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 Terminal | 26
Post Coping Details (Breakaway) | 27
Detail "A" Hinge for Breakaway Sign Posts | 29
Sign and Stub Post Details for S4x7.7 and S5x10.0 | 28
Sign and Stub Post Details for W Shapes | 30
Sign and Stub Post Details for O 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
OD 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
<table>
<thead>
<tr>
<th>SIGN SIZE</th>
<th>NO. OF DIGITS</th>
<th>DIMENSIONS</th>
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<td>36&quot; 36&quot; 9&quot; 18&quot; 9&quot; 2 1/4&quot; 1/2&quot; 1/2&quot;</td>
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<td>45&quot;x36&quot;</td>
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<td>45&quot; 36&quot; 9&quot; 18&quot; 9&quot; 2 1/4&quot; 1/2&quot; 1/2&quot;</td>
</tr>
</tbody>
</table>

Series of Digits "D"

M1-6A
Standard State Route Marker
Dr Alt~na.te
To Top Of Panel

**SINGLE FACE**

- SIGN PANEL
- POST
- TWO PIECE RIVET CONSISTING OF PIN (3/16' DIA.) AND COLLAR.

**DOUBLE FACE**

- SIGN PANEL
- POST
- TWO PIECE RIVET CONSISTING OF PIN (3/16' DIA.) AND COLLAR.

---

**P9 Post**
(Galvanized Steel Or Approved Alternate)

4' To Top Of Panel

3'- Min. (desirable)

Median Edge

2'- Embodment

---

**Notes:** All Milemarkers and Tenth of Milemarkers shall be fabricated with high intensity encapsulated lens reflective sheathing (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

<table>
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<tr>
<th>EXPWY-FWY USE</th>
<th>CONVENTIONAL USE</th>
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<tr>
<td>C</td>
<td>1/2</td>
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<td>D</td>
<td>3</td>
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<td>E</td>
<td>4C</td>
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<td>F</td>
<td>3</td>
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<td>J</td>
<td>4</td>
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<tr>
<td>K</td>
<td>1 1/2</td>
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<tr>
<td>L</td>
<td>4 5/8</td>
</tr>
<tr>
<td>M</td>
<td>4 7/8</td>
</tr>
</tbody>
</table>
TYPICAL H1-2

- Ø0.37" MOUNTING HOLE
- Thickness 0.080"
- Aluminum or Galvanized Steel

- R1.50"
- Yellow Reflectorizing Buttons

- Yellow (Non-Reflective)

Mounting Height Shall Be 4'0" To Bottom Of Sign.

TYPICAL LOCATION FOR H1-2

DIRECTION OF TRAFFIC

H1-2

DIRECTION OF TRAFFIC
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 MAINTENANCE OPERATIONS, BOTH REFLECTIZED.

* OR GREATER TO CLEAR GUARD RAIL BY MAXIMUM OF 6'
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 Sheet. Paint for black stripes shall be in accordance with the sheeting manufacturer's specification for black silk screen ink. For Hi-10A, Hi-10B, & Hi-10C.
TYPICAL PAVEMENT MARKINGS

100' MIN.

EDGE LINE

TAPER LINE

VARIABLE RADIUS

8' CHANNELIZING LINES

EDGE OF PAVEMENT

8' CHANNELIZING LINE

2'

RUBBLE BLOCK (OPTIONAL)

SHOULDER LINE

15' SPACING

3:1 SLOPE

12' LINES

12'

EDGE OF PAVEMENT

EDGE LINE

NOTE:

See next page for pavement markings table.
# PAVEMENT MARKINGS

<table>
<thead>
<tr>
<th>4&quot; WHITE</th>
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<th>12&quot; WHITE</th>
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<td>EDGE LINE (RIGHT)</td>
<td>CHANNELIZING LINE (GORE)</td>
<td>GORE CHEVRONS</td>
<td>EDGE LINE (LEFT)</td>
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<td>LANE LINE (ONE WAY TRAFFIC)</td>
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<tr>
<td>TAPER LINE</td>
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<td>SHOULDER LINE</td>
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<td>CHANNELIZING LINE</td>
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See alternate markings, manual on uniform traffic control devices (pages 3B-15 & 3B-17)

