PROCEDURE FOR ASSEMBLY OF BASE CONNECTION

1. Assemble post to stub with bolts and flat washers as shown.
2. Shim as required to plumb post (see shim detail).
3. Tighten all L bolts the maximum possible with 1'-0" to 1'-3" wrench to avoid washer and nuts.
4. Burr threads at junction with nut using a center punch to prevent nut loosening.

NOTE: All reinforcing bars to be Grade 60.

**At the option of the Contractor, D/0 Spiral Wire @ 6" Pitch Three Flat Turns Top and One Flat Turn Bottom may be utilized in lieu of specified.

Shop-welded assemblies of foundation stirrup reinforcing bars are permitted in reinforced concrete foundations provided that:
1. The reinforcing bars conform to ASTM Specification A416.
2. The shop welds meet the requirements of ASTM Specification A416.
3. The shop welding is performed by machines approved by the Engineer.
4. Quality control tests are performed on shop welded specimens and the test results are available upon request to the Engineer.

STEEL POST, BASE, FOUNDATION & FUSE PLATE DETAILS
### BASE CONNECTION DATA

<table>
<thead>
<tr>
<th>Section*</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>L</th>
<th>Torque (lbf·in)</th>
<th>R</th>
<th>b</th>
<th>f</th>
<th>S</th>
<th>t</th>
<th>#</th>
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<tbody>
<tr>
<td>W 6x12</td>
<td>4-3/4&quot;</td>
<td></td>
<td>5-1/8&quot;</td>
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<td>270 ± 45</td>
<td>3/8&quot;</td>
<td>1-1/8&quot;</td>
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<td>W 8x18</td>
<td>5-3/4&quot;</td>
<td>2-3/16&quot;</td>
<td>6-1/16&quot;</td>
<td>2-3/16&quot;</td>
<td>445 ± 75</td>
<td>7/16&quot;</td>
<td>1-7/16&quot;</td>
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<td>7&quot;</td>
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<td>7/16&quot;</td>
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<td>2-3/4&quot;</td>
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<td>7&quot;</td>
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<td>W 12x45</td>
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* Designations: Normal Depth in inches and weight in pounds per linear foot.

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### STEEL POST & ALTERNATIVE BASE DETAILS

- **BASE PLATE**
- **STIFFENER PLATE**
- **BOLT KEEPER PLATE**
GENERAL NOTES
1. For 'General Notes' covering Material Specifications see Index 11200.
2. Design based on 32 ft. maximum height to centroid of sign panel.
3. The Design Wind Speed shall conform to Wind Speed by County shown on Index 11200, Sheet 1.

STEEL OVERHEAD SIGN STRUCTURES

DETAILED OF SIGN FACE & TRUSS CONNECTION

TYPICAL DETAIL OF SIGN & TRUSS CONNECTION

BACKING STRIP DETAIL

SECTION C-C

TYPICAL SIGN FACE ELEVATION FOR OVERHEAD TRUSS

NOTE:
If the Sign Panels are deeper than 10'-0", a horizontal panel splice is allowed at an interior Zee support. shop drawings shall be required.

6 Hangers

Four Hangers

Three Hangers

Two Hangers

1. For 'General Notes' covering Material Specifications see Index 11200.
2. Design based on 32 ft. maximum height to centroid of sign panel.
3. The Design Wind Speed shall conform to Wind Speed by County shown on Index 11200, Sheet 1.
**CANTILEVER SIGN STRUCTURE NOTES**

1. Work this Index in conjunction with CANTILEVER SIGN STRUCTURE DATA TABLES in the Plans and Index 11300.

2. Handholes are required at pole base for DMS Structures. Refer to Index 18300 for Handhole Details.

3. Shop Drawings are required. Obtain Shop Drawing approval prior to fabrication. Include the following:
   - A. Field verification of all upright heights.
   - B. Foundation elevations: Ensure minimum vertical clearances of the sign panel over the roadway.
   - C. Height of the Foundation above adjacent ground.
   - D. Anchor bolt orientation with respect to centerline of truss and the direction of traffic.
   - E. Chord Splices
   - F. Handholes at pole base (when required).

4. Materials:
   - A. Sign Structure:
     - a. Upright and Chords (Steel Pipe): API-5L-X42, 42 ksi yield or ASTM A500, Grade B (Min.)
     - b. Steel Angles and Structural Plates and Bars: ASTM A709 Grade 36
   - B. Bolts, Nuts and Washers:
     - a. High Strength Bolts: ASTM A325 Type 1
     - b. Nuts: ASTM A563 Grade DH Heavy-Hex
   - C. Anchor Bolts, Nuts and Washers
     - a. Anchor Bolts: ASTM F1134 Grade 55
     - b. Nuts: ASTM A563 Grade A Heavy-Hex (5 per bolt)
     - c. Plate Washers: ASTM A36 (2 per bolt)
   - D. Concrete
     - a. Spread Footing Concrete: Class IV
     - b. Drilled Shaft concrete: Class IV (Drilled Shaft)
   - E. Reinforcing Steel: Specification Section 415

5. Fabrication:
   - A. Welding: Specification Section 460-6.4
   - B. Chord Splices: "SD" Panel from upright is the closest panel in which a chord splice may be used. See Plans for CANTILEVER SIGN STRUCTURE DATA TABLE. Minimum splice spacing is two truss panel lengths apart.
   - C. Upright splices: Not allowed
   - D. Structural bolt hole diameters: Bolt diameter plus $\frac{3}{4}$
   - E. Anchor bolt hole diameters: Bolt diameter plus $\frac{1}{2}$
   - F. Hot Dip Galvanize after fabrication.
   - G. Shop assemble the entire structure after galvanizing to validate/document alignment and clearance for bolted connections as well as contact between connecting plates. Take remedial action, if necessary, prior to shipment.
   - H. Disassemble, as necessary, and secure components for shipment.

6. Coatings:
   - A. Bolts, Nuts and Washers: ASTM F2232
   - B. All other steel, including Plate Washers: hot dip galvanize: ASTM A123

7. Construction:
   - A. Construct Foundation in accordance with Specification Section 455, except payment is included in the cost of the structure.
   - B. Prior to erection, record the as-built anchor locations and submit to the Engineer.
   - C. Place backfill around spread footings prior to installation of the sign panels. Do not remove or reduce backfill without prior approval of the Engineer.
   - D. Tighten nuts and bolts in accordance with Specification Section 700. Split-Lock Washers are not permitted.
   - E. Install Aluminum Sign Panels as shown on the Elevation drawing.
   - F. Place structural grout pad with drain between top of foundation and bottom of baseplate in accordance with Specification Section 649-7.
SPICE CONNECTION DETAIL
(Splice not allowed for trusses ≤ 40'
Splice optional for trusses > 40')

NOTE: Only 6 Bolts shown for clarity

Maximum Gap Between Pipes is 15/16".

1/8" for 1/4" Ø Bolts
3/8" for 3/8" Ø Bolts
7/16" for 7/16" Ø Bolts
11/16" for 1/2" Ø Bolts
3/4" for 1" Ø Bolts

5C Ø Bolts 'SP' Required
(Ge Half Each Side of Splice)

NOTE:  Only 6 Bolts

VIEW E-E
UPRIGHT-TRUSS CONNECTION DETAIL
(Web Members from back Truss Chord omitted for clarity)

SECTION F-F, SECTION G-G SIMILAR
(With Gusset Plate & Angles omitted for clarity)

DETAIL H

NOTES:
- Abbreviation
- OD = Outside Diameter
CANTILEVER SIGN STRUCTURE

2016 DESIGN STANDARDS

NOTE:
Abbreviation
OD = Outside Diameter

PAGE 4

SECTION 1-1

FRONT OF TRUSS ELEVATION
(Back Truss Chord and attached Angles not shown for clarity)

VIEW J-J
VIEW K-K Similar
(Out-of-Plane Members not shown for clarity)

SPAN LENGTH, comprised of M Equal Panels

Chord Splices not shown

See Detail M
Similar to Detail M
See Detail O

See Detail P

See Detail Q

See Detail N

See Detail L

See Plug Detail

Similar to Detail P

See Plug Detail

"D" Back Truss Chord

TOP TRUSS CHORD

See Detail N

"D" Web Angles (Typ.)

Similar to Detail M

See Detail M

"D" Truss Chords

M PANEL LENGTH

(Back Truss Chord and attached Angles not shown for clarity)
SPAN SIGN STRUCTURE NOTES

1. Work this Index in conjunction with SPAN SIGN STRUCTURE DATA TABLES in the Plans and Index 11300.

2. Handholes at the pole base are required for DMS Structures. Refer to Index 18300 for Handhole Details.

3. Shop Drawings are required. Obtain Shop Drawing approval prior to fabrication. Include the following:
   A. Field verification of all upright lengths.
   B. Foundation elevations; Ensure minimum vertical clearances of the sign panel over the roadway.
   C. Height of the Foundation above adjacent ground.
   D. Anchor bolt orientation with respect to centerline of truss and the direction of traffic.
   E. Method to be used to provide the required parabolic camber (see Camber Diagram).
   F. Handholes at pole base (when required).

4. Materials:
   A. Sign Structure:
      a. Upright and Chords (Steel Pipe): API-5L, X42, 42 ksi yield or ASTM A500, Grade B (Min.)
      b. Steel Angles and Plates: ASTM A36
      c. Weld Material: E70XX
   B. Bolts, Nuts and Washers:
      a. High Strength Bolts: ASTM A325, Type 1
      b. Nuts: ASTM A563, Grade DH Heavy-Hex
      c. Washers: ASTM F436, Type 1, on under turned element
   C. Anchor Bolts, Nuts and Washers
      a. Anchor Bolts: ASTM A325, Type 1
      b. Nuts: ASTM A563, Grade DH Heavy-Hex (5 per bolt)
      c. Plate Washers: ASTM A36 (2 per bolt)
   D. Concrete: Class IV (Drilled Shaft)
   E. Reinforcing Steel: Specification Section 415
   F. Handholes at pole base (when required).

5. Fabrication:
   A. Welding: Specification Section 460-6.4
   B. Chord Splices: Minimum splice spacing is three truss panel lengths apart and three truss panel lengths from the uprights. Chord Splices may be either the Standard Splice or the Alternate Splice but not both on the same structure.
   C. Plate Washers: Not allowed
   D. Structural bolt hole diameters: Bolt diameter plus $\frac{1}{16}$".
   E. Anchor bolt hole diameters: Bolt diameter plus $\frac{1}{8}$".
   F. Not dip galvanize after fabrication.
   G. Shop assemble the entire structure after galvanizing to validate/document alignment and clearance for bolted connections as well as contact between connecting plates. Take remedial action, if necessary, prior to shipment.
   H. Disassemble as necessary and secure components for shipment.

