**STEP 1:** Calculate the area and 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.

For the largest area, should be analyzed to determine the Column (Post) requirements.

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

**STEP 2:** Determine the height 'H' from groundline to the centroid of the individual sign or sign cluster.

Assume: 'B' = 1 ft., 'C' = 3 ft.

Calculated: $H = \frac{1}{2} \times X = 0.1 \text{ ft.}$

**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 (in.)</th>
<th>Local</th>
<th>Global</th>
<th>Global</th>
<th>$A_1$</th>
<th>$A_2$</th>
<th>$A_3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>$T_p$</td>
<td>$T_g$</td>
<td>$T_g$</td>
<td>$T_p$</td>
<td>$T_g$</td>
<td>$T_g$</td>
</tr>
<tr>
<td>(in.)</td>
<td>(in.)</td>
<td>(in.)</td>
<td>(in.)</td>
<td>(in.)</td>
<td>(in.)</td>
<td>(in.)</td>
</tr>
<tr>
<td>24 x 24</td>
<td>12</td>
<td>12/5 = 13.5</td>
<td>15/12 = 28</td>
<td>426</td>
<td>5,066</td>
<td>12,208</td>
</tr>
<tr>
<td>24 x 24</td>
<td>12</td>
<td>12/3 = 13.5</td>
<td>15/12 = 28</td>
<td>426</td>
<td>5,066</td>
<td>12,208</td>
</tr>
</tbody>
</table>

**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:**

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

2. Aluminum Sign, Wind Beams and Column (Post) Materials:

   A. Aluminum Plates: ASTM B209, Alloy 6061-T6
   B. Aluminum Bars and Extruded Shapes: ASTM B231, Alloy 6061-T6
   C. Aluminum Structural Shapes: ASTM B830, Alloy 6061-T6
   D. Cast Aluminum: ASTM B26, Alloy A356-T6
   E. Aluminum Weld Material: ER 5556 or 5356

3. Sign Mounting Bolts, Nuts and Washers:

   A. Aluminum Button Head and Flat Head Bolts: ASTM F468, Alloy 2024-T6
   B. Stainless Steel Nuts: ASTM F594
   C. All other Steel items (excluding stainless steel): Hot-dip Galvanize - ASTM A123
   D. Galvanized Hex Nuts: ASTM A563 Grade DH
   E. Galvanized High Strength Hex Head Bolts (Base
   F. Galvanized Bolts (Sleeve): ASTM A307 with Galvanized Hex Nuts and Washers
   G. Aluminum Button Head and Flat Head Bolts: ASTM F468, Alloy 2024-T6
   H. Stainless Steel Nuts: ASTM F594
   I. Aluminum Weld Material: ER 5556 or 5356

4. Stainless Steel Bolts, Nuts and Washers may be used in lieu of the Aluminum button head and flat head bolts as follows:

   A. Stainless Steel Bolts: ASTM F 593, Alloy 2024-T6
   B. Stainless Steel Nuts: ASTM F 594

5. Sign Column (Post) Bolts, Nuts and Washers:

   A. Galvanized U-Bolt (Column): ASTM A449 or ASTM A193 B7 according to ASTM A132 with double nuts
   B. Aluminum Bolts (Sleeves): ASTM F468, Alloy 6061-T6 or 6062-T6 and Washers B331.2, Alclad 2024-T4
   C. Galvanized High Strength Hex Head Bolts (Base Bolts): ASTM F3125, Grade 12.9, Type 1
   D. Galvanized Hex Nuts: ASTM A563 Grade D
   E. Galvanized Washers: ASTM F312
   F. Galvanized Bolts, Sleeves: ASTM A607 with Galvanized Hex Nuts and Washers

6. Coatings:

   A. Aluminum Fasteners: Anodic coating (0.002" inches max.) and chromate sealed
   B. High Strength Steel Bolts Nuts and Washers: ASTM F1329
   C. All other Steel items (excluding stainless steel): Hot dip Galvanize - ASTM A123
   D. Repair damaged galvanizing in accordance with Specification 363

7. BREAKAWAY SUPPORT REQUIREMENTS:

   Install non-frangible aluminum column (post) (larger than 3") with breakaway supports as shown on Sheet 4. Signs shielded by barrier wall or guardrail do not require breakaway support.
\[ x' = \frac{\Sigma (x \times A)}{\Sigma A} \quad y' = \frac{\Sigma (y \times A)}{\Sigma A} \]

- \( x' \) = Area of individual sign
- \( y' \) = Height of the edge of pavement from the mounting elevation
- \( C' \) = Height of the centroid of the sign or cluster from the edge of pavement elevation
- \( y \) = Individual sign height
- \( a \) = Individual sign width
- \( y'_c \) = Centroid horizontal location of sign or cluster from \( \Sigma \) Aluminum Column (Post)
- \( y'_m \) = Individual sign centroid horizontal location from \( \Sigma \) Aluminum Column (Post)

Notes:
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.

**Calculation of Sign Cluster Centroid**

**Typical Section**

**Design Example - Centroid**
### ALUMINUM COLUMN (POST) SELECTION TABLE (O.D. in.)

<table>
<thead>
<tr>
<th>O.D. (FT)</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>
<th>11 ft</th>
<th>12 ft</th>
<th>13 ft</th>
<th>14 ft</th>
<th>15 ft</th>
<th>16 ft</th>
<th>17 ft</th>
<th>18 ft</th>
<th>19 ft</th>
<th>20 ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 ft</td>
<td>2.5</td>
<td>3</td>
<td>3.5</td>
<td>4.0</td>
<td>4.5</td>
<td>5</td>
<td>5.5</td>
<td>6</td>
<td>6.5</td>
<td>7</td>
<td>7.5</td>
<td>8</td>
<td>8.5</td>
<td>9</td>
<td>9.5</td>
<td>10</td>
<td>10.5</td>
<td>11</td>
</tr>
<tr>
<td>9 ft</td>
<td>2.5</td>
<td>3.5</td>
<td>4</td>
<td>4.5</td>
<td>5</td>
<td>5.5</td>
<td>6</td>
<td>6.5</td>
<td>7</td>
<td>7.5</td>
<td>8</td>
<td>8.5</td>
<td>9</td>
<td>9.5</td>
<td>10</td>
<td>10.5</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>

### FOUNDATION TABLE

<table>
<thead>
<tr>
<th>Column (Post)</th>
<th>Drive Post</th>
<th>Foundation Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete (Class I)</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>2.0</td>
<td>½</td>
<td>4.5</td>
</tr>
<tr>
<td>2.5</td>
<td>½</td>
<td>5.0</td>
</tr>
<tr>
<td>3.0</td>
<td>½</td>
<td>5.0</td>
</tr>
<tr>
<td>3.5</td>
<td>½</td>
<td>6.0</td>
</tr>
<tr>
<td>4.0</td>
<td>½</td>
<td>6.0</td>
</tr>
<tr>
<td>4.5</td>
<td>½</td>
<td>6.0</td>
</tr>
<tr>
<td>5.0</td>
<td>½</td>
<td>6.0</td>
</tr>
</tbody>
</table>

### INSTALLING FRANGIBLE COLUMN SUPPORTS:

Columns (posts) 3½ 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.

### TOTAL PANEL AREA (SF)

- 8 ft: 30 sf
- 9 ft: 29 sf
- 10 ft: 28 sf
- 11 ft: 27 sf
- 12 ft: 26 sf
- 13 ft: 25 sf
- 14 ft: 24 sf
- 15 ft: 23 sf
- 16 ft: 22 sf
- 17 ft: 21 sf
- 18 ft: 20 sf
- 19 ft: 19 sf
- 20 ft: 18 sf

### COLUMN AND FOUNDATION TABLES

**NOTE:**

1. For offset sign placement see Index 700-101.
2. For signs with widths greater than 4 see Index 700-111.
3. Offset signs with driven posts require a soil plate.
NOTES:
1. Foundation Notes for Slip Base:
   A. Place Stub in concrete foundation given in the FOUNDATION TABLE using Class 1 Concrete.

2. Slip Base Fabrication Notes:
   A. The difference between the O.D. of the post and I.D. of the Sleeve must be 3 1/2" 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. Slip Base Assembly Instructions:
   A. Assemble the Slip Base as follows:
      1. Insert Post into Sleeve and connect using 2 - 1/2" diameter Sleeve Bolts. (See Detail 'A')
      2. Assemble top base plate to bottom Base Plate using Base Bolts (high strength) with 3 washers per bolt. (See Detail 'B').
      a. Place washer on each Base Bolt between the bottom Base Plate and the Base Bolt head.
      b. Place the next washer between the bottom Base Plate and the Bolt Keeper Plate.
      c. Use brass or galvanized steel shims to plumb the post.
      d. Add the top base plate section.
      e. Place the third washer between the Top Base Plate and the Nut.
   B. Orient the Bolt Keeper Plates in the Direction of Traffic.
   C. Tighten Base Bolts as follows:
      1. Tighten Base Bolts to the maximum possible with a 12" wrench (this will thread 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.
   D. Obtain a tight sleeve connection by placing 4 galvanized steel shims between the column (post) and sleeve. Space the shims every 6" around the perimeter of the column (1 between each bolt hole, 4 total). Use shims that are 1" shorter than the height of the sleeve.

SLIP BASE DETAILS

<table>
<thead>
<tr>
<th>Column (Post) Size</th>
<th>Sleeve Dia</th>
<th>Sleeve Height</th>
<th>Post Dia</th>
<th>Base Plate Dia</th>
<th>Hole Size 'D'</th>
<th>Hole Size 'H'</th>
<th>Base Plate Torque</th>
<th>Note Size 'D'</th>
<th>Shims</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot; I.D.</td>
<td>8&quot; x 10&quot;</td>
<td>1&quot;</td>
<td>4&quot; x 10&quot;</td>
<td>4&quot;</td>
<td>1&quot;</td>
<td></td>
<td>345 ft-lbs</td>
<td>1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>4&quot; I.D.</td>
<td>8&quot; x 10&quot;</td>
<td>1&quot;</td>
<td>4&quot; x 10&quot;</td>
<td>4&quot;</td>
<td>1&quot;</td>
<td></td>
<td>345 ft-lbs</td>
<td>1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>4&quot; I.D.</td>
<td>8&quot; x 10&quot;</td>
<td>1&quot;</td>
<td>4&quot; x 10&quot;</td>
<td>4&quot;</td>
<td>1&quot;</td>
<td></td>
<td>345 ft-lbs</td>
<td>1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>4&quot; I.D.</td>
<td>8&quot; x 10&quot;</td>
<td>1&quot;</td>
<td>4&quot; x 10&quot;</td>
<td>4&quot;</td>
<td>1&quot;</td>
<td></td>
<td>345 ft-lbs</td>
<td>1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>4&quot; I.D.</td>
<td>8&quot; x 10&quot;</td>
<td>1&quot;</td>
<td>4&quot; x 10&quot;</td>
<td>4&quot;</td>
<td>1&quot;</td>
<td></td>
<td>345 ft-lbs</td>
<td>1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>4&quot; I.D.</td>
<td>8&quot; x 10&quot;</td>
<td>1&quot;</td>
<td>4&quot; x 10&quot;</td>
<td>4&quot;</td>
<td>1&quot;</td>
<td></td>
<td>345 ft-lbs</td>
<td>1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>4&quot; I.D.</td>
<td>8&quot; x 10&quot;</td>
<td>1&quot;</td>
<td>4&quot; x 10&quot;</td>
<td>4&quot;</td>
<td>1&quot;</td>
<td></td>
<td>345 ft-lbs</td>
<td>1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>4&quot; I.D.</td>
<td>8&quot; x 10&quot;</td>
<td>1&quot;</td>
<td>4&quot; x 10&quot;</td>
<td>4&quot;</td>
<td>1&quot;</td>
<td></td>
<td>345 ft-lbs</td>
<td>1/2&quot;</td>
<td></td>
</tr>
</tbody>
</table>

SLIP BASE AND FOUNDATION DETAILS

1. Foundation Notes for Slip Base:
   A. Place Stub in concrete foundation given in the FOUNDATION TABLE using Class 1 Concrete.