PAVEMENT MARKINGS TABLE
Current Edition

Traffic Control Devices
For Dot

Mile Marker

White Delineator

Amber Delineator

Long Range

Table

<table>
<thead>
<tr>
<th>No.</th>
<th>Color</th>
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<tbody>
<tr>
<td>H1-4</td>
<td>Single White Delineator</td>
</tr>
<tr>
<td>H1-7</td>
<td>Double White Delineator</td>
</tr>
<tr>
<td>H1-6</td>
<td>Single Amber Delineator</td>
</tr>
</tbody>
</table>

Method of Attaching Delineator to P-9 Post

P-9 Post

3' Min

Edge of Shoulder of Curb Line

H4-4

H7

H1-6

Typical P-9 Posts

FRONT VIEW

-1" - 4" to 9" C. Width

-30 Holes 3/8" Dia. 1" C. to C.

Weight 112 lbs. per foot.
Finish-Hot Dipped Galvanized.

TYPICAL ELEVATION FOR DELINEATORS

END VIEW

Typical P-9 Posts

13/16" - 41/64" - 41/64" - 7/64" - 7/64" - 55/64" - 1 1/64" - 1 3/16" - 2 1/16"

DELINTEATOR SPACING

TYPICAL ELEVATION FOR DELINEATORS

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

PLAN VIEW

TRAFFIC FLOW

OVERHEAD SIGN POST

EDGE OF SHOULDER

PLAN VIEW

75' ±

125' ±

6'-0' MIN

CIRCULAR CURVE 37.5'

TANGENT 37.5'

PLAN VIEW

SEE TABLE ON PG.13 FOR DIMENSIONS

FOR DESCRIPTIONS, MATERIAL AND CONSTRUCTION METHODS, SEE SPECIFICATIONS AND 401.1.0 AND 401.5.0-401.10.0

FOR BACK UP PLATE DETAILS SEE 401.6.0 AND 401.8.0

DETAILS SHOWN HEREIN ALSO APPLY TO THRIE BEAM GUARD RAIL, EXCEPT AS OTHERWISE NOTED.

5- WHEN PLACED IN MEDIAN, CHANGE TO THRIE BEAM & HEIGHT 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.

ELEVATION VIEW

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 & HEIGHT 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

TABLE FOR OVERHEAD SIGN PROTECTION 403.3.9

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<td>SECTION</td>
<td>BEAM</td>
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<td>1'-6&quot;</td>
<td>3'-9&quot;</td>
<td>6'-6&quot;</td>
</tr>
<tr>
<td>4:1</td>
<td>6'-0&quot;</td>
<td>7'-9&quot;</td>
<td>11'-0&quot;</td>
</tr>
<tr>
<td>6:1</td>
<td>16'-0&quot;</td>
<td>17'-9&quot;</td>
<td>21'-0&quot;</td>
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TABLE OF OFFSETS FOR GUARDRAIL FLARED ENDS

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<td>SLOPED EDGING</td>
<td>1'-6&quot;</td>
<td>3'-3&quot;</td>
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<tr>
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<td>7'-0&quot;</td>
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TABLE FOR TYPICAL INSTALLATION

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<td>2'-6&quot;</td>
<td>5'-9&quot;</td>
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<tr>
<td>SLOPED EDGING</td>
<td>1'-6&quot;</td>
<td>3'-3&quot;</td>
<td>6'-6&quot;</td>
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<tr>
<td>TYPE &quot;A&quot; BERM</td>
<td>2'-0&quot;</td>
<td>3'-9&quot;</td>
<td>7'-0&quot;</td>
</tr>
</tbody>
</table>
TEMPORARY PAVEMENT MARKINGS IN WORK ZONES

Undivided 2 or 3 Lane Highway
- 3 days * 14 days More than
  or less or less 14 days

Undivided Multi-Lane Highway
- 14 days More than
  or less 14 days

Divided Multi-Lane Highways
- 14 days More than
  or less 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)

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 REQUIREMENTS 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 CALCULATIONS 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 NOT TO BE USED FOR THE DESIGN OF CANTILEVER SIGN FOUNDATIONS.

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TYPICAL SIGN SUPPORT FOUNDATION

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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.

