL NOTES, SEE SHEET 1 OF 16.

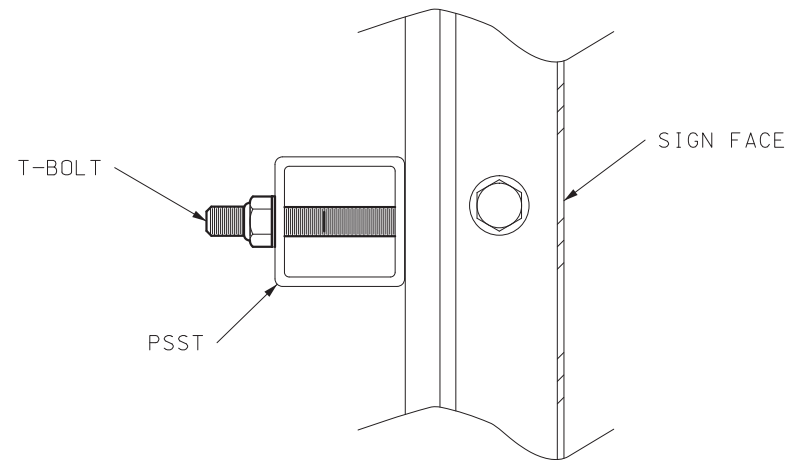
FOR MOUNTING HEIGHT AND OFFSET DETAILS,
SEE SHEET 10 OF 16.

FOR POST CLIP DETAILS, SEE STANDARD PLAN 903.02.

ALTERNATE PSST MOUNTING HARDWARE USE SHALL BE
ON APPROVED LIST.



POST CLIP METHOD



T-BOLT METHOD

EXTRUDED PANEL MOUNTING DETAIL

NUMBER OF BOLTS TO ATTACH STEEL CHANNEL TO PSST POST	
SIGN HEIGHT	NO. OF BOLTS PER PSST POST USED
1'	2
2'	3
3'	4
4'	5
5'	6
6'	7
7'	8

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SIGN MOUNTING DETAILS

PERFORATED SQUARE STEEL TUBE (PSST)

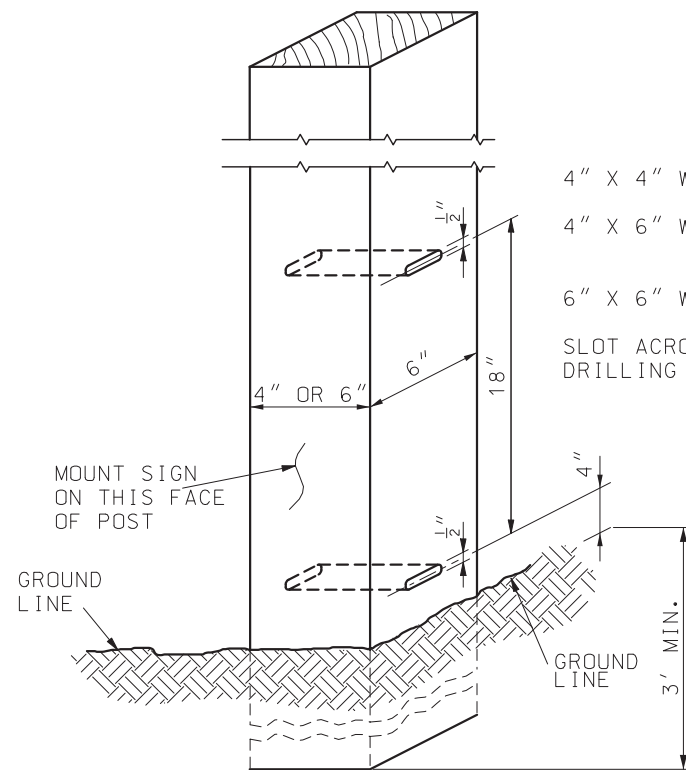
JONATHAN A. NELSON - CIVIL
MO-PE-2008019578

DATE EFFECTIVE: 1/1/2025

DATE PREPARED: 8/29/2024

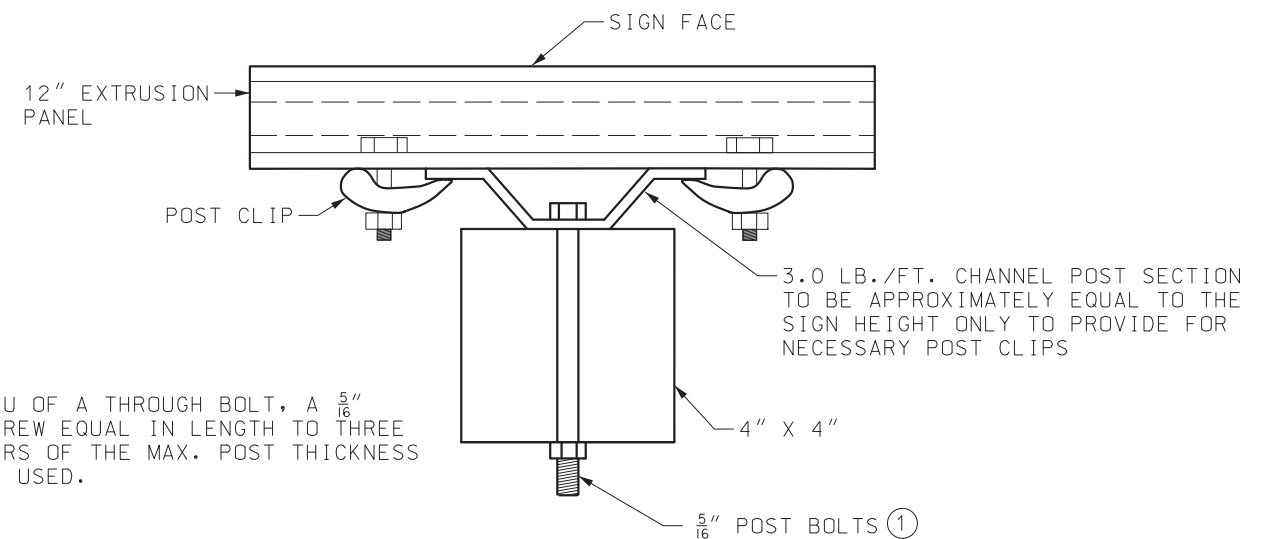
903.03BS

SHEET NO.
8 OF 16



4" X 4" WOOD POST - NO SLOTS OR HOLES REQUIRED
 4" X 6" WOOD POST - 1 1/2" X 1/2" SLOT ON 6" SIDE OR 1 1/2" DIA. HOLE ON 6" SIDE
 6" X 6" WOOD POST - 2" X 1/2" SLOT OR 2" DIA. HOLE
 SLOT ACROSS NEUTRAL AXIS FORMED BY SUCCESSIVE DRILLING WITH 1/2" BIT.

WOOD POST DETAIL

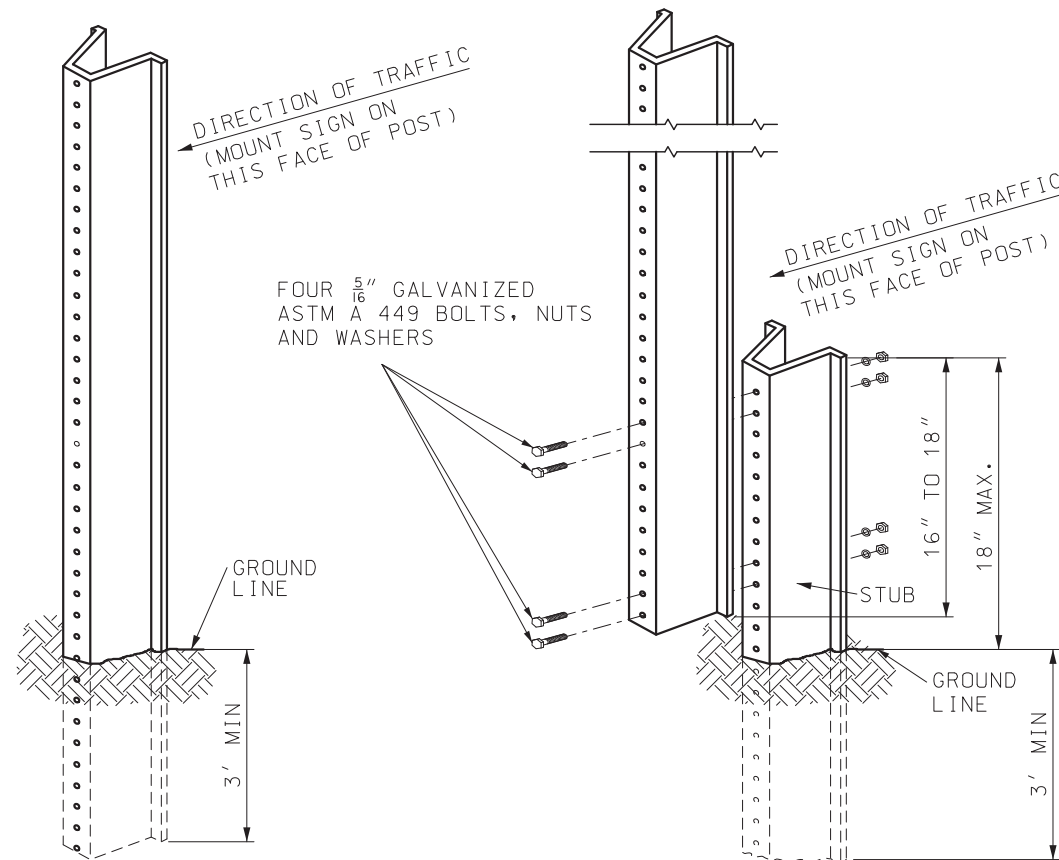


① IN LIEU OF A THROUGH BOLT, A 5/16" LAG SCREW EQUAL IN LENGTH TO THREE QUARTERS OF THE MAX. POST THICKNESS MAY BE USED.

PLAN VIEW

MOUNTING DETAILS FOR EXTRUDED PANELS ON WOOD POST

NUMBER OF BOLTS TO ATTACH STEEL CHANNEL TO WOOD POST	
SIGN HEIGHT	NO. OF BOLTS PER WOOD POST USED
1'	2
2'	3
3'	4
4'	5
5'	6
6'	7
7'	8



U-CHANNEL POST-STUB DETAIL

U-CHANNEL POST DETAIL OPTIONAL INSTALLATION

NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 16.

ALL POSTS SHALL BE EMBEDDED A MINIMUM OF 3 FEET INTO THE GROUND.

U-CHANNEL POST-STUB OVERLAP SHALL BE POSITIONED ENTIRELY BETWEEN GROUND LINE AND 18" ABOVE GROUND LINE.

FOR POST CLIP DETAILS, SEE STANDARD PLAN 903.02.

FOR MOUNTING HEIGHT AND OFFSET DETAILS, SEE SHEET 10 OF 16.