6. Coatings:
   A. Bolts, Nuts and Washers: ASTM F2329
   B. All other steel, including Plate Washers, hot dip galvanize: ASTM A123

7. Construction:
   A. Construct Foundation in accordance with Specification Section 495 Drilled Shaft, except payment is included in the cost of the structure.
   B. Prior to erection, record the as-built anchor locations and submit to the Engineer.
   C. Provide a parabolic camber with the maximum upward deflection as shown on the Camber Diagram.
   D. Anchor bolt orientation with respect to centerline of truss and the direction of traffic.
   E. Install Aluminum Sign Panels as shown on the Elevation drawing.
   F. After installation, place wire screen between top of foundation and bottom of baseplate in accordance with Specification Section 649-6.
Anchor Bolts
Equally Spaced between 'BD' Stiffner Plates
For Left Upright and Upright Center of Drilled Shaft
Equally Spaced
Anchor Bolts
'CB' For Right Upright
'BB' For Left Upright
Bolt Circle
'CH' For Right Upright
'BH' For Left Upright
See Upright Cap Detail
1.5 x 'F' OD
See Detail D
2 Equal Rows of Bolts
Top Truss Chord
Truss Web Angles
10' or 16" Bottom Truss Chord 'F'
See Detail D
'LD' or 'RD' Plate
'LA' or 'RA' Ø Bolts w/ Self-Locking Nuts
'LB' or 'RB' Hex Head Bolts
Anchor Bolts
Equally Spaced between 'CD' Stiffner Plates
For Right Upright
'CD' Right Upright
'BD' Left Upright
'CC' Right Upright
'BC' Left Upright
2 Bolt Dia.
2 x Bolt Diameter
2 x Bolt Diameter
1/4" Plate Washer
'Type'
Center of Drilled Shaft and Upright
For Left Upright
'BP' For Left Upright
'CM' For Right Upright
Anchor Bolts Equally Spaced between
Anchor Bolts
For Right Upright
'CD' Stiffner Plates Equally Spaced between
Anchor Bolts
1/4" Plate Washer (Typ.)
PLAN VIEW
BASE PLATE
BASE PLATE
PLAN VIEW
1/4" Plate Washer
2 Bolt Dia.
2 Bolt Dia.
1/4" Plate Washer
2 Bolt Dia.
2 Bolt Dia.
1/4" Plate Washer
2 Bolt Dia.
2 Bolt Dia.
1/4" Plate Washer
2 Bolt Dia.
2 Bolt Dia.
1/4" Plate Washer
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1/4" Plate Washer
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1/4" Plate Washer
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1/4" Plate Washer
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1/4" Plate Washer
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1/4" Plate Washer
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2 Bolt Dia.
1/4" Plate Washer
2 Bolt Dia.
2 Bolt Dia.
1/4" Plate Washer
2 Bolt Dia.
2 Bolt Dia.
1/4" Plate Washer
2 Bolt Dia.
2 Bolt Dia.
VIEW F-F
VIEW C-C Similar
(Out-of-Plane Members not shown for clarity)

Span Length, \( L \), comprised of \( D \) Equal Panels

\[
\frac{L}{D} = 1
\]

\( \frac{1}{2} \) The Number Of Panels For An Even Number Of Panels

\( \frac{1}{2} \) The Number Of Panels Rounded Down To The Closest Whole Number For An Odd Number Of Panels

FRONT OF TRUSS ELEVATION
(Back Truss Chord and attached Angles not shown for clarity)

BACK-SIDE SIGN MOUNTING DETAIL
**STEP 1:** Calculate the area and the centroid for an individual sign or a sign cluster. Note that the centroid and areas have been calculated for frequently used sign clusters. These are shown on Sheet No. 7 & 8 of 9.

**General Notes and Example:**
- **Determine the height \( H \) from groundline for the individual sign or the cluster.**
  \[ H = A + B + C = 10.26 \text{ ft.} \]
- **Assume:** Bay County, Wind Speed = 130 mph, \( A = 1 \text{ ft.} \), \( B = 7 \text{ ft.} \)
- \( A = 60,133 \text{ in.}^2 = 34.8 \text{ ft.}^2 \)

**Centroid and Height**
- \[ (X_c, Y_c) \]
- \[ (X_c x A, Y_c x A) \]
- \[ \Sigma (X_c x A) = -1,890 \text{ in.}^3 = -1.09 \text{ ft.}^3 \]
- \[ \Sigma (Y_c x A) = 60,133 \text{ in.}^3 = 34.8 \text{ ft.}^3 \]

**STEP 2:** Determine the height \( H \) from groundline for the individual sign or the cluster.
- **Assume:** Bay County, Wind Speed = 130 mph, \( X = 1 \text{ ft.} \), \( Y = 7 \text{ ft.} \)
- Calculated: \( K_Y = -0.1 \text{ ft.} \), \( K_Y = 7.5 \text{ ft.} \)
- Since \( K_Y = -0.1 \text{ ft.} \), this is not a cantilever sign, only dark-bold lines in the table will be referenced to.
- \( H = X + Y + W = 10.26 \text{ ft.} \)

**STEP 3:** Select the appropriate Aluminum Column (Post) Selection Tables by Wind Speed and find the intersection point. See Sheet 3.

For **WIND SPEED = 130 MPH**:
- \( H = 11 \text{ ft.} \), Area = 16 \text{ ft.}^2
- Refer to the 130 mph Aluminum Column (Post) Selection Table, as copied from Sheet 3 and shown here.
- Using the 16 ft. area on the left hand side of the table, go across to the 11 ft. height and find the cell marked with A.
- Find the symbol \( \square \) which the dark-bold line under the \( A \) cell leads to.

**STEP 4:** Design the Column (Post) and the foundation according to the dark-bold lines or shaded area (if cantilever sign) in the Aluminum Column (Post) Selection Tables and Column (Post) and Foundation Table. For sign assemblies with signs oriented in two directions, only the sign with the largest area should be analyzed to determine the Column (Post) requirements.

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**GENERAL NOTES:**
1. Design Wind Speed is determined by County (see WIND SPEEDS BY COUNTY).
2. Maximum sign area (single or cluster) is 30 ft.
3. Maximum sign width (X) single or cluster (including rotated sign panels) is 60 inches.
4. Shop drawings: Not required.
5. Aluminum Sign, Wind Beams and Column (Post) Materials:
   - b. Aluminum Bars and Extruded Shapes: ASTM B221, Alloy 6061-T6
   - c. Aluminum Structural Shapes: ASTM B308 Alloy 6061-T6
   - d. Cast Aluminum: Alloy 356-T6
   - e. Aluminum Weld Material: 60558
6. Sign Mounting Bolts ( Screws), Nuts and Washers:
   - a. Aluminum Button Head and Flat Head Bolts ( Screws): ASTM F 468 Alloy 2014-T4
   - b. Aluminum Hex Nuts: ASTM F467 Alloy 6061 or 6063-T9
   - c. Aluminum Washers: ASTM B221, Alloy 7075-T6
   - d. Galvanized Steel U-Bolts: ASTM A 307 Grade A
   - e. Galvanized Hex Nuts: ASTM A 563
7. Stainless Steel Bolts, Nuts and Washers may be used in lieu of the Aluminum button head and flat head bolts ( Screws) as follows:
   - a. Stainless Steel Bolts ( Screws): ASTM F 593 Alloy Group 2, Condition A, CW1 or SH1
   - b. Stainless Steel Nuts: ASTM F 1394
8. Sign Column (Post) Bolts, Nuts and Washers:
   - a. Galvanized Bolts (Screws): ASTM A307 with Galvanized Hex Nuts and Washers
   - b. Aluminum Bolts (Screws): ASTM B221, Alloy 6061-T6 or 2014 T4 with Hex Nuts and Washers
   - c. Galvanized High Strength Hex Head Bolts (Basic Bolts): ASTM A 325 Type 1
   - d. Galvanized Hex Nuts: ASTM A 563 Grade 01
   - e. Galvanized Washers: ASTM F 1390
9. Coatings:
   - a. Aluminum Fasteners: Anodic coating (0.0002 inches min.) and chrome sealed
   - b. High Strength Steel Bolts Nuts and Washers: ASTM F339
   - c. All other steel items (excluding stainless steel): Hot-dip Galvanize – ASTM A123
   - d. Repair damaged galvanizing in accordance with Specification Section 582

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**GUIDE TO USE THIS STANDARD**

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**NOTES AND EXAMPLE**

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NOTES:
1. For 'A' & 'B' see Index No. 17302 and Roadway Plans.
2. Do not exceed an area of 30 SF or a width of 60 inches for a sign or a sign cluster.
3. Vertical sign spacing (1" shown on Sign Cluster detail) also applies to rotated signs.

CALCULATION OF SIGN CLUSTER CENTROID

\[ x_c = \frac{\sum (X_i \cdot A_i)}{\sum A_i} \]
\[ y_c = \frac{\sum (Y_i \cdot A_i)}{\sum A_i} \]

'A' = Height of the mounting elevation to the edge of pavement elevation
'B' = Height of the edge of pavement elevation and the bottom of the sign or cluster
'C' = Height from the bottom of the sign or cluster to the centroid of the sign or cluster
'h' = Individual sign height
\( h/2 \) = Individual sign center
'H' = Height of sign or cluster centroid from groundline
\( h/2 \) = Individual sign center

\( X_c \) = Centroid horizontal location of sign or cluster from \( \xi \) Aluminum Column (Post)
\( Y_c \) = Centroid height of sign or cluster from bottom of sign cluster
\( X_n \) = Individual sign centroid horizontal location from \( \xi \) Aluminum Column (Post)
\( Y_n \) = Individual sign centroid height from bottom of sign cluster

CENTROID AND HEIGHT
### Aluminum Column (Post) Selection Table

#### Wind Speed = 100 MPH

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<thead>
<tr>
<th>Diameter (in)</th>
<th>Embedment Depth (ft) without Soil Plate</th>
<th>Embedment Depth (ft) with Soil Plate</th>
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<td>6.0</td>
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<td>8.0</td>
<td>24.0</td>
<td>24.0</td>
</tr>
</tbody>
</table>

#### Wind Speed = 130 MPH

<table>
<thead>
<tr>
<th>Diameter (in)</th>
<th>Embedment Depth (ft) without Soil Plate</th>
<th>Embedment Depth (ft) with Soil Plate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>6.0</td>
<td>6.0</td>
</tr>
<tr>
<td>2.5</td>
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<td>20.0</td>
</tr>
<tr>
<td>8.0</td>
<td>24.0</td>
<td>24.0</td>
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</tbody>
</table>

### Wind Speeds by County:

- **110 MPH**

- **130 MPH**

- **150 MPH**
  - Brevard, Collier, Escambia, Indian River, Martin, Miami-Dade, Monroe, Palm Beach, Santa Rosa and St. Lucie counties.

### Notes:

1. For cantilever sign installations see Index 17302.
2. For cantilever signs with widths greater than 4' see Index 11861.
NOTES:

1. Foundation Notes for Frangible Slip Base:
   A. Place Stub into concrete to diameter and depth shown in POST AND FOUNDATION TABLE using Class I Concrete.
   B. Install precast concrete stub section by placing into a preformed hole and backfilling with flowable fill or bagged concrete.

2. Slip Base Fabrication Notes:
   A. The difference between the O.D. of the post and I.D. of the Sleeve must be $\frac{1}{2}"$ or less.
   B. Base Plate to Sleeve and Base Plate to Stub may be welded or cast.
   C. For cast base plates bolted to foundation stubs, use a foundation stub the same size as the sign column (Post).

3. Slip-Base Assembly Instructions:
   A. Assemble Slip Base connections in the following manner:
      1. Insert Post into Sleeve and connect using 2-0.009" diameter Sleeve Bolts.
      2. Slip Base Fabrication Notes:
         A. The difference between the O.D. of the post and I.D. of the Sleeve must be $\frac{1}{2}"$ or less.
         B. Base Plate to Sleeve and Base Plate to Stub may be welded or cast.
         C. For cast base plates bolted to foundation stubs, use a foundation stub the same size as the sign column (Post).
   B. Base Plate to Sleeve and Base Plate to Stub may be welded or cast.
   C. For cast base plates bolted to foundation stubs, use a foundation stub the same size as the sign column (Post).
   D. Tighten Base Bolts as follows:
      a. Tighten Base Bolts to the maximum possible with a 12" to 15" wrench (this will bed the washers and shims and clear the bolt threads).
      b. Loosen each Base Bolt one turn.
      c. Under the supervision of the Engineer, use a calibrated wrench to tighten bolts to the torque prescribed in the SLIP BASE DETAILS Table. Over tightened Base Bolts are not permitted.
      d. Distort bolt threads at the junction with nuts to prevent loosening. Repair damaged galvanizing.
   E. Place galvanized steel shims between the Sleeve and Post to obtain a tight fit between the Post and Sleeve.

