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 Sheets 7, 8, and 9.

<table>
<thead>
<tr>
<th>Size x H (in.)</th>
<th>Local Y_n</th>
<th>Global Y_n</th>
<th>Global Y</th>
<th>( A_n )</th>
<th>( x ), ( y )</th>
<th>( x ), ( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Y_n</td>
<td>Global Y_n</td>
<td>Global Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \text{Local Y_n} )</td>
<td>( \text{Global Y_n} )</td>
<td>( \text{Global Y} )</td>
<td>( A_n )</td>
<td>( x ), ( y )</td>
<td>( x ), ( y )</td>
<td></td>
</tr>
</tbody>
</table>

\( \sum \text{Local Y_n} \times \text{Global Y_n} \times \text{Global Y} = 2.218 \text{ in.}^3 = 1.54 \text{ ft.}^3 \)

\( \sum \text{Local Y_n} \times \text{Global Y_n} = -1.890 \text{ in.}^3 = -1.09 \text{ ft.}^3 \)

\[ 1 \left( \text{Local Y_n} \times \text{Global Y_n} \right) = 60.133 \text{ in.}^3 = 34.8 \text{ ft.}^3 \]

\[ \frac{ \sum \text{Local Y_n} \times \text{Global Y_n} }{ A_n } = -0.1 \text{ ft.} \]

\[ \frac{ \sum \text{Local Y_n} \times \text{Global Y_n} }{ A_n } = 2.26 \text{ ft.} \]

STEP 2: Determine the height \( H \) from groundline to the centroid of the individual sign or sign cluster.

Assume: \( B = 1 \text{ ft.} \), \( C = 7 \text{ ft.} \)

Calculated: \( H_x = -0.1 \text{ ft.} \), \( H_y = 2.26 \text{ ft.} \)

\[ H = B + C + D = 13.26 \text{ ft.} \text{ USE 11 FT.} \]

\[ \sum (A_x Y) = 5,886 \text{ in.}\times \text{in.} = 96.4 \text{ ft.}^2 \]

\[ \sum (A_y Y) = -2,218 \text{ in.}^2 = -1.54 \text{ ft.}^2 \]

\[ \sum (A_x Y)_n \times (A_y Y)_n = 60,133 \text{ in.}^3 = 34.8 \text{ ft.}^3 \]

STEP 3: Refer to the Aluminum Column (Post) Selection Tables and find the intersection point. See Sheet 3.

**ALUMINUM COLUMN (POST) SELECTION TABLE**

<table>
<thead>
<tr>
<th>Size x H (in.)</th>
<th>Area (sq. in.)</th>
<th>Total Area (sq. in.)</th>
<th>( A_n )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Y_n</td>
<td>Global Y_n</td>
<td>Global Y</td>
<td></td>
</tr>
<tr>
<td>( \text{Local Y_n} )</td>
<td>( \text{Global Y_n} )</td>
<td>( \text{Global Y} )</td>
<td>( A_n )</td>
</tr>
</tbody>
</table>

For \( H = 11 \text{ ft.} \):

- Refer to the Aluminum Column (Post) Selection Table, from Sheet 3 and shown here for reference.
- To determine the required post size, find the intersection of the row labeled "16 Sq." and the column labeled "11 Ft." For the example the intersection value is " * " (20).
- In the Column (Post) and Foundation Table, the value " * " shows the design requires a 16" diameter and 3.5" thick Aluminum Column (Post) and a 3.2" diameter and 3.5" deep Concrete Foundation and 3.0" Stub.

STEP 4: 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.

**GUIDE TO USE THIS INDEX**

**GENERAL NOTES AND DESIGN EXAMPLE**

1. Shop Drawings:
   This Index is considered fully detailed. Submit Shop Drawings only for minor modifications not detailed in the Plans.

2. Aluminum Sign, Wind Beams, and Column (Post) Materials:
   - Aluminum Plates: ASTM A209, Alloy 6061-T6
   - Aluminum Bars and Extruded Shapes: ASTM B231, Alloy 6061-T6
   - Aluminum Structural Shapes: ASTM B830 Alloy 6061-T6
   - Cast Aluminum: ASTM B221 Alloy 6061-T6
   - Aluminum Weld Material: ER 5556 or 5356

3. Sign Mounting Bolts, Nuts and Washers:
   - Aluminum Button Head and Flat Head Bolts: ASTM F468, Alloy 2024-T4
   - High Strength Steel Bolts, Nuts and Washers: ASTM F2329, Grade A325, Type 1
   - Stainless Steel Nuts: ASTM F594
   - Galvanized U-Bolt (Column): ASTM A449 or ASTM A193 B7 according to ASTM D2329 with double nuts
   - Stainless Steel Bolts, Nuts and Washers may be used in lieu of the Aluminum button head and flat head bolts as follows:
   - Stainless Steel Bolts: ASTM F593 Alloy Group 2, Condition A, CWI or SM
   - Stainless Steel Washers: ASTM F1594

5. Sign Column (Post) Bolts, Nuts and Washers:
   - Galvanized U-Bolt (Column) ASTM A449 or ASTM A193 B7 according to ASTM D2329 with double nuts
   - Stainless Steel Bolts (Slips): ASTM F468, Alloy 6061-T6 or 6069-T16 and Washers B231, A493-76
   - Galvanized High Strength Hex Head Bolts (Bolts): ASTM F536, Grade 536, Type 1
   - Galvanized Hex Nuts: ASTM A663 Grade DH
   - Galvanized Washers: ASTM F1594
   - Galvanized Bolts (Slips): ASTM A307 with Galvanized Hex Nuts and Washers

6. Coatings:
   - Aluminum Fasteners: Anodic coating (0.0002 inches min.) and chromate sealed
   - High Strength Steel Bolts Nuts and Washers: ASTM F2329

7. Breakaway Supports REQUIREMENTS:
   - Install non-frangible aluminum column (post) (larger than 13") with breakaway support as shown on Sheet 4. Signs shielded by barrier wall or guardrail do not require breakaway support.
### DESIGN EXAMPLE - CENTROID

#### SIGN CLUSTER

\[
\begin{align*}
C_x &= \frac{\Sigma (X_i \times A_i)}{\Sigma A_i} \\
C_y &= \frac{\Sigma (Y_i \times A_i)}{\Sigma A_i}
\end{align*}
\]

- \(X_i\) = Area of individual sign
- \(Y_i\) = Height of the edge of pavement from the mounting elevation
- \(C_x\) = Height of the centroid of the sign or cluster from the edge of pavement elevation
- \(C_y\) = Height of the centroid of the sign or cluster from the bottom of the sign or cluster
- \(h\) = Individual sign height
- \(h_a\) = Height of sign or cluster centroid from groundline
- \(a\) = Individual sign width
- \(a/2\) = Individual sign centroid horizontal location from \(X\) Aluminum Column (Post)
- \(a/2\) = Individual sign centroid horizontal location from \(X\) Aluminum Column (Post)

#### TYPICAL SECTION

1. For 'B' & 'C' see Index 700-101 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, including rotated sign panels.
3. Vertical sign spacing (1" shown on Sign Cluster detail) also applies to rotated signs.

#### NOTES:

- Calculation of Sign Cluster Centroid

---

**COUNTY NORTH EAST**

**COUNTY SOUTH EAST**

**SIGN CLUSTER**

**TYPICAL SECTION**

**CENTROID**

**CALCULATION OF SIGN CLUSTER CENTROID**

**NOTE:**

- 1. For 'B' & 'C' see Index 700-101 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, including rotated sign panels.
- 3. Vertical sign spacing (1" shown on Sign Cluster detail) also applies to rotated signs.
### ALUMINUM COLUMN (POST) SELECTION TABLE (O.D. in.)

<table>
<thead>
<tr>
<th>Outside Diameter (in)</th>
<th>3 ft</th>
<th>4 ft</th>
<th>5 ft</th>
<th>6 ft</th>
<th>7 ft</th>
<th>8 ft</th>
<th>9 ft</th>
<th>10 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5</td>
<td>4.5</td>
<td>3.5</td>
<td>3.0</td>
<td>2.5</td>
<td>2.0</td>
<td>1.5</td>
<td>1.0</td>
<td>0.75</td>
</tr>
<tr>
<td>3.0</td>
<td>5.0</td>
<td>4.0</td>
<td>3.5</td>
<td>3.0</td>
<td>2.5</td>
<td>2.0</td>
<td>1.5</td>
<td>1.0</td>
</tr>
<tr>
<td>3.5</td>
<td>5.0</td>
<td>4.5</td>
<td>4.0</td>
<td>3.5</td>
<td>3.0</td>
<td>2.5</td>
<td>2.0</td>
<td>1.5</td>
</tr>
</tbody>
</table>

### FOUNDATION TABLE

<table>
<thead>
<tr>
<th>Column (Post) Size</th>
<th>Foundation Alternatives</th>
<th>Concrete (Class I)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter (in)</td>
<td>Wall Thickness (in)</td>
<td>Embedment Depth (in)</td>
</tr>
<tr>
<td>2.0</td>
<td>1/8</td>
<td>4.5</td>
</tr>
<tr>
<td>2.5</td>
<td>1/8</td>
<td>6.0</td>
</tr>
<tr>
<td>3.0</td>
<td>1/8</td>
<td>8.0</td>
</tr>
<tr>
<td>3.5</td>
<td>1/8</td>
<td>10.0</td>
</tr>
<tr>
<td>4.0</td>
<td>1/4</td>
<td>12.0</td>
</tr>
<tr>
<td>4.5</td>
<td>1/4</td>
<td>14.0</td>
</tr>
<tr>
<td>5.0</td>
<td>1/4</td>
<td>16.0</td>
</tr>
</tbody>
</table>

*INSTALLING FRANGIBLE COLUMN SUPPORTS:*

Columns (posts) 3.0" O.D. and less are considered frangible and may be installed either by driving the post or setting the posts in preformed holes. Backfill preformed holes with suitable material tamped in layers not thicker than 6" (to provide adequate compaction) or filled with flowable fill or bagged concrete.

### SINGLE COLUMN GROUND SIGNS

**OFFSET SIGN**

**NOTE:**

1. For offset sign placement see Index 700-101.
2. For signs with widths greater than 4' see Index 700-011.
3. Offset signs with driven posts require a soil plate.
**NOTES:**

1. Foundation Notes for Slip Base:
   A. Place Stub into concrete foundation given in the FOUNDATION TABLE using Class I Concrete.
   B. Slip Base Fabrication Notes:
      A. The difference between the O.D. of the post and I.D. of the Sleeve must be ≥ 1" or less.
      B. Either a Welded Stub Base or Bolted Stub/Sleeve Base may be used in Slip Base.
      C. For cast base plates bolted to foundation stubs, use a foundation stub the same size as the sign column (Post).

3. Base Plate Assembly Instructions:
   A. Assemble the Slip Base as follows:
      1. Insert Post into Sleeve and connect using 2 ~ 1/4" diameter Sleeve Bolts.
      
   B. Either a Welded Stub Base or Bolted Stub/Sleeve Base are not permitted.
      
C. Tighten Base Bolts as follows:
   1. 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).
   2. Loosen each Base Bolt one turn.
   3. 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.
   4. Distort bolt threads at the junction with nuts to prevent loosening. Repair damaged galvanizing.

**SLIP BASE DETAILS**

<table>
<thead>
<tr>
<th>Column (Post) Size</th>
<th>Sleeve Thickness</th>
<th>Sleeve Height</th>
<th>Post Size</th>
<th>Base Plate Torque</th>
<th>Note Size</th>
<th>SHIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>L x H</td>
<td>W x H</td>
<td>2&quot; Diameter</td>
<td>3&quot; Length</td>
<td>1&quot; Thick</td>
<td>1 1/4&quot;</td>
<td>3/16</td>
</tr>
<tr>
<td>4&quot; x 1/2&quot;</td>
<td>1/4&quot; Diameter</td>
<td>6&quot; Diameter</td>
<td>8&quot; Length</td>
<td>1/4&quot; Thick</td>
<td>3/16&quot;</td>
<td>3/16</td>
</tr>
<tr>
<td>4 1/2&quot; x 1/2&quot;</td>
<td>1/2&quot; Diameter</td>
<td>6&quot; Diameter</td>
<td>8&quot; Length</td>
<td>1/2&quot; Thick</td>
<td>3/16&quot;</td>
<td>3/16</td>
</tr>
<tr>
<td>6&quot; x 1/2&quot;</td>
<td>3/8&quot; Diameter</td>
<td>9&quot; Diameter</td>
<td>10&quot; Length</td>
<td>3/8&quot; Thick</td>
<td>1/2&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>8&quot; x 1/2&quot;</td>
<td>1&quot; Diameter</td>
<td>10&quot; Diameter</td>
<td>12&quot; Length</td>
<td>1&quot; Thick</td>
<td>3/4&quot;</td>
<td>1/4&quot;</td>
</tr>
<tr>
<td>1&quot; Diameter</td>
<td>1&quot; Diameter</td>
<td>10&quot; Diameter</td>
<td>12&quot; Length</td>
<td>1&quot; Thick</td>
<td>3/4&quot;</td>
<td>1/4&quot;</td>
</tr>
</tbody>
</table>

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SLIP BASE AND FOUNDATION DETAILS

**SINGLE COLUMN GROUND SIGNS**

4 of 10
**Optional Slotted Holes**

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**DETAIL "B"**

---

**ALUMINUM SOIL PLATE DETAIL**

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**DRIVEN POST DETAIL**

(Frangible Post In Crossovers, Medians & Sidewalks)

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**DRIVEN POST AND SOIL PLATE DETAIL**

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**DESCRIPTION:**

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**FY 2020-21 STANDARD PLANS**

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**INDEX**

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**SINGLE COLUMN GROUND SIGNS**

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**REV ISI O N**

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**LAST REV ISI O N:**

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**STANDARD PLANS**

---

**REVISION:**

---

**INDEX:**

---

**SHEET:**

---
WIND BEAM CONNECTIONS DETAILS

SINGLE SIGN DETAIL

VIEW A-A

BACK-TO-BACK SIGN DETAIL

NOTES:
1. Use bolts of 5/8" stainless steel hex head bolts with nylon washer under head and washer under nut may be used in lieu of 5/8" aluminum button or flat head bolts.
2. Use nylon washers (provided by the sheeting supplier) under the bolt heads to protect sign sheeting.
3. Slots up to 2" long are allowed in wind beams to accommodate U-Bolts for varying Column (Post) diameters.
4. Wind beams may be oriented in either direction.
5. For signs greater than 60" in height, install a third wind beam evenly spaced between the top and bottom wind beams. For signs up to 12" in height, use only one wind beam at 6" Sign. Install two wind beams on signs with heights greater than 12" and less than or equal to 60".

SIGN FACE

Aluminum Column (Post)

Wind Beam - Aluminum Zee
1½ x 1½ x 10'

Wind Beam Length
15' Min.

6" (Single Sign) 2'-9' Max.
1'-0" Min.

6" (Double Sign) 2'-9' Max.
1'-0" Min.

2" Max.
1'-0" Max.

6" Max.