2. Slip Base Fabrication Notes:
   A. The difference between the O.D. of the post and I.D. of the Sleeve must be 3 1/2" 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. Slip Base Assembly Instructions:
   A. Assemble the Slip Base as follows:
      1. Insert Post into Sleeve and connect using 2 - 1/2" diameter Sleeve Bolts. (See Detail 'A')
      2. Assemble top base plate to bottom Base Plate using Base Bolts (high strength) with 3 washers per bolt. (See Detail 'B').
      a. Place washer on each Base Bolt between the bottom Base Plate and the Base Bolt head.
      b. Place the next washer between the bottom Base Plate and the Bolt Keeper Plate.
      c. Use brass or galvanized steel shims to plumb the post.
      d. Add the top base plate section.
      e. Place the third washer between the top base plate and the nut.
   B. Orient the Bolt Keeper Plates in the direction of traffic.
   C. Tighten Base Bolts as follows:
      1. Tighten Base Bolts to the maximum possible with a 12" wrench (this will thread 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.
   D. Obtain a tight sleeve connection by placing 4 galvanized steel shims between the column (post) and sleeve. Space the shims every 6" around the perimeter of the column (I between each bolt hole, 4 total). Use shims that are 1" shorter than the height of the sleeve.
**Optional Slotted Holes**

**DETAIL "B"**

**ALUMINUM SOIL PLATE DETAIL**

- Ø Bolt Holes (Hole Spacing to match U-Bolts) (Washers as required)

**DRIVEN POST DETAIL**

(Fragile Post In Crossovers, Medians & Sidewalks)

**DRIVEN POST AND SOIL PLATE DETAIL**

- 3½˝ O.D. Max. Aluminum Column (Post) (Driven to Full Embedment)

**Concrete Sidewalk, Median, Etc.**
WIND BEAM CONNECTIONS DETAILS

SINGLE SIGN DETAIL

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

BACK-TO-BACK SIGN DETAIL

NOTES:
1. 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 66" 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 5/8" Sign. Install two wind beams on signs with heights greater than 12" and less than or equal to 66".

Wind Beam - Aluminum Zee
A
Wind Beam Length
1'-0" Max.
5/8" U-Bolt Sided Specifically For Column (Post) Diameter With Double Nuts
6" (Single Sign) 2'-9" Max.
5/8" Min.
6" Max.
6" (Double Sign) 1'-9" Min.
5/8" Max.
4" Max.
6" Max.
6" Max.

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

Align Top Of Signs

6 Bolts

Sign Face

Sign Face

A

VIEW A-A

WIND BEAM CONNECTION
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.
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 x 2½ x 3.38. Install Vertical Brace on 7'-0" to 8'-0" signs only.
5. Provide 2 x 0.0149" Thick (28 gauge) and 2 x 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>Sign Size</th>
<th>Column Size Diameter x Thickness</th>
<th>Sleeve Size Diameter x Thickness</th>
<th>U-bolt Diameter</th>
<th>Base Bolt Diameter x Length</th>
<th>Torque lbs/in</th>
<th>Base Plate Thickness</th>
<th>Footing Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>4'-0&quot; x 5'-0&quot;</td>
<td>4 NPS Schedule 80 (4.5&quot; x 0.337&quot;)</td>
<td>5 NPS Schedule 120 (5.562&quot; x 0.5&quot;)</td>
<td>1&quot;</td>
<td>7/32 &quot; x 3/32&quot;</td>
<td>250</td>
<td>1&quot;</td>
<td>6'-0&quot;</td>
</tr>
<tr>
<td>4'-0&quot; x 6'-0&quot;</td>
<td>4 NPS Schedule 80 (5.562&quot; x 0.432&quot;)</td>
<td>6 NPS Schedule 80 (6.625&quot; x 0.432&quot;)</td>
<td>1 1/8&quot;</td>
<td>5/8&quot; x 6&quot;</td>
<td>445</td>
<td>1 1/8&quot;</td>
<td>6'-0&quot;</td>
</tr>
</tbody>
</table>

VIEW A-A

SECTION B-B

SECTION C-C
NOTES:
1. Work with Index 700-010.
2. Shop Drawings: Not required.
3. Materials:
   A. Steel Plate: ASTM A36 or ASTM A709 Grade 36
   B. Steel Pipe (Support Post): ASTM A501 Schedule 40
   C. Aluminum Pipe: ASTM B429 Alloy 6063-T6
   D. Galvanized U-Bolts, Nuts and Plate Washers
      a. U-Bolts: ASTM A449
      b. Hex Nuts: ASTM A 563 Lock Nuts
      c. Plate Washer: ASTM A 36 or ASTM A570 Grade 36 or 50
   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
      d. Washers: ASTM F436
   F. Adhesive Anchor Bonding Material: Specification 931 Type HF Adhesive.
   G. Weld Material: E70XX
   H. 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 606-6.4
   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 1/32" 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.

SIGN SUPPORT ASSEMBLY

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

1. Existing Traffic Railings:
   A. 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.
   B. For concrete parapets less than 10" thick, through bolt 1/2" Heavy Hex Head Bolts with Nuts and Washers in lieu of Adhesive Bonded Anchors. Bolt heads shall not protrude more than 1" beyond traffic face of railing.
   C. For through bolting, 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 29/32".

2. New Traffic Railings:
   A. Optional Couplers are shown for slipforming; keep Anchor Bolt coupler threads free of concrete.
   B. For concrete parapets less than 10" thick, through bolt 1/2" Heavy Hex Head Bolts with Nuts and Washers in lieu of Adhesive Bonded Anchors. Bolt heads shall not protrude more than 1" beyond traffic face of railing.
   C. For through bolting, 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 29/32".

3. 36° Single-Slope Traffic Railing shown, other Traffic Railings and Parapets are similar.

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

A. 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.

B. For concrete parapets less than 10" thick, through bolt 1/2" Heavy Hex Head Bolts with Nuts and Washers in lieu of Adhesive Bonded Anchors. Bolt heads shall not protrude more than 1" beyond traffic face of railing.

C. For through bolting, 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 29/32".

Notes:

1. Existing Traffic Railings:
   A. 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.
   B. For concrete parapets less than 10" thick, through bolt 1/2" Heavy Hex Head Bolts with Nuts and Washers in lieu of Adhesive Bonded Anchors. Bolt heads shall not protrude more than 1" beyond traffic face of railing.
   C. For through bolting, 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 29/32".

2. New Traffic Railings:
   A. Optional Couplers are shown for slipforming; keep Anchor Bolt coupler threads free of concrete.
   B. For concrete parapets less than 10" thick, through bolt 1/2" Heavy Hex Head Bolts with Nuts and Washers in lieu of Adhesive Bonded Anchors. Bolt heads shall not protrude more than 1" beyond traffic face of railing.
   C. For through bolting, 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 29/32".

3. 36° Single-Slope Traffic Railing shown, other Traffic Railings and Parapets are similar.

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

A. 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.

B. For concrete parapets less than 10" thick, through bolt 1/2" Heavy Hex Head Bolts with Nuts and Washers in lieu of Adhesive Bonded Anchors. Bolt heads shall not protrude more than 1" beyond traffic face of railing.

C. For through bolting, 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 29/32".
SIGN SUPPORT ASSEMBLY

SIGN SUPPORT WELDMENT DETAIL

BASE PLATE

U-BOLT PLATE WASHER

END PLATE

DESCRIPTION:

SINGLE POST BRIDGE MOUNTED SIGN SUPPORT
NOTES:
1. Work with Index 700-010.
2. Shop Drawings: Not required.
3. Materials:
   A. Steel Plate: ASTM A36 or ASTM A709 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 A499
      b. Hex Nuts: ASTM A 563 Grade A
      c. Plate Washer: ASTM A 86 or ASTM A709 Grade 36 or 50
   D. Galvanized Anchor Bolts, Nuts and Washers:
      a. Anchor Bolt: ASTM F 1554 Grade 55 Fully Threaded (for Adhesive Anchors)
      b. Anchor Bolt: ASTM F 1554 Grade 55 Fully Threaded (for Welded Anchors)
      c. Nuts: ASTM A 325 Heavy Hex Locking
      d. Washers: ASTM F436
   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 F1329
   B. Other Steel: ASTM A123
5. Fabrication:
   A. Weld, Specification A60-6.4
   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. 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 cut anchors as necessary to maintain correct placement of C-1-P Embedded Anchor
      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
7. Removal of Temporary Signs on Permanent Traffic Railings:
   A. Cut anchor rods flush with the top of the railing
   B. Coat anchors with Type F-1 epoxy to prevent corrosion
      a. Exceed 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.

### 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>≤ 135 in²</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>&gt; 135 in²</td>
<td>≥ 135 in² ≤ 20</td>
<td>≥ 35</td>
</tr>
<tr>
<td>Permanent Signs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Index 521-001 Median Barrier shown; others similar)
**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>A</td>
<td>C</td>
</tr>
<tr>
<td>521-001</td>
<td>Cantilever or L-Wall</td>
<td>B</td>
<td>D</td>
</tr>
</tbody>
</table>

**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.

**DESCRIPTION:**

**LAST REVISION**
3/01/17

**INDEX**
700-013

**SHEET**
2 of 2
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 A999, Grade 36
      b. Steel Weld Metal: E70XX
      c. Shims: Brass ASTM B36 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 F221, Alloy 2024-T4
   D. Stainless Steel Bolts, Nuts and Washers: ASTM F2329
   E. Galvanized Washers: ASTM F436
   F. Concrete: Class 2
   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 F593, CW1 or SH1
   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 Plate 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 2) Tighten Base Bolts in accordance with Instructions Notes on Sheet 2.
## FOUNDATION NOTES:

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

At the Contractor's option, the #4 tie bars at 12" o.c. may be replaced by D10 Spiral Wire @ 6" pitch, with three flat turns at the bolt and one flat turn at the bottom in accordance with Specification 415.

## 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, and 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) and 2-0.0329" thick (21 gauge) shims per column.

   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 galling.
Wind Beam (Typ.) See Table For Number

### Wind Beam Table (Z 3 x 2½g x 2.33)

<table>
<thead>
<tr>
<th>Number of Horizontal Wind Beams Based on Sign Depth (D)</th>
<th>2 Beams</th>
<th>3 Beams</th>
<th>4 Beams</th>
<th>5 Beams</th>
<th>6 Beams</th>
</tr>
</thead>
<tbody>
<tr>
<td>D &lt; 5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6 ≤ D &lt; 10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>D ≥ 10</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td>24</td>
</tr>
</tbody>
</table>

### Hanger Table (I 6 x 4.69 or Z 5 x 3 x 6.19)

<table>
<thead>
<tr>
<th>Number of Vertical Hanger Beams Based on Wind Speed and Sign Length (L)</th>
<th>2 Hangers</th>
<th>3 Hangers</th>
<th>4 Hangers</th>
<th>5 Hangers</th>
<th>6 Hangers</th>
</tr>
</thead>
<tbody>
<tr>
<td>130 mph</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>150 mph</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>170 mph</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

**NOTE:** For Monroe County designs, use 170 mph values but with Z 5 x 3 x 6.19 vertical hanger beams only.

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 B574, Alloy 6061-T6
     - c. Bars, and Extruded Shapes: ASTM B 221, Alloy 6061-T6 or Alloy 6262-T9
       - d. Washers: ASTM B221, Alclad 2024-T4
   - B. Steel:
     - a. 2-Bolts: ASTM A499 or ASTM A193 B7
     - b. U-Bolts: ASTM A193 B7
     - c. Washers: ASTM F467, Alloy 6061-T6 or Alloy 6262-T9
   - C. Coatings:
     - a. Aluminum Bolts, Nuts and Washers: Anodic 0.0002 inches thick and chrome sealed.
     - b. Galvanized Steel Bolts, Nuts and Washers: ASTM F2329
     - c. 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 3/8"-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.)

