**GUIDE TO USE THIS INDEX**

**CONTENTS**

1. General Notes and Design Example
2. Design Example - Centered
3. Column and Foundation Tables
4. Step Base and Foundation Details
5. Drive Post and Soil Plate Details
6. Wire Beam Connection
7. 8 & 9 Frequently Used Sign Clusters

**GENERAL NOTES:**

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

2. **Aluminum Sign, Wind Beams and Column (Post) Materials:**
   - A. Aluminum Plates: ASTM B209, Alloy 6061-T6
   - B. Aluminum Bars and Extruded Shapes: ASTM B211, Alloy 6061-T6
   - C. Aluminum Structural Shapes: ASTM B808 Alloy 6061-T6
   - D. Cast Aluminum: ASTM B808 Alloy A356-T6
   - E. Aluminum Weld Material: ER 5556 or 5556

3. **Sign Mounting Bolts, Nuts and Washers:**
   - A. Aluminum Button Head and Flat Head Bolts: ASTM F468, Alloy 2024-T4
   - B. Aluminum Hex Nuts: ASTM F467, Alloy 6061-T6 or 6261-T6
   - C. Aluminum Washers: ASTM B221, Alloy 7075-T6

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 Group 2, Condition A, CWI or SMI
   - 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 D1322 with double nuts.
   - B. Galvanized Bolts (Solid): ASTM F468, Alloy 6061-T6 or 2024-T4 with hex nuts ASTM F467 6061-T6 or 6261-T6 and washers B231.
   - C. Galvanized High Strength Hex Head Bolts (Bolt-Back): ASTM F3123, Grade 5525, Type I
   - D. Galvanized Hex Nuts: ASTM A563 Grade OH
   - E. Galvanized Washers: ASTM F595
   - F. Galvanized Bolts (Solid): ASTM A307 with Galvanized Hex Nuts and Washers

6. Coatings:
   - A. Aluminum Fasteners: Anodic coating (0.0002 inches min.) and chromate sealed
   - B. High Strength Steel Bolts and Washers: ASTM F3129
   - C. All other steel items (excluding stainless steel): Hot dip Galvanizing - 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. Sign held by barrier wall or guardrail do not require breakaway support.
**TYPICAL SECTION**

**SIGN CLUSTER**

\[ \begin{align*}
X_C &= \frac{\sum (X_i \cdot A_i)}{\sum A_i} \\
Y_C &= \frac{\sum (Y_i \cdot A_i)}{\sum A_i}
\end{align*} \]

- \(X_C\) = Area of individual sign
- \(Y_C\) = Height of the edge of pavement from the mounting elevation
- \(X_C\) = Height of the centroid of the sign or cluster from the edge of pavement elevation
- \(Y_C\) = Height of the centroid of the sign or cluster from the bottom of the sign or cluster
- \(X_i\) = Individual sign height
- \(Y_i\) = Height of sign or cluster centroid from groundline
- \(A_i\) = Individual sign width
- \(X_C\) = Centroid horizontal location of sign or cluster from Aluminum Column (Post)
- \(Y_C\) = Centroid height of sign or cluster from bottom of sign cluster
- \(X_i\) = Individual sign centroid horizontal location from Aluminum Column (Post)
- \(Y_i\) = Individual sign centroid height from bottom of sign cluster

**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**
### COLUMN AND FOUNDATION TABLES

#### ALUMINUM COLUMN (POST) SELECTION TABLE (O.D. in.)

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<thead>
<tr>
<th>Outside Diameter (in)</th>
<th>Wall Thickness (in)</th>
<th>Embedment Depth (ft)</th>
<th>Concrete (Class 1)</th>
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<tr>
<td>6 ft</td>
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<td>5.0</td>
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* 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.

