COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

Standard Drawings for Signs and Supports

Bureau of Transportation Planning
and Development

1990

Commissioner

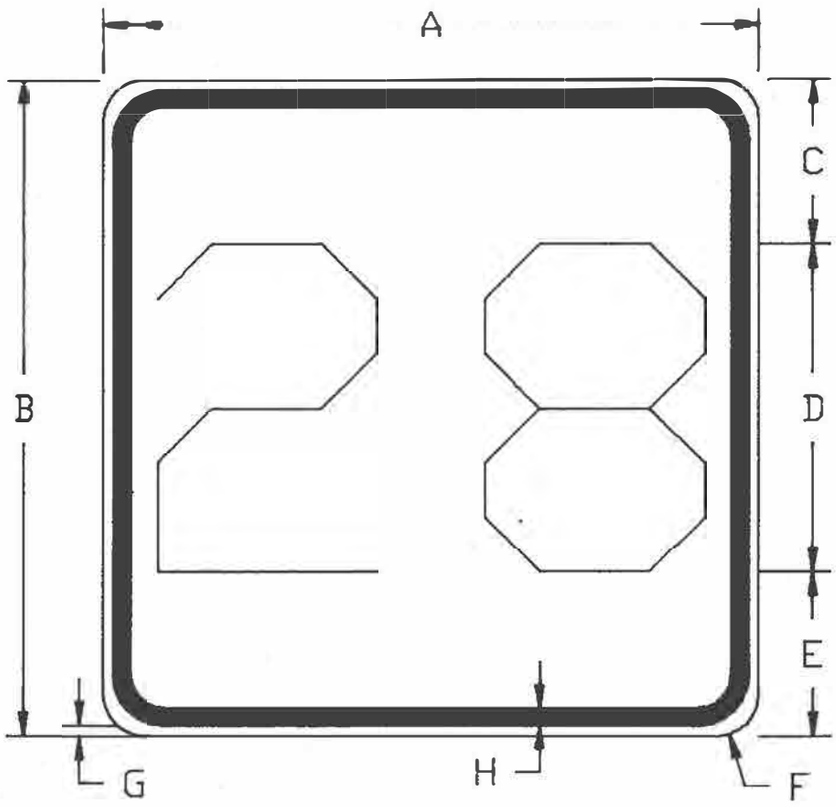
Chief Engineer

Director BTP&D

Traffic Engineer

TABLE OF CONTENTS

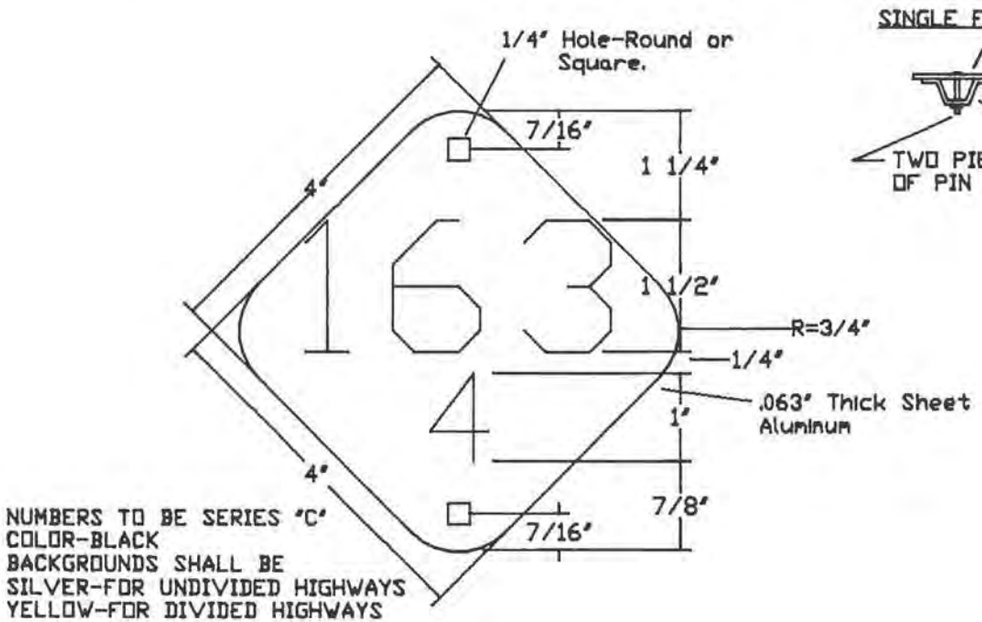
Description	Page No.
Standard State Route Marker (M1-6A)	3
Typical Tenth-of-Mile Marker (D10-9)	4
Typical Mile Marker Installation	5
Typical Reflectorized Warning Sign (H1-2)	6
Typical Abutment Warning Panel (H1-3 Left & Right)	7
Typical Attenuator Panels (H1-10A,B & C)	8
Typical Pavement Markings	9
Pavement Markings Table	10
Typical Spacing, Elevation & P-9 Posts for Delineators	11
Installation of Type SS Highway Guard Rail	12
Installation of Overhead Structure Guard Rail	13
Temporary Pavement Markings in Work Zone	14
Highway Sign Supports and Sign Support Foundations	15
Overhead Directional Sign Supports (Non-Breakaway)	16
Typical Sign Installation and Location	17
Aluminum Panel Details	18-20
Typical Exit Tab (E1-5, Integral Part of E1-1 Type Sign)	21
Typical Installation for Signs Over 20sq.ft. To 40sq.ft	22
Base Connection, Fuse Plate and Foundation Data	23
Post Weight Data	24
D-6 With D-8	25
Delineation for Guard Rail Termini	26
Post Coping Details (Breakaway)	27
Detail "A" Hinge for Breakaway Sign Posts	28
Sign and Stub Post Details for S4x7.7 and S5x10.0	29
Sign and Stub Post Details for W Shapes	30
Sign and Stub Post Details for ○ Shapes (D6 and DD6)	31
Typical Panel Attachment to Overhead Support	32-33
Double D-6 With D-8	34
Sign Bracket Details for D-6 and Double D-6	35
Clamp for D-8 Attachment	36
Sign Width Chart (Wind Zone 1)	37
Sign Width Chart (Wind Zone 2)	38
General Notes	39
Temporary Wooden Yielding Supports	40
Pavement Marking & Signing for 4 to 2 Lane Transition	41
Pavement Marking and Signing for Climbing Lanes	42
DD Sign Support Protection	43
Installation of P-5 Telescopic Post	44
Typical Installation for Small Signs (up to 20sq.ft.)	45
Aluminum Cap for 1-3/4" Post (for use with R6-1)	46
Installation for EZE-ERECT Sign Post	47-51
Plastic Drums	52

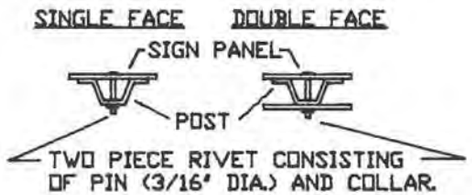


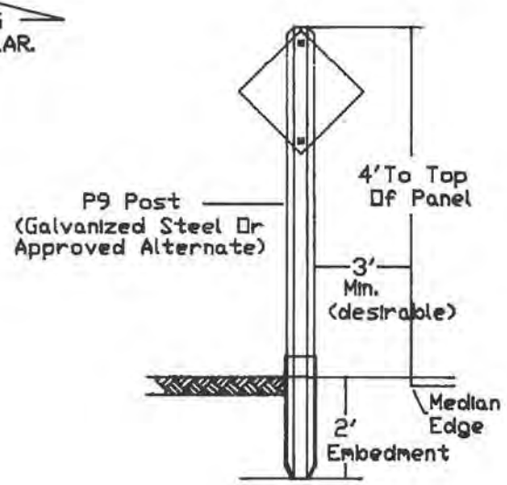
SIGN SIZE	NO. OF DIGITS	DIMENSIONS							
		A	B	C	D	E	F	G	H
24"x24"	1 or 2	24"	24"	6"	12"	6"	1 1/2"	3/8"	5/8"
30"x24"	3	30"	24"	6"	12"	6"	1 1/2"	3/8"	5/8"
36"x24"	4	36"	24"	6"	12"	6"	1 1/2"	3/8"	5/8"
36"x36"	1 or 2	36"	36"	9"	18"	9"	2 1/4"	1/2"	1/2"
45"x36"	3	45"	36"	9"	18"	9"	2 1/4"	1/2"	1/2"

Series of Digits "D"

M1-6A
Standard State Route Marker





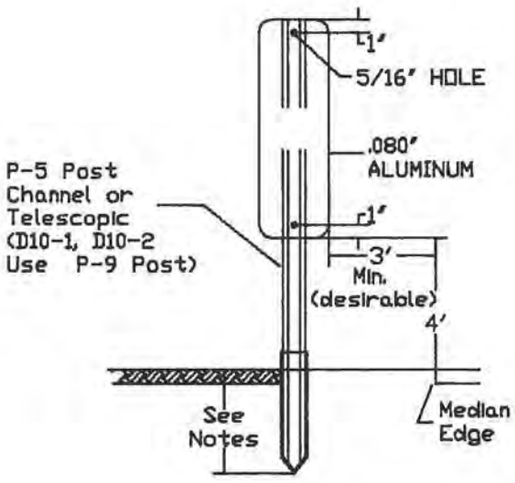


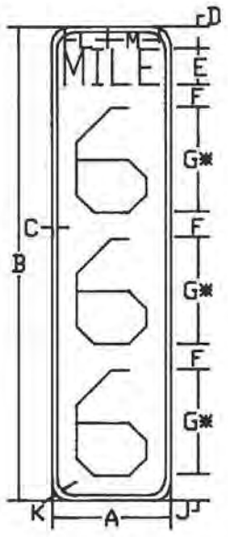
Notes: All Milemarkers and Tenth of Milemarkers Shall be Fabricated With High Intensity Encapsulated Lense Reflective Sheeting (Section M9.30.2)

TYPICAL TENTH-OF-MILEMARKER INSTALLATION

D10-9

TYPICAL MILEMARKER INSTALLATION





NOTE: If Milemarker Panel is 3'
The Embedment will be 2 1/2'
If Panel is 4', the embedment
will be 3'.

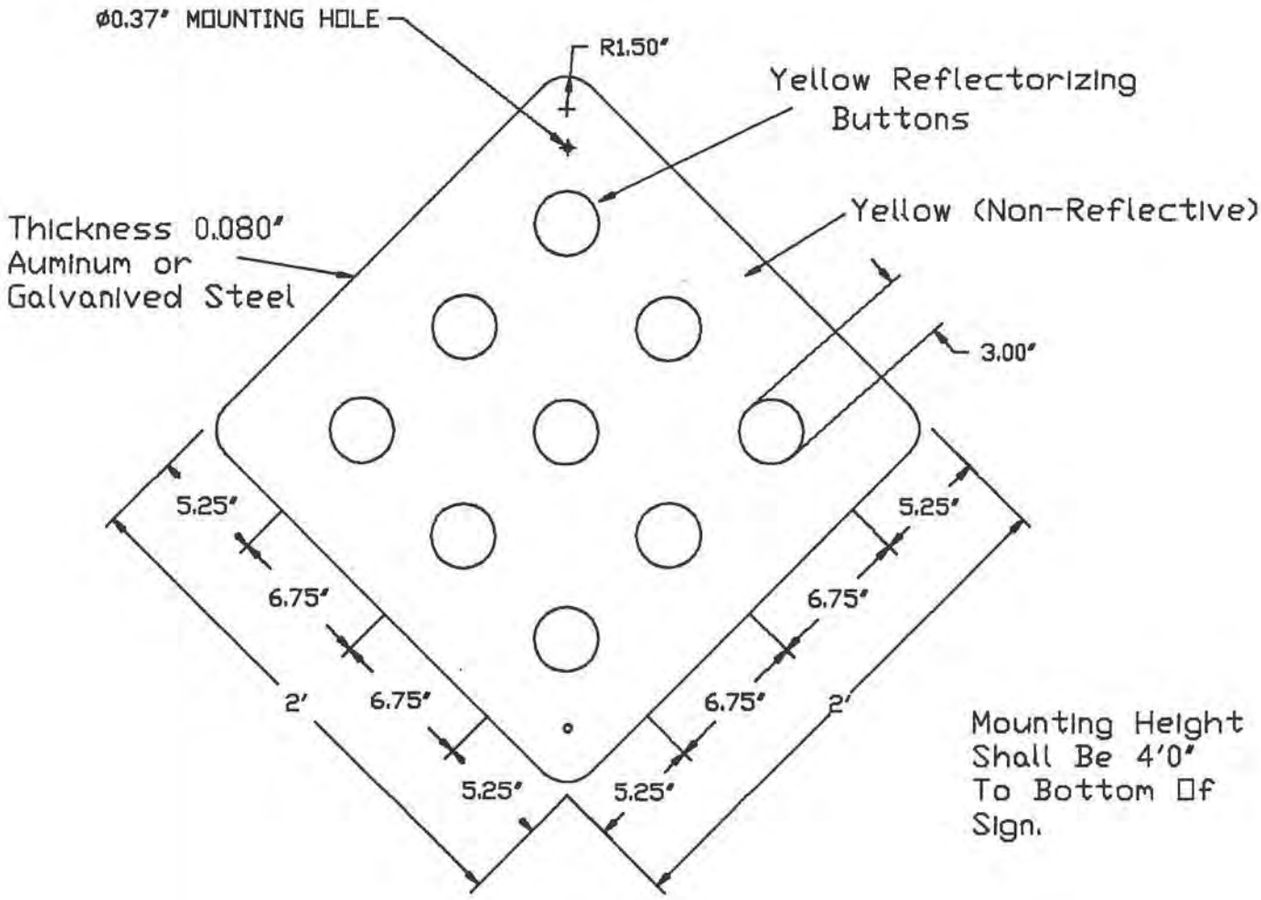
COLOR

BACKGROUND-GREEN REFLECTORIZED
NUMBERS-WHITE REFLECTORIZED
PIN & BOLT HEADS TO BE PAINTED
SAME COLOR AS PANEL BACKGROUND
NUMBERS TO BE SERIES "C"

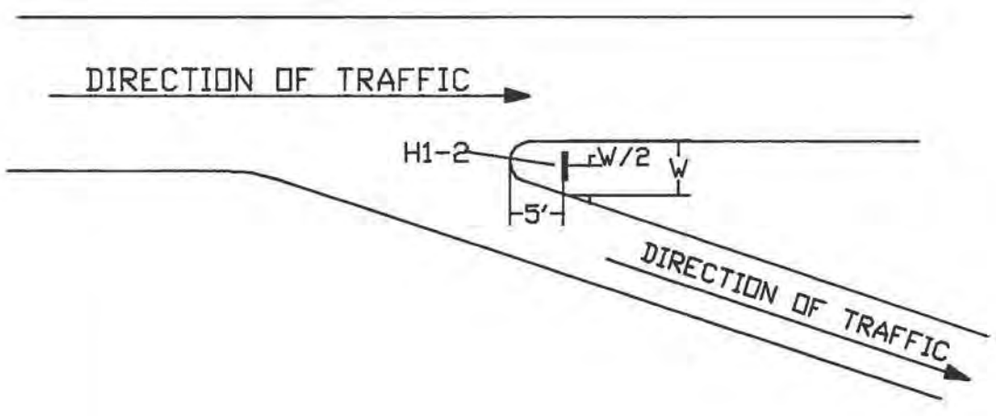
* Optically center numeral
about vertical centerline

	EXPWY-FWY USE			CONVENTIONAL USE		
	D10-4 (1-digit)	D10-5 (2-digits)	D10-6 (3-digits)	D10-1 *(1-digit)	D10-2 *(2-digits)	D10-3 *(3-digits)
A	12	12	12	10	10	10
B	24	36	48	18	27	36
C	1/2	1/2	1/2	1/2	1/2	1/2
D	3	3	3	2	2	2
E	4C	4C	4C	4B	4B	4B
F	3	3	3	2	2	2
G	10C	10C	10C	6C	6C	6C
H	-	3	2 1/2	-	3	3
J	4	3	3	4	4	4
K	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
L	4 5/8	4 5/8	4 5/8	3 5/8	3 5/8	3 5/8
M	4 7/8	4 7/8	4 7/8	3 7/8	3 7/8	3 7/8

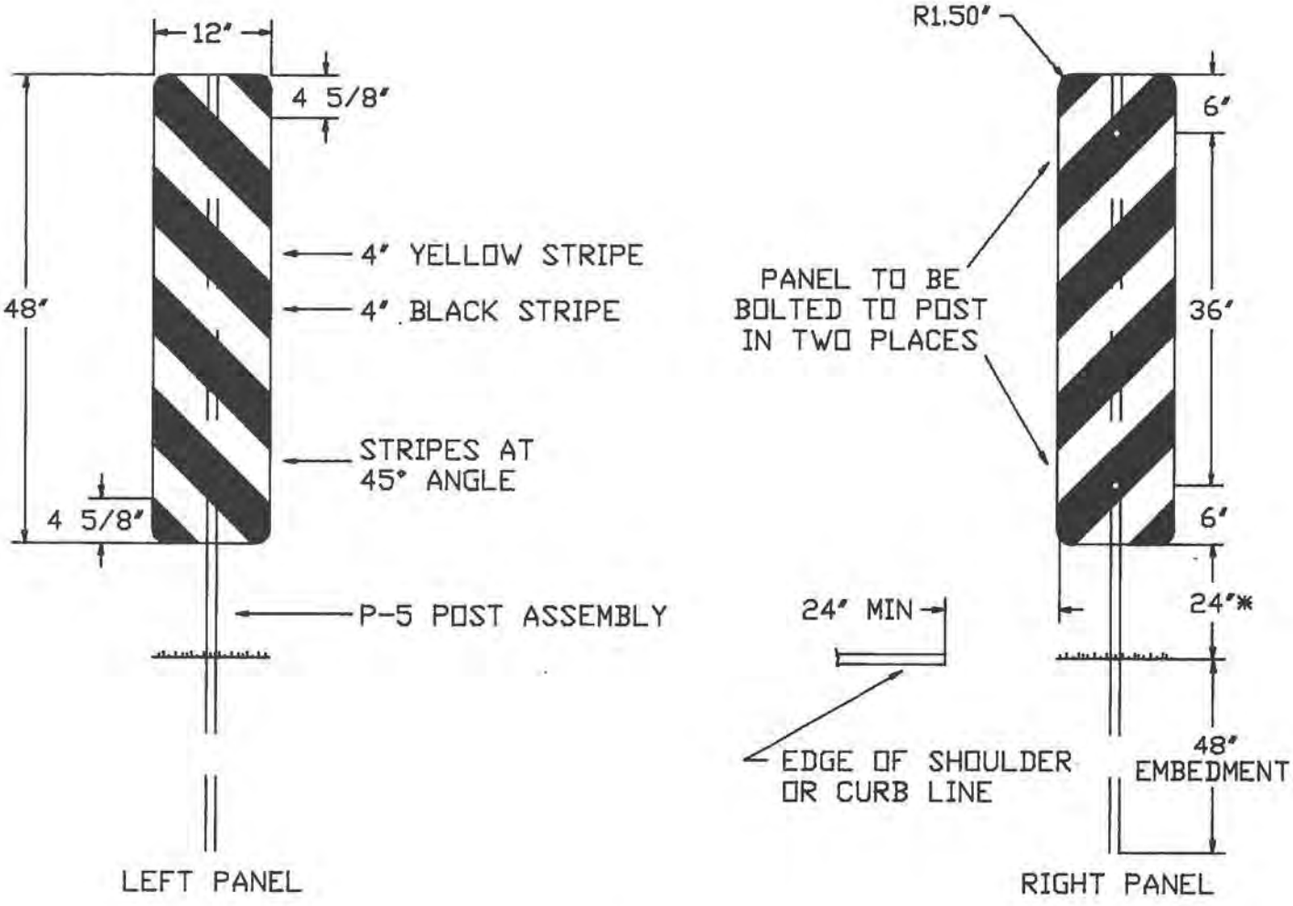
TYPICAL H1-2



TYPICAL LOCATION FOR H1-2



TYPICAL ABUTMENT WARNING PANEL (H1-3 LEFT & RIGHT)

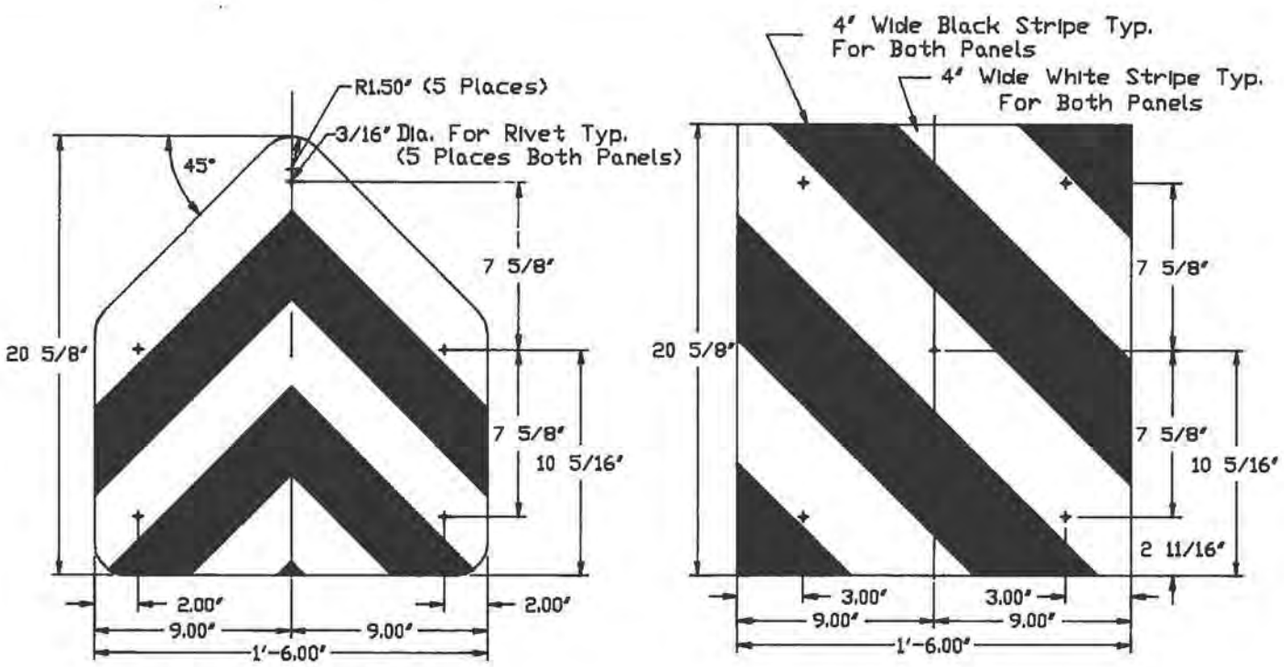


MATERIAL: SHALL BE 0.080 THICKNESS ALUMINUM, OR 3/4" PLYWOOD

COLORS:

ALTERNATE YELLOW AND BLACK STRIPES
YELLOW STRIPES TO BE REFLECTORIZED
ALTERNATE WHITE AND ORANGE STRIPES FOR CONSTRUCTION
AND MAINTANCE OPERATIONS, BOTH REFLECTIZED.

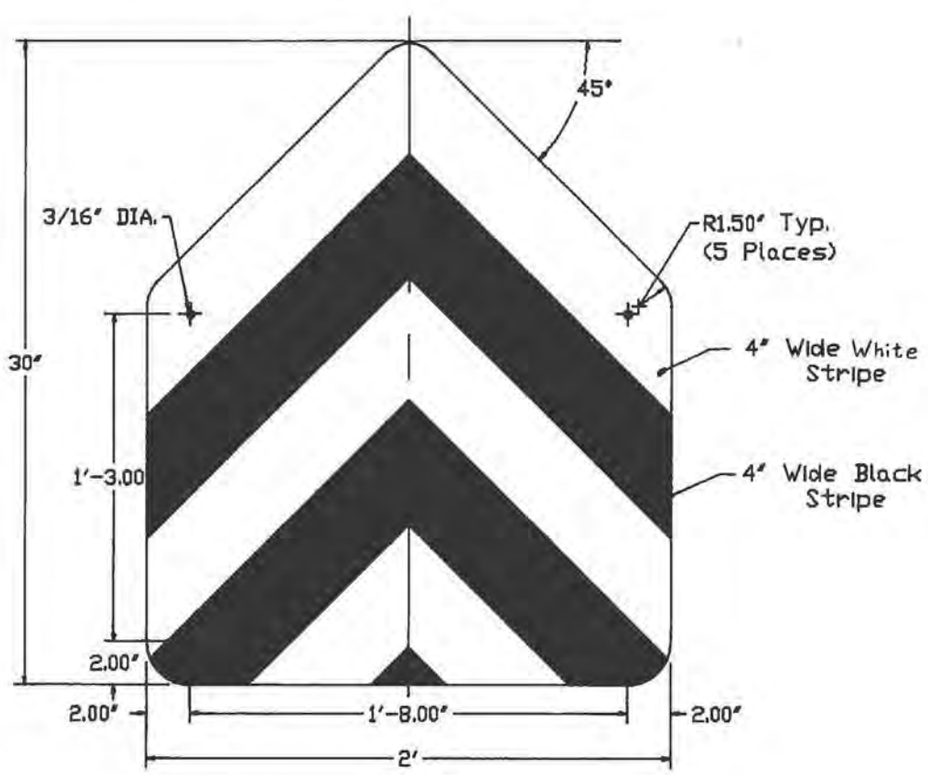
* OR GREATER TO CLEAR GUARD RAIL BY MAXIMUM OF 6"



H1-10B

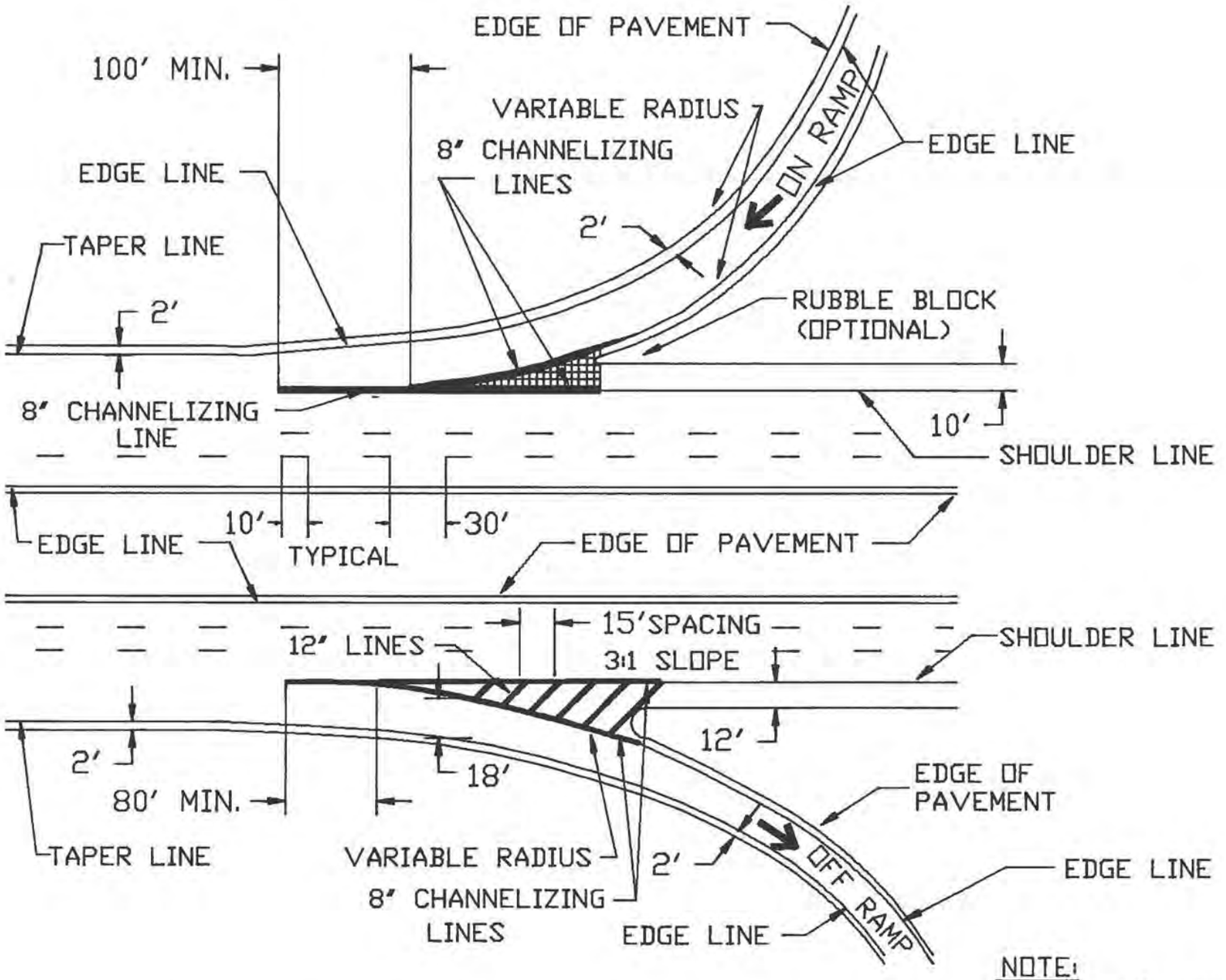
H1-10C
L or R

ATTENUATOR PANEL
FOR G.R.E.A.T. SYSTEM BARRIER NOSE COVER



H1-10A
ATTENUATOR PANEL

NOTE: The Striping Is To Be Mounted On .032 Aluminum Panel Using Alternating Black and White Stripes Sloping Down at an Angle Of 45°. The Aluminum Panel Shall Be In Accordance With ASTM B209 Alloy 6061-T6. The Silver Reflective Sheeting Shall Be In Accordance With Mass. Dept. of Public Works Specification M9.30.2 Encapsulated Lens Reflective Sheeting. Paint For Black Stripes Shall Be In Accordance With The Sheeting Manufacture's Specification For Black Silk Screen Ink. For H1-10A, H1-10B, & H1-10C.