2. Materials:
   A. Steel Pipe: ASTM A53 (Grade A or B)
   B. Steel Plate: ASTM A36
   C. Bolts: ASTM A307
   D. Hex Nuts: ASTM A563


4. All pipe dimensions are NPS.

5. Chord O.D. ± 2" (Min.)

6. "Ø Holes On 5" Ø

7. "Ø Holes On 9" Ø

8. "Ø Holes Thru 3" Sleeve

9. "Ø Holes Thru 3" Sleeve

10. "Ø Holes Thru 3" Sleeve

11. "Ø Holes Thru 3" Sleeve

12. "Ø Holes Thru 3" Sleeve

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99. "Ø Holes Thru 3" Sleeve

100. "Ø Holes Thru 3" Sleeve
NOTES:
1. Work this Index in conjunction with CANTILEVER SIGN STRUCTURE
DATA TABLES in the Plans and Index 700-030.
2. Handholes are required at pole base for DMS Structures. Refer to Index 700-050 for Handhole Details.

3. Shop Drawings are required.
   Obtain Shop Drawing approval prior to fabrication. Include the following:
   A. Upright Pipe height (F) and Foundation elevations. Verify dimension in the field prior to submittal 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:
   A. Sign Structure:
      a. Upright and Chords (Steel Pipe): API 5L X42 PSL2, 42 ksi yield or ASTM A606, Grade B (Wsh)
      b. Steel Angles and Structural Plates and Bars: ASTM A709 Grade 36
      c. Wood Material: ETSE
   B. Bolts, Nuts and Washers:
      a. High Strength Bolts: ASTM F3125, Grade AS2 Type 1
      b. Nuts: ASTM AS83 Grade DH Heavy-Hex
      c. Washers: ASTM F436 Type 1, one under turned element
   C. Anchor Bolts, Nuts and Washers:
      a. Anchor Bolts: ASTM F1554 Grade 55
      b. Nuts: ASTM AS83 Grade A Heavy-Five (5 per bolt)
      c. Plate Washers, ASTM A36 (2 per bolt)
   D. Concrete:
      a. Spread Footing Concrete: Class IV
      b. Drilled Shaft Concrete: Class IV (Drilled Shaft)
   E. Reinforcing Steel: Specification 415

5. Fabrication:
   A. Welding: Specification 460-6.4
   B. Chord Splices: "SD" Panel from upright is the closest panel in which a chord splice may be used. See Plans for CANTILEVER SIGN STRUCTURE DATA TABLE: Minimum splice spacing is two truss panel lengths apart.
   C. Upright Splices: Not allowed
   D. Structural bolt hole diameters: Bolt diameter plus 1/2"
   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 F3209
   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. Split-Lock Washers are not permitted.
   F. Install Aluminum Sign Panels as shown in the Plans.
   G. Place structural grub pad with drain between top of foundation and bottom of baseplate in accordance with Specification 649-7.
   H. Disassemble, as necessary, and secure components for shipment.

8. Components:
   A. Upright-Pipe height (F) before truss installation by using leveling bolt at Base Plate
   B. Anchor bolt hole diameters: Bolt diameter plus 1/4"
   C. Structural bolt hole diameters: Bolt diameter plus 1/2"
   D. Anchor bolt hole diameters: Bolt diameter plus 1/4"
   E. Hot Dip Galvanize after fabrication.
   F. 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.

9. Considerations:
   A. Work this Index in conjunction with CANTILEVER SIGN STRUCTURE
   B. Obtain Shop Drawing approval prior to fabrication. Include the following:
   C. Verify dimension in the field prior to submittal to ensure minimum vertical clearances of the sign panel over the roadway.
   D. Height of the foundation above adjacent ground.
   E. Anchor bolt orientation with respect to centerline of truss and the direction of traffic.
   F. Handholes at pole base (when required).

10. Conclusion:
    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. Split-Lock Washers are not permitted.
    F. Install Aluminum Sign Panels as shown in the Plans.
    G. Place structural grub pad with drain between top of foundation and bottom of baseplate in accordance with Specification 649-7.

ISOMETRIC VIEW
CAMBER DIAGRAM
CANTILEVER SIGN ASSEMBLY
### Notes:

1. Construction joint allowed, roughen surface to 1/16" 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.

### Directions of Travel

- **Plan**: CANTILEVER ASSEMBLY
- **Side Elevation**: CANTILEVER ASSEMBLY
- **Front Elevation**: CANTILEVER ASSEMBLY
- **Foundation**: CANTILEVER ASSEMBLY
- **Base Plate Connection**: CANTILEVER ASSEMBLY

### Foundation Details:

- **Footings and Pedestals**: Footing and Pedestal
- **Drilled Shaft**: Drilled Shaft
- **Foundation**: Foundation
- **Base Plate Connection**: Base Plate Connection

### Drainage Details:

- **Drainage**: Drainage
- **Leveling**: Leveling

### Structural Details:

- **Weld Size**: Weld Size
- **Cut Corner**: Cut Corner
- **Weld Plate Washer**: Weld Plate Washer
- **Anchor Bolt**: Anchor Bolt
- **Double Nut**: Double Nut
NOTE:
1. Wrap fillet weld around the stiffener termination on the tube wall.
2. Truss Chord Bolts:
   A. Top and Bottom, Install 'TC' hex head bolts.
   B. Back, Install 'TB' hex head bolts.

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

UPRIGHT-TRUSS CONNECTION DETAIL
(Web Members From Back Truss Chord Omitted For Clarity)

NOTE:
1. Wrap fillet weld around the stiffener termination on the tube wall.
2. Truss Chord Bolts:
   A. Top and Bottom, Install 'TC' hex head bolts.
   B. Back, Install 'TB' hex head bolts.

10/29/19
8:23:32 AM

REVISION DESCRIPTION:
LAST INDEX SHEET
REVISION
700-040 3 of 5

STANDARD PLANS
CANTILEVER SIGN STRUCTURE
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.

<table>
<thead>
<tr>
<th>Bolt Size</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8&quot; Ø</td>
<td>43/4&quot; 2½&quot;</td>
</tr>
<tr>
<td>1/4&quot; Ø</td>
<td>3½&quot; 1½&quot;</td>
</tr>
<tr>
<td>1/8&quot; Ø</td>
<td>2½&quot; 1½&quot;</td>
</tr>
<tr>
<td>5/32&quot; Ø</td>
<td>2½&quot; 1½&quot;</td>
</tr>
</tbody>
</table>

DETAIL 'D'
- 'E' Truss Web Angles (Typ.)
- 'B' Panel Length (Typ.)
- See DETAIL 'G'
- See DETAIL 'F'
- See DETAIL 'E'

DETAIL 'E'
- 'E' Truss Web Angles (Typ.)
- See DETAIL 'H'
- See DETAIL 'F'

DETAIL 'F'
- 'E' Truss Web Angles (Typ.)
- See DETAIL 'G'
- See DETAIL 'F'

DETAIL 'H'
- 'E' Truss Web Angles (Typ.)
- See DETAIL 'G'

DETAIL 'J'
- 'E' Truss Web Angles (Typ.)
- See DETAIL 'G'

TRUSS PLUGS
- See DETAIL 'F'
- See Upright-Truss Connection Detail (Sheet 3)

TRUSS PLUG (Typ.)
- See DETAIL 'F'

TRUSS CHORD (Typ.)
- 'GB' Ø Hex Head Bolts
- See Upright-Truss Connection Detail (Sheet 3)

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

Span length, comprised of 'N' equal panels

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

PLAN

SIDE ELEVATION

FRONT ELEVATION

UPRIGHT CAP DETAIL
NOTES:
1. Work this Index in conjunction with SPAN SIGN STRUCTURE DATA TABLES in the Plan and Index 700-020.
2. Handholes at the pole base are required for OMS 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, K) 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 PS12, 42 ksi yield or ASTM A500, Grade B (Min).
      b. Steel Angles and Plates: ASTM A709 grade 36
      c. Wedge Material: E70XX
   B. Bolts, Nuts and Washers:
      a. High Strength Bolts: ASTM F3122, Grade A325, Type 1
      b. Nuts: ASTM A563 Grade A Heavy-Hex
      c. Washers: ASTM F436, Type 1, one under turned element
   C. Anchor Bolts, Nuts and Washers:
      a. High Strength Bolts: ASTM F3122, Grade A325, Type 1
      b. Nuts: ASTM A563 Grade A Heavy-Hex (5 per bolt)
      c. Plated Washers: ASTM A152 (per bolt)
   D. Concrete: Class IV (Drilled Shaft)
   E. Reinforcing Steel: Specification 415
   F. Welding: Specification 460-6.4
   G. Coatings:
      a. Hot Dip Galvanize after fabrication.
      b. High Strength Bolts: ASTM F3125, Grade A325, Type 1
      c. Weld Material: E70XX

5. Fabrication:
   A. 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.
   B. Disassemble as necessary and secure components for shipment.

6. Coatings:
   A. High Strength Bolts: ASTM F3122
   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. Handholes at pole base (when required).
   F. After installation, place wire screen between top of foundation and bottom of baseplate in accordance with Specification 649-6.

DESCRIPTION:
FY 2020-21
STANDARD PLANS

INDEX
700-041
1 of 5
**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).

**DESCRIPTION:**

- **Foundation:**
  - Foundation Elevation (See Note 1)
  - Shaft Dia
  - 2'-0" Min (Min)
  - Tie Bar (Typ)
  - Cover (Typ)
  - CSL Tube (Typ)
  - #5 Tie Bar
  - Cover (Typ)
  - #5 Tie Bars: 6 Spaces @ 4"
  - Double Nut (Typ)

- **Drilled Shaft:**
  - Drilled Shaft
  - Shaft Dia
  - 2'-0" Min (Typ)
  - Cover (Typ)
  - 5 Spaces @ 4"
  - #5 Tie Bars: 6 Spaces @ 4"
  - Cover (Typ)
  - 5 Spaces @ 4"
  - Cover (Typ)
  - Bars Equally Spaced
  - Double Nut (Typ)
  - Bars Equally Spaced

- **Anchor Bolt:**
  - Anchor Bolt
  - Bolt Diameter (Max)
  - 2 x Bolt Dia
  - 2 Bolt Dia
  - 2 x Bolt Dia

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  - Bolt Diameter (Max)
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  - Bolt Diameter (Max)
  - 2 x Bolt Dia
  - 2 Bolt Dia
  - 2 Bolt Dia
SPAN SIGN ASSEMBLY

Upright-Truss Connection

SPAN SIGN STRUCTURE

SECTION A-A

Upright-Truss Connection Detail

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.

<table>
<thead>
<tr>
<th>Bolt Diameter (in.)</th>
<th>Distance (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>1%</td>
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<tr>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>%</td>
<td>2%</td>
</tr>
<tr>
<td>%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Front Elevation

Side Elevation

TRUSS

Back-Side Sign Mounting

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.

See DETAIL 'D'

See DETAIL 'E'

See DETAIL 'F'

See DETAIL 'G'

See DETAIL 'H'

See DETAIL 'I'

See DETAIL 'J'

See DETAIL 'K'

See DETAIL 'L'

See DETAIL 'M'

See DETAIL 'N'

See DETAIL 'O'

See DETAIL 'P'

See DETAIL 'Q'

See DETAIL 'R'

See DETAIL 'S'

See DETAIL 'T'

See DETAIL 'U'

See DETAIL 'V'

See DETAIL 'W'

See DETAIL 'X'

See DETAIL 'Y'

See DETAIL 'Z'

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<tr>
<td>1%</td>
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<td>%</td>
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<tr>
<td>%</td>
<td>2%</td>
</tr>
</tbody>
</table>
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 submittal of structural calculations and Shop Drawings that have been prepared by and sealed by the Specialty Engineer.