#### FOUNDATION TABLE

<table>
<thead>
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<th>Column (Post) Size</th>
<th>Driven Post by</th>
<th>Foundation Alternatives</th>
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<td>36&quot;</td>
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**NOTE:**

1. For offset sign placement see Index 700-101.
2. For signs with widths greater than 4 see Index 700-011.
3. Offset signs with driven posts require a soil plate.
SLIP BASE AND FOUNDATION DETAILS

1. Foundation Notes for Slip Base:
   A. Place Stub into concrete foundation given in the FOUNDATION TABLE using Class L Concrete.
   B. Slip Base Fabrication Notes:
      A. The difference between the O.D. of the post and I.D. of the Sleeve must be 3/4" 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).

2. Slip Base Assembly Instructions:
   A. Assemble the Slip Base as follows:
      1. Insert Post into Sleeve and connect using 2 ~ 3/4" 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 STUB/SLEEVE & BASE PLATE DETAILS)
         a. Place one 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" or 15" wrench (this will bed the washers and shims and clear the bolt threads).
      2. Loosen each Base Bolt one turn.
      3. Under the supervision of the Engineer, use a calibrated wrench to tighten bolts to the torque prescribed in the SLIP BASE DETAILS Table. Over tightened Base Bolts are not permitted.
      4. Distinct 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. Place the shims evenly around the perimeter of the column (1 between each bolt hole, 4 total). Place shims between the column (post) and sleeve. Space the shims evenly 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.

3. SLIP BASE DETAILS Table. Over tightened Base Bolts are not permitted.

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<tr>
<th>Column (Post) Size</th>
<th>Sleeve (Max)</th>
<th>Sleeve Height</th>
<th>Post Plate</th>
<th>Base Plate Torque</th>
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4. Sentence: Provide Bond Breaker Between Adjacent Concrete Surfaces.

SLIP BASE AND FOUNDATION DETAILS

(Non-Frangible Column, Typ.)

SINGLE COLUMN GROUND SIGNS

INDEX

SHEET

700-010

4 of 9
Optional Slotted Holes

DETAIL "B"

**ALUMINUM SOIL PLATE DETAIL**

(Fragile Post in Crossovers, Medians & Sidewalks)

**DRIVEN POST DETAIL**

**DRIVEN POST AND SOIL PLATE DETAIL**

**DESCRIPTION:**

**REVISION:**

**LAST:**

**REVOLUTION:**

**FY 2019-20 STANDARD PLANS**

**INDEX:**

**SHEET:** 5 of 9

**SINGLE COLUMN GROUND SIGNS**

**700-010**
Wind Beam Length

Wind Beam - Aluminum Zee
1½ x 1½ x 1.09

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

"Ø Aluminum Button Head Bolt with Nut and Washer (1½")

4.5" Max.

"Ø Stainless Steel Hex Head Bolts with Flat Washer under Head and Washer under Button or Flat Head Bolts.

NOTES:
1. 1½" Ø Stainless Steel Hex Head Bolts with Flat Washer under Head and Washer under Button may be used in lieu of 1¼" Ø Aluminum Button or Flat Head Bolts.

2. Use Nylon washers (provided by the sheeting supplier) under the bolt head 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 rectangular signs greater than 66" install a third wind beam evenly spaced between the top and bottom wind beams. For rectangular signs up to 12" in height, use only one wind beam at top Sign.

WIND BEAM CONNECTIONS DETAILS

SINGLE SIGN DETAIL

VIEW A-A

BACK-TO-BACK SIGN DETAIL

NOTE: Use the area and the centroid location of the largest sign to determine Column (Post) diameters.

Alignment Top Of Signs

Wind Beam - Aluminum Zee
1½ x 1½ x 1.09

6" (Double Sign) 1'-0" Max. 1" Min. 6" Max. (Along Bracket Connection)

"Ø Aluminum Button Head Bolt with Nut and Washer (1½")

4.5" Max.

NOTES:
1. 1½" Ø Stainless Steel Hex Head Bolts with Flat Washer under Head and Washer under Button may be used in lieu of 1¼" Ø Aluminum Button or Flat Head Bolts.