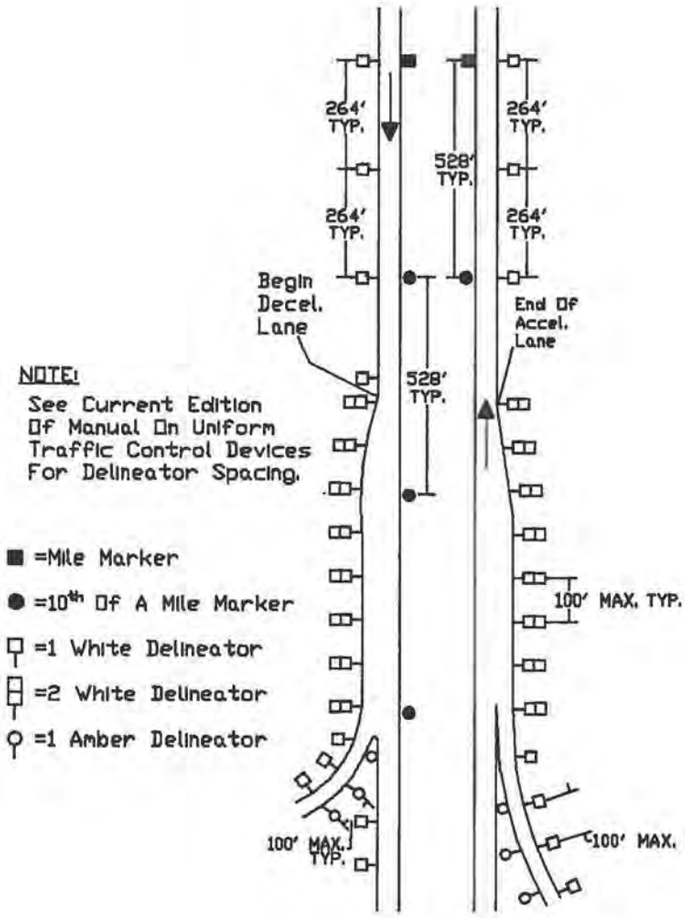
NOTE:
See next page for pavement markings table.

TYPICAL PAVEMENT MARKINGS

PAVEMENT MARKINGS			
4" WHITE	8" WHITE	12" WHITE	4" YELLOW
EDGE LINE (RIGHT)	CHANNELIZING LINE (GORE)	GORE CHEVRONS	EDGE LINE (LEFT)
LANE LINE (ONE WAY TRAFFIC)			
TAPER LINE			
SHOULDER LINE			
CHANNELIZING LINE			

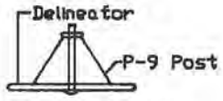
SEE ALTERNATE MARKINGS, MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (PAGES 3B-15 & 3B-17)

PAVEMENT MARKINGS TABLE

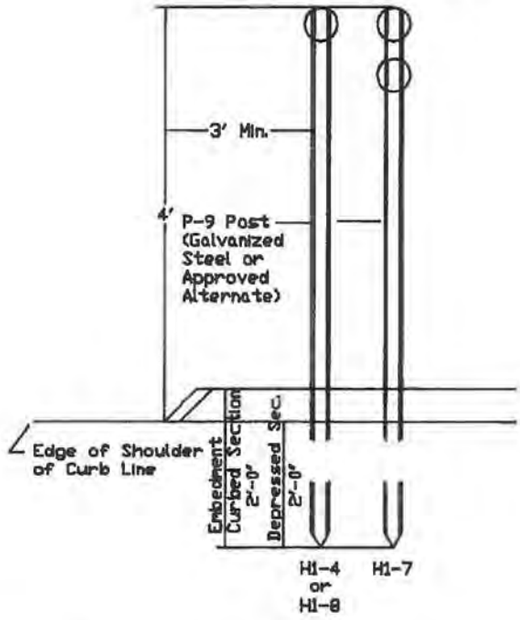


DELINEATOR SPACING

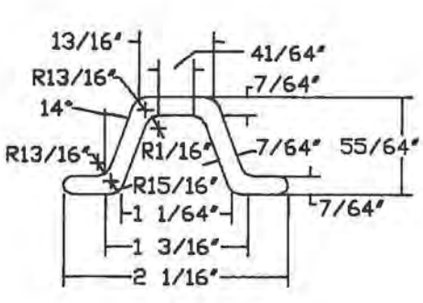
Table	
No.	Color
H1-4	Single White Delineator
H1-7	Double White Delineator
H1-8	Single Amber Delineator



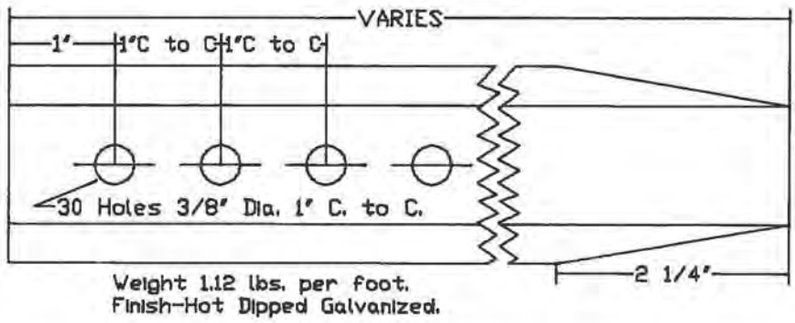
Method of Attaching Delineator to P-9 Post



TYPICAL ELEVATION FOR DELINEATORS



END VIEW

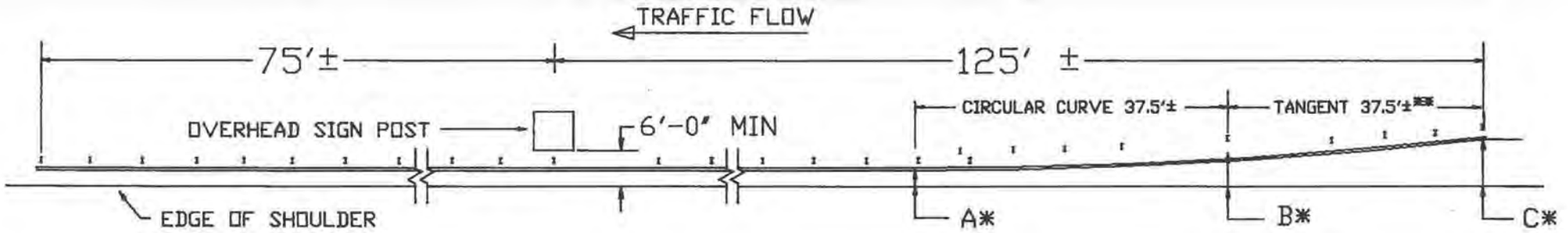


Weight 1.12 lbs. per foot.
Finish-Hot Dipped Galvanized.

FRONT VIEW

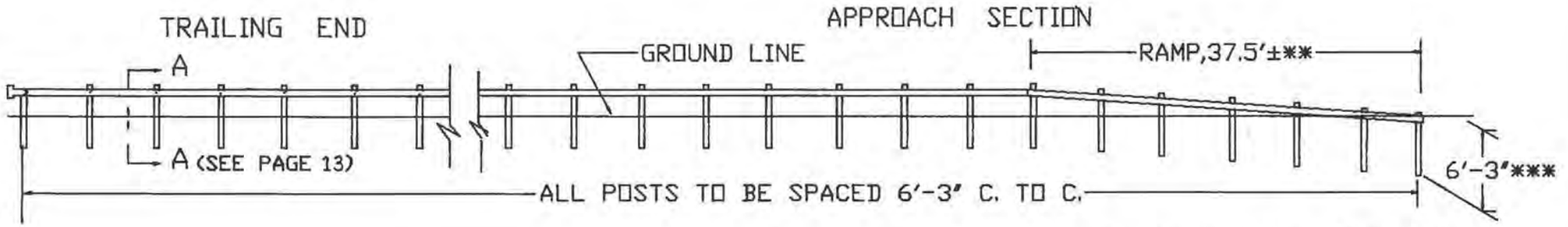
TYPICAL P-9 POSTS

INSTALLATION OF TYPE SS HIGHWAY GUARD RAIL FOR PROTECTION OF OVERHEAD SIGN POSTS.



PLAN VIEW

*SEE TABLE ON PG.13 FOR DIMENSIONS
**-50' FOR THRIE BEAM



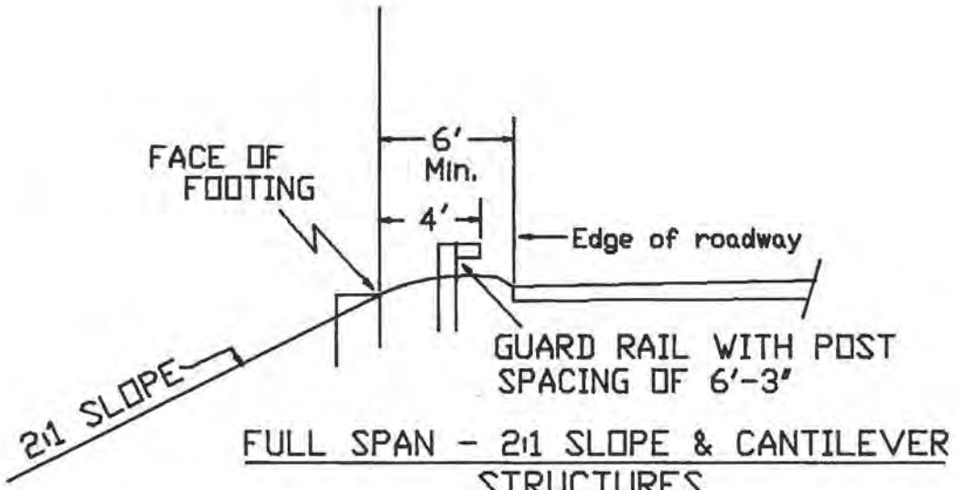
ELEVATION VIEW

*** STANDARD LENGTH POSTS SHALL BE USED IN RAMPED SECTIONS

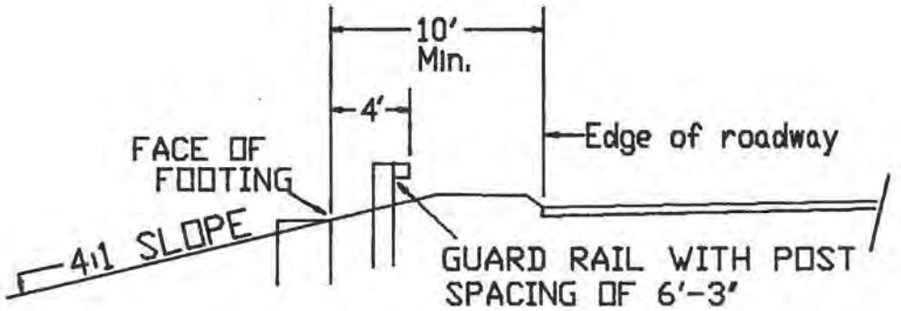
NOTES:

1-LENGTHS OF HIGHWAY GUARD SHOWN ARE MEASUREMENTS ALONG FACE OF RAILING
2-FOR DESCRIPTIONS, MATERIAL AND CONSTRUCTION METHODS, SEE SPECIFICATIONS AND 401.1.0 AND 401.5.0-401.10.0
3-FOR BACK UP PLATE DETAILS SEE 401.6.0 AND 401.8.0
4-DETAILS SHOWN HEREIN ALSO APPLY TO THRIE BEAM GUARD RAIL, EXCEPT AS OTHERWISE NOTED.
5-WHEN PLACED IN MEDIAN, CHANGE TO THRIE BEAM & HIGHT OF 2'-6 1/2"+1"
6-POST TYPES SHALL NOT BE INTERCHANGED IN ANY CONTINUOUS RUN OF GUARD RAIL. BRACKETS SHALL BE SIMILAR TO POST.

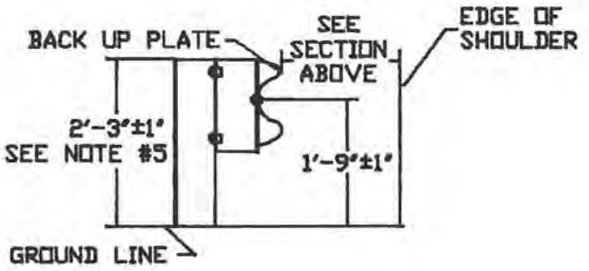
OVERHEAD STRUCTURE GUARD RAIL INSTALLATION



FULL SPAN - 2:1 SLOPE & CANTILEVER STRUCTURES



FULL SPAN - 4:1 SLOPE



SECTION A-A

TABLE FOR OVERHEAD SIGN PROTECTION 401.3.0

	A	B	C	
			W SECTION	THRIE BEAM
2:1 SLOPE	1'-6"±	3'-3"±	6'-6"±	7'-7"±
4:1 SLOPE	6'-0"±	7'-9"±	11'-0"±	12'-1"±
6:1 SLOPE	16'-0"±	17'-9"±	21'-0"±	22'-1"±

TABLE OF OFFSETS FOR GUARDRAIL FLARED ENDS

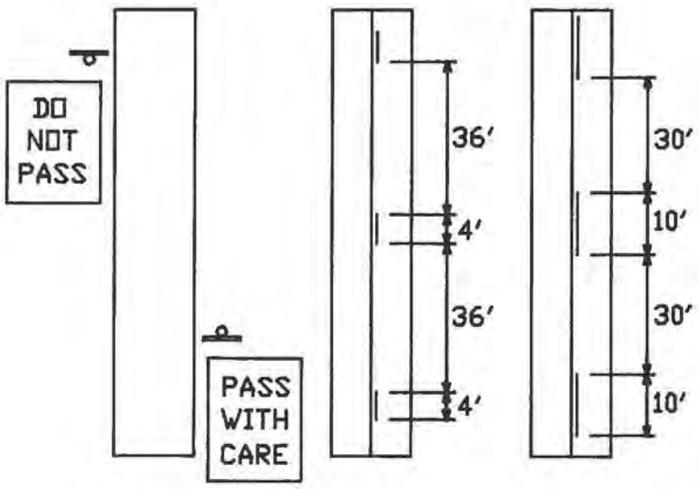
TABLE FOR TYPICAL INSTALLATION

	A	B	C	
			W SECTION	THRIE BEAM
VERTICAL CURB	0'-9"±	2'-6"±	5'-9"±	6'-10"±
SLOPED EDGING	1'-6"±	3'-3"±	6'-6"±	7'-7"±
TYPE 'A' BERM	2'-0"±	3'-9"±	7'-0"±	8'-1"±

TEMPORARY PAVEMENT MARKINGS IN WORK ZONES

Undivided 2 or 3 Lane Highway

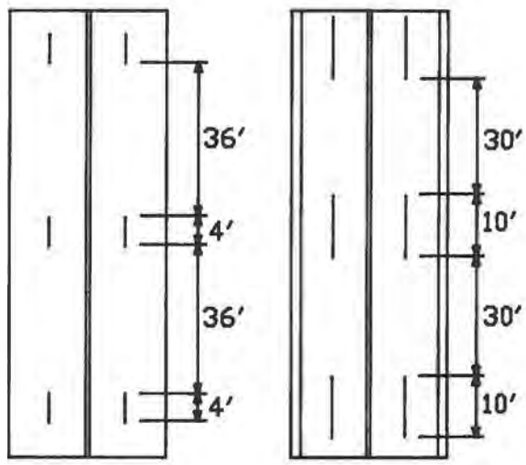
3 days * or less | 14 days or less | More than 14 days



* May be longer for low volume roads.

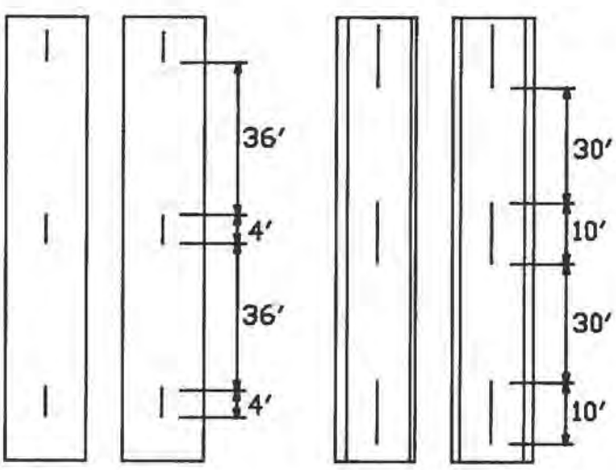
Undivided Multi-Lane Highway

14 days or less | More than 14 days



Divided Multi-Lane Highways

14 days or less | More than 14 days

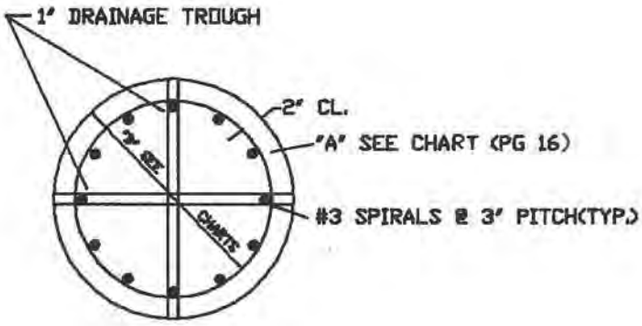


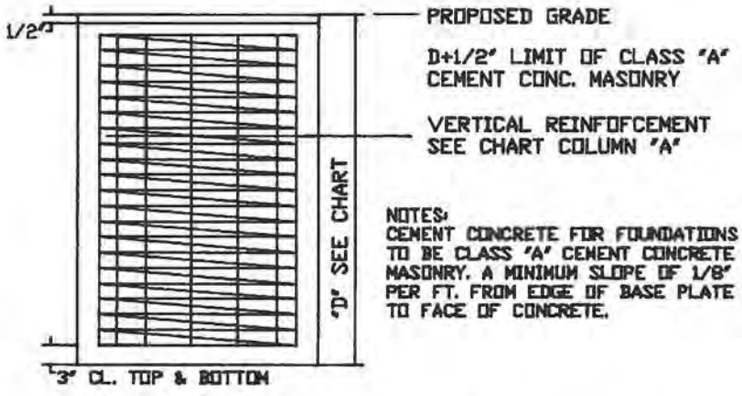
NOTES

1) Low volume highways should be defined in accordance with statewide policy as approved by the FHWA Division Office. It is recommended that up to 400-500 ADT be considered a low volume road.
2) Signs may be used instead of pavement markings on low volume roads for up to 2 weeks, after which permanent markings are required.
3) On other than low volume roads temporary or permanent markings shall be in place before road is opened to traffic.
4) Edgelines are required after 14 days on all interstate and rural multi-lane highways, and on other highways when state policy calls for edgelines.
5) For more information see MUTCD, Part IV, Sections 6D-1 and 6D-3.

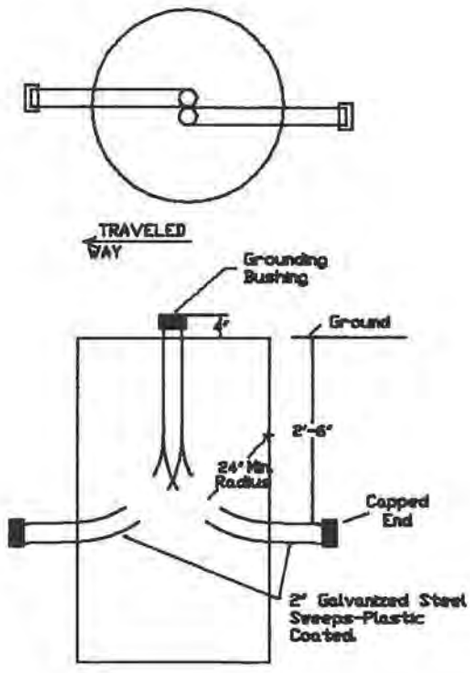
HIGHWAY SIGN SUPPORTS AND SIGN SUPPORT FOUNDATIONS

(NON-BREAKAWAY SUPPORTS)





TYPICAL SIGN SUPPORT FOUNDATION



TYPICAL DETAIL OF ELETRICAL CONDUIT SWEEPS TO BE PLACED IN STANDARD OVERHEAD SIGN FOUNDATIONS.

GENERAL NOTES

THE CONTRACTOR MAY SELECT ANY STRUCTURAL SIGN SUPPORT MEETING THE DESIGN CRITERIA OF THE CURRENT EDITION OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS "SPECIFICATIONS FOR DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS" AND SECTION 828 OF THE STANDARD SPECIFICATIONS.

REINFORCED CONCRETE FOUNDATIONS FOR SIGN SUPPORTS SELECTED SHALL CONFORM TO THE APPLICABLE TABULATION REQUIRMENTS BASED ON THE SECTION MODULUS AT THE BOTTOM OF THE SIGN SUPPORT POST.

THE FOUNDATIONS LISTED ARE INTENDED FOR A SINGLE POLE IN THE DIRECTION NORMAL TO THE SIGN, BUT THE NUMBER OF POLES PARALLEL TO THE SIGN SHALL CONFORM WITH THE CONSTRUCTION DRAWINGS. IF IT IS DESIRED TO USE OTHER THAN SINGLE POLE SUPPORTS, THE CONTRACTOR SHALL DESIGN THE FOUNDATIONS FOR SAME AND SUBMIT HIS DESIGN CALAULATIONS WITH SKETCHES.

ACCEPTANCE OF THE DESIGNS OF THE SIGN SUPPORTS AND SIGN SUPPORT FOUNDATIONS WILL BE CONTINGENT ON THE DEPARTMENT'S REVIEW AND APPROVAL OF DESIGN CALCULATIONS AND SHOP DRAWINGS SUBMITTED BY THE CONTRACTOR.

THE INFORMATION GIVEN BELOW IS TO BE USED IN CONJUNCTION WITH THE TABLE ON PAGE 16.

THESE TABLES ARE <u>NOT</u> TO BE USED FOR THE DESIGN OF CANTILEVER SIGN FOUNDATIONS.