SIGN AREA (SQ.FT.)	POST TYPE	
	U-CHANNEL	WOOD
≤ 10	1 - 3.0 LB./FT.*	1 - 4" X 4"*
> 10 ≤ 16	2 - 3.0 LB./FT.	2 - 4" X 4" 1 - 4" X 6"*
> 16 ≤ 24	2 - 3.0 LB./FT.	2 - 4" X 6"
> 24 ≤ 30	3 - 3.0 LB./FT.	2 - 4" X 6"
> 30 ≤ 50	N/A	2 - 6" X 6"

* SIGNS GREATER THAN 4 FEET IN WIDTH REQUIRE TWO POSTS, EXCEPT DIAMOND SHAPED WARNING SIGNS, YIELD SIGNS, AND ONE WAY SIGNS.

POST SIZE REQUIREMENTS

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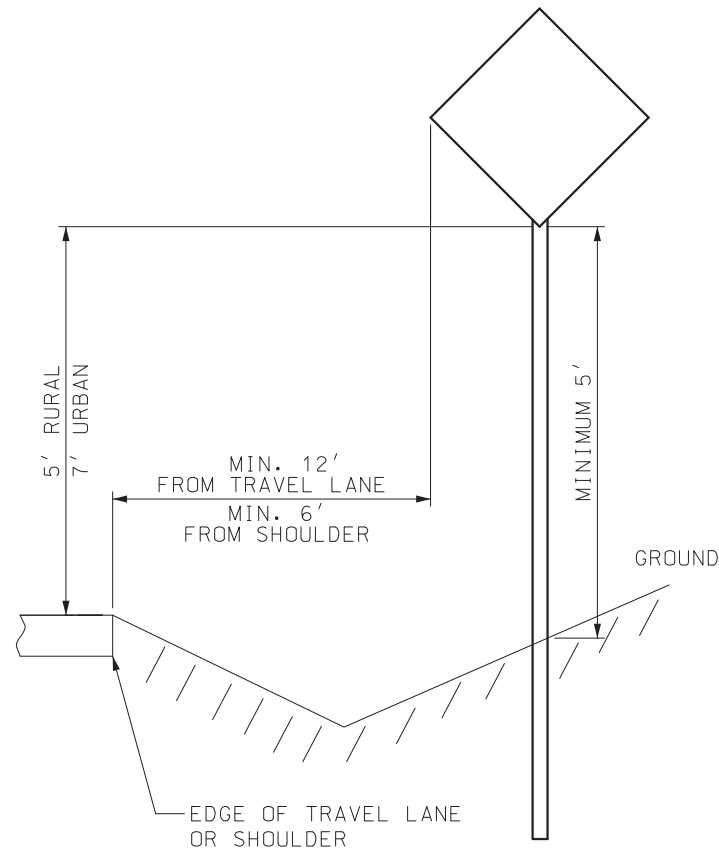
STATE OF MISSOURI
 JONATHAN A. NELSON
 NUMBER PE-2008019578
 PROFESSIONAL ENGINEER
 Jonathan A. Nelson - CIVIL
 MO-PE-2008019578

SIGN MOUNTING DETAILS
 WOOD AND U-CHANNEL POST

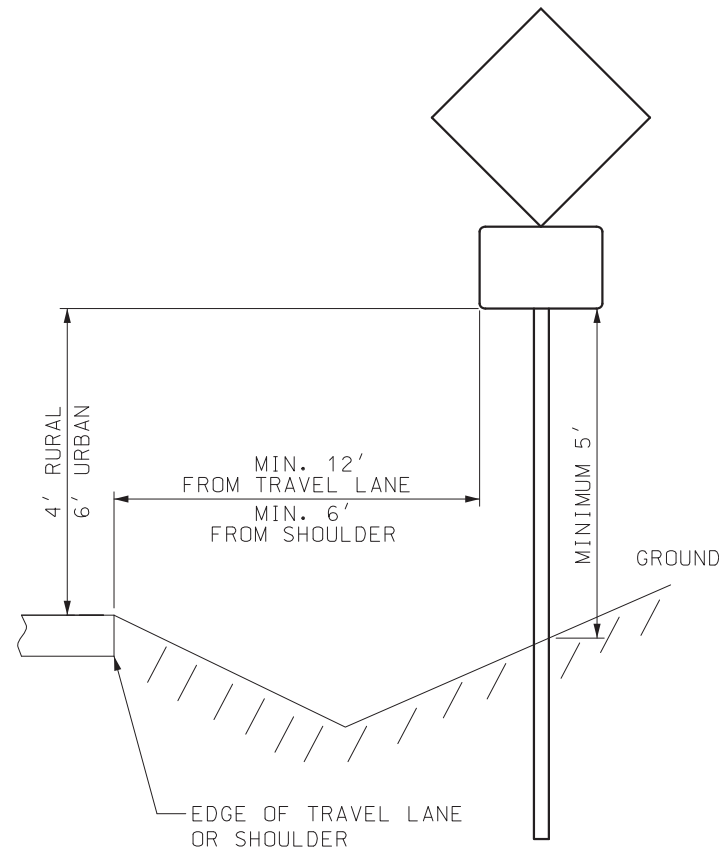
DATE EFFECTIVE: 1/1/2025
 DATE PREPARED: 8/29/2024

903.03BS

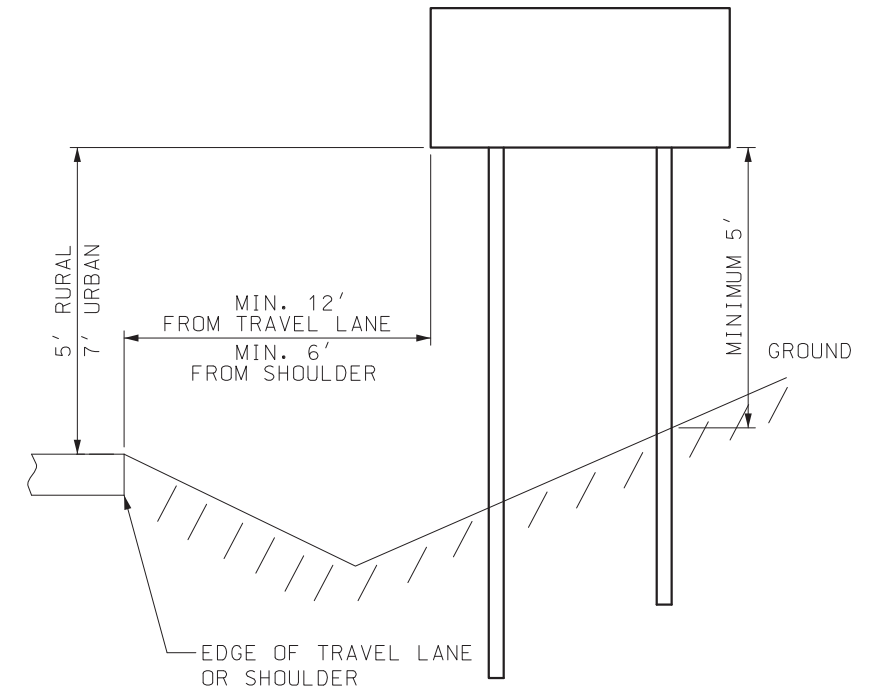
SHEET NO.
 9 OF 16



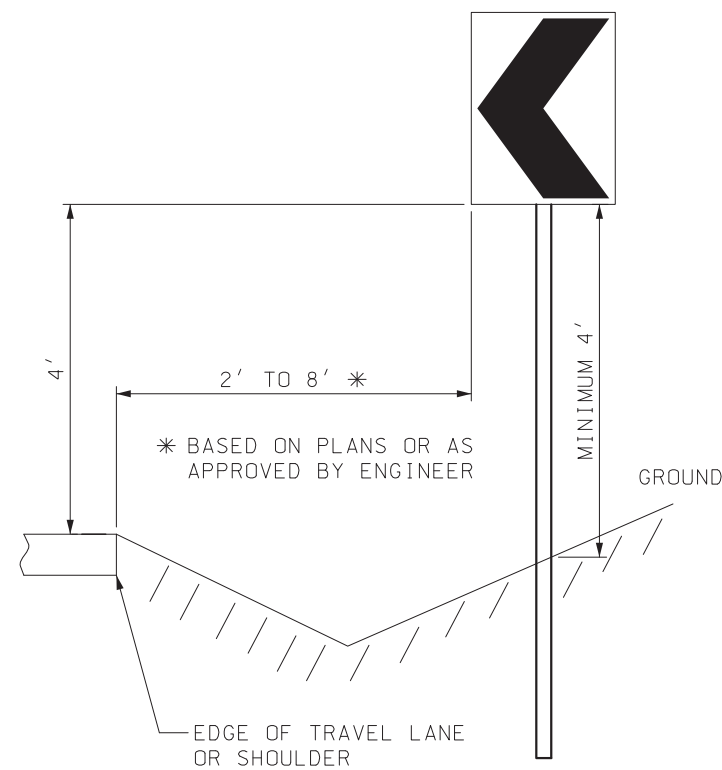
ONE POST - SINGLE SIGN



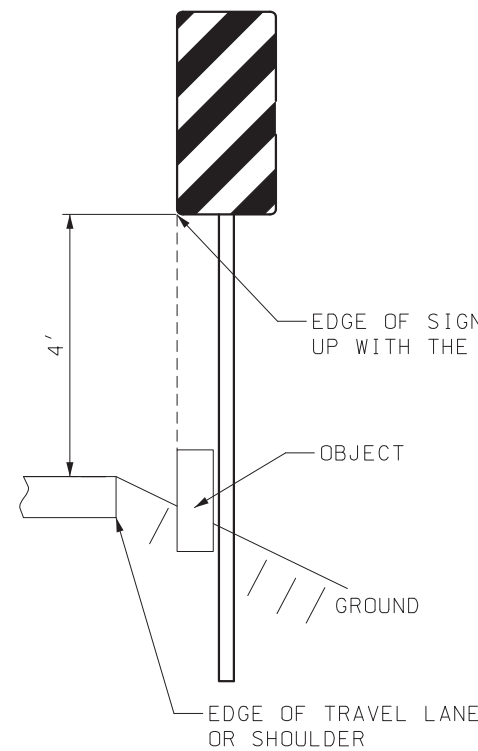
ONE POST - SINGLE SIGN WITH SUPPLEMENTAL PLAGUE



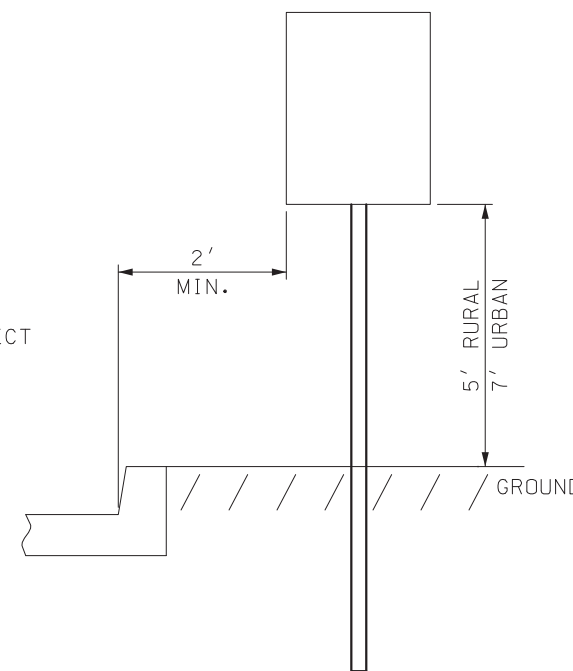
TWO POST



CHEVRON SIGN



TYPE 3 OBJECT MARKER



ADJACENT TO CURB

GENERAL NOTES:

SIGN MOUNTING BOLTS SHALL BE INSTALLED WITH A NYLON WASHER AGAINST THE SIGN FACE WITH A STEEL WASHER BETWEEN THE NYLON WASHER AND BOLT HEAD.

