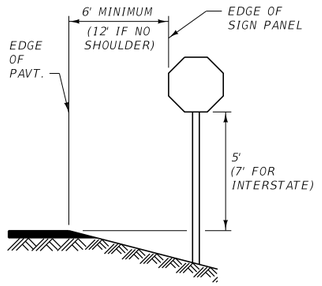
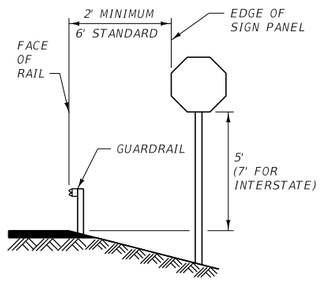
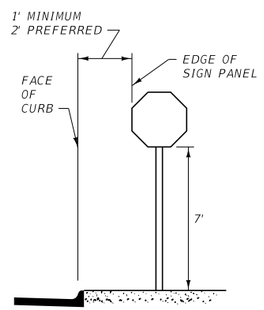
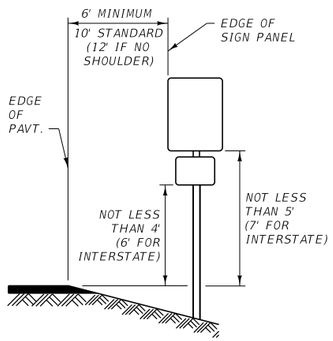
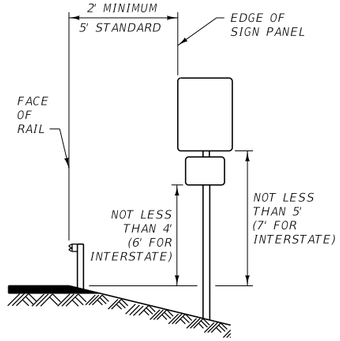
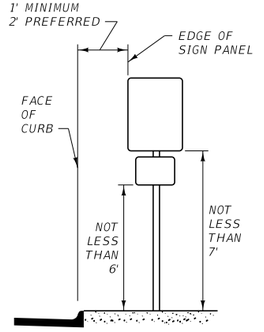
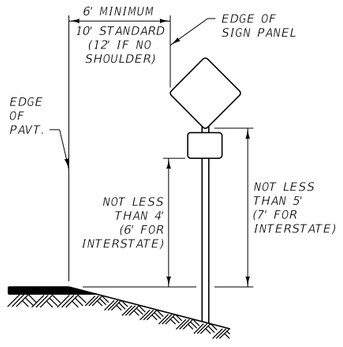
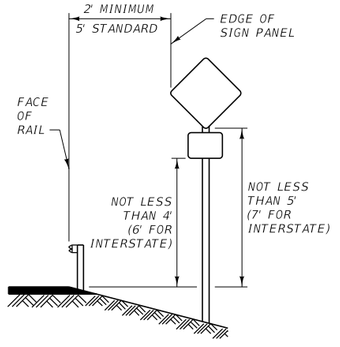
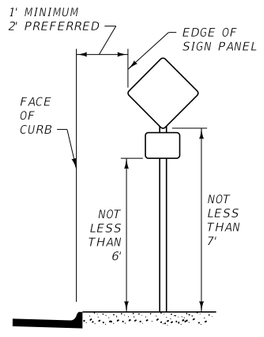
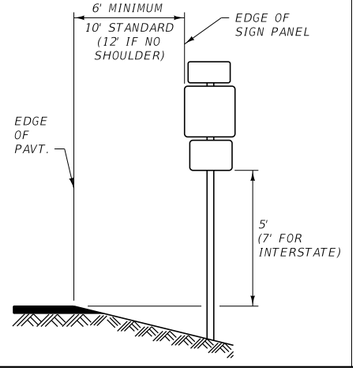
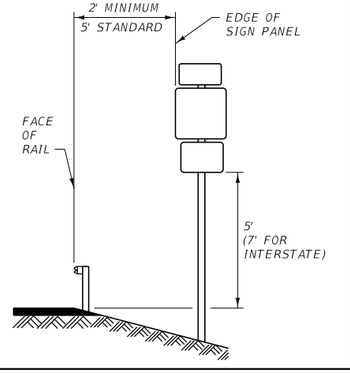
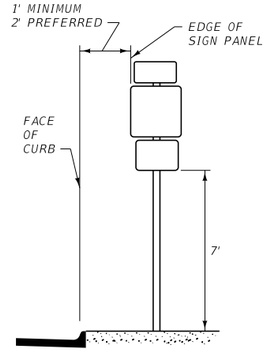
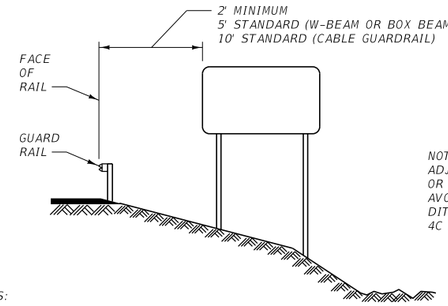
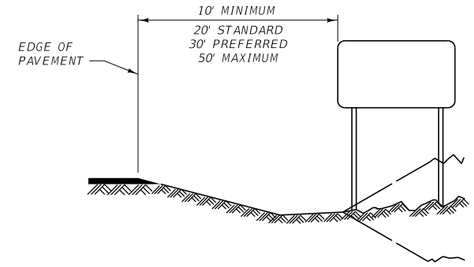
	RURAL ①	RURAL WITH GUARDRAIL ②	URBAN ③
REGULARY R1-1 / R1-2			
REGULARY EXCEPT R1-1 / R1-2			
WARNING			
ROUTE MARKERS			

GUIDE SIGNS



NOTE:
ADJUST SIGN LOCATION OR CLEARANCE SLIGHTLY TO AVOID PLACING POSTS IN DITCH BOTTOMS. SEE NOTE 4C BELOW.



NOTES:

1. PLACE ALL SIGNS AT THE CLEARANCE AND MOUNTING HEIGHTS SHOWN.
2. FOR REGULATORY, WARNING AND ROUTE MARKER SIGNS, AND THEIR ASSEMBLIES, ON HIGHWAYS OTHER THAN INTERSTATE:
   A) USE DIAGRAMS LOCATED IN COLUMN ① WHEN PLACING THESE SIGNS IN STANDARD RURAL CONDITIONS. USE COLUMN ② WHEN PLACING THESE SIGNS BEHIND GUARDRAIL IN RURAL CONDITIONS. USE COLUMN ③ WHEN PLACING THESE SIGNS IN URBAN CONDITIONS WHERE THERE IS ADEQUATE CLEARANCE AND SIDEWALK WIDTH.
   B) WHERE SIDEWALK WIDTH IS LIMITED IN URBAN CONDITIONS, SEE DTL. DWG. NO. 619-18 FOR PLACEMENT DETAILS.
3. FOR REGULATORY (ALL OTHER), WARNING AND ROUTE MARKER SIGNS, AND THEIR ASSEMBLIES, ON INTERSTATE HIGHWAYS: THE CLEARANCE IS 20' FROM THE EDGE OF PAVEMENT IN COLUMN ① FOR STANDARD RURAL CONDITIONS. THE CLEARANCES LISTED IN COLUMNS ② AND ③ REMAIN AS SHOWN.
4. FOR GUIDE SIGNS AND THEIR ASSEMBLIES:
   A) USE THE DIAGRAMS LOCATED ABOVE WHEN PLACING THESE SIGNS IN THE GIVEN RURAL CONDITIONS.
   B) FOR PLACEMENT OF THESE SIGNS IN URBAN CONDITIONS, SEE THE SIGN LOCATION AND SPECIFICATION SHEETS IN THE SIGNING PLANS FOR EACH INDIVIDUAL SIGN.
   C) THE MAXIMUM CLEARANCE OF THESE SIGNS IS 50' IN ANY CONDITION.
   D) SEE DTL. DWG. NO. 619-08 FOR MOUNTING HEIGHTS.
5. WITHIN THE CITY LIMITS OR IN A SIDEWALK AND CURB AREA, MOUNT SIGNS TO HAVE THE PROPER CLEARANCES, BUT AVOID ANY CONFLICT BETWEEN THE POST AND THE MAIN WALKING AREA OF THE SIDEWALK, OR WITH DOORWAYS OR WINDOWS OF ADJACENT BUILDINGS. THE EXACT LOCATION OF THESE SIGN INSTALLATIONS WILL BE DETERMINED BY THE PROJECT MANAGER. SEE DTL. DWG. NO. 619-18 FOR VARIOUS CANTILEVER TYPE MOUNTINGS.
6. EVALUATE SIGNS WITHIN CLEAR ZONES (TABLES BELOW) FOR SUPPORT BREAKAWAY REQUIREMENTS (CONTACT MDT TRAFFIC SECTION FOR CRITERIA).
7. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

CLEAR ZONE DISTANCES

(IN FEET FROM EDGE OF DRIVING LANE)

DESIGN SPEED	DESIGN ADT	FILL SLOPES			CUT SLOPES		
		6:1 OR FLATTER	5:1 TO 4:1	3:1	3:1	4:1 TO 5:1	6:1 OR FLATTER
40 MPH OR LESS	UNDER 750	7-10	7-10	**	7-10	7-10	7-10
	750-1499	10-12	12-14	**	10-12	10-12	10-12
	1500-6000	12-14	14-16	**	12-14	12-14	12-14
	OVER 6000	14-16	16-18	**	14-16	14-16	14-16
45-50 MPH	UNDER 750	10-12	12-14	**	8-10	8-10	10-12
	750-1499	12-14	16-20	**	10-12	12-14	14-16
	1500-6000	16-18	20-26	**	12-14	14-16	16-18
	OVER 6000	18-20	24-28	**	14-16	18-20	20-22
55 MPH	UNDER 750	12-14	14-18	**	8-10	10-12	10-12
	750-1499	16-18	20-24	**	10-12	14-16	16-18
	1500-6000	20-22	24-30	**	14-16	16-18	20-22
	OVER 6000	22-24	26-32 *	**	16-18	20-22	22-24
60 MPH	UNDER 750	16-18	20-24	**	10-12	12-14	14-16
	750-1499	20-24	26-32 *	**	12-14	16-18	20-22
	1500-6000	26-30	32-40 *	**	14-18	18-22	24-26
	OVER 6000	30-32 *	36-44 *	**	20-22	24-26	26-28
65-70 MPH	UNDER 750	18-20	20-26	**	10-12	14-16	14-16
	750-1499	24-26	28-36 *	**	12-16	18-20	20-22
	1500-6000	28-32 *	34-42 *	**	16-20	22-24	26-28
	OVER 6000	30-34 *	38-46 *	**	22-24	26-30	28-30

* WHEN AN INVESTIGATION OR ACCIDENT HISTORY INDICATES A HIGH PROBABILITY OF ACCIDENTS, CLEAR ZONE DISTANCES GREATER THAN 30' MAY BE PROVIDED AS INDICATED. CLEAR ZONES MAY ALSO BE LIMITED TO 30' TO PROVIDE A CONSISTENT ROADWAY TEMPLATE WHEN EXPERIENCE WITH PREVIOUS SIMILAR PROJECTS INDICATES SATISFACTORY PERFORMANCE.

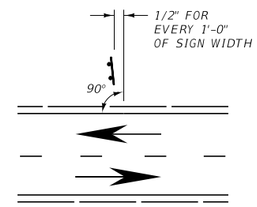
** FIXED OBJECTS, INCLUDING SIGN POSTS, SHOULD NOT BE ALLOWED IN THE VICINITY OF THE TOE OF THESE SLOPES. SEE AASHTO ROADSIDE DESIGN GUIDE FOR ADDITIONAL CONSIDERATIONS IN LOCATING SIGNS.

HORIZONTAL CURVE ADJUSTMENTS

(APPLICABLE ON OUTSIDE OF CURVE ONLY)

RADIUS (FT)	DESIGN SPEED (MPH)						
	40	45	50	55	60	65	70
2860	1.1	1.1	1.1	1.2	1.2	1.2	1.3
2290	1.1	1.1	1.2	1.2	1.2	1.3	1.3
1910	1.1	1.2	1.2	1.2	1.3	1.3	1.4
1640	1.1	1.2	1.2	1.3	1.3	1.4	1.5
1430	1.2	1.2	1.3	1.3	1.4	1.4	
1270	1.2	1.2	1.3	1.3	1.4	1.5	
1150	1.2	1.2	1.3	1.4	1.5		
950	1.2	1.3	1.4	1.5	1.5		
820	1.3	1.3	1.4	1.5			
720	1.3	1.4	1.5				
640	1.3	1.4	1.5				
570	1.4	1.5					
380	1.5						

TO AVOID GLARE, SKEW SIGN AWAY FROM ROADWAY AT THE ANGLE SHOWN WHEN SIGN IS < 30' FROM SHOULDER. SKEW SIGN TOWARDS ROADWAY AT THE SAME ANGLE IF SIGN IS > 30' FROM SHOULDER.



SKEW DIAGRAM

DETAILED DRAWING

REFERENCE STANDARD SPEC. SECTION 619, 704

DWG. NO. 619-00

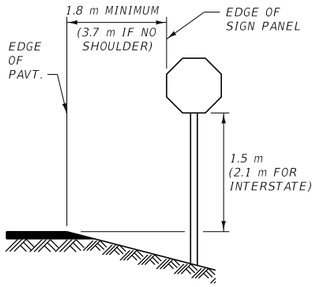
SIGN CLEARANCES AND MOUNTING HEIGHTS

MDT MONTANA DEPARTMENT OF TRANSPORTATION

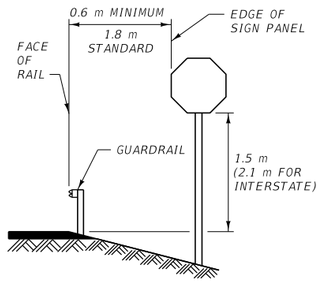
REGULARIZATORY

R1-1 / R1-2

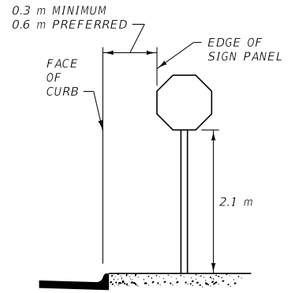
RURAL ①



RURAL WITH GUARDRAIL ②

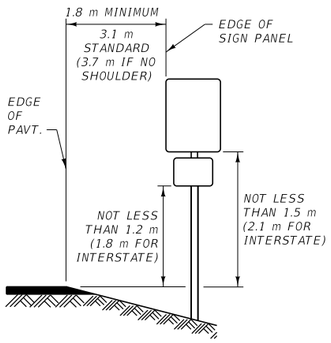


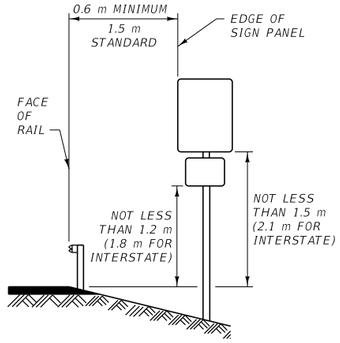
URBAN ③

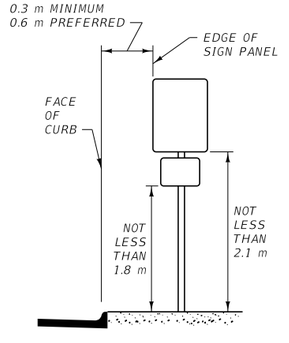


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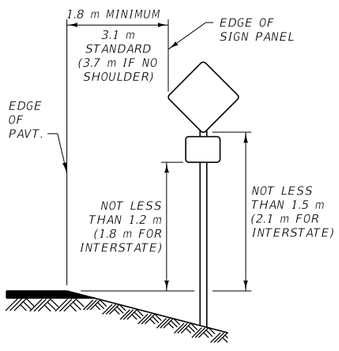
EXCEPT R1-1 / R1-2

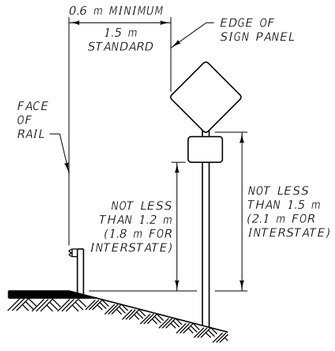


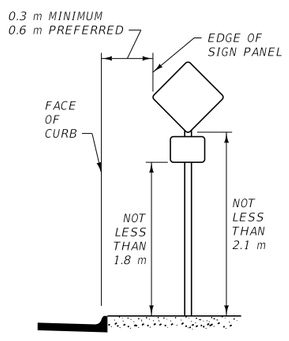




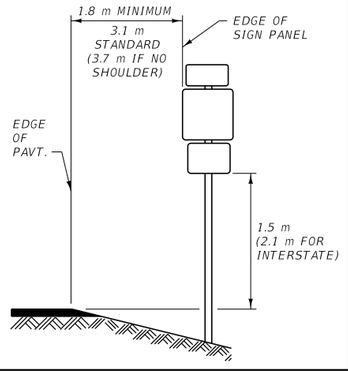
WARNING

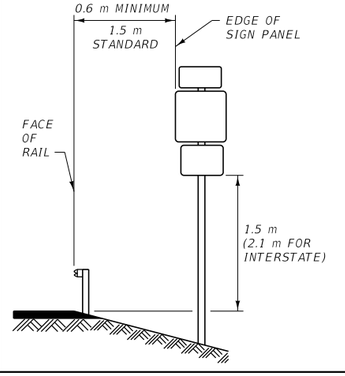


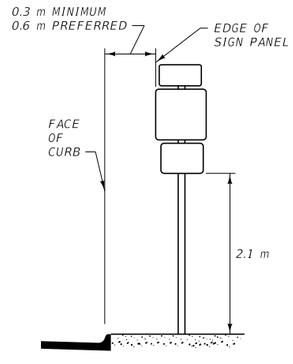




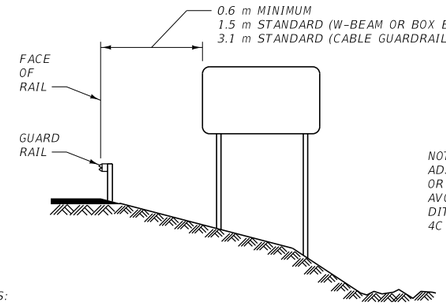
ROUTE MARKERS



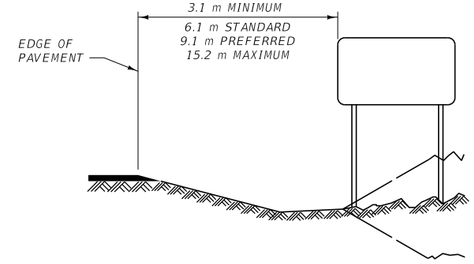




GUIDE SIGNS



NOTE:
ADJUST SIGN LOCATION OR CLEARANCE SLIGHTLY TO AVOID PLACING POSTS IN DITCH BOTTOMS. SEE NOTE 4C BELOW.



NOTES:

1. PLACE ALL SIGNS AT THE CLEARANCE AND MOUNTING HEIGHTS SHOWN.
2. FOR REGULATORY, WARNING AND ROUTE MARKER SIGNS, AND THEIR ASSEMBLIES, ON HIGHWAYS OTHER THAN INTERSTATE:
   A) USE DIAGRAMS LOCATED IN COLUMN ① WHEN PLACING THESE SIGNS IN STANDARD RURAL CONDITIONS. USE COLUMN ② WHEN PLACING THESE SIGNS BEHIND GUARDRAIL IN RURAL CONDITIONS. USE COLUMN ③ WHEN PLACING THESE SIGNS IN URBAN CONDITIONS WHERE THERE IS ADEQUATE CLEARANCE AND SIDEWALK WIDTH.
   B) WHERE SIDEWALK WIDTH IS LIMITED IN URBAN CONDITIONS, SEE DTL. DWG. NO. 619-18 FOR PLACEMENT DETAILS.
3. FOR REGULATORY (ALL OTHER), WARNING AND ROUTE MARKER SIGNS, AND THEIR ASSEMBLIES, ON INTERSTATE HIGHWAYS:
   THE CLEARANCE IS 6.1 m FROM THE EDGE OF PAVEMENT IN COLUMN ① FOR STANDARD RURAL CONDITIONS. THE CLEARANCES LISTED IN COLUMNS ② AND ③ REMAIN AS SHOWN.
4. FOR GUIDE SIGNS AND THEIR ASSEMBLIES:
   A) USE THE DIAGRAMS LOCATED ABOVE WHEN PLACING THESE SIGNS IN THE GIVEN RURAL CONDITIONS.
   B) FOR PLACEMENT OF THESE SIGNS IN URBAN CONDITIONS, SEE THE SIGN LOCATION AND SPECIFICATION SHEETS IN THE SIGNING PLANS FOR EACH INDIVIDUAL SIGN.
   C) THE MAXIMUM CLEARANCE OF THESE SIGNS IS 15.2 m IN ANY CONDITION.
   D) SEE DTL. DWG. NO. 619-08 FOR MOUNTING HEIGHTS.
5. WITHIN THE CITY LIMITS OR IN A SIDEWALK AND CURB AREA, MOUNT SIGNS TO HAVE THE PROPER CLEARANCES, BUT AVOID ANY CONFLICT BETWEEN THE POST AND THE MAIN WALKING AREA OF THE SIDEWALK, OR WITH DOORWAYS OR WINDOWS OF ADJACENT BUILDINGS. THE EXACT LOCATION OF THESE SIGN INSTALLATIONS WILL BE DETERMINED BY THE PROJECT MANAGER. SEE DTL. DWG. NO. 619-18 FOR VARIOUS CANTILEVER TYPE MOUNTINGS.
6. EVALUATE SIGNS WITHIN CLEAR ZONES (TABLES BELOW) FOR SUPPORT BREAKAWAY REQUIREMENTS (CONTACT MDT TRAFFIC SECTION FOR CRITERIA).
7. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

CLEAR ZONE DISTANCES

(IN METERS FROM EDGE OF DRIVING LANE)

DESIGN SPEED	DESIGN ADT	FILL SLOPES			CUT SLOPES		
		6:1 OR FLATTER	5:1 TO 4:1	3:1	3:1	4:1 TO 5:1	6:1 OR FLATTER
60 km/h OR LESS	UNDER 750	2.0-3.0	2.0-3.0	**	2.0-3.0	2.0-3.0	2.0-3.0
	750-1499	3.0-3.5	3.5-4.5	**	3.0-3.5	3.0-3.5	3.0-3.5
	1500-6000	3.5-4.5	4.5-5.0	**	3.5-4.5	3.5-4.5	3.5-4.5
	OVER 6000	4.5-5.0	5.0-5.5	**	4.5-5.0	4.5-5.0	4.5-5.0
70-80 km/h	UNDER 750	3.0-3.5	3.5-4.5	**	2.5-3.0	2.5-3.0	3.0-3.5
	750-1499	4.5-5.0	5.0-6.0	**	3.0-3.5	3.5-4.5	4.5-5.0
	1500-6000	5.0-5.5	6.0-8.0	**	3.5-4.5	4.5-5.0	5.0-5.5
	OVER 6000	6.0-6.5	7.5-8.5	**	4.5-5.0	5.5-6.0	6.0-6.5
90 km/h	UNDER 750	3.5-4.5	4.5-5.5	**	2.5-3.0	3.0-3.5	3.0-3.5
	750-1499	5.0-5.5	6.0-7.5	**	3.0-3.5	4.5-5.0	5.0-5.5
	1500-6000	6.0-6.5	7.5-9.0	**	4.5-5.0	5.0-5.5	6.0-6.5
	OVER 6000	6.5-7.5	8.0-10.0 *	**	5.0-5.5	6.0-6.5	6.5-7.5
100 km/h	UNDER 750	5.0-5.5	6.0-7.5	**	3.0-3.5	3.5-4.5	4.5-5.0
	750-1499	6.0-7.5	8.0-10.0 *	**	3.5-4.5	5.0-5.5	6.0-6.5
	1500-6000	8.0-9.0	10.0-12.0 *	**	4.5-5.5	5.5-6.5	7.5-8.0
	OVER 6000	9.0-10.0 *	11.0-13.5 *	**	6.0-6.5	7.5-8.0	8.0-8.5
110 km/h	UNDER 750	5.5-6.0	6.0-8.0	**	3.0-3.5	4.5-5.0	4.5-4.9
	750-1499	7.5-8.0	8.5-11.0 *	**	3.5-5.0	5.5-6.0	6.0-6.5
	1500-6000	8.5-10.0 *	10.5-13.0 *	**	5.0-6.0	6.5-7.5	8.0-8.5
	OVER 6000	9.0-10.5 *	11.5-14.0 *	**	6.5-7.5	8.0-9.0	8.5-9.0

* WHEN AN INVESTIGATION OR ACCIDENT HISTORY INDICATES A HIGH PROBABILITY OF ACCIDENTS, CLEAR ZONE DISTANCES GREATER THAN 9 m MAY BE PROVIDED AS INDICATED. CLEAR ZONES MAY ALSO BE LIMITED TO 9 m TO PROVIDE A CONSISTENT ROADWAY TEMPLATE WHEN EXPERIENCE WITH PREVIOUS SIMILAR PROJECTS INDICATES SATISFACTORY PERFORMANCE.

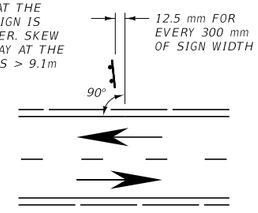
** FIXED OBJECTS, INCLUDING SIGN POSTS, SHOULD NOT BE ALLOWED IN THE VICINITY OF THE TOE OF THESE SLOPES. SEE AASHTO ROADSIDE DESIGN GUIDE FOR ADDITIONAL CONSIDERATIONS IN LOCATING SIGNS.

HORIZONTAL CURVE ADJUSTMENTS

(APPLICABLE ON OUTSIDE OF CURVE ONLY)

RADIUS (m)	DESIGN SPEED (km/h)					
	60	70	80	90	100	110
900	1.1	1.1	1.1	1.2	1.2	1.2
700	1.1	1.1	1.2	1.2	1.2	1.3
600	1.1	1.2	1.2	1.2	1.3	1.4
500	1.1	1.2	1.2	1.3	1.3	1.4
450	1.2	1.2	1.3	1.3	1.4	1.5
400	1.2	1.2	1.3	1.3	1.4	
350	1.2	1.2	1.3	1.4	1.5	
300	1.2	1.3	1.4	1.5	1.5	
250	1.3	1.3	1.4	1.5		
200	1.3	1.4	1.5			
150	1.4	1.5				
100	1.5					

TO AVOID GLARE, SKEW SIGN AWAY FROM ROADWAY AT THE ANGLE SHOWN WHEN SIGN IS < 9.1 m FROM SHOULDER. SKEW SIGN TOWARDS ROADWAY AT THE SAME ANGLE IF SIGN IS > 9.1m FROM SHOULDER.