6" Typical for Signs Heights < 4'-0'
12" Typical for Signs Heights > 4'-0'

Align Top Of Signs

NOTE: Use the area and the centroid location of the largest sign to determine aluminum column (Post) sizes.

1/01/19

SINGLE COLUMN GROUND SIGNS

FDOIT

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STANDARD PLANS

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700-010

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NOTES:
1. Install sign in the undeployed (down) position.

2. Provide a continuous stainless steel hinge with minimum 0.060” leaf thickness, 2” open width and 0.120” pin diameter. Stake the hinge at both ends to prevent pin movement.

3. Stowed 1 or 2 pcs of U-Bolt sized specifically for column (post) diameter with double nuts. Stowed on Wind Beam and displaced while deploying the sign.

4. Bolts, Wingnuts, and washers at the bottom corners of the sign hold the sign panels closed when in the undeployed (down) position. Store bolts, wingnuts, and washers in the bottom corner of the sign when in the deployed (up) position.
### Single Column Ground Signs

<table>
<thead>
<tr>
<th>Size</th>
<th>Area</th>
<th>Total Area</th>
<th>Centroid</th>
</tr>
</thead>
<tbody>
<tr>
<td>24x12</td>
<td>2.90 SF</td>
<td>2.90 SF</td>
<td>1.22 Ft.</td>
</tr>
<tr>
<td>24x12</td>
<td>2.90 SF</td>
<td>2.90 SF</td>
<td>1.22 Ft.</td>
</tr>
<tr>
<td>30x24</td>
<td>5.00 SF</td>
<td>5.00 SF</td>
<td>2.28 Ft.</td>
</tr>
<tr>
<td>21x15</td>
<td>2.19 SF</td>
<td>2.19 SF</td>
<td>1.83 Ft.</td>
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</tbody>
</table>

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<td>30x15</td>
<td>3.13 SF</td>
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<td>1.76 Ft.</td>
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<td>1.83 Ft.</td>
</tr>
<tr>
<td>18x18</td>
<td>1.71 SF</td>
<td>1.71 SF</td>
<td>1.55 Ft.</td>
</tr>
</tbody>
</table>

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<tr>
<td>18x18</td>
<td>1.71 SF</td>
<td>1.71 SF</td>
<td>1.55 Ft.</td>
</tr>
</tbody>
</table>

### Single Column Ground Signs

<table>
<thead>
<tr>
<th>Size</th>
<th>Area</th>
<th>Total Area</th>
<th>Centroid</th>
</tr>
</thead>
<tbody>
<tr>
<td>21x15</td>
<td>2.19 SF</td>
<td>2.19 SF</td>
<td>1.83 Ft.</td>
</tr>
<tr>
<td>18x18</td>
<td>1.71 SF</td>
<td>1.71 SF</td>
<td>1.55 Ft.</td>
</tr>
</tbody>
</table>

### Single Column Ground Signs

<table>
<thead>
<tr>
<th>Size</th>
<th>Area</th>
<th>Total Area</th>
<th>Centroid</th>
</tr>
</thead>
<tbody>
<tr>
<td>21x15</td>
<td>2.19 SF</td>
<td>2.19 SF</td>
<td>1.83 Ft.</td>
</tr>
<tr>
<td>18x18</td>
<td>1.71 SF</td>
<td>1.71 SF</td>
<td>1.55 Ft.</td>
</tr>
</tbody>
</table>
### Single Column Ground Signs

<table>
<thead>
<tr>
<th>Size</th>
<th>Area</th>
<th>Total Area</th>
<th>Centroid</th>
</tr>
</thead>
<tbody>
<tr>
<td>30x15</td>
<td>3.13 SF</td>
<td>12.12 SF</td>
<td>3.19 ft.</td>
</tr>
<tr>
<td>45x36</td>
<td>9.99 SF</td>
<td>45.45 SF</td>
<td>7.80 ft.</td>
</tr>
<tr>
<td>30x24</td>
<td>3.99 SF</td>
<td>9.98 SF</td>
<td>2.33 ft.</td>
</tr>
<tr>
<td>21x15</td>
<td>2.19 SF</td>
<td>2.19 SF</td>
<td></td>
</tr>
<tr>
<td>30x15</td>
<td>3.13 SF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30x24</td>
<td>3.99 SF</td>
<td>9.98 SF</td>
<td>2.33 ft.</td>
</tr>
<tr>
<td>21x15</td>
<td>2.19 SF</td>
<td>2.19 SF</td>
<td></td>
</tr>
<tr>
<td>30x30</td>
<td>4.69 SF</td>
<td>6.69 SF</td>
<td>1.61 ft.</td>
</tr>
<tr>
<td>24x12</td>
<td>0.90 SF</td>
<td>2.10 SF</td>
<td></td>
</tr>
<tr>
<td>30x30</td>
<td>4.69 SF</td>
<td>8.48 SF</td>
<td>1.37 ft.</td>
</tr>
<tr>
<td>30x18</td>
<td>3.75 SF</td>
<td>6.68 SF</td>
<td></td>
</tr>
<tr>
<td>36x16</td>
<td>9.00 SF</td>
<td>12.75 SF</td>
<td></td>
</tr>
<tr>
<td>30x18</td>
<td>3.75 SF</td>
<td>6.68 SF</td>
<td></td>
</tr>
<tr>
<td>24x12</td>
<td>2.00 SF</td>
<td>2.00 SF</td>
<td></td>
</tr>
<tr>
<td>30x30</td>
<td>4.69 SF</td>
<td>10.25 SF</td>
<td>3.29 ft.</td>
</tr>
<tr>
<td>24x24</td>
<td>4.00 SF</td>
<td>9.00 SF</td>
<td></td>
</tr>
<tr>
<td>36x16</td>
<td>9.00 SF</td>
<td>14.00 SF</td>
<td></td>
</tr>
<tr>
<td>30x18</td>
<td>3.75 SF</td>
<td>6.68 SF</td>
<td></td>
</tr>
<tr>
<td>24x12</td>
<td>2.00 SF</td>
<td>2.00 SF</td>
<td></td>
</tr>
<tr>
<td>30x30</td>
<td>4.69 SF</td>
<td>10.25 SF</td>
<td>3.29 ft.</td>
</tr>
<tr>
<td>24x24</td>
<td>4.00 SF</td>
<td>9.00 SF</td>
<td></td>
</tr>
<tr>
<td>36x16</td>
<td>9.00 SF</td>
<td>14.00 SF</td>
<td></td>
</tr>
<tr>
<td>30x18</td>
<td>3.75 SF</td>
<td>6.68 SF</td>
<td></td>
</tr>
</tbody>
</table>

### Index

- **FY 2020-21**
- **Standard Plans**

### Sheet

- **Index**: 700-010
- **Page**: 10 of 10

---

**Revision Description:**

- **Last Revised:** 01/01/19
- **Revision:**

---

**Date:** 10/29/2019

**Time:** 8:23:09 AM

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**FEET**

**MILES**

**XXX**

**X**
GENERAL NOTES:
1. Refer to Index 700-010 for additional notes, assembly of base connection and material specifications not given in this Index.
3. Place 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 3.3 x 2.063 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 plumb the post.
6. Use nylon washers under the button bolt heads to protect sign sheeting. Use aluminum washers under nut.

COLUMN SELECTION AND FOOTING SIZE TABLE

<table>
<thead>
<tr>
<th>Column Size</th>
<th>Sleeve Size</th>
<th>U-bolt Diameter</th>
<th>Base Bolt Diameter x Length</th>
<th>Torque</th>
<th>Base Plate Thickness</th>
<th>Footing Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter x Thickness</td>
<td>Diameter x Thickness</td>
<td>Diameter x Length</td>
<td>Base Bolt Diameter x Length</td>
<td>Torque</td>
<td>Base Plate Thickness</td>
<td>Footing Depth</td>
</tr>
<tr>
<td>4'-0&quot; x 5'-0&quot;</td>
<td>4 NPS Schedule 80 (4.5&quot; x 0.337&quot;)</td>
<td>1&quot;</td>
<td>¾&quot; x 3½&quot;</td>
<td>270 Y 45</td>
<td>1&quot;</td>
<td>6'-0&quot;</td>
</tr>
<tr>
<td>6'-0&quot; x 6'-0&quot;</td>
<td>5 NPS Schedule 120 (5.625&quot; x 0.375&quot;)</td>
<td>1&quot;</td>
<td>¾&quot; x 3½&quot;</td>
<td>445 Y 75</td>
<td>1½&quot;</td>
<td>6'-0&quot;</td>
</tr>
<tr>
<td>7'-0&quot; x 7'-0&quot;</td>
<td>6 NPS Schedule 80 (6.625&quot; x 0.432&quot;)</td>
<td>1½&quot;</td>
<td>3½&quot; x 2&quot;</td>
<td>445 Y 75</td>
<td>2½&quot;</td>
<td>7'-0&quot;</td>
</tr>
<tr>
<td>8'-0&quot; x 8'-0&quot;</td>
<td>5 NPS Schedule 80 (5.625&quot; x 0.432&quot;)</td>
<td>1½&quot;</td>
<td>3½&quot; x 2&quot;</td>
<td>445 Y 75</td>
<td>2½&quot;</td>
<td>7'-0&quot;</td>
</tr>
</tbody>
</table>

DESCRIPTION:

SINGLE COLUMN CANTILEVER
GROUND MOUNTED SIGN
**NOTES:**
1. Work with index 700-010.
2. Shop Drawings: Not required.
3. **Materials:**
   - A. Steel Pipe: ASTM A36 or ASTM A500 Grade 36
   - B. Steel Pipe (Support Post): ASTM A501 Schedule 40
   - C. Aluminum Pipe: ASTM B429 Alloy 6061-T6
   - D. Galvanized U-Bolts, Nuts and Plate Washer
      - a. U-Bolts: ASTM A499
      - b. Hex Nuts: ASTM A 563 Lock Nuts
   - E. Galvanized Anchor Bolts, Nuts and Washers:
      - a. Anchor Rod: ASTM F1554 Grade 55 fully threaded (for Adhesive Anchors)
      - b. Anchor Bolts: ASTM F1554 Grade 55 Grade A Hex
      - c. Nuts: ASTM A563 Heavy Hex Locking
   - F. Washers: ASTM F436
   - H. Weld Material: E70XX
   - I. Snap-In Post Cap: UV and weather-resistant glass-filled polyester cap

4. **Coatings:**
   - A. U-Bolts, Threaded Rods, Nuts and Washers: ASTM F21329
   - B. Other Steel: ASTM A123

5. **Fabrication:**
   - A. Weld: Specification 460-6.4
   - B. Hot dip galvanize after fabrication

6. **Construction:**
   - A. Locate Sign Support a minimum of 5 feet from an open joint or transition sign stationing may be adjusted to accommodate this requirement.
   - B. Base plate must be flush with back of Traffic Railing
   - C. Anchors in Traffic Railings:
      - a. Install Adhesive Anchors in accordance with Specification 416 except perform field test on one anchor per sign support location.
      - b. Use templates and tie anchors as necessary to maintain correct placement of C-I-P Embedded Anchors
      - c. Do not drill into existing conduit
   - D. Temporary Signs on Permanent Traffic Railings: Same as Permanent except Field testing of anchors is not required

7. **Removal of Temporary Signs on Permanent Traffic Railings:**
   - A. Cut anchor rods flush with the top of the traffic railing
   - B. Coat anchors with Type F-1 epoxy to prevent corrosion:
      - a. Extend coating 2 inches beyond edge of cut anchor rods
      - b. Epoxy coating 1/16" thick minimum

8. **Payment:**
   - Include the cost of all materials and labor in the cost of the single post sign assembly.

### SIGN LIMITATIONS TABLE

<table>
<thead>
<tr>
<th>MAX. SIGN AREA (SF)</th>
<th>MAX. SIGN CENTROID HEIGHT (DIM. A + DIM. C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>9'-7&quot;</td>
</tr>
</tbody>
</table>

Dimension A = Distance from centerline of the Support Post to the bottom of the sign or sign cluster.

Dimension C = Vertical distance from the bottom of the sign or sign cluster to the centroid of the sign or sign cluster.

---

**DESCRIPTION:**

- **Sign Support Assembly**
- **Support Post (5" NPS Schedule 40 Steel Pipe)**
- **Base Plate**
- **End Plate**
- **Traffic Railing**
- **Sign or Sign Cluster**

**INDEX:**

1. **SINGLE POST BRIDGE MOUNTED SIGN SUPPORT**

**REV. 01/01/18**
**NOTES:**

1. Existing Traffic Railings:
   - Locate existing conduit prior to drilling and adjust placement of base plate as necessary to avoid damaging 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.
   - For concrete parapets less than 10" thick, through bolt with 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. Countersink the nut and washer so that the bolt and nut does not extend beyond the face of the traffic railing. Do not exceed a countersink depth and diameter of 29/64".

2. New Traffic Railings:
   - Optional Couplers are shown for slipforming; keep Anchor Bolt coupler threads free of concrete.
   - 36" Single-Slope Traffic Railing shown, other Traffic Railings and Parapets are similar.
   - Bridge Deck shown, Approach Slab and Retaining Wall are similar.

3. Bridge Deck shown, Approach Slab and Retaining Wall are similar.

4. Bridge Deck shown, Approach Slab and Retaining Wall are similar.
SIGN SUPPORT ASSEMBLY

BASE PLATE

SIDE

U-BOLT PLATE WASHER

END PLATE

SIGN SUPPORT WELDMENT DETAIL

SINGLE POST BRIDGE MOUNTED SIGN SUPPORT

FAA 2020-21
STANDARD PLANS

INDEX
SHEET
700-012
3 of 3
NOTES:
1. Work with Index 700-010.
2. Shop Drawings: Not required.
3. Materials:
   A. Steel Plate: ASTM A36 or ASTM A572 Grade 36
   B. Steel Pipe (Support Post): ASTM A53 Grade B Schedule 40
   C. Galvanized U-Bolts, Nuts and Plate Washer
      a. U-Bolts: ASTM A449
      b. Nut: ASTM A 563 Lock Nut
   D. Galvanized Anchor Bolt: Nuts and Washers:
      a. Anchor Rod: ASTM F1554 Grade 55 Fully Threaded (for Adhesive Anchors)
      b. Rod: ASTM A325 Grade 50 Grade A Hex
      c. Nuts: ASTM A325 Heavy Hex Locking
      d. Washer: ASTM F312
   E. Adhesive Anchor Bonding Material: Specification 937 Type IV Adhesive
   F. Weld Material: E70XX
   G. Snap-In Post Cap: UV and weather-resistant glass-filled polyester cap
4. Coating:
   A. U-Bolts, Threaded Rods, Nuts and Washers: ASTM F2329
   B. Other Steel: ASTM A123
5. Fabrication:
   A. Weld: Specification 460-6.4
   B. Hot dip galvanize after fabrication
6. Construction:
   A. Locate Sign Support a minimum of 5 feet from an open joint or transition (sign stationing may be adjusted to accommodate this requirement)
   B. Base plate must be flush with top of Railing
   C. Anchors in Traffic Railings:
      a. Install Adhesive Anchors in accordance with Specification 416 except perform field test on one anchor per sign support location
      b. Use templates and tie anchors as necessary to maintain correct placement of C-I-P Embedded Anchors
      c. Do not drill into existing reinforcing
   D. Temporary Signs on Permanent Traffic Railings, Same as Permanent except field testing of anchors is not required
   E. Temporary Signs on Temporary Railings: Barriers:
      a. Install Sign Supports at the midpoint along the length of a single segment
      b. Avoid drilling through existing reinforcement; use of metal detector not required
      c. Field testing of anchors is not required
   F. Removal of Temporary Signs on Permanent Traffic Railings:
      a. Cut anchor rods flush with the top of the railing
      b. Coat anchors with Type I-1 epoxy to prevent corrosion
      c. Excavate coating 2 inches beyond edge of cut anchor rods
   G. Snap-In Post Cap: UV and weather-resistant glass-filled polyester cap
7. Payment:
   Include the cost of all materials and labor in the cost of the single post sign assembly.