2. Use Nylon washers (provided by the sheeting supplier) under the bolt head to protect sign sheeting.

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WIND BEAM CONNECTION

SINGLE COLUMN GROUND SIGNS

INDEX

FY 2019-20

STANDARD PLANS

700-010

6 of 9
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### Example Diagrams

- **EAST BUSINESS COUNTY JCT TO EAST TO INTERSTATE 75**
- **LEON COUNTY JCT TO INTERSTATE 75 EAST TO 301**
- **EAST TO SINGLE COLUMN GROUND SIGNS**
- **INTERSTATE 75**
- **INTERSTATE 295**

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**Description:**

**FY 2019-20 STANDARD PLANS**

**SINGLE COLUMN GROUND SIGNS**

**INDEX**

**700-010**

**Sheet 8 of 9**
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<td>36x36</td>
<td>9.00 SF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30x18</td>
<td>3.75 SF</td>
<td></td>
<td></td>
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<tr>
<td>30x30</td>
<td>4.69 SF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24x12</td>
<td>2.00 SF</td>
<td></td>
<td></td>
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<tr>
<td>24x24</td>
<td>4.00 SF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36x36</td>
<td>9.00 SF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30x18</td>
<td>3.75 SF</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GENERAL NOTES:
1. Refer to Index 100-010 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 2" x 3.38. Install Vertical Brace on 7'-0" to 8'-0" signs only.
5. Provide 2 - 0.0149" Thick (28 gauge) and 2 - 0.0329" Thick (21 gauge) Brass Shims Per Post. Used brass shims to plumb the post.
6. Use nylon washers under the button bolt heads to protect sign sheeting. Use aluminum washers under nut.

<table>
<thead>
<tr>
<th>TYPICAL SECTION</th>
<th>SIGN DETAIL</th>
</tr>
</thead>
</table>

VIEW A-A | SECTION B-B | SECTION C-C

COLUMN SELECTION AND FOOTING SIZE TABLE:

<table>
<thead>
<tr>
<th>Sign Size</th>
<th>Column Size</th>
<th>Sleeve Size</th>
<th>U-bolt Diameter</th>
<th>Base Bolt Diameter &amp; Length</th>
<th>Torque Lbs./ft</th>
<th>Base Plate Thickness</th>
<th>Footing Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height x Length</td>
<td>Diameter x Thickness</td>
<td>Diameter x Thickness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4'-0&quot; x 5'-0&quot;</td>
<td>4 NPS Schedule 80 (4.5&quot; x 0.337&quot;)</td>
<td>5 NPS Schedule 120 (5.562&quot; x 0.5&quot;)</td>
<td>3/4&quot;</td>
<td>3/4&quot; x 3/4&quot;</td>
<td>210 yd.</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 (4.5&quot; x 0.337&quot;)</td>
<td>6 NPS Schedule 80 (6.625&quot; x 0.432&quot;)</td>
<td>1 1/2&quot;</td>
<td>1 1/2&quot; x 1 1/2&quot;</td>
<td>443 yd.</td>
<td>1 1/2&quot;</td>
<td>6'-6&quot;</td>
</tr>
<tr>
<td>4'-0&quot; x 7'-0&quot;</td>
<td>4 NPS Schedule 80 (5.562&quot; x 0.375&quot;)</td>
<td>7 NPS Schedule 120 (6.625&quot; x 0.5&quot;)</td>
<td>2&quot;</td>
<td>2&quot; x 2&quot;</td>
<td>570 yd.</td>
<td>2&quot;</td>
<td>7'-0&quot;</td>
</tr>
<tr>
<td>4'-0&quot; x 8'-0&quot;</td>
<td>4 NPS Schedule 80 (6.625&quot; x 0.432&quot;)</td>
<td>8 NPS Schedule 120 (7.750&quot; x 0.688&quot;)</td>
<td>2 1/2&quot;</td>
<td>2 1/2&quot; x 2 1/2&quot;</td>
<td>665 yd.</td>
<td>2 1/2&quot;</td>
<td>7'-6&quot;</td>
</tr>
</tbody>
</table>

DESCRIPTION:

1. Refer to Index 700-011 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 2" x 3.38. Install Vertical Brace on 7'-0" to 8'-0" signs only.
5. Provide 2 - 0.0149" Thick (28 gauge) and 2 - 0.0329" Thick (21 gauge) Brass Shims Per Post. Used brass shims to plumb the post.
6. Use nylon washers under the button bolt heads to protect sign sheeting. Use aluminum washers under nut.