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### FOR OVERHEAD DIRECTIONAL SIGNS

**NON-BREAKAWAY SUPPORTS**

<table>
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<td>(1793') WALL THICKNESS</td>
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<tr>
<td>to 21.2</td>
<td>36'</td>
<td>6'-6&quot;</td>
<td>12-85</td>
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<td>21.21 to 23.5</td>
<td>36'</td>
<td>6'-6&quot;</td>
<td>8-86</td>
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<td>25.53 to 30.0</td>
<td>36'</td>
<td>7'-0&quot;</td>
<td>14-85</td>
</tr>
<tr>
<td>29.56 to 36.0</td>
<td>42'</td>
<td>7'-0&quot;</td>
<td>12-85</td>
</tr>
<tr>
<td>33.65 to 40.0</td>
<td>42'</td>
<td>7'-6&quot;</td>
<td>10-86</td>
</tr>
<tr>
<td>40.06 to 44.3</td>
<td>42'</td>
<td>8'-0&quot;</td>
<td>16-85</td>
</tr>
<tr>
<td>44.31 to 49.5</td>
<td>42'</td>
<td>8'-6&quot;</td>
<td>8-87</td>
</tr>
<tr>
<td>49.56 to 53.4</td>
<td>48'</td>
<td>8'-0&quot;</td>
<td>8-87</td>
</tr>
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</table>

| (2500') WALL THICKNESS                    |     |     |     |
| to 29.91                                 | 36' | 8'-0" | 12-86 |
| 29.91 to 32.9                             | 36' | 7'-0" | 8-86 |
| 36.91 to 45.0                             | 42' | 7'-0" | 10-87 |
| 40.45 to 45.6                             | 42' | 8'-0" | 10-87 |
| 45.61 to 53.3                             | 42' | 8'-6" | 8-87 |
| 49.41 to 54.9                             | 42' | 9'-0" | 22-85 |
| 54.91 to 63.0                             | 48' | 9'-0" | 12-85 |
| 63.01 to 68.2                             | 48' | 10'-0" | 22-85 |
| 68.21 to 75.7                             | 48' | 10'-6" | 10-87 |
| 71.21 to 75.7                             | 48' | 10'-0" | 22-85 |
| 75.71 to 79.8                             | 48' | 11'-0" | 12-85 |
| 78.91 to 83.6                             | 48' | 11'-6" | 16-86 |
| 83.61 to 89.9                             | 48' | 12'-0" | 10-87 |
| 89.91 to 100.6                            | 48' | 12'-6" | 20-86 |
| 100.61 to 109.6                           | 48' | 12'-0" | 18-88 |

| (1825') WALL THICKNESS                    |     |     |     |
| to 29.1                                   | 36' | 7'-0" | 12-86 |
| 29.11 to 34.3                             | 36' | 8'-0" | 10-87 |
| 34.51 to 39.9                             | 36' | 8'-6" | 10-87 |
| 39.91 to 45.2                             | 36' | 8'-6" | 20-85 |
| 45.21 to 53.5                             | 36' | 9'-0" | 24-85 |
| 53.51 to 54.8                             | 42' | 9'-0" | 22-85 |
| 54.81 to 59.1                             | 42' | 10'-0" | 12-87 |
| 59.11 to 63.4                             | 42' | 10'-0" | 18-86 |
| 63.41 to 67.9                             | 48' | 10'-0" | 14-87 |
| 67.91 to 71.4                             | 48' | 11'-0" | 26-85 |
| 71.41 to 75.2                             | 48' | 12'-6" | 10-83 |
| 75.21 to 84.3                             | 48' | 12'-6" | 16-86 |
| 84.31 to 93.7                             | 48' | 13'-0" | 14-88 |
| 93.71 to 103.5                            | 48' | 13'-0" | 20-83 |
| 103.51 to 113.9                           | 48' | 12'-0" | 10-89 |
| 113.91 to 124.7                           | 48' | 13'-0" | 14-88 |
| 124.71 to 136.0                           | 48' | 14'-0" | 20-87 |