SKEW DIAGRAM

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

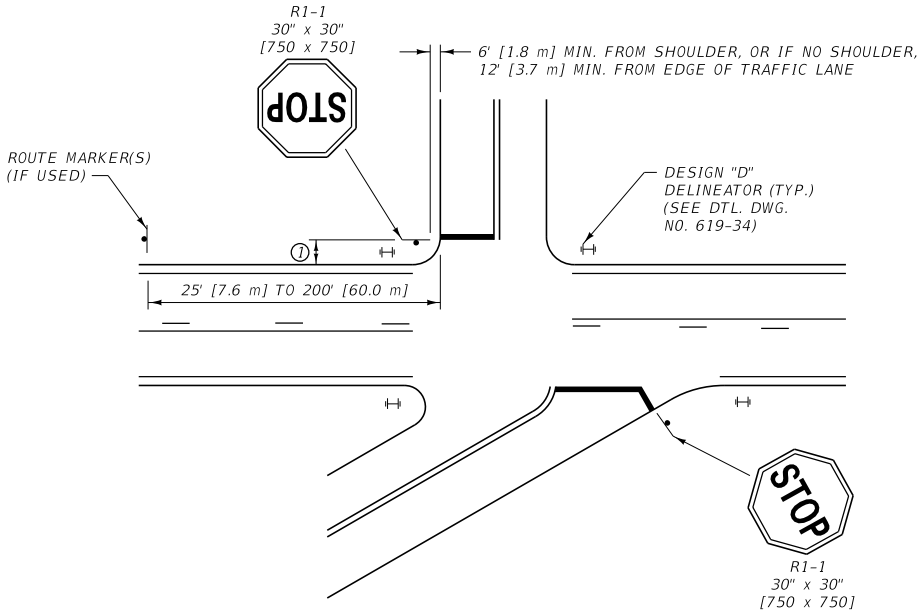
DETAILED DRAWING

REFERENCE
STANDARD SPEC.
SECTION 619, 704

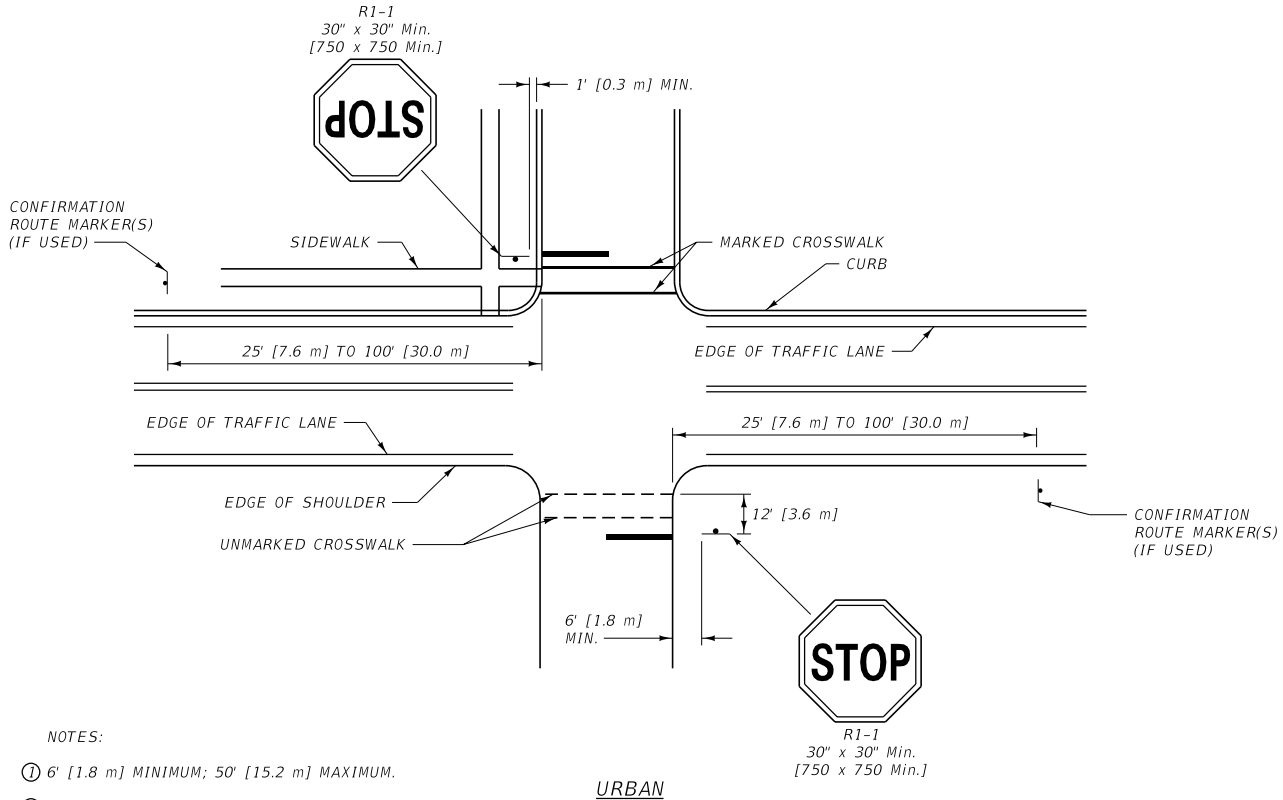
DWG. NO.
619-00

SIGN CLEARANCES AND MOUNTING HEIGHTS (METRIC)

MDT MONTANA DEPARTMENT OF TRANSPORTATION



RURAL



URBAN

NOTES:

1. 6' [1.8 m] MINIMUM; 50' [15.2 m] MAXIMUM.
2. PLACE R1-1 SIGN AT THE BEGINNING OF CURB RADIUS OR SHOULDER RADIUS, OR 4 FEET [1.2 m] IN ADVANCE OF THE MARKED OR UNMARKED CROSSWALK.
3. SEE PLANS FOR FINAL SIGNING AND PAVEMENT MARKING LOCATIONS.
4. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

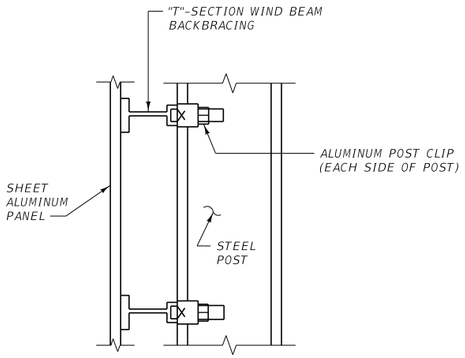
UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING

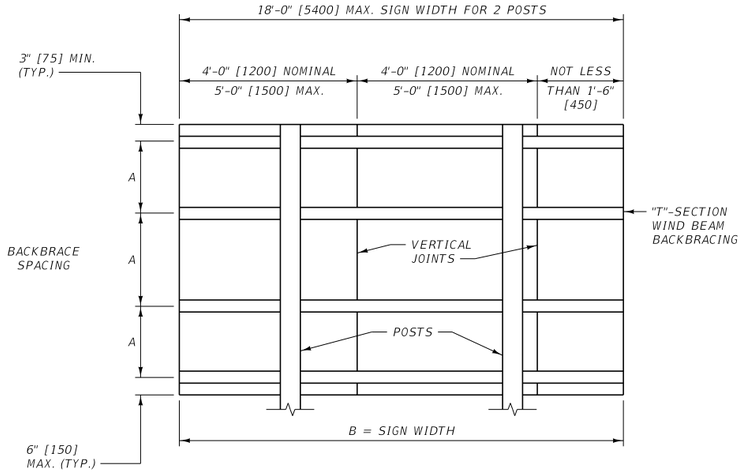
REFERENCE	DWG. NO.
STANDARD SPEC. SECTION 619, 704	619-02

TYPICAL RURAL AND URBAN APPROACHES

MONTANA DEPARTMENT OF TRANSPORTATION



BACKBRACE DETAIL

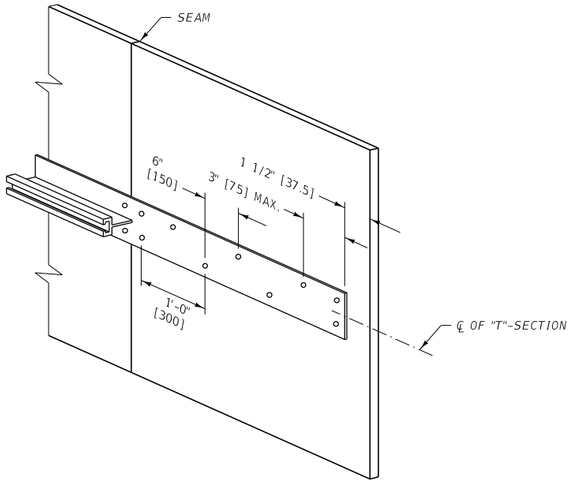


BACKBRACING TABLE - ALUMINUM SIGNS		
MAXIMUM BACKBRACE SPACING "A"	MAXIMUM WIDTH "B"	
	2 POST	3 POST
1'-8"	18'-0"	27'-0"
1'-10"	17'-0"	25'-8"
2'-0"	16'-6"	24'-8"
2'-6"	14'-9"	22'-0"
3'-0"	13'-6"	20'-0"
3'-6"	12'-6"	18'-6"

FOR ALUMINUM PLATE THICKNESS INFORMATION SEE SECTION 704.

METRIC BACKBRACING TABLE - ALUMINUM SIGNS		
MAXIMUM BACKBRACE SPACING "A" (mm)	MAXIMUM WIDTH "B" (mm)	
	2 POST	3 POST
500	5400	8100
550	5100	7700
600	4950	7400
750	4425	6600
900	4050	6000
1050	3750	5550

FOR ALUMINUM PLATE THICKNESS INFORMATION SEE SECTION 704.

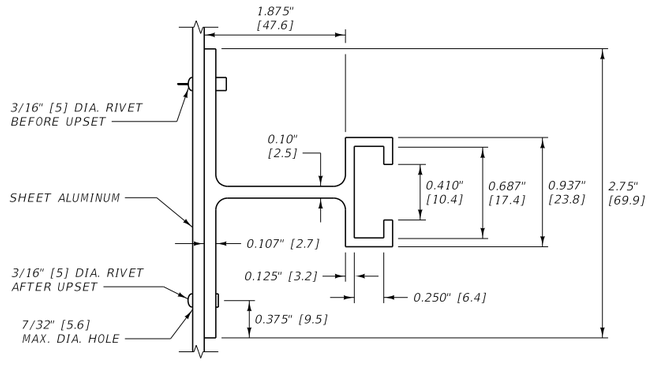


RIVET SPACING DETAIL

LOCATE RIVETS AT 6" [150] ALTERNATE CENTERS ON HORIZONTAL EXTRUDED "T"-SECTION.

DOUBLE RIVETS (TOP AND BOTTOM OR LEFT AND RIGHT OF EXTRUDED "T"-SECTION) AT HORIZONTAL AND VERTICAL JOINTS IN SHEET ALUMINUM FACE AND AT ENDS OF EXTRUDED "T"-SECTION.

COLOR RIVET HEADS TO MATCH ADJACENT SHEETING.



EXTRUDED "T"-SECTION BACKBRACE

NOTES:

1. CONFORM ALL ALUMINUM SIGNS TO SECTIONS 619, AND 704.
2. FOR SIGNS 4'-0" [1200] HIGH BY 6'-0" [1800] LONG OR LESS USE A SINGLE SHEET OF ALUMINUM.
3. DO NOT USE HORIZONTAL JOINTS ON SIGNS 6'-0" [1800] IN HEIGHT AND SMALLER. THE MINIMUM SHEET WIDTH IS 1'-6" [450].
4. SIGNS OVER 6'-0" [1800] HIGH MAY HAVE HORIZONTAL AND VERTICAL JOINTS. THE MINIMUM SHEET SIZE IS 1'-6" [450] WIDE BY 1'-6" [450] HIGH.
5. CLEAN AND DRY POST CLIP NUTS, THEN TORQUE TO 225 INCH POUNDS [25.4 N·m].
6. LOCATE ALL HORIZONTAL JOINTS AT A "T"-SECTION.
7. NO SPLICES ARE ALLOWED IN EXTRUDED "T"-SECTIONS.
8. USE SCREWS, BOLTS AND LOCKWASHERS MEETING THE REQUIREMENTS OF SECTION 704.
9. USE ONLY ALUMINUM RIVETS.
10. THE MAXIMUM GAP BETWEEN INDIVIDUAL SIGN PANELS AT JOINTS IS 1/16" [1.6] AT ANY POINT.
11. THE PROJECT MANAGER MAY APPROVE ADDITIONAL METHODS TO PREVENT LIGHT LEAKAGE THROUGH SIGN PANEL SEAMS.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

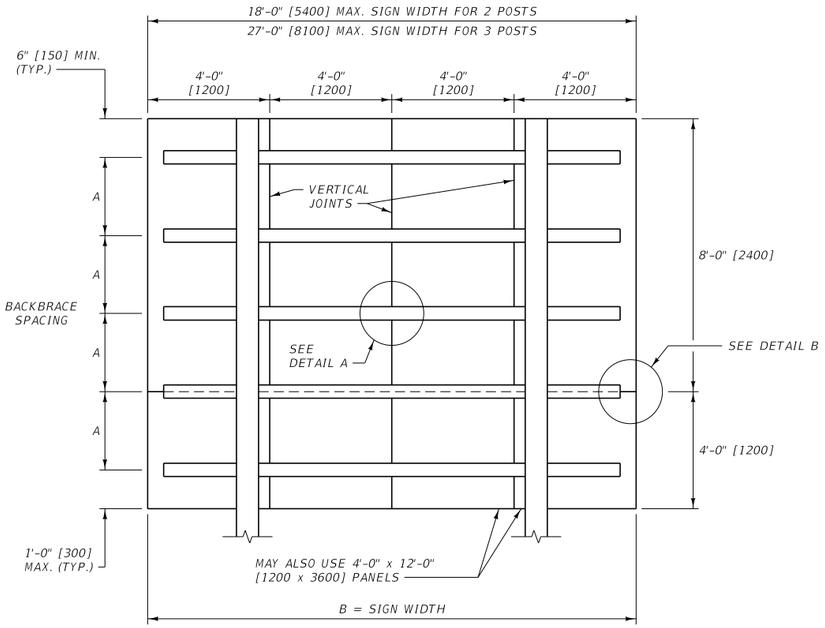
DETAILED DRAWING

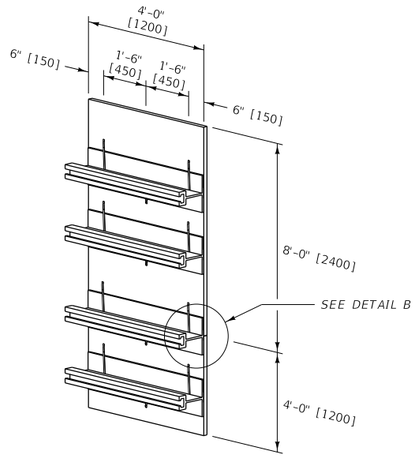
REFERENCE STANDARD SPEC. SECTION 619,704

DWG. NO. 619-04

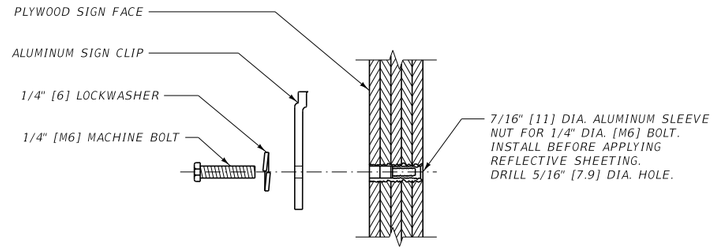
ALUMINUM SHEET INCREMENT SIGN CONSTRUCTION DETAILS

MONTANA DEPARTMENT OF TRANSPORTATION



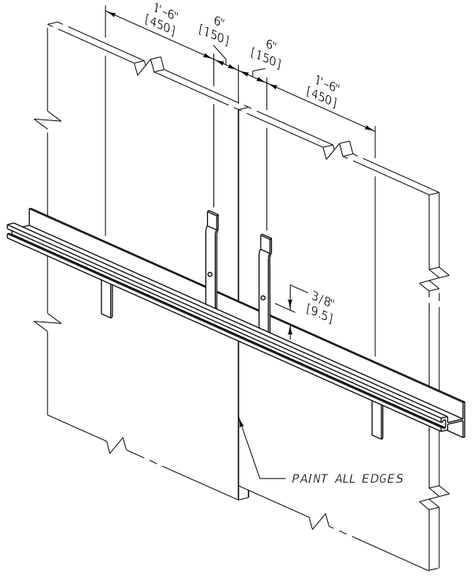


ALUMINUM CLIP PLACEMENT



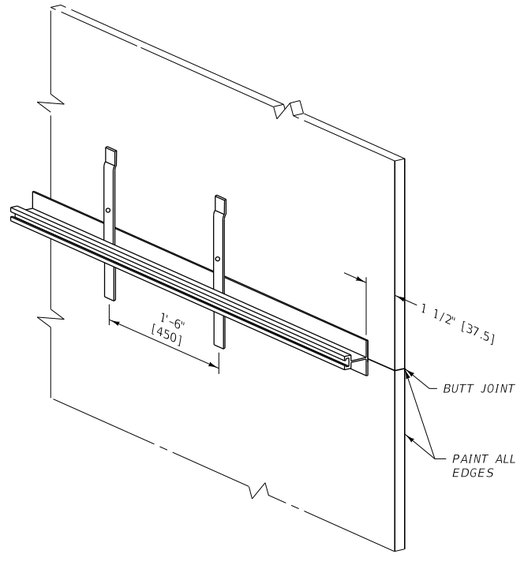
CLIP DETAIL

BACKBRACING TABLE - PLYWOOD SIGNS		
	DIMENSIONS	
MAXIMUM BACKBRACE SPACING "A"	MAXIMUM WIDTH "B"	
	2 POST	3 POST
1'-8"	18'-0"	27'-0"
1'-10"	17'-0"	25'-8"
2'-0"	16'-6"	24'-8"
2'-6"	14'-9"	22'-0"
3'-0"	13'-6"	20'-0"
3'-6"	12'-6"	18'-6"
	METRIC DIMENSIONS	
MAXIMUM BACKBRACE SPACING "A" (mm)	MAXIMUM WIDTH "B"	
	2 POST (mm)	3 POST (mm)
500	5400	8100
550	5100	7700
600	4950	7400
750	4425	6600
900	4050	6000
1050	3750	5550



DETAIL A

VERTICAL JOINT



DETAIL B

HORIZONTAL JOINT

NOTES:

1. CONFORM ALL PLYWOOD SIGNS TO SECTIONS 619 AND 704.
2. ON SIGNS 4'-0" [1200] HIGH AND GREATER, DO NOT USE ANY PANELS LESS THAN 4'-0" [1200] IN HEIGHT.
3. DO NOT USE HORIZONTAL JOINTS ON SIGNS LESS THAN 4'-0" [1200] IN HEIGHT.
4. FOR SIGNS WITH WIDTHS THAT ARE NOT IN MULTIPLES OF 4'-0" [1200], PLACE THE ODD LENGTH PANEL ON THE INSIDE EDGE.
5. FOR SIGNS OVER 10'-0" [3000] IN HEIGHT, THE FULL HEIGHT MAY BE OBTAINED WITH PANELS HAVING A FACTORY SCARFED JOINT IN LIEU OF USING STANDARD LENGTH PANEL AS SHOWN.
6. THE MINIMUM SIZE PANEL IS 1'-6" [450] WIDE BY 4'-0" [1200] HIGH.
7. CONSTRUCT PLYWOOD SIGNS OF ONE PIECE OF PLYWOOD UNLESS THE PLANS SPECIFY OTHERWISE FOR SPECIAL DESIGN SIGNS.
8. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

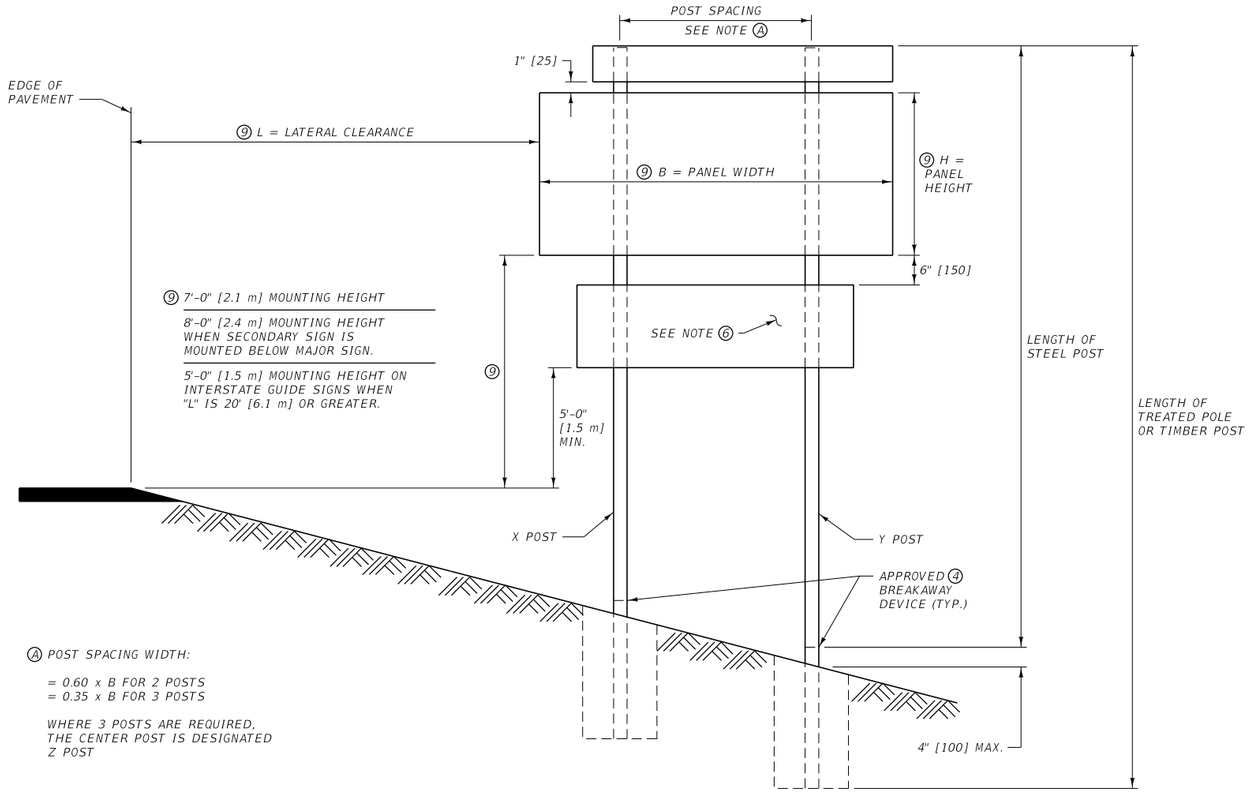
DETAILED DRAWING

REFERENCE STANDARD SPEC. SECTION 619,704

DWG. NO. 619-06

PLYWOOD SHEET INCREMENT GUIDE SIGN CONSTRUCTION DETAILS

MDT MONTANA DEPARTMENT OF TRANSPORTATION

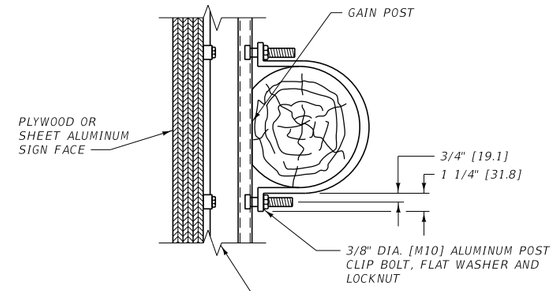


Ⓐ POST SPACING WIDTH:

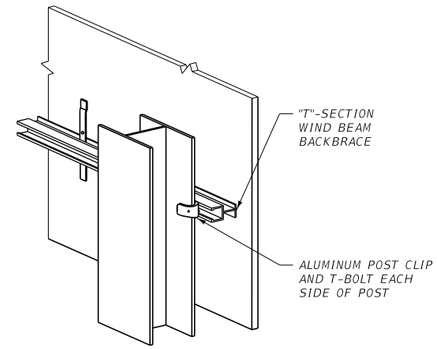
= 0.60 x B FOR 2 POSTS
= 0.35 x B FOR 3 POSTS

WHERE 3 POSTS ARE REQUIRED, THE CENTER POST IS DESIGNATED Z POST

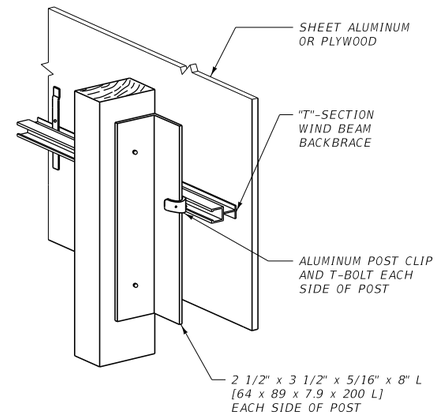
MOUNTING DETAILS



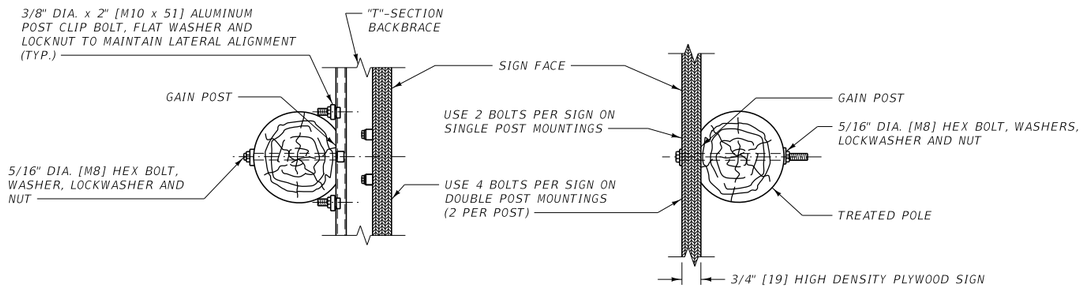
TREATED POLE



STEEL POST



TREATED TIMBER POST



DOUBLE POLE MOUNT

TREATED POLE SINGLE OR DOUBLE

(USED WHEN "T"-BAR WIND BEAMS NOT REQUIRED)

NOTES:

① MOUNTING SYSTEMS SHOWN ARE TYPICAL. OTHER SYSTEMS MAY BE APPROVED BY THE PROJECT MANAGER.

② USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

③ GAIN THE TOP HALF OF WOOD POLES ACCORDING TO THE TABLE ON DTL. DWG. NO. 619-20.

④ SEE THE SIGNING PLANS FOR THE TYPES OF POSTS AND FOUNDATIONS.

⑤ MOUNT ONE-PANEL PLYWOOD SIGNS DIRECTLY TO WOOD POLES OR POSTS, WHEN SPECIFIED IN THE PLANS, BY BOLTING THROUGH THE SIGN PLATE AND THE POLE AS REQUIRED BY THE DETAILED DRAWINGS, SPECIFICATIONS AND DESIGN. USE "T"-SECTION WIND BEAMS WHEN REQUIRED BY DTL. DWG. NO. 619-06.

⑥ SUSPEND LARGE SUPPLEMENTAL SIGNS, ADDED AFTER INITIAL SIGN INSTALLATION, FROM MAJOR SIGN PANEL OR BACKBRACING. ATTACHMENT TO MULTIPLE POSTS/POLES IS NOT ALLOWED.

⑦ USE POST SPACING, POST SIZE AND BREAKAWAY DEVICES SPECIFIED IN THE PLANS AND IN THE SPECIFICATIONS. FOR INFORMATION REGARDING APPROPRIATE BREAKAWAY DEVICES FOR NEW INSTALLATIONS NOT SUPPORTED BY THE PLANS, CONTACT THE TRAFFIC UNIT.

⑧ IN LOCATING SIGNS, AVOID PLACING POSTS IN DITCH BOTTOMS WHERE THEY WOULD IMPEDE DRAINAGE.