<table>
<thead>
<tr>
<th>Column (Post) Size</th>
<th>Dia (in)</th>
<th>Mater. (in)</th>
<th>Sleeve Dia (Max)</th>
<th>Sleeve Height (in)</th>
<th>Base Bolt</th>
<th>Base Plate Torque</th>
<th>Hole Size (in)</th>
<th>Slm</th>
</tr>
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<tr>
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<td>6</td>
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<td>3</td>
<td>29</td>
</tr>
<tr>
<td>45</td>
<td>$\frac{1}{4}$</td>
<td>40x40</td>
<td>6</td>
<td>$\frac{1}{8}$</td>
<td>$\frac{1}{8}$</td>
<td>$\frac{1}{8}$</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>5</td>
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<td>52x52</td>
<td>7</td>
<td>$\frac{1}{4}$</td>
<td>$\frac{1}{8}$</td>
<td>$\frac{1}{8}$</td>
<td>30</td>
<td>28</td>
</tr>
<tr>
<td>6</td>
<td>$\frac{1}{4}$</td>
<td>69x69</td>
<td>8</td>
<td>$\frac{1}{4}$</td>
<td>$\frac{1}{8}$</td>
<td>$\frac{1}{8}$</td>
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<td>$\frac{1}{8}$</td>
<td>30</td>
<td>25</td>
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</tbody>
</table>
NOTES:
1. Align Soil Plate bottom at 1/2 of embedment depth.
2. Slot up to 1" long is allowed to accommodate various Column (Post) sizes.
3. Rectangular soil plate of size 1'-2" x 1'-0" may be used as an alternative.

1'-6" Dia.

ALUMINUM SOIL PLATE DETAIL

W 1/4" Dia Bolt Holes
(Note: Spacing to match 3-Bolts)
(Washers as required)

CONCRETE/STUB DETAIL
(\textit{Frangible Post In Crossovers, Medians \& Sidewalks})

Note: Concrete foundation may be Class Non Structural if poured monolithically with sidewalk or separator.

DRIVEN POST DETAIL
(\textit{Frangible Post In Crossovers, Medians \& Sidewalks})
WIND BEAM CONNECTION NOTES:
1. \( \frac{3}{8} " \) Stainless Steel Hex Head Bolts with Flat Washer under Head and Lockwasher under Nut may be used in lieu of \( \frac{3}{8} " \) Aluminum Button Head Bolts.
2. Use Nylon washers (provided by the sheeting supplier) under the button bolt heads to protect sign sheeting.
3. Slots up to 1" long are allowed in wind beams to accommodate U-Bolts for varying Column (Post) diameters.
4. Wind beams may be oriented in either direction.

WIND BEAM PLACEMENT NOTES:
1. Install an additional third wind beam along the \( \xi \) for signs with heights greater than 30" and less than 72". For rectangular signs greater than 72" maintain a maximum wind beam spacing of 2'-6", with the additional wind beams spaced evenly between the top and bottom wind beams. For rectangular signs up to 12" in height, use only one wind beam at \( \xi \) Sign.
2. Install an additional third wind beam along the \( \xi \) for Yield and School signs greater than 36".
3. Install an additional third wind beam along the \( \xi \) for Diamond signs 30" or greater.
### Table 1: Single Column Ground Signs

<table>
<thead>
<tr>
<th>Size</th>
<th>Area</th>
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<th>Centroid</th>
</tr>
</thead>
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<td>2.00 SF</td>
</tr>
<tr>
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### Table 2: Design Standards

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<th>Description</th>
<th>Index No.</th>
<th>Sheet No.</th>
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<tbody>
<tr>
<td>Single Column Ground Signs</td>
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<td>8 of 9</td>
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*6/17/2015 1:22:08 PM*
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<td>14.25 SqFt</td>
<td>2.74 Ft</td>
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</table>
GENERAL NOTES:
1. Refer to FDOT Design Standards Index No. 11860 for additional notes, assembly of base connection and material specifications not given in this Index.
3. Provide galvanized steel shims between the Sleeve and Post to obtain a tight fit between the Post and Sleeve.
4. Wind Beam and Vertical Brace: Aluminum Z 2" x 2" x 3.38. Install Vertical Brace on 7'-0" to 8'-0" signs only.
5. Provide 2-0.0149" Thick (28 gauge) and 2-0.0329" Thick (21 gauge) Brass Shims Per Post. Used brass shims to plum the post.

<table>
<thead>
<tr>
<th>Sign Size</th>
<th>Column Size Diameter x Thickness</th>
<th>Sleeve Size Diameter x Thickness</th>
<th>U-bolt Diameter</th>
<th>Base Bolt Diameter &amp; Length</th>
<th>Torque Lbs.ft</th>
<th>Base Plate Thickness</th>
<th>Base Plate Diameter</th>
<th>Footing Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'-0&quot; x 9'-0&quot;</td>
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<td>5.569&quot; x 0.5&quot; (Schedule 80)</td>
<td>5/16&quot;</td>
<td>3/8&quot; x 3/4&quot;</td>
<td>270</td>
<td>45</td>
<td>1&quot;</td>
<td>6'-0&quot;</td>
</tr>
<tr>
<td>4'-0&quot; x 6'-0&quot;</td>
<td>4.5&quot; x 0.337&quot; (Schedule 80)</td>
<td>6.629&quot; x 0.437&quot; (Schedule 80)</td>
<td>3/16&quot;</td>
<td>5/32&quot; x 3/4&quot;</td>
<td>445</td>
<td>75</td>
<td>11/4&quot;</td>
<td>6'-0&quot;</td>
</tr>
</tbody>
</table>

**COLUMN SELECTION AND FOOTING SIZE TABLE**
SINGLE COLUMN CANTILEVER
GROUND MOUNTED SIGN

DESCRIPTION:

2016 DESIGN STANDARDS

INDEX NO. 11861

REVISED 07/01/15

5/17/15 1:15:55 PM

RIGHT OF WAY

ELEVATION

PLAN

SLEEVE & BASE PLATE DETAILS

BASE AND FOUNDATION DETAIL

STUB DETAIL

DETAIL 'A'

BOLT KEEPER PLATE DETAIL
GENERAL NOTES

1. ALUMINUM: Aluminum materials shall meet the requirements of Aluminum Association Alloy 6061-T6 (ASTM B209, B221, B308 or B429), except as noted.

2. Sign panel, wind beam and columns shall be installed in accordance with Index 11860 and Section 700 of the Specifications.

3. Height and offset to sign column shall be in accordance with Index 17302.

4. When aluminum column (posts) are installed with a frangible pedestal pole bases, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base.

5. Aluminum poles and transformer bases shall meets the requirements of Section 646 of the Specifications.

6. A concrete slab shall be installed around all flashing beacon assemblies installed on slopes 6:1 or greater. Minimum dimension of slab shall be 4'-0" by 5'-0".

7. A concrete slab shall be installed around all pull boxes. Minimum dimension of slab shall be 4'-0" by 4'-0". In urban areas where space is limited slab dimensions may be adjusted as shown in the plans.

8. For beacon assemblies connected to conventional power, provide single pole non-fused watertight breakaway electrical connectors in the frangible pedestal pole base.

9. Connection of controller cabinet and solar panel to the column shall be in accordance with manufacturer's recommendations.

10. Holes drilled in sign column for wire entry shall use a bushing or rubber grommet to protect conductors.

11. Orient solar panel to face South for optimal exposure to sunlight.

ALUMINUM:  Aluminum materials shall meet the requirements of Aluminum Association Alloy 6061-T6 (ASTM B209, B221, B308 or B429), except as noted.

12. Height and offset to sign column shall be in accordance with Index 17302.

13. All aluminum poles and transformer bases shall meet the requirements of Section 646 of the Specifications.

14. When aluminum column (posts) are installed with a frangible pedestal pole bases, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base.

15. A concrete slab shall be installed around all pull boxes. Minimum dimension of slab shall be 4'-0" by 4'-0". In urban areas where space is limited slab dimensions may be adjusted as shown in the plans.

16. For beacon assemblies connected to conventional power, provide single pole non-fused watertight breakaway electrical connectors in the frangible pedestal pole base.

17. Connection of controller cabinet and solar panel to the column shall be in accordance with manufacturer's recommendations.

18. Holes drilled in sign column for wire entry shall use a bushing or rubber grommet to protect conductors.

19. Orient solar panel to face South for optimal exposure to sunlight.
1. All flashing beacon assemblies with solar panels, controllers and batteries weighing more than 170 lbs. shall utilize a separate pole for mounting the solar panel, controller and batteries.

2. The auxiliary pole shall be installed outside the recoverable terrain distance and as near the right of way as possible. The recoverable terrain distance shall comply with Design Standard Index 700.

3. Auxilliary pole shall be the same length as the column for the beacon assembly.

3. Payment for the separate pole, foundation, conduit and wiring shall be included in the cost of the electronic warning sign with flashing beacon.

---

NOTES

Concrete Slab Detail

Solar Panel (Optional)

Nominal 4" (Sch. 40) Aluminum

Cabinet For Flasher Controller, Solar Control Unit And Batteries.

CONCRETE SLAB DETAIL

SOLAR POWERED BEACON WITH AUXILIARY POLE FOR SOLAR PANEL, CONTROLLER AND BATTERIES
NOTES

1. Details show a typical warning sign with two flashing beacon heads. When only one beacon is required, install upper beacon.

2. Sign column slip base shall be in accordance with Design Standard Index 11860.

3. Beacon and beacon controllers shall be listed on Approved Products List (APL).

SOLAR POWERED WARNING SIGN DETAILS

ROADSIDE FLASHING BEACON ASSEMBLY

INDEX NO. 11862

SHEET NO. 3 of 7

2016 DESIGN STANDARDS

DESCRIPTION: ROADSIDE FLASHING BEACON ASSEMBLY

LAST REVISION 12/15/14

STANDARD WARNING SIGN COLUMN SIZE

<table>
<thead>
<tr>
<th>Wind Speed</th>
<th>Sign Height</th>
<th>Column Size</th>
<th>Footing Depth</th>
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</thead>
<tbody>
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<td>4&quot;</td>
<td>4'</td>
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<td>150</td>
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<td>6&quot;</td>
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NOTES

1. Rectangular Rapid Flashing Beacon (RRFB) shall always be installed in pairs, one on either side of approach traffic.
2. Controller shall be installed on the backsides of posts from approach traffic.
3. All RRFB equipment and hardware shall be listed on the Approved Products List (APL).
4. The W11-2 sign shall be 30" X 30" for single lane facilities and a 36" X 30" sign for multi-lane facilities.
1. Details show a typical school zone sign with two flashing beacon heads. When only one beacon is required, install upper beacon.

2. The pedestal base shall be required for both solar powered and conventional powered applications.

3. Beacons and beacon controllers shall be on the Approved Products List (APL).

### Roadside Flashing Beacon Assembly

- **SCHOOL SPEED LIMIT 20 WHEN FLASHING**
- **Solar Panel (Optional)**
- **12" Yellow Flashing Beacon**
- **Solar Battery Compartment (Optional)**
- **55-1 (24" x 48")**
- **Nominal 4" (Sch. 40) Aluminum**
- **4" x 18" Anchor Bolts**
- **Optional Conduit**
- **SCHOOL REGULATORY SIGN DETAILS**
- **REV IS IO N NO. 07/01/15**
- **INDEX NO. 11862**
- **SHEET NO. 5 of 7**

NOTES

- **Roadside Flashing Beacon Assembly**

A1055-A0200
**NOTES**

1. The pedestal base shall be required for both solar powered and conventional powered applications.

2. Speed feedback display, beacons, beacon controllers and installation hardware shall be on the Approved Products List (APL).

3. Speed feedback display shall indicate 15" numeral heights for posted speeds less than 45 mph and 18" heights for posted speeds 45 mph or greater.

4. Only speed display units weighing 62 lbs. or less may be mounted with a 9'-0" clearance. Speed display units weighing more than 62 lbs. shall be mounted with a 7'-0" clearance.