A LOCKNUT SHALL BE USED TO FASTEN THE SIGN TO THE POST.

VERTICAL CLEARANCE FROM THE ROADWAY SHALL BE MET AND INCREASED ONLY TO MEET THE MINIMUM VERTICAL CLEARANCE FROM THE GROUND.

HORIZONTAL OFFSET MAY BE ADJUSTED BASED ON FIELD CONDITIONS.

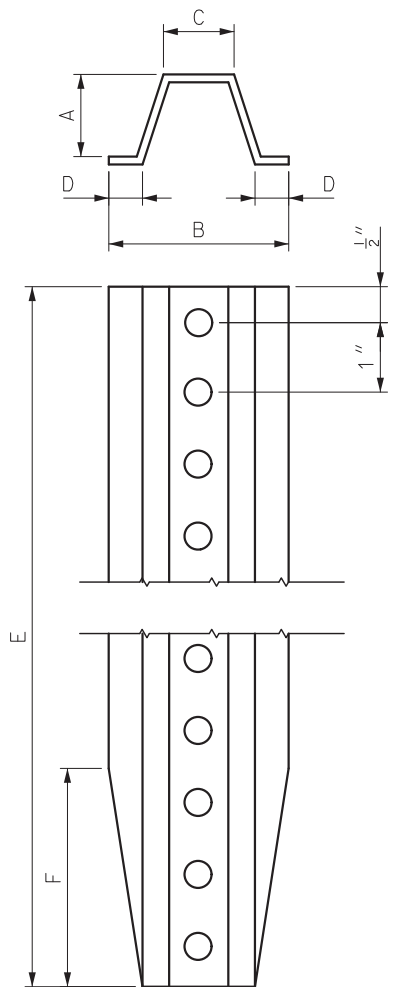
MoDOT MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
 105 WEST CAPITOL
 JEFFERSON CITY, MO 65102
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STATE OF MISSOURI
 JONATHAN A. NELSON
 NUMBER PE-2008019578
 PROFESSIONAL ENGINEER
 Jonathan A. Nelson
 JONATHAN A. NELSON - CIVIL
 MO-PE-2008019578

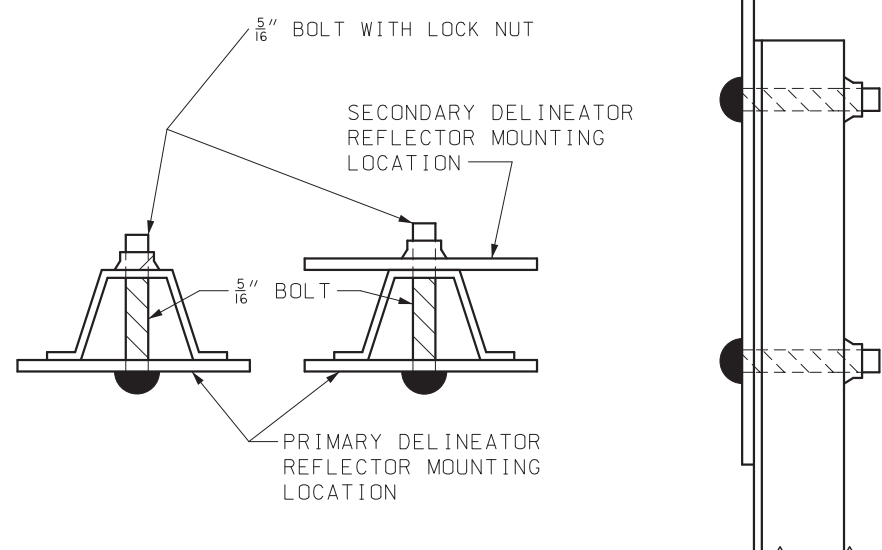
SIGN MOUNTING DETAILS
MOUNTING HEIGHT & OFFSET
PIPE POSTS, PSST, WOOD
& U-CHANNEL POSTS

DATE EFFECTIVE: 1/1/2025	903.03BS	SHEET NO. 10 OF 16
DATE PREPARED: 8/29/2024		

MOUNTING HEIGHT DETAILS



GROUND MOUNT U-CHANNEL

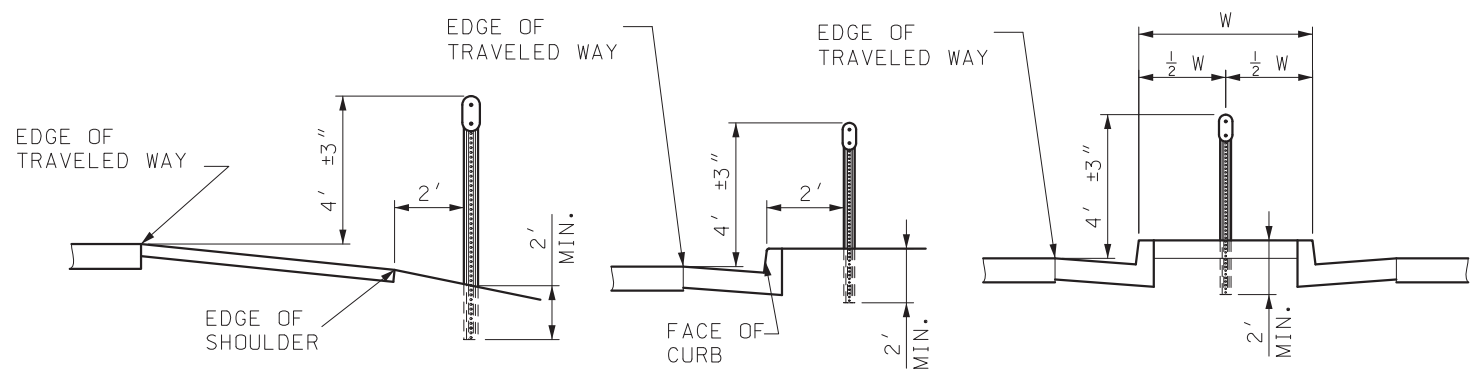


HOLE PUNCHING TO EQUAL 3/8" DIAMETER HOLES, ONE INCH CENTER TO CENTER, BEGINNING ONE-HALF INCH FROM THE END AND CONTINUING THE ENTIRE LENGTH OF THE POST.

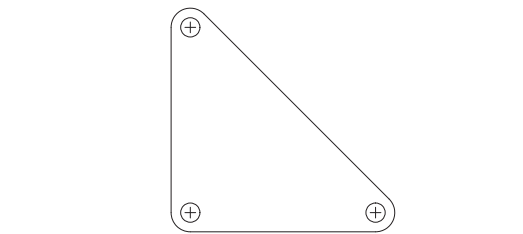
LIMITS		LBS/FT (2)	DIMENSIONS - INCHES				
			A	B	C	D	F
NOMINAL		1.12	1	2 1/4	7/8	3/8	84
TOLERANCE		± 5%	± 1/8	± 1/8	± 1/8	± 1/8	± 1/4

(2) WEIGHT BEFORE GALVANIZING OR PUNCHING.
THE CHANNEL POST FOR DELINEATORS SHALL BE MANUFACTURED FROM DUCTILE ASTM A 36 OR ASTM A 1011 GR 60.

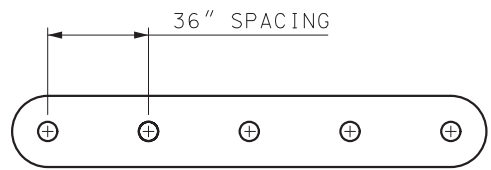
CHANNEL POST DELINEATOR AND FASTENER DETAILS



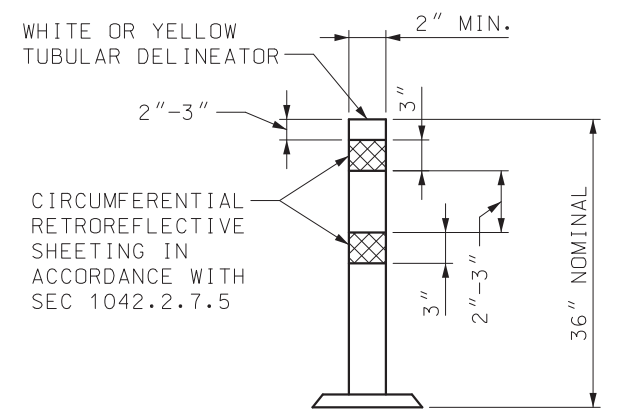
SHOULDER MOUNTED
OUTSIDE BARRIER CURB
NARROW PAVED MEDIAN
CHANNEL POST DELINEATOR MOUNTING DETAILS