Mast Arm Assembly

Span Wire Assembly

NOTES:
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 A414, Grade 70
      iii. D-Bolts: ASTM 4404 or A193 B7
      iv. Steel Bolts, Nuts, and Washers:
         1. High Strength Bolts: ASTM F3125, Grade A325, Type 1
         2. Nuts: ASTM F567
         3. Washers: ASTM F463 (Flat Washer)
   b. Coatings:
      i. All nuts, bolts and washers ASTM F2239
      ii. All other steel items ASTM 4123
      iii. Bolt hole diameters: Bolt plus 0.01" 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 structure.
   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.
   g. 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.
   h. Bends in the conduit must be greater than the minimum bending radius for the cable contained in the conduit.
   i. Completely encase all data, fiber optic and power cables for the DMS within the sign structure or in conduit.
   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.
CANTILEVER STRUCTURE PLAN VIEW

SPAN STRUCTURE PLAN VIEW

CANTILEVER STRUCTURE ELEVATION VIEW

SPAN STRUCTURE ELEVATION VIEW

DYNAMIC MESSAGE SIGN GENERAL LAYOUT

NOTE: Actual number and direction of travel lanes varies.

DYNAMIC MESSAGE SIGN WALK-IN
DYNAMIC MESSAGE SIGN GROUNDING AND CONDUIT DETAIL

POLE MOUNTED CABINET

GROUND MOUNTED CABINET

**POLE MOUNTED CABINET**

- **To Ground Rod C As Required**
- **To Ground Rod D As Required**
- **Transition Conduit Outside of Foundation (Typ.)**
- **Power Conduit (2" PVC)**
- **Spare Conduit (2" PVC) with #3 AWG Tin-Plated Bare Solid Copper Ground Wire Bonded to DMS Structure and Ground Rod with Exothermic Weld**
- **2" PVC Conduit**
- **Fiber Optic Communications Conduits (2" PVC)**
- **Concrete Slab**
- **Handrail (See DETAIL "E")**
- **Catwalk**
- **As Shown On Plans**
- **Foundation (Typ.)**
- **Outside of Transition Conduit**
- **Service and Communications Conduits for Electrical**
- **2~2" Watertight 2" Flexible Conduits**
- **2~J-Hooks to Support**

**GROUND MOUNTED CABINET**

- **To Power Service Assembly**
- **Ground Rod B As Required (See DETAIL "C")**
- **Ground Rod A As Required (See DETAIL "D")**
- **40'-0" (Typ.)**
- **3'-0" Max.**
- **12'-0" Min.**
- **Primary Ground Rod Assembly (See DETAIL "D")**
- **Spare Conduit (2" PVC)**
- **Fiber Optic Pull Box**
- **(See DETAIL "B")**
- **Fiber Optic Communications Conduits (2" PVC)**
- **As Shown On Plans**
- **Foundation (Typ.)**
- **Outside of Transition Conduit**
- **Service and Communications Conduits for Electrical**
- **2~2" Watertight 2" Flexible Conduits**
- **2~J-Hooks to Support**

**DYNAMIC MESSAGE SIGN WALK-IN**

- **Air Terminal (Typ.)-3/4" ETP Alloy 110 Copper (Class II) Surface**
- **Base of 8 Square-Inches Minimum Contact Area Per NFPA 780-4.16.3**
- **Removable Top Plate**
- **2~1/2" Threaded Couplings**
- **2~2" Watertight 2" Flexible Conduits for Electrical Service and Communications**
- **2" PVC Conduit with #3 AWG Tin-Plated Bare Solid Copper Ground Wire Bonded to DMS Structure and Ground Rod with Exothermic Weld**
- **2" PVC Conduit**
- **Fiber Optic Pull Box**
- **(See DETAIL "B")**
- **Foundation (Typ.)**
- **Outside of Transition Conduit**
- **Service and Communications Conduits for Electrical**
- **2~2" Watertight 2" Flexible Conduits**
- **2~J-Hooks to Support**

---

**DETAL "A"**

- **Access Door**
- **Dynamic Message Sign**
- **Door Latch/Handle**
- **Handrail**
- **Post**
- **Grating**
- **Catwalk**
- **Air Terminal**
- **2" PVC Conduit with #3 AWG Tin-Plated Bare Solid Copper Ground Wire Bonded to DMS Structure and Ground Rod with Exothermic Weld**
- **2" PVC Conduit**
- **Fiber Optic Pull Box**
- **(See DETAIL "B")**
- **Foundation (Typ.)**
- **Outside of Transition Conduit**
- **Service and Communications Conduits for Electrical**
- **2~2" Watertight 2" Flexible Conduits**
- **2~J-Hooks to Support**

---

**DESCRIPTION:**

REVISION LAST of STANDARD PLANS FY 2020-21 SHEET INDEX 700-090 3 of 5
**Detail "B"**

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

**Detail "C"**

- 2D Radius Each "Sphere of Influence"
- Ground Rod C
- #2 AWG
- 90° (Typical)
- Ground Rod D
- Sign Structure Foundation

**Detail "D"**

- Ground Rod Array Detail
- Typical (2D Rods, 40' Spacing)

**Detail "E"**

- Pole
- Partial Penetration Weld (Typ.)
- Tack Welded Cover Clip (Typ.)
- 11 Gage Handhole Cover
- 1/2" Ø Stainless Steel Hex Head Screw (Typ.)

**Section A-A**

- 11 Gage Handhole Cover
- 1/4" Hole (Typ.)
- Full Penetration Weld

**Ground Rod Details**

- Ground Rod B
- Ground Rod C
- Ground Rod D

**Overview**

- Finished Grade
- Pull Box
- Grounding Conduit
- Ground Rod

*(Pole Mounted Cabinet Configuration Shown)*

**Dynamic Message Sign Walk-In**

**Fiscal Year 2020-21 Standard Plans**

**Index 700-090**

**Sheet 4 of 5**
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 1'-0".

4. Maximum spacing of Catwalk hanger supports is 5'-0". Cantilever ends of grating is 8'-0".

5. Galvanized steel walkway grating meeting the requirements of Specification 504-23. Must support a 90 psf load and have a 3/16" 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
   D. High Strength Bolts, Nuts and Washers: Specification 962
   E. U-Bolts, nuts and washers: 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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<td>2</td>
<td>General Assembly and Fixed Base Details</td>
</tr>
<tr>
<td>3</td>
<td>Walkway Support Details</td>
</tr>
</tbody>
</table>

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CATWALK ASSEMBLY

(Cantilever Shown, Span Similar)
NOTES:
1. See manufacturer details for walkway planks and bolting criteria.
2. Fasten securely. See grating manufacturer details.
**Fall Protection Requirements**

- **Horizontal Life Line** Attached to W8x15 Hanger Meeting OSHA Requirements

**W8x15 Walkway Support**

- 2-⅝" @ U-Bolt (Typ.)

**W8x15 Hanger (Typ.)**

- Minimum 2 Required at 5'-0" Max. Spacing

**Truss Chord (Typ.)**

- See DETAIL "C"

**3'-0" Walkway Grating (Typ.)**

- Fixed Base

**W8x15 Support Beam (Typ.)**

- Bolting Plate (Typ.)

**W8x15 Hanger (Cap Open End)**

- with Nuts and Washer

**W8x15 Support Beam (Typ.)**

- Ø Galv. Steel U-Bolt

**Guiderail (Cap Open End)**

- ⅜" Ø Hole for U-Bolt (Typ.)

**Stiffener (Typ.)**

- Ø Holes (4)

**Stiffener Plate (Typ.)**

- See DETAIL "E"

**2'-11½" Max. Chain Link Infill Panel**

- Flange Plate (4 Typ.)

**Infill Panel to Lap Inside Toe Kick**

- ⅜" Ø Holes (4)
TYPICAL SECTIONS FOR PLACEMENT OF SINGLE AND MULTI-COLUMN SIGNS

CASE I
Use on Limited Access Roadways

CASE II
Use on Arterial and Collector Roadways, and Limited Access Ramps

CASE III
Use on Arterial and Collector Roadways

CASE IV
Use on Limited Access Roadways

CASE V
Use in Business or Residential Areas Only

CASE VI
Use on Roadways With Signs Behind Guardrail

CASE VII
REST AREA AND EXIT GORE SIGNS
Use on Limited Access Roadways

CASE VIII
Use on Island or Curbed Median

CASE IX
MILE POST MARKER
Use on Limited Access Roadways

CASE X
WRONG WAY SIGNS
Use on Interstate Exit Ramps

GENERAL NOTES:
1. Single-Column Signs Shown, Multi-Column Signs similar. These typical sections serve as a guide for locating the traffic signs required under various roadside conditions. For size and details of sign construction and footing, refer to the appropriate Index and Plans.
2. Verify the length of sign supports in the field prior to fabrication.
3. Install ground signs at an angle of 1 to 4 degrees away from the traffic flow (see illustrations). Install shoulder mounted signs rotated clockwise and median mounted signs rotated counterclockwise. Install signs on a curve as noted above from the perpendicular to the motorist line of sight.
4. The setback for Stop and Yield signs may be reduced to 3 minimum from the Edge of Travelled Way if required for visibility in business or residential sections with no curb and speeds of 30 MPH or less.
5. The mounting heights are measured from the bottom edge of the sign panel to a horizontal line extended from the traveled or from the traveled way or from the ground surface at the back of curb. If the standard heights cannot be met, the minimum heights are as follows:
   - Limited Access Roadways - 7'
   - Arterial and Collector Roadways: 5' - Rural
   - Urban (including residential with parking and/or pedestrian activity)
   - Limited Access Roadways:
     - If a secondary sign is mounted below the major sign, mount the major sign so that the bottom of the sign is at least 8' above the edge of the traveled way and the secondary sign at least 3' above the edge of the traveled way.
     - Arterial and Collector Roadways:
       - Rural, mount the secondary sign at least 5' above the edge of the traveled way.
       - Urban, mount the secondary sign at least 7' above the edge of the traveled way.
   - Setbacks for signs behind guardrails:
     - Limited Access Roadways - 7'
     - Arterial and Collector Roadways:
       - 3' minimum from the Edge of Traveled Way
6. Do not install sign supports in the bottom of ditches.
7. Install sign supports so they do not reduce the accessibility of sidewalks or shared use paths less than 4 min. clear width.

For more information refer to Section 2H of the MUTCD.
**NOTES:**
1. Florida marker shall have Black Legend with White Background.
2. Stroke width of State Outline shall be 1".
3. Stroke width of State Outline shall be 1".
4. Border on Blue Background.
5. Border on Blue Background.