### TABLE 1 - SIGN PANEL AND POST SIZING

<table>
<thead>
<tr>
<th>Temporary Signs</th>
<th>Max. Sign Area (SF)</th>
<th>Post (IN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.50 to 3.50</td>
<td>150</td>
<td>15</td>
</tr>
<tr>
<td>3.50 to 7.00</td>
<td>150</td>
<td>15</td>
</tr>
<tr>
<td>7.00 to 10.50</td>
<td>150</td>
<td>15</td>
</tr>
</tbody>
</table>

(Sign Panel (See Index 700-010)

Concrete Barrier

ELEVATION

**SINGLE POST MEDIAN BARRIER MOUNTED SIGN SUPPORT**
NOTES:
1. Place anchor rods in a staggered or linear pattern as necessary to avoid reinforcing.
2. Use a staggered pattern for all temporary barriers.

### TABLE 2 - BASE PLATE TYPE AND ANCHOR ROD SIZING

<table>
<thead>
<tr>
<th>Index</th>
<th>Type/Application</th>
<th>Base Plate Type</th>
<th>Anchor Rod Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>521-001</td>
<td>Full Wall</td>
<td>B</td>
<td>1&quot;</td>
</tr>
<tr>
<td>521-001</td>
<td>Cantilever or L-Wall</td>
<td>A</td>
<td></td>
</tr>
</tbody>
</table>

All listed above plus 102-110 & 102-100 Temporary Signs

C  1/4"  E  1/8"  V  1/16"

<table>
<thead>
<tr>
<th>Index</th>
<th>Type/Application</th>
<th>Base Plate Type</th>
<th>Anchor Rod Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>521-001</td>
<td>Full Wall</td>
<td>B</td>
<td>1&quot;</td>
</tr>
<tr>
<td>521-001</td>
<td>Cantilever or L-Wall</td>
<td>A</td>
<td></td>
</tr>
</tbody>
</table>

All listed above plus 102-110 & 102-100 Temporary Signs

C  1/4"  E  1/8"  V  1/16"
GENERAL NOTES:
1. Verify Column lengths in the field prior to fabrication.
2. Shop drawings:
   A. Sign Support Shop drawings are not required when fabricated in accordance with this Index and support columns do not exceed the length shown in the plans by more than 2'-0".
   B. Sign Panels: Horizontal panel splices are allowed at interior wind beams for sign panels with a depth ("D") greater than 10 feet. Shop drawings required for horizontal panel splice details.
   C. When shop drawings are required, obtain approval prior to fabrication.
3. Materials:
   A. Sign Panel Mounting Materials:
      a. Aluminum Bars, and Extruded Shapes: ASTM B221, Alloy 6061-T6 or Alloy 6351-T5
      b. Aluminum Structural Shapes: ASTM B308, Alloy 6061-T6
   B. Sign Support Structure Materials:
      a. Steel Plates and Structural Shapes: ASTM A36 or ASTM A399, Grade 36
      b. Steel Weld Metal: F100
      c. Shims: Brass ASTM B68 or Galvanized Steel
   C. Aluminum Bolts, Nuts and Washers:
      a. Flat Head and Button Head Bolts: ASTM F 468, Alloy 2024-T4
      b. Hex Nuts: ASTM F467, 2024-T4
      c. Washers: ASTM B221, Alloy 2024-T4
   D. Stainless Steel Bolts, Nuts and Washers Alloy Group 2, Condition A, may be substituted for the Aluminum bolts as follows:
      a. Bolts: ASTM F333, CW1 or SN1
      b. Nuts: ASTM F594
   E. High Strength (H.S.) Steel Bolts, Nuts and Washers:
      a. Galvanized Hex Head Bolts: ASTM F332, Grade A325, Type 1
      b. Galvanized Nuts: ASTM A563 Hex, Grade DH
      c. Galvanized Washers: ASTM F436
   F. Concrete: Class 1
   G. Reinforcing Bars or Welded Wire Reinforcement (WWR) Specification 415
4. Coatings:
   A. Aluminum Fasteners: Anodic coating (0.0002 inches min.) and chromate sealed
   B. Galvanize High Strength Steel Bolts Nuts and Washers: ASTM F332
   C. Galvanize all other steel items (excluding stainless steel) Hot-dip ASTM A123
   D. Treat damaged galvanizing in accordance with Specification 562
5. Fabrication:
   A. All Base Connections and Stub Column materials are steel unless otherwise specified.
   B. Drill or sub-punch and ream holes in Fuse Plates and Hinge Plates
   C. Weld Base Plate to Post & Stub or if using the Alternate Connection Detail weld Base Plate and Stiffeners to Post and Stub (Sheet 2)
   D. Hot-dip galvanize after fabrication. Remove all drips, runs or beads on base plate within washer contact areas (Including saw cuts)
6. Construction:
   A. Install the Sign Structure foundation in accordance with Specification 455. Orient Stub Post according to direction of traffic (Sheet 2)
   B. Tighten all high strength bolts except Base Bolts in accordance with Specification 700.
   C. Assemble Post to Stub with Base Bolts and three flat washers per bolt (See Base Connection Details, Sheet 3)
   D. Treat damaged galvanizing in accordance with Specification 562
   E. Hot dip galvanize after fabrication. Remove all drips, runs or beads on base plate within washer contact areas (Including saw cuts)
MULTI-COLUMN SIGN ASSEMBLY

FOUNDATION NOTES:
The Contractor may use Welded Wire Reinforcement (WWR) for foundation reinforcing.

INSTRUCTIONS NOTES:
1. Assembly of Base Instructions:
   - A. Place one washer on each Base Bolt between the Bottom Base Plate and the head of high strength Base Bolt; place the next washer between the Bottom Base Plate and the Bolt Keeper Plate; add the Top Base Plate section and place the third washer between the Top Base Plate and the Nut.
   - B. Shim as required to plumb column. Provide 2-0.0149" thick (28 gauge) shims per column.

2. H.S. Base Bolt L1 Tightening Instructions:
   - A. Tighten Base Bolts to the maximum possible with a 12" torque wrench. See Assembly of Base Instructions.
   - 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 Table. Over tightened Base Bolts will not be permitted.
   - D. Burr threads at junction with nut to prevent nut loosening. Treat damaged gagingrimp

ALTERNATIVE BASE CONNECTION DATA

<table>
<thead>
<tr>
<th>Sheet Section</th>
<th>a</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 6x12</td>
<td>4-1/4</td>
<td>1-1/8</td>
<td>0-3/8</td>
<td>2-1/2</td>
<td>1-1/2</td>
<td>3-1/4</td>
<td>5/8</td>
</tr>
<tr>
<td>M 8x18</td>
<td>5-1/2</td>
<td>1-1/2</td>
<td>0-1/4</td>
<td>2-1/8</td>
<td>1-1/16</td>
<td>3-1/8</td>
<td>5/8</td>
</tr>
<tr>
<td>M 10x24</td>
<td>7</td>
<td>1-3/4</td>
<td>1-3/8</td>
<td>3-1/2</td>
<td>3-1/4</td>
<td>3-3/4</td>
<td>3/8</td>
</tr>
<tr>
<td>M 12x30</td>
<td>8-1/4</td>
<td>2-3/4</td>
<td>1-7/8</td>
<td>4-3/4</td>
<td>3-5/8</td>
<td>1-1/8</td>
<td>7/8</td>
</tr>
</tbody>
</table>

* Designations (Nominal Depth in inches) x (weight in pounds per linear foot)
MULTI-COLUMN SIGN BACK PANEL

MULTI-COLUMN GROUND SIGN

WIND BEAM, BACKING STRIP & FUSE/HINGE PLATE DETAILS

WIND BEAM SIZE BASED ON SIGN DEPTH (D)

<table>
<thead>
<tr>
<th>No. Of Beams</th>
<th>2 Beams</th>
<th>3 Beams</th>
<th>4 Beams</th>
<th>5 Beams</th>
</tr>
</thead>
<tbody>
<tr>
<td>D ≤ 8</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>8 &lt; D ≤ 12</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>12 &lt; D ≤ 30</td>
<td>16</td>
<td>20</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>

WIND BEAM SIZE BASED ON SIGN LENGTH (L)

<table>
<thead>
<tr>
<th>No. Of Beams</th>
<th>2 Columns</th>
<th>3 Columns</th>
<th>4 Columns</th>
<th>5 Columns</th>
</tr>
</thead>
<tbody>
<tr>
<td>L ≤ 12</td>
<td>12 x 3.57</td>
<td>18 x 3.57</td>
<td>24 x 3.57</td>
<td>30 x 3.57</td>
</tr>
<tr>
<td>12 &lt; L ≤ 20</td>
<td>12 x 3.57</td>
<td>18 x 3.57</td>
<td>24 x 3.57</td>
<td>30 x 3.57</td>
</tr>
<tr>
<td>20 &lt; L ≤ 25</td>
<td>12 x 3.57</td>
<td>18 x 3.57</td>
<td>24 x 3.57</td>
<td>30 x 3.57</td>
</tr>
</tbody>
</table>

FUSE (HINGE) PLATE DATA

<table>
<thead>
<tr>
<th>Steel Section</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>D_1</th>
<th>D_2</th>
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NOTE: Designation gives (Nominal Depth in inches) x (Weight in Pounds Per Linear Foot)
1. Work this Index with Index 700-040 and 700-041.

2. The number and location of the Panel Splices are determined by the Sign Face supplier.

3. Spacing of Vertical Hangers:
   A. Two Vertical Hangers = 21.0% L
   B. Three Vertical Hangers = 33.0% L
   C. Four Vertical Hangers = 41.0% L
   D. Five Vertical Hangers = 50.0% L
   E. Six Vertical Hangers = 67.0% L

4. Spacing of Wind Beams:
   A. Two Wind Beams = 21.0% D
   B. Three Wind Beams = 33.0% D
   C. Four Wind Beams = 41.0% D
   D. Five Wind Beams = 50.0% D
   E. Six Wind Beams = 67.0% D

5. Shop Drawings:
   A. Required for Sign Panels deeper than 10'-0" with a horizontal panel splice.
   B. Splice must be located in between interior Zee Supports and only allowed on signs greater than 10'-0".

6. Materials:
   A. Aluminum:
      a. Bars, and Extruded Shapes: ASTM B 221, Alloy 6061-T6 or Alloy 6351-T5
      b. Structural Shapes: ASTM B633, Alloy 6061-T6
      c. Wind Beams, and Horizontal Machine Bolts: ASTM F468, Alloy 2024-T4
      d. Wind Beams, and Horizontal Machine Bolts: ASTM F468, Alloy 2024-T4
      e. Washers: ASTM B221, Alloy 2024-T4
      f. Structural Shapes: ASTM B633, Alloy 6061-T6
   B. Steel:
      a. U-Bolts: ASTM A449 or ASTM A193 B7
      b. Nut: ASTM A563, 2 per leg
      c. Hardware: ASTM F436, (Flat Washers)
   C. Steel:
      a. Aluminum Bolts: ASTM A499 or ASTM A193 B7
      b. Nut: ASTM A563, 2 per leg
      c. Washers: ASTM F436, (Flat Washers)
   D. Coatings:
      a. Wind Speed by county: see Index 715-010.

7. Coatings:
   A. Wind Speed by county: see Index 715-010.

8. Wind Speed by county: see Index 715-010.
PLACEMENT OF SIGN LIGHTS

1. This Index details a bottom luminaire support structure. For signs requiring top luminaire support structures, the detail can be reversed.

2. Luminaire spacing and arm length is shown on Guide Sign Worksheet.

3. The Guide Sign Worksheet indicates the sign luminaire used for basis of design.

The contractor may propose a different luminaire by submitting photometric calculations for each lighted sign for review by the Engineer.

SIGN LIGHTING INSTALLATION

Roadway Lighting included in contract:

1. Power for the sign lighting provided from the roadway lighting circuit.

2. Indicate sign location and a pull box location for connection to the sign lights in the lighting plans.

3. Lighting contractor installs pull box and loop 2' of lighting circuit conductors in the pull box for connection by the signing contractor.

4. Signing contractor furnishes and installs the luminaires, NEMA 3R enclosure, 30 amp breaker, conduit, conductors and all other electrical equipment necessary for connection to the lighting circuit.

Roadway Lighting not included in contract:

1. Signing plans include the pay item numbers to furnish and install conduit, conductors, ground rods, pull boxes and service point equipment.

2. Signing plans indicate the location of the service point equipment and circuit runs.

3. Signing contractor provides all electrical equipment necessary for connection of the sign lights.
**NOTES**

1. Install hanger pipe to each vertical beam crossed with a 1/2" U-Bolt, lock washers and hex nuts. Cap both ends of the horizontal pipe.