⑨ DIMENSIONS ARE SPECIFIED IN THE SIGNING PLANS.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

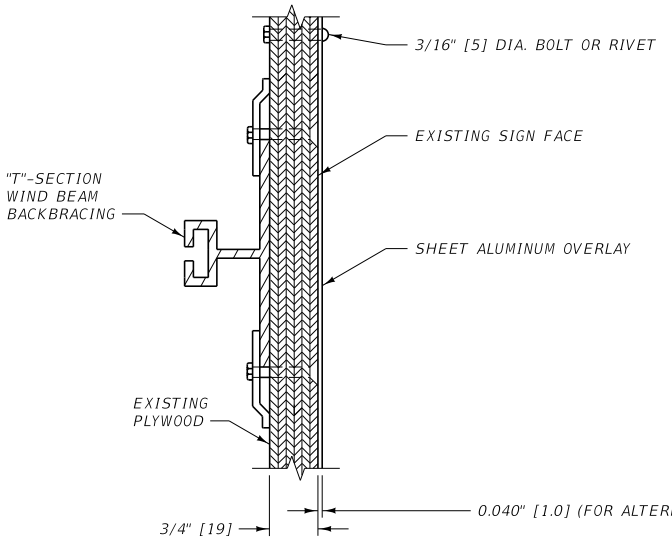
DETAILED DRAWING

REFERENCE STANDARD SPEC. SECTION 619,704

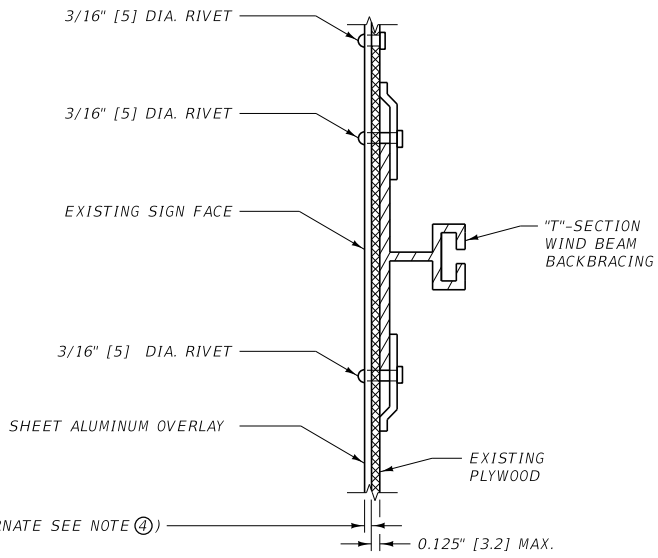
DWG. NO. 619-08

GUIDE SIGN CLEARANCE AND MOUNTING DETAILS

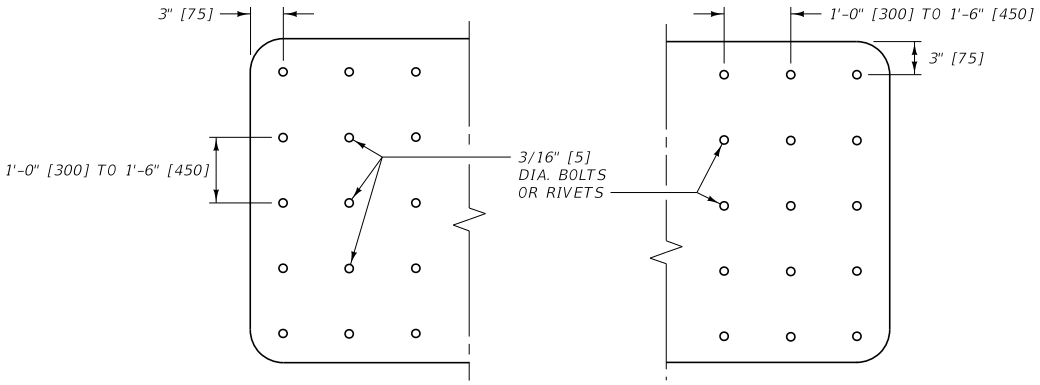
MDT MONTANA DEPARTMENT OF TRANSPORTATION



EXISTING PLYWOOD SIGNS



EXISTING ALUMINUM SIGNS



FASTENER PATTERN

NOTES:

1. REMOVE ALL RAISED LETTERS, NUMERALS, SYMBOLS, BORDERS AND PREVIOUS SIGN OVERLAYS TO BE REPLACED, AND CLEAN SIGN FACE TO A SMOOTH SURFACE BEFORE OVERLAYING.

2. ALL LETTERS, NUMERALS, SYMBOLS AND BORDERS ARE TYPE "C" CUTOUT UNLESS OTHERWISE SPECIFIED, AND APPLIED TO THE BACKGROUND SHEETING PRIOR TO FIELD APPLICATION OF THE SIGN.

3. THE SIZE OF ALL GUIDE SIGN OVERLAYS AND LEGENDS MUST BE VERIFIED BY THE PROJECT MANAGER PRIOR TO FABRICATION.

4. AN ADHESIVE-BACKED SHEETING MAY BE USED AS AN ALTERNATIVE ON SIGN WIDTHS OF 6'-0" [1800] OR LESS IF IT IS PREFABRICATED TO A MINIMUM THICKNESS OF 0.005" [.13] AND CONSTRUCTED OF PREAPPLIED REFLECTIVE SHEETING ON ADHESIVE-BACKED ALUMINUM. APPLY ADHESIVE-BACKED OVERLAY SHEETING WHEN AIR AND SURFACE TEMPERATURES ARE ABOVE 50°F (10°C). DO NOT USE THIS TYPE OF OVERLAY MATERIAL ON OVERHEAD SIGNS.

5. PROVIDE A MINIMUM REFLECTIVE SHEETING INTENSITY OF TYPE 4, MEETING THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS, UNLESS SPECIFIED OTHERWISE.

6. APPLY ALL MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

7. USE ALUMINUM ALLOY TYPE 6061-T6 OR AA5052-H38. CONVERSION COAT ALL ALUMINUM WITH A PROCESS SUCH AS ALODINE 1200 (OR EQUAL), AND RINSE AND DRY THOROUGHLY. PROTECT IT FROM SOIL BY ACCEPTABLE METHODS.

8. SIGN OVERLAYS MAY REQUIRE REMOVAL OF THE SIGN FROM THE POSTS TO AVOID PROJECTING BOLT HEADS. DO NOT LEAVE WARNING AND REGULATORY SIGNS TO BE OVERLAYED UNDISPLAYED FOR MORE THAN ONE (1) HOUR DURING DAYLIGHT. DO NOT LEAVE GUIDE SIGNS UNDISPLAYED FOR MORE THAN TEN (10) HOURS DURING DAYLIGHT. INSURE SIGNS TO BE OVERLAYED ARE OPERATIONAL PRIOR TO DARKNESS.

9. OVERLAY SIGNS SMALLER THAN 4'-0" x 6'-0" [1200 x 1800] WITH ONE PANEL OF MATERIAL. FOR SEAMS IN LARGE OVERLAYS, USE RIVETS OR BOLTS SPACED AS SHOWN ON THIS DRAWING AND PLACE PARALLEL TO AND NO MORE THAN 3" [75] LATERALLY FROM THE SEAM.

10. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING

REFERENCE
STANDARD SPEC.
SECTION 619, 704

DWG. NO.
619-10

SHEET ALUMINUM OVERLAY

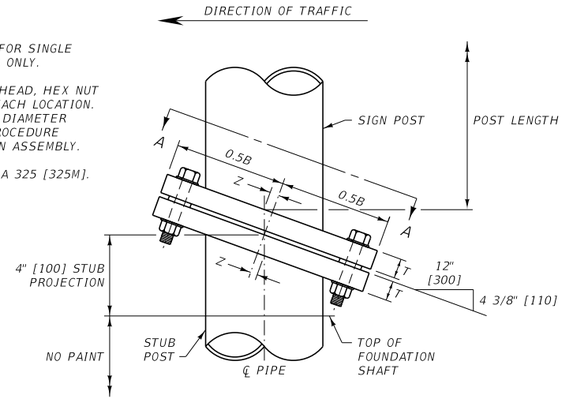
MDT MONTANA DEPARTMENT OF TRANSPORTATION

NOTES:

USE TUBULAR POSTS FOR SINGLE POST MOUNTED SIGNS ONLY.

USE BOLT WITH HEX HEAD, HEX NUT AND 3 WASHERS AT EACH LOCATION. SEE TABLE FOR BOLT DIAMETER AND TORQUE. SEE PROCEDURE FOR BASE CONNECTION ASSEMBLY.

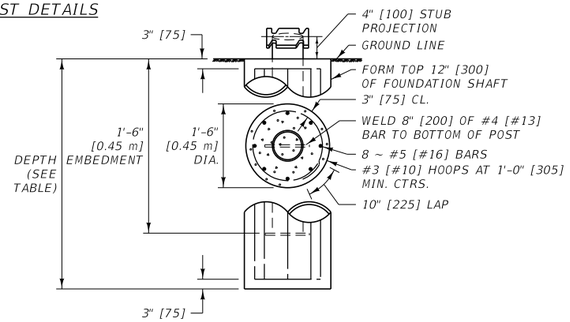
ALL BOLTS ARE ASTM A 325 [325M].



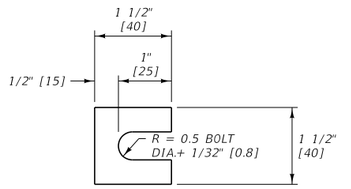
SIGN POST AND STUB POST DETAILS

PROCEDURE FOR BASE CONNECTION ASSEMBLY

1. ASSEMBLE POST TO STUB WITH BOLTS AND ONE FLAT WASHER BETWEEN PLATES.
2. SHIM AS REQUIRED TO PLUMB POST.
3. TIGHTEN BOLTS IN A SYSTEMATIC ORDER TO THE PRESCRIBED TORQUE (SEE TABLE BELOW).
4. LOOSEN EACH BOLT AND RETIGHTEN TO PRESCRIBED TORQUE IN THE SAME ORDER AS ORIGINAL TIGHTENING. DO NOT OVERTIGHTEN.
5. BURR THREADS AT JUNCTION WITH NUT USING A CENTER PUNCH TO PREVENT NUT LOOSENING.



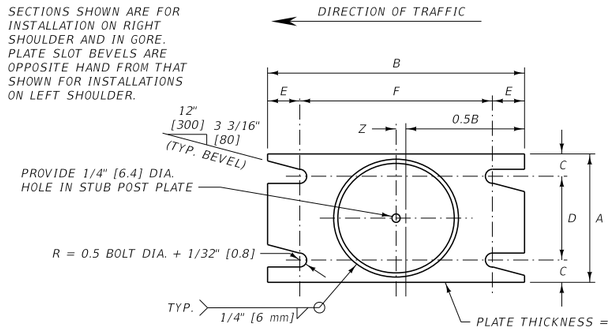
FOUNDATION SHAFT DETAIL



FURNISH TWO 0.012" [0.3] ± THICK AND TWO 0.032" [0.8] ± THICK SHIMS PER POST. USE SHIMS FABRICATED FROM BRASS SHIM STOCK OR STRIP CONFORMING TO ASTM B 36 [36M].

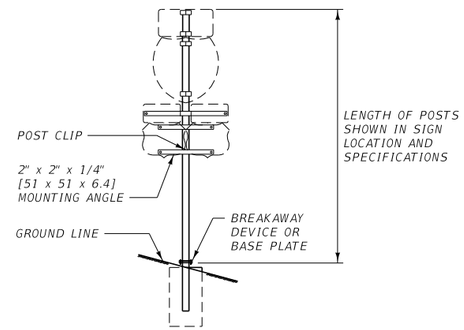
SHIM DETAIL

SECTIONS SHOWN ARE FOR INSTALLATION ON RIGHT SHOULDER AND IN GORE. PLATE SLOT BEVELS ARE OPPOSITE HAND FROM THAT SHOWN FOR INSTALLATIONS ON LEFT SHOULDER.



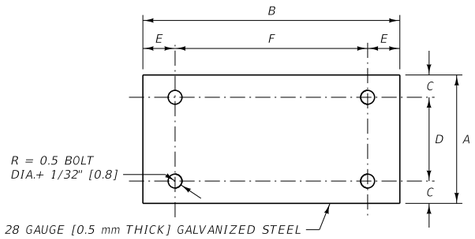
SECTION A-A

BASE PLATE DETAIL

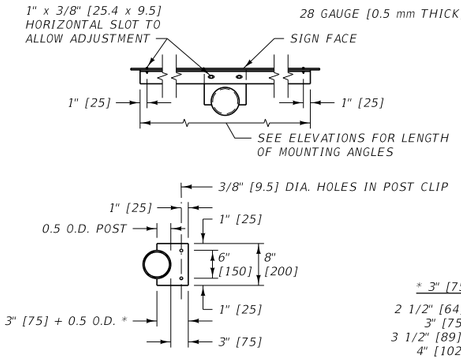


TYPICAL SIGN ELEVATION

FOR DETAILS OF MOUNTING ANGLES SEE DETAILED DRAWING NUMBER 619-16 AND BELOW.



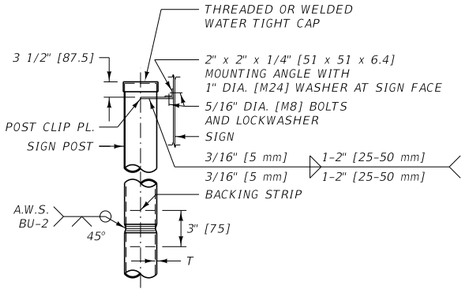
KEEPER PLATE DETAIL



* 3" [75] + 0.5 O.D. FOR:

2 1/2" [64] DIA. PIPE = 4 7/16" [111.5]
3" [75] DIA. PIPE = 4 3/4" [119.5]
3 1/2" [89] DIA. PIPE = 5" [126.0]
4" [102] DIA. PIPE = 5 1/4" [132.0]

POST CLIP DETAILS



TYPICAL SPLICE

BACKING STRIP THICKNESS = T OR 5/16" [8] MAX. LOCATE SPLICE IN TOP ONE-HALF OF POST.

BASE CONNECTION DATA											FOUNDATION	
NOMINAL PIPE DIA.	BOLT SIZE	BOLT TORQUE	A	B	C	D	E	F	T	Z	FOOTING DIAMETER	FOOTING DEPTH
3"	1/2" DIA. x 2 1/2"	240 IN.LB.	4 1/2"	7 1/2"	1"	2 1/2"	3/4"	6"	3/4"	5/16"	1'-6"	3'-0"
3 1/2" 4"	1/2" DIA. x 2 1/2"	240 IN.LB.	5 1/2"	8 1/2"	1"	3 1/2"	3/4"	7"	3/4"	5/16"	1'-6"	3'-0"
5"	5/8" DIA. x 3 1/4"	480 IN.LB.	6 1/2"	9 3/4"	1 1/4"	4"	7/8"	8"	1"	3/8"	1'-6"	4'-0"
6"	3/4" DIA. x 3 1/2"	780 IN.LB.	7 1/2"	11 1/4"	1 1/4"	5"	1"	9 1/4"	1"	3/8"	1'-6"	4'-6"

METRIC BASE CONNECTION DATA											METRIC FOUNDATION	
NOMINAL PIPE DIA.	BOLT SIZE	BOLT TORQUE	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	T (mm)	Z (mm)	FOOTING DIAMETER	FOOTING DEPTH
75 mm	M12 x 63	27 N•m	114.3	190.5	25.4	63.5	19.05	152.4	19	8	0.45 m	0.9 m
89 mm 102 mm	M12 x 63	27 N•m	139.7	215.9	25.4	88.9	19.05	177.8	19	8	0.45 m	0.9 m
127 mm	M16 x 83	54 N•m	165.1	247.66	31.75	101.6	22.23	203.2	25	10	0.45 m	1.2 m
152 mm	M20 x 89	88 N•m	190.5	285.75	31.75	127.0	25.4	234.95	25	10	0.45 m	1.4 m

TABLE OF WEIGHTS		
NOMINAL PIPE DIA.	NOMINAL WEIGHT (LB./FT.) OF PIPE	WEIGHT OF BASE PLATE & STUB POST (LB.)
3"	7.58	28.03
3 1/2"	9.11	35.85
4"	10.79	38.44
5"	14.62	61.51
6"	18.97	81.54

METRIC TABLE OF WEIGHTS		
NOMINAL PIPE DIA. (mm)	NOMINAL WEIGHT (kg/m) OF PIPE	WEIGHT OF BASE PLATE & STUB POST (kg)
75	11.28	12.71
89	13.56	16.26
102	16.06	17.44
127	21.76	27.90
152	28.23	36.99

NOTES:

1. USE STEEL PIPE CONFORMING TO THE REQUIREMENTS OF ASTM A 53 [53M], TYPE E OR S, GRADE B OR A 500 [500M], GRADE B.
2. USE CLASS GENERAL CONCRETE WITH A SMOOTH FINISH ON TOP. FORM TOP 12 INCHES [300] OF FOUNDATION.
3. SUBMIT SHOP PLANS FOR APPROVAL PRIOR TO FABRICATION.
4. FOR SIGN PLACEMENT AND DETAILS SEE THE SIGNING DETAILED DRAWINGS.
5. GALVANIZE PIPE PER SECTION 711.
6. EXCEPT AS OTHERWISE APPROVED BY THE PROJECT MANAGER, PAINT STRUCTURAL STEEL WITH ONE SHOP COAT AND ONE FIELD COAT OF ZINC RICH BASED PAINT AND ONE FIELD COAT OF ALUMINUM PAINT AS SPECIFIED IN THE STANDARD SPECIFICATIONS, ON ALL SURFACES NOT IN CONTACT WITH THE CONCRETE.
7. FRANGIBLE BOLT BREAKAWAY SYSTEMS LISTED ON THE DEPARTMENT'S QUALIFIED PRODUCTS LIST ARE ALLOWED TO BE USED IN PLACE OF THE DESIGN SHOWN HERE AS AN EQUAL OPTION (PER PROJECT MANAGER'S APPROVAL).
8. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING

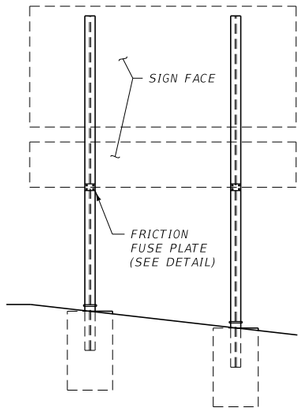
REFERENCE
STANDARD SPEC.
SECTION 556,619,704,711

DWG. NO. 619-12

TUBULAR SIGN POST DETAILS

MDT MONTANA DEPARTMENT OF TRANSPORTATION

BASE CONNECTION DATA										FUSE PLATE DATA											FOUNDATION DATA					
POST SIZE	BOLT SIZE	BOLT TORQUE	DIMENSIONS							BASE PLATES (LB.)	DIMENSIONS									BOLT DIA.	FUSE DEVICE (LB.)	FTG. DEPTH	STUB LENGTH	FTG. DIA.	BAR C SIZE	STUB POST (LB.)
			A	B	C	D	E	t_1	W		F	G	H	J	K	L	N	t_3	Y							
W4 x 13 M4 x 13	5/8" DIA. x 2 3/4"	40 FT. LB.	8 1/2"	5"	3/4"	2 3/4"	1 1/8"	3/4"	5/16"	21.58	3 3/4"	2"	1 1/8"	4"	2 1/4"	7/8"	5/8"	3/8"	13/16"	5/8"	1.60	3'-6"	2'-0"	1'-6"	#5	26.00
W8 x 18			12 1/2"	6 1/4"	3/4"	4"	1 1/8"	3/4"	5/16"	37.00	4 1/2"	2 1/2"	1 1/4"	5 1/4"	2 3/4"	1 1/4"	3/4"	1/2"	7/8"	3/4"	3.27	5'-6"	2'-6"	2'-0"	#7	45.00
W8 x 24	3/4" DIA. x 3 1/2"	65 FT. LB.	13"	7 1/2"	3/4"	5"	1 1/4"	1"	5/16"	60.86	4 3/4"	2 1/2"	1 1/2"	6"	3 1/2"	1 1/4"	3/4"	9/16"	15/16"	3/4"	4.66	7'-0"	3'-0"	2'-0"	#9	72.00
W12 x 30			17"	7 1/2"	7/8"	5"	1 1/4"	1"	5/16"	78.54	5 3/8"	3"	1 1/2"	6 1/2"	3 1/2"	1 1/2"	7/8"	9/16"	1 3/16"	7/8"	5.42	8'-0"	3'-0"	2'-6"	#9	90.00
S3 x 5.7	1/2" DIA. x 2 1/2"	20 FT. LB.	8"	3"	3/4"	1 1/2"	3/4"	5/8"	1/4"	10.37	3 1/8"	1 1/2"	1 1/8"	2 5/8"	1 1/2"	9/16"	1/2"	1/4"	11/16"	1/2"	0.64	3'-6"	1'-6"	1'-6"	#4	8.55
S4 x 7.7			8"	3"	3/4"	1 1/2"	3/4"	5/8"	1/4"	10.45	3 1/8"	1 1/2"	1 1/8"	2 5/8"	1 1/2"	9/16"	1/2"	1/4"	13/16"	1/2"	0.64	3'-6"	1'-6"	1'-6"	#4	11.55
S5 x 10.0	5/8" DIA. x 2 3/4"	40 FT. LB.	9 1/2"	4"	3/4"	2"	1"	3/4"	1/4"	19.08	3 1/8"	1 1/2"	1 1/8"	3"	1 7/8"	9/16"	1/2"	1/4"	13/16"	1/2"	0.66	3'-6"	1'-6"	1'-6"	#5	15.00

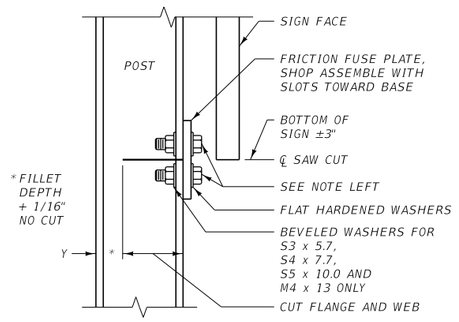


TYPICAL SIGN ELEVATION

PROCEDURE FOR BASE CONNECTION ASSEMBLY

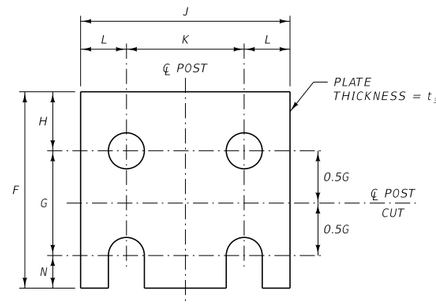
1. ASSEMBLE POST TO STUB WITH BOLTS AND ONE FLAT WASHER BETWEEN PLATES.
2. SHIM AS REQUIRED TO PLUMB POST.
3. TIGHTEN BOLTS IN A SYSTEMATIC ORDER TO THE PRESCRIBED TORQUE (SEE TABLE).
4. LOOSEN EACH BOLT AND RETIGHTEN TO PRESCRIBED TORQUE IN THE SAME ORDER AS ORIGINAL TIGHTENING. DO NOT OVERTIGHTEN.
5. BURR THREADS AT JUNCTION WITH NUT USING A CENTER PUNCH TO PREVENT NUT LOOSENING.

NOTE:
ALL BOLTS MUST BE ASTM A 325 AND BE TIGHTENED BY USE OF A DIRECT TENSION INDICATING DEVICE (LOAD INDICATING WASHER) IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.



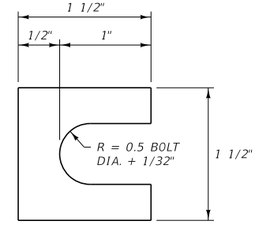
FRICTION FUSE PLATE DETAIL

DO NOT USE ON SINGLE POST SIGNS. NOT NECESSARY WHEN SIGN IS MOUNTED BEHIND GUARDRAIL OR BARRIER RAIL.



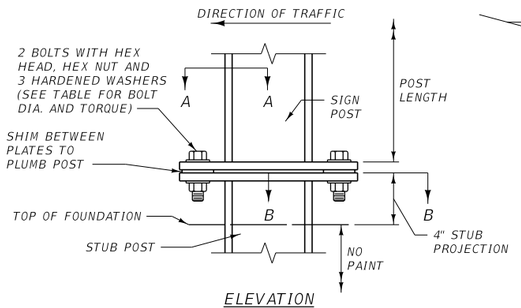
HOLE DIAMETER = BOLT DIA. + 1/16"

FRICTION FUSE PLATE DETAIL

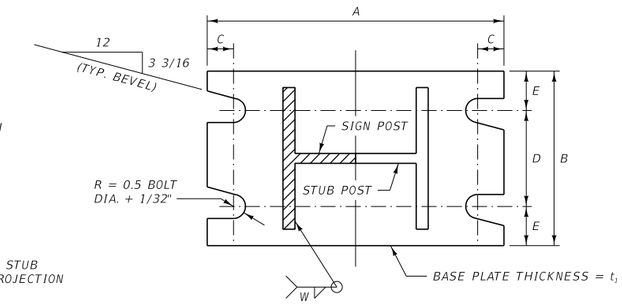


FURNISH TWO 0.012" ± THICK AND TWO 0.032" ± THICK SHIMS PER POST. USE SHIMS FABRICATED FROM BRASS SHIM STOCK OR STRIP CONFORMING TO ASTM B 36.

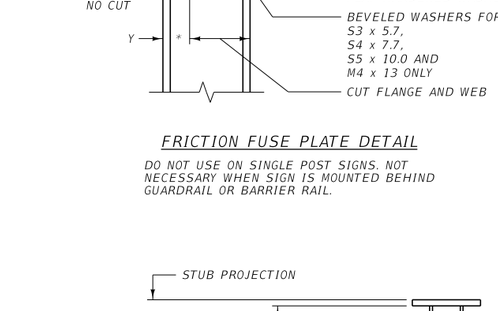
SHIM DETAIL



ELEVATION



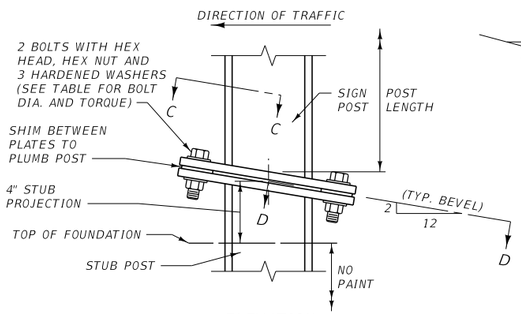
SECTION A-A



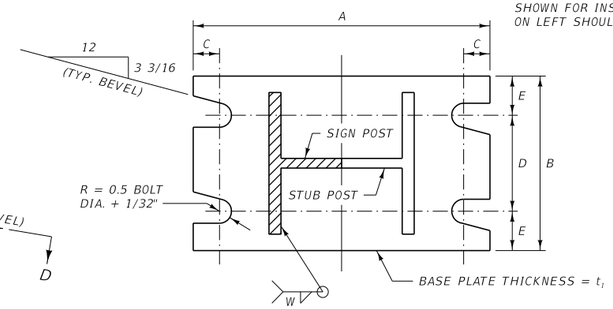
SECTION B-B

SIGN POST AND STUB POST DETAIL "A"

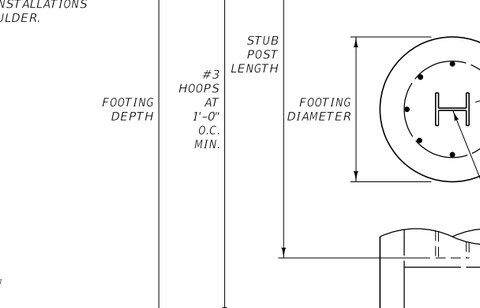
NOTE:
SECTIONS SHOWN ARE FOR INSTALLATIONS ON RIGHT SHOULDER AND IN GORE. PLATE SLOT BEVELS ARE OPPOSITE HAND FROM THAT SHOWN FOR INSTALLATIONS ON LEFT SHOULDER.