**INDEPENDENT USE FOR FREEWAY**

**3 OR 4 DIGITS**

<table>
<thead>
<tr>
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<th>NUMERAL SIZE</th>
<th>SERIES LEGEND</th>
<th>PANEL SIZE</th>
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<tr>
<td>1-3</td>
<td>1⅜&quot; C</td>
<td>D</td>
<td>48&quot; x 36&quot;</td>
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<tr>
<td>4</td>
<td>1⅜&quot; C</td>
<td>C</td>
<td>48&quot; x 36&quot;</td>
</tr>
</tbody>
</table>

**INDEPENDENT USE OTHER THAN FREEWAY**

**3 or 4 DIGITS**

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<tbody>
<tr>
<td>1</td>
<td>8&quot; C</td>
<td>D</td>
<td>30&quot; x 24&quot;</td>
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<tr>
<td>2</td>
<td>8&quot; C</td>
<td>B</td>
<td>30&quot; x 24&quot;</td>
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</tbody>
</table>

**GUIDE SIGN USE**

**1 OR 2 DIGITS**

**3 OR MORE DIGITS**

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<tr>
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<th>NUMERAL SIZE</th>
<th>SERIES LEGEND</th>
<th>PANEL SIZE</th>
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</thead>
<tbody>
<tr>
<td>1-2</td>
<td>10&quot; D</td>
<td>D</td>
<td>24&quot; x 24&quot;</td>
</tr>
<tr>
<td>3</td>
<td>8&quot; D</td>
<td>D</td>
<td>20&quot; x 24&quot;</td>
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</table>

**INDEX**

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<thead>
<tr>
<th>SIGN</th>
<th>DIMENSIONS</th>
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<tbody>
<tr>
<td>4 DIGIT POST MOUNTED</td>
<td>25¾&quot; x 42&quot;</td>
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<tr>
<td>2 DIGIT OVERHEAD</td>
<td>21½&quot; x 36&quot;</td>
</tr>
<tr>
<td>3 DIGIT OVERHEAD</td>
<td>23½&quot; x 42&quot;</td>
</tr>
<tr>
<td>4 DIGIT OVERHEAD</td>
<td>25½&quot; x 48&quot;</td>
</tr>
</tbody>
</table>

**Rectangular Yellow Background Dimensions (See Note 3)**

<table>
<thead>
<tr>
<th>SIGN</th>
<th>DIMENSIONS</th>
</tr>
</thead>
<tbody>
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<td>4 DIGIT POST MOUNTED</td>
<td>25⅞&quot; x 42&quot;</td>
</tr>
<tr>
<td>2 DIGIT OVERHEAD</td>
<td>22⅞&quot; x 36&quot;</td>
</tr>
<tr>
<td>3 DIGIT OVERHEAD</td>
<td>24⅞&quot; x 42&quot;</td>
</tr>
<tr>
<td>4 DIGIT OVERHEAD</td>
<td>27⅞&quot; x 48&quot;</td>
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</table>

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<td></td>
</tr>
</tbody>
</table>
SAFETY BELT CHILD RESTRAINT USE REQUIRED BY LAW

RECYCLING COLLECTION CENTER

WEIGHT LIMIT RESTRICTION AHEAD

DESCRIPTION:

REVISED 01/18

INDEX
700-102

SPECIAL SIGN DETAILS

6 of 11
**Official Use Only**

**Travel Info Call 511**

**Vending Machines**

**No Pedestrians Bicycles Motor Vehicles Less Than 5 Bhp**

**Emergency Info XX.X FM**

**Fire Smoke Area**

**FTP-62-06**

3 x 3
2" Radii /¾" Border
4" Series C Legend
Yellow Background Black Legend and Border

**FTP-65-06**

3 x 3
2" Radii /¾" Border
4" Series D Legend
White Legend and Border

**FTP-66-06**

4 x 3
2" Radii /¾" Border
7" Series D Legend
White Background
Black Legend and Border

**FTP-67-06**

3 x 4
2" Radii /¾" Border
5" Series D Legend
Blue Background
White Legend and Border

**FTP-68A-06**

9" x 1"-3"
1.5" Radii /¾" Border
Series B Legend
White Background
Black Legend and Border

**FTP-68B-06**

9" x 1"-6"
1.5" Radii /¾" Border
Series B Legend
White Background
Black Legend and Border

**FTP-69-06**

2" and 3" Series D Legend
4" Radii ¾" Border
White Legend and Border
Blue Background

**FTP-70-06**

3" x 2.65"
22° Radii /¾" Border
5" Series C Legend and 7" Series C Legend
Yellow Background
White Legend and Border

**FTP-71-06**

4" x 4"
2" Radii ¾" Border
4" Series C Legend
Yellow Background
Black Legend and Border

**FTP-72-06**

3 x 3
2" Radii ¾" Border
8" Series C Legend
Yellow Background
Black Legend and Border

**FTP-73-06**

5" x 2.65"
8" Radii ¾" Border
Blue Background
White Legend and Border

**FTP-74-06**

5" x 2.65"
8" Radii ¾" Border
Blue Background
White Legend and Border
GENERAL NOTES

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

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

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).

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.

Note: Roadway not drawn to scale.
Distances shown are adequate for driver communication but may be altered slightly if conditions require.

FOR LIMITED ACCESS HIGHWAYS
DESCRIPTION:

STATE OF FLORIDA
WELCOME CENTER
1 MILE

STATE OF FLORIDA
OFFICIAL
WELCOME CENTER

1/2 MILE

SIGN FTP-15B-06
SIGN FTP-15C-06

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

2,240'
2,240'

FOR PRIMARY HIGHWAYS

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 FTP-06 should be used depending on speed, roadside development & geometric conditions.

FTP-12-06
FTP-12-06

800' Maximum For Rural Conditions
50' Minimum For Rural Conditions
One-Way Traffic

2-Way Traffic

DESCRIPTION:

See Note 2. Minimum of three Type 2 Object Markers (Yellow) for every 50' for 1570'

For Paved Shoulders:

- 1' White @ 45°
- White on Right and Yellow on Left.

- 6' Solid Yellow
- 6' Solid White
- 6' Double Yellow
- 6' Skip Yellow
- 6' Skip White

- 6" Solid White
- 6" Solid Yellow
- 6" Double Yellow
- 6" Skip Yellow
- 6" Skip White

- Type 2 Object Markers (WHITE) Installed behind guardrail.
- Type 2 Object Markers (YELLOW) Installed behind guardrail.
- Black on Yellow 12" X 36" OM3L
- Black on Yellow 12" X 36" OM3R

- 4 Spaces @ 50'
- 4 Spaces @ 50'

- Slab Approach Bridge Begin
- Slab Approach Bridge Begin

70' 4 Spaces @ 50'

RURAL NARROW BRIDGE TREATMENT

FY 2020-21

STANDARD PLANS

700-106

INDEX

1 of 2
NOTES:

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

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

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

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

**LAST REVISION:** 11/01/17

**REVISION OF STANDARD PLANS FY 2020-21 SHEET INDEX 11/01/17**

**Note:** Signs D8-3 to be placed at or near the theoretical gore.

**WEIGH STATION SIGNING**

**WEIGH STATION**
- **STATION 1 MILE**
  - D8-1
  - FTP-1-06
  - D8-2
  - FTP-2-06
  - D8-3
  - FTP-3-06
  - FTP-83-08

**ALL TRUCKS ENTER**
- **WEIGH STATION**
- **NEXT RIGHT**

**WEIGH STATION 1 MILE**
- **500' Min.**
- **300' Min.**

**TYPICAL SIGNING FOR TRUCK WEIGH AND INSPECTION STATIONS**

**4 - LANE DIVIDED INSTALLATION**

**2 - LANE INSTALLATION**

**MEDIAN INSTALLATION**
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.
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 B308 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 dimensions 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.

   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.

   C. Extruded Shapes: ASTM B221 Alloy 6061-T6

   D. For Bolts, Nuts, and Washers requirements see Index 700-020 or 700-030.

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

   2. Materials (Aluminum):

      a. Sheets and Plates: ASTM B209 Alloy 6061-T6
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      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.

      C. Extruded Shapes: ASTM B221 Alloy 6061-T6

      D. For Bolts, Nuts, and Washers requirements see Index 700-020 or 700-030.
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 700-030 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'
CONVENTIONALLY-POWERED
(Type A1 Shown)

POWER CONFIGURATION 'B'
POWERED
(Solar-Powered)
(Type B1 Shown)

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.

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<td>5</td>
<td>Roadside Sign Assembly-3</td>
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<td>Roadside Sign Assembly-4</td>
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<td>Roadside Sign Assembly-5</td>
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<td>Roadside Sign Assembly-6</td>
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<td>9</td>
<td>Roadside Sign Assembly-7</td>
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<tr>
<td>10</td>
<td>Overhead Sign Assembly</td>
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CONDUIT, WIRING, AND FOUNDATION DETAILS

DETAIL "A"

Nominal 4" (Sch. 40) Aluminum Transformer Base

#6 Ground Wire

Strain Relief Fitting

Concrete Apron (Typ.)

Finished Grade

To Power Service or Auxiliary Pole

U.L. Approved Ground Rod 

1/2" 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

Strain Relief Fitting

Grounding Lug

Conduit for Future Use

Cap Conduit

PULL BOX

CONDUCTORS AND CONDUIT

Circuit Conductors in Schedule 40 PVC

Conductors and Conduit Spec as Shown in Plans (Typical)

CONCRETE APRON (Typ.)

Foot Depth

Concrete Apron (Typ.)

12" Bed of Pearock or Crushed Stone For Drainage.

Nominal 4" (Sch. 40) Aluminum Transformer Base

#6 Ground Wire

Strain Relief Fitting

Concrete Apron (Typ.)

Finished Grade

To Power Service or Auxiliary Pole

U.L. Approved Ground Rod 

1/2" Diameter 20' Long Copper Clad with Approved Ground Connection (At all Pull Boxes)
WARNING SIGN

12" Yellow Flashing Beacon

Sign Panel (48" x 48")

W-16-13P (24" x 18") Sign
(When Shown in Plans)

Nominal 4" (Sch. 40) Aluminum

Beacon Controller

NOTE:
Type A1 Assembly (conventionally-powered) is shown.
Type B1 Assemblies (solar-powered) similar.
12" Yellow Flashing Beacon

NOTE:
LIMIT SPEED SCHOOL FLASHING WHEN 20

Beacon Controller

S5-1 (24" x 48") Sign

1' -0" 1"

M in.

15 OR

See Index 700 -101

DOUBLED FINES SPEEDING

To Pull Box

Nominal 4" (Sch. 40) Aluminum

FTP-38-06 (24" X 30") Sign

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.
Nominal 4" (Sch. 40) Aluminum

NOTE:

See Index 700-101

DOUBLED FINES

SCHOOL SPEED LIMIT

20 OR 15

WHEN FLASHPING

FINES

DISTRIBUTED

FTP-38-06 (24" X 30") Sign

Highlight Sign Controller

S5-1 (24" X 48") Highlighted Sign

Nominal 4" (Sch. 40) Aluminum

To Pull Box

FRONT VIEW

SIDE VIEW

NOTE:
Type B4 Assembly (solar-powered) is similar.
Type B4 Assembly (conventionally-powered) is shown.
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 speed of 45 mph or less, and 18" high numerals for posted speeds greater than 45 mph.
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 18" 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 antennas in accordance with the manufacturer's instructions.
YELLOW RPM

MD/Y = MONO-DIRECTIONAL

Y/R = YELLOW/RED RPM

Y/Y = YELLOW/YELLOW RPM

W/R = WHITE/RED RPM

RPM = RAISED PAVEMENT MARKER

EOP = EDGE OF PAVEMENT

B/C = BACK OF CURB

**DESCRIPTION:**

**REVISION**

LAST REVISED 11/01/18

**STANDARD PLANS**

FY 2020-21

**TYPICAL PLACEMENT OF RAISED PAVEMENT MARKERS**

**INDEX**

706-001

1 of 6

**LEGEND:**

B/C = BACK OF CURB

EOP = EDGE OF PAVEMENT

RPM = RAISED PAVEMENT MARKER

W/R = WHITE/RED RPM

Y/R = YELLOW/RED RPM

Y/Y = YELLOW/YELLOW RPM

MD/Y = MIDI-DIRECTIONAL

YELLOW RPM

**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.

**DOUBLE SOLID LINE**

**SOLID LINE WITH ALTERNATING SKIP**

**MULTILANE**

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

**SOLID LINE WITH SKIP**

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

**SKIP LINE**

**ALTERNATING SKIP LINE**
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)

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

NOTE:
1. Center the Raised Pavement Markers between chevrons and crosshatching.
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 curb median radii to be parallel to direction of travel lanes.

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

RPM PLACEMENT DETAIL

RPM PLACEMENT AT MEDIAN OPENINGS
(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.