**DESCRIPTION:**

- 12" Yellow Flashing Beacon
- Solar Battery Compartment (When Required)
- Nominal 4" (Sch. 40) Aluminum
- 8 x 18" Anchor Bolts
- Solar Panel (Optional)
- Beacon Controller (When Required)
- Solar Battery Compartment (When Required)

**ROADSIDE FLASHING BEACON ASSEMBLY**

**SCHOOL REGULATORY WITH SPEED FEEDBACK DETAILS**

**2016 DESIGN STANDARDS**

**INDEX NO.** 11862

**SHEET NO.** 6 of 7

**REV.** 07/01/15

**REVISION 07/01/15**

**DESCRIPTION:**

- 12" Yellow Flashing Beacon
- Solar Battery Compartment (When Required)
- Nominal 4" (Sch. 40) Aluminum
- 8 x 18" Anchor Bolts
- Solar Panel (Optional)
- Beacon Controller (When Required)
- Solar Battery Compartment (When Required)

**SCHOOL REGULATORY WITH SPEED FEEDBACK DETAILS**

**2016 DESIGN STANDARDS**

**INDEX NO.** 11862

**SHEET NO.** 6 of 7

**REV.** 07/01/15

**DESCRIPTION:**

- 12" Yellow Flashing Beacon
- Solar Battery Compartment (When Required)
- Nominal 4" (Sch. 40) Aluminum
- 8 x 18" Anchor Bolts
- Solar Panel (Optional)
- Beacon Controller (When Required)
- Solar Battery Compartment (When Required)
NOTES

1. The pedestal base shall be required for both solar powered and conventional powered applications.

2. Speed feedback display, beacons, beacon controllers and installation hardware shall be on the Approved Products List (APL).

3. Speed feedback display shall indicate 15" numeral heights for posted speeds less than 45 mph, and 18" heights for posted speeds 45 mph or greater.

4. Only speed display units weighing 62 lbs. or less may be mounted with a 0' - 0" clearance. Speed display units weighing more than 62 lbs. shall be mounted with a 1'-0" clearance.
SIGN SUPPORT BRACKET

NOTES:


WIND SPEEDS: See Index 11860, "Wind Speeds by County" note.

GEOMETRY: Install signs with bottom edge of the lowest sign panel at 7' above the gutter line. Edge of sign panels must not extend beyond the inside face of the top of the traffic railing. Install sign posts plumb.

APPLICABILITY: Mount only to concrete traffic barriers in locations where ground mounting is not possible. Work this Index in conjunction with Index No. 11860.

SHOP DRAWINGS: Shop drawings are not required.

PAYMENT: Include payment for sign support bracket in the cost of the single post sign.

MATERIALS:

Coatings: Galvanize all steel and fasteners in accordance with Specification Section 962. Hot dip galvanize Sign Support Weldment after fabrication.


Sign Post: Aluminum Association Alloy 6061-T6 (ASTM B209, B221 or B308) 5" NPS Schedule 40 Aluminum Pipe.

Steel Plates: ASTM A36 or A709 Grade 36.

Anchor Rods & Bolts: ASTM F1534 Grade 55 with a single self-locking hex nut and washers. Install anchor rods or bolts perpendicular to the base plates on back of traffic railing. See Anchorage Notes, Sheet 2 of 2.

Adhesive Bonded Anchors: Fully threaded Anchor Rods with Type HV Adhesive Bonding Material System in accordance with Specification Section 416 & 937. In lieu of the number of anchors specified to be tested in Specification Section 416-6, field test all adhesive bonded anchors installed per this Design Standard.

U-Bolts: ASTM A449 sized for sign post, with flat washers and locking hex nuts.

Welding: Weld in accordance with American Welding Society Structural Welding Code (Steel), ANSI/AWS D1.1 (current edition). Required weld material is E70XX. Nondestructive testing is not required.

### SIGN LIMITATIONS TABLE

<table>
<thead>
<tr>
<th>MAX. WIND SPEED (MPH)</th>
<th>MAX. SIGN AREA (SF)</th>
<th>MAX. SIGN CENTROID HEIGHT (DIM. A + DIM. C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>30</td>
<td>9'-10&quot;</td>
</tr>
<tr>
<td>130</td>
<td>25</td>
<td>9'-7&quot;</td>
</tr>
<tr>
<td>150</td>
<td>20</td>
<td>9'-7&quot;</td>
</tr>
</tbody>
</table>

Dim. A = Distance from centerline of the Support Post to the bottom of the sign or sign cluster.  
Dim. C = Vertical distance from the bottom of the sign or sign cluster to the Centroid of the sign or sign cluster.
TYPICAL SECTION THRU EXISTING TRAFFIC RAILING AT SIGN SUPPORT BRACKET
(32" F-Shape Traffic Railing shown, other Traffic Railings & Parapet similar)
(Bridge Deck shown, Approach Slab and Retaining Wall Similar)

VIEW B-B
SIGN SUPPORT BRACKET

PLAN VIEW A-A
SIGN SUPPORT BRACKET

ANCHORAGE NOTES:
1. Existing Traffic Railings:
   a. Locate existing conduit prior to drilling. Adjust placement as necessary to avoid existing conduit. Base plate must be flush with back of traffic railing. Maintain a minimum cover 2" from face of traffic railing to tip of Adhesive Anchor.
   b. For concrete parapets less than 10" thick, through bolt 3/8" Heavy Hex Head Bolts with Nuts and Washers in lieu of Adhesive Bonded Anchors. Bolt heads shall not protrude more than 1/2" beyond traffic face of railing.

2. New Traffic Railings:
   a. Tie Anchor Bolts securely and use templates as necessary to maintain bolt spacing.
   b. Optional Couplers are shown for slipforming; keep Anchor Bolt coupler threads free of concrete.

CROSS REFERENCES:
For Base Plate, End Plate & U-Bolt Plate Washer Details see Sheet 1.
**ELEVATION**

(See Index 11860, "Wind speeds by County" note.)

**NOTES:**

**DESIGN SPECIFICATIONS:**


**WIND SPEEDS:**

See Index 11860, "Wind speeds by County" note.

**GEOMETRY:**

Maximum Sign Panel Height is 6'-0".

Edges of Sign Panels must be a minimum of 2'-0" clear from edge of adjacent Travel Way.

**APPLICABILITY:**

Work this Index in conjunction with Index No 11860.

**SHOP DRAWINGS:**

Shop drawings are not required.

**MATERIALS:**

Sign Post: ASTM A53 Grade B, NPS Schedule 40 Steel Pipe, sized per Table 1. Maximum post length is 10'-0".

Snap-In Pole Cap: Provide UV and weather-resistant glass-filled polyester cap.

Steel Plates: ASTM A572 Grade 50 or A709 Grade 50.

Welding: Weld in accordance with American Welding Society Structural Welding Code (Steel), ANSI/DWS D1.1 (current edition). Required weld material is E70XX. Non-destructive test is not required.

Coatings: Hot dip galvanize all steel, including fasteners, in accordance with Section 962. Galvanize Weldment after fabrication.

**INSTALLATION:**

Placement: For installations on permanent Median Barriers, locate Sign Support a minimum of 5'-0" away from open joints or transitions. For installations on Temporary Barriers, locate Sign Support at the midpoint along the length of a single segment. In all cases, shift locations as needed to avoid conflicts with reinforcement.

Bearing Surface: Surface of the railing must be structurally sound and free of cracks and spalls. Base plate must be flush with the concrete surface; grind any high spots to obtain a flat, smooth surface.

Saw Cut: For permanent installations only, saw cut a 1/2" deep groove transversely across the top of railing at the centerline of base plate vent hole location.

Anchor Rods: Use ASTM F1554 Grade 36, fully threaded rods with A563 or A194 single self-locking hex nuts and F436 washers. Size anchor rods per Table 2.

Adhesive Bonding Material: Install anchor rods using Type HSHV Adhesive Bonding Material System in accordance with Specification Sections 416 & 937. For temporary sign support installations, the use of a metal detector specifically designed for locating steel in concrete is not required. For reinforcement as stated within Specification Section 416-4. For temporary sign support installations, Specification Section 416-6 is not required. For permanent sign support installations, Specification Section 416-6 applies with the exception of the following: Perform field test on only one anchor per sign support location.

Removal of Signs: Cut anchor rods flush with top of railing and coat surface with Type F-1 epoxy."

---

**TABLE 1 - SIGN PANEL AND POST SIZING**

<table>
<thead>
<tr>
<th>Wind Speed (MPH)</th>
<th>Max. Sign Area (SF)</th>
<th>Post Ø (NPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 - All Temporary Signs</td>
<td>&lt; 24</td>
<td>3.0</td>
</tr>
<tr>
<td>110 &amp; 130</td>
<td>&lt; 13.5</td>
<td>3.0</td>
</tr>
<tr>
<td>13.5 &lt; Sign &lt; 20</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>&lt; 13.5</td>
<td>4.0</td>
</tr>
<tr>
<td>13.5 &lt; Sign &lt; 20</td>
<td>4.0</td>
<td></td>
</tr>
</tbody>
</table>

**INDEX NO.**

11871

**SHEET NO.**

1 of 2
MOUNTING EXIT NUMBER PANELS TO HIGHWAY SIGNS

ELEVATION

GENERAL NOTES

MATERIALS:
All aluminum materials shall meet the requirements of the Aluminum Association Alloy 6061-T6 and also the following ASTM specifications for the following: Sheets and plates B209; extruded shapes B207; and standard structural shapes B210.

ALUMINUM BOLTS, NUTS & LOCK WASHERS:
Aluminum bolts shall meet the requirements of the Aluminum Association Alloy 2024-T4 (ASTM F468). The bolts shall have an anodic coating of at least 0.0007" thick and be chrome-plated. Lockwashers shall meet the requirement of Aluminum Association Alloy 7075-T6 (ASTM B221). Nuts shall meet the requirement of Aluminum Association Alloy 6061-T6 (ASTM F467) or 6061-T6.

SIGN FACE:
All sign face corners shall be rounded. See sign layout sheet for dimension "L" and sign face details. For mounting details refer to Index No. 11300.

NOTE: Exit numbering panel shall be located to the right side for right exit and to the left for left exit.

Mounting of Exit Numbering Panels To Highway Signs

SECTION AA
GENERAL NOTES:
1. The typical sections shown herein serve as a guide for locating the traffic signs required under various roadside conditions. For size and details of sign construction and footing, refer to the appropriate standard index drawing for roadside sign.
2. It shall be the CONTRACTORS responsibility to verify the length of sign supports in the field prior to fabrication.
3. Ground signs shall be installed at an angle of 1 to 4 degrees away from the traffic flow (see illustration). Shoulder mounted signs shall be related counterclockwise and median mounted signs rotated clockwise. Signs on curves shall be mounted as noted above from the perpendicular to the motorist line of sight.

CASE I (MERGE SIGN)
For Use On All Rural, Freeway And Expressway Systems

CASE II (REST AREA & EXIT GORE SIGNS)
For Use On All Freeway and Expressway Systems

CASE III (MILE POST MARKER)
For Freeway And Expressway Systems

CASE IV (MERGE SIGN)
For Use On All Rural, Freeway And Expressway Systems

CASE V (MERGE SIGN)
For Use On All Freeway And Expressway Systems

CASE VI (MERGE SIGN)
For Use On All Freeway And Expressway Systems

CASE VII (REST AREA & EXIT GORE SIGNS)
For Use On All Freeway And Expressway Systems

CASE VIII (MILE POST MARKER)
For More Information Refer To Section 2H Or The Manual On Uniform Traffic Control Devices

1. The setback for stop and yield signs may be reduced to 2' minimum from the driving lane if required for visibility in business or residential sections with no curb and speeds of 30 MPH or less.
2. The mounting heights are measured from the bottom of the sign panel to a horizontal line extended from the edge of the driving lane. If the standard heights cannot be met, the minimum heights are as follows:
   - Expressway & Freeway Systems 7'
   - Rural (including residential with parking and/or pedestrian activity) 5'
   - Urban (including residential with parking and/or pedestrian activity) 6'
   If a secondary sign is mounted below the major sign, the major sign shall be at least 8' and the secondary sign 6' for Expressway & Freeway systems and for other systems the height to the secondary sign shall be at least 9' for rural and 7' for urban sections.
3. The setback for stop and yield signs may be reduced to 2' minimum from the driving lane if required for visibility in business or residential sections with no curb and speeds of 30 MPH or less.
4. Sign supports should never be placed in the bottom of ditches where erosion might affect the proper operation of the breakaway feature.
5. Sign supports shall not reduce the accessible route (continuous passage to less than 4' min. clear width as required by the Americans with Disabilities Act [ADA] Accessibility Guidelines).
4 - LANE DIVIDED INSTALLATION

- **WEIGH STATION 1 MILE**
  - DB-1
  - FTP-1-06
- **ALL TRUCKS ENTER**
  - FTP-83-08
- **WEIGH STATION NEXT RIGHT**
  - DB-2
- **ALL TRUCKS**
  - FTP-83-08
- **WEIGH STATION**
  - DB-3

Note: Signs DB-3 to be placed at or near the theoretical gore.