| (3586') WALL THICKNESS                    |     |     |     |
| to 31.6                                   | 36' | 9'-0" | 12-86 |
| 31.01 to 37.2                             | 36' | 9'-6" | 8-86 |
| 37.21 to 39.7                             | 36' | 10'-0" | 10-87 |
| 39.71 to 51.2                             | 36' | 9'-6" | 20-86 |
| 51.21 to 59.1                             | 36' | 10'-0" | 8-87 |
| 59.11 to 67.6                             | 36' | 10'-6" | 8-87 |
| 67.61 to 76.6                             | 42' | 10'-6" | 10-86 |
| 76.61 to 86.2                             | 42' | 11'-6" | 8-86 |
| 86.21 to 96.3                             | 48' | 12'-0" | 12-86 |
| 96.31 to 107.0                            | 48' | 12'-6" | 12-86 |
| 107.01 to 118.3                           | 48' | 13'-0" | 18-86 |
| 118.31 to 130.1                           | 48' | 13'-0" | 18-86 |

| (65825') WALL THICKNESS                   |     |     |     |
| to 31.0                                   | 36' | 9'-0" | 12-86 |
| 31.01 to 50.0                             | 36' | 9'-6" | 24-85 |
| 50.01 to 60.4                             | 36' | 10'-0" | 10-88 |
| 60.41 to 71.8                             | 42' | 10'-0" | 18-88 |
| 71.81 to 84.1                             | 42' | 11'-6" | 20-86 |
| 84.11 to 97.4                             | 48' | 12'-0" | 10-89 |
| 97.41 to 111.7                            | 48' | 12'-6" | 22-87 |
| 111.71 to 127.0                           | 48' | 13'-0" | 36-85 |
| 127.01 to 143.3                           | 48' | 14'-0" | 22-87 |
| 143.31 to 160.5                           | 48' | 14'-6" | 24-87 |
| 160.51 to 178.8                           | 48' | 16'-0" | 36-88 |
| 178.81 to 198.0                           | 48' | 17'-0" | 12-91 |
| 198.01 to 218.2                           | 48' | 18'-0" | 22-88 |
| 218.21 to 239.2                           | 54' | 18'-0" | 42-86 |

### Section Module List for Steel Sign Support Poles

- 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 ACTUAL DEPTH OF FOUNDATION SECTION MODULI OF THE POLES SHALL BE MULTIPLIED BY THE RATIO ALLOWABLE WORKING STRESS.

Minimum distance from center of the anchor bolts to the face of the concrete shall be 5'.
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


ALUMINUM

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

Panel Bolt ASTM-B211
Aluminum Alloy 2024-T4
3/8"-16x3/4" Long

Post Clip
Post

NOTE: All Extruded Aluminum Panels Shall Have Side Moulding.

ISOMETRIC SHOWING SIGN COMPONENTS

Panel Bolt & Washer
Aluminum Alloy 6262-T9
3/8"-16
ASTM-B211

NOTE: The Post Clip Method May Be Used With A Tee Beam Section In 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.

REAR ELEVATION

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

NOTE: Panel Bolts To Be Placed Symmetrically About E, DF Sign
ALUMINUM PANEL DETAILS

THICKNESS SIGN
ALUMINUM SIGN PANEL
TYPE B ALUMINUM
ALLOY 6063-T6
ASTM-B221

NOTE: EACH TEE BEAM SHALL BE
ATTACHED BY 10 POST CLIPS
-4 ON THE EXIT AND 6 ON
THE SIGN PANEL.

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 in a "Z" bar
section is used.
Post clips on ground signs only.

Isometric showing method of
attaching for exit tab
(E5-3-to sign panel)

Each tee beam
shall be attached
by 12 post clips,
6 on the exit tab
and 6 on the sign
panel.
Clip-Aluminum Alloy 356-T6 (SG70A)
ASTM-B26

Serrated Surface

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 B8F or
ASTM-A-194-Grade 8F

Flat Washer 3/4" Dia. x 0.062" 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)

Height of Sign - Radius
- Up to 2' - 3'
- 2' to 4' - 6'
- 4' 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''

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

ARRROW & 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 55 X 10 POSTS.
WEST OF LONGITUDE 71°-41' USE 54 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=
0.8 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