2. Materials:
   - A. Steel Pipe: ASTM A53 (Grade A or B)
   - B. Steel Plate: ASTM A36
   - C. Bolts: ASTM A563
   - D. Hex Nuts: ASTM A563
   - E. Washers: ASTM F436


4. All pipe dimensions are NPS.

5. Chord O.D. ± 2" (Min.)

6. Pipe Cap

---

**DESCRIPTION:**

LUMINAIRE SUPPORT STRUCTURE

- Steel Plate: ASTM A36
- Steel Pipe: ASTM A53 (Grade A or B)
- ASTM A153:
  - Coating: Hot-Dip Galvanize pipes, plates, structural shapes:
  - Fasteners and hardware:

**DETAIL A**

- (Luminaire Support Structure)

**DETAIL B**

- (Hanger Pipe Connection)

---

**REFERENCES**

- Galvanized Bolt With Curved Washer & Elastic Nut
- U-Bolt With Washers And Double Nuts (2 Bolts Req'd)
- U-Bolt, lock washers and hex nuts. Cap both ends of the horizontal pipe.
- All pipe dimensions are NPS.
- Chord O.D. ± 2" (Min.)
NOTES:

1. Work this Index in conjunction with CANTILEVER SIGN STRUCTURE
   DATA TABLES in the Plans and Index 700-090.
2. Handholes are required at pole base for DNS Structures. Refer to Index 700-090 for Handhole Details.
3. Shop Drawings are required:
   - Obtain Shop Drawing approval prior to fabrication. Include the following:
     A. Upright Pipe height ('A') and Foundation elevations. Verify dimension in the field prior to submission to ensure minimum vertical clearances of the sign panel over the roadway.
     B. Height of the foundation above adjacent ground.
     C. Anchor bolt orientation with respect to centerline of truss and the direction of traffic.
     D. Chord Splices
     E. Handholes at pole base (when required).
4. Materials:
   - Sign Structure:
     A. Upright and Chords (Steel Pipe): API 5L X42 PSL2, 42 ksi yield
     B. Steel Angles and Structural Plates and Bars: ASTM A709 Grade 36
     C. Wood Material - F70E5X
   - Bolts, Nuts and Washers:
     A. High Strength Bolts: ASTM F3125, Grade A325 Type 1
     B. Nuts: ASTM A563 Grade DH Heavy-Hex
     C. Washers: ASTM F436 Type 1, one under turned element
   - Anchor Bolts, Nuts and Washers:
     A. Anchor Bolts: ASTM F7154 Grade 55
     B. Nuts: ASTM A563 Grade A Heavy-Hex (1 per bolt)
     C. Plate Washers, ASTM A26 (2 per bolt)
   - Concrete:
     A. Spread Footing Concrete: Class IV
   - Reinforcing Steel: Specification A115
5. Fabrication:
   - Welding: Specification 460-6.4
   - 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.
   - Upright Splices: Not allowed
   - Structural bolt hole diameters: Bolt diameter plus 1/8
   - Anchor bolt hole diameters: Bolt diameter plus 1/8
   - Anchor bolt hole diameters: Bolt diameter plus 1/8
   - Hot Dip Galvanize after Fabrication.
   - Shop assemble the entire structure after galvanizing to validate/document alignment and clearances for bolted connections as well as contact between connecting plates. Take remedial action, if necessary, prior to shipment.
   - 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 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 above 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 700.
   - E. Handholes at pole base (when required).
   - F. Place structural grout pad with drain between top of foundation and bottom of baseplate in accordance with Specification 649-7.

A. Sign Structure:
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 1/8
E. Anchor bolt hole diameters: Bolt diameter plus 1/8
F. Hot Dip Galvanize after Fabrication.
G. Shop assemble the entire structure after galvanizing to validate/document alignment and clearances 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.

Materials:
- Sign Structure:
  A. Upright and Chords (Steel Pipe): API 5L X42 PSL2, 42 ksi yield
  B. Steel Angles and Structural Plates and Bars: ASTM A709 Grade 36
  C. Wood Material - F70E5X
- Bolts, Nuts and Washers:
  A. High Strength Bolts: ASTM F3125, Grade A325 Type 1
  B. Nuts: ASTM A563 Grade DH Heavy-Hex
  C. Washers: ASTM F436 Type 1, one under turned element
- Anchor Bolts, Nuts and Washers:
  A. Anchor Bolts: ASTM F7154 Grade 55
  B. Nuts: ASTM A563 Grade A Heavy-Hex (1 per bolt)
  C. Plate Washers, ASTM A26 (2 per bolt)
- Concrete:
  A. Spread Footing Concrete: Class IV
- Reinforcing Steel: Specification A115

Fabrication:
- Welding: Specification 460-6.4
- 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.
- Upright Splices: Not allowed
- Structural bolt hole diameters: Bolt diameter plus 1/8
- Anchor bolt hole diameters: Bolt diameter plus 1/8
- Anchor bolt hole diameters: Bolt diameter plus 1/8
- Hot Dip Galvanize after Fabrication.
- Shop assemble the entire structure after galvanizing to validate/document alignment and clearances for bolted connections as well as contact between connecting plates. Take remedial action, if necessary, prior to shipment.
- Disassemble, as necessary, and secure components for shipment.

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

Construction:
- A. Construct foundation in accordance with Specification 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 above 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 700.
- E. Handholes at pole base (when required).
- F. Place structural grout pad with drain between top of foundation and bottom of baseplate in accordance with Specification 649-7.
1. Construction joint allowed, roughen surface to 1/8" minimum amplitude prior to pour.

2. See Traffic Plans for elevation at top of Foundation.

3. Install Drilled Shaft with a 2'-0" minimum from top elevation of the drilled shaft to the finished grade, unless specified otherwise in the plans.

4. The shaft length is based on 2'-0" height above finished grade.

5. Structural Grout Pad dimension may be modified to be less than 3" where the footprint of the Structural Grout Pad does not provide adequate clearance for accessibility considerations.

6. Wrap fillet weld around the stiffener termination on the tube wall.

NOTES:

1. Construction joint allowed, roughen surface to 1/8" minimum amplitude prior to pour.

2. See Traffic Plans for elevation at top of Foundation.

3. Install Drilled Shaft with a 2'-0" minimum from top elevation of the drilled shaft to the finished grade, unless specified otherwise in the plans.

4. The shaft length is based on 2'-0" height above finished grade.

5. Structural Grout Pad dimension may be modified to be less than 3" where the footprint of the Structural Grout Pad does not provide adequate clearance for accessibility considerations.

6. Wrap fillet weld around the stiffener termination on the tube wall.
NOTE:
1. Wrap fillet weld around the stiffener termination on the tube wall.
2. Truss Chord Bolts:
   A. Top and Bottom: Install 1C hex head bolts.
   B. Back: Install 1B hex head bolts.
CANTILEVER ASSEMBLY

TRUSS NOTES:
1. Out-of-plane members are not shown for clarity.
2. Wrap fillet weld around plate termination on the tube wall.
3. Chord Splices not shown.

TRUSS

Bolt Size | Distance
----------|----------
1/2" Ø | 43%, 2½"
1" Ø | 35%, 1½"
5/8" Ø | 2", 1½"
5/8" Ø | 2½", 1½"

Section B-B (Section C-C Similar) (See Note 1 & 3)

Panel Length (Typ.)

Truss Chord (Typ.)

Front Elevation

SIDE ELEVATION

Connection Detail

See Upright-Truss Connection Detail (Sheet 3)

See Upright Pipe

DETAIL 'F'

DETAIL 'D'

DETAIL 'E'

DETAIL 'H'

DETAIL 'G'

DETAIL 'I'

CANTILEVER SIGN STRUCTURE
**CANTILEVER ASSEMBLY**

**SPLICE CONNECTION NOTES:**

1. Only 6 bolts are shown in detail for clarity. (One Half Each Side Of Splice)

2. Splices are not permitted for trusses less than or equal to 40', Splice optional for trusses greater than 40'.

**TRUSS PLUG DETAIL**

---

**UPRIGHT CAP DETAIL**

---

**PLAN**

- Gap Between Pipes ½' Max.
- ‘SC’ Ø Bolt ‘SB’ Required (See Note 1)
- ‘SC’ Ø Bolt (Typ.)

**SIDE ELEVATION**

- ‘SA’
- ‘SC’ Ø Bolt (Typ.)

**FRONT ELEVATION**

- ‘SC’ Ø Bolt ‘SB’ Required (See Note 1)
- ‘SC’ Ø Bolt (Typ.)

**ELEVATION**

- ½" Thick Neoprene Gasket (Glued To Cap)
- ½" Hex Head Bolt With Rubber Washer (Top)

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NOTES:
1. Work this Index in conjunction with SPAN SIGN STRUCTURE DATA TABLES in the Plans and Index 700-020.
2. Handholes at the pole base are required for DMS Structures. Refer to Index 700-090 for Handhole Details.
3. Shop Drawings are required.
   Obtain Shop Drawing approval prior to fabrication. Include the following:
   A. Upright Pipe height ("C" & "B") and foundation elevations; Verify minimum vertical clearances of the sign panel over the roadway.
   B. Length of the foundation above adjacent ground.
   C. Anchor bolt orientation with respect to centerline of truss and the direction of traffic.
   D. Method to be used to provide the required parabolic camber (see Camber Diagram).
   E. Handholes at pole base (when required).
4. Materials:
   A. Sign Structure:
      a. Upright and Chords (Steel Pipe): API 5L X42 PSL2, 42 ksi yield or ASTM A500, Grade B (Min).
      b. Steel Angles and Plates: ASTM A709 grade 36
      c. Weld Material: E70XX
   B. Bolts, Nuts and Washers:
      a. High Strength Bolts: ASTM F3125, Grade A325, Type 1
      b. Nuts: ASTM A563 Grade A Heavy-Hex
      c. Washers: ASTM F666, Type 1, one under turned element
   C. Anchor Bolts, Nuts and Washers:
      a. Anchor Bolt: ASTM A325
      b. Nuts: ASTM A563 Grade 56
      c. Plugs Washers: ASTM A159 (5 per bolt)
   D. Concrete: Class IV (Drilled Shaft)
   E. Reinforcing Steel: Specification 415
5. Fabrication:
   A. Welding: Specification 460-6.4
   B. Chord Splices: Minimum splice spacing is three truss panel lengths apart and three truss panel lengths from the uprights when panel lengths are 10'-0" or less. Chord Splices may be either the Standard Splice or the Alternate Splice, but not both on the same structure.
   C. Upright splice: Not allowed unless the upright exceeds available mill lengths (35' - 40').
   D. Structural bolt hole diameters: Bolt diameter plus 1/4".
   E. Anchor bolt hole diameters: Bolt diameter plus 1/4".
   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 F2329
   B. All other steel, including Plate Washers, hot dip galvanize: ASTM A123
7. Construction:
   A. Construct foundation in accordance with Specification 455 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 required upward deflection as shown on the Camber Diagram.
   D. Tighten nuts and bolts in accordance with Specification 700.
   E. Install Aluminum Sign Panels as shown in the Plans.
   F. After installation, place wire screen between top of foundation and bottom of baseplate in accordance with Specification 649-6.
NOTES:

1. See Traffic Plans for elevation at top of Foundation.
2. Install Drilled Shaft with a 2'-0" minimum from top elevation of the drill shaft to the finished grade, unless specified otherwise in the plans.
3. The shaft length is based on 2'-0" height above finished grade.
4. Wrap fillet weld around the stiffener termination on the tube wall (Typ.).
SPAN SIGN ASSEMBLY

SECTION A-A (With Gusset Plates and Web Angles Omitted For Clarity)

DETAIL "C"

UPRIGHT-TRUSS CONNECTION DETAIL

(Web Members From Back Truss Chord Omitted For Clarity, See Note 3)

NOTES:
1. Wrap fillet weld around the stiffener termination on the tube wall.
2. Truss Chord Bolts: 'LB' or 'RB' Hex Head Bolts 'LA' or 'RA'.
3. Right Upright Truss connection shown, Left Upright Truss connection similar.
SPAN SIGN ASSEMBLY

NOTES:
1. Out-of-plane members are not shown for clarity.
2. Back truss chord and attached angles are not shown for clarity.
3. Wrap fillet weld around plate termination on the tube wall.

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DETAIL 'D'
See DETAIL 'F' For Sign luminaire Mounting Details

DETAIL 'E'

DETAIL 'F'

TRUSS

SIDE ELEVATION

DETAIL 'G'

DETAIL 'H'

BACK-SIDE SIGN MOUNTING

DETAIL 'I'

DETAIL 'J'

DETAIL 'K'

DETAIL 'L'

SPAN SIGN STRUCTURE

INDEX
700-041

4 of 5
SPAN SIGN ASSEMBLY

SPlice CONNECTION DETAIL

Front Elevation

Side Elevation

Upright Pipe And Cap

Plan

Elevation

Upright Cap Detail

Truss Plug Detail

Alternate Splice Connection Detail

Splice Connection Detail

Description:

Standard Plans

SPAN SIGN STRUCTURE
DESCRIPTION:

1. Free-swinging, internally-illuminated street signs shall only be installed on the signal pole for span wire assemblies. For mast arm assemblies the street sign may be installed on the arm or pole.

2. Free-swinging, internally-illuminated street signs meet the requirements of Specification 700.

3. Pole attachments and cantilever arm (or truss) assemblies may be accepted by Contractor certification provided the signs being supported meet the weight and area limitations included in Specification 700 for "Acceptance by Certification".

4. Pole attachments and cantilever arm (or truss) assemblies supporting signs not meeting the weight or area limitations included in Specification 700 for "Acceptance by Certification" require the submission of structural calculations and Shop Drawings that have been prepared by and sealed by the Specialty Engineer.
GENERAL NOTES:
1. Mark this Index with Specification 700.
2. Furnish and install the Dynamic Message Sign (DMS) sign structure in accordance with Index 700-040 or 700-041. Locate foundations at locations shown in the Plans.
3. Shop Drawings are required:
   a. Include the DMS connection.
   b. Do not start fabrication until the shop drawings are approved.
4. If required, install guardrail at location shown in the Plans and in accordance with Index 536-001.
5. Materials:
   a. Sign Mounting Components:
      i. Aluminum Structural Shapes: ASTM B308, Alloy 6061-T6
      ii. Vertical Mangers: ASTM A404, Grade 36
      iii. U-Bolts: ASTM A440 or A193 B7
      iv. Steel bolts, nuts, and washers:
         1. High Strength Bolts: ASTM F3125, Grade A325, Type 1
         2. Nuts: ASTM F267
         3. Washers: ASTM F463 (Flat Washer)
   b. Coatings:
      i. All nuts, bolts and washers ASTM F2329
      ii. All other steel items ASTM A413
      iii. Bolt hole diameters: Bolt plus 1/8" before galvanizing
6. Installation:
   a. See project requirements for location of DMS Cabinet.
   b. Field adjust pole-mounted DMS cabinet height to achieve best access for maintenance personnel given site condition as directed by the Engineer. Avoid conflicts with stiffeners, handholes and maintenance of anchor bolts.
   c. Locate the sign horizontal on the structure as shown in the Plans. Vertically center the sign enclosure with the centerline of the truss.
   d. Before erection, field drill the bolt holes in the vertical hangers and horizontal mounting member attached to the sign enclosure. Field locate holes to allow vertical hanger placement as shown on the Plans with no conflicts with gusset or splice plates.
   e. Locate threaded couplings on sign side of upright above the sign truss.
   f. Connect grounding conductors to the steel framework that has been cleaned to base metal by use of bonding plates having contact area of not less than 8 square inches or by welding or brazing. Drilling and tapping the steel structure in accordance with Index 700-041. Locate foundations to the steel framework.
   g. Bends in the conduit must be greater than the minimum bending radius for the cable contained in the conduit.
   h. Completely encase all data, fiber optic and power cables for the DMS within the sign structure or in conduit.
   i. Transition conduit in foundation to indicate underground conduit with appropriate reducer outside the limits of the foundation.
   j. Permanently stamp/mark foundation to indicate conduit locations.
   k. Transition conduit in foundation to indicate underground conduit with appropriate reducer outside the limits of the foundation.
DESCRIPTION:

REVISION

LAST

of

STANDARD PLANS

FY 2020-21

SHEET

INDEX

Travel Lane

Travel Lane

Travel Lane

Travel Lane

Travel Lane

Travel Lane

Panel Shoulder

Panel Shoulder

CANTILEVER STRUCTURE PLAN VIEW

CANTILEVER STRUCTURE ELEVATION VIEW

Air Terminal (Typ.)
(See Sheet 3)

Guardrail (See General Note 4)

Shoulder

Shoulder

DYNAMIC MESSAGE SIGN GENERAL LAYOUT

NOTE: Actual number and direction of travel lanes varies.