DELINEATOR PLACEMENT LOCATED AT THE RADIUS POINTS
TUBULAR DELINEATOR PLACEMENT FOR ISLANDS

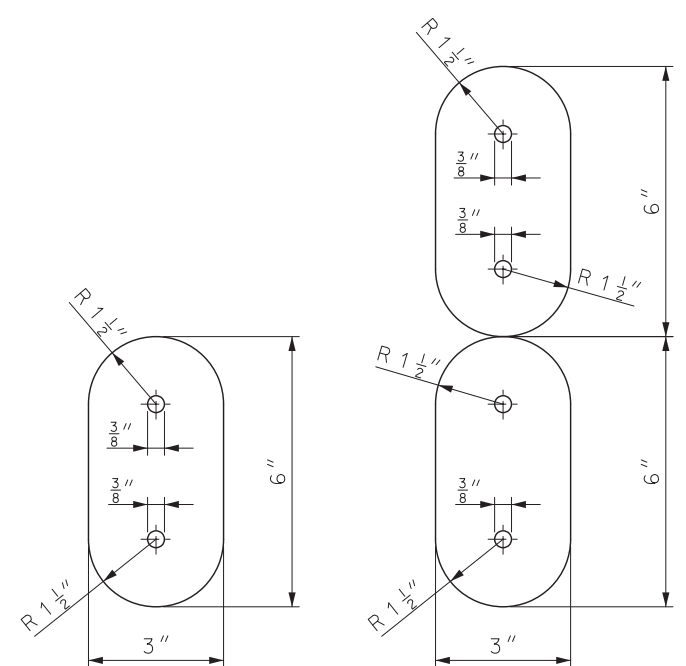


DELINEATOR PLACEMENT FOR MEDIAN STRIPS



36 INCH SURFACE-MOUNT DELINEATOR POST
TUBULAR DELINEATOR DETAIL

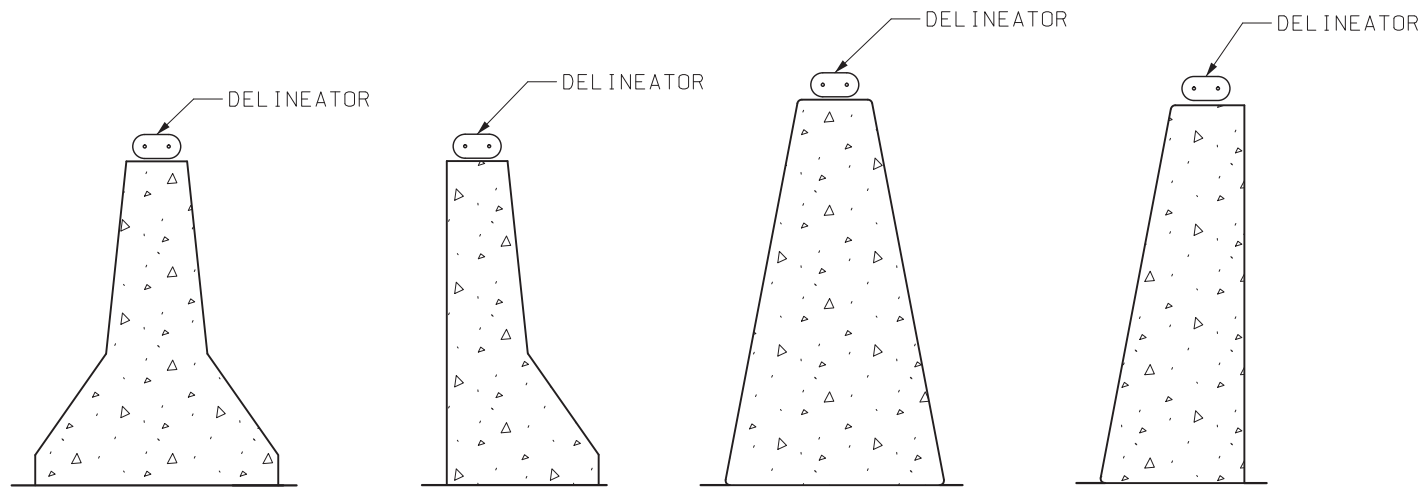
COLOR OF TUBULAR DELINEATOR AND REFLECTIVE SHEETING SHALL MATCH THE COLOR OF THE CLOSEST PAVEMENT MARKING OR CURB MARKING.
TUBULAR DELINEATOR SHAPE MAY BE ROUND OR T-SHAPED. TUBULAR DELINEATOR SHALL BE PERMANENTLY MOUNTED TO THE PAVEMENT SURFACE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.



SINGLE
DOUBLE STACKED
CHANNEL POST DELINEATOR REFLECTOR

NOTES:
RETROREFLECTIVE YELLOW, WHITE OR RED SHEETING IN ACCORDANCE WITH SEC 1042.2.7.5 SHALL BE APPLIED TO ONLY ONE SIDE OF THE DELINEATOR REFLECTOR BODY.
THE COLOR OF THE SHEETING SHALL CORRESPOND TO THE CLOSEST ADJACENT PAVEMENT MARKING.
3" X 6" DELINEATOR BODY SHALL BE MADE FROM 0.080 INCH ALUMINUM.

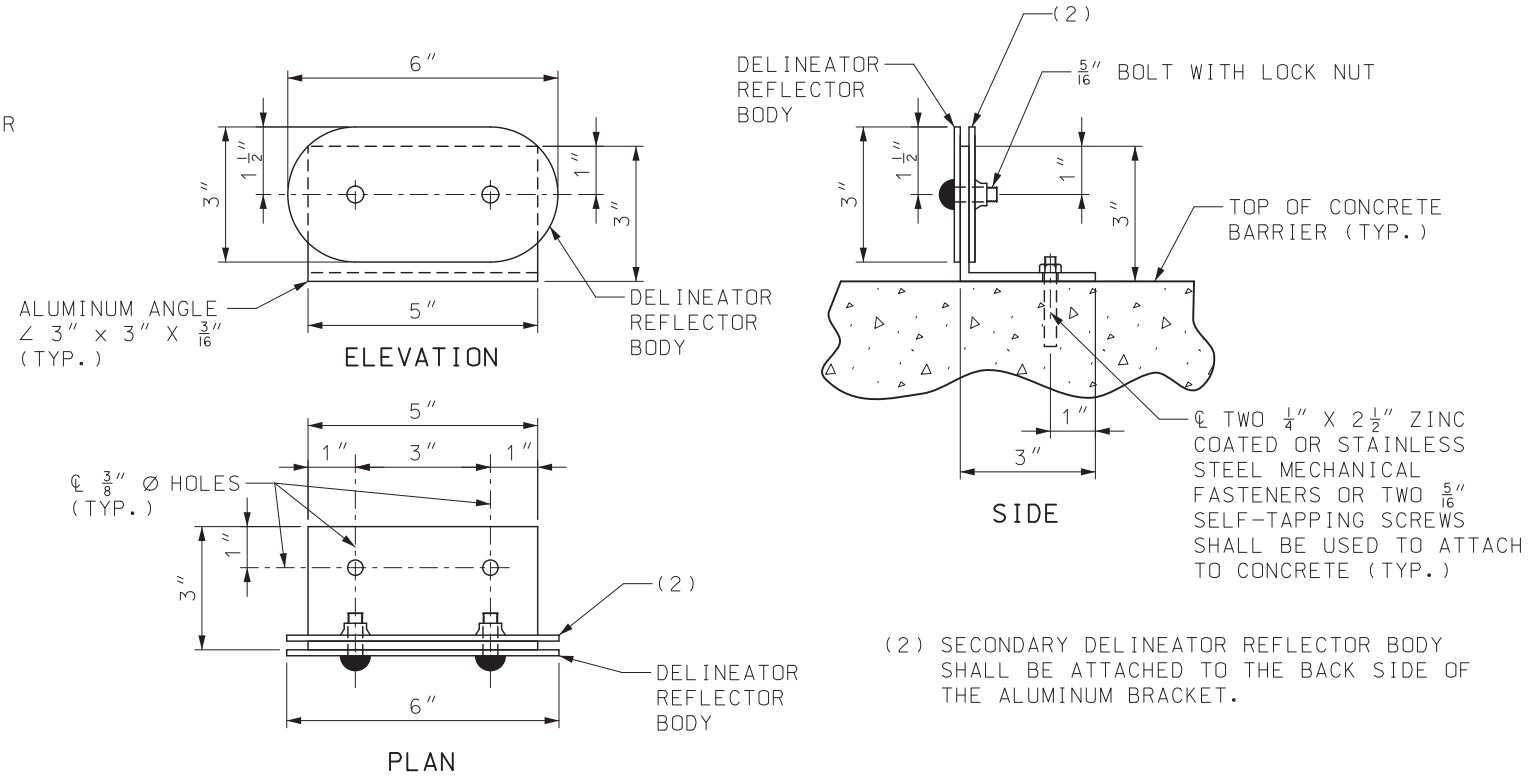
<p>MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION</p> <p>105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)</p>	<p>SIGN MOUNTING DETAILS DELINEATORS</p>	
	<p>STATE OF MISSOURI JONATHAN A. NELSON NUMBER PE-2008019578 PROFESSIONAL ENGINEER</p> <p><i>Jonathan A. Nelson</i> JONATHAN A. NELSON - CIVIL MO-PE-2008019578</p>	<p>DATE EFFECTIVE: 1/1/2025 DATE PREPARED: 8/29/2024</p>



TYPE A TYPE B AND SAFETY BARRIER CURB TYPE C AND TYPE E TYPE D

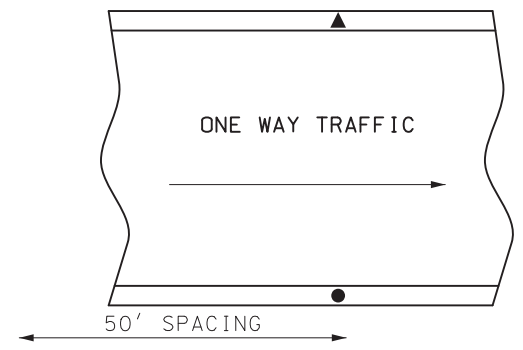
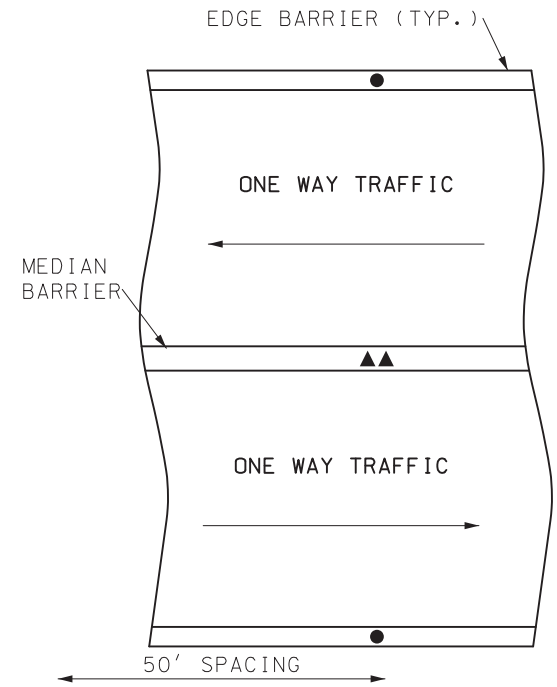
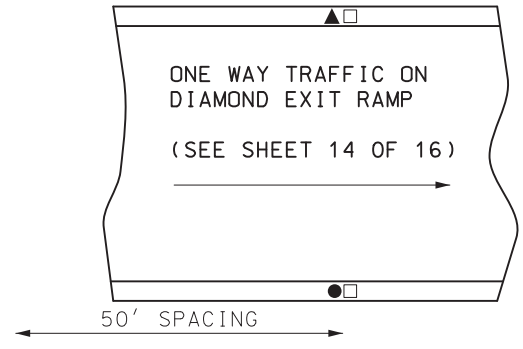
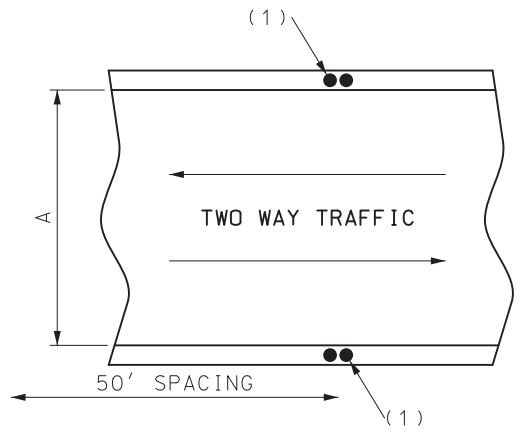
DELINEATORS ON CONCRETE TRAFFIC BARRIER

FOR CONCRETE BARRIER DETAILS, SEE STD PLANS 617.10 OR BRIDGE PLANS.