**MEDIAN INSTALLATION**

- **WEIGH STATION 1 MILE**
  - DB-1
  - FTP-1-06
- **ALL TRUCKS ENTER**
  - FTP-83-08
- **WEIGH STATION NEXT LEFT**
  - DB-2
- **WEIGH STATION**
  - DB-3

WEIGH STATION SIGNING
4 - LANE DIVIDED INSTALLATION

2 - LANE INSTALLATION

MEDIAN INSTALLATION

INSPECTION STATION SIGNING
Table:
<table>
<thead>
<tr>
<th>Approach Speed (MPH)</th>
<th>Distance A (Ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 or less</td>
<td>200</td>
</tr>
<tr>
<td>26 to 35</td>
<td>250</td>
</tr>
<tr>
<td>36 to 45</td>
<td>300</td>
</tr>
<tr>
<td>46 to 55</td>
<td>325</td>
</tr>
</tbody>
</table>

Notes:

S1-1

"No Right Turn On Red" Signs may be erected as deemed necessary by the local traffic engineers.

W16-9P

S1-1

"We Right Turn On Red" Signs may be erected as deemed necessary by the local traffic engineers.

Single-Line Pavement Marking

55 s.f.

Note:

Pavement Marking Should Not Extend Into Opposing Lane.

Notes:

1. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK AT A SIGNALIZED INTERSECTION

Note:

Special speed restrictions are not normally applicable to these two cases.
3. TRAFFIC CONTROL DEVICES FOR REDUCED SPEED ZONE AT A SCHOOL CROSSWALK 2 LANES-2 WAY TRAFFIC (40 MPH OR LESS) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)

4. TRAFFIC CONTROL DEVICES FOR REDUCED SPEED ZONE AT A SCHOOL CROSSWALK 2 LANES-2 WAY TRAFFIC (45 MPH OR GREATER) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)

5. TRAFFIC CONTROL DEVICES FOR A SCHOOL CROSSWALK WITHOUT A SPEED REDUCTION (2 LANE-2 WAY TRAFFIC)

<table>
<thead>
<tr>
<th>APPROACH SPEED MPH</th>
<th>DISTANCE IN FEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 or Less</td>
<td>200' Min.</td>
</tr>
<tr>
<td>26 To 35</td>
<td>250' Min.</td>
</tr>
<tr>
<td>36 To 45</td>
<td>300' Min.</td>
</tr>
<tr>
<td>46 To 55</td>
<td>325' Min.</td>
</tr>
</tbody>
</table>

SCHOOL ZONE

END SCHOOL ZONE

SCHOOL CROSSWALK Midblock crosswalks shall be a minimum of 10'.

See Index No. 17346.
6. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSTRAFFIC WITH OVERHEAD FLASHING BEACON SPEED LIMIT SIGNS (4 LANES UNDIVIDED 2 WAY TRAFFIC) (MIDBLOCK OR ON THRU STREET AT AN INTERSECTION)

7. TRAFFIC CONTROL DEVICES FOR A REDUCED SPEED ZONE AT A SCHOOL CROSSTRAFFIC WITH OVERHEAD OR GROUND MOUNTED FLASHING BEACON SPEED LIMIT SIGNS (4 LANES DIVIDED 2 WAY TRAFFIC)

8. TRAFFIC CONTROL DEVICES FOR SIGNALIZED MIDBLOCK SCHOOL CROSSTRAFFIC

---

**SCHOOL CROSSWALKS**

Midblock crosswalk shall be a minimum of 10'. See Index No. 17346.

**NOTE—CONDITION 7:** Where engineering judgement determines the overhead structure is not suitable or cannot be installed due to site restrictions, S5-1 with flashing beacons on each side of the road may be substituted for the overhead structure.

---

**APPENDIX DISTANCE IN FEET**

<table>
<thead>
<tr>
<th>APPROACH SPEED MPH</th>
<th>DISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 or less</td>
<td>A</td>
</tr>
<tr>
<td>26 to 35</td>
<td>200</td>
</tr>
<tr>
<td>36 to 45</td>
<td>300</td>
</tr>
<tr>
<td>46 to 55</td>
<td>325</td>
</tr>
</tbody>
</table>

---

**DESCRIPTION:**

- 6 / 10 / 2015
- 1:45:24 PM
- REVISION NO. 01
- SHEET NO. 3 of 6
- 2016 DESIGN STANDARDS
- SCHOOL SIGNS & MARKINGS

INDEX NO. 17344

---

**SCHOOL ZONE SPEED LIMIT MPH WHEN FLASHING**

- 25 or less: 100' Min.
- 26 to 35: 200' Min.
- 36 to 45: 300' Min.
- 46 to 55: 325' Min.
School zone limits or unregulated activity as defined by local school board through local traffic engineers.

Location of School Speed Limit Sign when a reduced speed limit has been approved.

Note:
The school bus stop ahead sign is to be used in advance of locations where a school bus, when stopped to pick up or discharge passengers, is not visible for a distance of 500' in advance. It shall have a min. size of 30" x 30". It is not intended that these signs be used whenever a school bus stops to pick up or discharge passengers. These signs are intended for use only where terrain and roadway features limit the approach sight distance and where there is no opportunity to relocate the stop to another location with adequate visibility.

These signs are intended for use only at those few locations where the school entrance is not evident to the motorist, and must be approved in advance by the responsible traffic engineering authority.
SCHOOL SIGNS & MARKINGS

SIGN PANEL

- Signal Head 12" Signal Head (Yellow Lens)
- To Roadway
- Wire Rope Clamp
- Catenary Wire
- ½" Ø-BOLT
- Messenger Wire
- Signal Cable & Clamps

TO FLASHER UNIT

- See Cable Entry Details

MOUNTING DETAIL

- Signal Head
- Lock Nut
- Cap
- Drill ½" Ø Hole
- ½ Flexible Conduct Or 90° Angle Connector
- Wire Rope Clamp

CABLE ENTRY DETAIL

- Signal Head
- Lock Nut
- Cap
- Drill ½" Ø Hole
- ½ Flexible Conduct Or 90° Angle Connector
- Wire Rope Clamp

ZEE SECTION DETAIL

- Wire Rope Clamp
- Mounting Sign
- ¼" Ø Bolts For Mounting Sign

SIDE VIEW

- 12" Signal Head (Yellow Lens)
- Note: Flashing beacon may be placed within or below panel
- Optional Location Of Flashing Beacon

FRONT VIEW

- 12" Signal Head (Yellow Lens)
- Note: Flashing beacon may be placed within or below panel
- To Roadway
- Wire Rope Clamp

REAR VIEW

- 12" Signal Head (Yellow Lens)
- Note: Flashing beacon may be placed within or below panel
- To Roadway
- Wire Rope Clamp

NOTE

- Flasher unit and cabinet to be placed on the strain pole supporting overhead sign assembly or on service pole. The flasher unit not to overhang private property or sidewalk.

- To Roadway
- ½" Ø-BOLT
- ½" Ø-U-BOLT
- Pipe Cap
- 1/8" Pipe, Nominal, 1 900 O.D.

- Sign Panel
- 19' Max.
- 17'-6" Min.
- To Roadway
- ZEE SECTION DETAIL
- CABLE ENTRY DETAIL
- MOUNTING DETAIL
- FRONT VIEW
- REAR VIEW

DESCRIPTION:

- REVISION
- SHEET NO.
- INDEX NO.

- SCHOOL SIGNS & MARKINGS
- 2016
- DESIGN STANDARDS
- 07/01/14
- 0.125"
SCHOOL ZONE 00 MPH WHEN FLASHING

SCHOOL ZONE

END SCHOOL ZONE

SCHOOL ENTRANCE

SCHOOL SPEED LIMIT 00

SCHOOL DAYS

0:00-0:00

0:00-0:00

SCHOOL BUS STOP AHEAD

END SCHOOL ZONE

SPEED LIMIT ASSEMBLY

SPEED LIMIT ASSEMBLY

AHEAD

OVERHEAD STANDARD

* Flashing Beacon May Be Placed Within Or Below Panel

Notes:

1. Standard size signs should be used whenever possible. Minimum sizes may be used only on low volume, low speed (less than 35 mph) streets. Special sizes should be used on expressway facilities where special emphasis is needed.

2. The value of the actual school zone speed limit shall be determined by the District Traffic Operations Engineer in cooperation with local school superintendents. In no case shall it be less than the 15 mph min. as set by law.

3. See Index No. 17355 for sign details.

4. When fluorescent yellow-green background color is used, a systematic approach featuring one background color within a zone or area should be used. The mixing of standard yellow and fluorescent yellow green background within a zone should be avoided.

Note:

Existing ground mount school speed limit signs utilizing a single 8" min. size beacon or two 6" min. size beacons inside the sign border are considered meeting the standard. However, replacement or upgrading of these school speed limit signs shall conform to the above standard. Numerical speed limit displays shall be established by appropriate regulatory authorities.
Shoulder Line

Edge Line

6" Yellow

Shoulder Line

Markers Every 40'.

Yellow-Red Reflective

Markers Every 40'.

White-Red Reflective

White Edge Line

6" White Edge Line

Maintain Full Ramp Width (15' Typical)

NOTE:

Reflective pavement markers are installed adjacent to the edge line.

Passenger Car, Daytime, Posted Speeds Or 85th Percentile (Use Higher Value)

NORMAL TAPERED EXIT (TWO THRU LANES)

DETAIL A

NORMAL TAPERED EXIT ONLY

(TWO THRU LANES - THREE APPROACH LANES)
Notes:
1. Post delineators spaced at 40' on curves of the entrance and exit of ramps. The spacing on the tangent portion of the ramp section shall be 300'. All delineators are to be setback 3' from shoulder break. Post delineators should not be discontinued in sections with guardrail.

Along the left edge line of the ramps, yellow-red reflective markers (every 40') at the P.T. terminate white-red markers at the theoretical gore. The physical gore or ± 100' from the wrong way arrow to be placed at the end of the yellow line. Begin white-red reflective markers at transition (40' spacing) 6" white.

Yellow-red reflective markers (every 40') along the left edge line of the ramps.

White-red reflective markers (every 40') at the beginning of yellow line. Begin yellow-red markers at transition (40' spacing) yellow-red reflective markers at every 40'.

Wrong way arrow to be placed at the theoretical gore of the physical gore ± 100' from theoretical gore. Yellow post mounted delineator (40' spacing) white-red reflective markers (every 40') white-red reflective markers (every 40') white arrow with direction of travel.