Air Terminal (Typ.)
(See Sheet 3)

Catwalk (See Index 700-091)

DYNAMIC MESSAGE SIGN WALK-IN

INDEX

700-090

2 of 5
**DESCRIPTION:**

REVISION LAST of STANDARD PLANS FY 2020-21

**SHEET INDEX**

Primary Ground Rod

- #2 AWG Tin-Plated Bare Solid Copper Wire to Ground Mounted Cabinet
- Exothermic Weld (Typ.)
- Primary Ground Rod

**DETAIL "B"**

11 Gage Handhole Cover

- 9/16" Hole (Typ.)

COVER

- 4" 1/2" Handhole Frame
- Tack Welded Cover Clip (Typ.)
- Threaded Hole for 1/2" ø Hex Head Screw (Typ.)

FRAME

- Full Penetration Weld

Ground Rod Array Detail

- #2 AWG (Typical)
- Sign Structure Foundation

**GROUND ROD ARRAY DETAIL**

**DETAIL "D"**

20' Radius Each "Sphere of Influence"

- Ground Rod C
- #2 AWG (Typical)
- Primary Ground Rod B
- Ground Rod D

**TYPICAL (20' Rods, 40' Spacing)**

**SECTION A-A**

**DETAIL "E"**

- 11 Gage Handhole Cover
- 1/2" ø Stainless Steel Hex Head Screw (Typ.)

(Thru Handhole)
Vertical Hanger Spacing 5'-0" (Max.)
Quantity and Spacing of the Members will be dictated by Locations of Truss Connection Plates, Splices and 2'-0" (Max.) Spacing.

2-½" Threaded Couplings

(Cantilever Sign Structure Shown, Span Sign Structure Similar)

HANGER LOCATION DETAIL

Zee Beam Aluminum Zee 4½x3½x337 (Typ.)
Horizontal Member Attached to the Internal Framework and Included with the DMS Sign

DMS Sign Enclosure
Top Truss Chord
2½" ± Zee Beams Equally Spaced
See Truss Data Sheet

Hanger @ 5' (Max.) Spacing
2½" Ø U-Bolts With Double Nuts and Washers
Provide 2 ~ ½" Ø Bolts
Field Drill Holes And

SECTION B-B

Aluminum Zee Beam
Back Face of DMS Sign Enclosure

SECTION C-C

Zee Beam
Truss Chord
Vertical Hanger

SECTION D-D

Dynamic Message Sign End View

Dynamic Message Sign Walk-In

FY 2020-21
STANDARD PLANS
GENERAL NOTES:

1. Work this Index with Specification 700.

2. Shop Drawings are required:
   A. Provide length as shown in the Plans
   B. Design in accordance with AISC, AASHTO, and OSHA requirements
   C. Do not start fabrication until the shop drawings are approved

3. Catwalk hangers must be positioned to avoid conflicts with the sign structure truss and gusset plates. Place walkway close to the sign with a maximum open distance from walkway grate to DNS sign of 15”.

4. Maximum spacing of Catwalk hanger supports is 3'-0". Cantilever ends of grating is 8'.

5. Galvanized steel catwalk grating meeting the requirements of Specification 504-23. Must support a 90 psf load and have a 30’ minimum toe kick. Attach grating in accordance with the manufacturer's instructions using stainless steel or galvanized fasteners.


7. Chain link fabric options (2" mesh with knuckled selvage top and bottom for all options):
   A. AASHTO M181 Type I - Zinc Coated Steel, No. 9 gage (coated wire diameter), coated at the rate of 1.8 oz./ft². (M181 Class D 2.0 oz./ft². modified to 1.8 oz./ft².).
   B. AASHTO M181 Type II - Aluminum Coated Steel, No. 9 gage (coated wire diameter), coated at the rate of 0.40 oz./ft².

8. Install 2" NPS (Sch. 40) guiderail and posts: ASTM A53 Grade B for standard weight pipe.

9. Welding:
   E70XX

10. Materials:
   A. Steel Plates ASTM A 36 or A709 Grade 36.
   B. W. Sections: ASTM A572 Grade 36 or 50.
   C. Steel Pipe Railings or Structural Tubing: Specification 962.

11. Coatings/Galvanizing:
   Hot dip galvanize support frame after fabrication and galvanize non-stainless steel fasteners in accordance with Specification 962.

---

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<table>
<thead>
<tr>
<th>Sheet</th>
<th>Description</th>
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<td>1</td>
<td>General Notes and Content</td>
</tr>
<tr>
<td>2</td>
<td>General Assembly and Fixed Base Details</td>
</tr>
<tr>
<td>3</td>
<td>Walkway Support Details</td>
</tr>
</tbody>
</table>

**CATWALK ASSEMBLY**

(Cantilever Shown, Span Similar)
NOTES:
1. See manufacturer details for walkway planks and bolting criteria.
2. Fasten securely. See grating manufactures details.
**Revision of Standard Plans FY 2020-21**

- Minimum of 2 W6x15 Hangers at 5'-0" Max. Spacing
  - Type: W6x15 Hanger (Typ.)
- Fall Protection Requirements
  - Type: W8x15 Support Beam (Typ.)
  - Type: W6x15 Hanger (Typ.)
- Horizontal Life Line Attached to W6x15 Hanger Meeting OSHA Fall Protection Requirements
- 2" Max. Chain Link Infill Panel
- Fixed Base
- Guiderail (Cap Open End) with Nuts and Washer
- Guiderail (Attchment)
- 16" x 6" x 10" Bolting Plate
- Clip 1/2" @ 45°

**Walkway Details**

- See DETAIL "C"
- See DETAIL "D"
- See DETAIL "E"

**Sections**

- A-A
- B-B

**Plan Details**

- Horizontal Life Line Attached to W6x15 Hanger Meeting OSHA Fall Protection Requirements
- Minimum of 2 W6x15 Hangers at 5'-0" Max. Spacing
- Fixed Base
- Guiderail (Cap Open End) with Nuts and Washer
- Guiderail (Attchment)
- 16" x 6" x 10" Bolting Plate
- Clip 1/2" @ 45°
1. Series D Legend.

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.

4. When two or more County Route Markers are mounted together, use the dimensions of the largest marker for all other markers.
No Obstruction to text or symbols from holes or bolts. Sign mounting holes can be punched or field drilled with no obstruction to text or symbols from holes or bolts.


**FTP-62-06**
3 x 3
2” Radio ¼” Border
5” Series C Legend
Yellow Background
Black Legend and Border

**FTP-65-06**
3 x 1-7/8
2” Radio ¼” Border
4” Series D Legend
White Background
Black Legend and Border

**FTP-67-06**
3 x 4
2” Radio ¼” Border
5” Series D Legend
Blue Background
White Legend and Border

**FTP-66-06**
4 x 5
2” Radio ¼” Border
7” Series D Legend
White Background
Black Legend and Border

**FTP-68A-06**
9” x 1-3/4
7.5” Radii
Series B Legend
White Background
Black Legend and Border

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

**FTP-69-06**
2” and 3” Series D Legend
2” Radii
4” Series D Legend
White Legend and Border

**FTP-70-06**
3” x 2-1/4
2” Radio ¼” Border
5” Series C and 7” Series C Legend
Blue Background
White Legend and Border

**FTP-71-06**
4” x 4
2” Radio ¼” Border
5” Series C Legend
Yellow Background
White Legend and Border

**FTP-72-06**
3” x 3
2” Radio ¼” Border
8” Series C Legend
Black Legend and Border

**FTP-73-06**
5” x 2-1/4
4” Radii
8” Series D Legend
Blue Background
White Legend and Border

**FTP-68A-06**
DETAIL for FTP-66 and FTP-67

**FTP-68B-06**

**FTP-69-06**

**FTP-70-06**

**FTP-71-06**

**FTP-72-06**

**FTP-73-06**

**FTP-70-06**

**FTP-71-06**

**FTP-72-06**

**FTP-73-06**

**FTP-70-06**

**FTP-71-06**

**FTP-72-06**

**FTP-73-06**

**FTP-70-06**

**FTP-71-06**

**FTP-72-06**

**FTP-73-06**
**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"

**Sign to be installed at beginning of deceleration lane.**

**Proposed Guide Sign**

**Proposed Supplemental Guide Sign**

**See Detail "A"**

**NOTE**

When approved for attachment to the advance guide sign, 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 the mounting the supplementary panel.

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 700-010 for Single-column Ground Signs or Index 700-020 for Multi-column Ground Signs.
Tourist Information Center
NEXT RIGHT

Sign FTP-14-06

Note: Sign FTP-14-06 shall be used as a supplemental guide sign at interchanges which have a Tourist Information Center approved for such signing (locate half-way between normal guide signs).

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 700-020.
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 700-102 for sign details.

FOR LIMITED ACCESS HIGHWAYS
FOR PRIMARY HIGHWAYS

STATE OF FLORIDA
WELCOME CENTER
1 MILE

STATE OF FLORIDA
OFFICIAL
WELCOME CENTER

1/2 MILE

SIGN FTP-15B-06

SIGN FTP-12-06

SIGN FTP-15C-06

FTP-15A-06
FTP-15B-06
FTP-15C-06
FTP-12-06
FTP-12-06

2,240'
2,240'

800' Maximum For Rural Conditions
50' Minimum For Rural Conditions

Notes:
1. Signs and sign structures shall be erected in accordance with the details shown on Index 700-020.
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.
One-Way Traffic

2-Way Traffic
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 curb 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.

<table>
<thead>
<tr>
<th>Shoulder Width</th>
<th>No. of RPM's</th>
<th>Spacing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>14&quot;</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>13&quot;</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>19&quot;</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>16.67&quot;</td>
</tr>
</tbody>
</table>
2. Location of Sign 3 may require some field adjustment.
3. The Cross Road is the last detour to route around the restricted bridge.
4. Location of Sign 2 should be established from the Cross Road the following approximate distances: Interstate-1 Mile, Non-Interstate-1/2 Mile.
5. See Index 700-102 for sign details.
DESCRIPTION:

REVISIO

of STANDARD PLANS
FY 2020-21
SHEET
INDEX
11/01/17
AND INSPECTION STATIONS
TYPICAL SIGNING FOR TRUCK WEIGH

WEIGH STATION SIGNING

4 - LANE DIVIDED INSTALLATION

WEIGH STATION
ALL TRUCKS
WEIGH STATION
ALL TRUCKS
WEIGH STATION
ALL TRUCKS
WEIGH STATION

DB-1
FTP-1-06
DB-2
FTP-3-06
DB-3
FTP-3-06
DB-3
FTP-1-06

1000' Min.
1890'
1890'
2640'
1640'

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

1500' Min.
1890'

2 - LANE INSTALLATION

WEIGH STATION
ALL TRUCKS
WEIGH STATION
WEIGH STATION
WEIGH STATION
ALL TRUCKS
WEIGH STATION

DB-1
FTP-1-06
DB-2
FTP-3-06
DB-3
FTP-3-06
DB-3
FTP-1-06

1500' Min.
1890'
1890'
2640'
1640'

MEDIAN INSTALLATION
TYPICAL SIGNING FOR TRUCK WEIGHT AND INSPECTION STATIONS

INSPECTION STATION SIGNING

FY 2020-21
STANDARD PLANS

INDEX

700-108
2 of 2
TYPE 1 OBJECT MARKER PLACEMENT

NOTES:
1. Index applicable to residential and minor streets only. Major streets to be evaluated on a case-by-case basis.
2. Install Object Markers in accordance with Index 700-010
3. See Index 711-001 for pavement markings.

TYPE 4 OBJECT MARKER PLACEMENT

OBJECT MARKER DETAIL
NOTES:
1. Work with Indexes 700-020 and 700-030.

2. Materials (Aluminum):
   A. Sheets and Plates: ASTM B209 Alloy 6061-T6
   B. Standard Structural Shapes: ASTM B209 Alloy 6061-T6
   C. Extruded Shapes: ASTM B221 Alloy 6061-T6
   D. For Bolts, Nuts, and Washers requirements see Index 700-020 or 700-030.

3. Fabrication:
   A. See sign layout sheet for dimension "L" and sign face details in the Plans.
   B. Round all sign corners.

4. For right exits, install the Exit Numbering Panel to the top right side of the Highway Sign.

5. For left exits, install the Exit Numbering Panel to the top left side of the Highway Sign.

1. Work with Indexes 700-020 and 700-030.

2. Materials (Aluminum):
   A. Sheets and Plates: ASTM B209 Alloy 6061-T6
   B. Standard Structural Shapes: ASTM B209 Alloy 6061-T6
   C. Extruded Shapes: ASTM B221 Alloy 6061-T6
   D. For Bolts, Nuts, and Washers requirements see Index 700-020 or 700-030.

3. Fabrication:
   A. See sign layout sheet for dimension "L" and sign face details in the Plans.
   B. Round all sign corners.

4. For right exits, install the Exit Numbering Panel to the top right side of the Highway Sign.

5. For left exits, install the Exit Numbering Panel to the top left side of the Highway Sign.
GENERAL NOTES:
1. Install sign assemblies based on Alpha-Numeric Type designation shown in the Plans (e.g., Type A1).
   Assembly Type is based on Power Configuration 'Alpha' Identification shown above and Numerical
   Identification shown on Sheet 3 thru 8.
2. Install sign panel and wind beam in accordance with Index 700-010 and Specification 700.
3. Engage all threads on the transformer base and post unless the aluminum post is fully seated into base.
4. Meet the requirements of Specification 646 for aluminum poles and transformer bases.
5. Install a concrete slab around all roadside assemblies on slopes 6:1 or greater. The minimum slab
   dimension is 4'-0" by 5'-0".
6. When wire entry holes are drilled in the sign column, use a bushing or rubber grommet to protect conductors.

POWER CONFIGURATION 'A' NOTES:
1. Install a separate pole for mounting the solar panel, controller and batteries for all roadside assemblies with solar
   panels, controllers and batteries weighing more than 170 lbs.
2. Install the auxiliary pole as close to the right of way boundary as possible.
3. Install the auxiliary pole so that the height is the same as the column for the roadside assembly.
4. Orient solar panel to face South for optimal exposure to sunlight.
5. The controller and the solar batteries may be located in the same compartment.

POWER CONFIGURATION 'B' NOTES:
1. Install a separate pole for mounting the solar panel, controller and batteries for all roadside assemblies with solar
   panels, controllers and batteries weighing more than 170 lbs.
2. Install the auxiliary pole as close to the right of way boundary as possible.
3. Install the auxiliary pole so that the height is the same as the column for the roadside assembly.
4. Orient solar panel to face South for optimal exposure to sunlight.
5. The controller and the solar batteries may be located in the same compartment.
CONDUIT, WIRING, AND FOUNDATION DETAILS

DETAIL "A"

Nominal 4" (Sch. 40) Aluminum
Transformer Base
#6 Ground Wire
Grounding Lug
6 x 18' Anchor Bolts
Concrete Apron (Typ.)
Finished Grade

Circuit Conductors & Sheaths 4-20 PVC
Conductors and Conduit Spec as Shown in Plans (Typical)

12" Bed of Pearock or Crushed Stone For Drainage.