ELEVATION



SECTION C-C



SECTION D-D

SIGN POST AND STUB POST DETAIL "B"

USE ONLY WITH SINGLE POST SIGNS

FOUNDATION DETAIL

NOTES:

1. USE CLASS GENERAL CONCRETE WITH A SMOOTH FINISH ON TOP. FORM TOP 12 INCHES OF FOUNDATION.
2. SEE THE STANDARD SPECIFICATIONS FOR REQUIREMENTS GOVERNING STRUCTURAL STEELS AND THEIR FABRICATIONS. TO AVOID OVERSIGHT, NOTE THESE REQUIREMENTS ON THE SHOP DRAWINGS.
3. SUBMIT SHOP PLANS FOR APPROVAL BEFORE FABRICATION BEGINS.
4. FOR GUIDE SIGN PLACEMENT AND DETAILS, SEE SIGNING DTL. DWG. NO. 619-08.
5. FRANGIBLE BOLT BREAKAWAY SYSTEMS LISTED ON THE DEPARTMENT'S QUALIFIED PRODUCTS LIST ARE ALLOWED TO BE USED IN PLACE OF THE DESIGN SHOWN HERE AS AN EQUAL OPTION (PER PROJECT MANAGER'S APPROVAL).
6. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

PAINT:
EXCEPT AS OTHERWISE APPROVED BY THE PROJECT MANAGER, PAINT STRUCTURAL STEEL WITH ONE SHOP COAT AND ONE FIELD COAT OF ZINC RICH BASED PAINT AND ONE FIELD COAT OF ALUMINUM PAINT ON ALL SURFACES NOT IN CONTACT WITH CONCRETE.

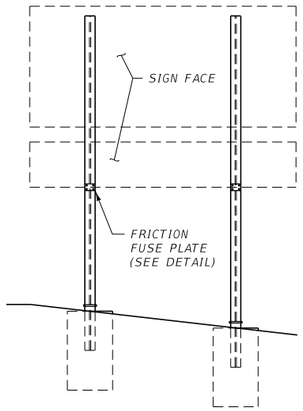
DETAILED DRAWING

REFERENCE STANDARD SPEC. SECTION 619, 704

DWG. NO. 619-13

STRUCTURAL STEEL SIGN POST DETAILS

MDT MONTANA DEPARTMENT OF TRANSPORTATION



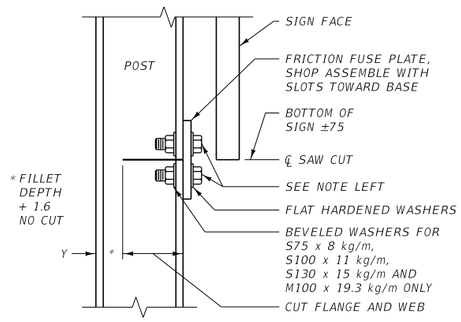
TYPICAL SIGN ELEVATION

BASE CONNECTION DATA										FUSE PLATE DATA											FOUNDATION DATA					
POST SIZE (mm x kg/m)	BOLT SIZE	BOLT TORQUE	DIMENSIONS							BASE PLATES (kg)	DIMENSIONS									BOLT DIA.	FUSE DEVICE (kg)	FTG. DEPTH	STUB LENGTH	FTG. DIA.	BAR C SIZE	STUB POST (kg)
			A	B	C	D	E	t_1	W		F	G	H	J	K	L	N	t_3	Y							
W100 x 19 M100 x 19.3	M16 x 70	54 N·m	215	125	18.6	69.8	27.6	19	8	9.79	95	50.8	28.2	100	57.2	21.4	16.0	10	20.6	M16	0.73	1.1 m	600	0.45 m	#16	11.79
W200 x 27			320	160	20.3	101.6	29.2	19	8	16.78	115	63.5	31.5	135	69.8	32.6	20.0	13	22.2	M20	1.48	1.7 m	750	0.60 m	#22	20.41
W200 x 36	M20 x 89	88 N·m	330	190	19.0	127.0	31.5	25	8	27.61	120	63.5	36.5	150	88.8	30.6	20.0	14	23.8	M20	2.11	2.1 m	900	0.60 m	#29	32.66
W310 x 45			430	190	21.3	127.0	31.5	25	8	35.63	135	76.2	38.8	165	88.8	38.1	22.0	14	30.2	M22	2.46	2.4 m	900	0.75 m	#29	40.82
S75 x 8	M12 x 63	27 N·m	205	75	20.0	38.0	18.5	16	6	4.70	80	38.1	29.9	65	38.0	13.5	12.0	6	17.5	M12	0.29	1.1 m	450	0.45 m	#13	3.88
S100 x 11			205	75	20.0	38.0	18.5	16	6	4.74	80	38.1	29.9	65	38.0	13.5	12.0	6	20.6	M12	0.29	1.1 m	450	0.45 m	#13	5.24
S130 x 15	M16 x 70	54 N·m	240	100	18.4	50.8	24.6	19	6	8.65	80	38.1	29.9	75	47.6	13.7	12.0	6	20.6	M12	0.30	1.1 m	450	0.45 m	#16	6.80

PROCEDURE FOR BASE CONNECTION ASSEMBLY

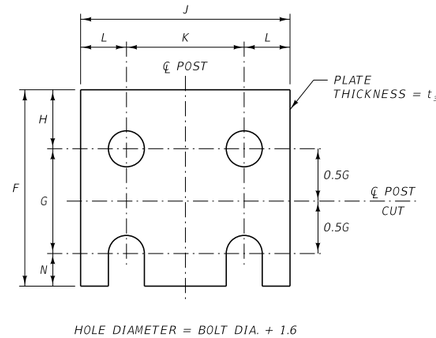
1. ASSEMBLE POST TO STUB WITH BOLTS AND ONE FLAT WASHER BETWEEN PLATES.
2. SHIM AS REQUIRED TO PLUMB POST.
3. TIGHTEN BOLTS IN A SYSTEMATIC ORDER TO THE PRESCRIBED TORQUE (SEE TABLE).
4. LOOSEN EACH BOLT AND RETIGHTEN TO PRESCRIBED TORQUE IN THE SAME ORDER AS ORIGINAL TIGHTENING. DO NOT OVERTIGHTEN.
5. BURR THREADS AT JUNCTION WITH NUT USING A CENTER PUNCH TO PREVENT NUT LOOSENING.

NOTE:
ALL BOLTS MUST BE ASTM A 325M AND BE TIGHTENED BY USE OF A DIRECT TENSION INDICATING DEVICE (LOAD INDICATING WASHER) IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.



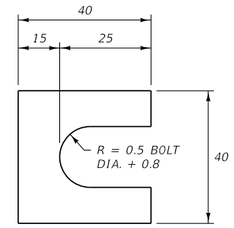
FRICTION FUSE PLATE DETAIL

DO NOT USE ON SINGLE POST SIGNS. NOT NECESSARY WHEN SIGN IS MOUNTED BEHIND GUARDRAIL OR BARRIER RAIL.



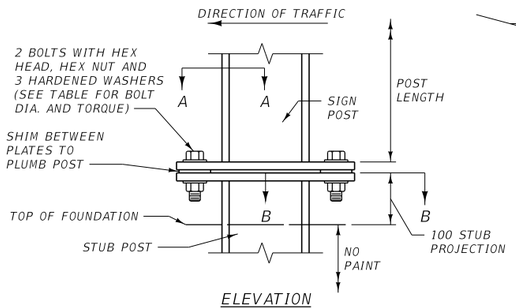
HOLE DIAMETER = BOLT DIA. + 1.6

FRICTION FUSE PLATE DETAIL

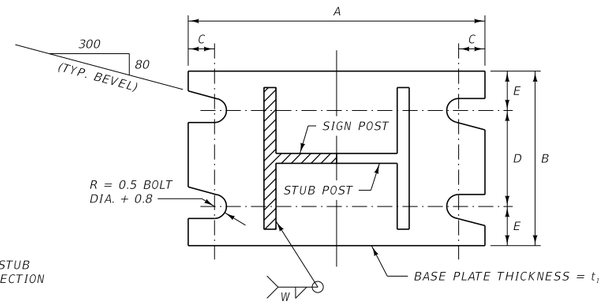


FURNISH TWO 0.3 mm ± THICK AND TWO 0.8 mm ± THICK SHIMS PER POST. USE SHIMS FABRICATED FROM BRASS SHIM STOCK OR STRIP CONFORMING TO ASTM B 36M.

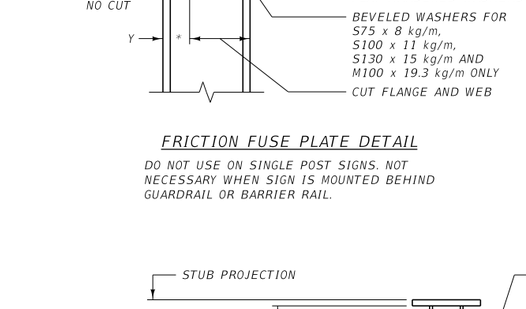
SHIM DETAIL



ELEVATION



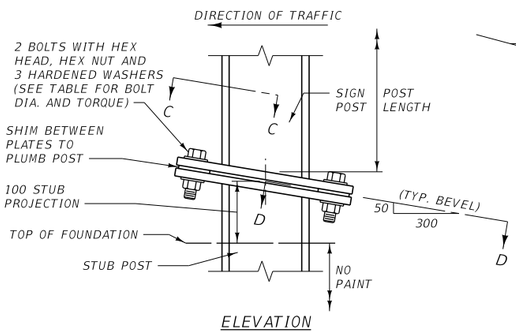
SECTION A–A



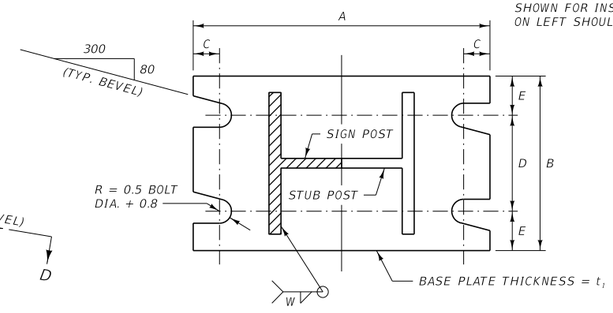
SECTION B–B

SIGN POST AND STUB POST DETAIL "A"

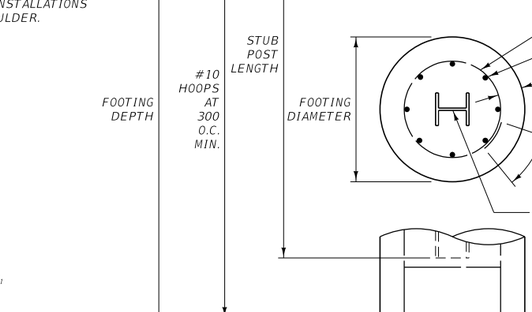
NOTE:
SECTIONS SHOWN ARE FOR INSTALLATIONS ON RIGHT SHOULDER AND IN GORE. PLATE SLOT BEVELS ARE OPPOSITE HAND FROM THAT SHOWN FOR INSTALLATIONS ON LEFT SHOULDER.



ELEVATION



SECTION C–C



SECTION D–D

SIGN POST AND STUB POST DETAIL "B"

USE ONLY WITH SINGLE POST SIGNS

FOUNDATION DETAIL

NOTES:

1. USE CLASS GENERAL CONCRETE WITH A SMOOTH FINISH ON TOP. FORM TOP 300 mm OF FOUNDATION.
2. SEE THE STANDARD SPECIFICATIONS FOR REQUIREMENTS GOVERNING STRUCTURAL STEELS AND THEIR FABRICATIONS. TO AVOID OVERSIGHT, NOTE THESE REQUIREMENTS ON THE SHOP DRAWINGS.
3. SUBMIT SHOP PLANS FOR APPROVAL BEFORE FABRICATION BEGINS.
4. FOR GUIDE SIGN PLACEMENT AND DETAILS, SEE SIGNING DTL. DWG. NO. 619-08.
5. FRANGIBLE BOLT BREAKAWAY SYSTEMS LISTED ON THE DEPARTMENT'S QUALIFIED PRODUCTS LIST ARE ALLOWED TO BE USED IN PLACE OF THE DESIGN SHOWN HERE AS AN EQUAL OPTION (PER PROJECT MANAGER'S APPROVAL).
6. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

PAINT:
EXCEPT AS OTHERWISE APPROVED BY THE PROJECT MANAGER, PAINT STRUCTURAL STEEL WITH ONE SHOP COAT AND ONE FIELD COAT OF ZINC RICH BASED PAINT AND ONE FIELD COAT OF ALUMINUM PAINT ON ALL SURFACES NOT IN CONTACT WITH CONCRETE.

ALL DIMENSIONS ARE MILLIMETERS (mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING

REFERENCE
STANDARD SPEC.
SECTION 619, 704

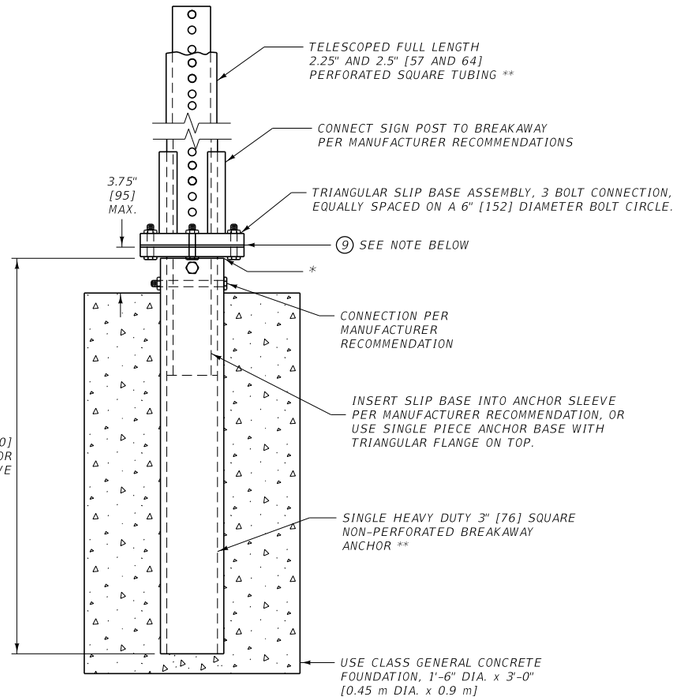
DWG. NO.
619-13

STRUCTURAL STEEL
SIGN POST DETAILS
(METRIC)

MDT MONTANA DEPARTMENT OF TRANSPORTATION

TELESCOPED SQUARE TUBES SIGN POST INSTALLATION ON SLIP BASE

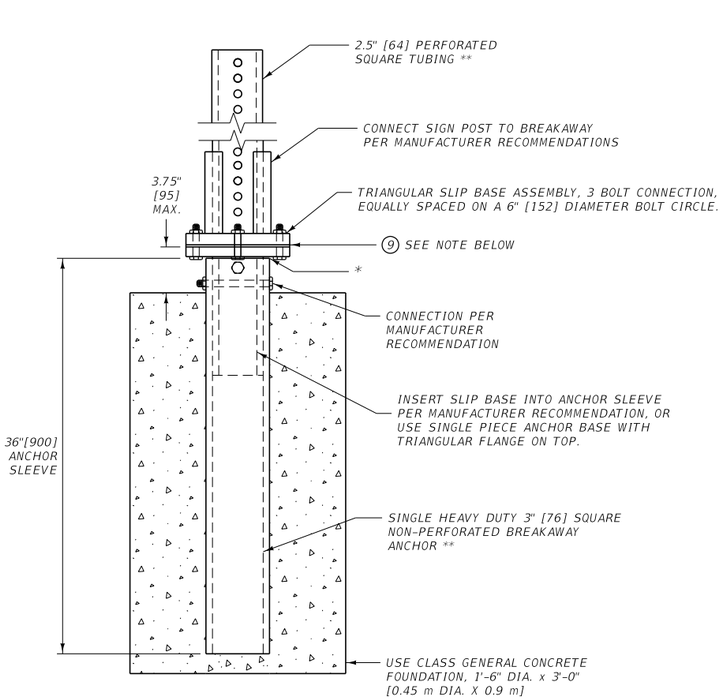
AS NOTED BY THE STAR SYMBOL ★ ON THE LOCATION AND SPECIFICATION SHEETS.



* SHIM AS REQUIRED PER MANUFACTURER RECOMMENDATION TO TAKE UP TOLERANCE BETWEEN SLIP BASE STUB AND ANCHOR SLEEVE.

SINGLE SQUARE TUBE SIGN TO POST INSTALLATION ON SLIP BASE

AS NOTED BY THE CIRCLE SYMBOL ● ON THE LOCATION AND SPECIFICATION SHEETS.

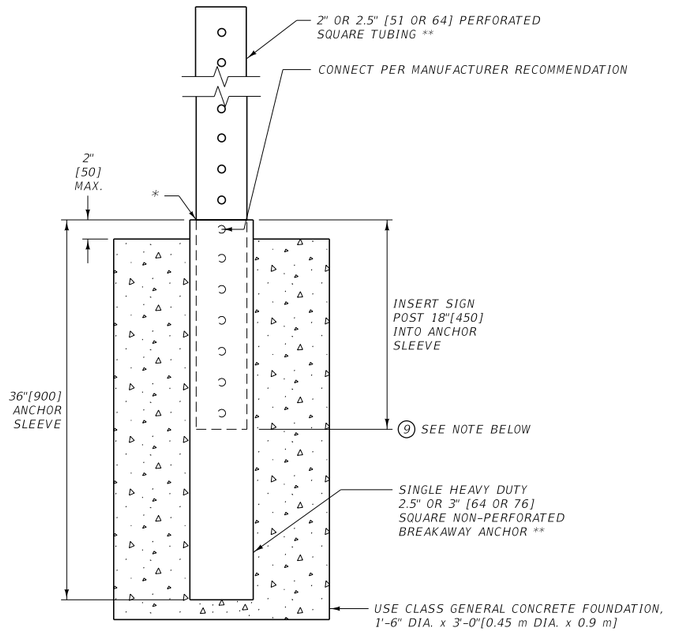


* SHIM AS REQUIRED PER MANUFACTURER RECOMMENDATION TO TAKE UP TOLERANCE BETWEEN SLIP BASE STUB AND ANCHOR SLEEVE.

SINGLE SQUARE TUBE SIGN POST INSTALLATION

AS NOTED BY THE TRIANGLE SYMBOL ▲ ON THE LOCATION AND SPECIFICATION SHEETS.

(SURFACE MOUNT SYSTEMS LISTED ON THE DEPARTMENT'S QUALIFIED PRODUCTS LIST ARE ALLOWED TO BE USED IN PLACE OF THE DESIGN SHOWN HERE AS AN EQUAL OPTION.)



* MINIMUM OF 2 SHIMS REQUIRED PER INSTALLATION TO TAKE UP TOLERANCE BETWEEN SUPPORT AND ANCHOR SLEEVE.

** SUPPORT AND ANCHOR COMPONENT UNIT WEIGHT

SUPPORT			ANCHOR		
TUBE SIZE	WEIGHT	WALL THICKNESS	TUBE SIZE	WEIGHT	WALL THICKNESS
2" [51]	2.42 LB./FT. [3.6 kg/m]	0.105"(12 GAUGE) [2.7 (12 GAUGE)]	2.5" [64]	18.36 LB. EA. [8.33 kg EACH]	0.135"(7 GAUGE) [3.4 (7 GAUGE)]
2.25" [57]	2.77 LB./FT. [4.12 kg/m]	0.105"(12 GAUGE) [2.7 (12 GAUGE)]	3" [76]	22.98 LB. EA. [10.43 kg EACH]	0.188"(7 GAUGE) [4.8 (7 GAUGE)]
2.5" [64]	3.14 LB./FT. [4.67 kg/m]	0.105"(12 GAUGE) [2.7 (12 GAUGE)]			

NOTES:

① BREAKAWAY DEVICES MUST BE LISTED ON THE DEPARTMENT'S QUALIFIED PRODUCTS LIST.

② USE CLASS GENERAL CONCRETE WITH WOOD FLOAT FINISH ON TOP. FORM TOP 6" [150] OF FOUNDATION.

③ GALVANIZE PIPE PER AASHTO M 111.

④ PAINT PIPE WITH ONE SHOP COAT AND ONE FIELD COAT OF ZINC RICH BASED PAINT AND ONE FIELD COAT OF ALUMINUM PAINT, AS SPECIFIED IN THE STANDARD SPECIFICATIONS SECTION 710, ON ALL SURFACES NOT IN CONTACT WITH THE CONCRETE.

⑤ CONFORM STEEL PIPE TO THE REQUIREMENTS OF ASTM A 53 TYPE E OR S, GRADE B.

⑥ SUBMIT SHOP DRAWINGS TO BE APPROVED BY THE MONTANA DEPARTMENT OF TRANSPORTATION BEFORE FABRICATION HAS BEGUN.

⑦ STEEL POSTS AND FOOTINGS IN PLACE, INCLUDING ALL CONCRETE, WELDING, EXCAVATION, AND ALL INCIDENTALS ARE INCLUDED IN THE UNIT PRICE BID PER POUND FOR TUBULAR STEEL POSTS.

⑧ USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

⑨ POST LENGTH IS MEASURED FROM POINT INDICATED TO TOP OF POST. TYPE OF POSTS AND FOUNDATIONS, AS WELL AS LENGTHS ARE NOTED IN THE SIGNING QUANTITIES.

⑩ POST AND ANCHOR COMPONENTS MEASURED BY WEIGHT ACCORDING TO "SUPPORT AND ANCHOR COMPONENT UNIT WEIGHT" TABLE.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

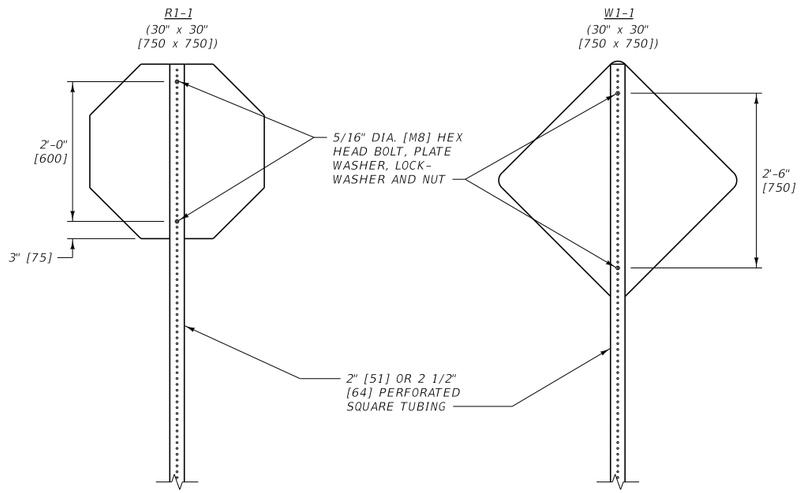
DETAILED DRAWING

REFERENCE STANDARD SPEC. SECTION 556,619,704,710

DWG. NO. 619-14

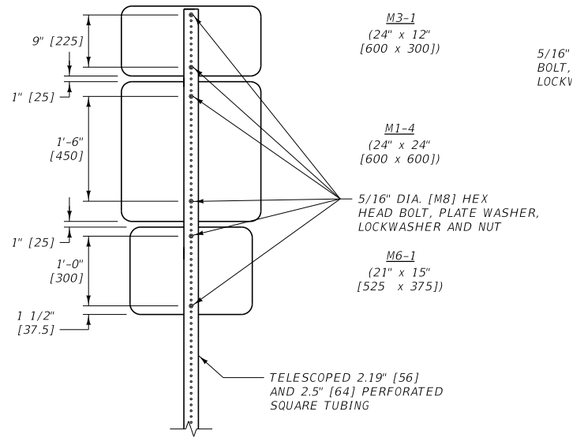
SQUARE TUBULAR SIGN POST BREAKAWAY DEVICES

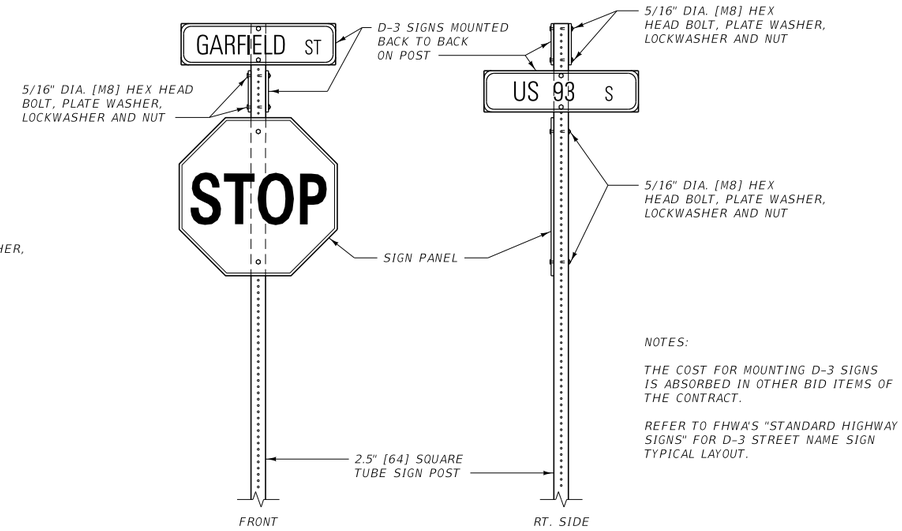
MDT MONTANA DEPARTMENT OF TRANSPORTATION



SIGNS WITHOUT BACKBRACING

(SEE PLANS FOR BACKBRACING REQUIREMENTS)



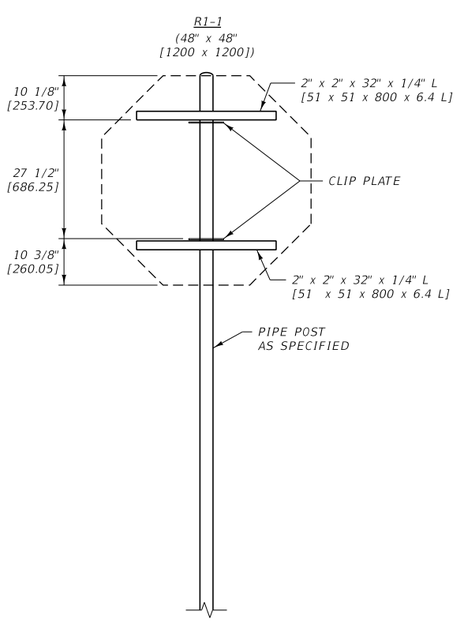


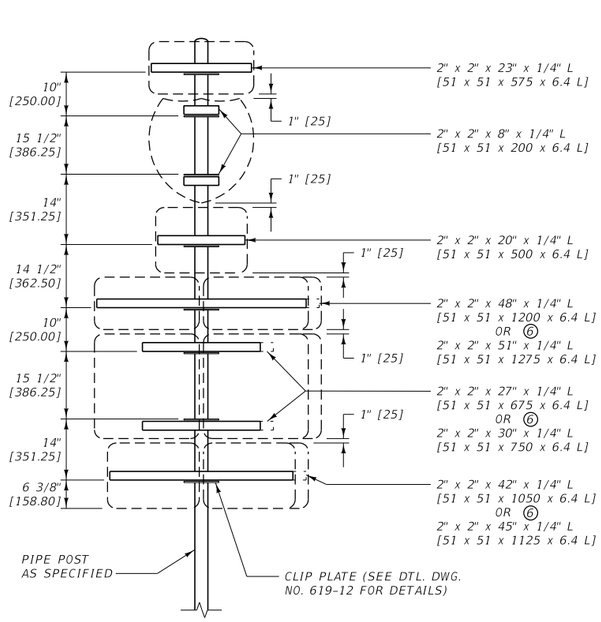
NOTES:

THE COST FOR MOUNTING D-3 SIGNS IS ABSORBED IN OTHER BID ITEMS OF THE CONTRACT.