Notes:
- 6" Yellow
- 8" White
- 8" Solid White
- 2'-4" Wrong Way Arrow
- White Post Mounted Delineator (40' Spacing)
- Wrong Way Arrow To Be Placed At End Of Physical Gore Or ± 100' From End Of Theoretical Gore

White Arrow With White-Red Reflective Markers

Wrong Way Arrow

Direction Of Travel

White Arrow With White-Red Reflective Markers

Wrong Way Arrow

White Arrow With White-Red Reflective Markers

Wrong Way Arrow

White Arrow With White-Red Reflective Markers

Wrong Way Arrow

White Arrow With White-Red Reflective Markers

Wrong Way Arrow

White Arrow With White-Red Reflective Markers

Wrong Way Arrow
**Types of Pavement Marking Lines**

1. **Solid Edge Line or Lane Line**
   - $6''$

2. **Solid Channelizing Line**
   - $6''$, $12''$ or $18''$

3. **Two-Lane Passing Prohibited Line**
   - $6''$

4. **Double Solid Lines**
   - $6''$

5. **12'' Solid Pedestrian Crosswalk Line**
   - $12''$ or $24''$

6. **24'' Solid Stop Line**
   - $12''$ or $24''$

**2'-4' Dotted Guide Line**

**6'-10' Dotted Extension Line**

**3'-9' Dotted Interchange Line**

**3'-9' Dotted Lane Drop Line**

**10'-30' Skip Line**

**10' White Skip With 10' Black Contrast and 20' Gaps**

**10' Black Contrast**

**CONTRAST MARKINGS**

Yield Lines consist of five - $18''$ x $27''$ white triangles which face traffic. Equally space triangles within travel lane. Add one additional triangle using same spacing when a bike lane is present.

**YIELD LINES**
**PAVEMENT MARKINGS AND DELINEATORS FOR MEDIAN CROSS-OVER**

**PLACEMENT OF EDGE LINES**

**NOTES:**
- Markings applied to median noses shall be yellow in color.

**PAVEMENT MARKINGS FOR INTERSECTIONS WITH MAJOR AND MINOR ROADS**
Use Stop Line At Signalized Intersection Only

300' Max. Intervals Between Double Arrows
For use in congested urban areas where available storage length between intersections is limited and a permanent point of transition from the two-way turning lane to the exclusive turning lane cannot be determined.

SCHEME ONE

TYPICAL CROSSWALK MARKINGS FOR CURB RAMPS

SCHEME TWO

For use in rural & suburban areas where an adequate storage lane length can be specifically determined.

300' Max. Intervals Between Double Arrows
For use in congested urban areas where available storage length between intersections is limited and a permanent point of transition from the two-way turning lane to the exclusive turning lane cannot be determined.

(TWO WAY LEFT TURN LANE)
These markings may be used for locations with restricted left turn lengths, only when called for in plans.

RESTRICTED LEFT TURN MARKING

100' Minimum or as determined by L=WS

(l = \frac{W}{S} < 45 \text{ mph}) where
W is the lateral offset in feet and
S is the 85th percentile speed in miles per hour (speed limit)

For left turn storage lane detail see Sheet 11 of this index.

TYPICAL INTERSECTION 2 THRU LANES PLUS LEFT TURN LANE, WITH CROSSWALK

RIGHT TURN LANE DROP AND ISLAND DETAILS
LEFT TURN LANE DROP IS MIRROR IMAGE

RIGHT TURN LANE AND ISLAND DETAILS

NOTES:
1. When public sidewalk curb ramps are present, refer Index No. 17344 and Index No. 304 for crosswalk widths.
2. Double yellow longitudinal center lines on all roadway approaches shall be extended back 100' for projects involving intersection improvements only.
3. When specified, 'stop' message shall be placed 25' back of stop lines.
**ONE-WAY SIGNS ON DIVIDED HIGHWAY INTERSECTIONS**

**PAVEMENT MARKINGS FOR TRAFFIC CHANNELIZATION AT GORE**

(TRAFFIC FLOWS IN SAME DIRECTION)

**PAVEMENT MARKING FOR TRAFFIC SEPARATION**

(TRAFFIC FLOWS IN OPPOSING DIRECTIONS)

**SPECIAL MARKING AREAS**
TYPICAL TRANSITION MARKING
COLOR SHALL BE THE SAME AS RESPECTIVE EDGE LINE

LEFT ROADWAY CENTERED ON EXISTING ROADWAY

RIGHT ROADWAY CENTERED ON EXISTING ROADWAY

SCHEMES FOR TRANSITION - 2 LANE / 4 LANE ROADWAY

SPECIAL MARKING AREAS

2016 DESIGN STANDARDS

REVISED 07/01/09

DESCRIPTION:

REV NO.

INDEX NO.

SHEET NO.

17346 6 of 14
NOTES:
1. Messages shall meet requirements of Specification Section DFT-6 and Section 711.
2. The thickness of the preformed message shall be 125 mils.
3. The message shall consist of white letters and numbers with black contrasting material. The black material shall meet the mat dimensions shown and have a minimum skid resistance value of 55 BPN.
4. The "EXIT NUMBER" position remains the same distance from the beginning of taper regardless of the number of lines of information.
The Railroad Traffic Control Device is to be located a minimum of 12' from the railroad centerline. See Index No. 17882 for Protection Devices.

NOTES:
1. When computing pavement messages, quantities do not include transverse lines.
2. When dynamic devices are not present or are to be installed, the crossbar shall be located at the future location of the RR gate or signal and gate in accordance with Index No. 17882.
3. Placement of sign W10-1 in a residential or business district, where low speeds are prevalent. The W10-1 sign may be placed a minimum distance of 100' from the crossing. Where street intersections occur between the RR pavement message and the tracks an additional W10-1 sign & additional pavement message shall be used.
4. Recommended location for FTP-61-06 or FTP-62-06 sign, 100 urban & 300' rural in advance of the crossing.
5. A portion of the pavement marking symbol should be directly opposite the W10-1 sign.

SPECIAL MARKING AREAS

INDEX
No. 17346

SHEET
No. 8 of 14

TYPICAL PAVEMENT MARKINGS FOR R/R CROSSING

NOTE:
- Pavement Markings symmetrical about centerline
- Width May Vary According To Lane Width
- 69 s.f. *Does not include 24" bars.

PAVEMENT MARKINGS FOR TERMINATION OF TWO WAY LEFT TURN AT R/R CROSSINGS

NOTE:
- Pavement Markings symmetrical about centerline
- See Detail This Sheet For Placement Of Railroad Pavement Markings.

WIDTHS MAY VARY ACCORDING TO LANE WIDTH

See notes 1, 4 & 5 for sign placement.

DO NOT STOP ON TRACKS

DO NOT STOP ON TRACKS

RAILROAD CROSSING AT 2-LANE ROADWAY

RAILROAD CROSSING AT 4-LANE ROADWAY

When Present.
From & Parallel To Gate
Edge Of Travelway Or 8' Stop Bar Perpendicular To
6" Yellow
24" White

See notes 1, 4 & 5 for sign placement.

When Present.
From & Parallel To Gate
Edge Of Travelway Or 8' Stop Bar Perpendicular To
6" Yellow
24" White

6" Double Yellow
24" White

6" Double Yellow
24" White

6" Yellow
White
24" White

6" Yellow
White
24" White

6" Dbl. Yellow
Parallel To Gate When Present
Of Travelway Or 8' From &
Stop Bar Perpendicular To Edge

6" Yellow
White
24" White

6" Yellow
White
24" White

6" Yellow
White
24" White

DO NOT STOP ON TRACKS

DO NOT STOP ON TRACKS

The Railroad Traffic Control Device is to be located a minimum of 12' from the railroad centerline. See Index No. 17882 for Protection Devices.

The Railroad Traffic Control Device is to be located a minimum of 12' from the railroad centerline. See Index No. 17882 for Protection Devices.
1. For traffic and pedestrian signal installation, refer to Index No. 17721 through 17890.
2. For public sidewalk curb ramps, refer to Index No. 304.
3. For pavement marking and sign installation, refer to Indexes 11200 through 17356.
4. Crosswalk minimum widths: Intersection Crosswalk 6', Midblock Crosswalk 10'.
5. All crosswalk marking must be white.
6. Longitudinal markings in Special Emphasis Crosswalk must be 24" wide and spaced to avoid the wheel path of vehicles (see detail). Center the longitudinal markings at each lane line. Place additional longitudinal markings at the center of each lane (12") to the lane lines. When the Crosswalk is skewed to the lane lines, the longitudinal markings should be parallel to the lane lines. Longitudinal markings in Special Emphasis Crosswalk must be preformed thermoplastic.
7. Transverse lines in the Special Emphasis Crosswalk may be standard thermoplastic or preformed thermoplastic.

All crosswalk marking must be white.

Crosswalk minimum widths: Intersection Crosswalk 6', Midblock Crosswalk 10'.

For traffic and pedestrian signal installation, refer to Index No. 17721 through 17890.

For public sidewalk curb ramps, refer to Index No. 304.

For pavement marking and sign installation, refer to Indexes 11200 through 17356.
1. Plans shall indicate which crosswalk scheme is to be used.

2. The details shown do not depict the signing and markings for multi-lane roadways with divided medians. For these applications, additional signs shall be installed on the median side. Minimum width of Mid-Block Crosswalks is 10 ft.

3. All mid-block crosswalks shall use special emphasis crosswalk markings.

4. Crosswalk marking shall be performed marking materials.

<table>
<thead>
<tr>
<th>APPROACH SPEED MPH</th>
<th>A SUGGESTED DISTANCE (Ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 or Less</td>
<td>200</td>
</tr>
<tr>
<td>26 to 35</td>
<td>250</td>
</tr>
<tr>
<td>36 to 45</td>
<td>300</td>
</tr>
</tbody>
</table>

Special Marking Areas

Scheme 1: Crosswalk with Warning Signing

Scheme 2: Crosswalk with Stop Signing

Scheme 3: Signalized Crosswalk

Solid White

100' of 6"
SINGLE LEFT TURNS

** Queue Length is measured from the median nose radial point or, when a stop bar is required, from the stop bar.

DOUBLE LEFT TURNS

The ONLY pavement message is required for turn lanes, where the thru lane becomes turn lane.

Through Lane Becomes Exclusive Left Turn

Through Lane Becomes Optional Left Turn

** Arrow Spacing**

Arrow should be evenly spaced between first and last arrow. Turn lanes longer than 200' add one arrow for each 100' additional length.

NOTES:

1. The "Begin Lane Line" locations are based on the standard lengths shown in Design Standard 301. These locations must be adjusted on a case-by-case basis for turn lanes not meeting the standard lengths.

2. Yellow left turn edge marking may be used adjacent to raised curb or grass medians if lane use is not readily apparent to drivers approaching a left turn storage lane.

3. Refer to Design Standard Index 301 for roadway details.

4. This index applies to right turn lanes.

** Arrow Spacing**
GENERAL NOTES (Signalized & Nonsignalized)

1. For entrances to a one-way street, the downstream restriction may be reduced to 20'.
2. Parking shall not be allowed within 20' of a crosswalk.
3. All parking lane markings shall be 6' white.
4. Parking lane lines shall be broken at driveways.
5. Refer to Chapter 316, Fla. Statutes, for laws governing parking spaces.
6. Where curb and gutter is used, the gutter pan width may be included as part of the minimum width of parking lane, but desirably the lane width should be in addition to that of the gutter pan.

MINIMUM PARKING RESTRICTION FOR NON SIGNALIZED INTERSECTIONS

NOTES:

1. Distances measured longitudinally along the street from driver location of entering vehicle to end of parking restriction.
2. Distances applicable to intersecting street, major driveways and other driveways to the extent practical.
3. For nonsignalized intersections, the values above shall be compared with the values for signalized intersections and the minimum restrictions implemented. These restrictions apply to both accessible and non-accessible parking.

MINIMUM PARKING RESTRICTION FOR SIGNALIZED INTERSECTIONS

NOTES:

1. Distances measured longitudinally along the street from driver location of entering vehicle to end of parking restriction.
2. Distances applicable to intersecting street, major driveways and other driveways to the extent practical.
3. For signalized intersections, the values above shall be compared with the values for signalized intersections and the minimum restrictions implemented. These restrictions apply to both accessible and non-accessible parking.