To Power Service or Auxiliary Pole
U.L. Approved Ground Rod
1/4" Diameter 20' Long Copper Clad with Approved Ground Connection (At all Pull Boxes)

DETAIL "B"

Nominal 4" (Sch. 40) Aluminum
Transformer Base
#6 Ground Wire
Grounding Lug
6 x 18' Anchor Bolts
Concrete Apron (Typ.)
Finished Grade

Conduit for Future Use

Cap Conduit

ENHANCED HIGHWAY SIGNING ASSEMBLIES
FY 2020-21 STANDARD PLANS
INDEX 700-120
SHEET 2 of 10
WARNING SIGN

12" Yellow Flashing Beacon

Sign Panel (48" x 48")

Front View

Side View

1'-0"

Flashing When

See Index 700-101

W-16-13P (24" x 12") Sign
When Shown in Plans

Nominal 4" (Sch. 40) Aluminum

NOTE:
Type A1 Assembly (conventionally-powered) is shown. Type B1 Assemblies (solar-powered) similar.
NOTE:
Type B2 Assembly (conventionally-powered) is shown. Type B3 Assemblies (solar-powered) similar.
NOTES:
1. Type A3 Assembly (conventionally-powered) is shown. Type B3 Assemblies (solar-powered) similar.
2. Use electronic speed feedback sign with 15" high numerals for posted speed of 45 mph or less, and 18" high numerals for posted speeds greater than 45 mph.
NOTE:
Type A4 Assembly (conventionally-powered) is shown.
Type B4 Assemblies (solar-powered) similar.
NOTES:
1. Type A5 Assembly (conventionally-powered) is shown.
   Type B5 Assemblies (solar-powered) similar.
2. Use electronic speed feedback sign with 15" high numerals for posted speeds of 45 mph or less,
   and 18" high numerals for posted speeds greater than 45 mph.

REVISION
07/01/19

LICENSE
700-120
7 of 10

ENHANCED HIGHWAY SIGNING ASSEMBLIES

ROADSIDE SIGN ASSEMBLY-5
NOTES:

1. Type A6 Assembly (conventionally-powered) is shown. Type B6 Assemblies (solar-powered) similar.
2. Use electronic speed feedback sign with 15" high numerals for posted speed of 45 mph or less, and 20" high numerals for posted speeds greater than 45 mph.
NOTES:

1. Type A7 Assembly (Conventionally-Powered) is shown. Type B7 Assemblies (Solar-Powered) Similar.

2. Install cameras, point to point microwave link, microwave detectors, and antennae in accordance with the manufacturer's instructions.
**GENERAL NOTES:**

1. Offset all RPMs 1" from solid longitudinal lines unless otherwise noted or shown.
2. Spacing may be reduced for sharp curves if required.
3. For placement of RPMs on ramps, see Index 711-003.
4. Make the traffic face of the RPM the same color as the pavement marking that it is supplementing.

**LEGEND:**

- B/C = BACK OF CURB
- EOP = EDGE OF PAVEMENT
- RPM = RAISED PAVEMENT MARKER
- W/R = WHITE/RED RPM
- Y/Y = YELLOW/YELLOW RPM
- Y/R = YELLOW/RED RPM
- MD/Y = MONO-DIRECTIONAL YELLOW RPM
RAISED PAVEMENT MARKERS

TYPICAL PLACEMENT OF
RAISED PAVEMENT MARKERS

RPM PLACEMENT AT INTERSECTIONS

RPM PLACEMENT AT TRAFFIC CHANNELIZATION AT GORE
(Traffic Flows In Same Direction)

RPM PLACEMENT AT TRAFFIC SEPARATION
(Traffic Flows In Opposite Direction)

RPM PLACEMENT AT ROADSIDE CROSSHATCHING

NOTE:
1. Center the Raised Pavement Markers between chevrons and crosshatching.

LEGEND:
B/C = BACK OF CURB
EDP = EDGE OF PAVEMENT
RPM = RAISED PAVEMENT MARKER
W/R = WHITE/RED RPM
Y/Y = YELLOW/YELLOW RPM
Y/R = YELLOW/RED RPM
MD/Y = MONO-DIRECTIONAL YELLOW RPM
NOTES:
1. For Type "C" Curb, install RPMs along the pavement edge marking using the same spacing shown.
2. Orient traffic faces of RPMs in curb median radii to be parallel to direction of travel lanes.
RPM PLACEMENT AT ISLANDS
(When called for in the Plans)

NOTES:
1. For Type "E" Curb install RPMs along the pavement edge marking using the same spacing shown.
2. Orient traffic faces of RPMs in median radii to be parallel to direction of travel lanes.

RPM PLACEMENT AT TRAFFIC SEPARATORS
(When called for in the Plans)

LEGEND:
B/C = BACK OF CURB
EOP = EDGE OF PAVEMENT
RPM = RAISED PAVEMENT MARKER
W/R = WHITE/RED RPM
Y/Y = YELLOW/YELLOW RPM
W/R = WHITE/RED RPM
MD/W = MONO-DIRECTIONAL WHITE RPM
MD/Y = MONO-DIRECTIONAL YELLOW RPM

POSTED SPEED LIMIT RPM
IN FEET

<table>
<thead>
<tr>
<th>SPEED LIMIT</th>
<th>FEET</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 OR LESS</td>
<td>10</td>
</tr>
<tr>
<td>35</td>
<td>20</td>
</tr>
<tr>
<td>40</td>
<td>30</td>
</tr>
<tr>
<td>45</td>
<td>40</td>
</tr>
<tr>
<td>50 OR MORE</td>
<td>50</td>
</tr>
</tbody>
</table>
RPM PLACEMENT FOR CROSSES ON LIMITED ACCESS ROADWAYS

3 Yellow RPMs
See DETAIL "L"

2 Yellow RPMs

1 Yellow RPM

6" Yellow Edge Line

Edge of Traveled Way

DETAIL "L"
Blue RPM

Fire Hydrant

Two-lane Roadway

Multilane Roadway

Multilane Roadway with Turn Lane

Limited Access Roadway

Two-lane Roadway at Intersection

Multilane Roadway at Intersection

Blue RPM Placement

Typical Placement of Raised Pavement Markers
NOTES FOR PAVEMENT MESSAGES:
1. When an arrow or another pavement message is used with a pavement message, maintain a minimum distance of 5" between items, measured from the base of each item. See the Pavement Message Spacing Table for 5" value.
2. Place all pavement messages 25' back from the stop line.
3. Dimensions are within 1" ±.
4. All grids are 4" x 4".
5. All pavement messages must be white except route shields.
6. Increase width of route shield for routes with three digits.

GENERAL NOTE:
1. See Index 509-076 for pavement markings at railroad crossings.

PAVEMENT MESSAGE AND ARROW DETAILS

PAVEMENT MESSAGE SPACING TABLE

<table>
<thead>
<tr>
<th>Posted Speed (mph)</th>
<th>Distance &quot;S&quot; (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 - 30</td>
<td>22</td>
</tr>
<tr>
<td>30 - 35</td>
<td>28</td>
</tr>
<tr>
<td>35 - 40</td>
<td>30</td>
</tr>
<tr>
<td>40 - 45</td>
<td>34</td>
</tr>
<tr>
<td>45 - 50</td>
<td>38</td>
</tr>
<tr>
<td>50 - 55</td>
<td>40</td>
</tr>
<tr>
<td>55 - 60</td>
<td>42</td>
</tr>
<tr>
<td>60 - 70</td>
<td>44</td>
</tr>
<tr>
<td>70 - 80</td>
<td>46</td>
</tr>
<tr>
<td>80 - 90</td>
<td>48</td>
</tr>
<tr>
<td>90 - 100</td>
<td>50</td>
</tr>
</tbody>
</table>

Pavement Markings

FY 2020-21
STANDARD PLANS

PAVEMENT MARKINGS

INDEX 711-001

1 of 13
**DESCRIPTION:**

Yield Lines consist of five, 18" X 21" white triangles which face traffic. Equally spaced triangles within traffic lane. When a bike lane is present, add one additional triangle in the center of the bike lane.

**PAVEMENT MARKING LINES**

<table>
<thead>
<tr>
<th>Line Type</th>
<th>Length</th>
<th>Color</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Edge Line or Lane Line</td>
<td>4&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid Channelizing Line</td>
<td>9&quot;, 12&quot; or 18&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-Lane Passing Prohibited Lines</td>
<td>6&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double Solid Lines</td>
<td>6&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12' Solid Pedestrian Crosswalk Line</td>
<td>12' or 24&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2'-4' Dotted Guide Line</td>
<td>2'-4'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12&quot; Solid Pedestrian Crosswalk Line</td>
<td>12&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6'-10' Dotted Extension Line</td>
<td>6'-10'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3'-9' Dotted Interchange Line</td>
<td>3'-9'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3'-9' Dotted Lane Drop Line</td>
<td>3'-9'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10'-30' Skip Line</td>
<td>10'-30'</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10'-30' SKIP LINE WITH SHADOW MARKINGS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 White Skip (Typ.)</td>
<td>3'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Black Contrast (Typ.)</td>
<td>3'</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DOTTED LINE WITH ALTERNATING SHADOW MARKINGS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3'-9' Dotted Line Shown, Other Dotted Lines Similar)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**YIELD LINES**

When a bike lane is present, add one additional triangle in the center of the bike lane.
CURB AND GUTTER

FLUSH SHOULDER

\[ X = \text{LANE WIDTH (FT.)} \]
\[ Y = \text{BUFFERED BIKE LANE WIDTH (FT.)} \]

STRIPING FOR BUFFERED BIKE LANE

STRIPING WITH SHOULDER OR NON-BUFFERED BIKE LANE

STRIPING WITH NO SHOULDER OR BIKE LANE

NOTES:
1. Lane widths (X) may not be same for each lane in the section.
2. For placement of RPMs, see Index 706-001.

PLACEMENT OF LONGITUDINAL PAVEMENT MARKINGS
INTERSECTION APPROACH STRIPING WITH TURN
LANES AND BUFFERED BIKE LANE KEY HOLE

NOTES:
1. Lane widths (X) may not be same for each lane in the section.
3. For placement of RPMs, see Index 706-001.
4. For placement of Express Lane markers and associated RPMs, see the Plans.

BUFFERED EXPRESS LANE STRIPING

PLACEMENT OF LONGITUDINAL PAVEMENT MARKINGS
PLACEMENT OF LONGITUDINAL PAVEMENT MARKINGS

DESCRIPTION:

FLUSH SHOULDER SHOWN
DESCRIPTION:

PAVEMENT MARKINGS AND DELINEATORS FOR MEDIAN Crossover

PAVEMENT MARKINGS FOR INTERSECTIONS WITH MAJOR AND MINOR ROADS

NOTE:

1. Apply yellow reflective paint to the noses of curbed medians, traffic separators, and raised islands. When applying yellow reflective paint in conjunction with raised pavement markers, see Index 706-001.

2. Use yellow retro-reflective sheeting on both sides of the delineator. Install the post so that the top is 4' above the grade at the edge of the pavement.

3. Extend double yellow centerlines 100' back from intersection on all approaches or 50' for unmarked cross roads.
TWO WAY LEFT TURN LANE
(With Single Lane Left Turn Channelization)

NOTE:
See Sheet 1 for "S" value.

TRAFFIC CHANNELIZATION AT GORE

NOTE:
See Sheet 1 for "S" value.
NOTES:

1. For crosswalk width, exceed width of the adjacent sidewalk, but do not make width less than 6' for intersection crosswalks and 10' for midblock crosswalks. Measure width from the inside of the transverse crosswalk markings.

2. When the Special Emphasis Crosswalk is not perpendicular to the lane lines, make the longitudinal markings parallel to the lane lines.

3. Refer to Index 522-002 when Curb Ramps are present.
Turn Lane Markings

**Notes:**
1. Turn lanes are not dimensioned in the Plans.
2. Use a minimum of three arrows.
3. Use additional arrows in accordance with the Plans or as directed by the Engineer.
4. Space arrows evenly throughout the available length with a minimum spacing of "S" between arrows.
5. For turn lanes greater than 225' in length, use a minimum of three arrows. Use additional arrows in accordance with the Plans or as directed by the Engineer.

**SINGLE LEFT TURNS**

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

**TURN LANE MARKINGS**

**URBAN CONDITIONS**

<table>
<thead>
<tr>
<th>Posted Speed (mph)</th>
<th>Clearance Distance</th>
<th>Brake To Stop Distance</th>
<th>Total Dess. Distance</th>
<th>Clearance Distance</th>
<th>Brake To Stop Distance</th>
<th>Total Dess. Distance</th>
<th>Clearance Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>L1</td>
<td>L2</td>
<td>L3</td>
<td>L4</td>
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<td>L7</td>
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<td>400</td>
<td>230</td>
<td>290</td>
<td>460</td>
<td>370</td>
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</table>

**RURAL CONDITIONS**

<table>
<thead>
<tr>
<th>Posted Speed (mph)</th>
<th>Clearance Distance</th>
<th>Brake To Stop Distance</th>
<th>Total Dess. Distance</th>
<th>Clearance Distance</th>
<th>Brake To Stop Distance</th>
<th>Total Dess. Distance</th>
<th>Clearance Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>L1</td>
<td>L2</td>
<td>L3</td>
<td>L4</td>
<td>L5</td>
<td>L6</td>
<td>L7</td>
</tr>
<tr>
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<td>100</td>
<td>135</td>
<td>240</td>
<td>160</td>
<td>185</td>
<td>290</td>
<td>140</td>
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<tr>
<td>50</td>
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<td>55</td>
<td>140</td>
<td>260</td>
<td>400</td>
<td>230</td>
<td>290</td>
<td>460</td>
<td>370</td>
</tr>
</tbody>
</table>

**ARROW SPACING**

1. Arrow spacing varies between 125' to 225'.
2. Use a minimum of three arrows.
3. Use additional arrows in accordance with the Plans or as directed by the Engineer.
4. Space arrows evenly throughout the available length with a minimum spacing of "S" between arrows.

**NOTES:**
1. When installing lane lines for turn lanes, use the dimensions in the Plans or the above values for turn lanes not dimensioned in the Plans.
NOTES:

1. Dimensions are to the centerline of markings.

2. An Access Aisle is required for each accessible space when angle parking is used.

3. Criteria for pavement markings only, not public sidewalk curb ramp locations. For ramp locations refer to plans.

4. Tint blue pavement markings to match color 15180 of Federal Standards SRSA.

5. Mount FTP-22-06 sign below the FTP-21-06 sign.

6. Use of the pavement symbol in accessible parking spaces is optional. When pavement symbol is used, the symbol is either 3'-0" or 5'-0" high and white in color.
NOTES:
1. All grids are 4" x 4".
2. Pavement Marking Should Not Extend Into Opposing Lane.

SCHOOL PAVEMENT MARKING

MARKINGS FOR SCHOOL ZONES

SINGLE-LANE APPROACH

TWO-LANE APPROACH

MULTI-LANE APPROACH
(Three or More)
NOTES:
1. All bicycle markings and pavement messages shall be White.
2. All bicycle markings shall be preformed thermoplastic.
3. All grids are 4" x 4".

---

STANDARD PAVEMENT MARKING MESSAGE LAYOUTS

---

Shared Lane Marking (SLM) 8.1 S.F.