DELINEATOR CONNECTION ON CONCRETE TRAFFIC BARRIER DETAIL

(2) SECONDARY DELINEATOR REFLECTOR BODY SHALL BE ATTACHED TO THE BACK SIDE OF THE ALUMINUM BRACKET.



- LEGEND**
- WHITE DELINEATOR
 - ▲ YELLOW DELINEATOR
 - RED DELINEATOR

(1) SECONDARY DELINEATOR ON BACK SIDE NOT REQUIRED IF ROADWAY "A" HAS MORE THAN 2 LANES

ROADWAY OR BRIDGE CONCRETE TRAFFIC BARRIER DELINEATION

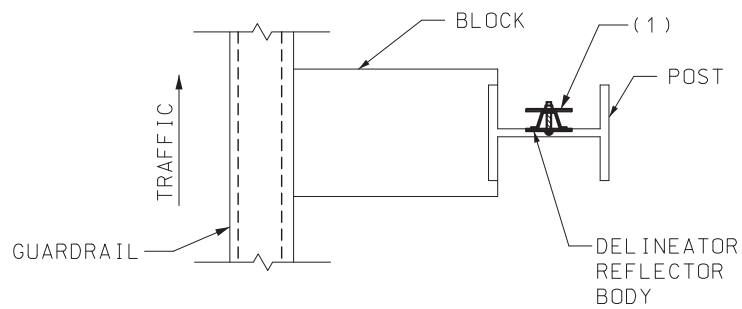
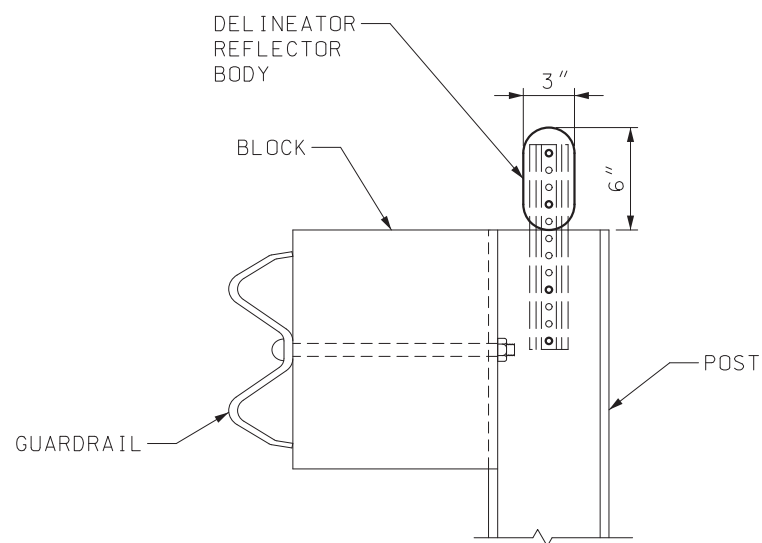
NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 16.

RETROREFLECTIVE YELLOW, WHITE OR RED SHEETING IN ACCORDANCE WITH SEC 1042.2.7.5 SHALL BE APPLIED TO ONLY ONE SIDE OF THE DELINEATOR REFLECTOR BODY.

THE COLOR OF THE SHEETING SHALL CORRESPOND TO THE CLOSEST ADJACENT PAVEMENT MARKING.

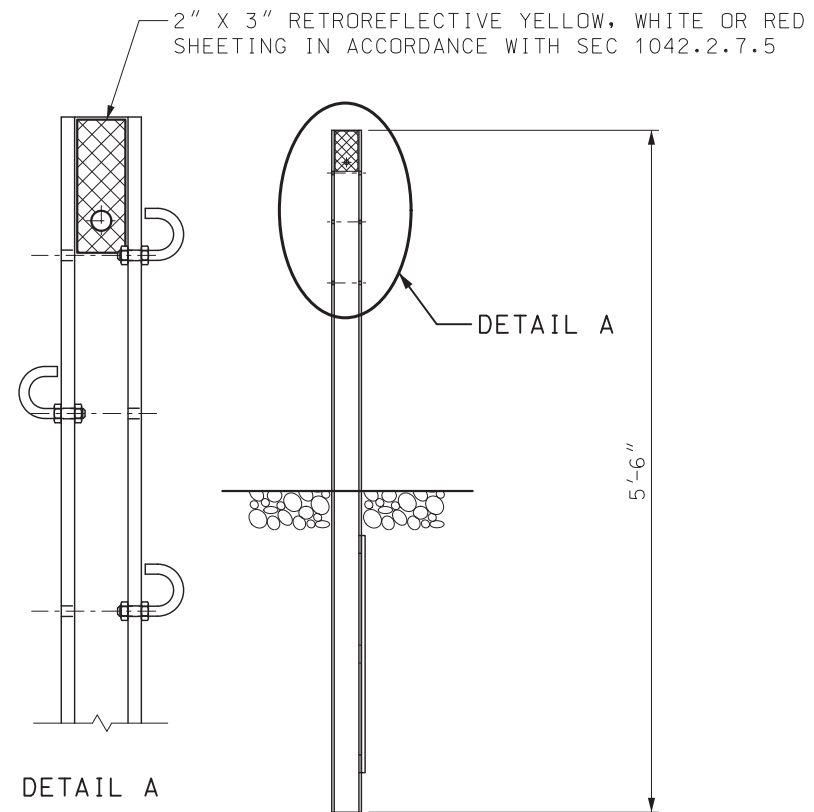
	MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION 105 WEST CAPITOL JEFFERSON CITY, MO 65102 1-888-ASK-MODOT (1-888-275-6636)	
	SIGN MOUNTING DETAILS CONCRETE BARRIER DELINEATORS	
	DATE EFFECTIVE: 1/1/2025 DATE PREPARED: 8/29/2024	903.03BS SHEET NO. 12 OF 16



DELINEATORS ON GUARDRAIL

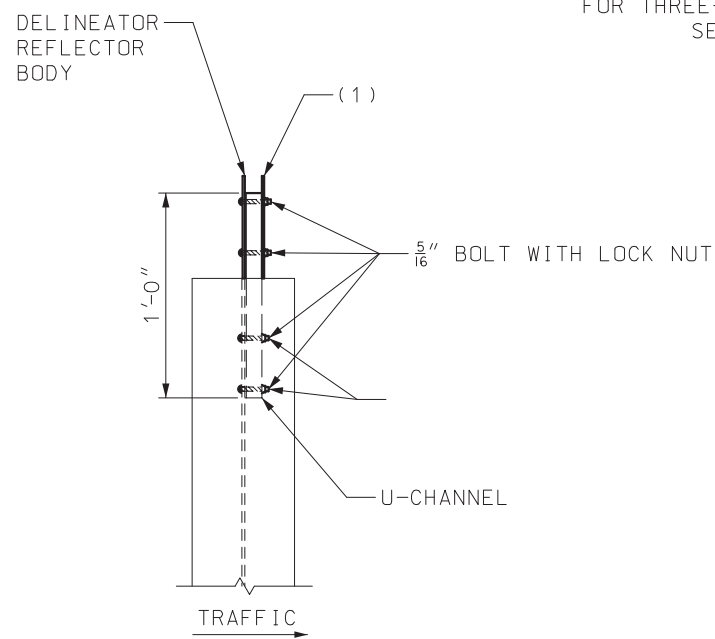
FOR GUARDRAIL DETAILS, SEE STD PLANS 606.00 AND 606.50.

(1) A SECONDARY DELINEATOR WITH RED SHEETING SHALL BE ATTACHED TO THE BACK SIDE OF THE CHANNEL WHEN THE DELINEATION IS PLACED ALONG AN INTERCHANGE RAMP AND COULD BE VIEWED BY WRONG WAY TRAFFIC.



**DELINEATORS ON THREE-STRAND
MEDIAN GUARD CABLE**

FOR THREE-STRAND GUARD CABLE DETAILS
SEE STD PLANS 606.41.



NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 16.

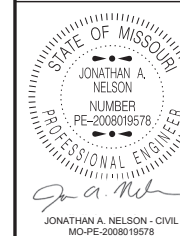
RETROREFLECTIVE YELLOW, WHITE OR RED SHEETING IN ACCORDANCE WITH SEC 1042.2.7.5 SHALL BE APPLIED TO ONLY ONE SIDE OF THE DELINEATOR REFLECTOR BODY.

THE COLOR OF THE SHEETING SHALL CORRESPOND TO THE CLOSEST ADJACENT PAVEMENT MARKING.



**MISSOURI HIGHWAYS AND TRANSPORTATION
COMMISSION**

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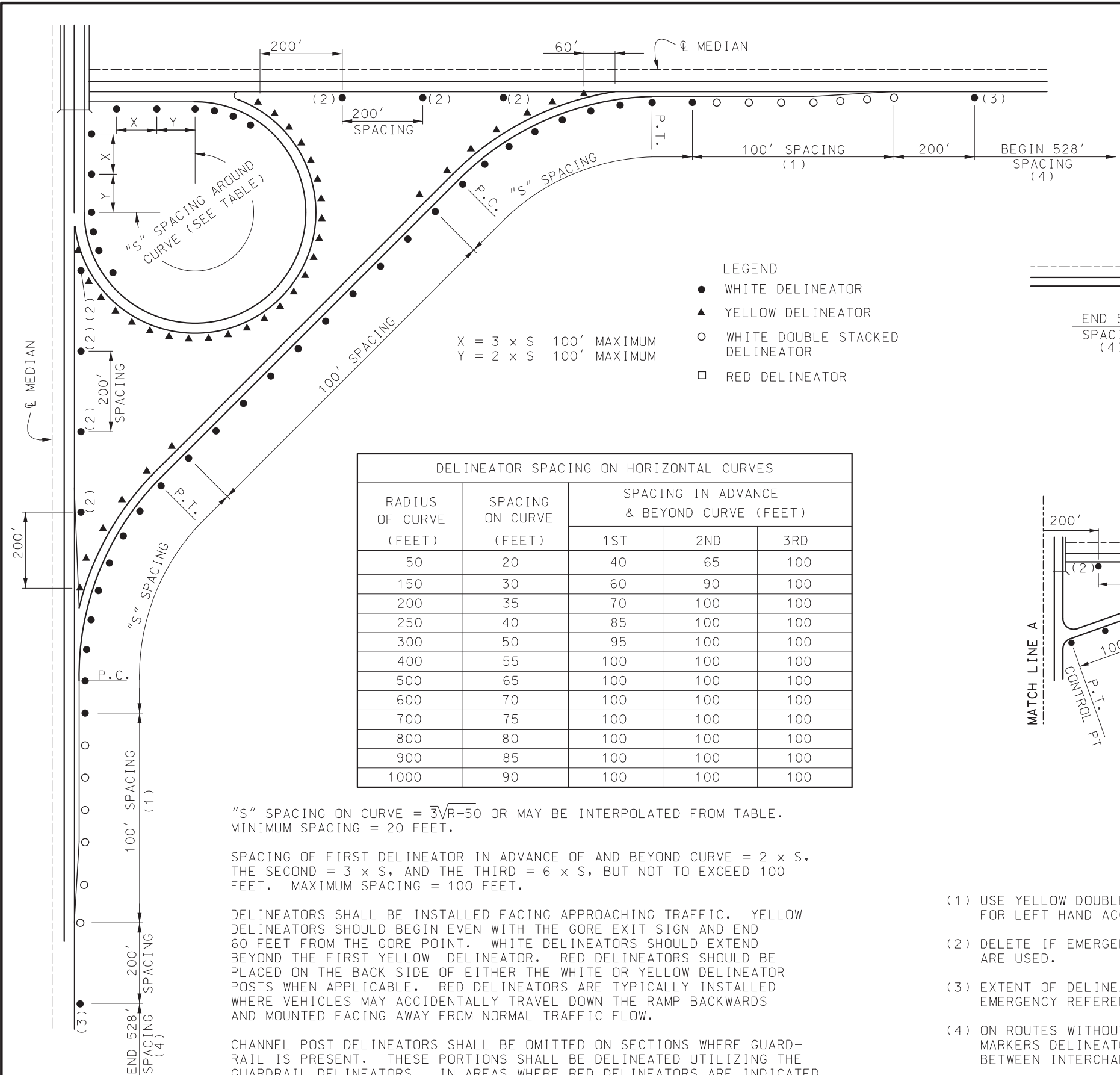