STIFFENER PLATE DETAIL
SEE TABLE FOR DIMENSION
### BASE CONNECTION DATA TABLE

<table>
<thead>
<tr>
<th>BOLT SIZE &amp; TORQUE</th>
<th>T1</th>
<th>T2</th>
<th>W</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>M16 X 12</td>
<td>5&quot;</td>
<td>2&quot;</td>
<td>1 1/8</td>
<td>2 1/8</td>
</tr>
<tr>
<td>M16 X 15</td>
<td>6&quot;</td>
<td>2&quot;</td>
<td>1 1/8</td>
<td>2 1/8</td>
</tr>
<tr>
<td>M18 X 18</td>
<td>8&quot;</td>
<td>2&quot;</td>
<td>1 1/8</td>
<td>2 1/8</td>
</tr>
<tr>
<td>M18 X 21</td>
<td>10&quot;</td>
<td>2&quot;</td>
<td>1 1/8</td>
<td>2 1/8</td>
</tr>
</tbody>
</table>

### FUSE PLATE DATA TABLE

<table>
<thead>
<tr>
<th>BOLT SIZE &amp; TORQUE</th>
<th>T1</th>
<th>T2</th>
<th>W</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>M16 X 12</td>
<td>5&quot;</td>
<td>2&quot;</td>
<td>1 1/8</td>
<td>2 1/8</td>
</tr>
<tr>
<td>M16 X 15</td>
<td>6&quot;</td>
<td>2&quot;</td>
<td>1 1/8</td>
<td>2 1/8</td>
</tr>
<tr>
<td>M18 X 18</td>
<td>8&quot;</td>
<td>2&quot;</td>
<td>1 1/8</td>
<td>2 1/8</td>
</tr>
<tr>
<td>M18 X 21</td>
<td>10&quot;</td>
<td>2&quot;</td>
<td>1 1/8</td>
<td>2 1/8</td>
</tr>
</tbody>
</table>

### FOUNDATION DATA

<table>
<thead>
<tr>
<th>STUB LENGTH</th>
<th>STUB PROJ.</th>
<th>SR. SHAFT DIA.</th>
<th>BARS</th>
<th>V BASE W.</th>
<th>DEPTH CONC. SHAFT</th>
<th>MIA. DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>W6 X 12</td>
<td>2'-0'</td>
<td>3'</td>
<td>2'-0'</td>
<td>5</td>
<td>5'-6'</td>
<td>—</td>
</tr>
<tr>
<td>W6 X 15</td>
<td>2'-0'</td>
<td>3'</td>
<td>2'-0'</td>
<td>5</td>
<td>6'-6'</td>
<td>2'-3'</td>
</tr>
<tr>
<td>W8 X 18</td>
<td>2'-0'</td>
<td>3'</td>
<td>2'-0'</td>
<td>6</td>
<td>7'-0'</td>
<td>2'-3'</td>
</tr>
<tr>
<td>W8 X 21</td>
<td>2'-0'</td>
<td>3'</td>
<td>2'-0'</td>
<td>7</td>
<td>8'-0'</td>
<td>2'-1'</td>
</tr>
<tr>
<td>W10 X 22</td>
<td>3'-0'</td>
<td>2'</td>
<td>2'-0'</td>
<td>8</td>
<td>9'-0'</td>
<td>2'-5'</td>
</tr>
<tr>
<td>W10 X 26</td>
<td>3'-0'</td>
<td>2'</td>
<td>2'-0'</td>
<td>9</td>
<td>10'-0'</td>
<td>2'-6'</td>
</tr>
<tr>
<td>W12 X 26</td>
<td>3'-0'</td>
<td>2'</td>
<td>2'-0'</td>
<td>10</td>
<td>11'-0'</td>
<td>3'-0'</td>
</tr>
<tr>
<td>W12 X 30</td>
<td>3'-0'</td>
<td>2'</td>
<td>2'-0'</td>
<td>11</td>
<td>12'-0'</td>
<td>3'-0'</td>
</tr>
<tr>
<td>W12 X 40</td>
<td>3'-0'</td>
<td>2'</td>
<td>2'-0'</td>
<td>12</td>
<td>13'-0'</td>
<td>3'-0'</td>
</tr>
</tbody>
</table>

See Page 29 & 30 for Base Plate Assembly

See Page 27 For Fuse Plate Details

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

<table>
<thead>
<tr>
<th>POST SIZE*</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>W6 x 12</td>
<td>158.4 Lb.</td>
</tr>
<tr>
<td>S4 x 7.7</td>
<td>96.1 Lb.</td>
</tr>
<tr>
<td>S5 x 10.0</td>
<td>122.6 Lb.</td>
</tr>
</tbody>
</table>