REFER TO FHWA'S "STANDARD HIGHWAY SIGNS" FOR D-3 STREET NAME SIGN TYPICAL LAYOUT.

STREET NAME SIGN INSTALLATION





M3-1a
(24" x 12"
[600 x 300])

M1-1
(24" x 24"
[600 x 600])

M6-1
(21" x 15"
[525 x 375])

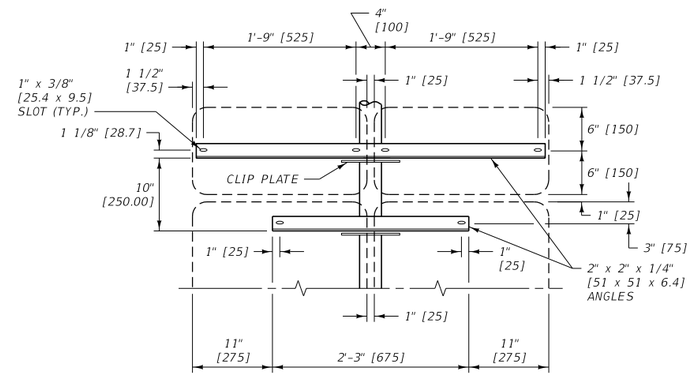
M3-1
(2 SIGNS)
(24" X 12"
[600 X 300])

M1-4
(2 SIGNS)
(24" X 24"
[600 X 600])
OR
(30" X 24"
[750 X 600])

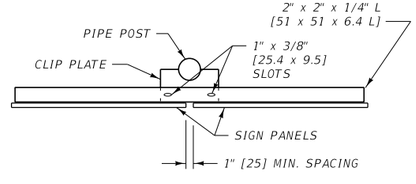
M6-1
(2 SIGNS)
(21" X 15"
[525 X 375])

SIGNS WITH BACKBRACING

(SEE PLANS FOR BACKBRACING REQUIREMENTS.
SIGN FACE IS SHOWN IN FRONT OF BACKBRACING.)



ELEVATION



PLAN VIEW

TYPICAL MOUNTING DETAILS

(FOR 3" [75] DIA. AND LARGER PIPE)

NOTES:

1. VERTICAL DIMENSIONS SHOWN ARE FROM TOP TO TOP OF ALL POST CLIP PLATES.
2. PLACE A SUITABLE WATERTIGHT CAP ON TOP OF ALL PIPE POSTS.
3. CONFORM MATERIAL USED IN FABRICATION OF POST CLIPS AND ANGLE BRACKETS TO SECTION 556.
4. THE LENGTH OF EACH ANGLE BRACKET DEPENDS ON THE MOUNTING ASSEMBLY AND HOLE SPACING OF EACH SIGN. THE ASSEMBLIES SHOWN ARE TYPICAL INSTALLATIONS. ERECT SIMILAR ASSEMBLIES IN A LIKE MANNER.
5. REFER TO FHWA'S "STANDARD HIGHWAY SIGNS" FOR STANDARD HOLE SPACING IN SIGNS.
6. SEE SIGNING PLANS FOR ROUTE MARKER ASSEMBLY LAYOUT.
7. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

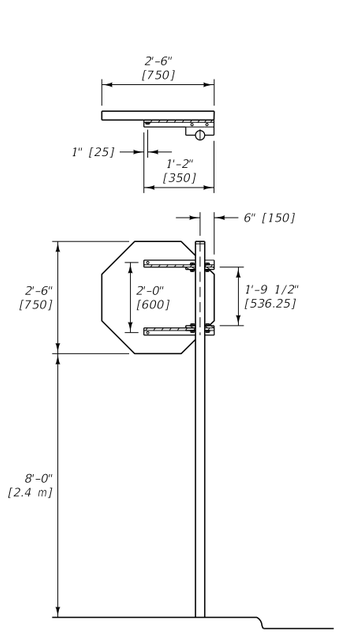
DETAILED DRAWING

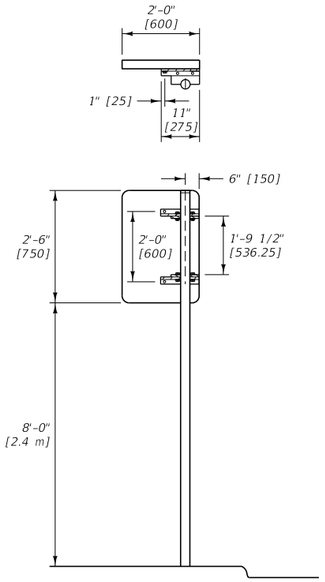
REFERENCE STANDARD SPEC. SECTION 556,619,704

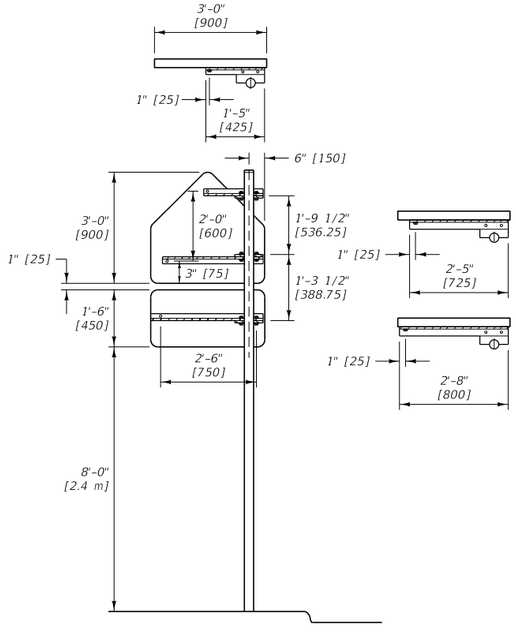
DWG. NO. 619-16

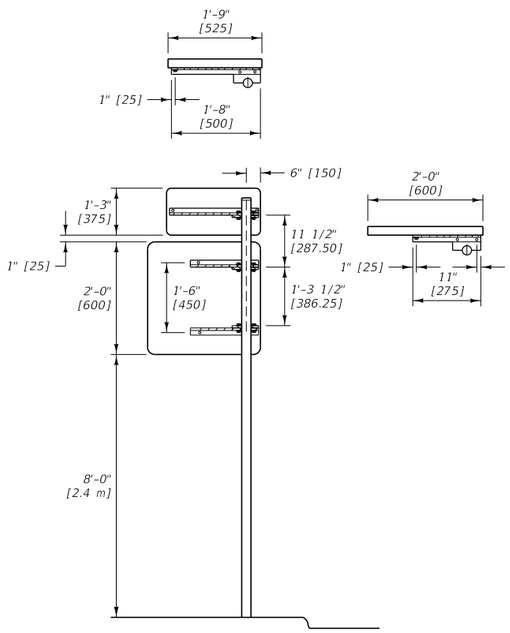
TYPICAL STEEL POST MOUNTING DETAILS

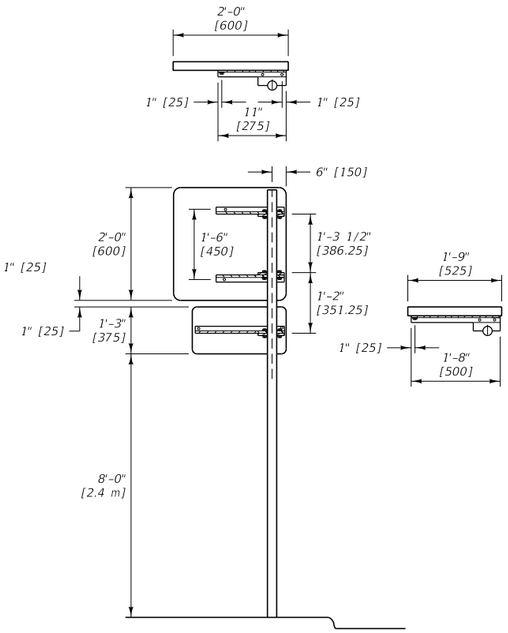
MDT MONTANA DEPARTMENT OF TRANSPORTATION





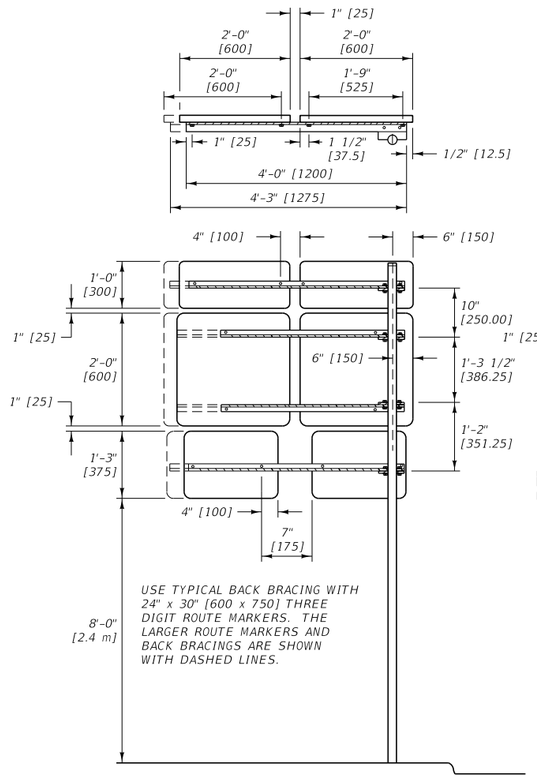




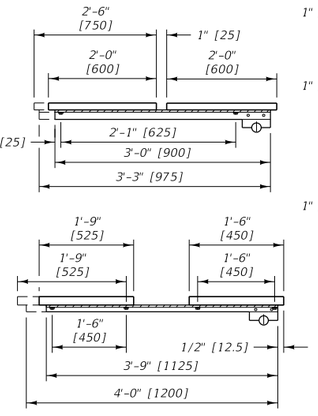


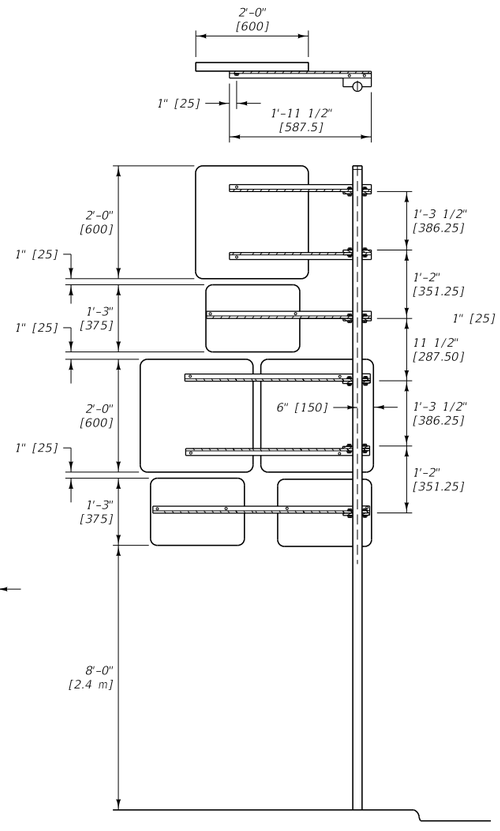
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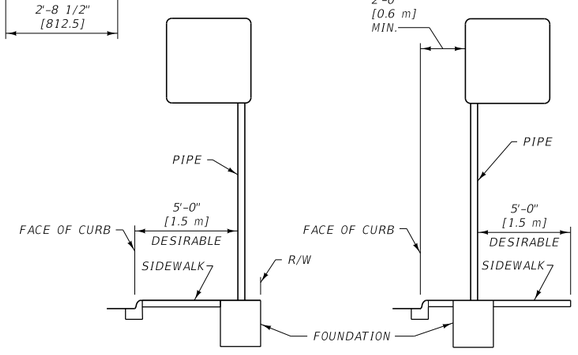
1. REFER TO FHWA'S MANUAL "STANDARD HIGHWAY SIGNS" FOR STANDARD HOLE SPACING IN SIGNS.
2. USE POST CLIPS AS SHOWN IN SIGNING DETAILED DRAWING NO. 619-12 WHEN CANTILEVER MOUNTING IS NECESSARY.
3. USE POSTS ONE SIZE LARGER THAN THOSE REQUIRED FOR STANDARD MOUNTINGS.
4. DIMENSIONS FOR POST CLIP SPACING ARE SHOWN TO THE TOP OF EACH CLIP.
5. ALTERNATE MOUNTING MUST BE APPROVED BY THE PROJECT MANAGER.
6. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.



USE TYPICAL BACK BRACING WITH 24" x 30" [600 x 750] THREE DIGIT ROUTE MARKERS. THE LARGER ROUTE MARKERS AND BACK BRACINGS ARE SHOWN WITH DASHED LINES.



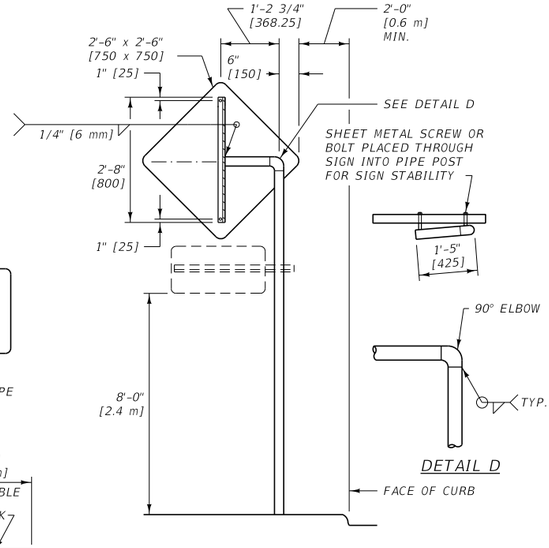




ALTERNATE A

ALTERNATE B

USE THE STANDARD TYPE MOUNTING BEHIND SIDEWALKS IF R/W LIMITS PERMIT. IF R/W DOES NOT PERMIT, THEN ALTERNATE A SHOULD BE USED BEHIND SIDEWALKS OR IN THE SIDEWALK NEXT TO A BUILDING. IF CONDITIONS ARE SUCH THAT THE SIGN CANNOT BE MOUNTED ON THE BACKSIDE OF THE SIDEWALK THEN USE ALTERNATE B.



DETAIL D

DETAIL C

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

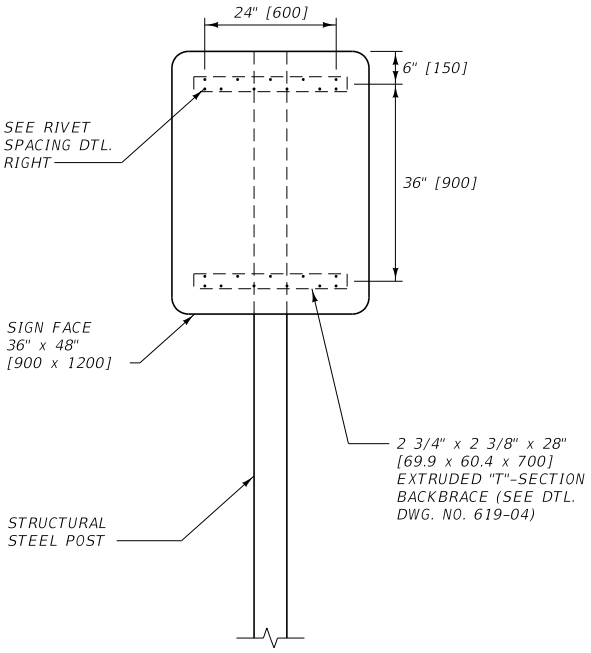
DETAILED DRAWING

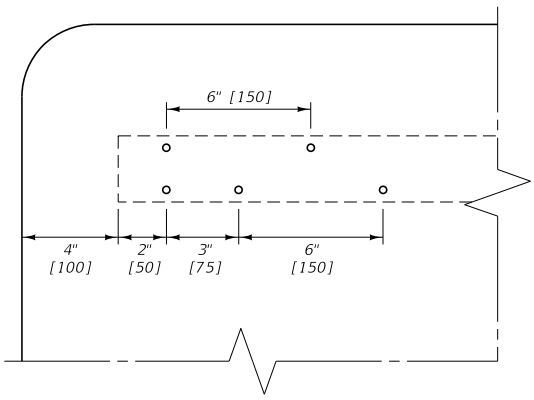
REFERENCE STANDARD SPEC. SECTION 556,619,704

DWG. NO. 619-18

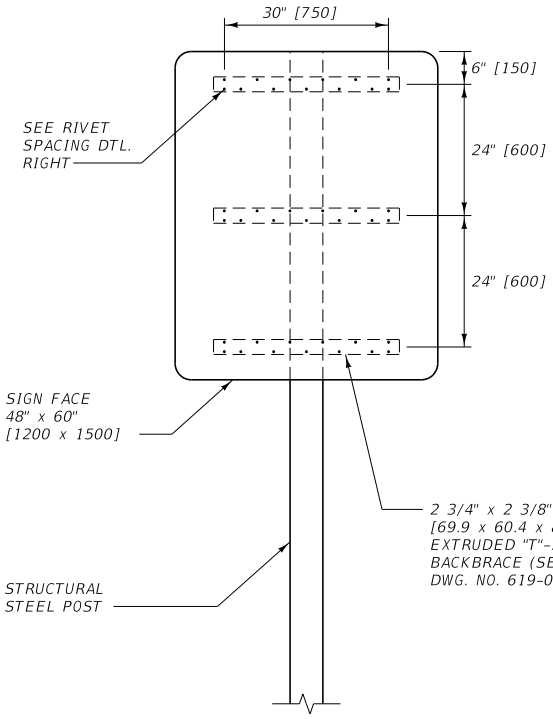
CANTILEVER TYPE SIGN SUPPORT DETAILS FOR SIDEWALK AREAS

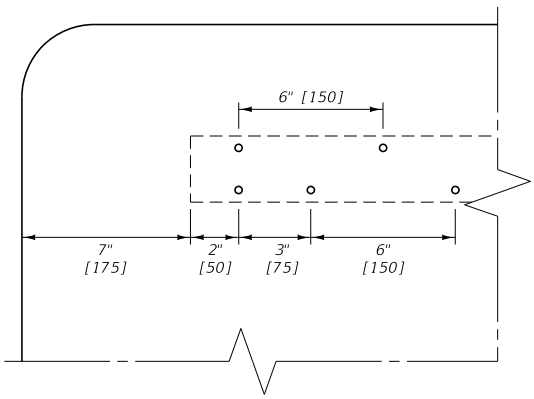
MDT MONTANA DEPARTMENT OF TRANSPORTATION





RIVET SPACING





RIVET SPACING

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

NOTES:

1. SEE THE PLANS FOR BACKBRACING REQUIREMENTS.
2. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

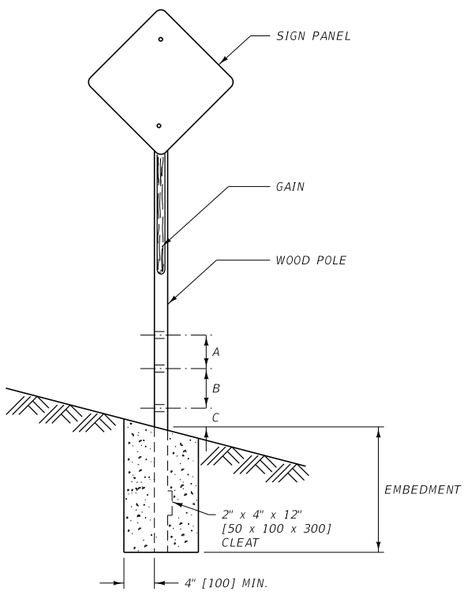
DETAILED DRAWING

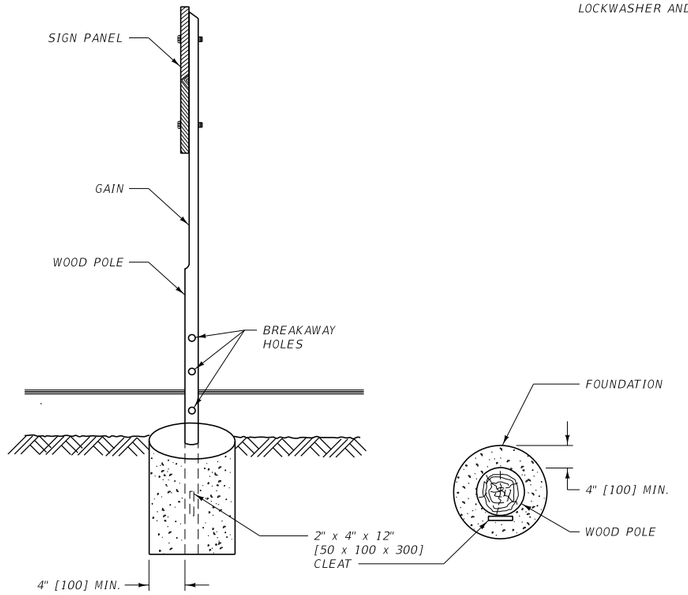
REFERENCE STANDARD SPEC. SECTION 619,704

DWG. NO. 619-19

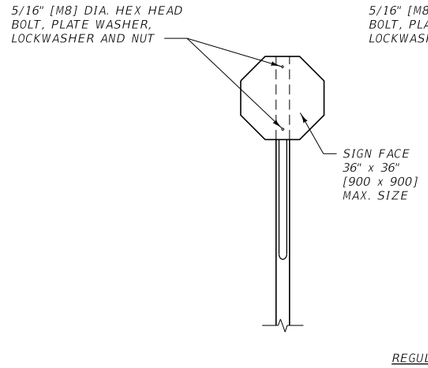
STRUCTURAL STEEL POST SIGN MOUNTING DETAILS

MDT MONTANA DEPARTMENT OF TRANSPORTATION

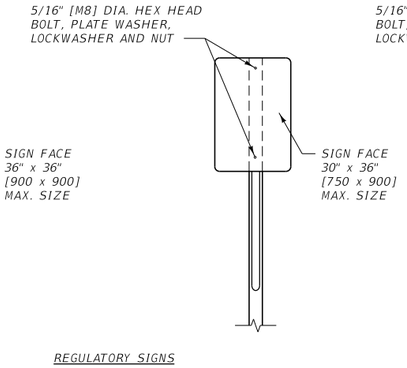


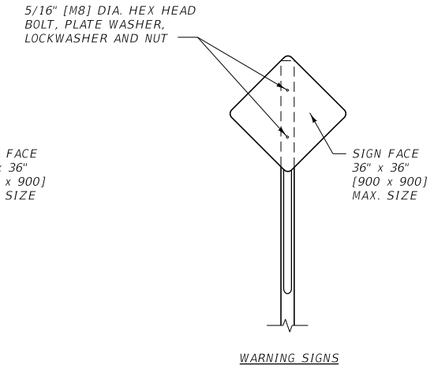


BREAKAWAY AND FOOTING DETAILS



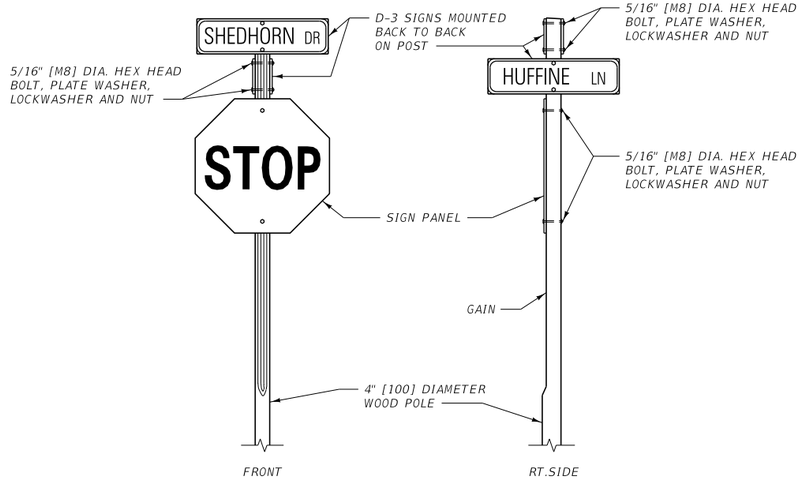
REGULATORY SIGNS





WARNING SIGNS

TYPICAL SIGN MOUNTINGS

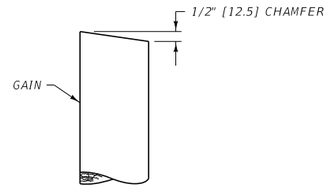


NOTES:

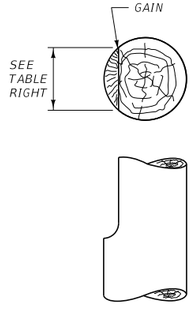
THE COST FOR MOUNTING D-3 SIGNS IS ABSORBED IN OTHER BID ITEMS OF THE CONTRACT.

REFER TO FHWA'S "STANDARD HIGHWAY SIGNS" FOR D-3 STREET NAME SIGN TYPICAL LAYOUT.

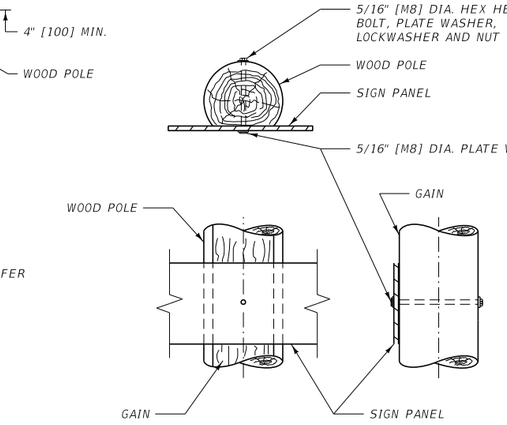
STREET NAME SIGN INSTALLATION



TOP END TREATMENT



GAIN DETAIL



SIGN MOUNTING DETAIL

NOTES:

1. CONFORM ALL WOOD POLES TO THE REQUIREMENTS OF SECTION 704.
2. GAIN ALL POLES ON THE SIGN SIDE THE MINIMUM WIDTH SHOWN IN THE TABLE, FOR HALF THE LENGTH OF EACH POLE.
3. BREAKAWAY DETAILS ARE STANDARD FOR ALL WOOD POLES LISTED IN THE TABLE, ON SINGLE AND MULTIPLE SIGN SUPPORTS.
4. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.
5. ATTACH A 2" x 4" x 12" [50 x 100 x 300] BOARD 12" [300] FROM THE BOTTOM OF THE POLE TO PREVENT SPINNING. ATTACH THIS CLEAT BY DRIVING TWO 16d NAILS THROUGH THE CLEAT AND INTO THE POLE. TREAT THE 2" x 4" [50 x 100] CLEAT.
6. THE MAXIMUM CROSS-SECTIONAL AREA AT A POINT 4" [100] ABOVE GROUND LEVEL MAY NOT EXCEED 24 SQUARE INCHES [15 480 mm²] EXCLUSIVE OF DRILLED BREAKAWAY HOLES FOR UNPROTECTED POST INSTALLATIONS. THE HOLE DIAMETER MAY BE ENLARGED IF NECESSARY TO ENSURE THIS REQUIREMENT IS MET.
7. USE SOIL CEMENT FOR THE FOUNDATION – PER SECTION 619.
8. FOR SIGNS REQUIRING BACKBRACING, CONSULT DTL. DWG. NO. 619-21 AND 619-22 FOR BACKBRACING OPTIONS AND DETAILS.