FOR OVERHEAD DIRECTIONAL SIGNS*
NON-BREAKAWAY SUPPORTS

Section Modulus at Bottom of Support (in³)			'B'	'D'+	'A'
		(.1793") WALL THICKNESS			
	to	21.2	30"	6'-6"	12-#5
21.21	to	25.5	36"	6'-6"	8-#6
25.53	to	29.9	36"	7'-0"	14-#5
29.98	to	33.6	42"	7'-0"	12-#5
33.65	to	40.0	42"	7'-6"	10-#6
40.06	to	44.5	42"	8'-0"	16-#5
44.51	to	48.9	42"	8'-6"	8-#7
48.96	to	53.4	48"	8'-0"	10-#6
		(.2500") WALL THICKNESS			
	to	29.91	30"	8'-0"	12-#6
29.11	to	32.9	36"	7'-6"	8-#7
32.91	to	36.9	36"	8'-0"	12-#6
36.91	to	40.9	36"	8'-6"	10-#7
40.91	to	45.6	42"	8'-0"	10-#7
45.61	to	50.3	42"	8'-6"	10-#7
50.41	to	54.9	42"	9'-0"	22-#5
54.91	to	63.0	42"	9'-6"	12-#5
63.01	to	68.2	42"	10'-0"	22-#5
68.21	to	71.2	48"	9'-6"	10-#7
71.21	to	75.7	48"	10'-0"	22-#5
75.71	to	79.8	48"	10'-0"	22-#5
79.81	to	83.6	48"	10'-6"	16-#6
83.61	to	91.9	48"	11'-0"	12-#7
91.91	to	100.6	48"	11'-6"	20-#6
100.61	to	109.6	48"	12'-0"	12-#8
		(.3125") WALL THICKNESS			
	to	29.1	30"	7'-6"	12-#6
29.11	to	34.5	30"	8'-0"	10-#7
34.51	to	39.9	36"	8'-6"	10-#7
39.91	to	45.2	36"	8'-6"	20-#5
45.21	to	50.5	36"	9'-6"	24-#5
50.51	to	54.8	42"	9'-0"	22-#5
54.81	to	59.1	42"	9'-6"	12-#7
59.11	to	63.4	42"	10'-0"	18-#6
63.41	to	67.9	42"	10'-0"	14-#7
67.91	to	75.5	42"	10'-0"	30-#5
75.51	to	84.3	48"	10'-6"	12-#7
84.31	to	93.7	48"	11'-0"	26-#5
93.71	to	103.5	48"	12'-0"	30-#5
103.51	to	113.9	48"	12'-6"	10-#9
113.91	to	124.7	48"	13'-0"	14-#8
124.71	to	136.0	48"	14'-0"	20-#7
		(.3586") WALL THICKNESS			
	to	31.0	30"	8'-0"	
31.01	to	37.2	30"	8'-6"	
37.21	to	43.9	36"	8'-6"	
43.91	to	51.2	36"	9'-6"	
51.21	to	59.1	36"	10'-0"	
59.11	to	67.6	42"	10'-0"	
67.61	to	76.6	42"	10'-6"	
76.61	to	86.2	42"	11'-6"	
86.21	to	96.3	48"	11'-6"	
96.31	to	107.0	48"	12'-0"	
107.01	to	118.3	48"	12'-6"	
118.31	to	130.1	48"	13'-6"	

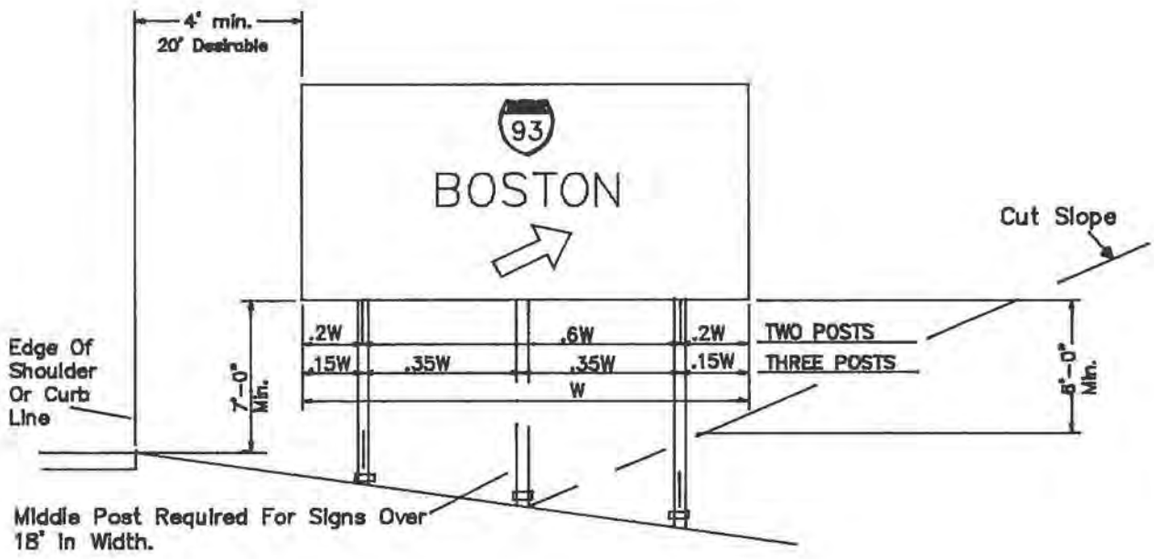
Section Modulus at Bottom of Support (in³)			'B'	'D'+	'A'
		(.4293) WALL THICKNESS			
0	to	36.3	30"	8'-6"	8-#8
36.31	to	43.6	36"	8'-6"	14-#6
43.61	to	51.6	36"	9'-6"	10-#8
51.61	to	60.3	36"	10'-6"	30-#5
60.31	to	69.7	36"	11'-0"	24-#6
69.71	to	79.7	42"	11'-0"	10-#9
79.71	to	90.4	42"	12'-0"	38-#5
90.41	to	101.8	42"	12'-6"	22-#7
101.81	to	113.8	48"	12'-6"	10-#9
113.81	to	126.5	48"	13'-6"	36-#5
126.51	to	140.0	48"	14'-0"	16-#8
140.01	to	154.0	48"	15'-0"	14-#9
		(.5000") WALL THICKNESS			
0	to	41.4	36"	8'-6"	20-#5
41.41	to	49.9	36"	9'-0"	12-#6
49.91	to	59.1	36"	10'-0"	12-#7
59.91	to	69.1	36"	11'-0"	12-#9
69.11	to	79.9	36"	12'-0"	14-#9
79.91	to	91.5	36"	13'-0"	16-#8
91.51	to	103.9	42"	13'-0"	14-#8
103.91	to	117.0	42"	14'-0"	16-#8
117.01	to	131.0	42"	14'-6"	14-#9
131.01	to	145.7	48"	14'-6"	22-#7
145.71	to	161.2	48"	15'-6"	34-#6
161.21	to	177.5	48"	16'-6"	28-#7
177.51	to	194.6	48"	17'-6"	18-#9
194.61	to	212.5	54"	17'-0"	16-#10
		(.5625") WALL THICKNESS			
0	to	45.8	36"	9'-0"	22-#5
45.81	to	55.2	36"	10'-0"	14-#7
55.21	to	65.5	36"	10'-6"	16-#7
65.51	to	76.7	42"	11'-0"	12-#8
76.71	to	88.8	42"	11'-6"	36-#5
88.81	to	101.8	42"	12'-6"	14-#8
101.81	to	115.6	42"	13'-6"	20-#7
115.61	to	130.3	48"	13'-6"	12-#9
130.31	to	145.9	48"	14'-6"	22-#7
145.91	to	162.9	48"	15'-6"	19-#8
162.41	to	179.8	48"	16'-6"	38-#6
179.81	to	198.0	48"	17'-6"	12-#11
198.01	to	217.2	54"	17'-0"	16-#10
217.21	to	237.2	54"	18'-0"	30-#8
		(.6250") WALL THICKNESS			
0	to	50.0	36"	9'-6"	24-#5
50.01	to	60.4	36"	10'-0"	10-#8
60.41	to	71.8	36"	11'-0"	12-#8
71.81	to	84.1	42"	11'-6"	20-#6
84.11	to	97.4	42"	12'-6"	10-#9
97.41	to	111.7	42"	13'-6"	12-#9
111.71	to	127.0	48"	13'-6"	36-#5
127.01	to	143.3	48"	14'-6"	22-#7
143.31	to	160.5	48"	15'-6"	24-#7
160.51	to	178.8	48"	16'-6"	38-#6
178.81	to	198.0	48"	17'-6"	12-#11
198.01	to	218.2	54"	17'-6"	22-#8
218.21	to	239.2	54"	18'-6"	24-#8
239.21	to	261.5	60"	18'-0"	42-#6

* THE SECTION MODULI LISTED ABOVE ARE TO BE USED FOR STEEL SIGN SUPPORT POLES WITH AN ALLOWABLE WORKING STRESS OF 49,764 P.S.I. IF POLES OF AN ALTERNATE MATERIAL ARE USED THE SECTION MODILI OF THE POLES SHALL BE MULTIPLIED BY THE RATIO $\frac{\text{ALLOWABLE WORKING STRESS}}{49{,}764}$

MINIMUM DISTANCE FROM CENTER OF THE ANCOR BOLTS TO THE FACE OF THE CONCRETE SHALL BE 5"

+ THE ACTUAL DEPTH OF FOUNDATION WILL BE THE 'D' DIMENSION ABOVE PLUS THE 1/2" REVEAL.

TYPICAL SIGN INSTALLATION AND LOCATION



GENERAL NOTES

BREAKAWAY SIGN SUPPORTS SHALL BE FABRICATED FROM STRUCTURAL STEEL AND SHALL CONFORM TO THE BREAKAWAY DESIGN SHOWN ON THESE PAGES OF "STANDARD GROUND MOUNTED SIGN SUPPORTS BREAKAWAY DESIGN" AND TO THE APPLICABLE REQUIREMENTS OF THE MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS "STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES."

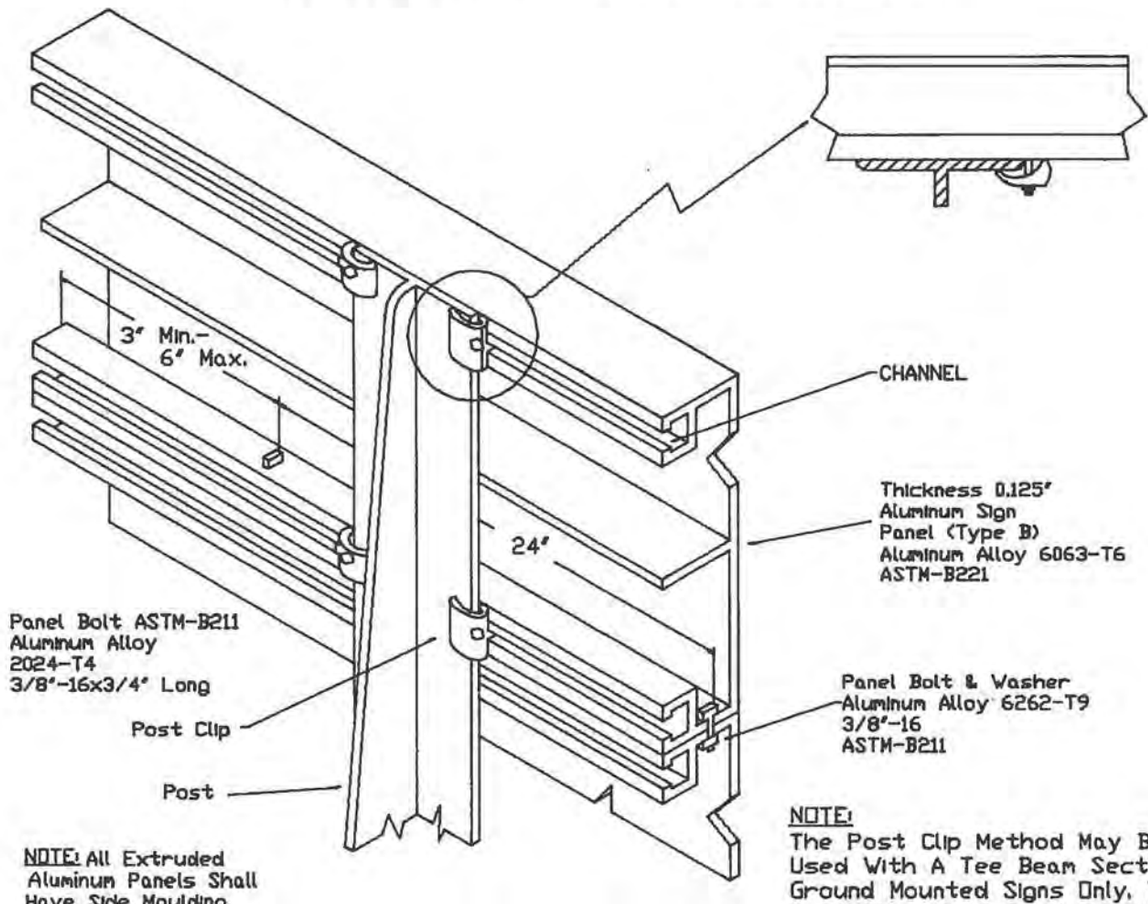
STEEL

DESIGN CONFORMS WITH "AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY SIGNS, LUMINARIES, AND TRAFFIC SIGNALS."
ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM-A36. FLANGE HOLES FOR FUSE BOLTS SHALL BE DRILLED.
ALL HIGH STRENGTH BOLTS, NUTS, AND WASHERS SHALL CONFORM TO ASTM-A325.
TIGHTEN THE HIGH STRENGTH BOLTS IN THE BASE PLATE CONNECTION ONLY TO THE TORQUE SHOWN IN THE TABLE. DO NOT OVER TIGHTEN.
NOTCHED STEEL FUSE PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM-A36.
ALL HOLES SHALL BE DRILLED. ALL PLATE CUTS SHALL BE SAW CUTS.
ALL BOLTS OTHER THAN HIGH STRENGTH BOLTS SHALL CONFORM TO ASTM-A307 CLASS A.
ALL BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED AS PER ASTM-A135.
STRUCTURAL STEEL SHALL BE GALVANIZED AS PER ASTM-A123 AFTER FABRICATION EXCEPT AS NOTED.
IN ALL CASES THE BOTTOM OF THE FOOTING SHALL BE PLACED TO THE DESIGN DEPTH.

ALUMINUM

PANELS, ATTACHMENTS, AND HARDWARE SHALL CONFORM TO THE REQUIREMENTS OF M.D.P.W. SPECIFICATIONS.

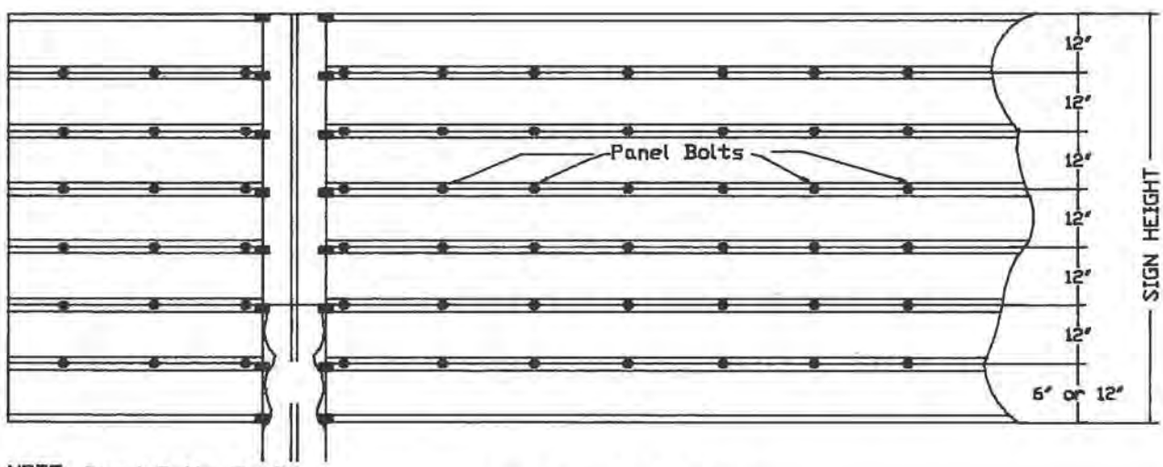
ALUMINUM PANEL DETAILS



NOTE: All Extruded Aluminum Panels Shall Have Side Moulding.

ISOMETRIC SHOWING SIGN COMPONENTS

NOTE:
The Post Clip Method May Be Used With A Tee Beam Section On Ground Mounted Signs Only. The Post Clips Must Be Used At Each Aluminum Channel Attached To The Sign Panel.
Post Clips Shall Not Be Used With "Z" Bar Sections.
Bolts Must Be Used If A "Z" Bar Section Is Used.

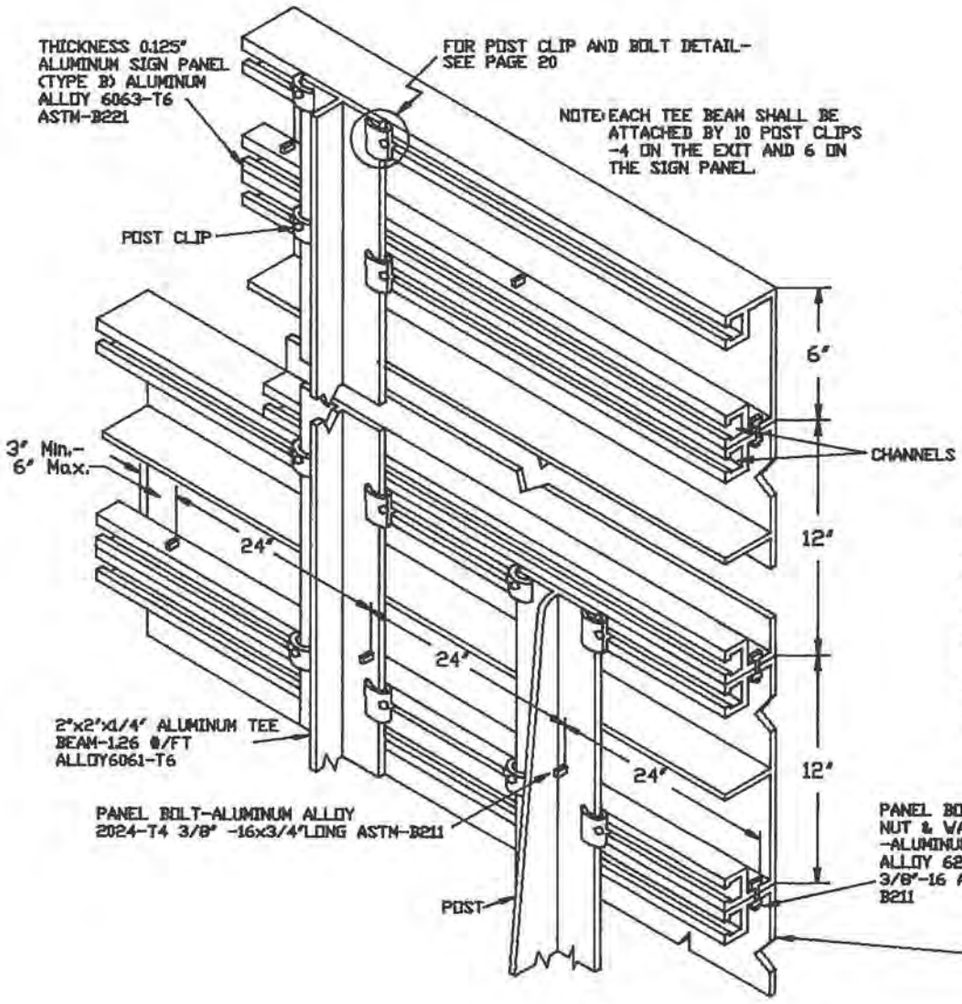


NOTE: Panel Bolts To Be Placed Symmetrically About ℄ Of Sign

REAR ELEVATION

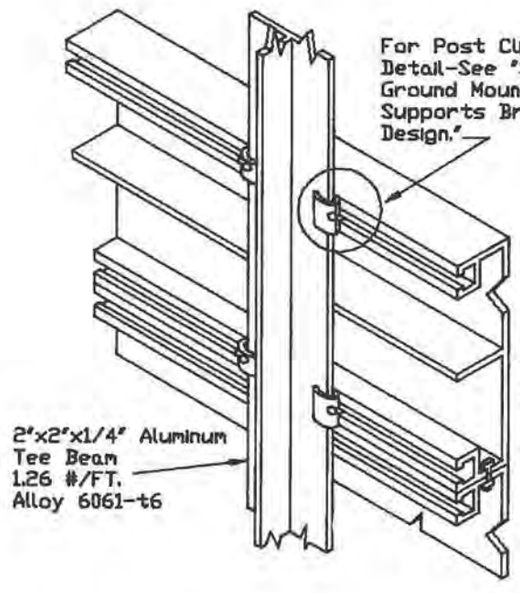
Showing Arrangement Of Post Clips (Both Posts Or All Posts) And Panel Bolts.

ALUMINUM PANEL DETAILS

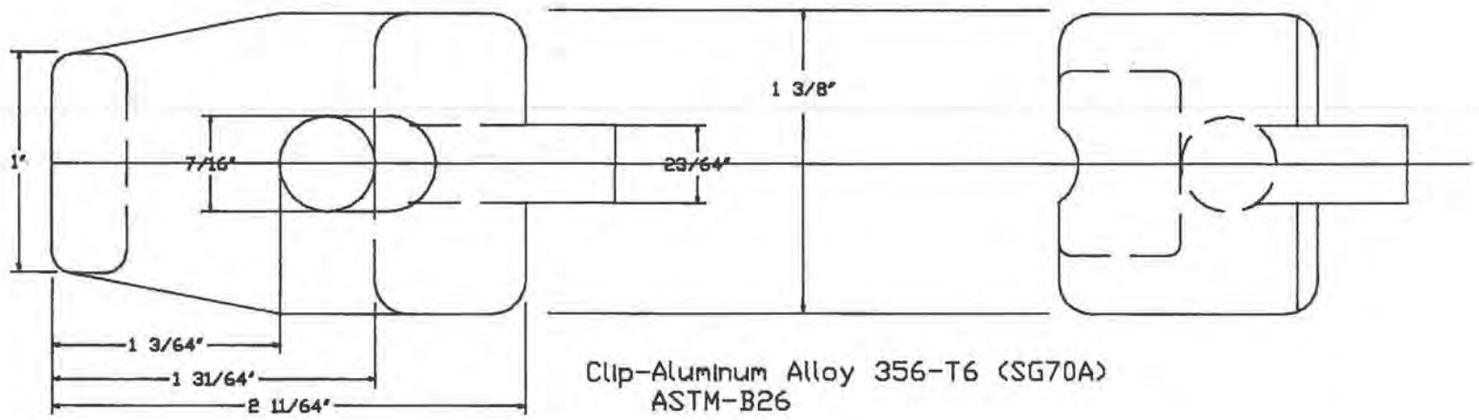


ISOMETRIC SHOWING METHOD OF ATTACHMENT FOR EXIT TAB. (E5-2 TO SIGN PANEL)

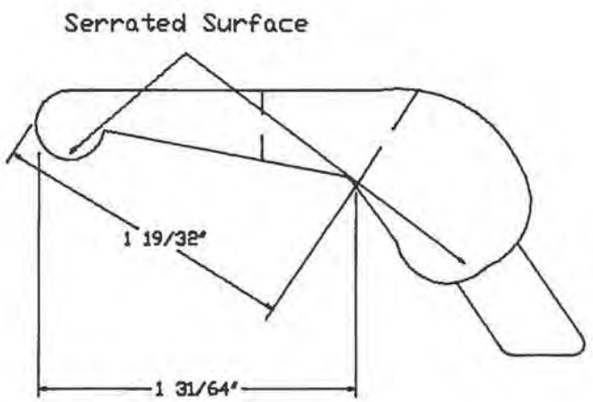
NOTE
THE POST CLIP METHOD MAY BE USED WITH A TEE BEAM SECTION ON GROUND MOUNTED SIGNS ONLY.
THE POST CLIPS MUST BE USED AT EACH ALUMINUM CHANNEL ATTACHED TO THE SIGN PANEL.
POST CLIPS SHALL NOT BE USED WITH "Z" BAR SECTIONS.
BOLTS MUST BE USED IA A "Z" BAR SECTION IS USED.
POST CLIPS ON GROUND SIGNS ONLY.

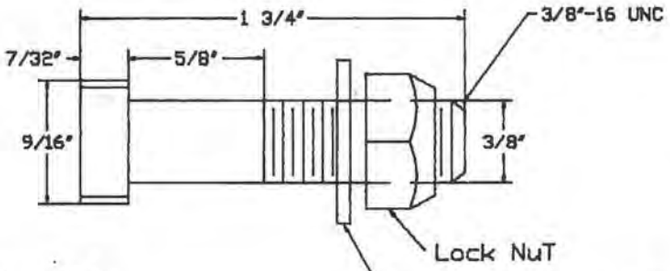


ISOMETRIC SHOWING METHOD OF ATTACHMENT FOR EXIT TAB (E1-5)--TO SIGN PANEL.



Clip-Aluminum Alloy 356-T6 (SG70A)
ASTM-B26





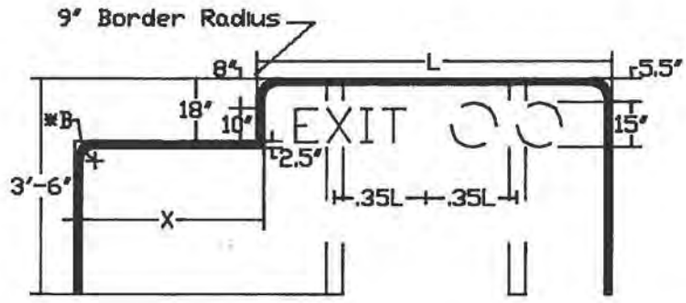
Machine
Bolt- Stainless Steel Alloy 304
ASTM-A-193-Grade B8 or
ASTM-A-194-Grade 8
Nut- Stainless Steel Alloy 303
ASTM-A-193-Grade B 8F or
ASTM-A-194-Grade 8F

Flat Washer 3/4" Dia. x.062"
with .406 Dia. hole ASTM-A-276
Type 302 (Stainless Steel)

POST CLIP AND BOLT DETAIL
(FOR EXTRUDED ALUMINUM)

ALUMINUM PANEL DETAILS

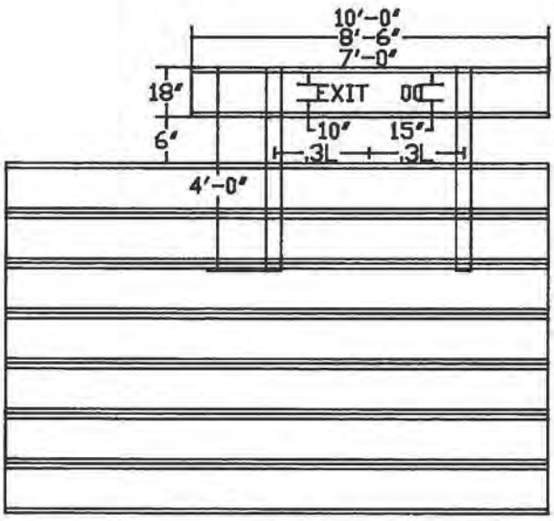
TYPICAL EXIT TAB (E1-5, INTEGRAL PART OF E1-1 TYPE SIGN)



*B Height of Sign	Radius
Up to 2'	3"
2.5' to 4'	6"
4.5' to 6'	9"
6.5' & Over	12"

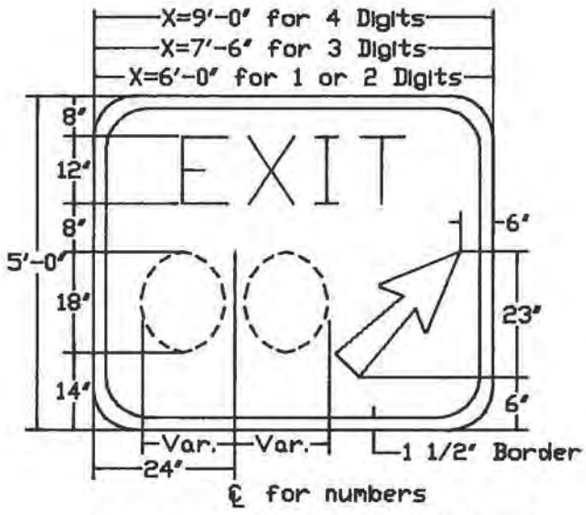
The minimum distance for X shall be one (1) foot.