*LAST FIGURES=POST WEIGHT 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**

<table>
<thead>
<tr>
<th>POST SIZE*</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>V6 x 12</td>
<td>128.4 Lb.</td>
</tr>
<tr>
<td>V6 x 15</td>
<td>160.1 Lb.</td>
</tr>
<tr>
<td>V8 x 18</td>
<td>197.2 Lb.</td>
</tr>
<tr>
<td>V8 x 21</td>
<td>229.3 Lb.</td>
</tr>
<tr>
<td>V10 x 22</td>
<td>259.6 Lb.</td>
</tr>
<tr>
<td>V10 x 26</td>
<td>301.7 Lb.</td>
</tr>
<tr>
<td>V12 x 26</td>
<td>302.3 Lb.</td>
</tr>
<tr>
<td>V12 x 30</td>
<td>353.1 Lb.</td>
</tr>
<tr>
<td>V12 x 40</td>
<td>460.6 Lb.</td>
</tr>
<tr>
<td>S4 x 7.7</td>
<td>76.9 Lb.</td>
</tr>
<tr>
<td>S5 x 10.0</td>
<td>97.6 Lb.</td>
</tr>
</tbody>
</table>

*LAST FIGURES=POST WEIGHT 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.
Plywood Panel or 0.25" Sheet Aluminum

3/4" Plywood Panel or 0.25" Sheet Aluminum

4" (Nom.) Steel Pipe—10.79#/ft., Length 10'

3000 psi Cement Concrete Footing

Max. 6"
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.

Trailing End

Approach End

6083-76 Aluminum (.08" thick)

Delination For Guardrail Termini
POST COPING DETAILS


NOTE: Cut Surface Will Not Be Treated Until Plate Is Installed With All Bolts Fully Tightened.

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.

FUSE PLATE DETAIL
Flange Holes For Hinge Shall Be Drilled Or Sub-Punched & Reamed.

Cut To 1/16" From Fillet Leg

Beveled Washers For S5x10.0 & S4x7.7 Posts.
Flat Washer On Others.

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.

<table>
<thead>
<tr>
<th>Bolt Size</th>
<th>Tension</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2&quot;</td>
<td>12,000 lbs.</td>
</tr>
<tr>
<td>5/8&quot;</td>
<td>19,000 lbs.</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>28,000 lbs.</td>
</tr>
<tr>
<td>7/8&quot;</td>
<td>36,000 lbs.</td>
</tr>
</tbody>
</table>

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.
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 22.
4. After the initial torquing a second nut will be used to ensure 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 300 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 burled just above the first nut using a center punch, in order to ensure that the prescribed torque is maintained.

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.
TYP.

H.S. BOLT WITH HEX HD., HEX NUT & 3 WASHERS WITH EACH BOLT. (SEE TABLE FOR BOLT DIAMETER AND TORQUE. SEE BOLTING PROCEDURE)

STUB POST

SIGN POST AND STUB POST FOR W SHAPES

ELEVATION

SECTION A-A

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.

NOTE:
WELD=FLGE., THICKNESS=1/16"
**BASE CONNECTION DATA TABLE**

<table>
<thead>
<tr>
<th>Nom. Pipe Size Dimension</th>
<th>Bolt Size &amp; Torque</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>T</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'</td>
<td>1/8&quot; x 3/4&quot; with 1/2&quot; thread</td>
<td>5'</td>
<td>7'</td>
<td>1'</td>
<td>3/4&quot;</td>
<td>6'</td>
<td>4&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>5'</td>
<td>5/16&quot; x 3/4&quot; with 1/2&quot; thread</td>
<td>6'</td>
<td>9'</td>
<td>1 1/2&quot;</td>
<td>4&quot;</td>
<td>8&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
</tr>
<tr>
<td>6'</td>
<td>5/32&quot; x 3/4&quot; with 1/2&quot; thread</td>
<td>7'</td>
<td>10'</td>
<td>1 1/2&quot;</td>
<td>4&quot;</td>
<td>8&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
<td>1&quot;</td>
</tr>
</tbody>
</table>

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

**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-6 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 LENS.
TYPICAL PANEL ATTACHMENT TO OVERHEAD SUPPORT

ENLARGED DETAIL OF TOP OF CONNECTING ANGLE

5" DIA. BOLT WITH FLAT AND LOCK WASHERS AND HEX NUT STAINLESS OR GALVANIZED STEEL.