SIGN MOUNTING DIMENSIONS

POLE SIZE	A	B	C	HOLE DIA. (SEE NOTE 6)	EMBEDMENT	GAIN
3" TOP DIA.	~	~	~	~	3'-0"	2 3/4"
4" TOP DIA.	~	~	~	~	3'-0"	3 1/2"
5" TOP DIA.	~	12"	4"	2"	3'-6"	4"
6" TOP DIA.	~	12"	4"	2 1/2"	4'-6"	4"
CLASS 4	~	12"	4"	2"	5'-0"	4"
CLASS 3	~	12"	4"	2 1/2"	5'-6"	4"
CLASS 2	6"	6"	4"	2"	6'-0"	4"
CLASS 1	6"	6"	4"	2 1/2"	6'-6"	4"

MUST BE PROTECTED OR OUT OF CLEAR ZONE

METRIC SIGN MOUNTING DIMENSIONS

POLE SIZE (mm)	A (mm)	B (mm)	C (mm)	HOLE DIA. (SEE NOTE 6) (mm)	EMBEDMENT	GAIN (mm)
75 TOP DIA.	~	~	~	~	0.9 m	70
100 TOP DIA.	~	~	~	~	0.9 m	90
130 TOP DIA.	~	300	100	51	1.1 m	100
150 TOP DIA.	~	300	100	64	1.4 m	100
CLASS 4	~	300	100	51	1.5 m	100
CLASS 3	~	300	100	64	1.7 m	100
CLASS 2	150	150	100	51	1.8 m	100
CLASS 1	150	150	100	64	2.0 m	100

MUST BE PROTECTED OR OUT OF CLEAR ZONE

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

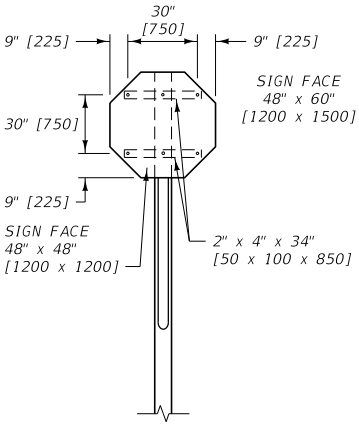
DETAILED DRAWING

REFERENCE STANDARD SPEC. SECTION 619,704

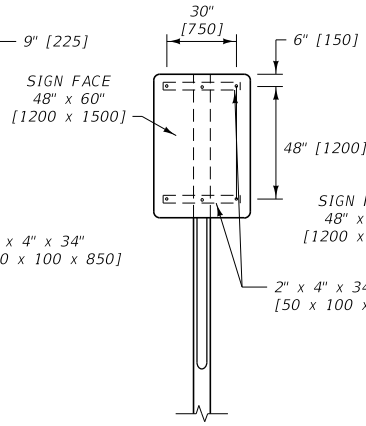
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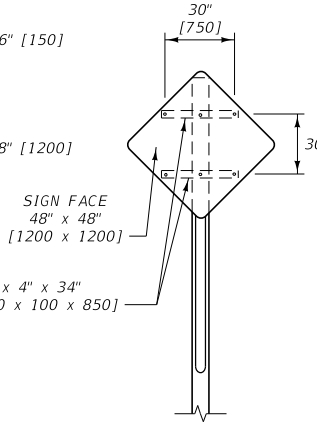
TREATED WOOD POLE SIGN MOUNTING AND SUPPORT DETAILS

MDT MONTANA DEPARTMENT OF TRANSPORTATION

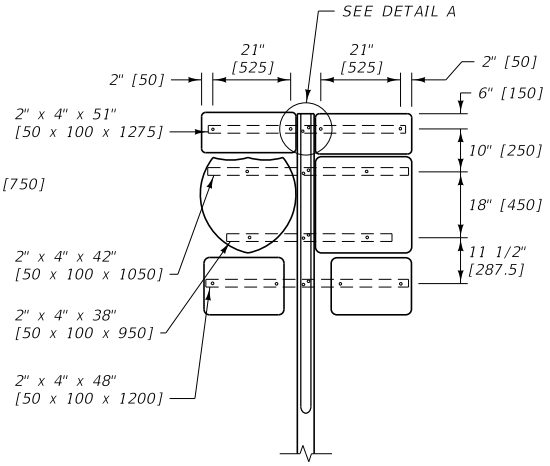


REGULATORY SIGNS





WARNING SIGNS

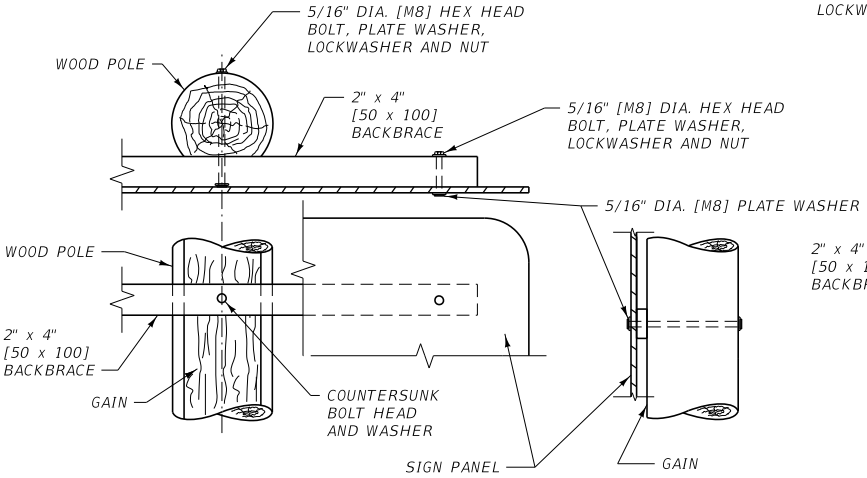


ROUTE MARKER ASSEMBLY

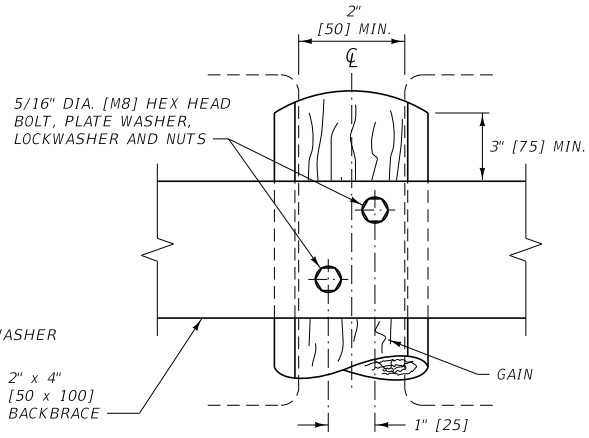
NOTE:

1. SIGNS OF THESE SIZES AND LARGER REQUIRE WOOD BACKBRACING.
2. SMALLER SIGNS MAY REQUIRE BACKBRACING IF THE CONDITIONS WARRANT (SEE SIGNING PLANS). IN THIS CASE, THE CONTRACTOR HAS THE OPTION OF USING WOOD OR STEEL BACKBRACING (SEE DTL. DWG. NO. 619-22).

WOOD BACKBRACE INSTALLATIONS



SIGN MOUNTING DETAIL

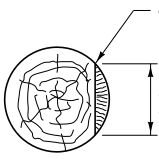


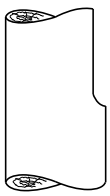
DETAIL A

(BACKBRACE)

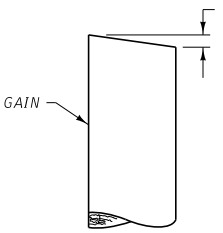
NOTES:

1. CONFORM ALL WOOD POLES TO THE REQUIREMENTS OF SECTION 704.
2. GAIN ALL POLES ON THE SIGN SIDE THE MINIMUM WIDTH SHOWN IN THE TABLE ON DTL. DWG. NO. 619-20, FOR HALF THE LENGTH OF EACH POLE.
3. USE TREATED 2" x 4" [50 x 100] S4S LUMBER FOR ALL WOOD BACKBRACING, CONFORMING TO THE REQUIREMENTS OF SECTION 704.
4. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.
5. SEE DTL. DWG. NO. 619-20 FOR BREAKAWAY AND SUPPORT DETAILS.





GAIN DETAIL



TOP END TREATMENT

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

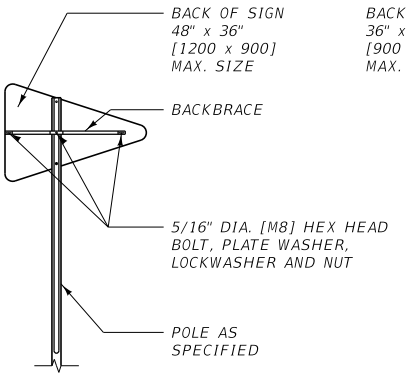
DETAILED DRAWING

REFERENCE
STANDARD SPEC.
SECTION 619,704

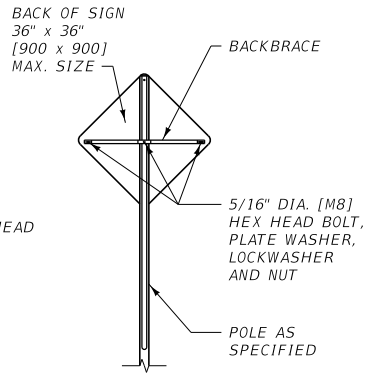
DWG. NO.
619-21

TREATED WOOD POLE SIGN MOUNTING DETAILS

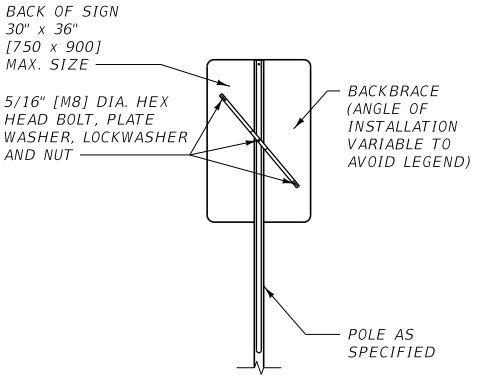
MDT MONTANA DEPARTMENT OF TRANSPORTATION



NO PASSING PENNANTS

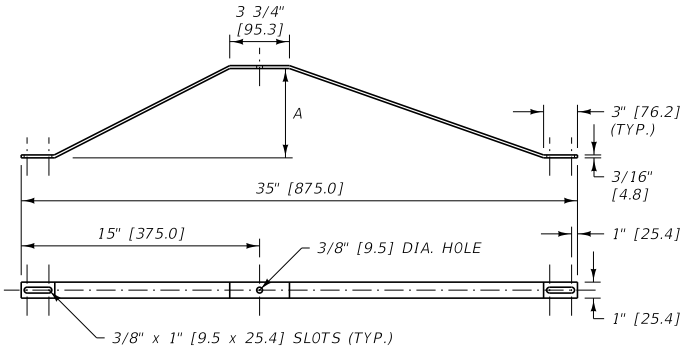


WARNING SIGNS

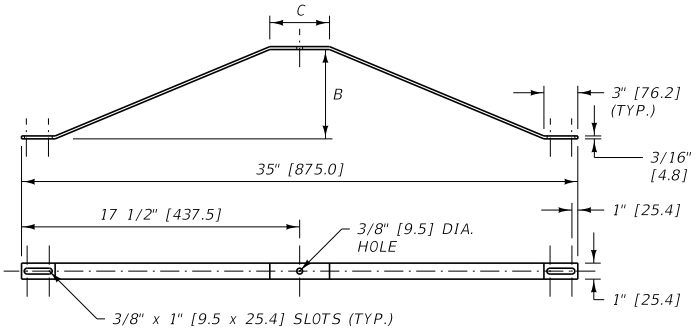


REGULATORY SIGNS

STEEL BACKBRACE INSTALLATIONS



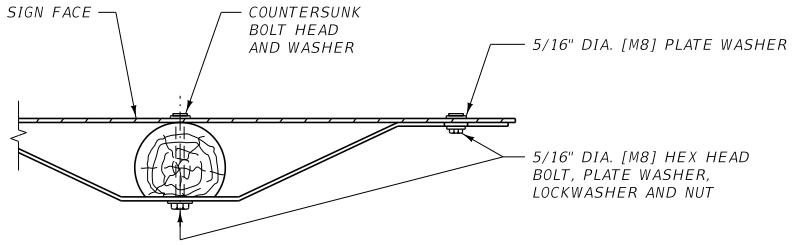
NO PASSING PENNANTS

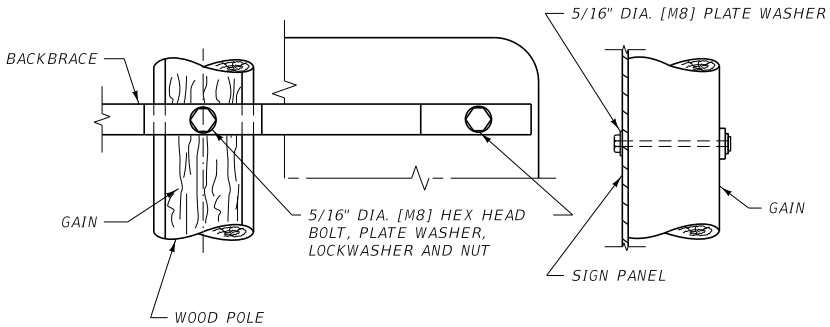


REGULATORY AND WARNING SIGNS

POLE DIA.	A	B	C
3" [75]	2 1/8" [54.0]	2 1/8" [54.0]	3 3/4" [95.3]
4" [100]	3" [76.2]	3" [76.2]	3 3/4" [95.3]
5" [130]	~	4" [101.6]	4 1/4" [108.0]
6" [150]	~	5 1/4" [133.4]	4 1/4" [108.0]

STEEL BACKBRACE DETAILS





SIGN MOUNTING DETAIL

NOTES:

1. USE COMMERCIAL QUALITY, MILD STEEL, THAT IS HOT-DIPPED AFTER FABRICATION. GALVANIZE IN ACCORDANCE WITH SUBSECTION 711.08.
2. SEE DTL. DWG. NO. 619-20 FOR ADDITIONAL SIGN MOUNTING REQUIREMENTS. MOUNT SIGN FACE TO POLE BEFORE INSTALLING BACKBRACING.
3. SEE DTL. DWG. NO. 619-20 FOR BREAKAWAY AND SUPPORT DETAILS.
4. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

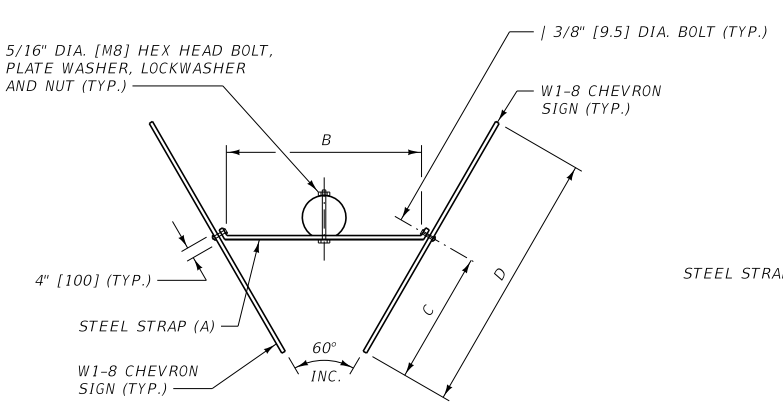
DETAILED DRAWING

REFERENCE
STANDARD SPEC.
SECTION 619, 704, 711

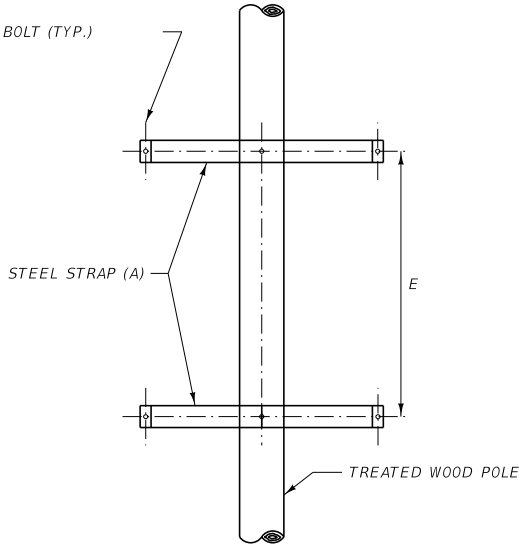
DWG. NO.
619-22

TREATED WOOD POLE OPTIONAL BACKBRACE

MDT MONTANA DEPARTMENT OF TRANSPORTATION



PLAN VIEW



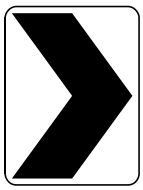
ELEVATION

SIGN SIZE	DIMENSIONS				
	A	B	C	D	E
18" x 24"	1/4" x 2" x 1'-11"	15"	9"	18"	18"
24" x 30"	1/4" x 2" x 2'-2"	18"	12"	24"	24"
30" x 36"	1/4" x 2" x 2'-5"	21"	15"	30"	30"
36" x 48"	1/4" x 2" x 2'-8"	24"	18"	36"	36"

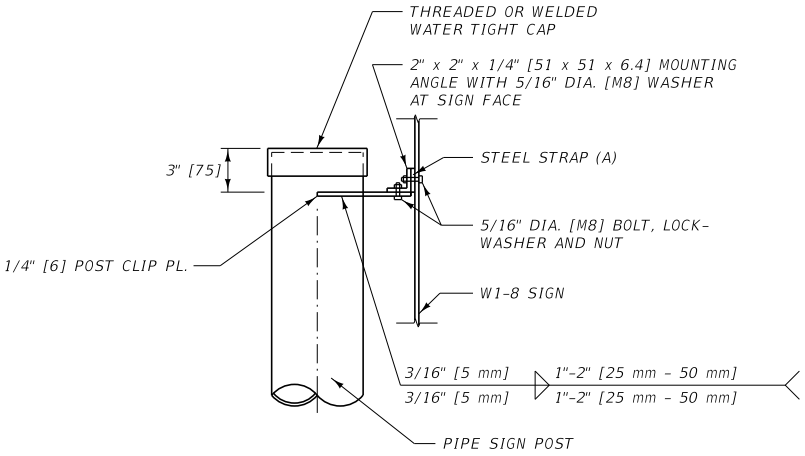
SIGN SIZE (mm)	METRIC DIMENSIONS (mm)				
	A	B	C	D	E
450 x 600	6 x 50 x 580	380	225	450	450
600 x 750	6 x 50 x 655	455	300	600	600
750 x 900	6 x 50 x 735	535	375	750	750
900 x 1200	6 x 50 x 810	610	450	900	900

WOOD POST MOUNTING

MOUNT 2 CHEVRON SIGNS ON EACH POST WITH EACH PANEL ADJUSTED TO APPROXIMATE RIGHT ANGLE TO ROADWAY CENTERLINE. EXACT LOCATION AND ANGLE TO BE DETERMINED BY THE PROJECT MANAGER.



W1-8 CHEVRON ALIGNMENT SIGNS MAY BE USED AS AN ALTERNATE OR AS A SUPPLEMENT TO DELINEATION TO PROVIDE ADDITIONAL EMPHASIS AND GUIDANCE WHEN A CHANGE IN HORIZONTAL ALIGNMENT EXISTS IN THE ROADWAY.



STEEL PIPE MOUNTING

NOTES:

1. INSTALL CHEVRONS WITH A MINIMUM 10'-0" [3.1 m] HORIZONTAL CLEARANCE AND A 5'-0" [1.5 m] VERTICAL MOUNTING HEIGHT.
2. SPACING FOR DESIGN PURPOSES IS DOUBLE THE SPACING SHOWN IN THE TABLE ON DTL. DWG. NO. 619-36, UP TO A MAXIMUM CHEVRON SPACING OF 200' [60 m]. A MINIMUM OF 3 VISIBLE CHEVRONS ARE REQUIRED THROUGH A CURVE.
3. FIELD INSPECT THE CHEVRONS AT NIGHT AND ADJUST THEIR LOCATIONS TO ACHIEVE 500' [150 m] OF VISIBILITY.
4. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING

REFERENCE STANDARD SPEC. SECTION 619, 704

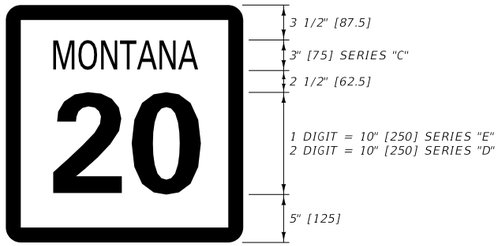
DWG. NO. 619-24

CHEVRON MOUNTING DETAILS

MDT MONTANA DEPARTMENT OF TRANSPORTATION

PANELS

FOR USE ON ROUTE MARKER ASSEMBLIES



M1-5

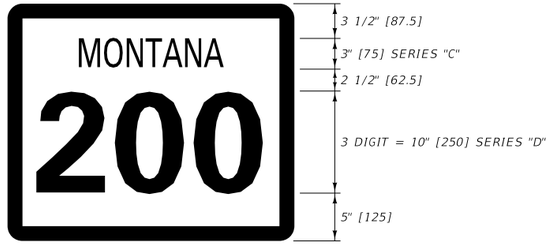
24" x 24" [600 x 600]

MARGIN = NONE

BORDER = 1 1/2" [37.5]

CORNER RADIUS = 1 1/2" [37.5]

BLACK LEGEND AND BORDER ON A RETRO-REFLECTORIZED WHITE BACKGROUND.



M1-5

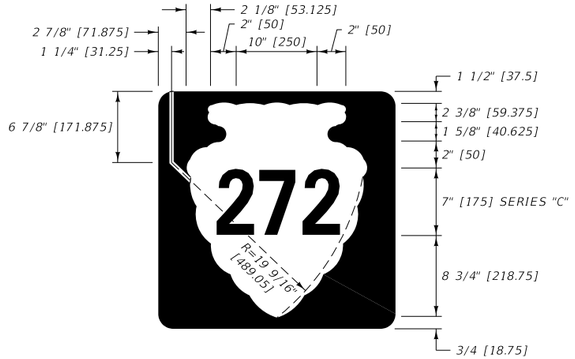
30" x 24" [750 x 600]

MARGIN = NONE

BORDER = 1 1/2" [37.5]

CORNER RADIUS = 1 1/2" [37.5]

BLACK LEGEND AND BORDER ON A RETRO-REFLECTORIZED WHITE BACKGROUND.



M1-12

24" x 24" [600 x 600]

MARGIN = NONE

BORDER = SEE DESIGN ABOVE

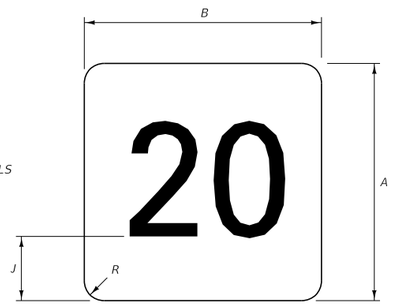
CORNER RADIUS = 1 1/2" [37.5]

BLACK LEGEND AND BORDER ON A RETRO-REFLECTORIZED WHITE BACKGROUND.

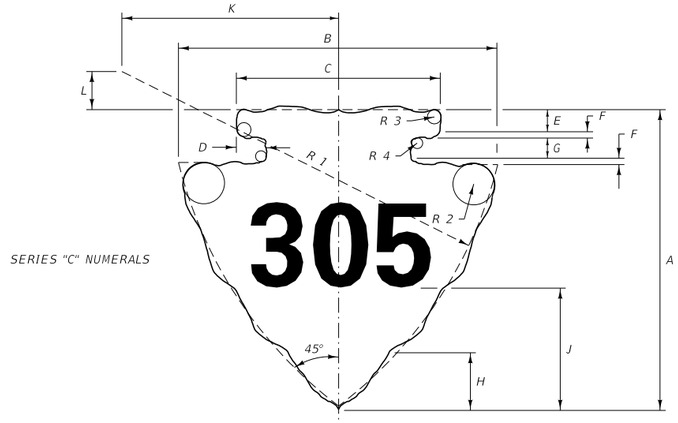
SHIELDS

FOR USE ON GUIDE SIGNS

SERIES "D" NUMERALS



SERIES "C" NUMERALS



	SIGN DIMENSIONS					
	10" NUMERALS		12" NUMERALS		18" NUMERALS	
	2 DIGIT	3 DIGIT	2 DIGIT	3 DIGIT	2 DIGIT	3 DIGIT
A	21"	21"	24"	24"	36"	36"
B	24"	30"	24"	30"	36"	45"
J	6"	6"	6 1/2"	6 1/2"	9 1/2"	9 1/2"
R	1 1/2"	1 1/2"	2"	2"	2 1/2"	2 1/2"
	METRIC SIGN DIMENSIONS (mm)					
	250 mm NUMERALS		300 mm NUMERALS		450 mm NUMERALS	
	2 DIGIT	3 DIGIT	2 DIGIT	3 DIGIT	2 DIGIT	3 DIGIT
A	525	525	600	600	900	900
B	600	750	600	750	900	1125
J	150	150	162.5	162.5	237.5	237.5
R	37.5	37.5	50	50	62.5	62.5

BLACK LEGEND ON A RETRO-REFLECTORIZED WHITE BACKGROUND WITH NO BORDER.

		SIGN DIMENSIONS											RADII			
		A	B	C	D	E	F	G	H	J	K	L	R 1	R 2	R 3	R 4
*	8" NUMERALS	26"	28"	18 1/2"	2 5/8"	3"	5/16"	2"	5 1/2"	11"	17"	2 1/4"	32"	1 3/4"	5/8"	5/16"
**	10" NUMERALS	32"	34"	22 1/2"	3 1/4"	3 5/8"	3/8"	2 1/2"	6 3/4"	13 3/4"	20 1/2"	2"	38 1/2"	2"	3/4"	3/8"
***	12" NUMERALS	40"	42"	28"	4"	4 1/2"	1/2"	3"	8 7/16"	17"	25"	2 7/8"	48"	2 1/2"	1"	1/2"
		METRIC SIGN DIMENSIONS (mm)											METRIC RADII (mm)			
		A	B	C	D	E	F	G	H	J	K	L	R 1	R 2	R 3	R 4
*	200 mm NUMERALS	650	700	462.5	65.625	75	7.8	50	137.5	275	425	56.25	800	43.75	15.625	7.8
**	250 mm NUMERALS	800	850	562.5	81.25	90.625	9.375	62.5	168.75	343.75	512.5	50	962.5	50	18.75	9.375
***	300 mm NUMERALS	1000	1050	700	100	112.5	12.5	75	210.9	425	625	71.875	1200	62.5	25	12.5

BLACK LEGEND ON A RETRO-REFLECTORIZED WHITE BACKGROUND.