ONE	DIGIT	(EXIT 0)	L=7'-0"
TWO	DIGITS	(EXIT 00)	L=8'-6"
THREE	DIGITS	(EXIT 000)	L=10'-0"
FOUR	DIGITS	(EXIT 0000)	L=12'-0"



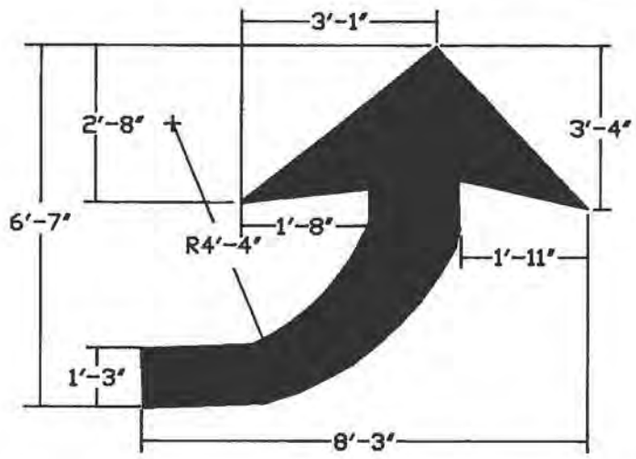
E1-5

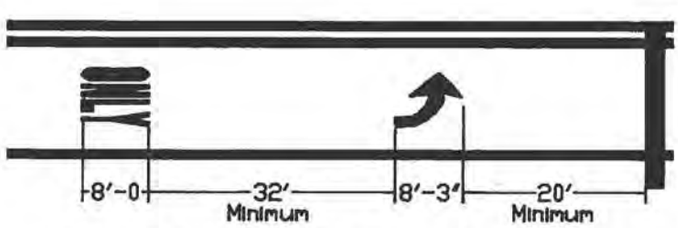
TYPICAL EXIT TAB ATTACHED TO SIGN PANEL



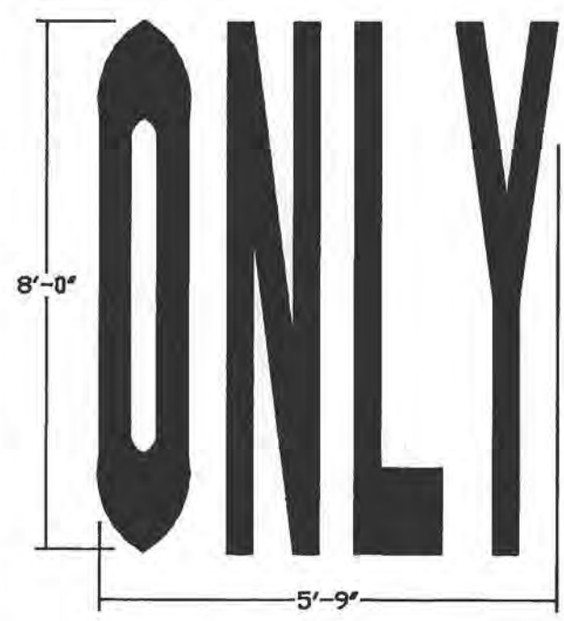
Legend & Border-White (Reflect.)
Background------Green (Reflect.)
Arrow Design------"A"

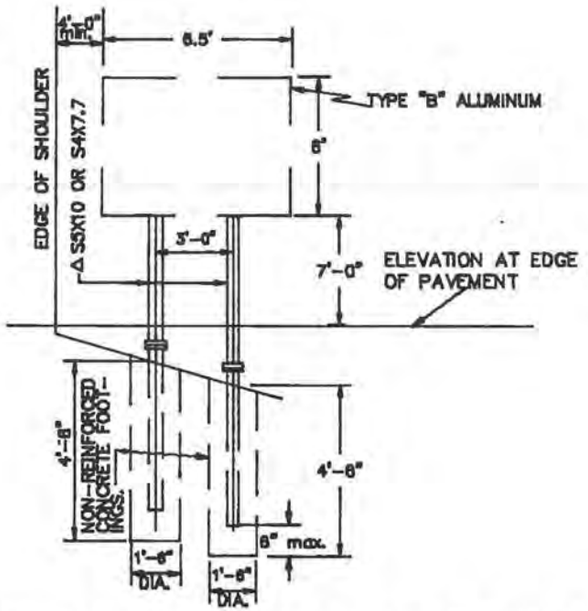
E5-1A





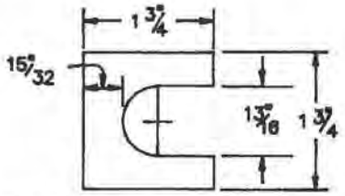
ARROW & ONLY=APPROX. 46 Sq. Ft. OF Paint





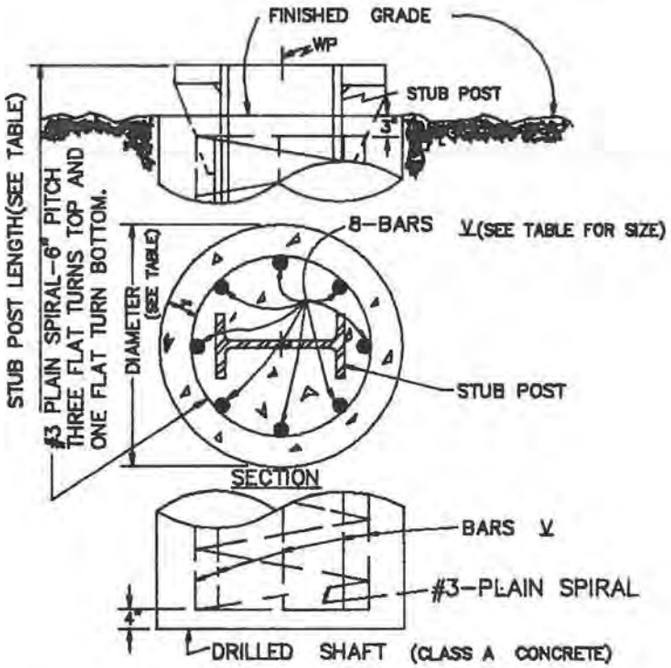
TYPICAL INSTALLATION FOR SIGNS WITH AREA OVER 20 SQ.FT. UP TO 40 SQ.FT.

NOTE:-EAST OF LONGITUDE 71°-41' USE S5 X 10 POSTS.
WEST OF LONGITUDE 71°-41' USE S4 X 7.7 POSTS.
SPACING OF POSTS AND FOUNDATION DETAIL AS SHOWN FOR SIGNS UP TO 5'-0" IN WIDTH
OVER 5'-0" IN WIDTH SPACING BETWEEN POSTS= 0.6 X WIDTH
FOR BASE CONNECTION AND FUSE PLATE DATA SEE PAGE 23.

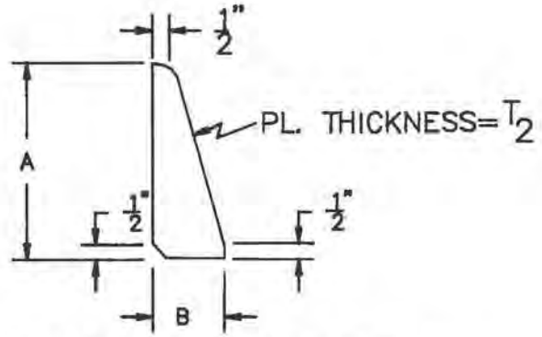


FURNISH 2-.012"+THICK AND 2-.032"±THICK SHIMS PER POST. SHIMS SHALL BE FABRICATED FROM BRASS SHIM STOCK OR STRIP CONFORMING TO ASTM-B36

SHIM DETAIL



FOUNDATION DETAILS FOR SIGNS WITH AREA OVER 40 SQ.FT.



STIFFENER PLATE DETAIL

SEE TABLE FOR DIMENSION

BASE CONNECTION DATA TABLE										
DIMENSION / POST SIZE	BOLT SIZE &TORQUE	A	B	C	D	E	T_1	T_2	W	R
W6 X 12	$\frac{5}{8}$" × 3 $\frac{1}{4}$" With 1 $\frac{3}{4}$" Thread TORQUE 450'#	5"	2"	1 $\frac{1}{4}$"	2 $\frac{3}{4}$"	1 $\frac{1}{8}$"	$\frac{3}{4}$"	$\frac{1}{2}$"	$\frac{1}{4}$"	$\frac{11}{32}$"
W6 X 15										
W8 X 18										
W8 X 21										
W10 X 22	$\frac{3}{4}$" × 4" With 1 $\frac{7}{8}$" Thread TORQUE 750'#	6"	2 $\frac{1}{4}$"	1 $\frac{3}{8}$"	3 $\frac{1}{2}$"	1 $\frac{1}{4}$"	1"	$\frac{3}{4}$"	$\frac{5}{16}$"	$\frac{13}{32}$"
W10 X 26										
W12 X 26										
W12 X 30		8"	2 $\frac{3}{4}$"	1 $\frac{5}{8}$"	5 $\frac{1}{2}$"	1 $\frac{1}{4}$"	1"	$\frac{3}{4}$"	$\frac{5}{16}$"	$\frac{17}{32}$"
W12 X 40										
S 4 X 7.7	$\frac{5}{8}$" × 3 $\frac{1}{4}$" With 1 $\frac{7}{8}$" Thread TORQUE 200'#	SEE DETAIL								
S 5 X 10.0										

See Pages 29 & 30 for Base Plate Assembly

FUSE PLATE DATA TABLE											
DIMENSION / POST SIZE	F	G	H	J	K	L	N	D_1	T_3	BOLT DIA.	WT. OF EACH FUSE PL.
W6 X 12	3 $\frac{3}{4}$"	2"	1 $\frac{1}{8}$"	4"	2 $\frac{1}{4}$"	$\frac{7}{8}$"	$\frac{5}{8}$"	$\frac{11}{16}$"	$\frac{3}{8}$"	$\frac{5}{8}$"	1.60 #
W6 X 15	4 $\frac{1}{2}$"	2 $\frac{1}{2}$"	1 $\frac{1}{4}$"	6"	3 $\frac{1}{2}$"	1 $\frac{1}{4}$"	$\frac{3}{4}$"	$\frac{13}{16}$"	$\frac{1}{2}$"	$\frac{3}{4}$"	3.75 #
W8 X 18	4 $\frac{1}{2}$"	2 $\frac{1}{2}$"	1 $\frac{1}{4}$"	5 $\frac{1}{4}$"	2 $\frac{3}{4}$"	1 $\frac{1}{4}$"	$\frac{3}{4}$"	$\frac{13}{16}$"	$\frac{1}{2}$"	$\frac{3}{4}$"	3.27 #
W8 X 21	4 $\frac{7}{8}$"	2 $\frac{1}{2}$"	1 $\frac{1}{2}$"	5 $\frac{1}{4}$"	2 $\frac{3}{4}$"	1 $\frac{1}{4}$"	$\frac{7}{8}$"	$\frac{15}{16}$"	$\frac{1}{2}$"	$\frac{7}{8}$"	3.93 #
W10 X 22	5 $\frac{3}{8}$"	3"	1 $\frac{1}{2}$"	5 $\frac{3}{4}$"	2 $\frac{3}{4}$"	1 $\frac{1}{2}$"	$\frac{7}{8}$"	$\frac{15}{16}$"	$\frac{1}{2}$"	$\frac{7}{8}$"	4.75 #
W10 X 26	5 $\frac{3}{8}$"	3"	1 $\frac{1}{2}$"	5 $\frac{3}{4}$"	2 $\frac{3}{4}$"	1 $\frac{1}{2}$"	$\frac{7}{8}$"	$\frac{15}{16}$"	$\frac{1}{2}$"	$\frac{7}{8}$"	4.79 #
W12 X 26	5 $\frac{3}{8}$"	3"	1 $\frac{1}{2}$"	6 $\frac{1}{2}$"	3 $\frac{1}{2}$"	1 $\frac{1}{2}$"	$\frac{7}{8}$"	$\frac{15}{16}$"	$\frac{1}{2}$"	$\frac{7}{8}$"	5.42 #
W12 X 30	5 $\frac{3}{8}$"	3"	1 $\frac{1}{2}$"	6 $\frac{1}{2}$"	3 $\frac{1}{2}$"	1 $\frac{1}{2}$"	$\frac{7}{8}$"	$\frac{15}{16}$"	$\frac{1}{2}$"	$\frac{7}{8}$"	5.42 #
W12 X 40	5 $\frac{7}{8}$"	3"	1 $\frac{1}{2}$"	8"	5"	1 $\frac{1}{2}$"	1 $\frac{3}{8}$"	1 $\frac{1}{16}$"	$\frac{1}{2}$"	1"	6.12 #
S 4 X 7.7	3 $\frac{1}{8}$"	1 $\frac{1}{2}$"	1 $\frac{1}{8}$"	2 $\frac{7}{8}$"	1 $\frac{1}{2}$"	$\frac{9}{16}$"	$\frac{1}{2}$"	$\frac{9}{16}$"	$\frac{1}{4}$"	$\frac{1}{2}$"	0.64 #
S 5 X 10.0	3 $\frac{1}{8}$"	1 $\frac{1}{2}$"	1 $\frac{1}{8}$"	2 $\frac{7}{8}$"	1 $\frac{1}{2}$"	$\frac{9}{16}$"	$\frac{1}{2}$"	$\frac{9}{16}$"	$\frac{1}{4}$"	$\frac{1}{2}$"	0.64 #

See Page 27 For Fuse Plate Details

FOUNDATION DATA						* ALTERNATE	
DIMENSION / POST SIZE	STUB LENGTH	STUB PROJ.	DR. SHAFT DIA.	BARS V. SIZE	DEPHT CONC. SHAFT	DIA.	DEPTH
W6 X 12	2'-0"	3"	2'-0"	# 5	5'-6"	—	—
W6 X 15	2'-0"	3"	2'-0"	# 5	6'-6"	2'-3"	6'
W8 X 18	2'-6"	3"	2'-0"	# 6	7'-0"	2'-3"	6'
W8 X 21	2'-6"	3"	2'-0"	# 7	8'-0"	2'-6"	6'
W10 X 22	3'-0"	2 $\frac{1}{2}$"	2'-0"	# 8	9'-6"	2'-6"	6'
W10 X 26	3'-0"	2 $\frac{1}{2}$"	2'-0"	# 9	10'-0"	2'-6"	6'
W12 X 26	3'-0"	2 $\frac{1}{2}$"	2'-0"	# 10	11'-0"	3'-0"	6'
W12 X 30	3'-0"	2 $\frac{1}{2}$"	2'-0"	# 11	12'-0"	3'-0"	6'
W12 X 40	3'-0"	2 $\frac{1}{2}$"	2'-6"	# 10	12'-0"	3'-0"	6'
S 4 X 7.7	1'-6"	3 $\frac{1}{2}$"	1'-6"	# 5	4'-0"		
S 5 X 10.0	1'-6"	3 $\frac{1}{2}$"	1'-6"	# 5	5'-0"		

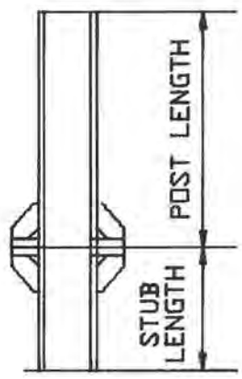
See Page 22 For Foundation Details

* IF ROCK, LEDGE OR WATER ENCOUNTERED, ALTERNATE FOOTINGS MAY BE EMPLOYED ONLY WITH THE WRITTEN APPROVAL OF THE ENGINEER.

POST WEIGHT DATA

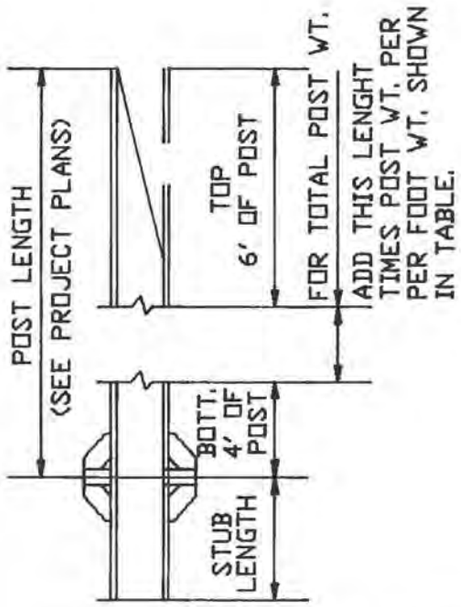
POST WEIGHT DATA	
POST SIZE*	WEIGHT
W6 x 12	158.4 LB.
S4 x 7.7	96.1 LB.
S5 x 10.0	122.6 LB.

* LAST FIGURES=POST WEIGTH PER FOOT. NO TAPER



WEIGHT DATA IS THE WEIGHT OF ITEMS SHOWN FOR ONE POST-(INCLUDES 10' OF POST LENGTH, POST FOUNDATION STUB, RELATED BASE CONNECTION PLATES AND STIFFENERS, FRICTION FUSE PLATE AND ALL HIGH STRENGTH BOLTS, NUTS, AND WASHERS.)

FOR SIGNS HAVING A TOTAL AREA OVER 20 SQ. FT. TO 40 SQ. FT.

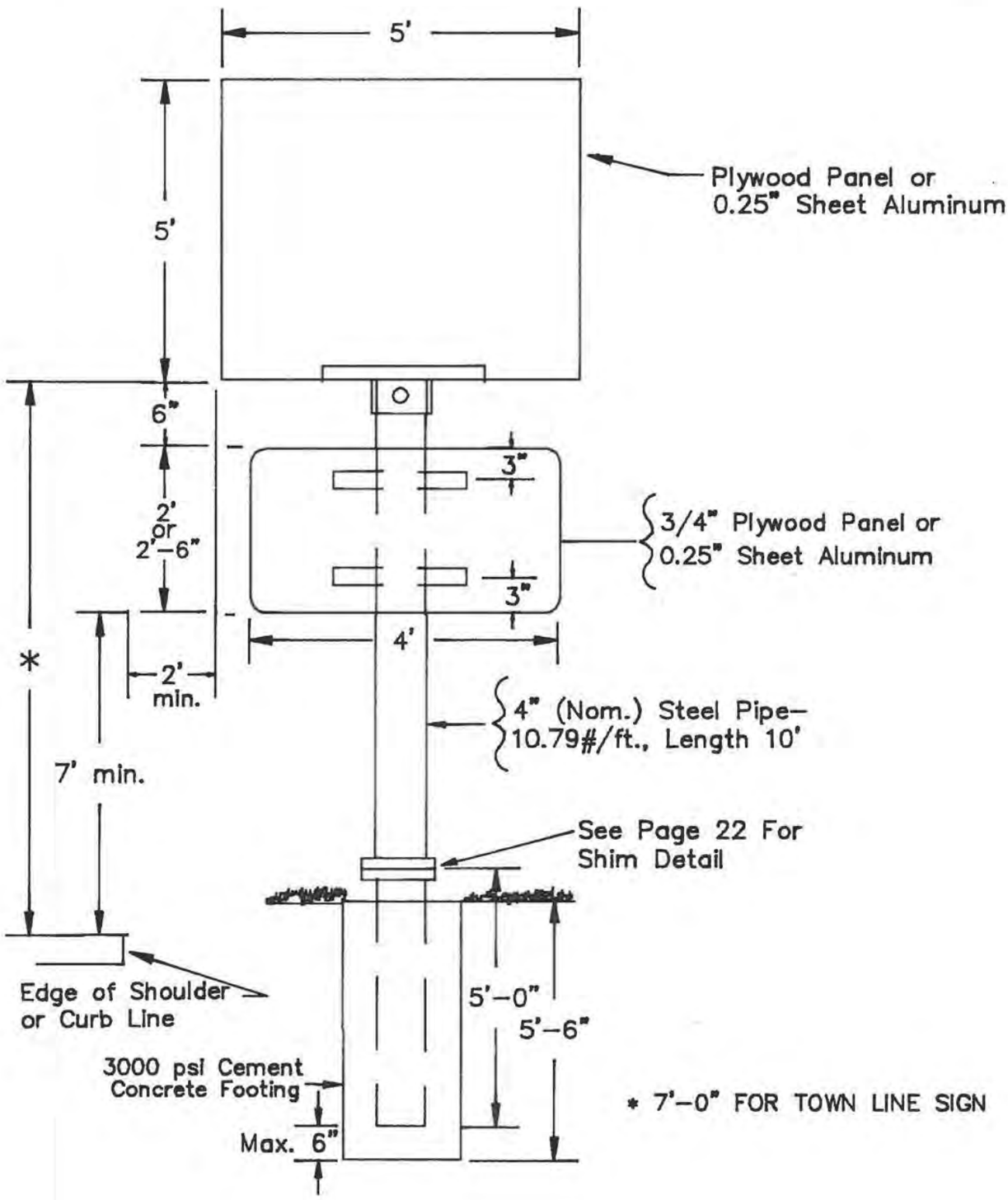


POST WEIGHT DATA	
POST SIZE*	WEIGHT
W6 x 12	128.4 LB.
W6 x 15	160.1 LB.
W8 x 18	197.2 LB.
W8 x 21	229.3 LB.
W10 x 22	259.6 LB.
W10 x 26	301.7 LB.
W12 x 26	302.3 LB.
W12 x 30	353.1 LB.
W12 x 40	460.6 LB.
S4 x 7.7	76.9 LB.
S5 x 10.0	97.6 LB.

* LAST FIGURES=POST WEIGTH PER FOOT.

WEIGHT DATA IS THE WEIGHT OF ITEMS SHOWN FOR ONE POST-(INCLUDES TOP 6' OF POST, BOTTOM 4' OF POST, POST FOUNDATION STUB, RELATED BASE CONNECTION PLATES AND STIFFENERS, FRICTION FUSE PLATES AND ALL HIGH STRENGTH BOLTS, NUTS, AND WASHERS.)

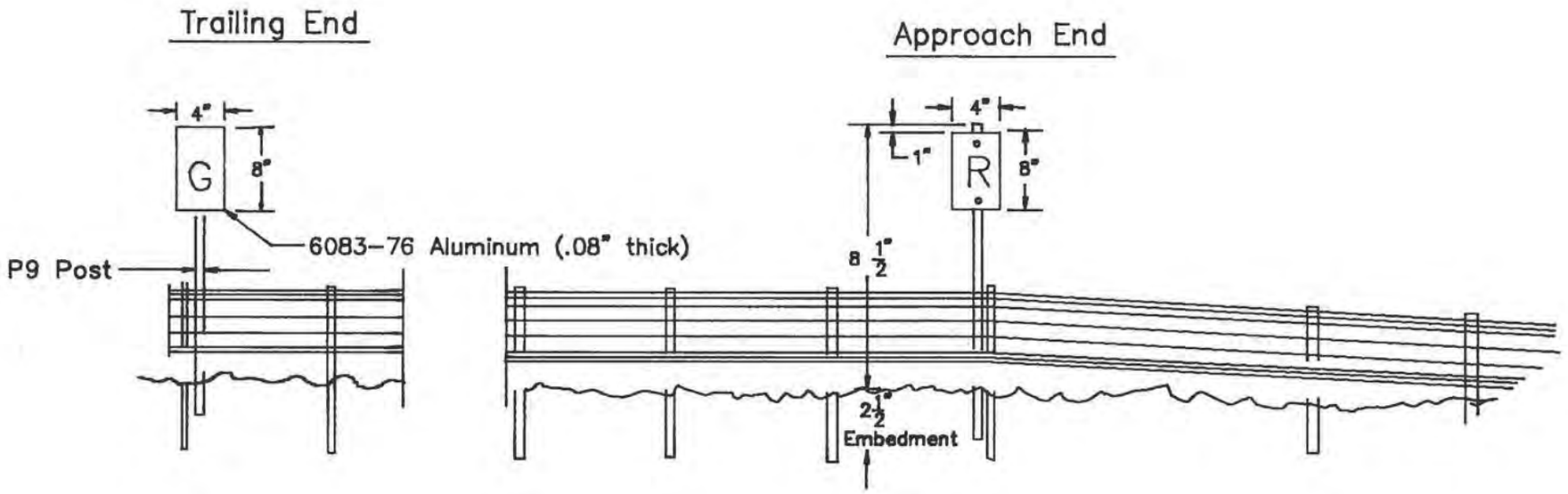
FOR SIGNS HAVING A TOTAL AREA OVER 40 SQ. FT.


5'
5'
Plywood Panel or
0.25" Sheet Aluminum
6"
2'
or
2'–6"
3"
3"
3/4" Plywood Panel or
0.25" Sheet Aluminum
4'
*
2'
min.
4" (Nom.) Steel Pipe–
10.79#/ft., Length 10'
7' min.
See Page 22 For
Shim Detail
Edge of Shoulder
or Curb Line
5'–0"
5'–6"
3000 psi Cement
Concrete Footing
Max. 6"
* 7'–0" FOR TOWN LINE SIGN

D–6 with D–8

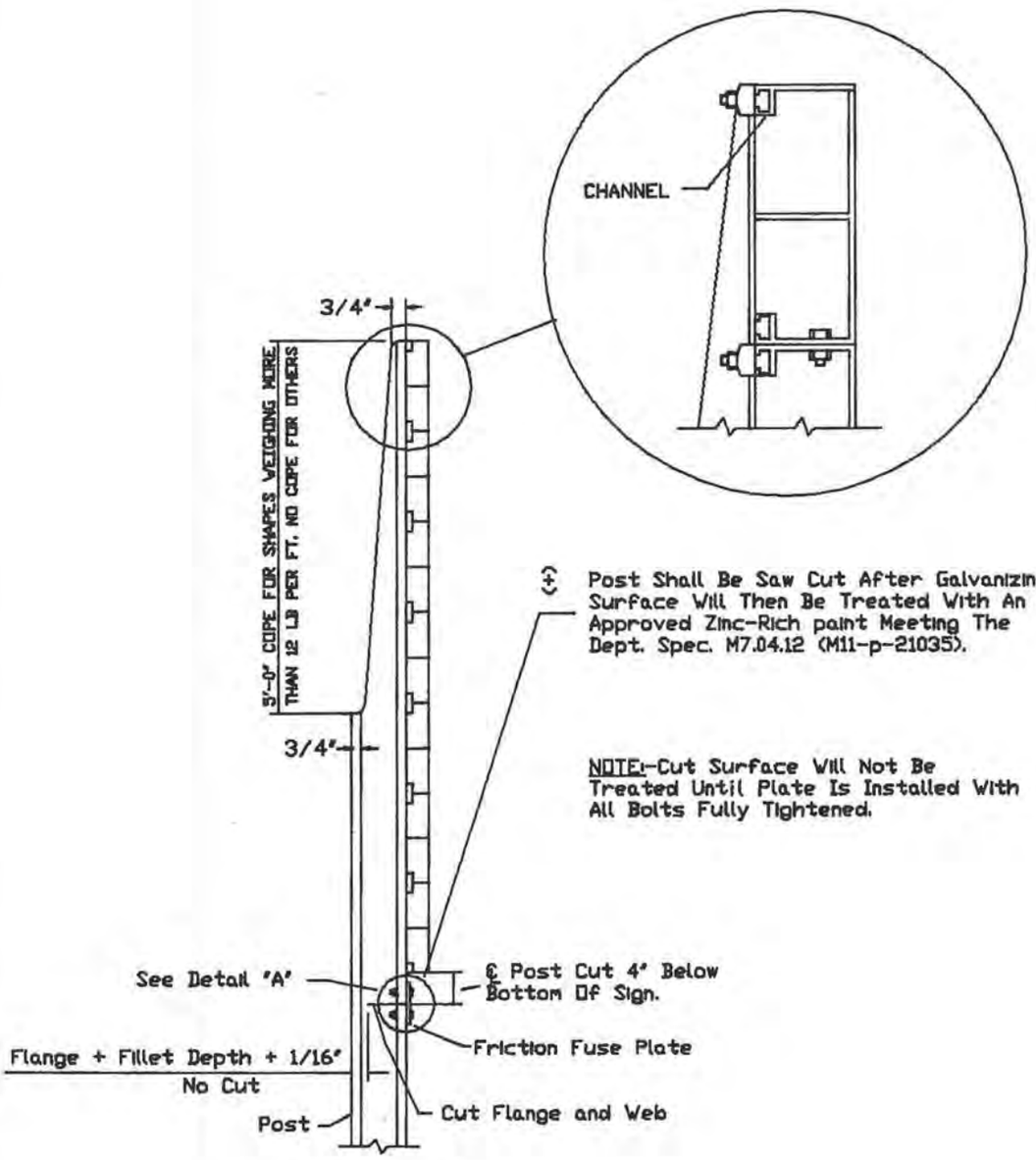
NOTES:

1. The First Full Height Post Encountered In The Direction Of Travel Shall Be Marked By a "Red" Delineator and The Last Full Height End Post In The Section Shall Be Marked By A "Green" Delineator.
2. Delineators Shall Be Fabricated From Reflective Sheeting.
3. P9 Posts Shall Be Erected Within 6" Perpendicular To The Web Of Guardrail Post.