4"x3½"x1½" ALUM. Z-BAR

1½" U-BOLT WITH FLAT AND LOCK WASHERS AND HEX NUTS STAINLESS OR GALVANIZED STEEL

U-BOLT DETAIL

1" DIA. STAINLESS OR GALVANIZED STEEL U-BOLT WITH HEX. NUTS AND FLAT AND LOCK WASHERS.
TYPICAL PANEL ATTACHMENT TO OVERHEAD SUPPORT (CONT'D)

TYPE A
VERTICAL MEMBER FOR SIGN WITH NO 6" PANEL

9" WIDE X 2" LG. PUNCH FOR U-BOLT TYP.

TYPE B
VERTICAL MEMBER FOR SIGN WITH 6" PANEL. OTHERWISE SAME AS ABOVE
With or Without Tab

Elevation of panels and embedment of footing same as D6 with D8

Double D-6 with D-8
FOR PLYWOOD PANEL FOR ALUMINUM PANEL

Weld 5/16" Weld

1/4" Plate Weld to Top of Sleeve

Weld 5/16" Weld

TOP VIEW

8'-0" 6"

7 Spaces of 1" Each

4-1/4"

3/8" Hole

1/4" Weld

Plate welded to top of sleeve.

8 1/4" Hole

2-1/2"x1/2" L

1/2" Bolt (Typ.)

2-1/2"x2-1/2"x1/4" L

Drill both wall and post in alignment & bolt with 3/8"x8" Hex. bolt & nut for 6" Post Cap.

6" Post Cap I.D.=6-3/4-3/4
Wall Thickness
4" & 5" Same as Below

SIGN BRACKET FOR DOUBLE D-6

4" Post Cap I.D.=4-3/8-3/8
Wall Thickness

5" Post Cap I.D.=5-3/8-3/4
Wall Thickness

FRONT VIEW

4 1/2"x4 1/2" x 3/16

Bolt with 1/2"x2-1/2" hex head bolts & hex nuts for Plywood Panel 1/2"x1-1/2" Aluminum Panel

Drill both walls in alignment for 1/8 hole & bolt with 3/8"x6" hex. head bolt & hex. nut for 4" Post Cap, & 1/2"x7" hex. head bolt & hex. nut for 5" Post Cap.

FRONT VIEW

SIGN BRACKET FOR D-6
For plywood panel use 3/8" x 1/2" hex. head bolt & hex. nut. with lock washer & Gal. Flat Washer.

All holes above 3/16" Dia. 7" Plugweld or steel rivet.

1-1/2" 3/16" 3/4" 3/8" 7" 3/16"

R = 3/8" R = 2 1/4" R = 2 3/4" R = 3 1/4"

1" 1 1/4" 1/8" 1/2" 1 1/8" 1 1/4"

NOTE:
For D-8 Attachment
Use 2 Clamps
For Each sign

3/8" x 1 1/2" Hex.
head bolt & hex. nut with lock washer.

CLAMP FOR D-8 ATTACHMENT
SIGN WIDTH IN FEET
WIND ZONE 1 EAST OF LONGITUDE 71°-41'

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.

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

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

APPROVED:

BRIDGE ENGINEER

TRAFFIC ENGINEER
SIGN WIDTH IN FEET

WIND ZONE 2 WEST OF LONGITUDE 71°-41'

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

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.

NOTE: I/J 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.

NOTE: X equals the average height from the ground line to the bottom edge of the sign at post locations 'MADIMUM DISTANCE 12".

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

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 amended.)