* USE WITH STANDARD 24" [600] U.S. SHIELD.

** USE WITH STANDARD 30" [750] AND 36" [900] U.S. SHIELD.

*** USE WITH STANDARD 42" [1050] U.S. SHIELD AND ALL INDEPENDENT USE.

NOTES:

1. CENTER ALL NUMERALS USED ON PANELS AND SHIELDS OPTICALLY ABOUT VERTICAL CENTERLINE.
2. SEE SIGNS AND SIGNING MATERIALS CATALOG FOR COMPLETE LISTING OF SIGNS AND SIGN SIZES. DESIGNS ARE AVAILABLE FROM THE TRAFFIC ENGINEERING SIGNING UNIT FOR SIGNS UNIQUE TO MONTANA.
3. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

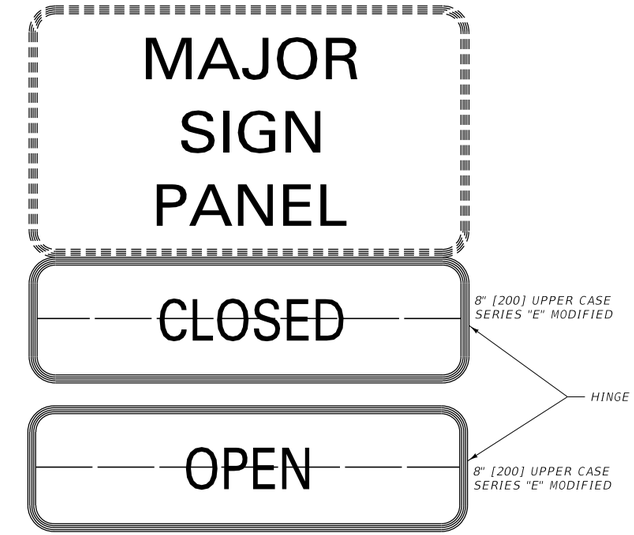
DETAILED DRAWING

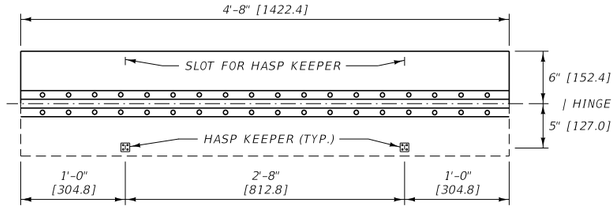
REFERENCE STANDARD SPEC. SECTION 619, 704

DWG. NO. 619-26

SPECIAL DESIGN ROUTE MARKER PANELS AND SHIELDS

MDT MONTANA DEPARTMENT OF TRANSPORTATION

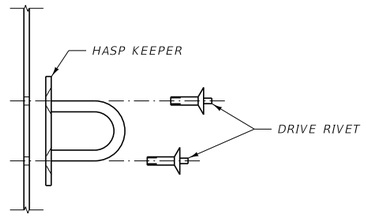




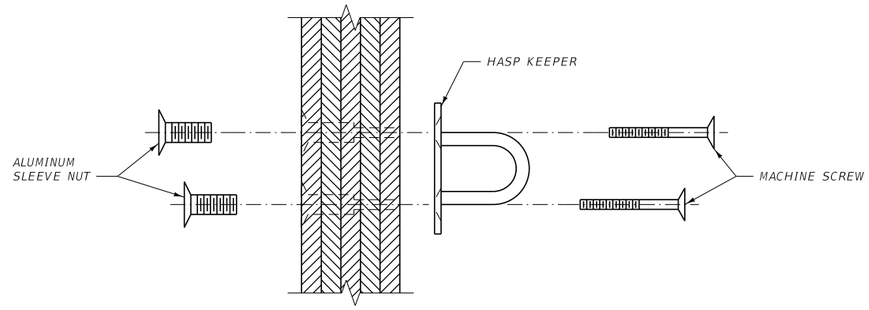
HINGE DETAIL
EXAMPLE

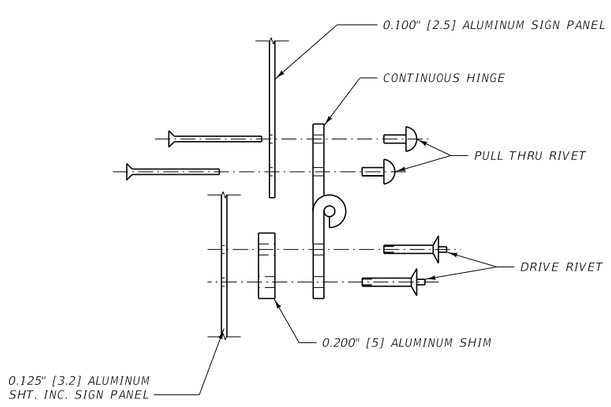
(5'-6" x 4'-0" [1650 x 1200] D8-2A WEIGH STATION SIGN SHOWN)

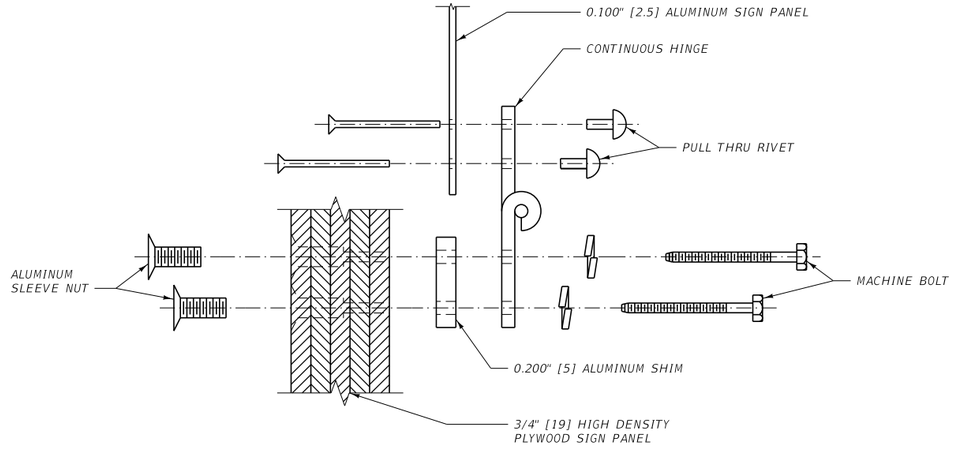
ALUMINUM SHEET MOUNTING



PLYWOOD MOUNTING







NOTES:

1. SEE SIGNS AND SIGNING MATERIALS CATALOG FOR COMPLETE LISTING OF SIGNS AND SIGN SIZES. DESIGNS ARE AVAILABLE FROM THE TRAFFIC ENGINEERING SIGNING UNIT FOR SIGNS UNIQUE TO MONTANA.
2. THE SIGN PANEL CONSISTS OF 3/4" [19] HIGH DENSITY PLYWOOD OR 0.125" [3.2] ALUMINUM SHEET INCREMENT AS SPECIFIED ON THE PLANS. THE HINGED PANEL CONSISTS OF 0.100" [2.5] SHEET ALUMINUM.
3. PAINT ALL HARDWARE VISIBLE ON THE SIGN FACE OR COVER WITH RETRO-REFLECTIVE SHEETING, THE SAME COLOR AS THE SIGN.
4. SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.
5. SUPPLEMENTAL SIGN PANEL BELOW MAJOR SIGN PANEL MUST HAVE RETRO-REFLECTORIZED LEGEND AND BACKGROUND MATCHING COLORS OF MAJOR PANEL.
6. THE MINIMUM MOUNTING HEIGHT TO THE BOTTOM OF THE SECONDARY PANEL IS 5'-0" [1.5 m].
7. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

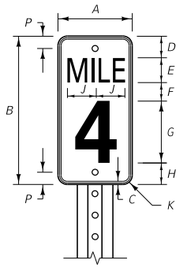
DETAILED DRAWING

REFERENCE
STANDARD SPEC.
SECTION 619,704

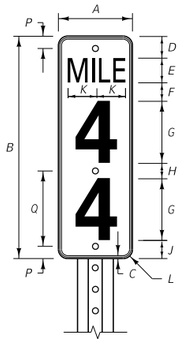
DWG. NO.
619-30

SIGN HINGE
DETAILS

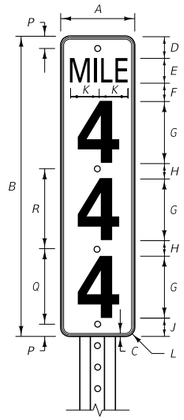
MDT MONTANA DEPARTMENT OF TRANSPORTATION



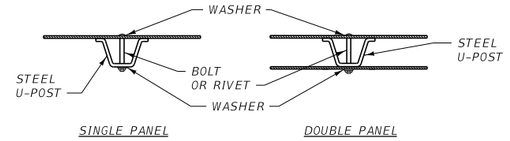
D10-1 AND D10-4



D10-2 AND D10-5



D10-3 AND D10-6



TYPICAL PANEL MOUNTING

PANEL DIMENSION INFORMATION

INTERSTATE			
DIMENSION	D10-4 (1 DIGIT)	D10-5 (2 DIGIT)	D10-6 (3 DIGIT)
A	12.0"	12.0"	12.0"
B	24.0"	36.0"	48.0"
C	0.5"	0.5"	0.5"
D	3.5"	3.0"	3.0"
E	4.0" SERIES "D"	4.0" SERIES "D"	4.0" SERIES "D"
F	3.0"	3.0"	3.0"
G ⊙	10.0" SERIES "D"	10.0" SERIES "D"	10.0" SERIES "D"
H	3.5"	3.0"	2.5"
J	4.0"	3.0"	3.0"
K	1.5"	4.0"	4.0"
L	~	1.5"	1.5"
P	2.0"	2.0"	2.0"
Q	~	12.5"	12.5"
R	~	~	12.5"

NON-INTERSTATE			
DIMENSION	D10-1 (1 DIGIT)	D10-2 (2 DIGIT)	D10-3 (3 DIGIT)
A	10.0"	10.0"	10.0"
B	18.0"	27.0"	36.0"
C	0.5"	0.5"	0.5"
D	3.0"	3.0"	3.0"
E	4.0" SERIES "D"	4.0" SERIES "D"	4.0" SERIES "D"
F	2.0"	2.0"	2.0"
G ⊙	6.0" SERIES "D"	6.0" SERIES "D"	6.0" SERIES "D"
H	3.0"	3.0"	3.0"
J	4.0"	3.0"	3.0"
K	1.5"	4.0"	4.0"
L	~	1.5"	1.5"
P	1.5"	1.5"	1.5"
Q	~	9.0"	9.0"
R	~	~	9.0"

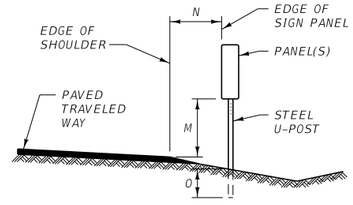
⊙ OPTICALLY CENTER DIGITS ON VERTICAL ℄ OF PANEL.

METRIC PANEL DIMENSION INFORMATION

INTERSTATE #			
DIMENSION	D10-4 (1 DIGIT)	D10-5 (2 DIGIT)	D10-6 (3 DIGIT)
A	300	300	300
B	600	900	1200
C	10	10	10
D	88	75	75
E	100 SERIES "D"	100 SERIES "D"	100 SERIES "D"
F	75	75	75
G ⊙	250 SERIES "D"	250 SERIES "D"	250 SERIES "D"
H	87	75	63
J	98	75	74
K	40	98	98
L	~	40	40
P	50	50	50
Q	~	313	313
R	~	~	313

NON-INTERSTATE #			
DIMENSION	D10-1 (1 DIGIT)	D10-2 (2 DIGIT)	D10-3 (3 DIGIT)
A	250	250	250
B	450	675	900
C	10	10	10
D	75	75	75
E	100 SERIES "D"	100 SERIES "D"	100 SERIES "D"
F	50	50	50
G ⊙	150 SERIES "D"	150 SERIES "D"	150 SERIES "D"
H	75	75	75
J	98	75	75
K	30	98	98
L	~	30	30
P	37.5	37.5	37.5
Q	~	225	225
R	~	~	225

⊙ OPTICALLY CENTER DIGITS ON VERTICAL ℄ OF PANEL.
ALL UNITS ARE IN MILLIMETERS (mm)



PLACEMENT DIMENSIONS		
DIMENSION	INTERSTATE	NON-INTERSTATE
M	4'	4'
N	6'	2' TO 6' *
O	3' MIN.	3' MIN.
METRIC PLACEMENT DIMENSIONS		
DIMENSION	INTERSTATE	NON-INTERSTATE
M	1.2 m	1.2 m
N	1.8 m	0.6 m TO 1.8 m *
O	0.9 m MIN.	0.9 m MIN.

* NORMALLY IN LINE WITH DELINEATORS

TYPICAL PLACEMENT

NOTES:

1. MILEPOST PANELS CONSIST OF A RETRO-REFLECTORIZED WHITE LEGEND AND BORDER ON A RETRO-REFLECTORIZED GREEN BACKGROUND.
2. MOUNT ALL MILEPOSTS ON STEEL U-POSTS (MIN. 2 LB./FT. [3 kg/m]) EXCEPT THE D10-6, WHICH IS MOUNTED ON A STEEL U-POST (MIN. 3 LB./FT. [4.5 kg/m]) AS NOTED IN THE SIGNING PLANS.
3. USE GALVANIZED OR CADMIUM PLATED 5/16" DIA. [M8] BOLT, NUT AND WASHER, AND JAM THREADS AFTER TIGHTENING. USE 5/16" [8] DIA. ALUMINUM OR CADMIUM PLATED BOLT RIVETS OR PAINT RIVET HEADS WITH BRILLIANT GREEN SIGN ENAMEL.
4. DO NOT RELOCATE OR MOVE A MILEPOST ONCE IT HAS BEEN PROPERLY PLACED.
5. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

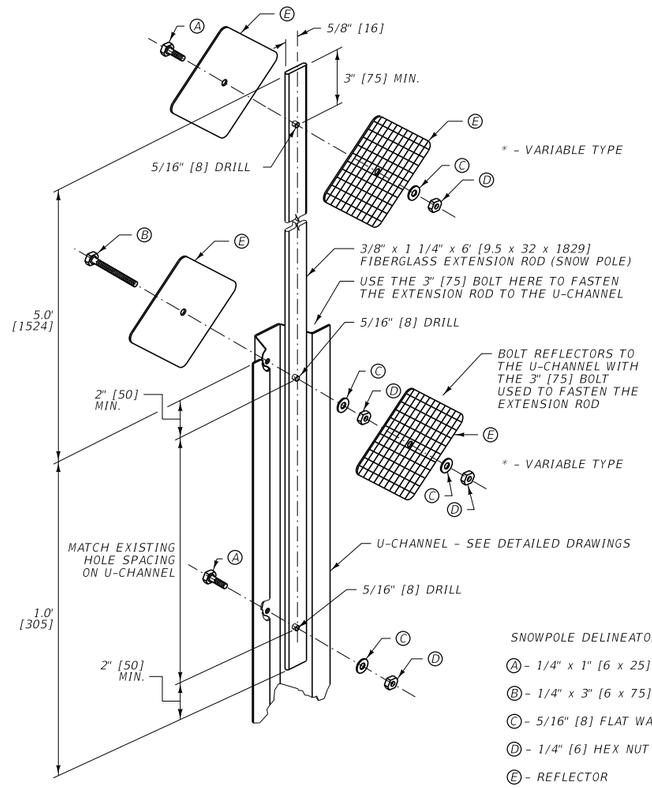
DETAILED DRAWING

REFERENCE STANDARD SPEC. SECTION 619, 704

DWG. NO. 619-32

MILEPOST (REFERENCE POST) DETAILS

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SNOWPOLE DELINEATOR NOTES:

- (A) – 1/4" x 1" [6 x 25] BOLT
- (B) – 1/4" x 3" [6 x 75] BOLT
- (C) – 5/16" [8] FLAT WASHER
- (D) – 1/4" [6] HEX NUT
- (E) – REFLECTOR

* = MATCH SNOWPOLE DELINEATOR WITH ROADWAY DELINEATOR.

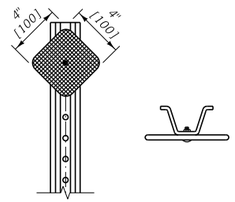
SNOWPOLE DELINEATOR DETAIL

DESIGN A USAGE:

USE FOR CONTINUOUS DELINEATION AND RT. SHOULDER OF ALL ROUTES.

DESIGN H USAGE:

USE ON LT. SHOULDER OF INTERSTATE ROUTES.



DESIGN A (WHITE)
DESIGN H (YELLOW)

DESIGN B USAGE:

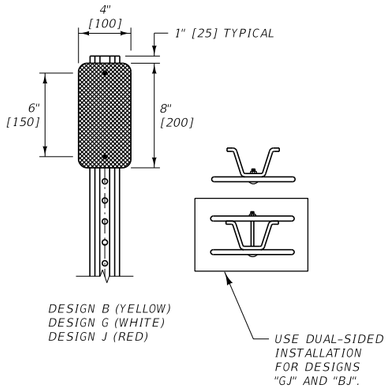
USE ON LT. SHOULDER OF INTERSTATE RAMPS AND AUTHORIZED VEHICLE ONLY CROSSOVERS.

DESIGN G USAGE:

USE ON RT. SHOULDER OF INTERSTATE RAMPS.

DESIGN J USAGE:

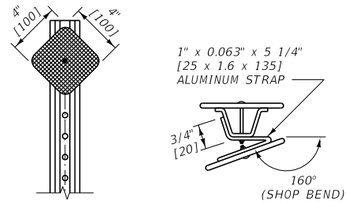
USE FOR TRUCK ESCAPE RAMPS AND INTERCHANGE OFF RAMPS FROM MID-POINT TO GORE LT & RT FOR WRONG WAY TRAVELERS.



DESIGN B (YELLOW)
DESIGN G (WHITE)
DESIGN J (RED)

DESIGN C USAGE:

USE FOR CURVES WITH RADII 573' [170 m] OR LESS, BOTH OUTSIDE AND INSIDE OF CURVE.



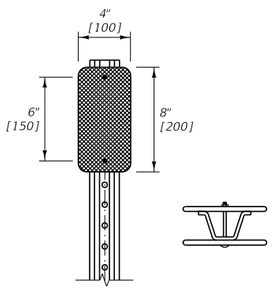
DESIGN C (WHITE)

NOTES:

1. SOME TYPICAL USES ARE SHOWN FOR EACH DESIGN. REFER TO THE MUTCD FOR SPECIFIC GUIDANCE.
2. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

DESIGN D USAGE:

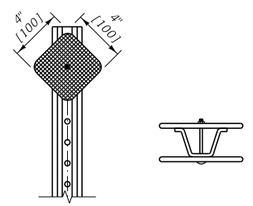
NON-INTERSTATE ROUTES: USE AT APPROACHES WITH STOP OR YIELD SIGNS.
INTERSTATE ROUTES: USE AT INTERSECTION OF RAMPS AND CROSSROAD.



DESIGN D (YELLOW)

DESIGN F USAGE:

USE FOR CURVES WITH RADII GREATER THAN 573' [170 m]; 1433' [450 m] TO 765' [231 m] RADIUS: OUTSIDE ONLY,
764' [230 m] TO 573' [171 m] RADIUS: OUTSIDE AND INSIDE OF CURVE.



DESIGN F (WHITE)

DELINEATOR LEGEND	
DESIGN "A"	⊣
DESIGN "B"	⊣⊢
DESIGN "C"	⋔
DESIGN "D"	⊣⊢
DESIGN "F"	⊢⊣
DESIGN "G"	⊣<
DESIGN "H"	⊣>
DESIGN "J"	⊣×
DESIGN "GJ"	×⊣<
DESIGN "BJ"	×⊣⊢

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

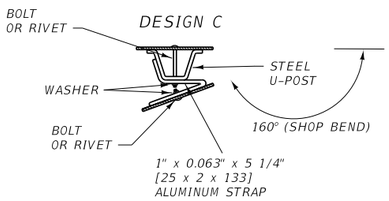
DETAILED DRAWING

REFERENCE STANDARD SPEC. SECTION 619,704

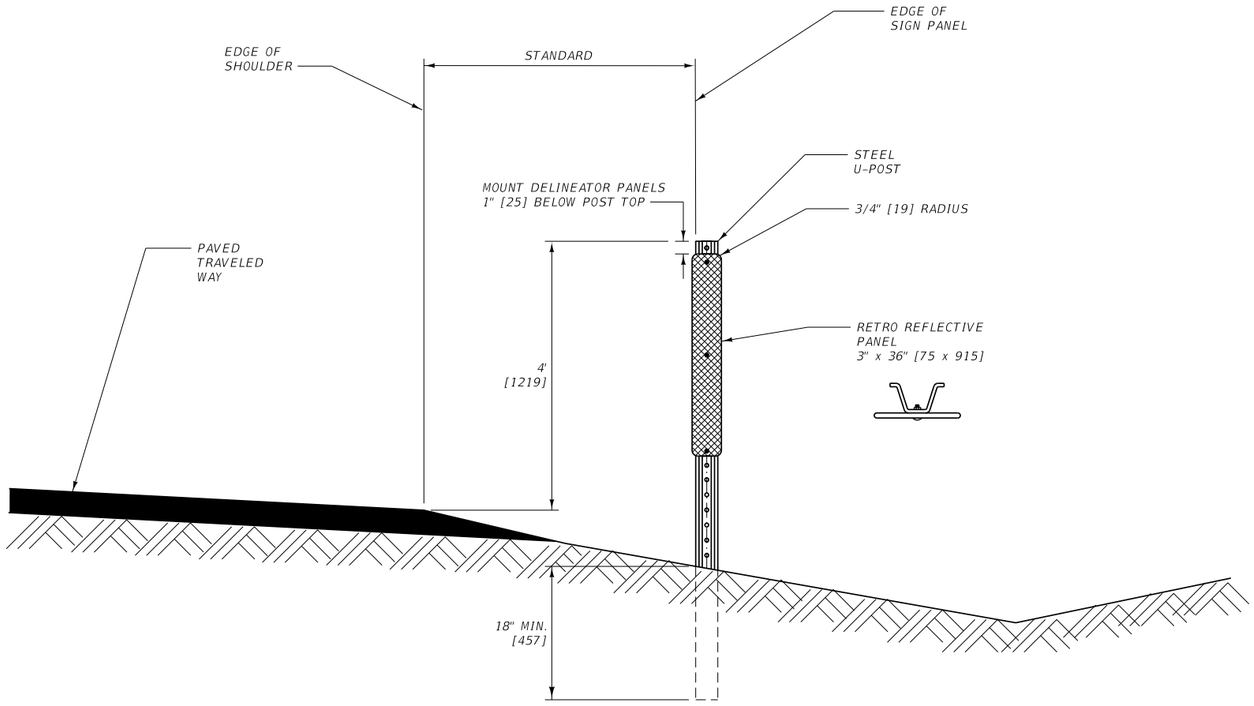
DWG. NO. 619-34

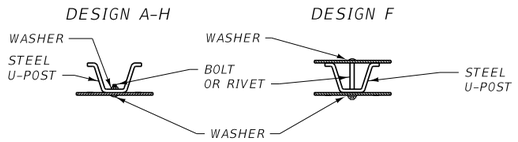
DELINEATOR DETAILS

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DOUBLE PANEL
(BOTH SIDES)





SINGLE PANEL
(FACING ONCOMING TRAFFIC)

DOUBLE PANEL
(BOTH SIDES)

NOTE: TYPE "C & F" DELINEATORS TO HAVE STRIPS ON BOTH SIDES OF POSTS.

NOTES:

1. FURNISH RETRO-REFLECTIVE SHEETING ACCORDING TO THE STANDARD SPECIFICATIONS FOR RETRO-REFLECTIVE SHEETING IV (HIGH INTENSITY). POSITION DELINEATOR FACES PERPENDICULAR TO THE TANGENT TO CURVE CENTERLINE.

2. MOUNT PANEL DELINEATOR ON METAL U-POSTS (1.12 LB./FT. MIN. AND 2 LB./FT. MAX.). USE 5/16 [M8] DIAMETER GALVANIZED OR CADMIUM PLATED BOLT, NUT, AND WASHER. JAM THREADS AFTER TIGHTENING TO PREVENT REMOVAL. INSTALL PANEL TO POST USING BOLTS AT PANEL TOP, MIDDLE, AND BOTTOM.

3. PLACE DELINEATORS AT A CONSTANT CLEARANCE DISTANCE FROM THE EDGE OF THE PAVEMENT EXCEPT WHERE GUARDRAIL OR OTHER OBSTRUCTIONS INTERFERE. ALIGN THE DELINEATORS WITH THE INSIDE EDGE OF THE OBSTRUCTION. CLEARANCE FOR DELINEATORS IS 6'-0" [1829] ON INTERSTATE HIGHWAYS, 4'-0" [1219] ON PRIMARY AND SECONDARY HIGHWAYS OR AS DETERMINED BY THE ENGINEER. THE STANDARD MOUNTING HEIGHT IS 4'-0" [1219] TO THE TOP OF THE POST. SUPPLY POST LENGTHS TO MAINTAIN THE PROPER MOUNTING HEIGHT AND A MINIMUM OF 18" [457] EMBEDMENT.

4. SPACE DELINEATORS ACCORDING TO DETAILED DRAWING 619-36. UNDER NORMAL SPACING, SHOULD A DELINEATOR FALL WITHIN A CROSSROAD OR APPROACH, IT MAY BE MOVED IN EITHER DIRECTION A DISTANCE NOT TO EXCEED ONE QUARTER OF THE NORMAL SPACING. ELIMINATE DELINEATORS STILL FALLING IN SUCH AREAS.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING	
REFERENCE STANDARD SPEC. SECTION 619,704	DWG. NO. 619-35

PANEL DELINEATOR DETAIL

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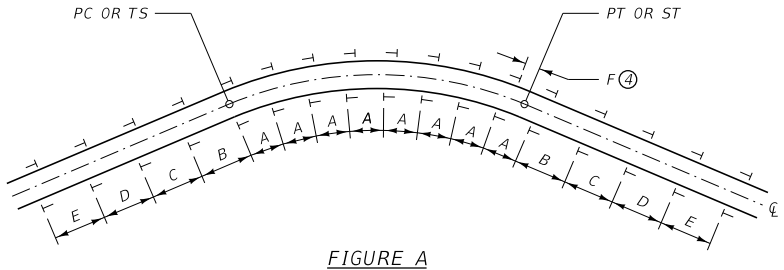


FIGURE A

SEE TABLE BELOW FOR SPACING VALUES

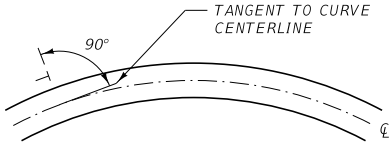


FIGURE B

HORIZONTAL CURVE SPACING TABLE					
RADIUS	SPACING ON CURVE	SPACING ON BOTH APPROACH TANGENTS			
	A	B	C	D	E
5730' & UP	300'	400'	400'	400'	400'
2865'– 5729'	225'	400'	400'	400'	400'
1910'– 2864'	160'	320'	400'	400'	400'
1433'– 1909'	130'	260'	400'	400'	400'
955'– 1432'	110'	220'	330'	400'	400'
716'– 954'	90'	185'	275'	400'	400'
478'– 715'	75'	150'	230'	300'	400'
287'– 477'	60'	125'	185'	300'	400'
0'– 286'	45'	90'	140'	275'	400'

METRIC HORIZONTAL CURVE SPACING TABLE					
RADIUS (m)	SPACING ON CURVE (m)	SPACING ON BOTH APPROACH TANGENTS (m)			
	A	B	C	D	E
1750 & UP	90	120	120	120	120
900 – 1749	65	120	120	120	120
600 – 899	50	95	120	120	120
450 – 599	40	75	120	120	120
300 – 449	35	65	100	120	120
200 – 299	25	55	80	120	120
150 – 199	20	45	70	90	120
100 – 149	20	35	55	90	120
0 – 99	15	25	40	80	120

NOTES:

(1) FURNISH RETRO-REFLECTIVE SHEETING ACCORDING TO THE STANDARD SPECIFICATIONS FOR RETRO-REFLECTIVE SHEETING B (HIGH INTENSITY). POSITION DELINEATOR FACES PERPENDICULAR TO THE TANGENT TO CURVE CENTERLINE AS SHOWN IN FIGURE B.