Deliniation For Guardrail Termini

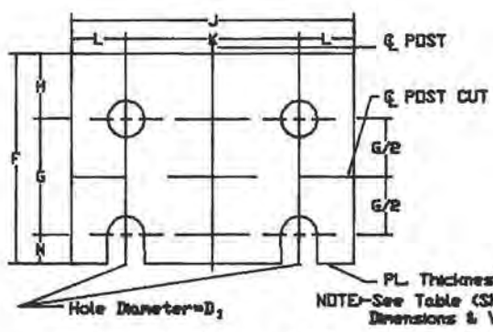
POST COPING DETAILS



SIDE VIEW

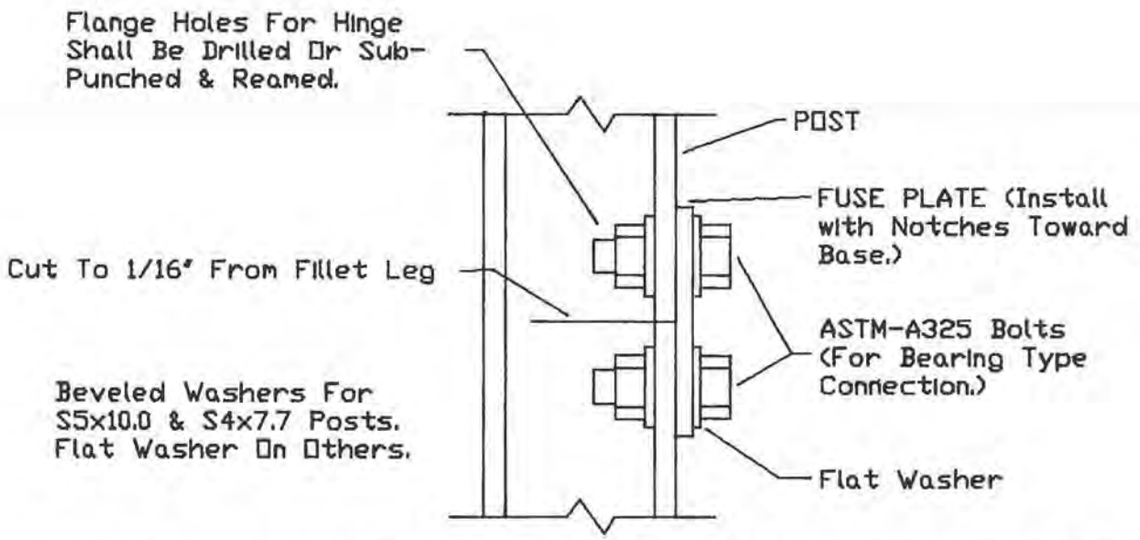
NOTE:

THE POST CLIP METHOD MAY BE USED WITH A TEE BEAM SECTION ON GROUND MOUNTED SIGNS ONLY. THE POST CLIPS MUST BE USED AT EACH ALUMINUM CHANNEL ATTACHED TO THE SIGN PANEL.
POST CLIPS SHALL NOT BE USED WITH "Z" BAR SECTIONS.
BOLTS MUST BE USED IF A "Z" BAR SECTION IS USED.



Use H.S. Bolts With Hex. Hd. & Hex Nut, One Flat Washer Under Each Bolt Head And Bevel Or Flat Washer (Where Required) Under Nut.

FUSE PLATE DETAIL



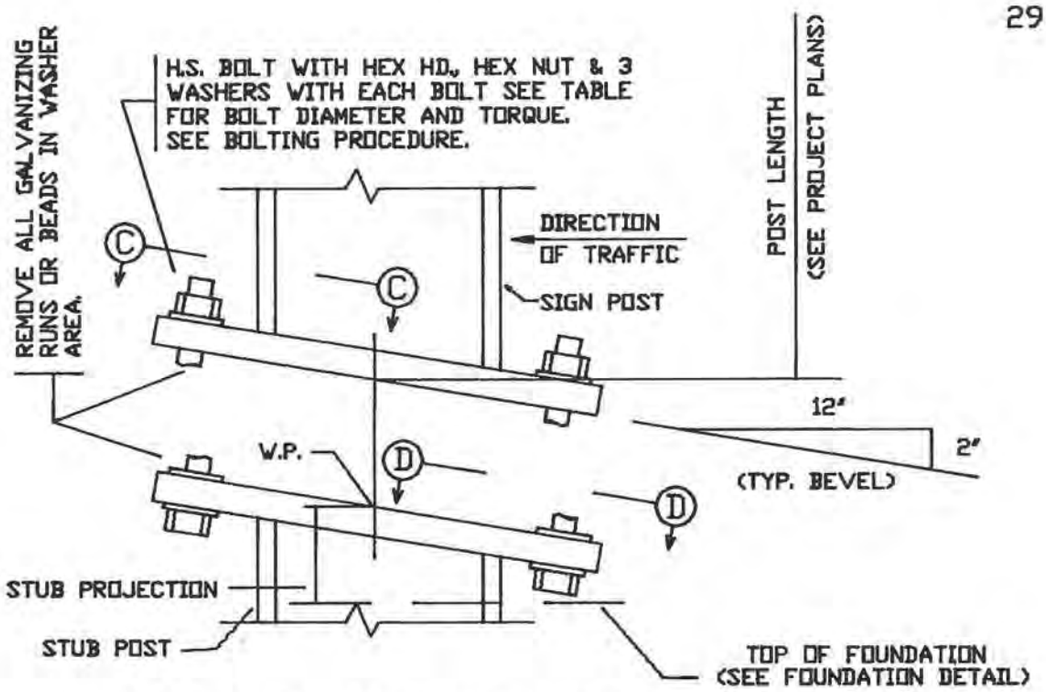
Field Note: All fuse plate bolts shall be 2 3/4" in length and have 2 1/4" of thread on the end of the bolt. All friction fuse bolts shall be tightened in the presence of the Department's representative in the field and in accordance with the requirements of Article 2.10.20, with a wrench calibrated daily at the Contractor's expense at the project site with a hydraulic bolt tension calibrator to obtain the following tension in each bolt.

Refer To Sheet 27 Fuse Plate Detail

Bolt Size	Tension
1/2"	12,000 lbs.
5/8"	19,000 lbs.
3/4"	28,000 lbs.
7/8"	36,000 lbs.

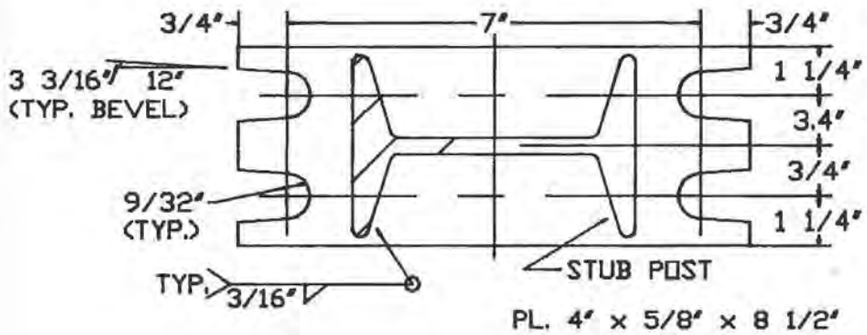
This installation procedure shall comprise the inspection required by the above mentioned specification. Fabricator shall assemble the signs in the shop with suitable erection bolts for shipment to the project whereupon said bolts shall be replaced with the specified hi-strength bolts and tested to the values shown above. Inspection shall be accordance with the above mentioned Article 2.10.20 except that the inspection wrench shall be a torque wrench and that all bolts installed on the various fuse plates shall be inspected.

DETAIL "A" HINGE



SIGN POST AND STUB POST ELEVATION

FOR S4x7.7 AND S5x10.0 SHAPES

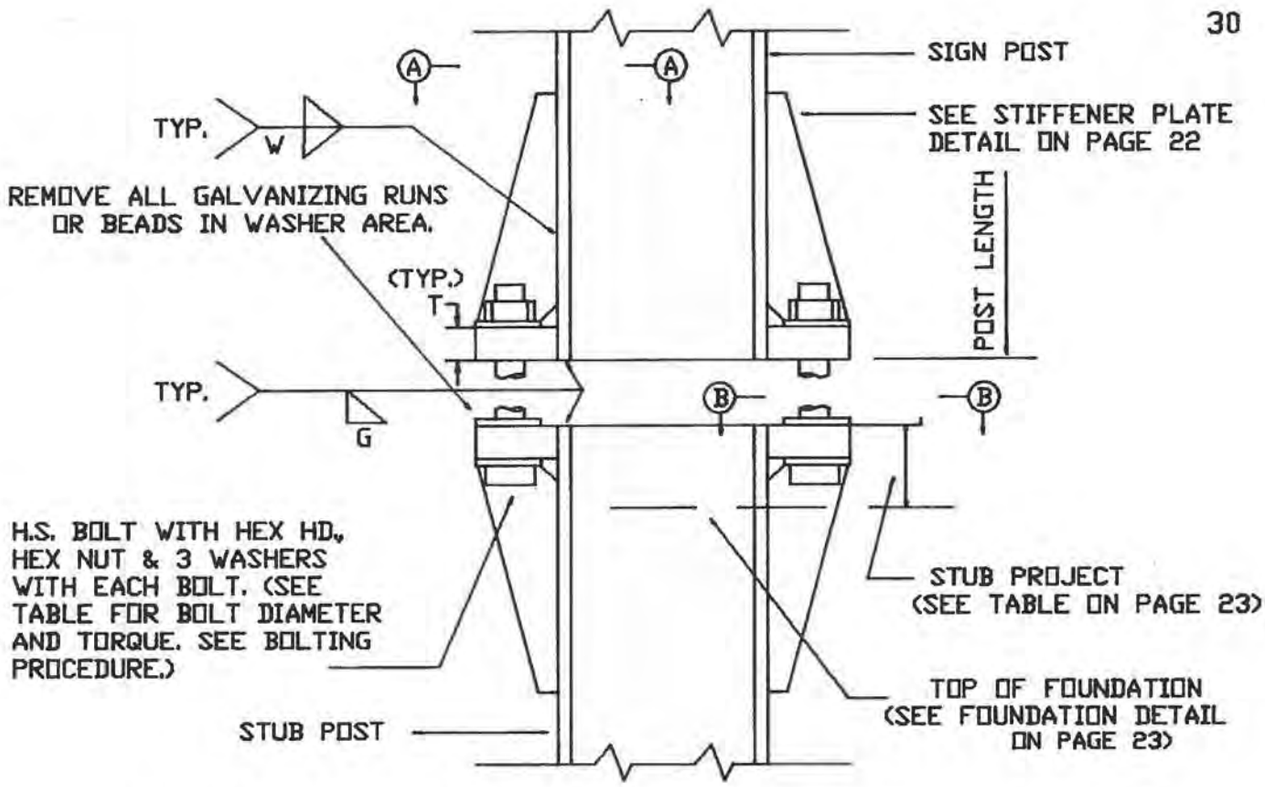


SECTION C-C SECTION D-D

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

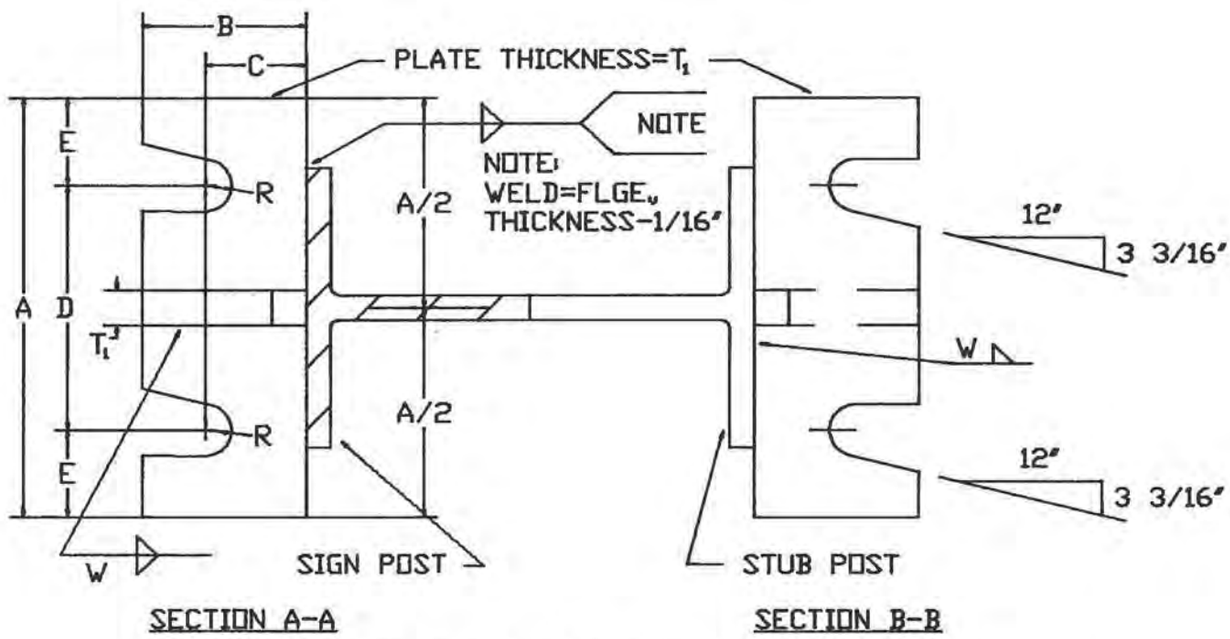
PROCEDURE FOR ASSEMBLY OF BASE CONNECTION

1. ASSEMBLE POST TO STUB WITH BOLTS AND WITH ONE FLAT WASHER ON EACH BOLT BETWEEN PLATES.
2. SHIM AS REQUIRED TO PLUMB POST.
3. TIGHTEN ALL BOLTS THE MAXIMUM POSSIBLE WITH 12 TO 15" WRENCH TO BED WASHERS AND SHIMS AND TO CLEAN BOLT THREADS, THEN LOOSEN EACH BOLT IN TURN AND RETIGHTEN IN A SYSTEMATIC ORDER TO THE PRESCRIBED TORQUE. (SEE TABLE ON PAGE 23)
4. AFTER THE INITIAL TORQUING A SECOND NUT WILL BE USED TO INSURE THAT THE FIRST NUT WILL NOT BACK OFF.
5. THE CONTRACTOR TOGETHER WITH A DEPARTMENT INSPECTOR WILL RETURN TO THE SIGN FOR TWO INTERVALS OF 30± DAYS FOR THE PURPOSE OF MAINTAINING THE PRESCRIBED TORQUE.
6. IMMEDIATELY AFTER THE SECOND RE-TORQUING, THE TOP NUT SHALL BE REMOVED AND THE THREAD SHALL BE BURRED JUST ABOVE THE FIRST NUT USING A CENTER PUNCH, IN ORDER TO INSURE THAT THE PRESCRIBED TORQUE IS MAINTAINED.



SIGN POST AND STUB POST FOR W SHAPES

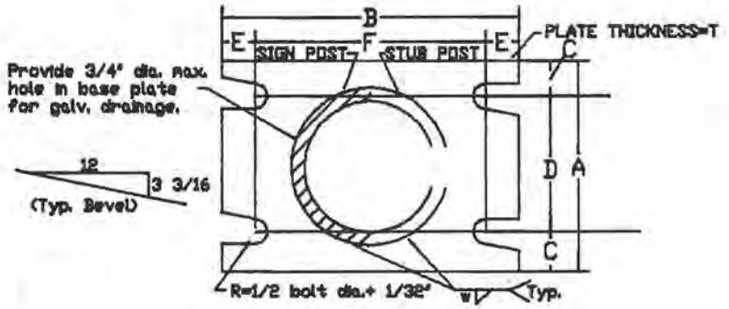
ELEVATION



SECTION A-A

SECTION B-B

SEE TABLE ON SHEET 23 FOR DIMENSIONS
SECTIONS SHOWN ARE FOR INSTALLATIONS ON RIGHT SHOULDER AND IN GORE. FOR INSTALLATIONS ON LEFT SHOULDER, PLATE AND SLOT BEVELS ARE OPPOSITE HAND.

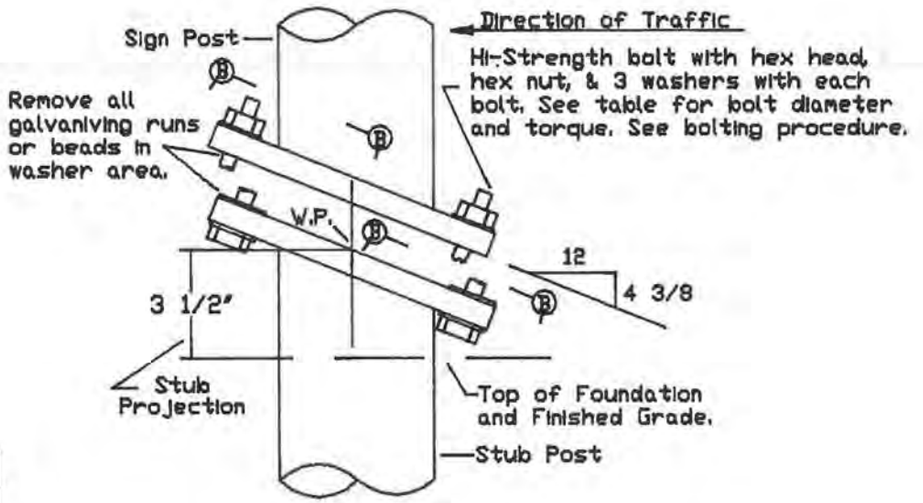


Section A-A Section B-B

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.

BASE CONNECTION DATA TABLE									
Nom. Pipe Size Dimension	Bolt Size & Torque	A	B	C	D	E	F	T	W
4"	1/2" x 3" with 1/2" thread Torque 200 Ft. Lbs.	5 1/2"	7 3/4"	1"	3 1/2"	3/4"	6 1/4"	3/4"	3/8"
5"	5/8" x 3 3/8" with 1 3/4" thread Torque 450 Ft. Lbs.	6 1/2"	9 3/4"	1 1/4"	4"	7/8"	8"	1"	7/16"
6"		7 1/4"	10 1/2"	1 1/8"	4 1/2"	7/8"	8 3/4"	1"	7/16"

*Plates for base connection shall conform with the requirements of ASTM-A36.



D6 & DD6

SIGN POST AND STUB POST ELEVATION

GENERAL NOTES

BREAKAWAY SIGN SUPPORTS SHALL CONFORM TO THE BREAKAWAY DESIGN SHOWN ON THE SHEETS FOR 'GROUND MOUNTED SIGN SUPPORTS BREAKAWAY DESIGN FOR THE D-6 AND D-6 WITH D-8 SIGN OR SIGN ASSEMBLY' AND THE MASS. DEPT. OF PUBLIC WORKS 'STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.'

THE STEEL POSTS SHALL BE SEAMLESS STEEL PIPE AND SHALL CONFORM TO THE ASTM DESIGNATION A53.

ALL HIGH STRENGTH BOLTS, NUTS, AND WASHERS SHALL CONFORM TO ASTM-A325.

TIGHTEN THE HIGH STRENGTH BOLTS IN THE BASE PLATE CONNECTION ONLY TO THE TORQUE SHOWN IN THE TABLE. DO NOT OVERTIGHTEN.

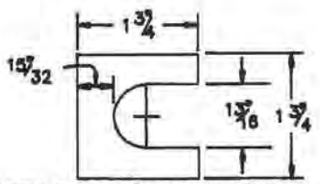
ALL BOLTS, OTHER THAN HIGH STRENGTH BOLTS SHALL CONFORM TO ASTM-A307 CLASS A.

ALL STEEL HARDWARE SHALL BE GALVANIZED AS PER ASTM-A153.

SEAMLESS STEEL PIPE AND BASE PLATES SHALL BE GALVANIZED AS PER ASTM-A123.

IN ALL CASES THE BOTTOM OF THE FOOTING SHALL BE PLACED TO THE DESIGN DEPTH.

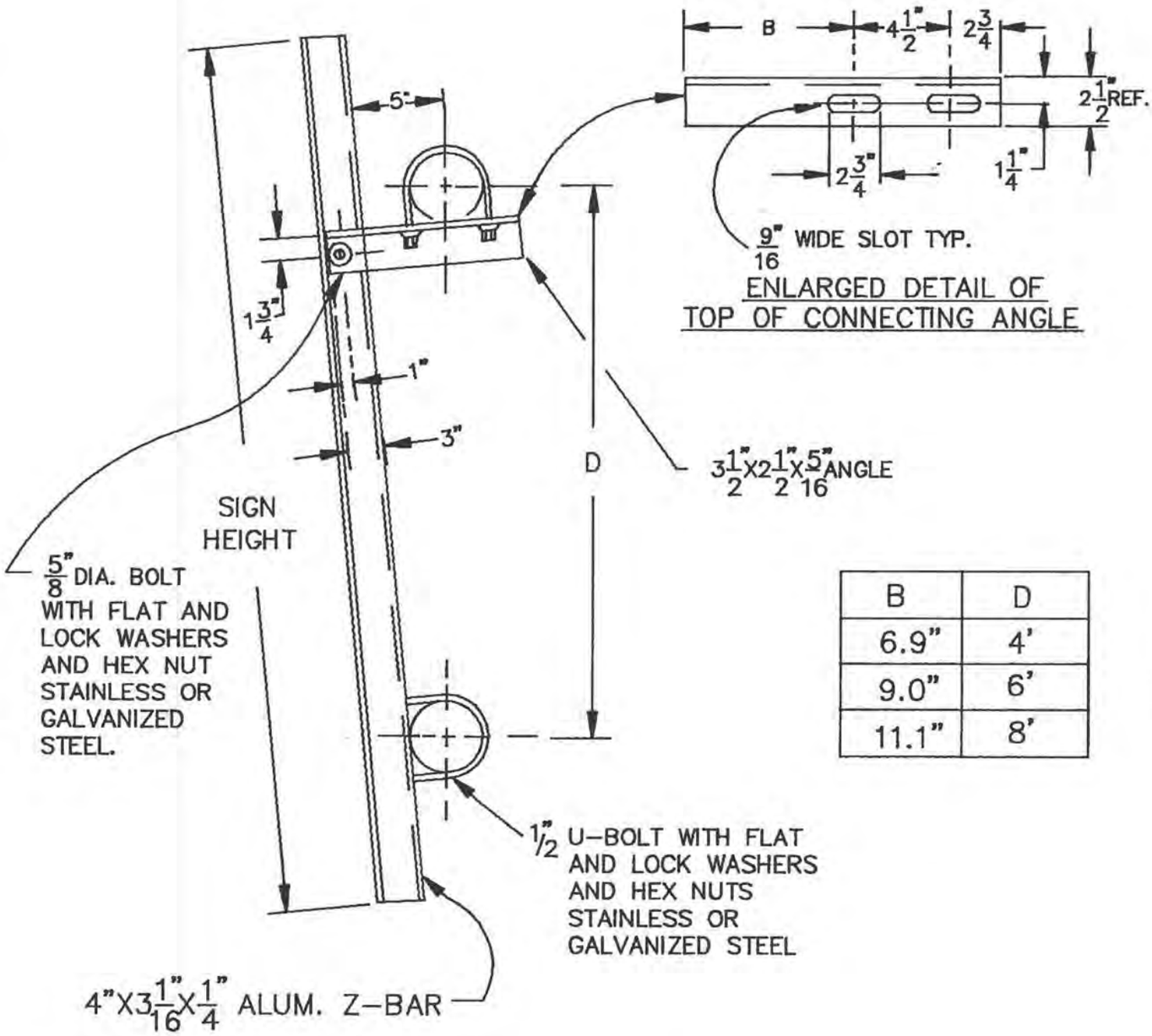
THE LEGEND AND BORDER FOR D-6 SIGNS SHALL BE HIGH INTENSITY ENCAPSULATED LENSE.