DATE EFFECTIVE: 1/1/2025
DATE PREPARED: 8/29/2024

**SIGN MOUNTING DETAILS
GUARDRAIL AND GUARDCABLE
DELINEATORS**

903.03BS

SHEET NO.
13 OF 16



$X = 3 \times S$ 100' MAXIMUM
 $Y = 2 \times S$ 100' MAXIMUM

- LEGEND
- WHITE DELINEATOR
 - ▲ YELLOW DELINEATOR
 - WHITE DOUBLE STACKED DELINEATOR
 - RED DELINEATOR

DELINEATOR SPACING ON HORIZONTAL CURVES				
RADIUS OF CURVE (FEET)	SPACING ON CURVE (FEET)	SPACING IN ADVANCE & BEYOND CURVE (FEET)		
		1ST	2ND	3RD
50	20	40	65	100
150	30	60	90	100
200	35	70	100	100
250	40	85	100	100
300	50	95	100	100
400	55	100	100	100
500	65	100	100	100
600	70	100	100	100
700	75	100	100	100
800	80	100	100	100
900	85	100	100	100
1000	90	100	100	100

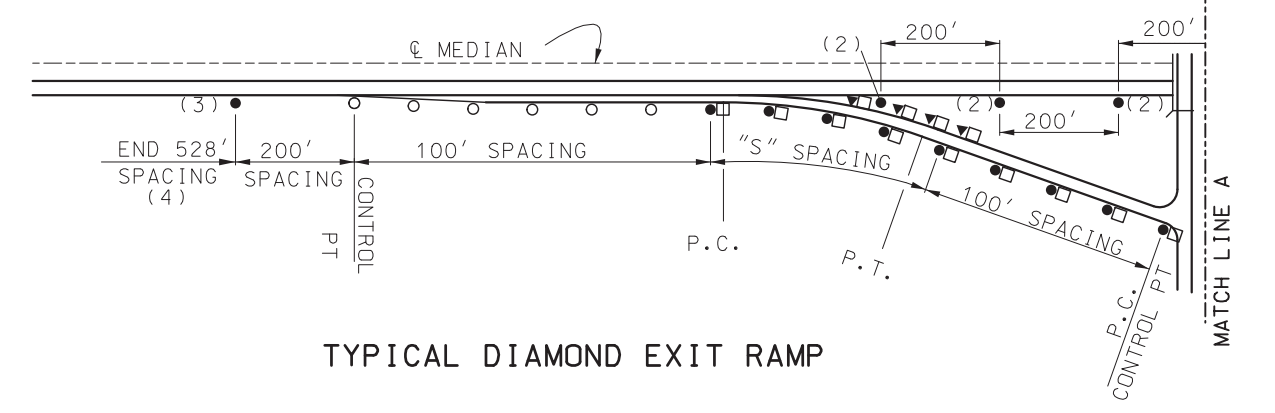
"S" SPACING ON CURVE = $\sqrt[3]{R-50}$ OR MAY BE INTERPOLATED FROM TABLE. MINIMUM SPACING = 20 FEET.

SPACING OF FIRST DELINEATOR IN ADVANCE OF AND BEYOND CURVE = $2 \times S$, THE SECOND = $3 \times S$, AND THE THIRD = $6 \times S$, BUT NOT TO EXCEED 100 FEET. MAXIMUM SPACING = 100 FEET.

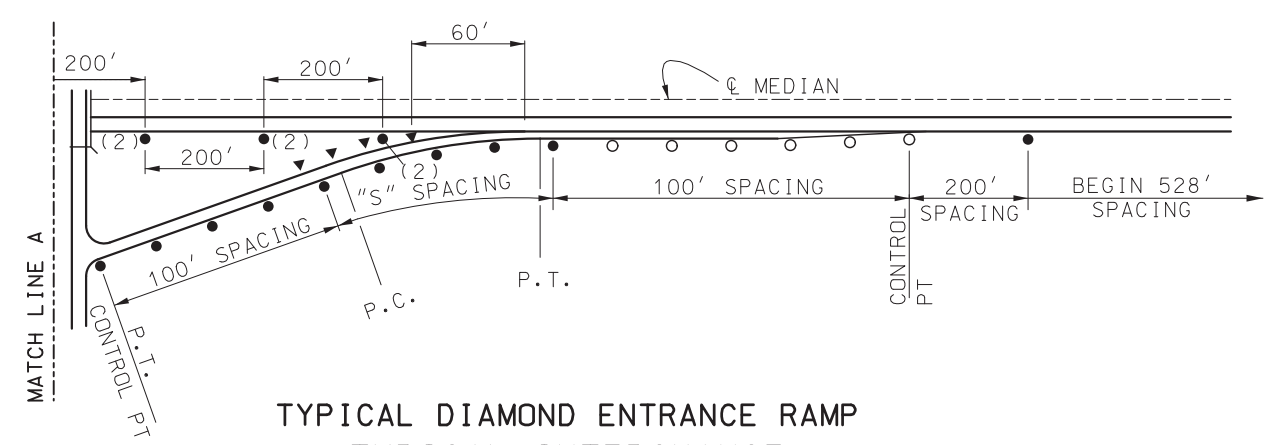
DELINEATORS SHALL BE INSTALLED FACING APPROACHING TRAFFIC. YELLOW DELINEATORS SHOULD BEGIN EVEN WITH THE GORE EXIT SIGN AND END 60 FEET FROM THE GORE POINT. WHITE DELINEATORS SHOULD EXTEND BEYOND THE FIRST YELLOW DELINEATOR. RED DELINEATORS SHOULD BE PLACED ON THE BACK SIDE OF EITHER THE WHITE OR YELLOW DELINEATOR POSTS WHEN APPLICABLE. RED DELINEATORS ARE TYPICALLY INSTALLED WHERE VEHICLES MAY ACCIDENTALLY TRAVEL DOWN THE RAMP BACKWARDS AND MOUNTED FACING AWAY FROM NORMAL TRAFFIC FLOW.

CHANNEL POST DELINEATORS SHALL BE OMITTED ON SECTIONS WHERE GUARDRAIL IS PRESENT. THESE PORTIONS SHALL BE DELINEATED UTILIZING THE GUARDRAIL DELINEATORS. IN AREAS WHERE RED DELINEATORS ARE INDICATED, RED RETROREFLECTIVE SHEETING WILL BE PLACED ON THE BACK SIDE OF THE GUARDRAIL DELINEATOR.

RETROREFLECTIVE SHEETING SHALL BE IN ACCORDANCE WITH SEC 1042.2.7.5.



TYPICAL DIAMOND EXIT RAMP



TYPICAL DIAMOND ENTRANCE RAMP
TYPICAL INTERCHANGE

NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 16.

THE CONTRACT UNIT PRICE FOR EACH CHANNEL POST DELINEATOR SHALL INCLUDE THE REFLECTOR, FASTENERS AND POST.

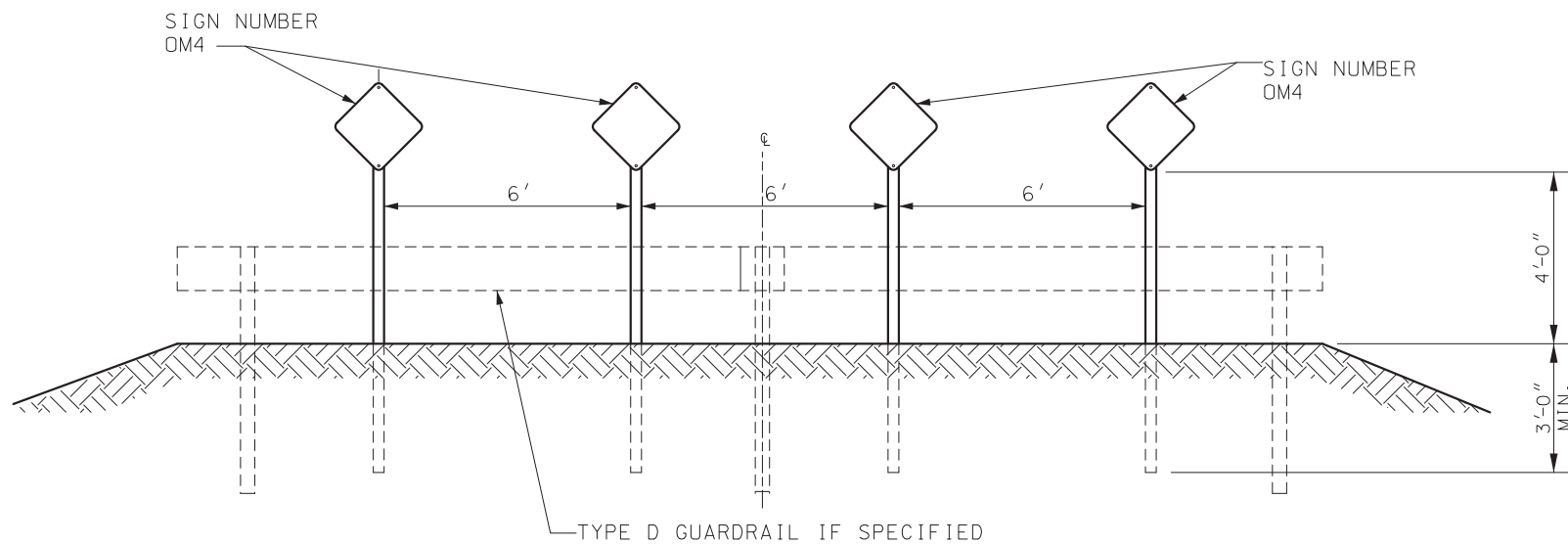
- (1) USE YELLOW DOUBLE STACKED DELINEATORS FOR LEFT HAND ACCEL/DECEL LANES.
- (2) DELETE IF EMERGENCY REFERENCE MARKERS ARE USED.
- (3) EXTENT OF DELINEATION ON ROUTES WITH EMERGENCY REFERENCE MARKERS.
- (4) ON ROUTES WITHOUT EMERGENCY REFERENCE MARKERS DELINEATORS SHALL BE INSTALLED BETWEEN INTERCHANGES EVERY 528'.