Helmeted Bicyclist Symbol 6.3 S.F.

Bike Lane Arrow 4.2 S.F.

Railroad Crossing (For Shared Use Path Only) 9.0 S.F.

---

1. All bicycle markings and pavement messages shall be White.
2. All bicycle markings shall be preformed thermoplastic.
3. All grids are 4" x 4".
EOP  

Center of Solid Line and Dotted Line  

7'-4" Dotted Line  

Radius Curb Return or Stop Line  

Shared Lane 15'  

Lane Width  

SIDEWALK  

TRAVEL LANE  

BIKE LANE  

APPROACH TO INTERSECTIONS DETAILS  

BUFFERED BIKE LANES  

FAR SIDE OF INTERSECTION DETAIL  

STANDARD BUFFERED BIKE LANE STRIPING  

6" White Solid Line  

6" White Solid Line  

6" White Solid Line  

BUFFERED BIKE LANES  

FA S E OF INTERSECTION DETAIL
GENERAL NOTES:
1. Make the traffic face of the raised pavement marker (RPM) the same color as the pavement marking that it is supplementing.
2. See Index 706-001 for additional information on RPMs.
INTERCHANGE MARKINGS

TYPICAL MARKINGS AT DUAL LANE EXITS

TYPICAL LANE DROP MARKINGS AT EXIT RAMPS

PARALLEL ACCELERATION AND DECELERATION LANE

Descripion:

Last Revision: 01/01/17

FY 2020-21

STANDARD PLANS

INDEX

711-003

Sheet 3 of 7
NOTES:

1. Place the Wrong Way Arrow at the physical gore or 100'-0" from the theoretical gore.

2. Post delineators spaced at 40' on curves of the entrance and exit of ramps. The spacing on the tangent portion of the ramp section is 300'-0". All delineators are to be setback 4' from shoulder break. Post delineators should not be discontinued in sections with guardrail.
NOTES:

1. Place the Wrong Way Arrow at the end of the physical gore or 100'-0" ± from the end of theoretical gore.

2. Post delineators spaced at 40' on curves of the entrance and exit of ramps. The spacing on the tangent portion of the ramp section is 300'-0". All delineators are to be setback 4' from shoulder break. Post delineators should not be discontinued in sections with guardrail.

TYPICAL INTERSECTION
**DESCRIPTION:**

**NOTE:**
Do not place wrong way arrows in between consecutive directional arrows.

**DESCRIPTION:**

**NOTE:**
Do not place wrong way arrows in between consecutive directional arrows.

**TYPICAL PARTIAL CLOVERLEAF/TRUMPET EXIT RAMP**

**INTERCHANGE MARKINGS**

**INDEX:**

**FY 2020-21 STANDARD PLANS**

**INDEX:**

**SHEET:**

11/01/17

6 of 7
NOTES:

1. This Index shows layouts for 1, 2, and 3 lane designs.

2. The message consists of white letters and numbers with black contrasting material.

3. The "EXIT NUMBER" position remains the same distance from the beginning of taper regardless of the number of lines of information.

4. All grids are 4" x 4".
**CONVENTIONAL LIGHTING**

**METAL POLE DETAIL**

NOTES:

1. Barrier wall or bridge mounted poles: The wiring shall be in accordance with Specification 962.

2. Provide cable length to remove fuseholders from transformer base, pole base or pullbox for maintenance. Remove slack from the luminaire cable to provide tension on the fuseholders if the pole breaks away. Pull excess cable into pull box tighten strain relief fittings or cable clamps at both ends of conduit to prevent cable from slipping.
NOTES:

1. Use compacted select material in accordance with Index 120-001.
2. Concrete shall be Class N5 with a minimum strength at 28 days of f'c=2.5 ksi.
3. Outside edge of slab shall be cast against formwork.
4. The pull box shown is 13" x 24"; others approved under Specification 635 may be used.
5. Slabs to be placed around all Poles and Pull Boxes in rural locations. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
6. Concrete for slabs around pull boxes shall be included in the price of pull box.
NOTES:
1. Use compacted select material in accordance with Index 120-001.
2. Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.
3. Outside edge of slab shall be cast against formwork.
4. The pull box shown is 1' x 24'; others approved under Specification 635 may be used.
5. Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
6. Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.
7. The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.

Concrete shall be Class NS with a minimum strength at 28 days of Fc=2.5 ksi.

Outside edge of slab shall be cast against formwork.

The pull box shown is 1' x 24'; others approved under Specification 635 may be used.

Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with a APL approved Type A sealant meeting the requirements of Specification 932.
GENERAL NOTES:

1. Poles are designed to support the following:
   a. Luminaire Effective Projected Area (EPA): 1.55 SF
   b. Weight: 55 lb
2. Shop Drawings: This Index is considered fully detailed, only submit shop drawings for minor modifications not included in the Plans.
3. Materials:
   a. Pole, Pole Connection Extrusions and Arm Extrusions, ASTM B221, Alloy 6063-T6 or Alloy 6061-T6
   b. Bars, Plates, Stiffeners and Backer Ring: ASTM B221, Alloy 6063-T6
   c. Caps and Covers: ASTM B-26, Alloy 319-T
   d. Steel Bearing Plate: ASTM A709 or ASTM A36 Grade 36
   e. Aluminum Weld Material: ER 4043
   g. Bolts, Nuts and Washers:
      a. Anchor Bolt: ASTM F3125, Grade A325, Type 1
      b. Nuts: ASTM A193 Grade UN Heavy-Hex
      c. Washer: ASTM A36
   h. Transformer and Frangible Base Materials: ASTM B26 or ASTM B108, Alloy 356-T6
   i. Anchor Bolts: ASTM A3124 Grade 55
   j. Nuts: ASTM A193 Grade A Heavy-Hex
   k. Pipe Fitting: ASTM A36
   l. Stainless Steel Fasteners: ASTM B26 Alloy Group 2, Condition A, CW1 or S11
   m. Cap Covers: ASTM B221, Alloy 619-F
4. Fabrication:
   a. Weld Arm and Pole (Alloy 6063) in the 14 temper using 4043 filler. Age the Arm and Pole artificially to the T6 temper after welding.
   b. Transverse welds are only allowed at the base.
   c. Roadway Light Pole Taper: Taper as required to provide a round top O.D. of 6" and a base O.D. of 8" for 20' and 25' mounting heights and 10" O.D. for poles with 30' to 50' mounting heights. Portions of the pole near the base and at the arm connections may be held constant to simplify fabrication.
   d. Median Barrier Mounted Light Pole Taper: Taper as required to provide a 6" O.D. round top with an 11" x 7" O.D. oblong base. Portions of the pole near the base and at the arm connections may be held constant at 11" x 7" oblong and 6" round respectively to simplify fabrication.
   e. Provide 2", 2-1/2", or 3" hole at top of pole for electrical wires.
   f. Provide a watertight cover with neoprene gasket and secure cover with galvanized screws.
   g. Perform all welding in accordance with AWS D1.2.
   h. Embedded Junction Box (EJB): Install EJBs per Note 4 and in accordance with Specification 635, as shown on the following Sheets.
5. Coatings/Finish:
   a. Pole and Arm Finish: 50 grit satin rubbed.
   b. Galvanize Steel Bolts, Screws, Nuts and Washers: ASTM F1239
   c. Hot Dip Galvanize EJB and other steel items including poles and plate washers: ASTM A123
6. Construction:
   a. Foundation: Specification 655, except payment for the foundation is included in the cost of the pole.
   b. Frangible Base, Base Shoe, and Clamp:
      a. Certify that the Clamp, Frangible Transformer Base, and Base Shoe Design are capable of providing the required capacity.
      b. Certify the Base conforms to the current FMHC required AASHTO Frangibility Requirements, tested under WCHP Report 350 Guidelines (e.g. Akron Foundry TB1-17).
      c. Do not erect pole without Luminaire attached.
7. Embedded Junction Box (EJB): Install EJBs per Note 4 and in accordance with Specification 635, as shown on the following Sheets.
8. Wind Speed by County:
   120 MPH:
   140 MPH:
   160 MPH:
   Brevard, Broward, Charlotte, Collier, Escambia, Indian River, Lee, Martin, Miami-Dade, Monroe, Palm Beach, Sarasota and St. Lucie Counties.

STANDARD PLANS

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STANDARD ALUMINUM LIGHTING

715-002

1 of 8
DIMPLE DETAIL

VINYL CAP DETAIL

HIGH TEMP VIEW B-B

VIEW C-C

ARM & DAMPER DETAILS

ARM TUBE EXTRUSIONS NOTES:

At the pole connections, provide arm tube extrusions with dimensions as shown, uniformly transition elliptical section to a cylindrical section at the arm connection.

The fabricator may substitute elliptical cross sections other than those tabulated, provided the section properties about the vertical axis and the area of the section equal or exceed that of the required section, and provide minimum wall thickness of \( \frac{1}{8} \) nominal and within the Aluminum Association Tolerances.

The outside diameter about the minor axis should be held at 2\( \frac{1}{8} \) at the upper and lower arms.
### Pole and Base Details for Roadway Aluminum Light Pole

**Foundation Notes:**
1. Depths shown are for slopes equal to or flatter than 1:6. For slopes steeper than 1:4 and equal to or flatter than 1:2 and 2:6 to foundation depths shown.
2. Foundation Tie Bars: #4 Tie Bars @ 12" centers (max) or #6 (or W10) spiral @ 6" pitch, 3 flat turns top and 1 flat turn bottom.

**POLE TABLE**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Pole Wall Thickness</th>
<th>Top of Base Shoe Weld</th>
<th>Inside of Base Shoe Weld</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>0.126</td>
<td>16</td>
<td>3</td>
</tr>
<tr>
<td>P1</td>
<td>0.156</td>
<td>16</td>
<td>5</td>
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<tr>
<td>P2</td>
<td>0.230</td>
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<tr>
<td>P3</td>
<td>0.313</td>
<td>16</td>
<td>5</td>
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</tbody>
</table>

**Foundation Table**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Bolt Min. Embedment</th>
</tr>
</thead>
<tbody>
<tr>
<td>6'-0&quot;</td>
<td>2'-6&quot; Ø</td>
</tr>
<tr>
<td>7'-0&quot;</td>
<td>3'-6&quot; Ø</td>
</tr>
<tr>
<td>8'-0&quot;</td>
<td>3'-6&quot; Ø</td>
</tr>
</tbody>
</table>

**Top Mount Pole Table**

<table>
<thead>
<tr>
<th>Assembly Height (ft)</th>
<th>Wind Speed and Arm Lengths (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 mph</td>
<td>10, 12, 15</td>
</tr>
<tr>
<td>140 mph</td>
<td>8, 10, 12</td>
</tr>
<tr>
<td>160 mph</td>
<td>6, 8, 10, 12</td>
</tr>
</tbody>
</table>

**Foundation Notes:**
1. Pole wall thicknesses shown are nominal and must be within the Aluminum Association tolerances.
2. Thicker walls are permitted and tapered walls may be used in accordance with the minimum Aluminum Association tolerances.

**Arm Pole Notes:**
1. See ARM SECTION detail on Sheet 3 for all A1 and A2 Values.
2. See Pole Table for all P1, P2, and P3 values.
4. For 20' and 25' assembly heights use only 8' or 10' arm A1 with P0.
NOTE:
1. For locations of Bearing Plates, Base Plates and Detail 'A' see Sheets 6 & 7.
2. Double Nuts: The bottom hex nut may be substituted by a half-height 'jam' nut.
3. Provide individual nut covers (not shown) for each bolt.
4. Pole wall thicknesses shown are nominal and shall be within the Aluminum Association Tolerances. Thicker walls are permitted and tapered walls may be used in accordance with the minimum Aluminum Association thicknesses.

1. For locations of Bearing Plates, Base Plates and Detail 'A' see Sheets 6 & 7.
2. Double Nuts: The bottom hex nut may be substituted by a half-height 'jam' nut.
3. Provide individual nut covers (not shown) for each bolt.
4. Pole wall thicknesses shown are nominal and shall be within the Aluminum Association Tolerances. Thicker walls are permitted and tapered walls may be used in accordance with the minimum Aluminum Association thicknesses.
**STANDARD ALUMINUM LIGHTING**

**FY 2020-21 STANDARD PLANS**

**715-002** 6 of 8

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**DESCRIPTION:**

**REVISION:**

**LAST REVIEWED:**

**STANDARD BARRIER MOUNTED ALUMINUM LIGHT POLE**

---

**PLAN**

- Median Barrier (Index 521-001)
- Reinforcing steel not shown

**ELEVATION**

- 20'-0" Min.
- 2 Sp. @ 16" ±
- 7 Sp. @ 8" ±
- 2 Sp. @ 16" ±

**END VIEW**

- Bar 5V
- Bar 5W1
- Spacing Bars 5V & 5W1

**EMBEDDED JUNCTION BOX DETAILS**

- 4" Cover (Typ.)

**NOTES:**

1. For Bearing Plate and Base Plate details, see Sheet 5.

2. For connections to adjacent Median Barrier, use the Doweled Joint detail per Index 521-001. Alternatively, a continuous concrete pour or a construction joint may be substituted; these alternatives require the Median Barrier's longitudinal steel to lap a minimum of 2'-0" with the longitudinal steel shown herein.
PLAN
(Reinforcing steel not shown)
Provide dowel bars @ construction joint

SPEED (MPH)
WIND
HEIGHT (FT)
MOUNTING DESIGN
DEPTH FOUNDATION

#4 Bars (Typ.)

NOTE:
Avoid cylindrical foundation.

#5 Bars, 6'-10" long (Typ.)

SECTION C-C

NOTES:
1. For Bearing Plate and Base Plate Details, see Sheet 5.
2. For connections to adjacent Median Barrier, use the Dowelled joint detail per Index 521-001. Alternatively, a continuous concrete pour or a construction joint may be substituted; these alternatives require the Median Barrier's longitudinal steel to lap a minimum of 2'-0" with the longitudinal steel shown herein.

BARRIER MOUNTED ALUMINUM LIGHT POLE

SHEET INDEX 715-002

STANDARD ALUMINUM LIGHTING

FY 2020-21
STANDARD PLANS

INDEX 715-002

REVISION 10/01/17

DESCRIPTION:
REV ISIO N

FOUNDATION TABLE

WIND SPEED (MPH)
DESIGN MOUNTING HEIGHT (FT)
FOUNDATION DEPTH (FT)

120 40 8
140 40 9
160 40 9

HEIGHT (FT)
MOUNTING DESIGN
DEPTH FOUNDATION

#4 Bars (Typ.)

NOTE:
Avoid cylindrical foundation.

#5 Bars, 6'-10" long (Typ.)

SECTION C-C

NOTES:
1. For Bearing Plate and Base Plate Details, see Sheet 5.
2. For connections to adjacent Median Barrier, use the Dowelled joint detail per Index 521-001. Alternatively, a continuous concrete pour or a construction joint may be substituted; these alternatives require the Median Barrier's longitudinal steel to lap a minimum of 2'-0" with the longitudinal steel shown herein.