FURNISH 2-.012"+THICK AND 2-.032"±THICK SHIMS PER POST. SHIMS SHALL BE FABRICATED FROM BRASS SHIM STOCK OR STRIP CONFORMING TO ASTM-B36

SHIM DETAIL

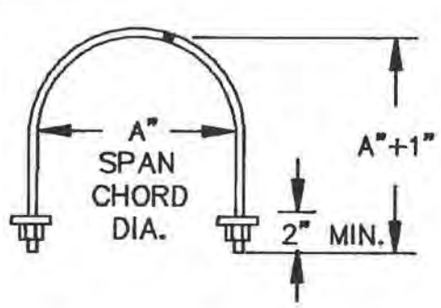
TYPICAL PANEL ATTACHMENT TO OVERHEAD SUPPORT



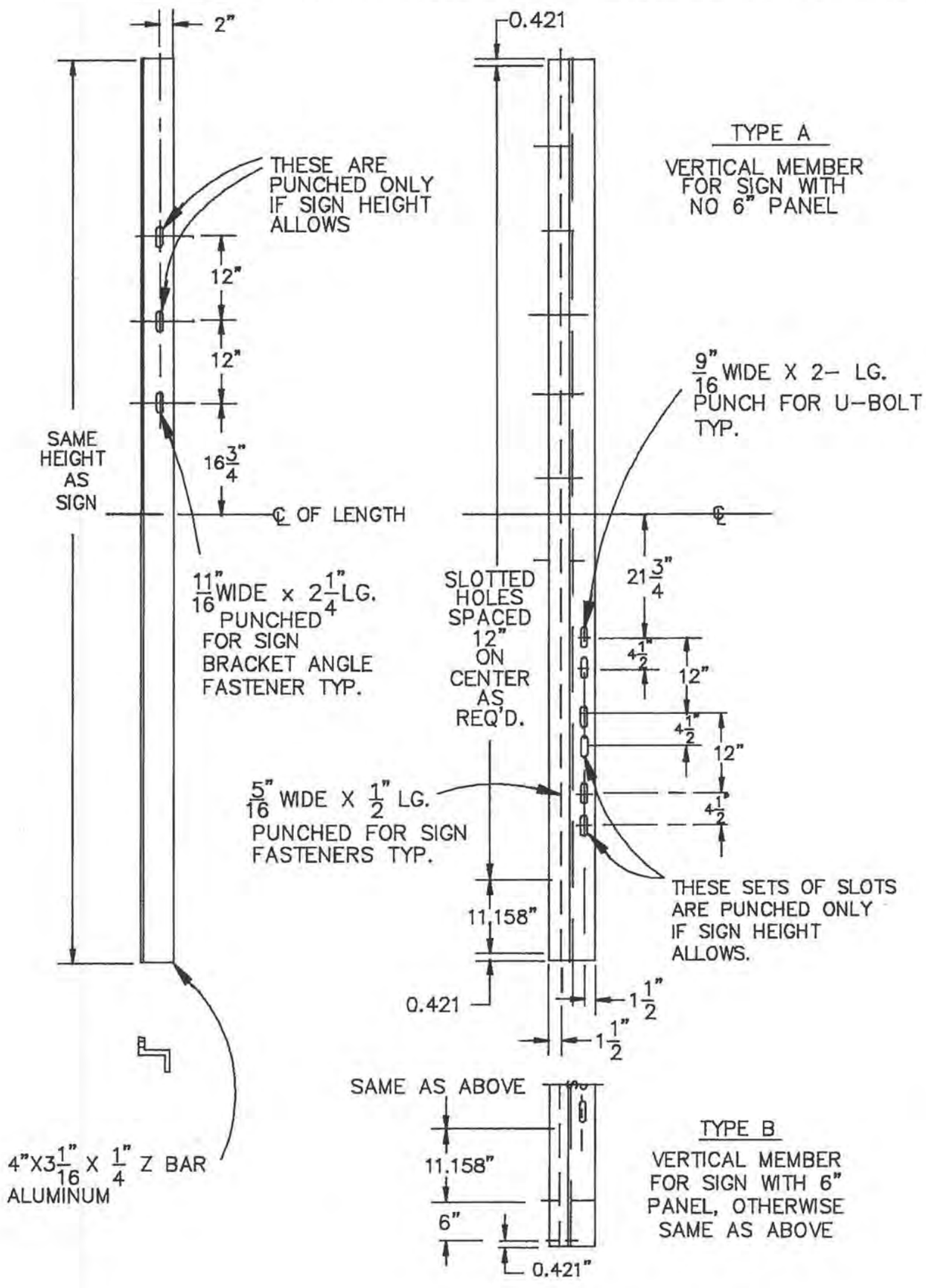
B	D
6.9"	4'
9.0"	6'
11.1"	8'

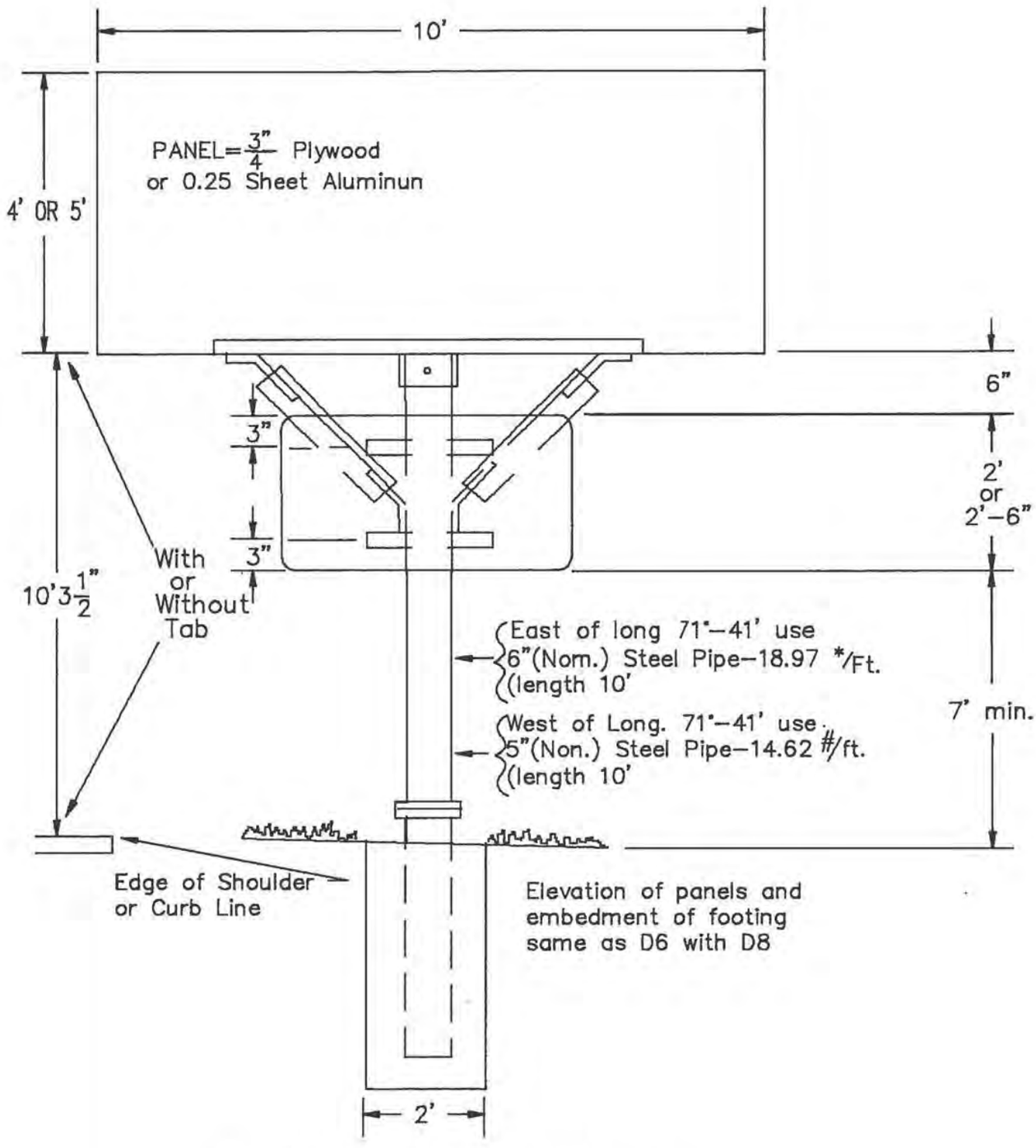
U-BOLT DETAIL

1/2" DIA. STAINLESS OR GALVANIZED STEEL U-BOLT WITH HEX. NUTS AND FLAT AND LOCKWASHERS.

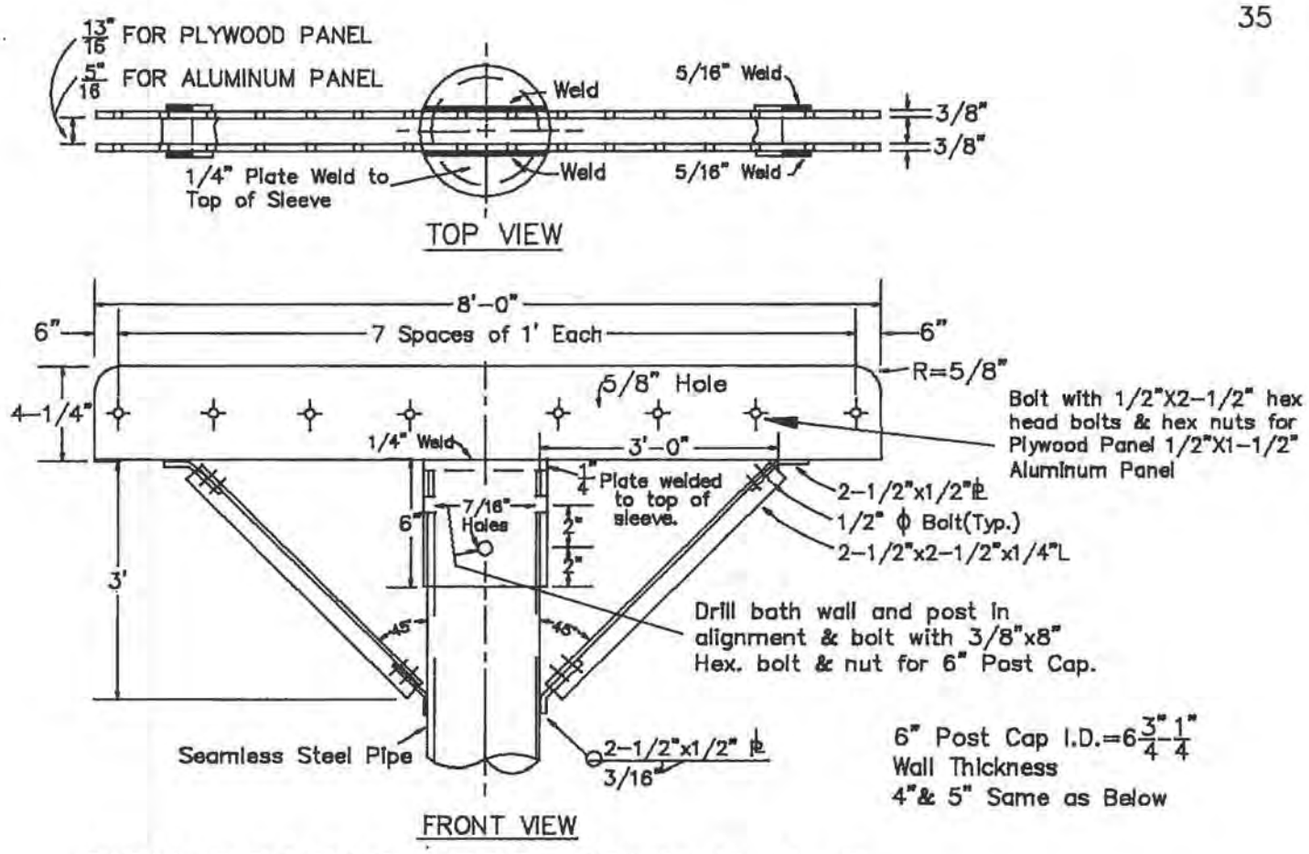


TYPICAL PANEL ATTACHMENT TO OVERHEAD SUPPORT (CONT'D)





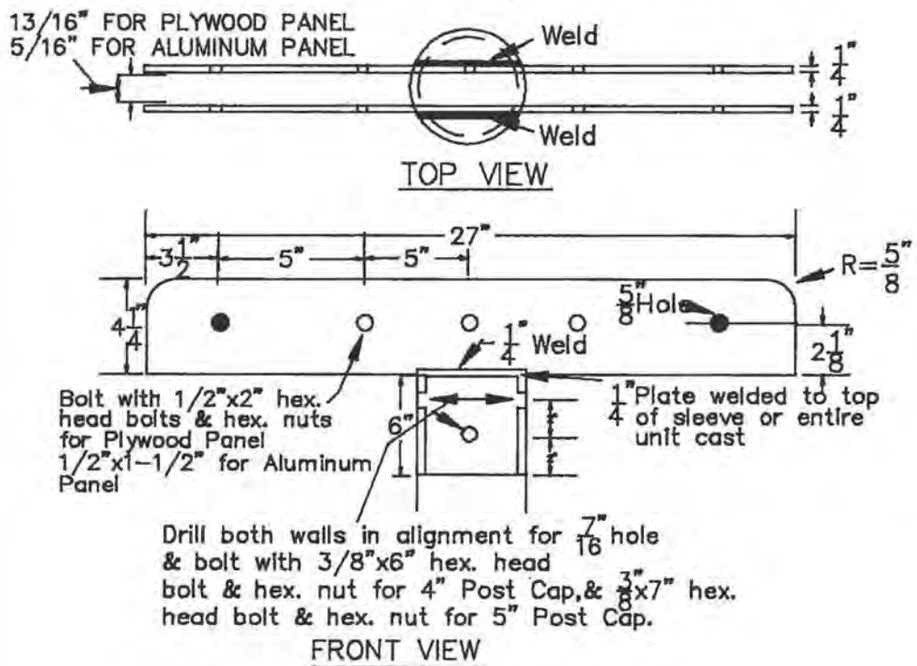
Double D-6 with D-8



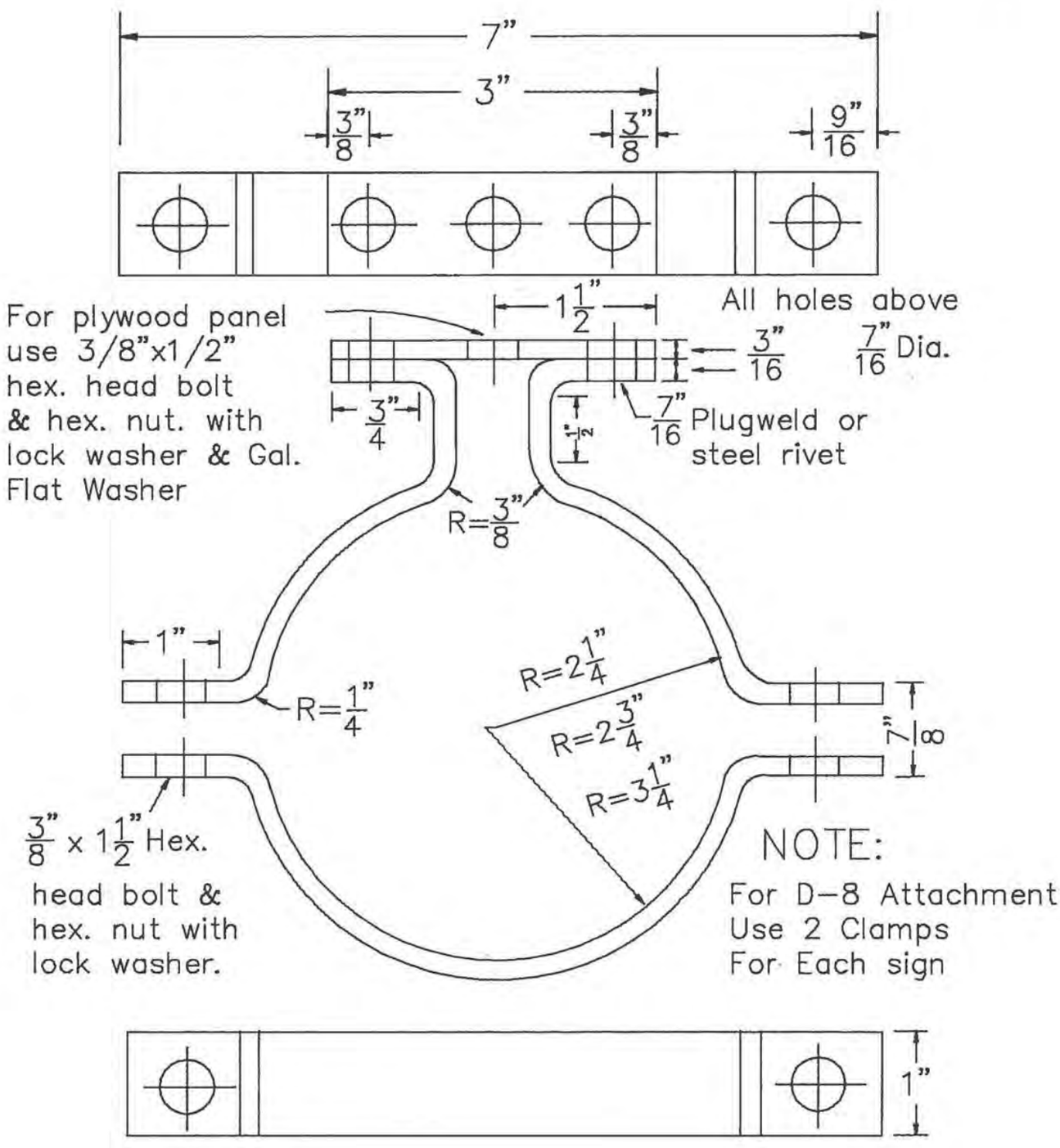
SIGN BRACKET FOR DOUBLE D-6

4" Post Cap I.D.=$4\frac{5}{8}" - \frac{3}{16}"$ Wall Thickness

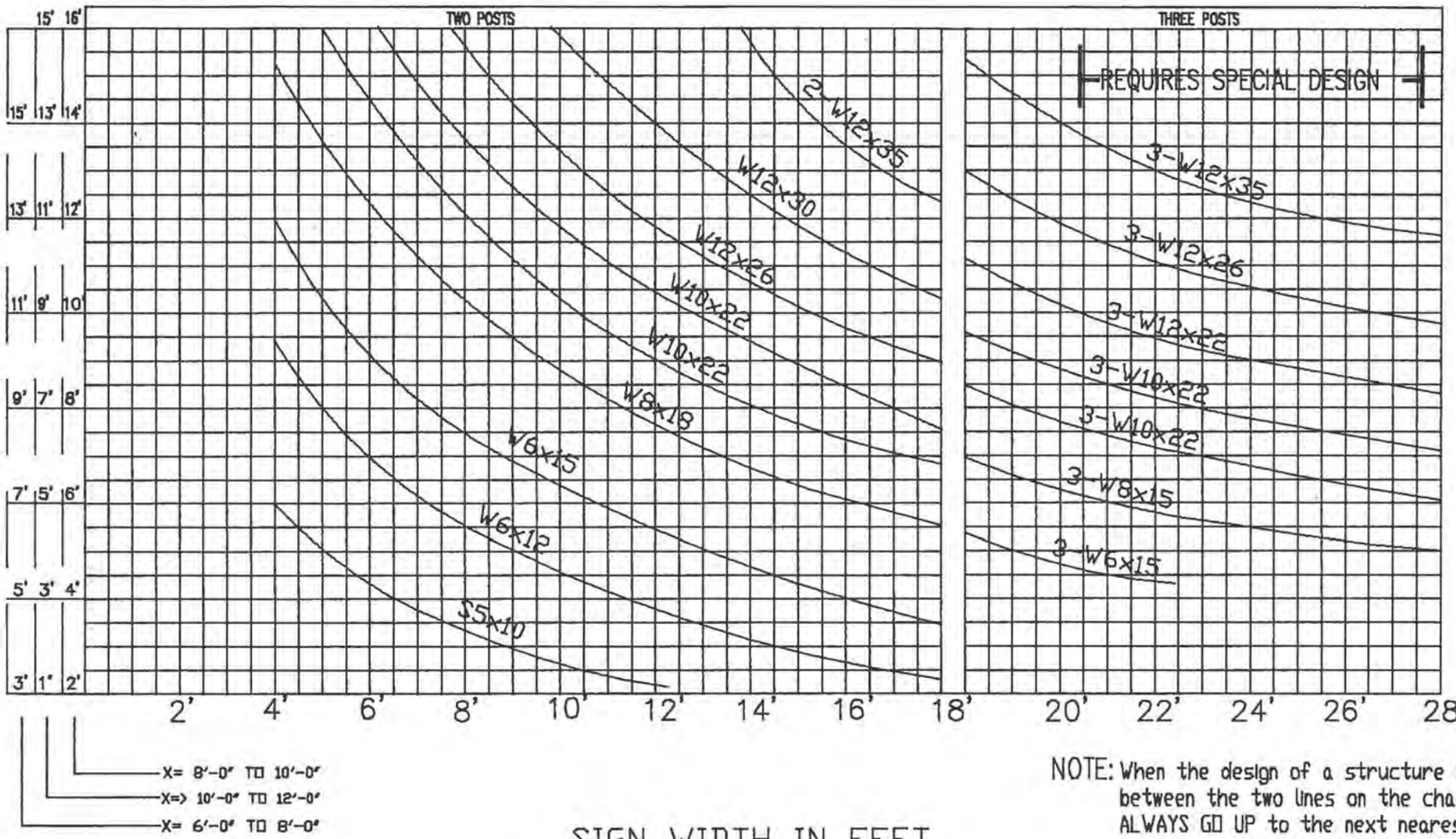
5" Post Cap I.D.=$5\frac{3}{4}" - \frac{1}{4}"$ Wall Thickness



SIGN BRACKET FOR D-6



CLAMP FOR D-8 ATTACHMENT



NOTE: When the design of a structure falls between the two lines on the chart, ALWAYS GO UP to the next nearest line to choose the size of the section

SIGN WIDTH IN FEET

WIND ZONE 1 EAST OF LONGITUDE 71°-41'

V = 90 MPH, P = 35 PSF x Cd Ch

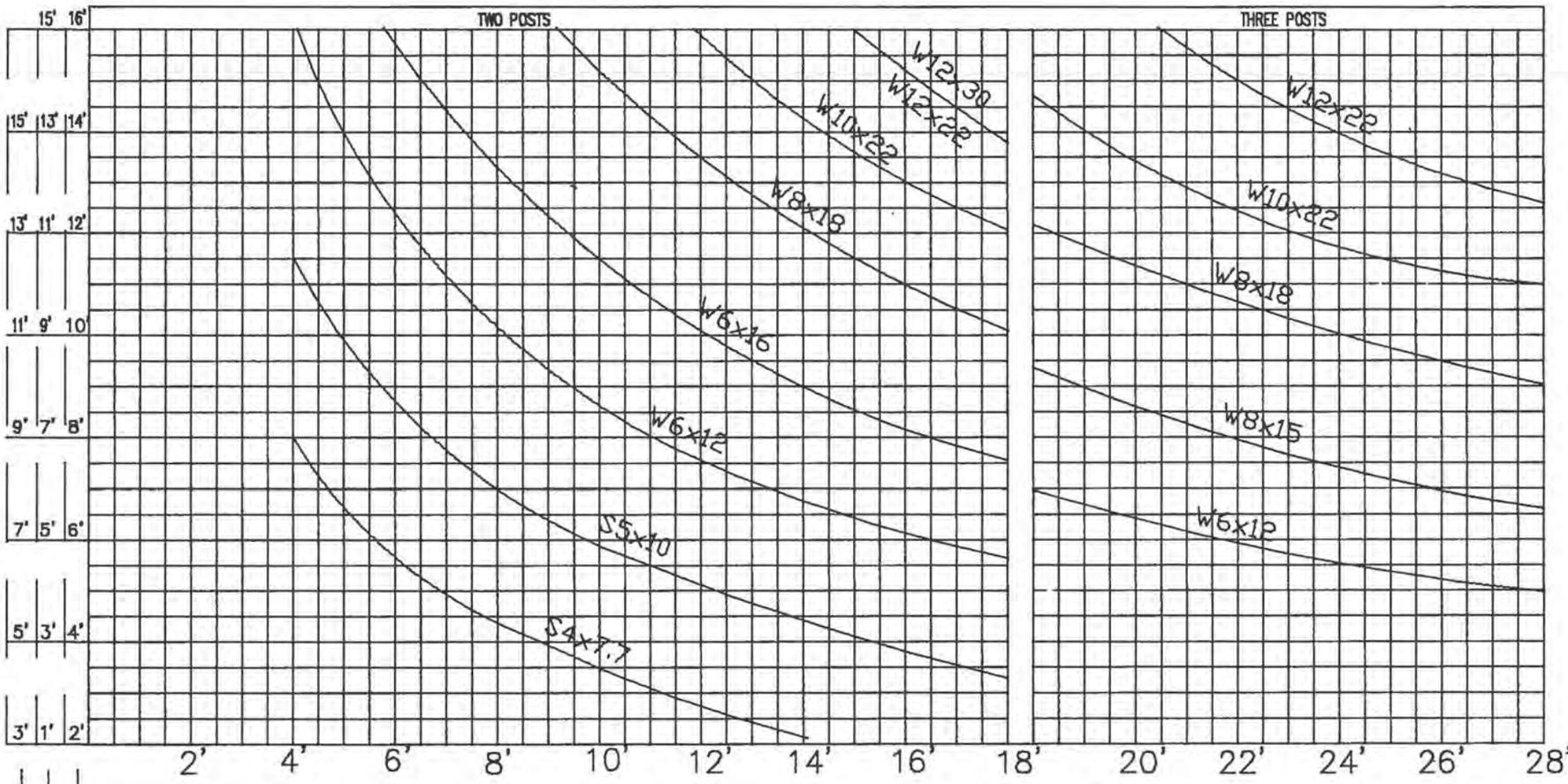
APPROVED:

NOTE:

"X" EQUALS THE AVERAGE HEIGHT FROM THE GROUND LINE TO THE BOTTOM EDGE OF THE SIGN AT POST LOCATIONS MAXIMUM DISTANCE 12'.

BRIDGE ENGINEER

TRAFFIC ENGINEER



NOTE:
"X" EQUALS THE AVERAGE HEIGHT FROM THE GROUND LINE TO THE BOTTOM EDGE OF THE SIGN AT POST LOCATIONS MAXIMUM DISTANCE 12'.

SIGN WIDTH IN FEET

WIND ZONE 2 WEST OF LONGITUDE 71°-41'

V = 70 MPH, P = 21.2 PSF x Cd Ch

Nomographs to be used where signs panels are over 40 s.f.

NOTE: When the design of a structure falls between the two lines on the chart, ALWAYS GO UP to the next nearest line to choose the size of the section

APPROVED:

BRIDGE ENGINEER

TRAFFIC ENGINEER

GENERAL NOTES

The signs, foundations, and supports shall be fabricated and erected to conform with the following:

The Department's Standard Specifications for Highways and Bridges (1988 edition and as subsequently ammended.)

The Department's Manual on Uniform Traffic Control Devices (Current edition of the MUTCD with subsequent ammendments.)