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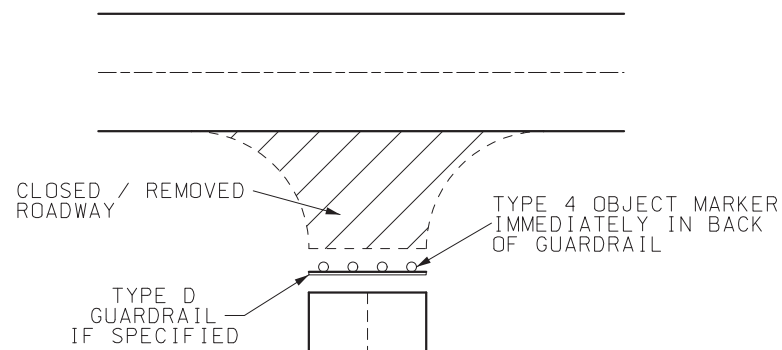
JONATHAN A. NELSON - CIVIL
 MO-PE-2008019578

**SIGN MOUNTING DETAILS
INTERCHANGE DELINEATION**

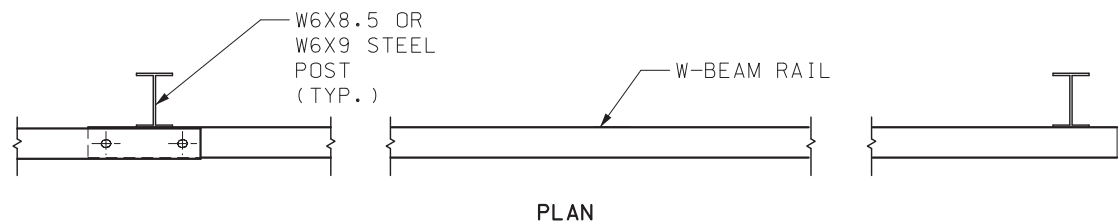
DATE EFFECTIVE: 1/1/2025	903.03BS	SHEET NO. 14 OF 16
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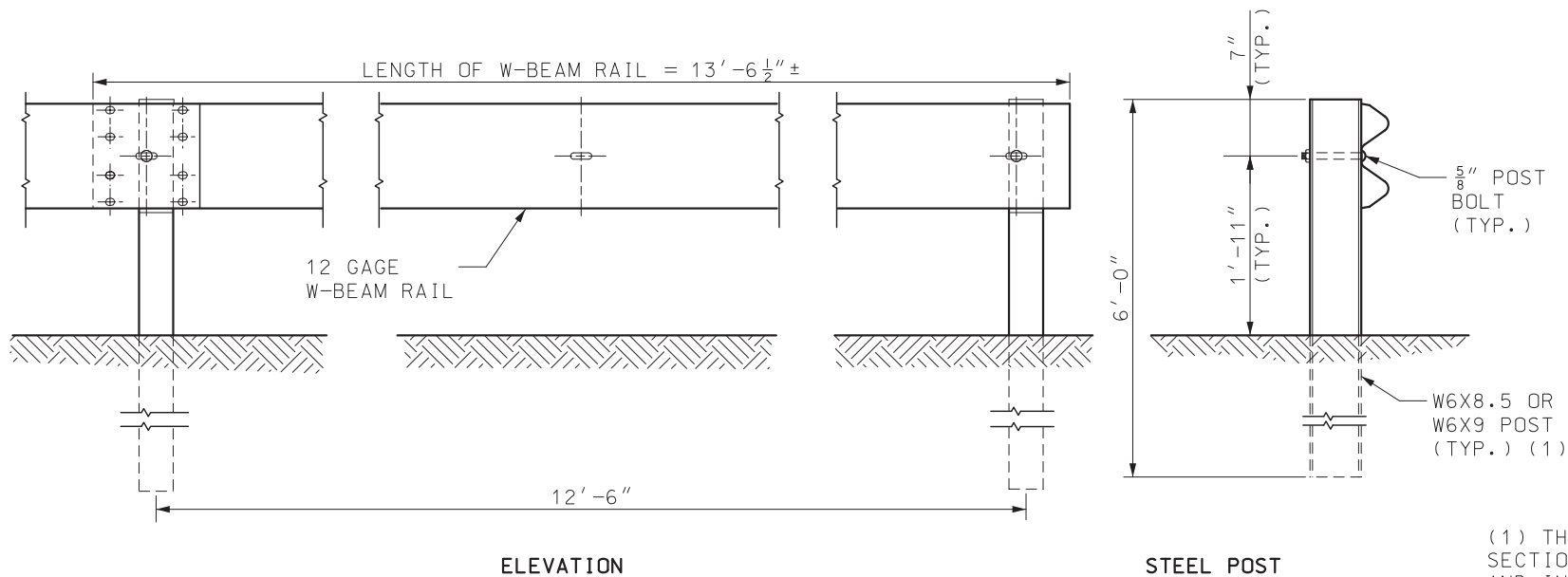
TYPE 4 OBJECT MARKER INSTALLATION



TYPICAL ROAD CLOSURE



PLAN



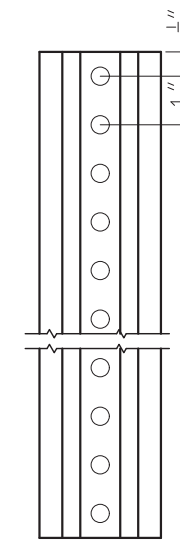
ELEVATION

STEEL POST

TYPE D GUARDRAIL

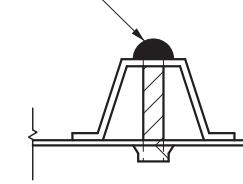
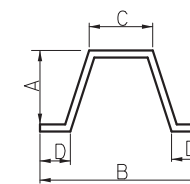
(1) THE CONTRACTOR MAY FURNISH EQUIVALENT SECTIONS FABRICATED FROM MATERIAL MEETING AND IN ACCORDANCE WITH SEC 1040.

STEEL OBJECT MARKER POST					
LIMITS	LBS/FT (2)	DIMENSIONS - INCHES			
		A	B	C	D
MIN.	2.40	1 1/4	2 1/2	1	1/2
MAX.	2.80	1 5/8	3 1/4	1 3/8	3/4



(2) WEIGHT BEFORE GALVANIZING OR PUNCHING. LIMITS SHOWN ARE ABSOLUTE. NO FURTHER WEIGHT, DIMENSIONAL OR COMMERCIAL TOLERANCE WILL BE ACCEPTABLE.

BURR THREADS OF BOLT AS APPROVED BY THE ENGINEER.



HOLE PUNCHING TO EQUAL 3/8" DIAMETER HOLES, ONE INCH CENTER TO CENTER, BEGINNING ONE-HALF INCH FROM THE END AND CONTINUING THE ENTIRE LENGTH OF THE POST.

OBJECT MARKER POST AND FASTENER DETAILS

NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 16.

TYPE D GUARDRAIL IS ACCESS RESTRAINT AND VISUAL TARGET VALUE ONLY. IT HAS NO REDIRECTIVE CAPABILITY.

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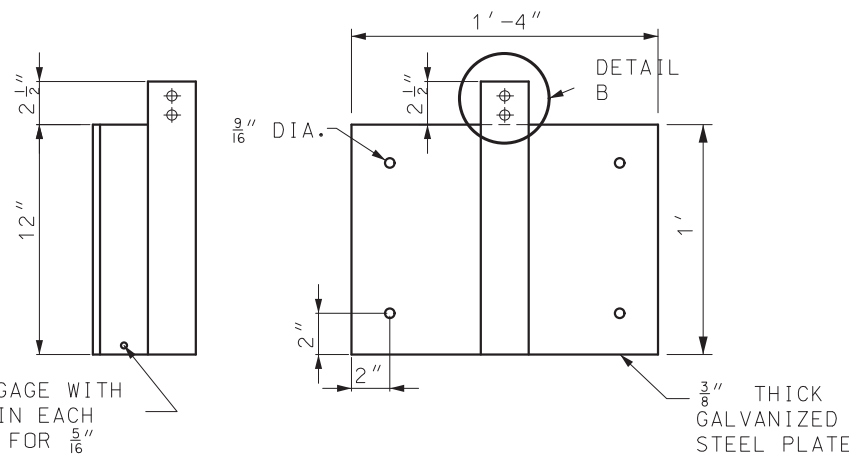
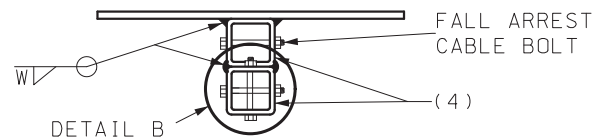
STATE OF MISSOURI
 JONATHAN A. NELSON
 NUMBER PE-2008019578
 PROFESSIONAL ENGINEER
 Jonathan A. Nelson
 JONATHAN A. NELSON - CIVIL
 MO-PE-2008019578

SIGN MOUNTING DETAILS
 OBJECT MARKERS FOR
 ROAD CLOSURE

DATE EFFECTIVE: 1/1/2025
 DATE PREPARED: 8/29/2024

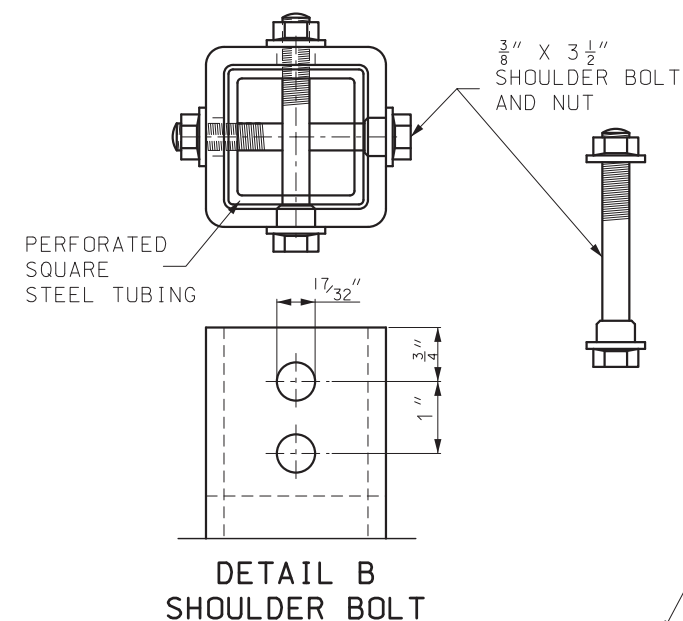
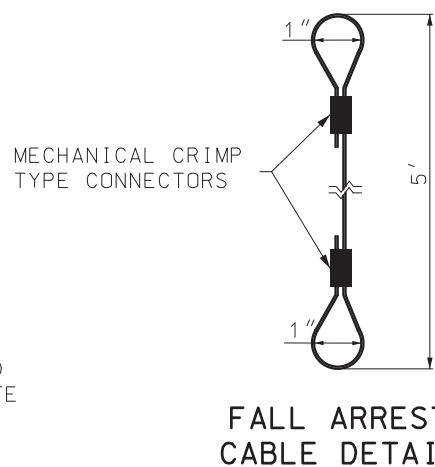
903.03BS