(2) MOUNT DELINEATORS ON METAL U-POSTS (1.12 LB./FT. [1.7 kg/m] MIN. AND 2 LB./FT. [3 kg/m] MAX.) WITH 3/16" [5] DIA. CADMIUM PLATED BOLT(S). DRILL OR PUNCH TWELVE 3/8" [9.5] MAXIMUM DIAMETER HOLES ON 1 INCH [25] CENTERS MEASURED FROM THE TOP OF THE POST. 1/4" [6.4] SQUARE HOLES MAY BE USED. IF SQUARE HOLES ARE USED, USE A LARGE HEADED BOLT OR AN APPROPRIATE WASHER. JAM THREADS AFTER TIGHTENING THE NUT TO PREVENT REMOVAL.

(3) PLACE DELINEATORS AT A CONSTANT CLEARANCE DISTANCE FROM THE EDGE OF THE PAVEMENT EXCEPT WHERE GUARDRAIL OR OTHER OBSTRUCTIONS INTERFERE. ALIGN THE DELINEATORS WITH THE INSIDE EDGE OF THE OBSTRUCTION. CLEARANCE FOR DELINEATORS IS 6'-0" [1.8 m] ON INTERSTATE HIGHWAYS, 2'-0" TO 6'-0" [0.6 m TO 1.8 m] ON PRIMARY AND SECONDARY HIGHWAYS OR AS DETERMINED BY THE PROJECT MANAGER. THE STANDARD MOUNTING HEIGHT IS 4'-0" [1.2 m] TO THE TOP OF THE POST. SUPPLY POST LENGTHS TO MAINTAIN THE PROPER MOUNTING HEIGHT AND A MINIMUM OF 18" [0.45 m] EMBEDMENT.

(4) SPACE DELINEATORS ACCORDING TO THE DISTANCES FOUND IN THE TABLE ABOVE OR AS SPECIFIED IN THE PLANS. IN FIGURE A, IF "F" IS GREATER THAN 20' [6 m] ADD ONE REGULAR DELINEATOR IN AT "A" SPACING. UNDER NORMAL SPACING, SHOULD A DELINEATOR FALL WITHIN A CROSSROAD OR APPROACH, IT MAY BE MOVED IN EITHER DIRECTION A DISTANCE NOT TO EXCEED ONE QUARTER OF THE NORMAL SPACING. ELIMINATE DELINEATORS STILL FALLING IN SUCH AREAS.

(5) ALL DELINEATOR REFLECTORS HAVE 3/4" [18.75] CORNER RADII EXCEPT DESIGN "E".

(6) MOUNT THE DELINEATOR REFLECTOR 1" [25] BELOW THE TOP OF THE METAL U-POST.

(7) USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING

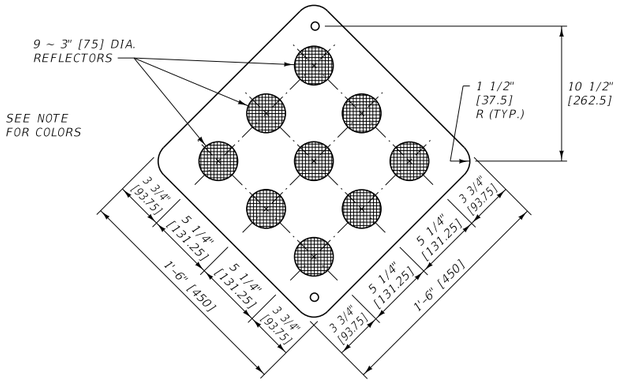
REFERENCE
STANDARD SPEC.
SECTION 619,704

DWG. NO.
619-36

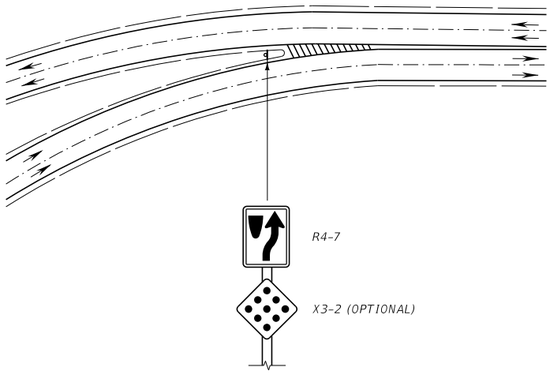
DELINEATOR PLACEMENT DETAILS

MDT MONTANA DEPARTMENT OF TRANSPORTATION

TYPE 1
X3-2



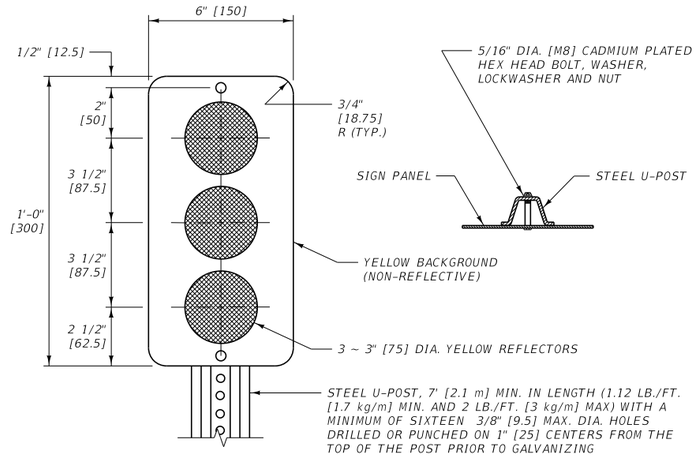
NOTE:
TYPE 1 OBJECT MARKERS HAVE YELLOW REFLECTORS ON A YELLOW OR BLACK BACKGROUND OR AN ALL YELLOW RETRO-REFLECTORIZED PANEL OF THE SAME SIZE. IF USED AS END OF ROAD MARKERS, TYPE 1 MARKERS ARE RETRO-REFLECTORIZED RED OR HAVE RED REFLECTORS ON A RED OR BLACK BACKGROUND.



TYPICAL USE AND PLACEMENT

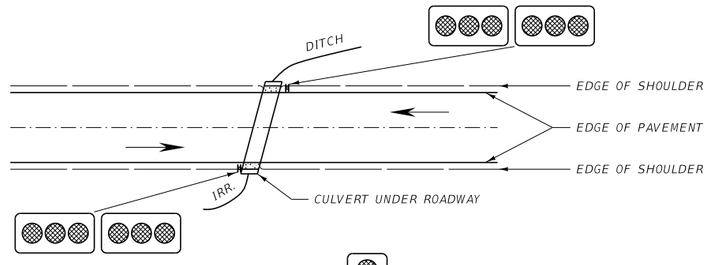
PLACEMENT OF X3-2 IS USED ONLY AS OPTIONAL TO ENHANCE TARGET VALUE WHEN NEEDED.

TYPE 2
X3-3

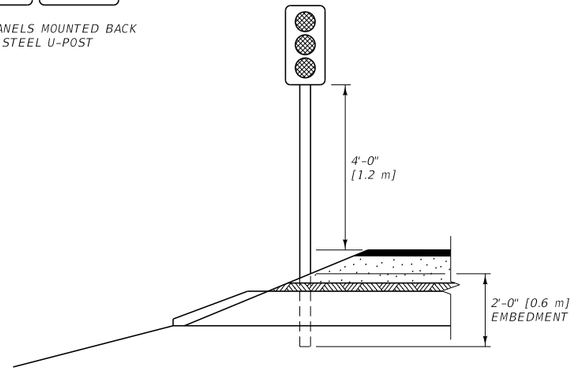


ALTERNATE DESIGN FOR TYPE 2 OBJECT MARKERS IS A YELLOW RETRO-REFLECTORIZED PANEL OF THE SAME SIZE.

TWO X3-3 PANELS MOUNTED BACK TO BACK ON STEEL U-POST



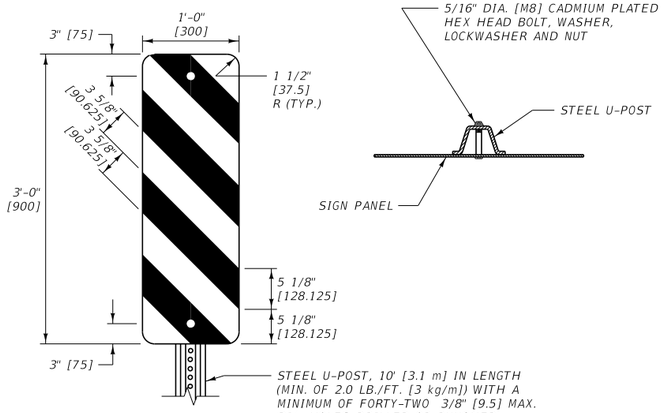
TWO X3-3 PANELS MOUNTED BACK TO BACK ON STEEL U-POST

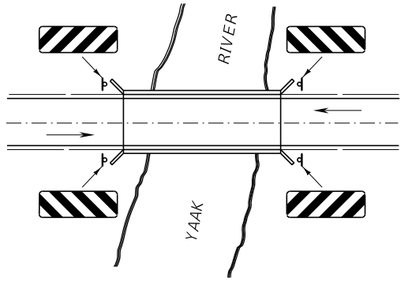


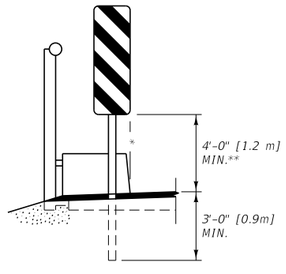
PLACE POST AND PANEL(S) SO THAT PANEL(S) ARE DIRECTLY ADJACENT TO INNER-MOST EDGE OF OBJECT NEAREST TRAVELED WAY.

TYPICAL USE AND PLACEMENT

TYPE 3
OM-3
(OM-3L SHOWN)







* PLACE POST AND PANEL SO THAT PANEL EDGE IS FLUSH WITH FACE OF OBJECT NEAREST TRAVELED WAY.

** WHEN MOUNTED 8'-0" [2.4 m] OR MORE FROM CURB OR SHOULDER, THE MOUNTING HEIGHT IS MEASURED FROM THE GROUND LINE INSTEAD OF THE EDGE OF PAVEMENT.

TYPICAL USE AND PLACEMENT

GENERAL NOTES:

1. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

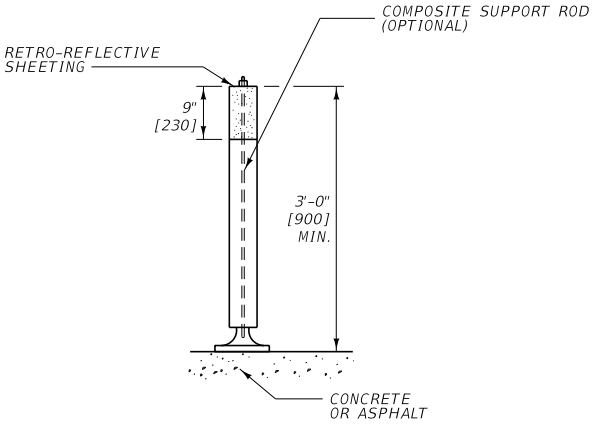
DETAILED DRAWING

REFERENCE STANDARD SPEC. SECTION 619,704

DWG. NO. 619-38

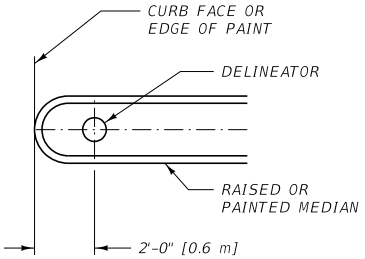
OBJECT MARKER DESIGN AND PLACEMENT DETAILS FOR OBSTRUCTIONS ADJACENT TO OR WITHIN HIGHWAYS

MDT MONTANA DEPARTMENT OF TRANSPORTATION

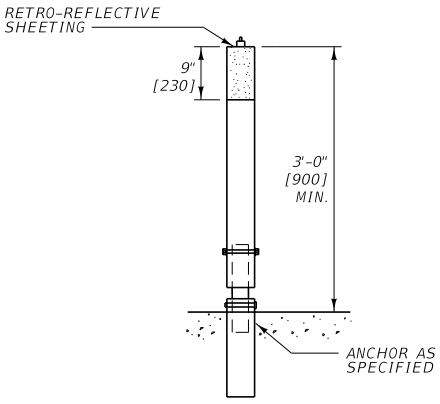


DETAILS ARE REPRESENTATIVE ONLY. ACTUAL DESIGN USED/SPECIFIED MAY VARY (SEE PLANS).

FLEXIBLE SURFACE-MOUNTED DELINEATORS



TYPICAL USE AND PLACEMENT



DETAILS ARE REPRESENTATIVE ONLY. ACTUAL DESIGN USED/SPECIFIED MAY VARY (SEE PLANS).

FLEXIBLE DRIVABLE DELINEATORS

NOTES:

1. MOUNT OR DRIVE FLEXIBLE DELINEATORS TO THE MANUFACTURER'S SPECIFICATIONS.
2. THE EXACT LOCATION AND PLACEMENT OF THE FLEXIBLE DELINEATORS ARE SHOWN IN THE SIGNING PLANS.
3. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING

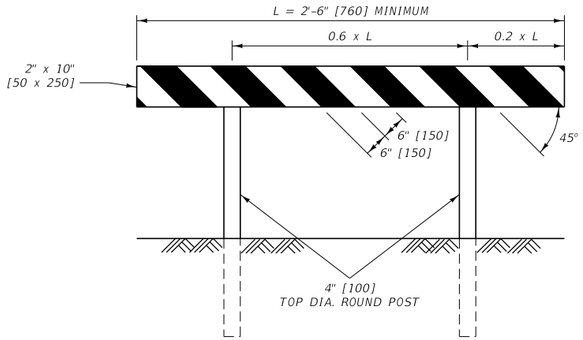
REFERENCE	DWG. NO.
STANDARD SPEC. SECTION 619, 704	619-40

FLEXIBLE DELINEATORS

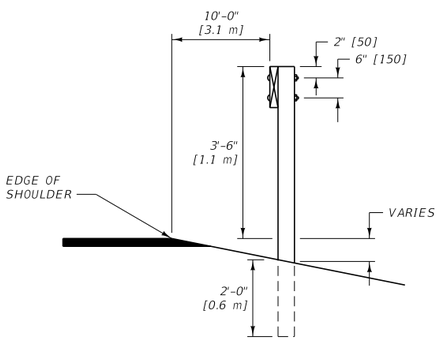
MDT MONTANA DEPARTMENT OF TRANSPORTATION

BI BARRICADE

B(1)-L SHOWN

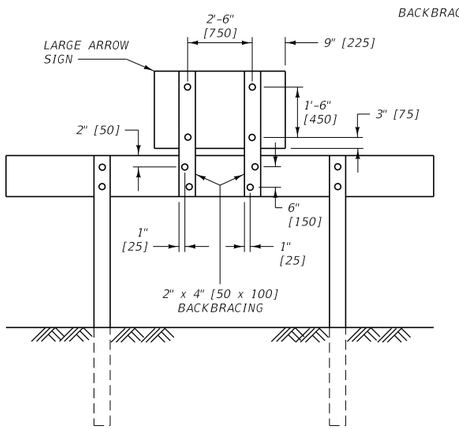


FRONT VIEW

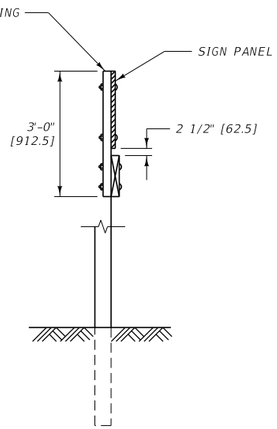


RIGHT SIDE VIEW

BARRICADE DETAILS



REAR VIEW



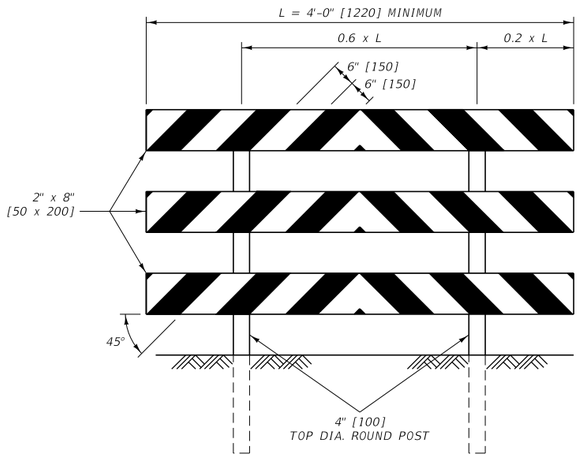
LEFT SIDE VIEW

SIGN MOUNTING DETAILS

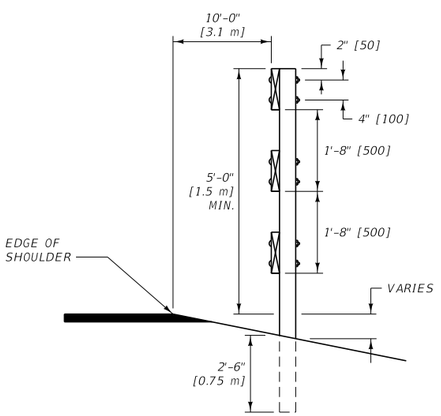
NOTES:

1. CONSTRUCT ALL PORTIONS OF THE BARRICADE NOT IN GROUND CONTACT USING COMMON GRADE 2 OR BETTER S4S LUMBER. PAINT ALL NON-TREATED BARRICADE MEMBERS WITH TWO COATS OF WHITE PAINT IN ACCORDANCE WITH SECTION 710.
2. FURNISH TREATED, ROUND WOOD POSTS IN ACCORDANCE WITH 704.01.6. GAIN POSTS PER DETAIL DRAWING 619-20 AND FOR A LENGTH TO PROPERLY SEAT ALL PANELS OF THE BARRICADE.
3. USE 3/8" [M10] DIAMETER BOLTS, WASHERS, AND NUTS MEETING 704.01.13 FOR ALL CONNECTIONS.
4. ALL BARRICADES HAVE ALTERNATING RETRO-REFLECTIVE RED AND WHITE STRIPES, 6" [150] IN WIDTH AT AN ANGLE OF 45° TO THE VERTICAL, SLANTING DOWNWARD TOWARD THE SIDE OR SIDES ON WHICH TRAFFIC IS TO FLOW. NOMINAL DIMENSIONS OF ROLL MATERIAL FOR STRIPES IS ACCEPTABLE.
5. BARRICADES DESIGNATED "L" ARE PLACED ON THE LEFT SIDE OF APPROACHING TRAFFIC. BARRICADES DESIGNATED "R" ARE PLACED ON THE RIGHT SIDE OF APPROACHING TRAFFIC.
6. RETRO-REFLECTORIZE ALL BARRICADES WITH THE SHEETING MOUNTED ON SHEET ALUMINUM BACKING AT LEAST 0.019" [0.5] THICK. FURNISH ALUMINUM SHEETING IN ACCORDANCE WITH 704.01.1. SECURE RETRO-REFLECTIVE ALUMINUM SHEETING WITH ALUMINUM NAILS.
7. DETERMINE THE POST LENGTHS IN THE FIELD, COMPLYING WITH THE MOUNTING HEIGHTS AND FOUNDATION DEPTHS LISTED ON THIS SHEET.
8. USE MATERIALS FOR BARRICADE FRAMEWORK AND ASSEMBLY, INCLUDING ANY SIGNS AND MEANS OF ATTACHMENT, THAT MEET THE REQUIREMENTS FOR NCHRP 350 FOR WORK ZONE DEVICES. AS AN OPTION, SIGNS AND BARRICADES MAY BE MOUNTED DIRECTLY BEHIND BARRICADES ON SEPARATE SIGN SUPPORTS MEETING NCHRP 350 CRITERIA.
9. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

BIII BARRICADE

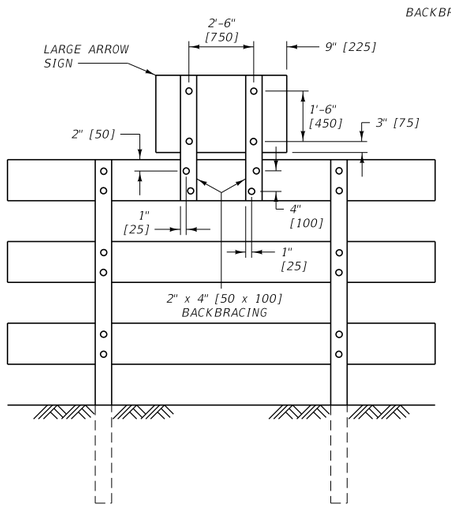


FRONT VIEW

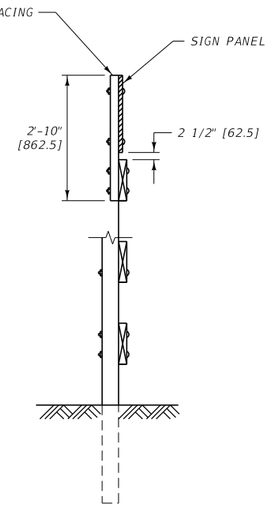


RIGHT SIDE VIEW

BARRICADE DETAILS



REAR VIEW



LEFT SIDE VIEW

SIGN MOUNTING DETAILS

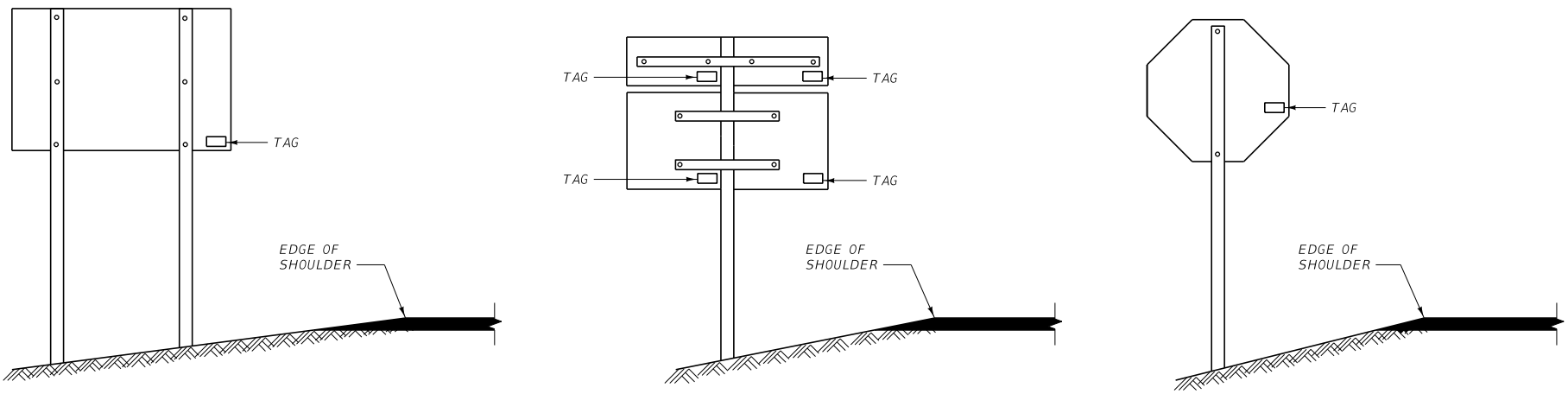
UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING

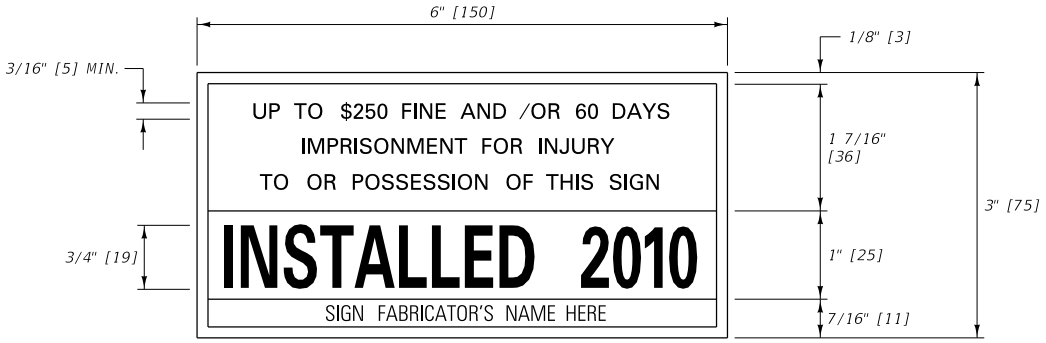
REFERENCE	DWG. NO.
STANDARD SPEC. SECTION 619, 704, 710	619-42

PERMANENT BARRICADE DESIGN DETAILS

MDT MONTANA DEPARTMENT OF TRANSPORTATION



PLACEMENT DETAILS



DATE TAG DETAIL

NOTES:

1. FURNISH AND PLACE INSTALLATION DATE TAGS ON ALL SIGNS PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
2. THE TAGS DISPLAY THE YEARS IN WHICH THE SIGNS WERE INSTALLED. SEE THE COLOR SEQUENCE TABLE SHOWN ON THIS DRAWING FOR THE APPROPRIATE COLORS. DATE TAGS ARE TO BE RETRO-REFLECTIVE.
3. PLACE A TAG ON THE BACK OF EACH SIGN, LOCATED NEAR THE LOWER CORNER OF THE SIGN NEAREST THE EDGE OF ROADWAY, TO BE VISIBLE FROM THE ROADWAY AS SHOWN IN THE EXAMPLES ABOVE.
4. PLACE TAGS ON ANY NEW SIGN INSTALLED IN THE FIELD AS ROUTINE MAINTENANCE BY MDT FORCES. MAINTENANCE DESIGN DATE TAGS CAN BE ORDERED FROM THE SIGN SHOP IN HELENA.
5. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

DATE TAG COLOR SEQUENCE

DATE TAG COLOR CORRESPONDS TO THE LAST DIGIT OF THE INSTALLATION YEAR AS FOLLOWS:

0 - YELLOW	5 - RED
1 - WHITE	6 - PURPLE
2 - LIGHT BLUE	7 - ORANGE
3 - GOLD	8 - BLUE
4 - LIGHT GREEN	9 - GREEN

UNITS SHOWN IN BRACKETS [] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING

REFERENCE
STANDARD SPEC.
SECTION 619, 704

DWG. NO.
619-44

INSTALLATION DATE TAGS

MDT MONTANA DEPARTMENT OF TRANSPORTATION