Pavement Marking for Public Sidewalk Curb Ramps in Rest Areas

NOTES:

1. Dimensions are to the centerline of markings.
2. An Access Aisle is required for each accessible space when accessible parking is used.
3. Criteria for pavement markings only, not public sidewalk curb ramp locations. For ramp locations refer to plans.
4. Blue pavement markings shall be tinted to match shade 15180 of Federal Standards 595a.
5. The FTP-22-06 panel shall be mounted below the FTP-21-06 sign.
6. Use of pavement symbol in accessible parking spaces is optional, when used the symbol shall be 3 or 5 sign and white in color.

UNIVERSAL SYMBOL OF ACCESSIBILITY

Notes:

1. Parking restrictions measured from curb radius point.
2. Restrictions for accessible parking are the same as those applied to nonsignalized intersections.

MINIMUM PARKING RESTRICTION FOR SIGNALIZED INTERSECTION

Notes:

1. Parking restrictions measured from curb radius point.
2. Restrictions for accessible parking are the same as those applied to nonsignalized intersections.
TYPICAL RURAL INTERSECTION WITHOUT TURN LANES

TYPICAL RURAL INTERSECTION WITH TURN LANES

GENERAL NOTES:

1. Remove raised retroreflective pavement markers when in conflict with the installation of the centerline profiled thermoplastic pavement markings. The cost of removal is included in the cost of the profiled thermoplastic pavement marking.

2. Replacement of retroreflective pavement markers removed during the installation of the centerline profiled thermoplastic pavement markings will be paid for under Pay Item 766.

PROFILED THERMOPLASTIC MARKINGS
2 LANE CONCRETE ROADWAYS
NOTES:

1. All bicycle markings and pavement messages shall be White.

2. All bicycle markings shall be preformed thermoplastic.

3. Recommended placement of bicycle lane markings:
   a) At the beginning of a bicycle lane, on the far side of major intersections, and prior to and within the bicycle lane keyhole.
   b) Along the roadway as needed to provide a maximum spacing of 1,320 feet for posted speeds less than or equal to 45 mph,
      2,640 feet for a posted speed of 50 mph or greater.

4. Recommended spacing for shared lane marking (SLM) immediately after intersections and at a maximum spacing of 500 feet.
**DESCRIPTION:**

**SCENARIO #1**

**LANE WIDTH ≤ 14'**

- C&G Lip or EOP
- 6" White Solid Line
- Lane Width (See Plans)
- Lane in Center

**SCENARIO #2**

**ADJACENT TO PARKING**

- C&G Lip or EOP
- 6" White Solid Line
- Lane Width (See Plans)
- Lane in Center

**REQUIRED LANE MARKINGS**

- Center of Lane Line
- 6" White Solid Line
- Lane Width (See Plans)
- Lane in Center

**NOTICE**

- This page is part of the 2016 FDOT Design Standards for Bicycle Markings.

**INDEX No. 17347**

**SHEET No. 2 of 5**
BIKE LANE TYPICAL SECTION

FLUSH SHOULDER WITH BUFFERED INTERSECTION WITH NO RIGHT TURN LANE,

DESCRIPTION:

2'-4' Dotted
6" White Spaces

Parking at 10' Spacing
Diagonal Hatching

3' Buffer With 6" White Diagonal Hatching at 10' Spacing

BIKE LANE ADJACENT TO ON STREET PARKING
NO RIGHT TURN LANE,
CURB AND GUTTER TYPICAL SECTION

Paved Shoulder
Buffered Bike Lane
(See Plans for Dimensions)

Indicates Paved Shoulder

BIKE LANE MARKINGS

2016 BICYCLE MARKINGS

INDEX NO. 17347
SHEET NO. 4 of 5
CASE I

Type 1 Object Markers shall consist of nine yellow reflectors mounted on a yellow reflective background or consist of a retroreflective panel of the same size.

CASE II

End of Road Markers shall consist of nine red reflectors mounted on a red reflective background or consist of a retroreflective panel of the same size.

NOTES:

1. This index applicable to residential and minor streets only. Major streets to be evaluated on a case by case basis.

2. "T" Intersection Two-Way arrows and reflectors are optional. The need shall be based on a review of each location.

3. For additional details on aluminum round post, sign panel material and bolts, nuts and washers see Index No. 11860.

4. Case I Installation - The arrow panels and object markers shall be located approximately 20', but not less than 12' from the edge of the travel lane.

5. Dead end sign shall be posted a sufficient advance distance to permit the vehicle operator to avoid the dead end by turning off, if possible, at the nearest intersecting street.

6. For pavement marking see Index No. 17346.

7. No guardrail is required unless special field conditions require its use.
** Note:

Two assemblies are required: one for each side of the ramp, showing those services in each particular direction from the ramp terminal.

Ramp mounted signs shall be installed to avoid conflict with existing signs and in no case should they be placed within 100' of another sign.

** One Post Service Signs
See Detail "D"

Approximate Position Of
Second Motorist Service Sign
Details "B" Or "C"
For Interchanges
With Two Exit Ramps

GENERAL NOTES

1. Only those services meeting criteria established by the Department and approved by the State Traffic Operations Engineer for each interchange shall be shown. Symbol signs for motorist services shall always appear in the following order: reading from left to right and top to bottom: Gas, Food, Lodging, Phone*, Hospital, Camping.

* The phone symbol shall not be shown whenever any Gas, Food, Lodging or Camping symbol appears.

2. Symbols shall appear consecutively on the sign with no positions left blank or reserved for intermediate symbols not currently approved for a particular interchange.

3. All motorist service signs to have White Legend and Border with Blue Background.

4. For mounting details see Index 11200 for Type "A" breakaway or Index 11860 for Type "C" frangibility.

** ** Note:

When approved for attachment to the advance guide signs, up to 3 services may be used for an exit. The symbol signs shall be suspended from the guide sign panel or existing wind beams. Symbol signs are not to be connected to existing sign posts.

The mounting height of the advance guide sign shall be increased, where necessary, to provide 8' between the level of the pavement edge and the bottom of the guide sign, prior to mounting the supplementary panel.

** Note:

Or

See Detail "D"

Proposed
Advance Guide Sign

Proposed
Supplemental
Guide Sign

See
Detail "A"

NOTE

For mounting details see Index 11200 for Type "A" breakaway or Index 11860 for Type "C" frangibility.
Note: Roadway not drawn to scale
Distances shown are adequate for driver communication
but may be altered slightly if conditions require.

Notes:
1. Signs and sign structures shall be erected in accordance with the details shown on Index No. 11200.
2. Sign FTP-12-06 shall be located on the Welcome Center grounds in proximity to the building and as far from the main line roadway as possible (2 signs back to back).
3. Sign FTP-10-06, 11-06, 12-06 shall be located as limited access highways only.
4. All legend to be Series E.
5. See Index No. 17355 for sign details.

FOR LIMITED ACCESS HIGHWAYS

WELCOME CENTER SIGNING

INDEX NO. 17351

DESCRIPTION: 2016 DESIGN STANDARDS
STATE OF FLORIDA
WELCOME CENTER
1 MILE

STATE OF FLORIDA
OFFICIAL
WELCOME CENTER

1/2 MILE

SIGN NO. FTP-15A-06
SIGN NO. FTP-12-06
SIGN NO. FTP-15B-06
SIGN NO. FTP-15C-06

FTP-15A-06
FTP-15B-06
2,240'

FTP-15C-06
FTP-12-06

FTP-12-06

2,240'

FOR PRIMARY HIGHWAYS

Notes:
1. Signs and sign structures shall be erected in accordance
   with the details shown on Index 11200.
2. Sign FTP-12-06 shall be located on the Welcome Center grounds
   in proximity to the building and as far from the Main Line
   Roadway as possible (2 signs back to back).
3. All legend to be Series E.
4. One sign FTP-15A-06 or 15B-06 should be used depending on
   speed, roadside development & geometric conditions.

FTP-12-06

800' Maximum For Rural Conditions
50' Minimum For Rural Conditions
1. Reflective Pavement Markers shall be spaced at 40’ on all skip lane lines and skip center lines. This spacing may be reduced to 20’ if specifically called for in the plans.

2. The spacing on solid lines and solid/skip combination lines shall be 40’.

3. All RPM’s shall be offset 1” from solid longitudinal lines.

4. These spacings may be reduced for sharp curves if required.

5. All RPM’s shall be class “B”.

---

**TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS**

**2016 DESIGN STANDARDS**

**FILE**: 17352

**DATE**: 01/01/10

---

**DESCRIPTION**

**SOLID LINE WITH SKIP**

**SOLID LINE WITH ALTERNATING SKIP**

**SKIP LINE**

**SKIP LINE WITH TWO-WAY LEFT TURN LANE**

**ALTERNATING SKIP LINE**

**ALTERNATING SKIP LINE WITH TWO-WAY LEFT TURN LANE**

**DOUBLE SOLID LINE**

**MULTILANE**
1. Set Raised Pavement Markers 1" from line.
2. Center the Raised Pavement Markers between chevrons.

RPM PLACEMENT FOR TRAFFIC CHANNELIZATION AT GORE (TRAFFIC FLOWS IN SAME DIRECTION)

RPM PLACEMENT FOR TRAFFIC SEPARATION (TRAFFIC FLOWS IN OPPOSITE DIRECTION)

PLACEMENT OF RPM'S ON SHOULDER MARKINGS

Right side of the roadway shown. For the left side of roadway, the pavement marking is yellow and oriented opposite hand.

For Placement of RPM's on Ramps See Index 17345.

PLACEMENT OF RPM'S AT INTERSECTIONS

NOTE

Raised pavement markers (Bidirectional White/Red) should be used in all gores of this type.

1. Center the Raised Pavement Markers between chevrons.
2. Set Raised Pavement Markers 1" from line.
STEEL U-CHANNEL TRIPLE POST DIRECT BURIAL

6'-4" Maximum Sign Width

12" Min.
16"
16"  

3'-8" Maximum Combined Sign Height

2'-1 1/2" 2'-1 1/2"

STEEL U-CHANNEL SINGLE POST

SUNSHINES GIFT SHOPPE

TREASURE COAST

TWO POST STEEL I BEAM WITH SLIP BASE

MULTIPOST SIGN EXAMPLES

TOURIST ACTIVITIES

PETIT FARM 5 BED & BREAKFAST

COUNTRY KURIO SHOP

THOMAS TUBE RENTAL 25

DESIGN FOR TOURIST ORIENTED DIRECTIONAL SIGNS

OPTIONS FOR ALUMINUM ROUND TUBE, STEEL I BEAM AND STEEL U-CHANNEL.