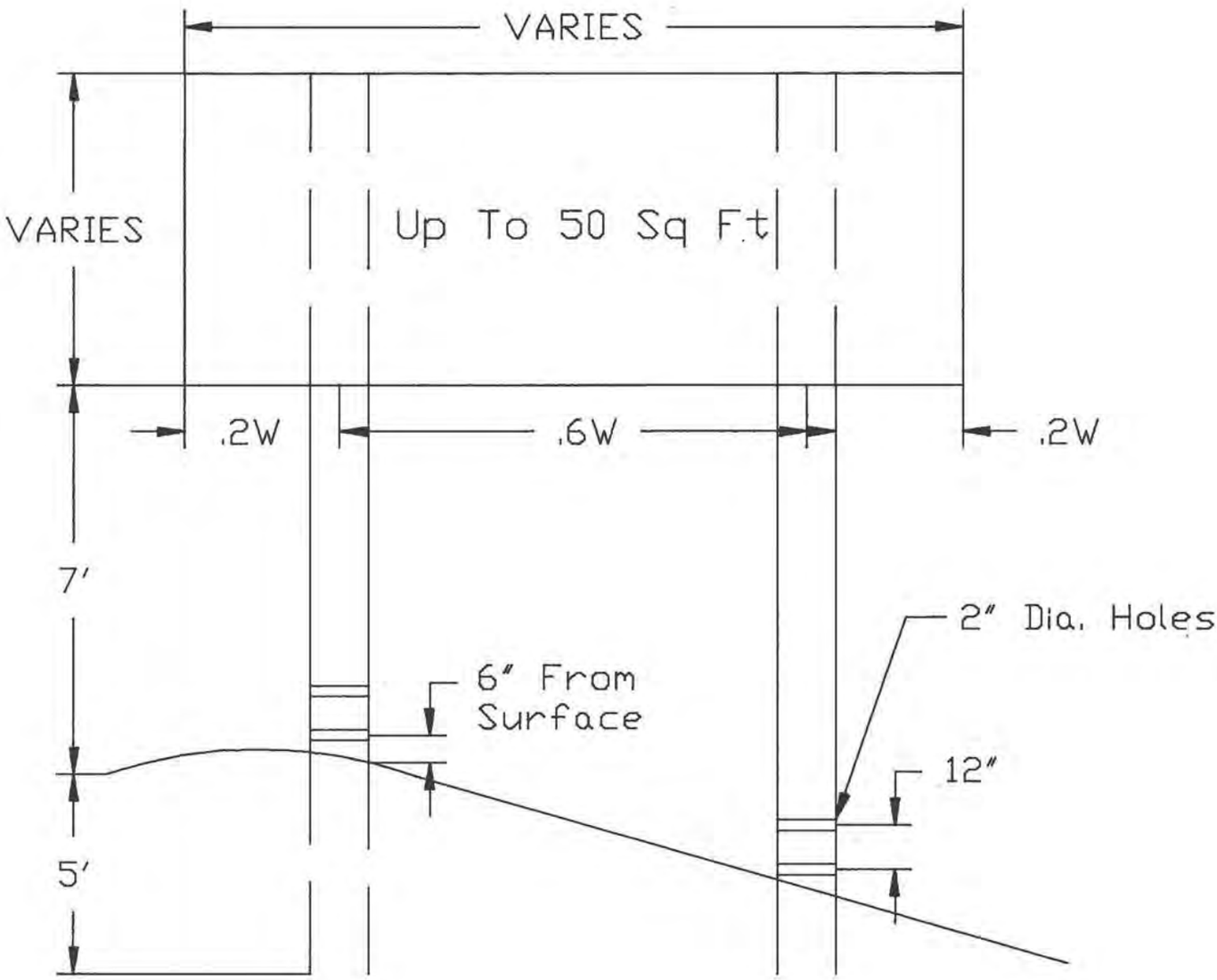
The A.A.S.H.T.O. publication entitled "Specifications for Design and Construction of Structural Supports for Highway Signs". (current edition)

The Department has standardized certain signs and supports, pavement markings, and other delineation. The design, placement, etc. of these as shown herein shall be used on all contracts as needed.

All stiffeners, bolts, nuts, clamps, and angles (steel or aluminum) must be designed by the contractor or his agent to withstand all design loads and forces.

When designs other than those shown as Department Standards are recommended, permission to use other designs must be obtained from the Department before fabrication or erection.

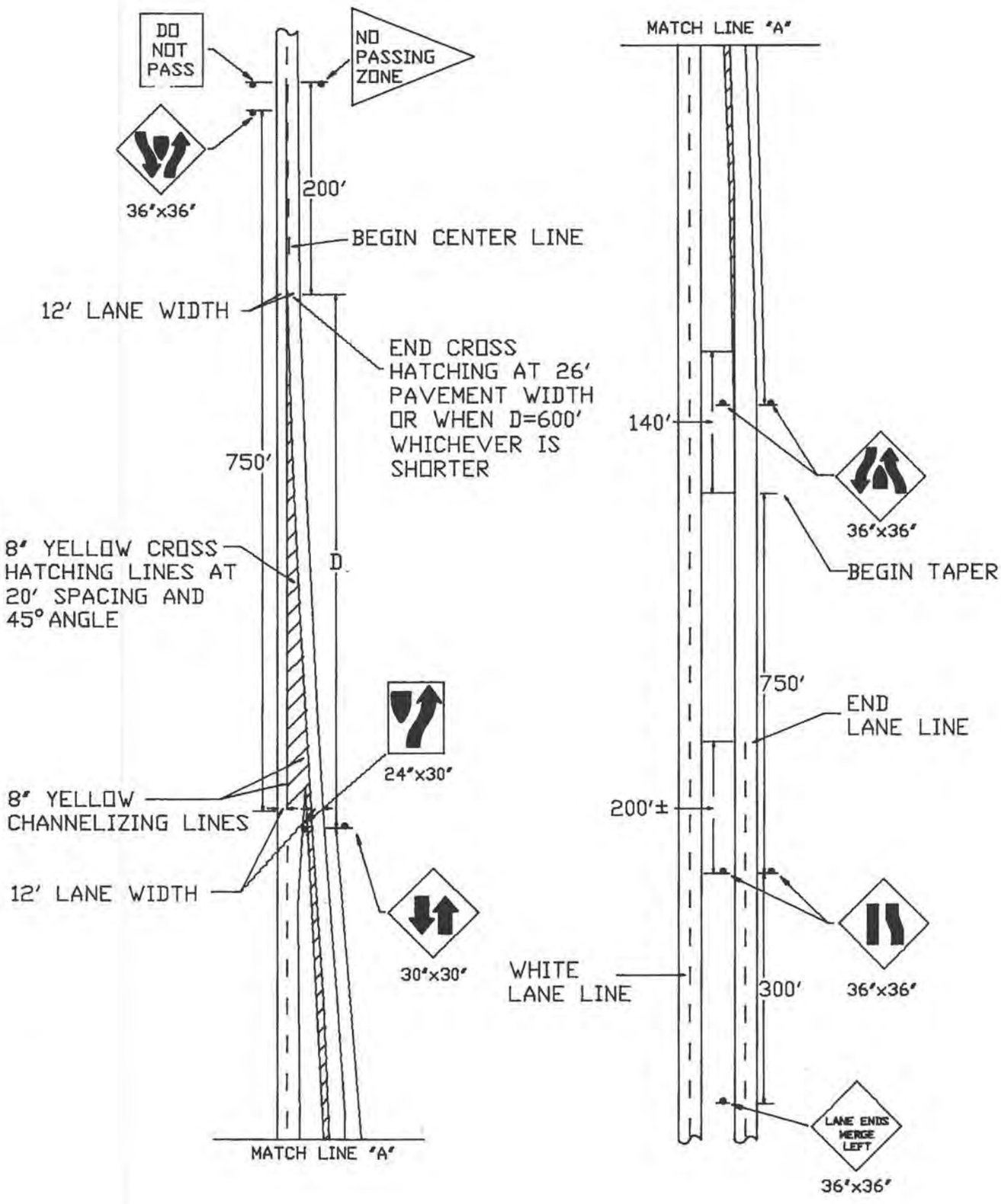
Temporary Wooden Yielding Supports



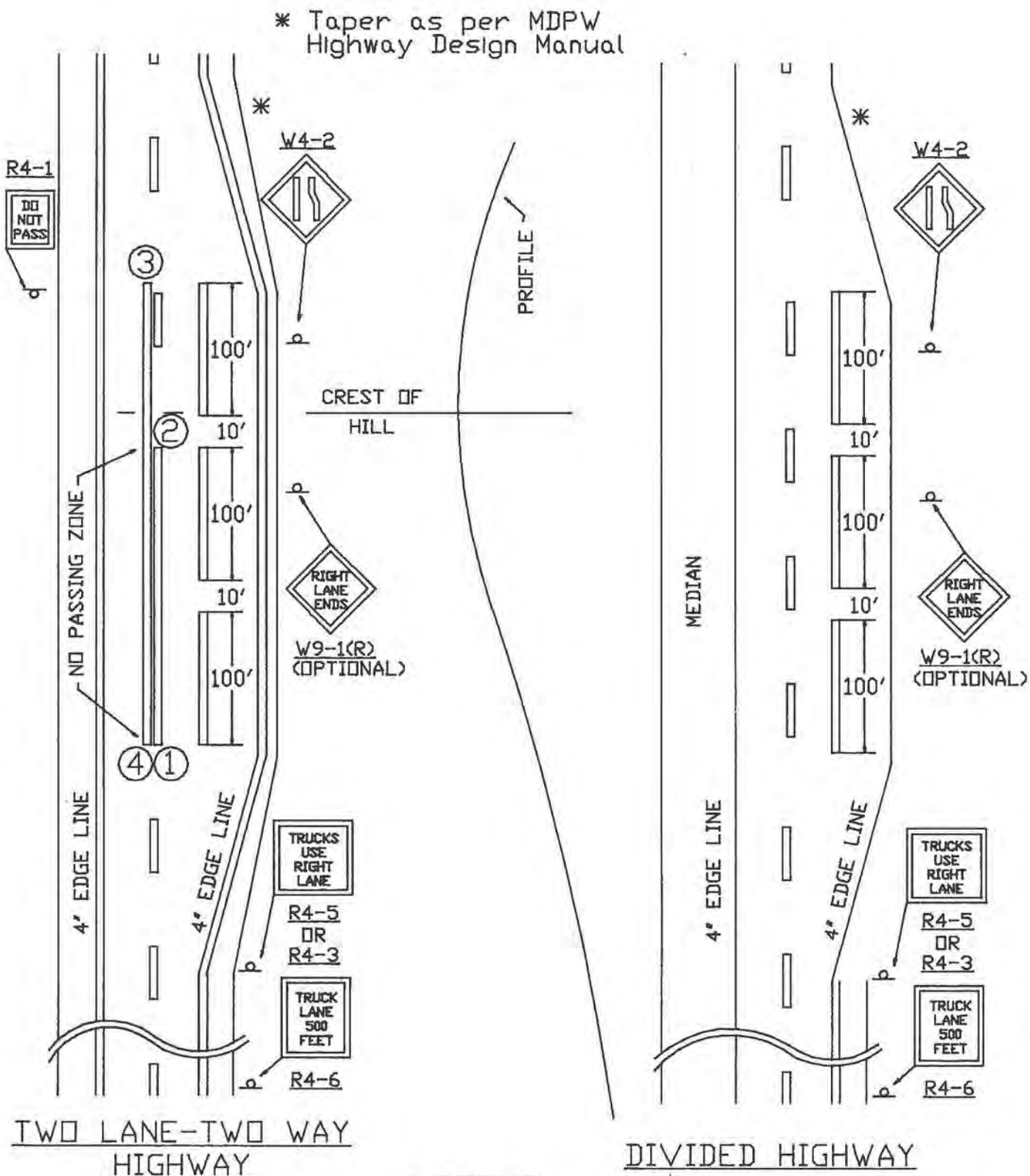
NOTES:

1. FOR SIGNS OVER 50 SQ. FT., CALCULATIONS MUST BE SUBMITTED FOR WIND LOAD AND POST SIZE.
2. USE 6" X 6" DOUGLAS FIR OR SOUTHERN YELLOW PINE.

PAVEMENT MARKINGS AND SIGNING FOR TRANSITION FROM 4 LANES DIVIDED TO 2 LANES



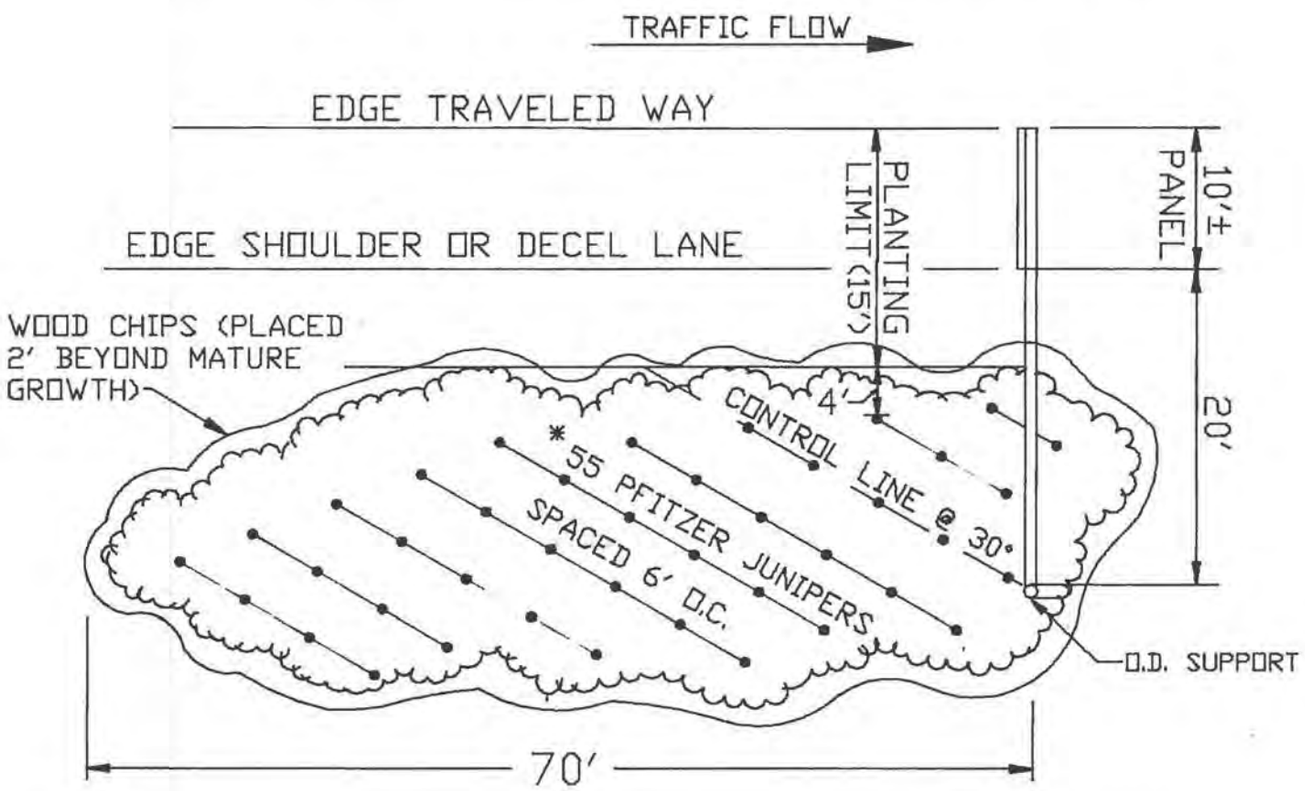
CLIMBING LANES



LEGEND

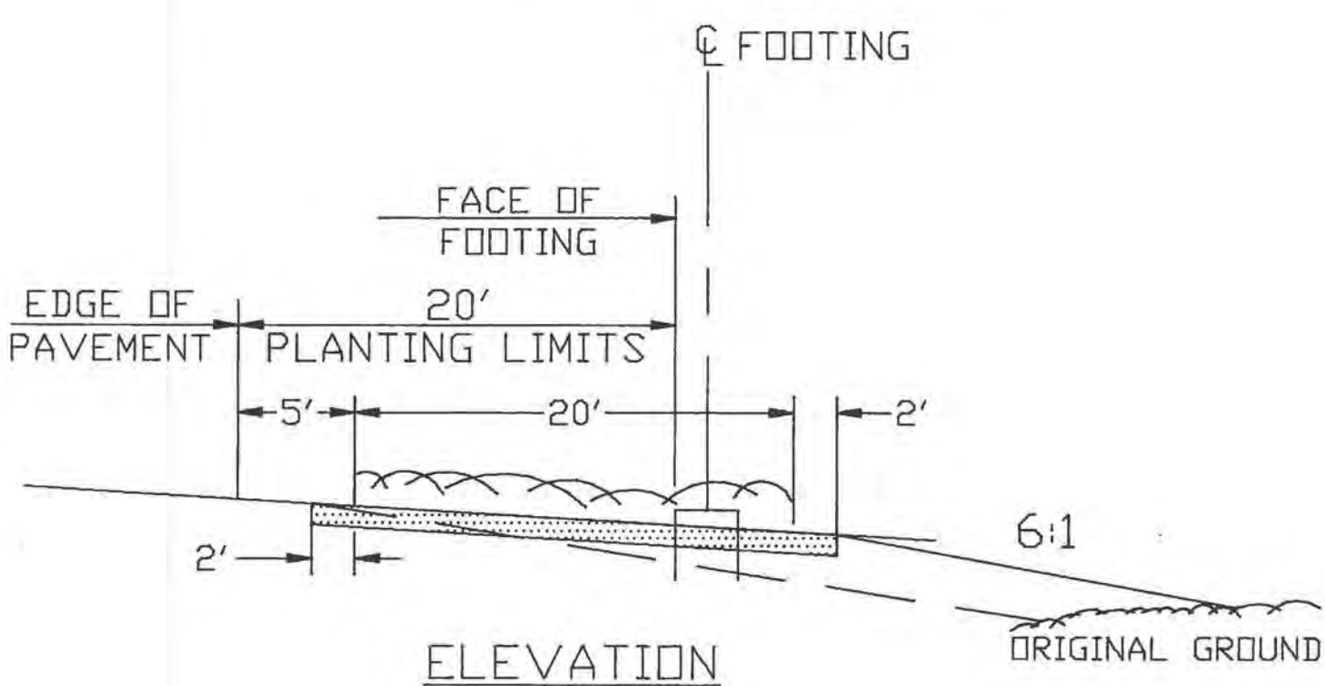
1&3 BEGINING OF NO-PASSING ZONE.
2&4 END OF NO-PASSING ZONE.
2&3 BASED ON LIMITED SIGHT DISTANCE.
1&4 OPPOSITE BEGINING OF CLIMBING LANE.

OD SIGN SUPPORT PROTECTION



PLAN

* OR OTHER APPROVED SPECIES AND/OR SPACING



ELEVATION

GROUND INSTALLATION

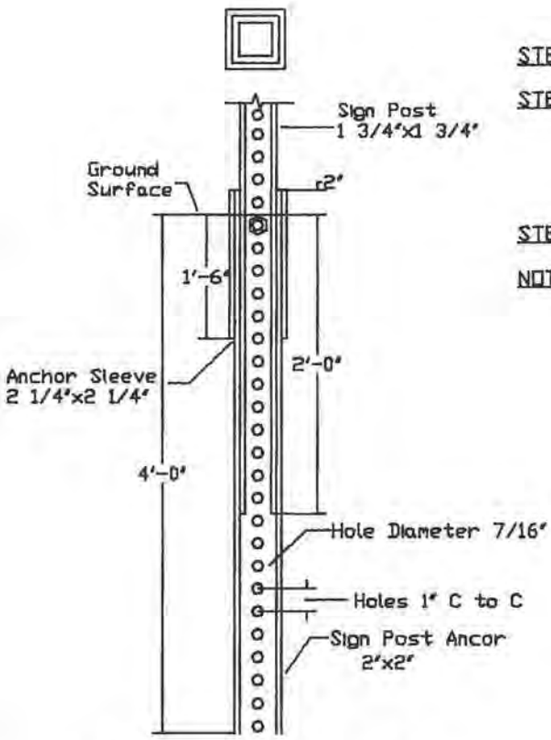
METHOD OF INSTALLATION

STEP 1 Drive Sign Post Anchor To Within 3 Or 4' Of Surface.

STEP 2 Pre-cut Anchor Sleeve So That The Holes Will Match And Still Be Flush With Top Of Sign Post Anchor, Drive Anchor Sleeve Untill Holes Match As Noted Above, Then Drive Both The Sign Post Anchor And Anchor Sleeve Until One Hole Is Exposed Above Ground For Bolt Connection.

STEP 3 Insert Sign Post And Bolt In Place.

NOTE: Driving Caps Must Be Used To Drive Posts. Retain 4'-0" Depth To Reach Theoretical Frost Line.



P-5 TELESCOPIC POST

GENERAL NOTES

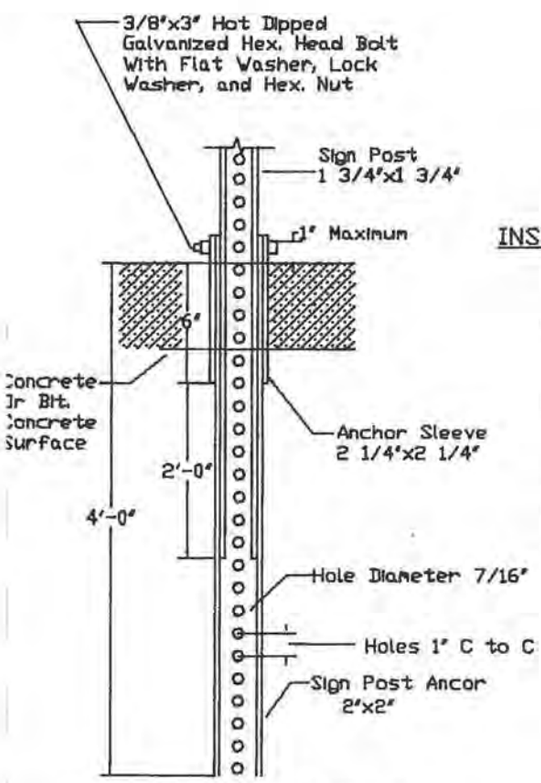
BREAKAWAY SIGN SUPPORTS SHALL BE FABRICATED FROM STEEL AND SHALL CONFORM TO THE BREAKAWAY DESIGN SHOWN ON THIS SHEET OR "GROUND MOUNTED SIGN SUPPORTS BREAKAWAY DESIGN FOR SIGNS WITH AREA 20 SQ. FT. AND BELOW" AND THE MASS. DEPT. OF PUBLIC WORKS "STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES".

THE STEEL POSTS SHALL CONFORM TO ASTM-A366. THE CROSS SECTION OF THE POST SHALL BE SQUARE TUBE FORMED OF 12 GAUGE (.105" U.S.S. GAUGE) COLD-ROLLED CARBON STEEL SHEETS WHICH HAVE BEEN ZINC COATED (1.25 oz.) CONFORMING TO ASTM-A525, CAREFULLY ROLLED TO SIZE AND WELDED DIRECTLY IN THE CORNER BY HIGH FREQUENCY RESISTANCE WELDING OR EQUAL AND EXTERNALLY SCARFED TO AGREE WITH CORNER RADI.

STANDARD OUTSIDE CORNER CORNER RADIUS SHALL BE 5/32" PLUS OR MINUS 1/64".

ALL BOLTS SHALL CONFORM TO ASTM-A307, CLASS A.

ALL BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED AS PER ASTM-A153.



P-5 TELESCOPIC POST

SIGN SIZE	TELESCOPIC POST SIZE
5 S.F. AND UNDER	1-1 3/4"x1 3/4"
OVER 5 S.F. UP TO 10 S.F.	1-2"x2"
OVER 10 S.F. UP TO 20 S.F.	2-2"x2"

INSTALLATION FOR CONCRETE OR BITUMINOUS CONCRETE SURFACES

METHOD OF INSTALLATION

STEP 1 Sign post anchor can be driven through black top surface without first making a hole. In concrete, however, breaking a hole will be necessary. Drive sign post anchor to within 3 or 4' of surface.

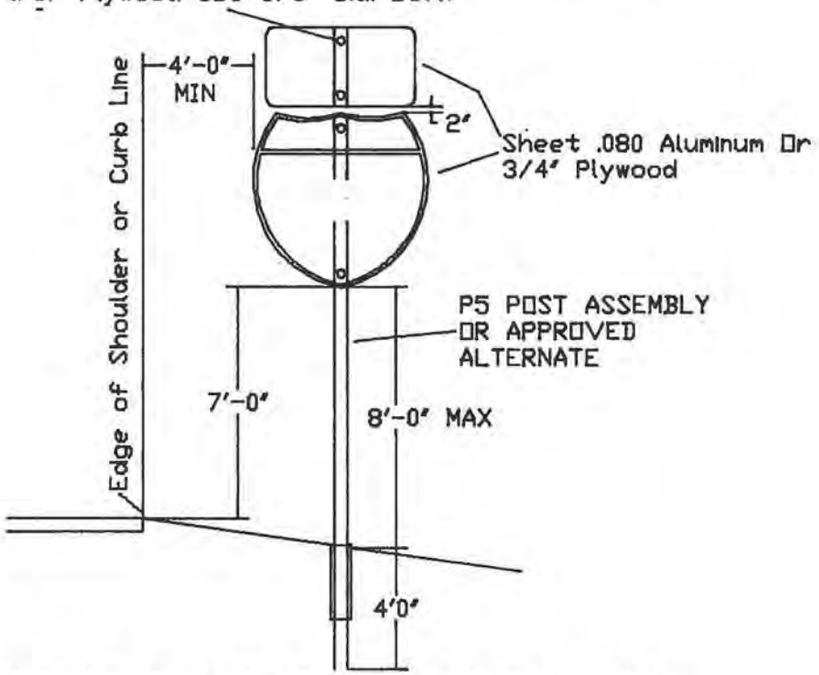
STEP 2 Pre-cut anchor sleeve so that holes will match and still be flush with top of sign post anchor. Drive anchor sleeve until holes match as noted above, then drive both the sign post anchor and anchor sleeve until one hole is exposed above ground for bolt connection.

STEP 3 Insert sign post and bolt in place.

NOTES:

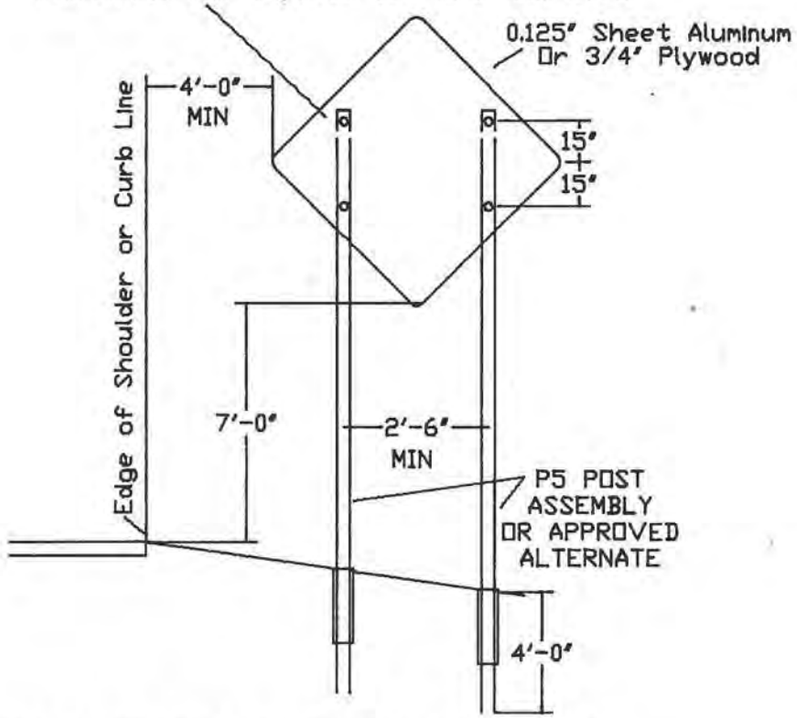
1. Driving caps must be used to drive posts.
2. Sign with a width of 4' or greater require 2 posts.
3. This erection procedure applies to Unistrut supports. Other P-5 square tube small sign supports on the approved product lists, such as Allied Quick Punch and Allied Postmate, may deviate from this procedure, In those cases, the manufacturer's recommendations shall be followed.