BARRIER MOUNTED ALUMINUM LIGHT POLE

SHEET INDEX 715-002

STANDARD ALUMINUM LIGHTING

FY 2020-21
STANDARD PLANS

INDEX 715-002

REVISION 10/01/17

DESCRIPTION:
REV ISIO N
**DESCRIPTION:**

REVISION OF STANDARD PLANS FY 2020-21

**SECTIONS:**

- **PLAN:** (Reinforcing steel and 2" Ø Conduit not shown)
- **ELEVATION:** (Longitudinal and transverse deck reinforcing steel not shown)

**NOTES:**

1. For Base Plate Details, Bearing Plate Details, and Detail 'A', see Sheet 5.
2. See Index 521-426 for details of adjacent Traffic Railing (Median 36" Single-Slope) and for angles 'A' and 'B'.
3. See Index 630-010 for Conduit, EJB and supplemental reinforcing details.

**DETAILS FOR TRAFFIC RAILING (MEDIAN 36" SINGLE-SLOPE) MOUNTED ALUMINUM LIGHT POLE**

**Bars:**
- 5R (Typ.)
- 5S
- 5W

**Anchor Bolt Embedment Depth:**
- Min. 5' from open joint

**Construction Joint:**
- Optional Const. Joint

**Supplemental #5 Bar:**
- Shift horizontally to avoid Anchor Bolts

**Optional Splice:**
- See Note 3

**Optional Const. Joint:**
- Embedded Junction Box **B** (Note 3)

**Traffic Railing:**
- (Median 36" Single-Slope)

**Bridge Deck:**
- Symmetrical about Light Pole

**Bar SW:**
- 4 ~ 1½" Ø Anchor Bolts

**Base Plate:**
- 1" Ø Conduit

**Construction Joint:**
- 8" Min. Embedment

**Supplemental #5 Bar**
- Optional Const. Joint

**EJB:**
- "B"
HIGHMAST LIGHTING NOTES:

1. Poles are designed to support the following:
   a. One (1) cylindrical head assembly with a maximum effective projected area of 6 sf and 140 lbs (Max.)
   b. Eight (8) cylindrical luminaires with a maximum effective projected area of 1.5 sf and 17 lbs each.

2. Shop Drawings: This Index is considered fully detailed, only submit shop drawings for minor modifications not detailed in the Plans.

3. High Mast Structure Materials:
   a. Poles and Backing Rings:
      i. Less than 70°: ASTM A1011 Grade 50, 55, 60 or 65
      ii. Greater than or equal to 70°: ASTM A572 Grade 50, 55, 60 or 65
      iii. ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield)
   b. Steel Plates: ASTM A36 or ASTM A709
   c. Pole Caps: ASTM A1011 Grade 50, 55, 60, 65 or ASTM B209
   d. Bolt Material: C1022
   e. Stainless Steel Screws: AISI 316
   f. Anchor Bolts, Nuts and Washers:
      i. Anchor Bolts: ASTM F1554 Grade 55
      ii. Nuts: ASTM A563 Grade A Heavy-Hex (5 per anchor bolt)
      iii. Plate Washer: ASTM A36 (4 per anchor bolt)
   g. Nut Covers: ASTM B66 (319-F)
   h. Concrete: Class IV (Drilled Shaft)
   i. Reinforcing Steel: Specification 415

4. Fabrication:
   a. Welding:
      i. Specification 460-6.4 and
      ii. AASHTO LRFD Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals Section 14.4.4
   b. Poles:
      i. Round or 16-sided (Min.)
      ii. Base Wall Thickness
      iii. Yield Strength (Fy of Steel)
      iv. Manufacturers’ Name
      v. Pole Height
      vi. Financial Project ID
   c. Fabricate Pole longitudinal seam welds (2 maximum) with 60 percent minimum penetration or fusion except as follows:
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices
      ii. Use full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   d. Circumferentially welded pole shafts and laminated pole shafts are not permitted
   e. Use full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   f. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   g. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   h. Include the following information on the ID Tag:
      i. Location on the inside of the pole and visible from the handhole
      ii. 2” x 4” (Max.) aluminum tag
      iii. Secure with 1/8” diameter stainless steel rivets or screws.
   i. 2” x 4” (Max.) aluminum tag
   j. Locate on the inside of the pole and visible from the handhole
   k. Include the following information on the ID Tag:
      i. Financial Project ID
      ii. Pole Type
      iii. Pole Height
      iv. Manufacturer’s Name
      v. Tapped Length (Fy of Steel)
      vi. Base Rail Thickness
   l. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   m. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   n. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   o. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   p. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   q. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   r. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   s. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   t. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   u. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   v. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   w. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   x. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   y. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   z. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.

5. Coating:
   a. Galvanize Anchor Bolts, Nuts and Washers: ASTM F2329
   b. Hot Dip Galvanize all other steel items including plate washers: ASTM A123

6. Construction:
   a. Foundation: Specification 455 Drilled Shaft, except that payment is included in the cost of the Structure.
   b. After Installation: Place wire screen between top of foundation and bottom of baseplate in accordance with Specification 649-6

7. Wind Speed by County:
   a. 120 MPH
   b. 150 MPH
   c. 170 MPH
      i. Bradford, Broward, Charlotte, Collier, Escambia, Indian River, Lee, Martin, Miami-Dade, Monroe, Palm Beach, Sarasota and St. Lucie Counties.
**POLE DESIGN TABLE**

<table>
<thead>
<tr>
<th>Design Wind Speed</th>
<th>Pole Overall Height (ft)</th>
<th>Base Plate Diameter (in.)</th>
<th>Base Plate Thickness (in.)</th>
<th>Bolt Circle (in.)</th>
<th>No. Bolts</th>
<th>Bolt Diameter (in.)</th>
<th>Bolt Embedment (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SECTION 1 (TOP)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>130 mph</td>
<td>80</td>
<td>30.0</td>
<td>3.000</td>
<td>2.000</td>
<td>8</td>
<td>1.75</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>38.0</td>
<td>3.875</td>
<td>2.800</td>
<td>8</td>
<td>2.00</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>44.0</td>
<td>3.875</td>
<td>3.500</td>
<td>8</td>
<td>2.25</td>
<td>52</td>
</tr>
<tr>
<td>150 mph</td>
<td>80</td>
<td>30.0</td>
<td>3.000</td>
<td>2.000</td>
<td>8</td>
<td>1.75</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>38.0</td>
<td>3.875</td>
<td>2.800</td>
<td>8</td>
<td>2.00</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>44.0</td>
<td>3.875</td>
<td>3.500</td>
<td>8</td>
<td>2.25</td>
<td>52</td>
</tr>
<tr>
<td>170 mph</td>
<td>80</td>
<td>30.0</td>
<td>3.000</td>
<td>2.000</td>
<td>8</td>
<td>1.75</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>38.0</td>
<td>3.875</td>
<td>2.800</td>
<td>8</td>
<td>2.00</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>44.0</td>
<td>3.875</td>
<td>3.500</td>
<td>8</td>
<td>2.25</td>
<td>52</td>
</tr>
</tbody>
</table>

**BASE PLATE AND BOLTS DESIGN TABLE**

<table>
<thead>
<tr>
<th>Design Wind Speed</th>
<th>Pole Overall Height (ft)</th>
<th>Base Plate Diameter (in.)</th>
<th>Base Plate Thickness (in.)</th>
<th>Bolt Circle (in.)</th>
<th>No. Bolts</th>
<th>Bolt Diameter (in.)</th>
<th>Bolt Embedment (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SECTION 2</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>130 mph</td>
<td>80</td>
<td>30.0</td>
<td>3.000</td>
<td>2.000</td>
<td>8</td>
<td>1.75</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>38.0</td>
<td>3.875</td>
<td>2.800</td>
<td>8</td>
<td>2.00</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>44.0</td>
<td>3.875</td>
<td>3.500</td>
<td>8</td>
<td>2.25</td>
<td>52</td>
</tr>
<tr>
<td>150 mph</td>
<td>80</td>
<td>30.0</td>
<td>3.000</td>
<td>2.000</td>
<td>8</td>
<td>1.75</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>100</td>
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<td>3.875</td>
<td>2.800</td>
<td>8</td>
<td>2.00</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>44.0</td>
<td>3.875</td>
<td>3.500</td>
<td>8</td>
<td>2.25</td>
<td>52</td>
</tr>
<tr>
<td>170 mph</td>
<td>80</td>
<td>30.0</td>
<td>3.000</td>
<td>2.000</td>
<td>8</td>
<td>1.75</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>38.0</td>
<td>3.875</td>
<td>2.800</td>
<td>8</td>
<td>2.00</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>44.0</td>
<td>3.875</td>
<td>3.500</td>
<td>8</td>
<td>2.25</td>
<td>52</td>
</tr>
</tbody>
</table>

**SHAFT DESIGN TABLE**

<table>
<thead>
<tr>
<th>Design Wind Speed</th>
<th>Pole Overall Height (ft)</th>
<th>Shaft Diameter</th>
<th>Shaft Length</th>
<th>Longitudinal Reinforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>130 mph</td>
<td>80</td>
<td>4'-0&quot;</td>
<td>13'-0&quot;</td>
<td>14-#13</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>4'-0&quot;</td>
<td>14'-0&quot;</td>
<td>16-#13</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>4'-0&quot;</td>
<td>16'-0&quot;</td>
<td>16-#13</td>
</tr>
<tr>
<td>150 mph</td>
<td>80</td>
<td>4'-0&quot;</td>
<td>13'-0&quot;</td>
<td>14-#13</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>4'-0&quot;</td>
<td>14'-0&quot;</td>
<td>16-#13</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>5'-0&quot;</td>
<td>18'-0&quot;</td>
<td>18-#13</td>
</tr>
<tr>
<td>170 mph</td>
<td>80</td>
<td>4'-0&quot;</td>
<td>13'-0&quot;</td>
<td>14-#13</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>4'-0&quot;</td>
<td>14'-0&quot;</td>
<td>16-#13</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>5'-0&quot;</td>
<td>20'-0&quot;</td>
<td>18-#13</td>
</tr>
</tbody>
</table>

**ADDITIONAL SHAFT DEPTH DUE TO GROUND SLOPE**

<table>
<thead>
<tr>
<th>Ground Slope</th>
<th>4'-0&quot; Shaft Diameter</th>
<th>5'-0&quot; Shaft Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:5</td>
<td>3'-0&quot;</td>
<td>4'-0&quot;</td>
</tr>
<tr>
<td>1:4</td>
<td>4'-0&quot;</td>
<td>5'-0&quot;</td>
</tr>
<tr>
<td>1:3</td>
<td>5'-0&quot;</td>
<td>6'-0&quot;</td>
</tr>
<tr>
<td>1:2</td>
<td>7'-0&quot;</td>
<td>8'-0&quot;</td>
</tr>
</tbody>
</table>
1. For Pull Boxes between Poles refer to Index 715-001.
2. Slabs to be placed around all Poles and Pull Boxes.
3. Seal in accordance with Specification 630.

NOTES:
1. At all pull boxes and pole bases, ends of conduit shall be sealed in accordance with Specification 630.
2. Slabs to be placed around all Poles and Pull Boxes.
3. For Pull Boxes between Poles refer to Index 715-001.
The contractor's attention is directed to the plan sheets detailing the mounting of luminaires at the pole top. Particular attention is directed to the alignment of luminaire light distributions. Special attention must be exercised in the physical alignment of the luminaires to ensure that the approved photometric layout is physically produced at each lighting standard in the field. A marking shall be placed on the external face of the refractor to allow visual inspection of alignment. The marking shall correspond to the 0° axis of the refractor.

The 2" slip fitter assembly is equally spaced around the ring. A surge protector shall be located in the pole with the circuit breaker. The surge protector shall be mounted at the front near the hand hole for easy access. A marking shall correspond to the 0° axis of the refractor for visual inspection of alignment. The marking shall correspond to the 0° axis of the refractor for visual inspection of alignment.

600 Volt rated Pole Cable, size of conductors to be determined by luminaire load. 600 Volt rated Circuit Breaker Cable, size of conductors to be determined by luminaire load.

All hardware for mounting heavy duty drill to pole shall be Stainless Steel.
6.5 heavy duty reversible or 1 HP Portable Motor(1) per project.
A step-down transformer provided with 1320V grounded receptacle for electric drill & receptacle for supply cable. (See schematic) 25' minimum remote control cable same as Pole Cable.

A marking shall correspond to the 0° axis of the refractor. A marking shall be placed on the external face of the refractor.
NOTES:

1. Use compacted select material in accordance with Index 120-001.
2. Concrete shall be Class NS with a minimum strength at 28 days of f'c=2.5 ksi.
3. Outside edge of slab shall be cast against formwork.
4. The pull box shown is 13" x 24" others approved under Specification 635 may be used.
5. Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
6. Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.
7. The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/8" of expansion material shall be removed after pouring the slab and sealed with an APL approved Type K sealant meeting the requirements of Specification 932.

Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.
STOP ZONE FOR RUBBER CROSSING

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Zone Length (Distance From Stop)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 or Less</td>
<td>250'</td>
</tr>
<tr>
<td>50 – 65</td>
<td>350'</td>
</tr>
<tr>
<td>65 – 70</td>
<td>500'</td>
</tr>
<tr>
<td>70</td>
<td>600'</td>
</tr>
</tbody>
</table>

Notes:

1. Type R Crossings are NOT to be used for multiple track crossings within zones for an existing or scheduled future vehicular stop. Zone lengths are charted above.

2. Single track Type R Crossings within the zones on the chart may be used unless engineering or safety considerations dictate otherwise.

GENERAL NOTES

1. The Railroad Company will furnish and install all track bed (ballast), crossties, rails, crossing surface panels and accessory components. All pavement material, including that through the crossing, will be furnished and installed by the Department or its Contractor, unless negotiated otherwise.

2. When a railroad grade crossing is located within the limits of a highway construction project, a transition pavement will be maintained at the approaches of the crossing to reduce vehicular impacts to the crossing. The transition pavement will be maintained as appropriate to protect the crossing from low clearance vehicles and vehicular impacts until the construction project is completed and the final highway surface is constructed.

3. The Central Rail Office will maintain a list of currently used Railroad Crossing Products and will periodically distribute the current list to the District Offices as the list is updated.

4. The Railroad Company shall submit engineering drawings for the proposed crossing surface type to the Construction Project Engineer and/or the District Rail Office for concurrence along with the list of Railroad Crossing Products. The approved engineering drawings of the crossing surface type shall be made a part of the installation agreement.

5. Sidewalks shall be constructed through the crossing between approach sidewalks of the crossing. Sidewalks shall be constructed with appropriate material to allow unobstructed travel through the crossing in accordance with ADA requirements.

6. Install pavement in accordance with the Specifications.

7. The Department will participate in crossing work, that requires adjustments to rail outside of the crossing, no more than 50 feet from the edge of the travel way.
**DESCRIPTION:**

**REVISION**

**LAST REVIEWED:**

**REVISED:**

**INDEX:**

**SHEET:**

**FAA/AIM STANDARD PLANS**

**REVISION:**

**LAST REVIEWED:**

**REVISED:**

**INDEX:**

**SHEET:**

**FAA/AIM STANDARD PLANS**

**REVISION:**

**LAST REVIEWED:**

**REVISED:**

**INDEX:**

**SHEET:**