No. of Signs (Total Area)

10
16-20
14-16
22-24
30-32
88

Single Post Configuration

3'-1/2" x 0.125"
4" x 0.125"
S3X5.7
W6X12
3 lb/ft
4 lb/ft

Aluminum Tube
Aluminum Tube
Steel I Beam
Steel I Beam
Direct Burial
Slip Base
Slip Base
Slip Base
Slip Base
Lap Splice
Lap Splice

Two Post Configuration

NA
NA
NA
NA
NA
NA

Three Post Configuration

NA
NA
NA
NA
NA
NA

* Limited to 22 s.f. Total Sign Area.
<table>
<thead>
<tr>
<th>Description</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FREEWAY USE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11' - 6&quot;  X 5' - 6&quot;</td>
<td>6&quot; Series E Legend</td>
<td>6' Radii 2&quot; Border</td>
</tr>
<tr>
<td><strong>OTHER THAN FREEWAY USE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4' - 0&quot;  X 7' - 0&quot;</td>
<td>6&quot; Series E Legend</td>
<td>6' Radii 2&quot; Border</td>
</tr>
<tr>
<td><strong>WEIGH STATION 1000 FT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5' - 8&quot;  X 36' - 4&quot;</td>
<td>6&quot; Series E Legend</td>
<td>White Legend and Border</td>
</tr>
<tr>
<td><strong>CLOSED</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4' - 0&quot;  X 6&quot;</td>
<td>6&quot; Series E Legend</td>
<td>White Legend and Border</td>
</tr>
</tbody>
</table>

### Special Sign Details

- **FTP-1-06**
  - 11' - 6"  X 5' - 6"
  - 9" Radii 2" Border
  - Black Legend and Border
  - White Background
  - 6" Series E Legend
- **FTP-2-06**
  - 7' - 0"  X 4' - 0"
  - 6" Radii 2" Border
  - Black Legend and Border
  - White Background
  - 6" Series E Legend
- **FTP-3-06**
  - 4' - 0"  X 3' - 0"
  - 6" Radii 2" Border
  - White Legend and Border
  - Green Background
  - 6" Series E Legend
- **FTP-4-06**
  - 6' - 0"  X 5' - 0"
  - 5" Radii 2" Border
  - White Legend and Border
  - Green Background
  - 6" Series E Legend
- **FTP-5-06**
  - 14' - 6"  X 7' - 6"
  - 12" Radii 2" Border
  - White Legend and Border
  - Green Background
  - 10" Series E Legend
- **FTP-6A-06**
  - 14' - 0"  X 7' - 0"
  - 12" Radii 2" Border
  - White Legend and Border
  - Green Background
  - 10" Series E Legend
- **FTP-6B-06**
  - 14' - 6"  X 7' - 6"
  - 11" Radii 2" Border
  - White Legend and Border
  - Green Background
  - 10" Series E Legend
- **FTP-7A-06**
  - 12' - 0"  X 7'
  - 11" Radii 2" Border
  - White Legend and Border
  - Green Background
  - 10" Series E Legend
- **FTP-8-06**
  - 14' - 6"  X 7' - 6"
  - 12" Radii 2" Border
  - White Legend and Border
  - Green Background
  - 10" Series E Legend
- **FTP-9A-06**
  - 14' - 0"  X 4' - 6"
  - 11" Radii 2" Border
  - White Legend and Border
  - Green Background
  - 10" Series E Legend
- **FTP-9B-06**
  - 14' - 6"  X 7' - 6"
  - 13" Radii 2" Border
  - White Legend and Border
  - Green Background
  - 10" Series E Legend
- **FTP-10-06**
  - 17' - 0"  X 11' - 0"
  - 15" Radii 2" Border
  - White Legend and Border
  - Blue Background
  - 10" Series E Legend

**Note:**
- FTP-4-06 to be used with FTP-3-06
- FTP-8-06 to be used with FTP-7A-06

**FTP-1-06**
- FTP-2-06
- FTP-3-06
- FTP-4-06
- FTP-5-06
- FTP-6A-06
- FTP-6B-06
- FTP-7A-06
- FTP-8-06
- FTP-9A-06
- FTP-9B-06
- FTP-10-06

**FTP-1-06**
- FTP-2-06
- FTP-3-06
- FTP-4-06
- FTP-5-06
- FTP-6A-06
- FTP-6B-06
- FTP-7A-06
- FTP-8-06
- FTP-9A-06
- FTP-9B-06
- FTP-10-06
1. The 24" x 24" panel shall only be used for a 3-digit route when the panel is to be used on a sign cluster with other 24" X 24" panels.
2. Florida Route Marker shall have Black Legend with White Background.
3. Stroke width of State Outline shall be 1".

**SIGN**

**DIMENSIONS**

**NOTES**:
1. All Legend Series "D".
2. Color: Yellow Legend and Border on Blue Background.
3. When used on a guide sign, marker must be overlaid on a rectangular Yellow Background as shown in chart.

**COLORS**

**SIZE**

**SERIES**

**DIGITS**

**SPECIAL SIGN DETAILS**
**REVISION NO. SHEET NO. INDEX**

**DESCRIPTION:**

- Revision of Design Standards 2016

- Levels: GSCOLORFILL | GSBWFILL | GSOUTLINE

- Sign Mounting Holes Can Be Punched or Field Drilled With No Obstruction to Text or Symbols from Holes or Bolts.

- Spacing and Symbol Sizes.

- FTP-65-06
  - 3' x 3.6' 2" Radii 1/8" Border
  - 4" Series D Legend
  - White Background
  - Black Legend and Border

- FTP-66-06
  - 4' x 6' 2" Radii 1/8" Border
  - 7" Series D Legend
  - White Background
  - Black Legend and Border

- FTP-67-06
  - 4' x 6.5' 3" Radii 1/8" Border
  - 5" Series D Legend
  - White Background
  - Black Legend and Border

**SPECIAL SIGN DETAILS**

- **FTP-68-06**
  - 9" x 1'-2" 1 3/4" Radii 1/8" Border
  - Series B Legend
  - White Background
  - Black Legend and Border


- **FTP-69-06**
  - 3'-6" x 2'-6" 4" Radii 1/8" Border
  - 3" and 3 1/2" Series D Legend
  - White Background
  - Black Legend and Border

- **FTP-70-06**
  - 2'-6" x 2'-6" 2 1/2" Radii 1/8" Border
  - 5" Series C and 7" Series C Legend
  - Blue Background
  - Black Legend and Border

- **FTP-71-06**
  - 4'-0" x 4'-0" 4" Radii 1/8" Border
  - 8" Series C Legend
  - Yellow Background
  - Black Legend and Border

- **FTP-72-06**
  - 3'-0" x 3'-0" 4" Radii 1/8" Border
  - 5" Series C Legend
  - White Background
  - Blue Legend and Border

- **FTP-73-06**
  - 5'-0" x 2'-6" 4" Radii 1/8" Border
  - 6" Series D Legend
  - Blue Background
  - Yellow Legend and Border

- **FTP-74-06**
  - 5'-0" x 2'-6" 4" Radii 1/8" Border
  - 6" Series D Legend
  - Blue Background
  - White Legend and Border

**LAST REVISION:**

- 07/01/14

**INDEX NO.:** 17355

**SHEET NO.:** 8 of 11

**REVISOR:**

- 2016 DESIGN STANDARDS
**REV No.**

**INDEX No.**

**DESCRIPTION:**

**REVISION**

**LAST of DESIGN STANDARDS** 2016

**SPECIAL SIGN DETAILS**

- **07/01/14**
- **17/355**

- **MOT-1-06**
  - 4' x 4'
  - 2' Radii
  - ⅛' Border
  - 6" Series C Legend
  - Orange Background
  - Black Legend and Border

- **MOT-2-06**
  - 4' x 4'
  - 2' Radii
  - ⅛' Border
  - Orange Background
  - Black Arrows and Border

- **MOT-3-06**
  - 4' x 4'
  - 2' Radii
  - ⅛' Border
  - Orange Background
  - Black Arrows and Border

- **MOT-4-06**
  - 4' x 4'
  - 2' Radii
  - ⅛' Border
  - Orange Background
  - Black Arrows and Border

- **MOT-5-06**
  - 5' x 5'
  - 2' Radii
  - ⅛' Border
  - 6" Series C Legend
  - Orange Background
  - Black Legend and Border

- **MOT-6-06**
  - 5' x 5'
  - 2' Radii
  - ⅛' Border
  - 6" Series D Legend
  - Orange Background
  - Black Legend and Border

- **MOT-7-06**
  - 5' x 5'
  - 2' Radii
  - ⅛' Border
  - 6" Series D Legend
  - Orange Background
  - Black Legend and Border

- **MOT-8-06**
  - 5' x 5'
  - 2' Radii
  - ⅛' Border
  - 6" Series D Legend
  - Orange Background
  - Black Legend and Border

- **MOT-9-06**
  - 5' x 5'
  - 2' Radii
  - ⅛' Border
  - 6" Series B Legend
  - Orange Background
  - Black Legend and Border

- **MOT-10-06**
  - 5' x 5'
  - 2' Radii
  - ⅛' Border
  - 6" Series C Legend
  - Orange Background
  - Black Legend and Border

- **MOT-11-06**
  - 5' x 5'
  - 2' Radii
  - ⅛' Border
  - 6" Series B Legend
  - Orange Background
  - Black Legend and Border

- **MOT-12-06**
  - 5' x 5'
  - 2' Radii
  - ⅛' Border
  - 6" Series B Legend
  - Orange Background
  - Black Legend and Border
Span Wire Clamp

Type A

Messenger Wire

Type C

Catenary Wire

Type B

Adjustable Hanger

Span Wire Mounted Sign Details

Index 17356

1. Bottom edge of signs shall be approximately at the same elevation.
2. Type B & C attachments with one hanger shall have wind beams for signs wider than 30'. The beams shall extend to within 6' of the sign edge.
3. Type B & C attachments for signs 1' and wider shall have 2 hangers. Signs 7' and wider shall have wind beams that extend to within 6' of the sign edge.
4. Type D attachments shall be for signs 30' wide or less.
5. Sign panels shall meet the requirements of Index 11200.
6. Refer to section 634 of the Standard Specifications For Road and Bridge Construction.
7. All bolts, nuts, and washers shall be passivated stainless steel, AISI 300 series, commercial grade, type 316.

**Notes:**

- The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing between bolts of 2".
- The beams for signs wider than 30' shall extend to within 6" of the sign edge.
- Sign panels shall meet the requirements of Index 11200.
- Refer to section 634 of the Standard Specifications For Road and Bridge Construction.
- All bolts, nuts, and washers shall be passivated stainless steel, AISI 300 series, commercial grade, type 316.

**TYPICAL INSTALLATIONS FOR SIGN PANEL(S) MOUNTED ON SPAN WIRE**

**SIGN MOUNTING DETAIL**

- 1/4" Stainless steel round head bolts with nuts and lock washers. Bolts shall be spaced on 12" centers max.

**TYPICAL SPAN WIRE INSTALLATION**

- Aluminum Zee 1.75 x 1.75 x 1.08 for pole attachment.

**DETAIL OF OPPOSING SIGNS SPAN WIRE MOUNTED**

- 10" Min. clearance
- 1/4" Min. clearance
- 1/4" Stud clearance

**ADJUSTABLE HANGER FOR SIGN MOUNTING**

- Adjustable Hanger
- Shurlock Serrations
- 10" Min.
- Aluminum Zee 1.75 x 1.75 x 1.08
- Wire Rope Clamp
- Sign Face (No. 1)
- Sign Face (No. 2)
- Messenger Wire
- Catenary Wire
- Wire Rope Clamp

**TWO POINT ATTACHMENT**

- Type D attachments shall be for signs 30' wide or less.
- Type B & C attachments with one hanger shall have wind beams for signs wider than 30'. The beams shall extend to within 6' of the sign edge.
- Type B & C attachments for signs 1' and wider shall have 2 hangers. Signs 7' and wider shall have wind beams that extend to within 6' of the sign edge.
- Type D attachments shall be for signs 30' wide or less.
- Sign panels shall meet the requirements of Index 11200.
- Refer to section 634 of the Standard Specifications For Road and Bridge Construction.
- All bolts, nuts, and washers shall be passivated stainless steel, AISI 300 series, commercial grade, type 316.
SIGN LOCATIONS TYPICAL

2. Location of Sign No. 3 may require some field adjustment.
3. The Cross Road is the last detour to route around the restricted bridge.
4. Location of Sign No. 2 should be established from the Cross Road
   the following approximate distances: Interstate-1 Mile Non-
   Interstate-1/2 Mile.
5. See Index 17355 for sign details.
One-Way Traffic

See Note 2: Minimum of Three Type 2 Object Markers (Yellow)

For Paved Shoulders 1P White @ 45° Every 50' For 1570'
White on Right and Yellow on Left.

Two-Way Traffic

See Note 2: Minimum of Three Type 2 Object Markers (Yellow)

For Paved Shoulders 1P White @ 45° Every 50' For 1570'

NOTES:

1. Roadways with Two-Way Traffic:
   No passing zone should be extended 1570' in advance of narrow bridge.

2. If the bridge or the approach is on a curve, delineators shall be installed for a distance of 1570' in advance of narrow bridge on the outside portion of the roadway. Spacing shall be 100' between delineators. Delineators are to be placed not less than 2 or not more than 8' outside the outer edge of pavement.

3. Object markers and delineators on both sides of roadway shall face traffic approaching bridge.

4. The OM-3R & OM-3L object markers shall be installed 4' above the roadway edge. The panels may be post mounted at the bridges.