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


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

VARIES

VARIES

Up To 50 Sq F.t

.2W

.6W

.2W

7'

5'

6' From Surface

2" Dia. Holes

12"

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

DO NOT PASS

36''x36''

BEGIN CENTER LINE

12'' LANE WIDTH

END CROSS HATCHING AT 26'
PAVEMENT WIDTH OR WHEN D=600'
WHICHSOEVER IS SHORTER

8'' YELLOW CROSS HATCHING LINES AT
20' SPACING AND 45° ANGLE

8'' YELLOW CHANNELIZING LINES

12'' LANE WIDTH

MATCH LINE "A"

200'

MATCH LINE "A"

200'±

36''x36''

END LANE LINE

300'

36''x36''

MATCH LINE "A"

36''x36''

BEGIN TAPER

750'

WHITE LANE LINE
CLIMBING LANES

* Taper as per MDPW Highway Design Manual

TWO LANE TWO WAY HIGHWAY

DIVIDED HIGHWAY

LEGEND
18.3 BEGINING OF NO-PASSING ZONE.
28.4 END OF NO-PASSING ZONE.
28.3 BASED ON LIMITED SIGHT DISTANCE.
18.4 OPPOSITE BEGINING OF CLIMBING LANE.
BEYOND MATURE
FACE OF FOOTING
EDGE OF 20' PAVEMENT PLANTING LIMITS

WOOD CHIPS (PLACED)
2' BEYOND MATURE GROWTH

55 PFIFFER JUNIPERS
SPACED 6' O.C.

CONTROL LINE @ 30°

DD SIGN SUPPORT PROTECTION

TRAFFIC FLOW

EDGE TRAVELED WAY

EDGE SHOULDER OR DECEL LANE

PLANTING LIMIT (5')

10' ±

20'

70'

PLAN

* OR OTHER APPROVED SPECIES AND/OR SPACING

EDGE SHOULDER DR DECEL LANE

SUPPORT

DR OTHER APPROVED PLAN SPECIES AND/OR SPACING

C FOOTING

FACE OF FOOTING

EDGE OF PAVEMENT

PLANTING LIMITS

6:1

ORIGINAL GROUND

2'
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 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.

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

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 (300' U.S.S. GAUGE) COLD-ROLLED CARBON STEEL SHEETS WHICH HAVE BEEN ZINC COATED (0.25 oz.) CONFORMING TO ASTM-A527, CAREFULLY ROLLED TO SIZE AND WELDED DIRECTLY IN THE CORNER BY HIGH FREQUENCY RESISTANCE WELDING OR EQUAL AND EXTERNALLY SCARFed TO AGREE WITH CORNER RADIUS. STANDARD OUTSIDE CORNER CORNER RADIUS SHALL BE 5/32' PLUS Or MINUS 1/64'.

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


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.

NOTED:
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 3/8" 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)

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 5/16" 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.

TYPICAL INSTALLATION FOR SMALL SIGNS (UP TO 20 SQ.FT.)
ALUMINUM CAP FOR 1\(\frac{3}{4}\)" 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 COMPLETELY TIGHTENING ASSEMBLY.

** DIRECTION OF TRAFFIC

SIGN PANEL (TYP)  
SIGN POST (TYP)  
TOP OF GRADE

TYPICAL END VIEW  
(Finished Assembly)
ATTACHMENT OF SIGN POST TO BASE POST

SIGN POST

HEX HEAD, INTEGRAL FLANGE BOLT, NUT AND LOCK WASHER, 4 REQ'D.

RETAINER SPACER STRAP

BASE POST
EZE-ERECT BASE POST

3/8" Dia. Holes on 1.00" Centers, Except First and Fifth are 3/8" x 1/2" slots
Punched 18 Holes
Bottom Pointed
Available in 2.5, 3.0 & 4.0 lb/ft
Length -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 LOCK WASHER

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 DS, except using clear chromate

<table>
<thead>
<tr>
<th>SIGN SIZE</th>
<th>CHANNEL POST POST-WITH STRAP (EZE-ERECT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 S.F. AND UNDER</td>
<td>1-2 LB./FT.</td>
</tr>
<tr>
<td>OVER 5 S.F. UP TO 10 S.F.</td>
<td>1-2.25 LB./FT.</td>
</tr>
<tr>
<td>OVER 10 S.F. UP TO 20 S.F.</td>
<td>2-2.25 LB./FT.</td>
</tr>
</tbody>
</table>

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

GALVANIZING FINISH
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 proceeding 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.

DATE: 7/18/90

Signature: Robert J. Shea, Traffic Engineer
Signature: [Signature]

Chief Engineer

Date: 7/18/90