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 Yellow RPM
- MD/Y = Mono-Directional Yellow RPM

**TYPICAL PLACEMENT OF RAISED PAVEMENT MARKERS**

**RPM PLACEMENT AT ISLANDS**
(When called for in the Plans)

**RPM PLACEMENT AT TRAFFIC SEPARATORS**
(When called for in the Plans)
RPM PLACEMENT FOR CROSSOVERS ON LIMITED ACCESS ROADWAYS

3 Yellow RPMs
2 Yellow RPMs
1 Yellow RPM

Shoulder

500'-0" 500'-0" 500'-0"

1500'-0" Yellow RPMs Spaced at 500'-0" Intervals Approaching Crossover (Typ. Each Side)

5 of 6
NOTES FOR PAVEMENT MESSAGES:

1. When an arrow or another pavement message is used with a pavement message, maintain a minimum distance of "S" between items, measured from the base of each item. See the Pavement Message Spacing Table for "S" 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 SPACING TABLE

<table>
<thead>
<tr>
<th>Posted Speed (mph)</th>
<th>Distance &quot;S&quot; (feet)</th>
</tr>
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<tr>
<td>&gt; 25</td>
<td>40</td>
</tr>
<tr>
<td>35 - 39</td>
<td>36</td>
</tr>
<tr>
<td>20 - 34</td>
<td>32</td>
</tr>
<tr>
<td>&lt; 20</td>
<td>28</td>
</tr>
</tbody>
</table>
YIELD LINES

Yield Lines consist of five 18" x 27" 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.
Curb and Gutter

Flush Shoulder

Striping for Buffered Bike Lane

Striping with No Shoulder or Non-Buffered 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.
NOTES:
1. Lane widths (X) may not be same for each lane in the section.
2. For placement of Express Lane markers and associated RPMs, see the Plans.
3. For placement of RPMs, see Index 706-001.
4. For placement of Express Lane markers and associated RPMs, see the Plans.

**INTERSECTION APPROACH STRIPING WITH TURN**
**LANES AND BUFFERED BIKE LANE KEY HOLE**

**BUFFERED EXPRESS LANE STRIPING**

**PLACEMENT OF LONGITUDINAL PAVEMENT MARKINGS**
PLACEMENT OF LONGITUDINAL PAVEMENT MARKINGS

FLUSH SHOULDER SHOWN

DESCRIPTION:

LAST REVISION: 11/01/19

REV 711-001

PAVEMENT MARKINGS

INDEX 6 of 13

FY 2020-21 STANDARD PLANS
PAVEMENT MARKINGS AND DELINEATORS FOR MEDIAN Crossover

DESCRIPTION:

1. Apply yellow reflective paint to the noses of 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.

NOTE:

PAVEMENT MARKINGS FOR INTERSECTIONS WITH MAJOR AND MINOR ROADS
Two Way Left Turn Lane
(With Single Lane Left Turn Channelization)

Right Turn Lane Drop and Island Details
Left Turn Lane Drop is Mirror Image

Traffic Channelization at Gore

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

DESCRIPTION:

REVISION

STANDARD PLANS

FY 2020-21

PAVEMENT MARKINGS

INDEX

9 of 13

NOTE:

See DETAIL "D"

NOTE:

See DETAIL "E"

NOTE:

See Sheet 1 for "S" value.

NOTE:

Make pavement markings yellow for left roadway centered on existing roadway. Right roadway centered on existing roadway is similar with white pavement markings.

NOTE:

White Delineators Shall Be Used Throughout The Transition Where Design Speeds Are Greater Than 50 mph.
STANDARD CROSSWALK DETAILS

SPECIAL EMPHASIS CROSSWALK DETAILS

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

### SINGLE LEFT TURNS

**Through Lane Becomes Exclusive Left Turn**

**Through Lane Becomes Optional Left Turn**

### DOUBLE LEFT TURNS

**ARROW SPACING**

**NOTES:**

1. This Index also applies to right turn lanes.
2. Make pavement marking yellow for left-turn lanes and white for right-turn lanes.
3. See Sheet 1 for "S" value.
4. Space arrows evenly between the first and last arrow with a minimum spacing of "S" between arrows.
5. For turn lanes greater than 225 ft in length, use a minimum of three arrows. Use additional arrows in accordance with the Plans or as directed by the Engineer. Space arrows evenly throughout the available length with a minimum spacing of "S" between arrows.

### TURN LANE MARKINGS

**U R B A N  C O N D I T I O N S**

<table>
<thead>
<tr>
<th>Posted Speed (mph)</th>
<th>Clearance Distance</th>
<th>Brake To Stop Distance</th>
<th>Total Decel. Distance</th>
<th>Clearance Distance</th>
<th>Brake To Stop Distance</th>
<th>Total Decel. Distance</th>
<th>Clearance Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;=30</td>
<td>70''</td>
<td>70''</td>
<td>140''</td>
<td>110''</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>35</td>
<td>80''</td>
<td>70''</td>
<td>150''</td>
<td>120''</td>
<td>--</td>
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<tr>
<td>40</td>
<td>85''</td>
<td>100''</td>
<td>180''</td>
<td>125''</td>
<td>--</td>
<td>--</td>
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<tr>
<td>45</td>
<td>100''</td>
<td>135''</td>
<td>240''</td>
<td>160''</td>
<td>185''</td>
<td>290''</td>
<td>160''</td>
</tr>
<tr>
<td>50</td>
<td>125''</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>270''</td>
<td>350''</td>
<td>195''</td>
</tr>
<tr>
<td>55</td>
<td>140''</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>260''</td>
<td>405''</td>
<td>230''</td>
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<tr>
<td>&gt;=60</td>
<td>170''</td>
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<td>--</td>
<td>--</td>
<td>290''</td>
<td>465''</td>
<td>270''</td>
</tr>
</tbody>
</table>

### R U R A L  C O N D I T I O N S

**NOTE:** When installing lane lines for turn lanes, use the dimensions in the Plans, or use the above values for turn lanes not dimensioned in the Plans.
**FOR ACCESSIBLE MARKINGS - SEE ABOVE**

**DIMENSIONS**

<table>
<thead>
<tr>
<th>4'5&quot;</th>
<th>'A'</th>
<th>'F'</th>
<th>9'0&quot;</th>
<th>24'0&quot;</th>
<th>17'0&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>45°</td>
<td>17'-0&quot;</td>
<td>22'-0&quot;</td>
<td>7'-0&quot;</td>
<td>24'-0&quot;</td>
<td>17'-0&quot;</td>
</tr>
</tbody>
</table>

**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 SRWA.
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.
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**
APPRAoch To INTERSECTIONS DETAILS

BUFFERED BIKE LANES

CENTER OF SOLID LINE
AND DOTTED LINE

2'-4'
DOTTED LINE

EOP

RADIUS CURB RETURN OR STOP LINE

STOP LINE
RETURN OR CURB RADIUS RETURN

BIKE LANE STRIPING

BIKE LANE

STANDARD BUFFERED

BIKE LANE

LANE WIDTH

SHARED LANE 150'

TRAVEL LANE

LARGE PAINTED CURB AND GUTTER

6' WHITE SOLID LINE

6' WHITE SOLID LINE

6' WHITE SOLID LINE

5' MIN. FROM CURB RADIUS RETURN

FAR SIDE OF INTERSECTION DETAIL

BUFFERED BIKE LANES

STANDARD PLANS

FY 2020-21

INDEX

711-002

2 of 2
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.

DETAIL "A"
INTERCHANGE MARKINGS

TAPER - TYPE ENTRANCE

PARALLEL - TYPE ENTRANCE

Paved Shoulder

6" White (10'-30')

6" White

12" White

White/Red Raised Pavement Markers

White/Red Raised Pavement Markers

6" Yellow

Paved Shoulder

6" White (3'-9')

6" White

Maintain Full Ramp Width (15' Typ.)

White/Red Raised Pavement Markers

White/Red Raised Pavement Markers

6" White

Paved Shoulder

6" Yellow

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Pave...
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:**

TYPICAL PARTIAL CLOVERLEAF/TRUMPET EXIT RAMP

**NOTE:**

Do not place wrong way arrows in between consecutive directional arrows.

**INTERCHANGE MARKINGS**

**FY 2020-21 STANDARD PLANS**

**INDEX:**

711-003

6 of 7
EXIT RAMP WITHOUT AUXILIARY LANE

EXIT RAMP WITH AUXILIARY LANE

MAT DIMENSIONS

NOTEs:
1. This Index shows layouts for 1, 2, and 3 lanes.
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 6".

MESSAGE SIZE AND SPACING
**DESCRIPTION:**

**REVISION LAST REVIEWED:**

**STANDARD PLANS FY 2020-21 SHEET INDEX**

**INDEX:**

**CONVENTIONAL LIGHTING**

**12" bed of Pearock or crushed stone for drainage.**

**METAL POLE DETAIL**

**NOTES:**

1. Barrier wall or bridge mounted poles: The wiring shall be in accordance with Specification 992.

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

**WIRING DIAGRAM**

**WIRING DETAILS**
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 633 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.

CONVENTIONAL LIGHTING
SLAB DETAILS FOR INTERMEDIATE PULLBOX LOCATIONS

SLAB DIMENSIONS

SECTION A-A
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 ½" of closed-cell polyethylene foam expansion material. The top ½" of expansion material shall be removed after pouring the slab and sealed with an 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. Use compacted select material in accordance with Index 120-001.

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 ½" of closed-cell polyethylene foam expansion material. The top ½" of expansion material shall be removed after pouring the slab and sealed with an APL approved Type A sealant meeting the requirements of Specification 932.

Specifications for concrete and materials should be in accordance with the requirements of Specification 932.
GENERAL NOTES:

1. Poles are designed to support the following:
   - Luminaire Effective Projected Area (EPA): 1.55 SF
   - Weight: 75 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-F
   - D. Steel Bearing Plate: ASTM A709 or ASTM A36 Grade 36
   - E. Aluminum Weld Material: ER 4043
   - G. Bolts, Nuts and Washers:
     - a. Anchor Bolts: Alloy 6063-T6 or Alloy 6061-T6
     - b. Nuts: ASTM A563 Grade A Heavy-Hex
     - c. Washer: ASTM F436 Type 1
   - H. Anchor Bolts, Nuts, and Washers:
     - a. Anchor Bolts: ASTM F3125, Grade A325, Type 1
     - b. Nuts: ASTM A563 Grade A Heavy-Hex
     - c. Washer: ASTM F436 Type 1
   - I. Stainless Steel Fasteners: ASTM F593 Alloy Group 2, Condition A, CW1 or SH1
   - J. Nut Covers: ASTM B26 or ASTM B108, Alloy 319-F
   - K. Concrete: Class 1
   - L. Reinforcing Steel: Specification 415

4. Fabrication:
   - A. Weld Arm and Pole (Alloy 6063-T6) 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 shoe 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' or 0' hook at top of pole for electrical wires.
   - F. Provide a rupture of 8" x 8" minimum for free median barriers/Traffic Railings with a vibration damper.
   - 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 F1554 Grade 55
   - C. Not dip Galvanize EJB and other steel items including poles and plate washers: ASTM A123

6. Construction:
   - A. Foundation: Specification 455, 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 FHWA required AASHTO Frangibility Requirements, tested under MCHP Report 350 Guidelines (e.g. Akron Foundry TB1-17).
     - c. Do not erect pole without Luminaire attached.

7. Embedded Junction Box (EJB):
   - A. Foundation: Specification 455, 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 FHWA required AASHTO Frangibility Requirements, tested under MCHP Report 350 Guidelines (e.g. Akron Foundry TB1-17).
     - c. Do not erect pole without Luminaire attached.

8. Wind Speed by County:
   - A. 120 MPH
   - B. 160 MPH
   - C. 180 MPH
     - Brevard, Broward, Charlotte, Collier, Escambia, Indian River, Lee, Martin, Miami-Dade, Monroe, Palm Beach, Sarasota and St. Lucie Counties.