Use 5/16" Dia. Hot Dipped Galvanized Button Head Bolt With A Slot In Head And Nut With Lockwasher, With A Minimum Of 1/4" Of Threads Beyond Nuts On All Signs After They Are Securely Fastened. (For Plywood Use 3/8" Dia. Bolt)



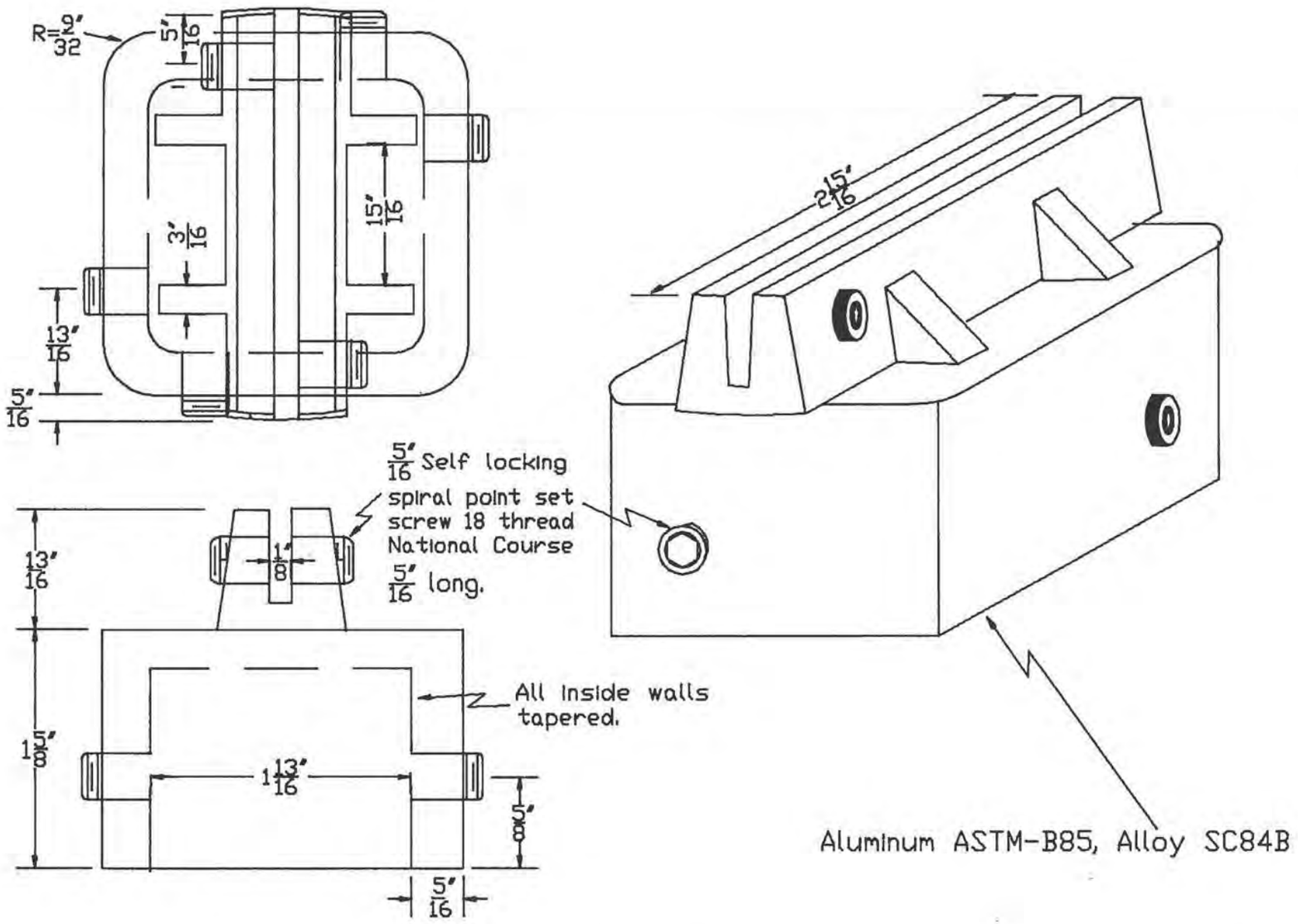
TYPICAL INSTALLATION FOR SIGNS WITH AREA UP TO AND INCLUDING 10 SQ. FT. SIGNS WITH A WIDTH OF 4' AND OVER SHALL REQUIRE TWO POSTS.

Use 3/8" Dia. Hot Dipped Galvanized Button Head With A Slot In Head And Nut With Lockwasher, With A Minimum Of 1/4" Of Threads Beyond Nuts On All Signs After They Are Securely Fastened. (For Plywood Use 3/8" Dia. Bolt)



TYPICAL INSTALLATION FOR SIGNS WITH AREA OVER 10 SQ. FT. UP TO AND INCLUDING 20 SQ. FT.

TYPICAL INSTALLATION FOR SMALL SIGNS (UP TO 20 SQ.FT.)



ALUMINUM CAP FOR 1 3/4" □ POST -(FOR USE WITH R6-1)

EZE-ERECT SIGN POST INSTALLATION*

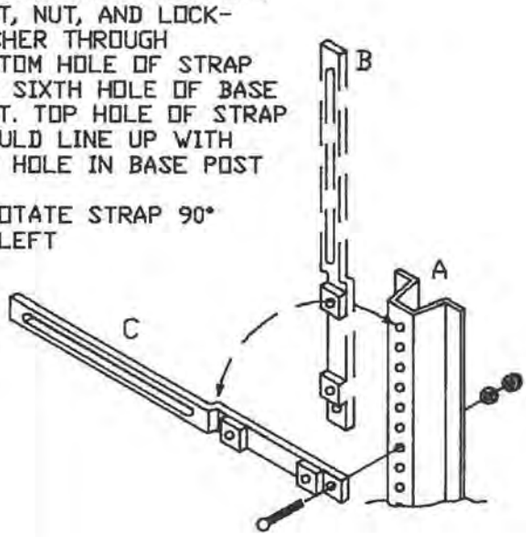
BOLTS: 5/16"-18 UNC x 2", GRBD, FOR 4.0 LB POSTS
5/16"-18 UNC x 1 3/4", GRBC, FOR 2.0, 2.25, 2.5 & 3.0 LB. POSTS

DO NOT USE 5/16" GRBC BOLTS ON 4.0 LB POSTS

1 A-DRIVE BASE POST TO WITHIN 12 IN. OF GROUND LEVEL

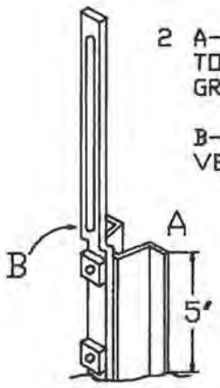
B-ATTACH RETAINER-SPACER STRAP WITH ONE BOLT, NUT, AND LOCK-WASHER THROUGH BOTTOM HOLE OF STRAP AND SIXTH HOLE OF BASE POST. TOP HOLE OF STRAP SHOULD LINE UP WITH TOP HOLE IN BASE POST

C-ROTATE STRAP 90° TO LEFT



2 A-DRIVE BASE POST TO 4 IN. ABOVE GROUND

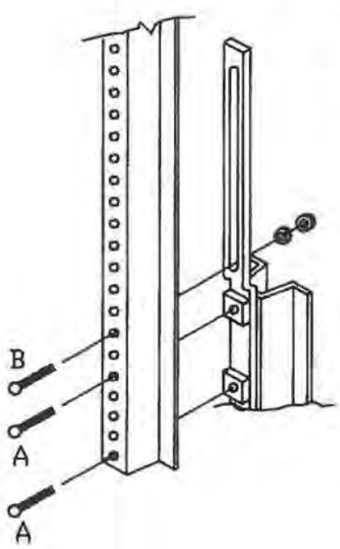
B-ROTATE STRAP TO VERTICAL POSITION

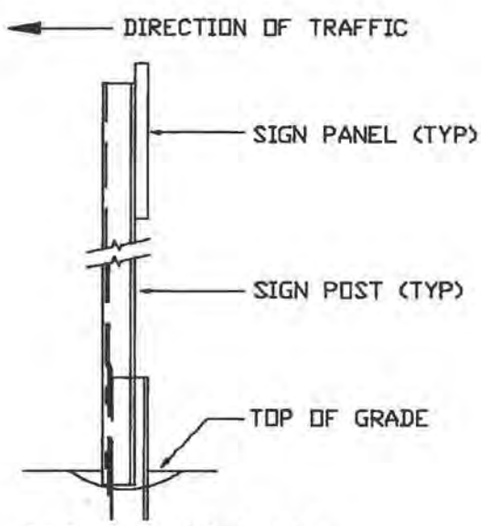


* **Notwithstanding references to the availability of 3 and 4 lb./linear ft. posts, the sign size vs. post weight table on page 50 shall govern.**

3 A-ATTACH SIGN POST WITH TWO BOLTS, NUTS, AND LOCKWASHERS IN BOTTOM AND FIFTH HOLES. (THESE CORRESPOND WITH SMALL HOLES IN STRAP)

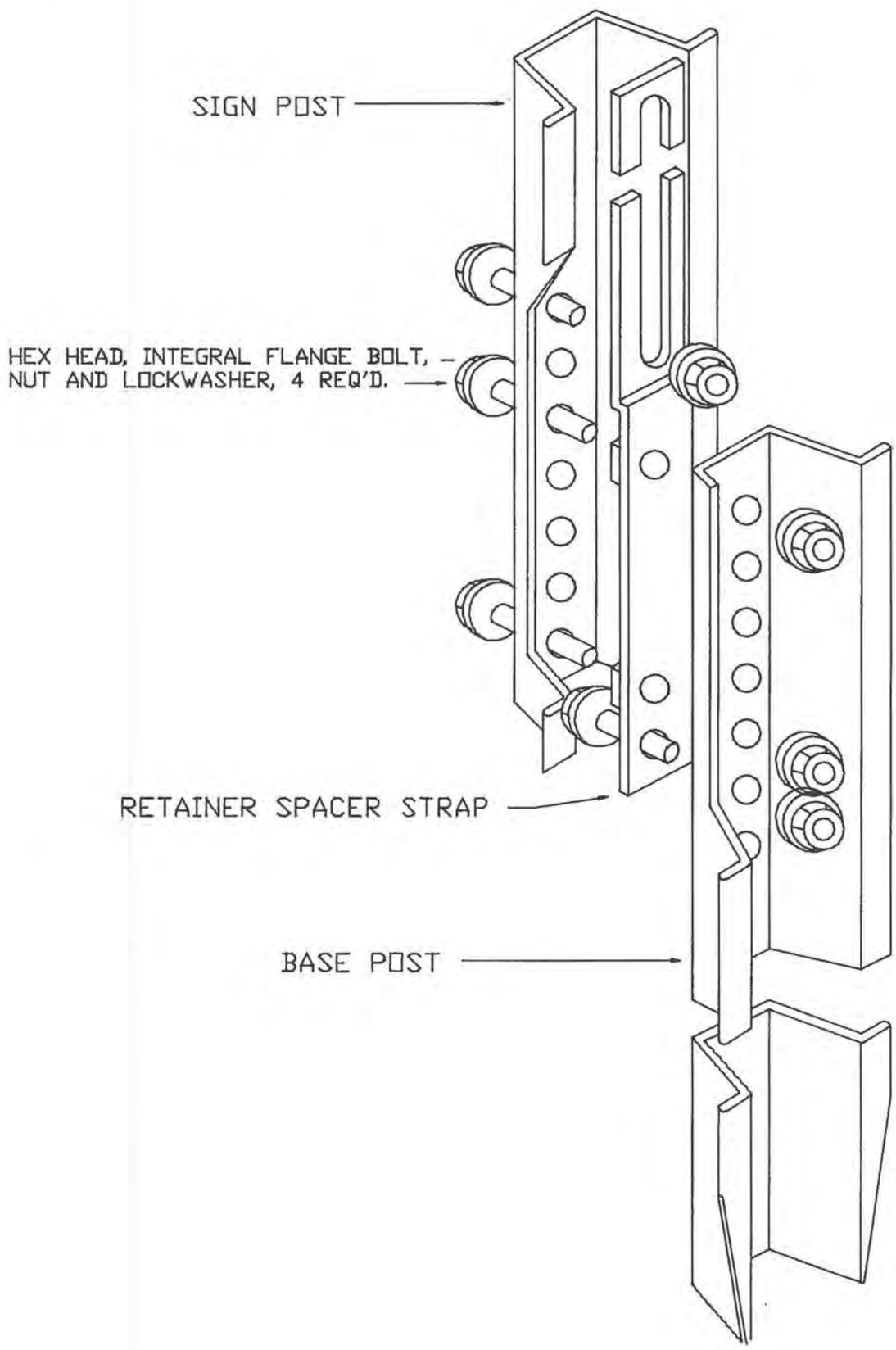
B-INSERT ONE BOLT THROUGH SIGN POST AND BOTTOM OF LONG SLOT IN STRAP. TIGHTEN ALL NUTS SNUGLY BEFORE COMPLETE-LY TIGHTENING ASSEMBLY.

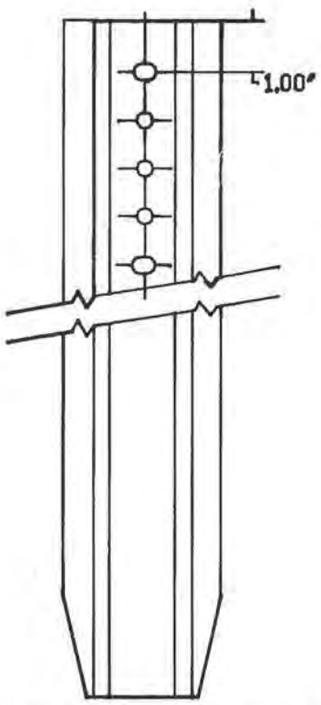




TYPICAL END VIEW
(Finished Assembly)

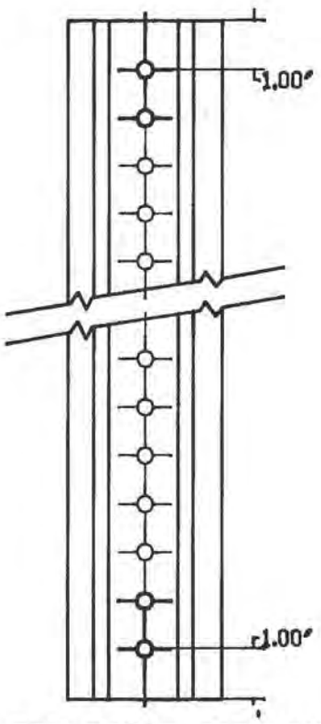
ATTACHMENT OF SIGN POST TO BASE POST





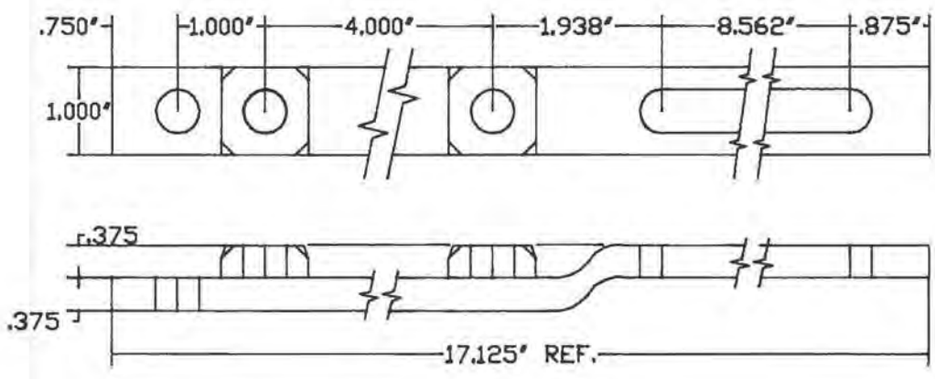
EZE-ERECT BASE POST

3/8" Dia. Holes on 1.00" Center, Execpt
First and Fifth are 3/8" x 1/2" slots
Punched 18 Holes
Botton Pointed
Available in 2.5, 3.0 & 4.0 lb/ft
Lenght -3'6" and 4'0"



EZE-ERECT SIGN POST

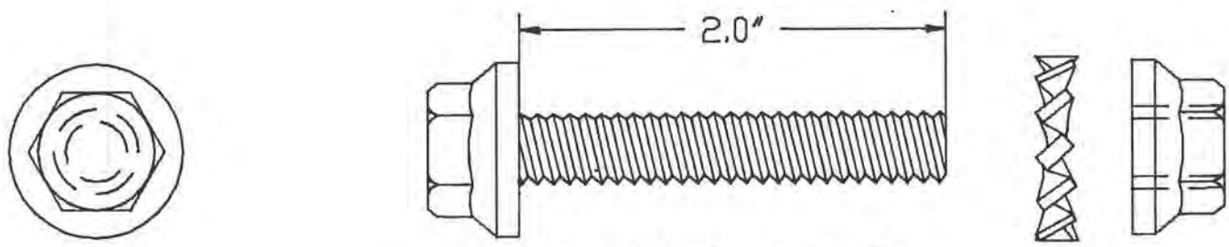
3/8" Dia. Holes on 1.00" Centers
Punched Full Length Available
in 2.0, 2.25, 2.5, 3.0 & 4.0 lb/ft
Length -6'0", 7'0", 8'0", 9'0",
10'0", 11'0", and 12'0"



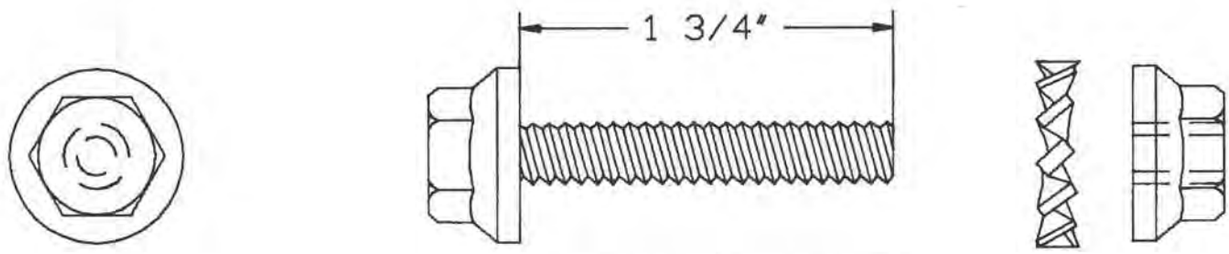
RETAINER-SPACER STRAP

For All Weights of Sign Posts
Material-Mild Steel
Finish-Hot Dip Galvanize Per ASTM A-123

HEX HEAD-INTEGRAL FLANGE BOLT, NUT AND LOCKWASHER



5/16"-18 UNC-BD



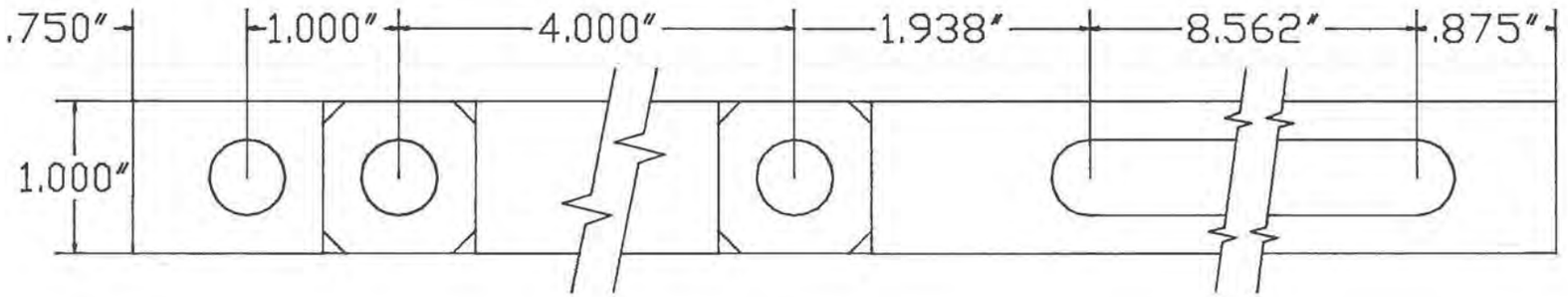
5/16"-18 UNC-BC

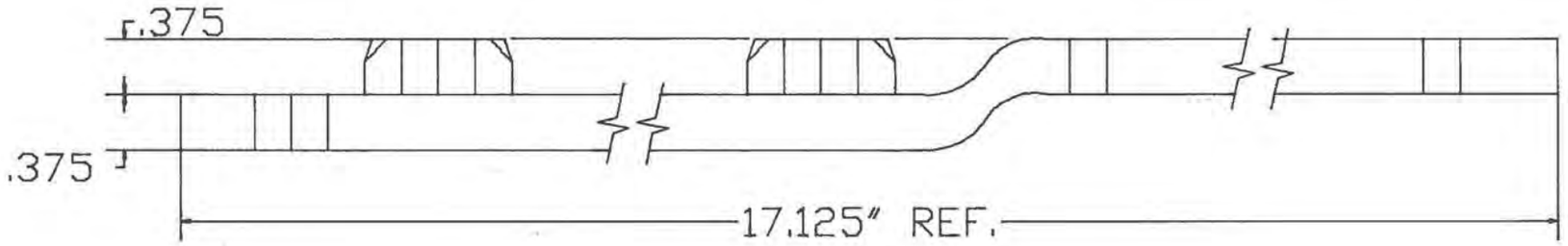
5/16"-18 UNC x 2.0" Long (for 4.0 lb. posts) or 5/16"-18 UNC x 1 3/4" (for 2.0, 2.25, 2.5 & 3.0 lb. posts)
Bolt per ASTM A354, Grade BD or Grade BC
Nut per ASTM A563, Grade DH
Lockwasher is heavy duty external toothed.
Finish-Cadmium plated per ASTM A165-80, Type □S, except using clear chromate

SIGN SIZE	CHANNEL POST POST-WITH STRAP (EZE-ERECT)
5 S.F. AND UNDER	1-2 LB./FT.
□VER 5 S.F. UP T□ 10 S.F.	1-2.25 LB./FT.
* □VER 10 S.F. UP T□ 20 S.F.	2-2.25 LB./FT.

* NOTE: Signs with a width of 4' and over shall require 2 posts.

GALVANIZING FINISH
Galvanizing Shall Conform with ASTM Specification A123-73. It Shall Be Galzanized After All Fabrication and Punching, Has Been Completed.





RETAINER-SPACER STRAP

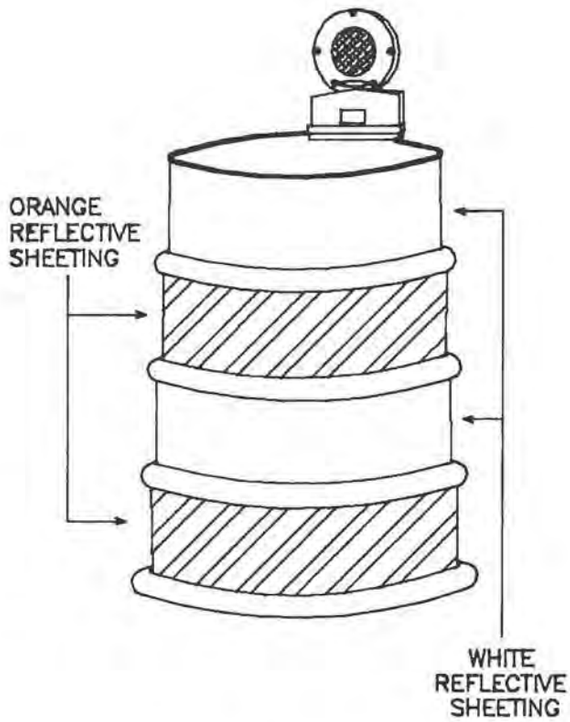
For 2.5 and 4.0 lb/ft Sign Posts
Material-Mild Steel
Finish-Hot Dip Galvanize Per ASTM A-123

PLASTIC DRUMS

ITEM #	DESCRIPTION
859.	REFLECTORIZED DRUM
859.1	REFLECTORIZED DRUM WITH FLASHER (TYPE A) - Used to continually warn drivers that they are approaching or proceding in a hazardous area (see MUTCD Sect. 6E4,6E5).
859.2	REFLECTORIZED DRUM WITH LIGHT (TYPE C) - Steady burn device used to delineate the edge of the traveled way on lane closures, detour curves, lane changes and other similar conditions (see MUTCD Sect. 6E4,6E5)

NOTES:

1. DRUM DESIGN AND APPLICATION SHALL BE AS PER THE CURRENT EDITION OF THE MUTCD.
2. DRUMS SHALL BE APPROXIMATELY 36" IN HEIGHT, HAVING A MINIMUM WALL THICKNESS OF 3/32" AND A MINIMUM DIAMETER OF 18" REGARDLESS OF ORIENTATION.
3. DRUM MATERIAL MUST BE APPROVED U.V. RESISTANT, LOW DENSITY, IMPACT RESISTANT LINEAR POLYETHYLENE (OR APPROVED EQUIVALENT). METAL DRUMS ARE PROHIBITED FROM USE ON ALL STATE HIGHWAY PROJECTS.
4. SHEETING SHALL BE APPROVED ORANGE AND WHITE TYPE IV REFLECTORIZED SHEETING CONFORMING TO M.9.30.0.
5. ALL DRUMS SHALL BE WELL MAINTAINED INCLUDING REMOVAL OF DUST OR ROAD FILM, SO AS TO NOT REDUCE REFLECTIVE EFFICIENCY. WHEN A DRUM LOSES TARGET VALUE IT SHALL BE REPLACED.
6. WHEN A DRUM IS NO LONGER NEEDED IT SHALL BE STORED IN A DRUM STORAGE AREA, UNLESS IT IS REQUIRED FOR FUTURE USE WITHIN A FIVE DAY. PERIOD, IN WHICH CASE IT MAY BE STORED ON LOCATION.



Robert L Shea
TRAFFIC ENGINEER

CHIEF ENGINEER

DATE: 7/18/90