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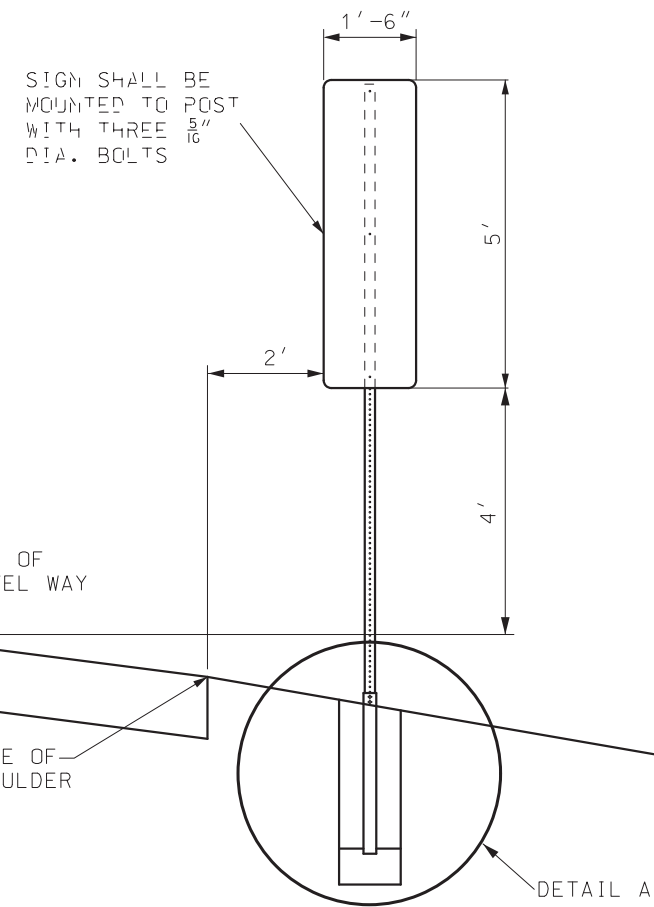


2 1/2" X 2 1/2" 7 GAGE WITH 17/32" DIA HOLE IN EACH SIDE OF TUBE FOR 5/16" THROUGH BOLT TO RETAIN FALL ARREST CABLE

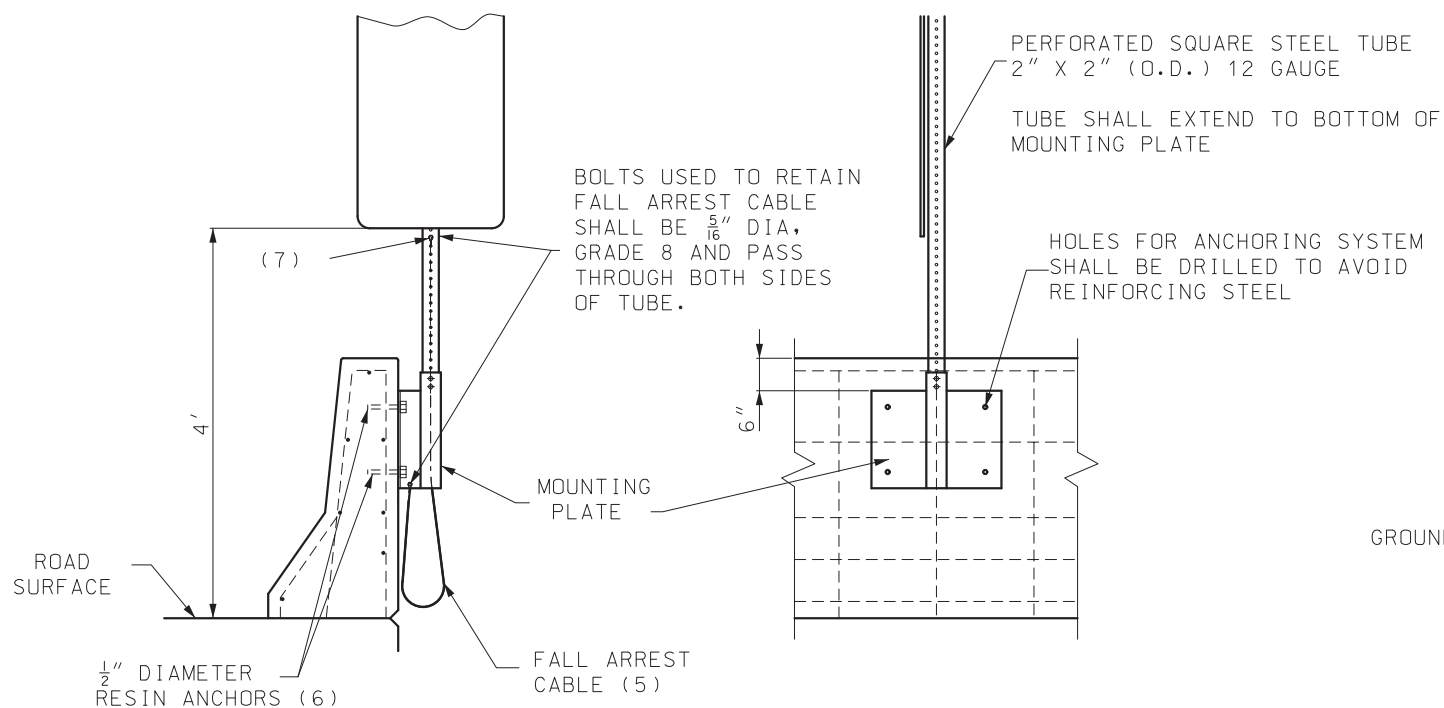
MOUNTING PLATE DETAIL



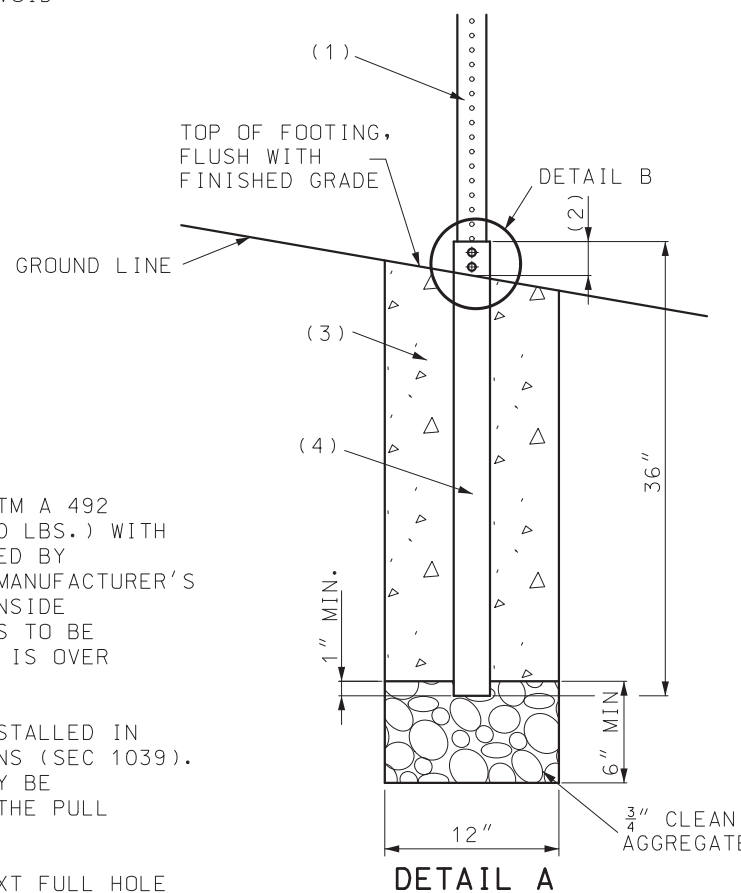
DETAIL B SHOULDER BOLT



GROUND INSTALLATION



BARRIER WALL INSTALLATION



DETAIL A

NOTES:

FOR GENERAL NOTES, SEE SHEET 1 OF 16.

PERFORATED SQUARE STEEL TUBE SHALL BE SECURED TO FOUNDATION TUBE OR BARRIER WALL MOUNTING PLATE WITH A SHOULDER BOLT PER PERFORATED SQUARE STEEL TUBE MANUFACTURER'S SPECIFICATION.

- (1) PERFORATED SQUARE STEEL TUBE 2" X 2" (O.D.) 12 GAUGE. TUBE SHALL EXTEND A MINIMUM OF 6" BELOW THE TOP OF THE FOUNDATION TUBE.
- (2) TUBE TO EXTEND ABOVE FOUNDATION ONLY ENOUGH TO ALLOW BOLT TO BE INSERTED 2 1/2" MAXIMUM.
- (3) SEE SEC 903 FOR CONCRETE MATERIAL REQUIREMENTS.
- (4) 2 1/2" X 2 1/2" (O.D.) SQUARE TUBE GALVANIZED 7 GAGE WITH TWO 17/32" DIAMETER HOLES IN EACH FACE 3/4" BELOW TOP OF TUBE.
- (5) 1/8" X 5' LONG STAINLESS STEEL CABLE (ASTM A 492 TYPE 304 MINIMUM BREAKING STRENGTH 200 LBS.) WITH A 1" DIA. LOOP AT EACH END LOOPS FORMED BY MECHANICAL CRIMP TYPE CONNECTION PER MANUFACTURER'S SPECIFICATIONS. CABLE IS TO BE RUN INSIDE PERFORATED SQUARE STEEL TUBE. CABLE IS TO BE USED ONLY WHEN SIGN MOUNTING LOCATION IS OVER ANOTHER TRAVELED WAY.
- (6) 1/2" DIAMETER RESIN ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD SPECIFICATIONS (SEC 1039). AN APPROVED MECHANICAL TYPE ANCHOR MAY BE USED IF THE DEVICE EQUALS OR EXCEEDS THE PULL TEST REQUIREMENTS OF SEC. 1039.
- (7) FALL ARREST CABLE TO BE SECURED TO NEXT FULL HOLE BELOW SIGN

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	SIGN MOUNTING DETAILS EMERGENCY REFERENCE MARKERS	
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