9. Lightning Protection:
   - A. Lightning Rods:
     - B. Straps:
     - C. Grounding:

10. Code Compliance:
    - A. National Electrical Code (NEC):
    - B. American National Standards Institute (ANSI):
    - C. American National Standards Institute (ANSI):
    - D. National Fire Protection Association (NFPA):
    - E. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
    - F. Illuminating Engineering Society of North America (IESNA):
    - G. American National Standards Institute (ANSI):

11. Certification:
    - A. Factory Mutual (FM):
    - B. Underwriters Laboratories (UL):
    - C. Intertek (ETL):

12. Testing:
    - A. Load Testing:
    - B. Wind Testing:
    - C. Seismic Testing:
    - D. Fire Testing:

13. Inspection:
    - A. Pre-Installation Inspection:
    - B. On-Site Inspection:
    - C. Post-Installation Inspection:

14. Maintenance:
    - A. Preventive Maintenance:
    - B. Emergency Maintenance:
    - C. Repair Maintenance:

15. Parts List:
    - A. Aluminum Extrusions:
    - B. Steel Extrusions:
    - C. Accessories:

16. Standard and Optional Features:
    - A. Standard Features:
    - B. Optional Features:

17. Safety and Security:
    - A. Safety:
    - B. Security:

18. Environmental Considerations:
    - A. Energy Efficiency:
    - B. Sustainability:

19. References:
    - A. Reference 1:
    - B. Reference 2:
    - C. Reference 3:

20. Acknowledgments:
    - A. Acknowledgment 1:
    - B. Acknowledgment 2:
    - C. Acknowledgment 3:
DESCRIPTION:

REVISION

LAST

REVISED

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STANDARD PLANS

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STANDARD ALUMINUM LIGHTING

INDEX

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STANDARD ALUMINUM LIGHTING

MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

ON CYLINDRICAL FOUNDATION

MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

ON SPREAD FOOTING FOUNDATION

SECTION A-A

ON SPREAD FOOTING FOUNDATION

MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

ON CYLINDRICAL FOUNDATION

ELEVATIONS

STANDARD ROADWAY ALUMINUM LIGHT POLE W/ARM

STANDARD ROADWAY ALUMINUM LIGHT POLE W/TOP MOUNT

Transition zone from round shape to oblong shape

Begin Pole Taper

Internal Vibration Damper

Fixture Arm Length (8', 10', or 12')

2'-6" Ø Concrete Foundation

Transition zone from round shape to oblong shape

Begin Pole Taper

Internal Vibration Damper

2'-6" Ø Pole top with Cast Aluminum Cap attached to pole with 3 Stainless Steel Set Screws (Typ.)

2'-6" or 9'-6" See Sheet 3 (Typ.)

3'-2"

W/ARM ALUMINUM LIGHT POLE

STANDARD ROADWAY ALUMINUM LIGHT POLE

W/TOP MOUNT

4"x6" (Min.) Handhole with reinforced frame and cover with Hex Head screws.

Finished Grade

Pole Base in Base Shoe Casting (See Sheet 4)

Transition zone from round shape to oblong shape

Begin Pole Taper

Internal Vibration Damper

4"x6" (Min.) Handhole with reinforced frame and cover with Hex Head screws.

Finished Grade

For Fixture Arm Details See Sheet 4

Casting (See Sheet 4)

Pole Base in Base Shoe

Frangible/ Breakaway Transformer Base

(See Sheet 4)

2'-6" Ø Concrete Foundation

Transition zone from round shape to oblong shape

Begin Pole Taper

Internal Vibration Damper

4"x6" (Min.) Handhole with reinforced frame and cover with Hex Head screws.

Finished Grade

_ Pole

Taper Vertically

Pole Vertically

Taper Vertically

Taper Vertically

22.5°

22.5°

22.5°

22.5°

SECTION A-A

ON SPREAD FOOTING FOUNDATION

MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

ON CYLINDRICAL FOUNDATION

ELEVATIONS

STANDARD ROADWAY ALUMINUM LIGHT POLE W/ARM

STANDARD ROADWAY ALUMINUM LIGHT POLE W/TOP MOUNT

Transition zone from round shape to oblong shape

Begin Pole Taper

Internal Vibration Damper

2'-6" Ø Pole top with Cast Aluminum Cap attached to pole with 3 Stainless Steel Set Screws (Typ.)

2'-6" or 9'-6" See Sheet 3 (Typ.)

3'-2"

W/ARM ALUMINUM LIGHT POLE

STANDARD ROADWAY ALUMINUM LIGHT POLE

W/TOP MOUNT

4"x6" (Min.) Handhole with reinforced frame and cover with Hex Head screws.

Finished Grade

Pole Base in Base Shoe Casting (See Sheet 4)

Transition zone from round shape to oblong shape

Begin Pole Taper

Internal Vibration Damper

4"x6" (Min.) Handhole with reinforced frame and cover with Hex Head screws.

Finished Grade

For Fixture Arm Details See Sheet 4

Casting (See Sheet 4)

Pole Base in Base Shoe

Frangible/ Breakaway Transformer Base

(See Sheet 4)

2'-6" Ø Concrete Foundation

Transition zone from round shape to oblong shape

Begin Pole Taper

Internal Vibration Damper

4"x6" (Min.) Handhole with reinforced frame and cover with Hex Head screws.

Finished Grade

_ Pole

Taper Vertically

Pole Vertically

Taper Vertically

Taper Vertically

22.5°

22.5°

22.5°

22.5°

SECTION A-A

ON SPREAD FOOTING FOUNDATION

MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

ON CYLINDRICAL FOUNDATION

ELEVATIONS

STANDARD ROADWAY ALUMINUM LIGHT POLE W/ARM

STANDARD ROADWAY ALUMINUM LIGHT POLE W/TOP MOUNT

Transition zone from round shape to oblong shape

Begin Pole Taper

Internal Vibration Damper

2'-6" Ø Pole top with Cast Aluminum Cap attached to pole with 3 Stainless Steel Set Screws (Typ.)

2'-6" or 9'-6" See Sheet 3 (Typ.)

3'-2"

W/ARM ALUMINUM LIGHT POLE

STANDARD ROADWAY ALUMINUM LIGHT POLE

W/TOP MOUNT

4"x6" (Min.) Handhole with reinforced frame and cover with Hex Head screws.

Finished Grade

Pole Base in Base Shoe Casting (See Sheet 4)

Transition zone from round shape to oblong shape

Begin Pole Taper

Internal Vibration Damper

4"x6" (Min.) Handhole with reinforced frame and cover with Hex Head screws.

Finished Grade

For Fixture Arm Details See Sheet 4

Casting (See Sheet 4)

Pole Base in Base Shoe

Frangible/ Breakaway Transformer Base

(See Sheet 4)
STANDARD ALUMINUM LIGHTING

ARM CONNECTION DETAIL

Upper Arm Tubing Connection

Press on or Welded Cap at Lower Arm

4" Min. Radius at Bend

ARM ELEVATION

Fixture Arm Length = 8', 10', 12' or 15'

2" O.D. Pipe Beyond This Point - See Arm Tube Extrusion Note

2" Nominal Pipe Size Slipfitter (2/" O.D.) for Luminaire Attachment

ARM SECTION

Fixture Arm Length = 3'-0" / 4 (Fixture Arm Length - 3'-0") / 4

3'-0" (8 and 10' Fixture Arm Lengths)

5'-6" (12' and 15' Fixture Arm Lengths)

As Required

2" O.D. x 0.125 (Min.)

Strut - 15° O.D. x 0.125 (Min.)

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 ellipsoidal 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 the area of the section equal or exceed that of the required section, and provide minimum wall thickness of 1/8" nominal and within the Aluminum Association Tolerances.

The outside diameter about the minor axis should be held at 2" ± 0.0625 at the upper and lower arms.

See General Notes on Sheet 1 for Pole Connection Extrusion (Typical)

This Point - See Arm Tube Extrusion Note

B221 Alloy 6063-T6

Aluminum Pipe ASTM 2" x 12" Long Sch. 10

Vinyl Cap (both ends)

" High Temp 2

1"

ASTM A36 Hot Rolled Rod 2" long

B221 Alloy 6063-T6

Aluminum Pipe ASTM 2" x 12" Long Sch. 10

L 3x2x (Arm A1)

L 3x2x (Arm A2)

Connection Extrusion at Base of Upper Arm Only

Extrusion at Base of Upper Arm Only

Hole in Connection Provided 2" Ø Wiring Long (Typ.)

" Ø Tapped Hole L 3x2x (Arm A1)

" Ø Tapped Hole L 3x2x (Arm A2)

" Chamfer (Typ.)

4

3

16

3

3

2

16

3

2

16

3

2

16

3

2

16

3

2

"Ø Stainless

Steel Bolts with Hex Nuts and 2 1/4" O.D. Flat Washers and a Split Lockwasher Each Side of Pole where Shown.

At Lower Arm Welded Cap Press on or Saddle, or other Acceptable Connection

4" Min. Radius at Bend

ARM & DAMPER DETAILS

VIBRATION DAMPER ELEVATION

VIEW B-B

VIEW C-C

HIGH TEMP VINYL CAP DETAIL

ARM ELEVATION

DOUBLE ARM CONFIGURATION IS ONLY FOR MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLES

ASTM 02287 PVC Type 65500

2" O.D. x 3" Bar Each Side of Arms, Extruded Saddle, or other Acceptable Connection

Provide 2" Ø Tapping Hole in Connection Extrusion at Base of Upper Arm Only

Provide 2" Ø Tapping Hole at 4" of Upper Arm for 1" Min. I.D. Rubber Grommet

Filler Weld Arm Tube to Connection Extrusion 0.250" (Arm A1)

0.311" (Arm A2)

Connection Extrusion Supplied by Vendor

Dimple (See Detail)

10 /29 /2019

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REVISION

DESCRIPTION:

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STANDARD PLANS

FY 2020-21

STANDARD ALUMINUM LIGHTING

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ARM-POLE TABLE

<table>
<thead>
<tr>
<th>Wind Speed (mph)</th>
<th>8, 10, 12</th>
<th>140 mph</th>
<th>160 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 mph</td>
<td>8, 10, 12</td>
<td>140 mph</td>
<td>160 mph</td>
</tr>
<tr>
<td>140 mph</td>
<td>8, 10, 12</td>
<td>140 mph</td>
<td>160 mph</td>
</tr>
<tr>
<td>160 mph</td>
<td>8, 10, 12</td>
<td>140 mph</td>
<td>160 mph</td>
</tr>
</tbody>
</table>

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.

POLE TABLE

<table>
<thead>
<tr>
<th>Pole</th>
<th>Pole Wall Thickness</th>
<th>Top of Base Shoe</th>
<th>Inside of Base Shoe</th>
<th>Weld</th>
</tr>
</thead>
<tbody>
<tr>
<td>P0</td>
<td>0.126</td>
<td>¾</td>
<td>¾</td>
<td>-</td>
</tr>
<tr>
<td>P1</td>
<td>0.156</td>
<td>¾</td>
<td>¾</td>
<td>-</td>
</tr>
<tr>
<td>P2</td>
<td>0.250</td>
<td>½</td>
<td>½</td>
<td>-</td>
</tr>
<tr>
<td>P3</td>
<td>0.313</td>
<td>½</td>
<td>½</td>
<td>-</td>
</tr>
</tbody>
</table>

POLE NOTES:
1. Pole wall thickness 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.

FOUNDATION TABLE

<table>
<thead>
<tr>
<th>Assembly Height (ft)</th>
<th>120 mph</th>
<th>140 mph</th>
<th>160 mph</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Pole P0</td>
<td>Pole P0</td>
<td>Pole P0</td>
</tr>
<tr>
<td>25</td>
<td>Pole P0</td>
<td>Pole P0</td>
<td>Pole P0</td>
</tr>
<tr>
<td>30</td>
<td>Pole P1</td>
<td>Pole P1</td>
<td>Pole P1</td>
</tr>
<tr>
<td>35</td>
<td>Pole P1</td>
<td>Pole P1</td>
<td>Pole P1</td>
</tr>
<tr>
<td>40</td>
<td>Pole P2</td>
<td>Pole P2</td>
<td>Pole P2</td>
</tr>
<tr>
<td>45</td>
<td>Pole P2</td>
<td>Pole P2</td>
<td>Pole P2</td>
</tr>
</tbody>
</table>

FOUNDDATION 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 2:9 to foundation depths shown.
2. Foundation Tie Bars: #4 Tie Bars @ 12” centers (max) or Ø10 (no Ø10) spiral Ø 6” pitch, 3 flat turn top and 1 flat turn bottom.

POLE AND BASE DETAILS FOR ROADWAY ALUMINUM LIGHT POLE
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.
DESCRIPTION:

STANDARD ALUMINUM LIGHTING

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STANDARD ALUMINUM LIGHTING

11'-0" 5'-6"

Bearing Plate

Symmetrical about Light Pole

Median Barrier (Index 521-001)

Median Barrier (Index 521-001)

Median Barrier (Index 521-001)

Median Barrier (Index 521-001)

Median Barrier (Index 521-001)

Median Barrier (Index 521-001)

Median Barrier (Index 521-001)

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Median Barrier (Index 521-001)

Median Barrier (Index 521-001)

Median Barrier (Index 521-001)

Median Barrier (Index 521-001)

MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

EMBEDDED JUNCTION BOX DETAILS

SPREAD FOOTING DETAILS FOR MEDIAN BARRIER MOUNTED ALUMINUM LIGHT POLE

NOTES:

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

2. For connections to adjacent Median Barrier, use the Doweled Joint detail (Index 521-001). Alternatively, a continuous concrete pour or a prefabricated construction joint may be substituted; these alternatives require the Median Barrier's longitudinal steel to lap a minimum of 3'-0" with the longitudinal steel shown herein.
**DESCRIPTION:**

**REVISION LAST OF STANDARD PLANS FY 2020-21 SHEET INDEX**

Bars 5S (Typ.)

**STANDARD ALUMINUM LIGHTING**

Bars 5R (Typ.)

Bearing Plate

Bars 5W (Typ.)

2" Ø Conduit

Bars 5S

4 ~ 1\½" Ø Anchor Bolts

1" Ø Conduit

**NOTES:**

1. For Base Plate Details, Bearing Plate Details, and Detail 'A', see Sheet 5.
2. See Index C21-426 for details of adjacent Traffic Railing (Median 36" Single-Slope) and for angles A and B.
3. See Index C20-010 for Conduit, EJB and supplemental reinforcing details.

**SECTION D-D**

(Longitudinal and transverse deck reinforcing steel not shown)

**ELEVATION**

(Longitudinal and transverse deck reinforcing steel not shown)
HIGHEST 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 130 lbs (Max.)
   B. Eight (8) cylindrical luminaires with a maximum effective projected area of 1.5 sf and 71 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 Bucking Rings:
      a. Less than \( \frac{5}{16} \): ASTM A1011 Grade 50, 55, 60 or 65
      b. Greater than or equal to \( \frac{5}{16} \): ASTM A572 Grade 50, 55, 60 or 65
   B. ASTM A595 Grade B (35 ksi yield) or Grade B (60 ksi yield)
   C. Pole Caps: ASTM A1011 Grade 50, 55, 60, or 65 or ASTM B209
   D. Bolt: ENOZ
   E. Steel Plate: ASTM A1011
   F. Stainless Steel Screws: AISI 316
   G. Anchor Bolts, Nuts and Washers:
      a. Anchor Bolts: ASTM F1554 Grade 55
      b. Nuts: ASTM A563 Grade A Heavy-Hex (5 per anchor bolt)
      c. Plate Washer: ASTM A36 (4 per anchor bolt)
   H. Nut Covers: ASTM B36 (316-F)
   I. Concrete: Class IV (Drilled Shaft)
   J. Reinforcing Steel: Specification 412

4. Fabrication:
   A. Welding:
      a. Specification Section 460-6.4 and
      b. ANSI/CSA Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals Section 14.4.4
   B. Poles:
      a. Round or 16-sided (Min.)
      b. Taper pole diameter at 0.14 inches per foot
      c. Pole shaft may be up to three sections using telescopic field splices
   C. Identification Tag: (Submit details for approval)
      i. Use a full-penetration groove weld on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
      ii. Use full-penetration groove welds on the female and section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
      iii. Use full-penetration groove welds on the female and section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
   D. After Installation: Place wire screen between top of foundation and bottom of baseplate in accordance with Specification 455 Drilled Shaft, except that payment is included in the cost of the Structure.
   E. Reinforcing Steel: Specification 415

5. Coating:
   A. Galvanize Anchor Bolts, Nuts and Washers: ASTM F2129
   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 449-6

7. Wind Speed by County:
   130 MPH
   150 MPH
   170 MPH
   - Brevard, 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>130 mph</td>
<td>80</td>
<td>30.0</td>
<td>3.00</td>
<td>23.0</td>
<td>8</td>
<td>1.75</td>
<td>38.0</td>
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<td>100</td>
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<td>3.00</td>
<td>27.0</td>
<td>8</td>
<td>1.75</td>
<td>42.0</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>38.0</td>
<td>3.00</td>
<td>30.0</td>
<td>8</td>
<td>2.00</td>
<td>48.0</td>
</tr>
<tr>
<td>150 mph</td>
<td>80</td>
<td>30.0</td>
<td>3.00</td>
<td>23.0</td>
<td>8</td>
<td>1.75</td>
<td>43.0</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>40.0</td>
<td>3.00</td>
<td>25.0</td>
<td>8</td>
<td>1.75</td>
<td>42.0</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>44.0</td>
<td>3.00</td>
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<td>8</td>
<td>2.25</td>
<td>52.0</td>
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<tr>
<td>170 mph</td>
<td>80</td>
<td>32.0</td>
<td>3.00</td>
<td>25.0</td>
<td>8</td>
<td>1.75</td>
<td>47.0</td>
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<td>100</td>
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<td>3.00</td>
<td>29.0</td>
<td>8</td>
<td>2.00</td>
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<td>37.0</td>
<td>8</td>
<td>2.25</td>
<td>58.0</td>
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</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>130 mph</td>
<td>80</td>
<td>30.0</td>
<td>3.00</td>
<td>23.0</td>
<td>8</td>
<td>1.75</td>
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<tr>
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<td>8</td>
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<td>44.0</td>
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<td>35.0</td>
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<td>37.0</td>
<td>8</td>
<td>2.25</td>
<td>58.0</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'-#11</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>4'-6&quot;</td>
<td>14'-0&quot;</td>
<td>16'-#11</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>5'-0&quot;</td>
<td>16'-0&quot;</td>
<td>16'-#11</td>
</tr>
<tr>
<td>150 mph</td>
<td>80</td>
<td>4'-0&quot;</td>
<td>13'-0&quot;</td>
<td>14'-#11</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>4'-6&quot;</td>
<td>14'-0&quot;</td>
<td>16'-#11</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>5'-0&quot;</td>
<td>18'-0&quot;</td>
<td>18'-#11</td>
</tr>
<tr>
<td>170 mph</td>
<td>80</td>
<td>4'-6&quot;</td>
<td>15'-0&quot;</td>
<td>16'-#11</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>5'-0&quot;</td>
<td>17'-0&quot;</td>
<td>16'-#11</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>5'-0&quot;</td>
<td>20'-0&quot;</td>
<td>18'-#11</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>1:3</td>
<td>5'-0&quot;</td>
<td>6'-0&quot;</td>
</tr>
<tr>
<td>1:4</td>
<td>4'-0&quot;</td>
<td>5'-0&quot;</td>
</tr>
<tr>
<td>1:5</td>
<td>3'-0&quot;</td>
<td>4'-0&quot;</td>
</tr>
<tr>
<td>1:6</td>
<td>2'-0&quot;</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>1:7</td>
<td>1'-0&quot;</td>
<td>2'-0&quot;</td>
</tr>
</tbody>
</table>

* Diameter measured flat to flat.
**BASE PLATE AND ANCHORAGE ELEVATION**

(Conduits Not Shown)

- **Base Diameter**
- **Handhole Ring**
- **Drilled Shaft**
- **Anchor Bolts**

**SECTION A-A**

- **Bolt Circle**
- **Base Diameter**
- **Handhole Ring**
- **Center of Drilled Shaft**

**SECTION B-B**

- **Drilled Shaft**
- **Bolt Diameter**
- **Wall Thickness**
- **Conduits**

**SECTION C-C**

- **Section**
- **Base Diameter**
- **Wall Thickness**
- **Drilled Shaft**
- **Base Plate**

**SECTION E-E**

- **Center of Arm**
- **Wall Thickness**
- **Drilled Shaft**
- **Conduits**

**FOUNDER PLAN**

(Anchor Bolts and Conduits Not Shown)

- **Shaft Diameter**
- **Bolt Circle**
- **Handhole Ring**

**HANDHOLE RING**

- **Double Nuts**
- **Back Ring**
- **Silicone Caulk**

**HANDHOLE DOOR**

- **Anchor Bolt**
- **Base Plate**
- **Leveling Nuts**

**SECTION A-A**

- **Drilled Shaft**
- **Center of Arm**
- **Base Diameter**

**SECTION B-B**

- **Base Diameter**
- **Handhole Ring**
- **Drilled Shaft**

**SECTION C-C**

- **Base Diameter**
- **Wall Thickness**
- **Drilled Shaft**

**SECTION E-E**

- **Center of Arm**
- **Wall Thickness**
- **Drilled Shaft**

**DESCRIPTION:**

**REVISION:**

**LAST REVISON:**

**FY 2020-21**

**STANDARD PLANS**

**HIGH MAST LIGHTING**

**INDEX:**

**715-010**

**3 of 6**
For Pull Boxes between Poles refer to Index 715-001.

1. Slabs to be placed around all Poles and Pull Boxes.
2. Circuits Conductors and conduit size as shown in plans (Typical).

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 those plan sheets detailing the mounting of luminaires at the pole top. Particular attention is directed to alignment of luminaire light distributions. Special attention must be exercised in the physical alignment of these 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.

A surge protector shall be located in the pole with the circuit breaker. The surge protector shall be mounted at the front near hand hole for easy access.

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.

A surge protector shall be located in the pole with the circuit breaker. The surge protector shall be mounted at the front near hand hole for easy access.

All hardware for mounting heavy duty drill to pole shall be Stainless Steel.

1/2" heavy duty reversible or 1 HP Portable Motor(s) per project.

Step-down transformer provided with 120V grounded receptacle for electric drill & receptacle for supply cable. (see schematic)

25' minimum remote control cable same as Pole Cable.

120V. grounded receptacle for electric supply cable receptacle.

Step-down transformer provided with 120V grounded receptacle for electric drill & receptacle for supply cable. (see schematic)

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Step-down transformer provided with 120V grounded receptacle for electric drill & receptacle for supply cable. (see schematic)

25' minimum remote control cable same as Pole Cable.
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 ½” of closed-cell polyethylene foam expansion material. The top ½” of expansion material shall be removed after pouring the slab and sealed with an APL approved Type A sealant meeting the requirements of Specification 932.
CROSSING SURFACES

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Concrete</td>
</tr>
<tr>
<td>R</td>
<td>Rubber</td>
</tr>
<tr>
<td>RA</td>
<td>Rubber/Asphalt</td>
</tr>
<tr>
<td>TA</td>
<td>Timber/Asphalt</td>
</tr>
</tbody>
</table>

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 - 55</td>
<td>350'</td>
</tr>
<tr>
<td>60 - 65</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.
TYPICAL CROSSING MATERIAL REPLACEMENT AT RR CROSSINGS

VERTICAL ROADWAY ALIGNMENT THROUGH A RAILROAD CROSSING

To prevent low-clearance vehicles from becoming caught on the tracks, the crossing surface should be at the same plane as the top of the rails for a distance of 2 feet outside the rails. The surface of the highway should also not be more than 3 inches higher or lower than the top of the nearest rail at a point 30 feet from the rail unless track super-elevation makes a different level appropriate. Vertical curves should be used to traverse from the highway grade to a level plane at the elevation of the rails. Rails that are super-elevated, or a roadway approach section that is not level, will necessitate a site specific analysis for rail clearances.

HALF PLAN

ROADWAYS WITH FLUSH SHOULDERS

SECTION VIEW

CROSSING SHOULDER PAVEMENT
(Except Area Occupied By Crossing Surfacing Material):
1. To Shoulder Line For Outside Shoulders Less Than 8' Wide.
2. To Maximum Width For Outside Shoulders 8' Or Wider
(Regardess Of Approach Shoulder Pavement Width).
3. For Median Shoulders.

* Where the existing shoulder is substandard for the facility type, the shoulder width is to be widened to accommodate crossing shoulder pavement.