<table>
<thead>
<tr>
<th>COLUMN SELECTION AND FOOTING SIZE TABLE</th>
</tr>
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<table>
<thead>
<tr>
<th>Column Size</th>
<th>Sleeve Size</th>
<th>U-bolt Diameter</th>
<th>Base Bolt Diameter &amp; Length</th>
<th>Torque Lbs./ft</th>
<th>Base Plate Thickness</th>
<th>Footing Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height x Length</td>
<td>Diameter x Thickness</td>
<td>Diameter x Thickness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4'-0&quot; x 5'-0&quot;</td>
<td>4 NPS Schedule 80 (4.5&quot; x 0.337&quot;)</td>
<td>5 NPS Schedule 120 (5.562&quot; x 0.5&quot;)</td>
<td>3/4&quot;</td>
<td>3/4&quot; x 3/4&quot;</td>
<td>210 yd.</td>
<td>1&quot;</td>
</tr>
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<td>1 1/2&quot; x 1 1/2&quot;</td>
<td>443 yd.</td>
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</tr>
<tr>
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<td>4 NPS Schedule 80 (5.562&quot; x 0.375&quot;)</td>
<td>7 NPS Schedule 120 (6.625&quot; x 0.5&quot;)</td>
<td>2&quot;</td>
<td>2&quot; x 2&quot;</td>
<td>570 yd.</td>
<td>2&quot;</td>
</tr>
<tr>
<td>4'-0&quot; x 8'-0&quot;</td>
<td>4 NPS Schedule 80 (6.625&quot; x 0.432&quot;)</td>
<td>8 NPS Schedule 120 (7.750&quot; x 0.688&quot;)</td>
<td>2 1/2&quot;</td>
<td>2 1/2&quot; x 2 1/2&quot;</td>
<td>665 yd.</td>
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<th>U-bolt Diameter</th>
<th>Base Bolt Diameter &amp; Length</th>
<th>Torque Lbs./ft</th>
<th>Base Plate Thickness</th>
<th>Footing Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height x Length</td>
<td>Diameter x Thickness</td>
<td>Diameter x Thickness</td>
<td></td>
<td></td>
<td></td>
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<td>2 1/2&quot;</td>
<td>2 1/2&quot; x 2 1/2&quot;</td>
<td>665 yd.</td>
<td>2 1/2&quot;</td>
</tr>
</tbody>
</table>
NOTES:
1. Work with index 700-010.
2. Shop Drawings: Not required.

3. Materials:
   A. Steel Pipe: ASTM A36 or ASTM A500 Grade 36
   B. Steel Pipe (Support Post): ASTM A501 Schedule 40
   C. Aluminum Pipe: ASTM B429 Alloy 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 A500 Grade 36 or 50
   E. Galvanized anchor bolts, nuts and washers:
      a. Anchor Rod: ASTM F7554 Grade 55 fully threaded (for Adhesive Anchors)
      b. Anchor Bolts: ASTM F1554 Grade 55 Grade A Hex
      c. Nuts: ASTM A563 Heavy Hex Locking
   F. Washers: ASTM F436
   H. Weld Material: E70XX
   I. Snap-In Post Cap: UV and weather-resistant glass-filled polyester cap

4. Coatings:
   A. U-Bolts, Threaded Rods, Nuts and Washers: ASTM F2329
   B. Other Steel: ASTM A123

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

6. Construction:
   A. Locate Sign Support a minimum of 5 feet from an open joint or transition (sign stationing may be adjusted to accommodate this requirement).
   B. Base plate must be flush with 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 1.5" Dia. 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</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**

- **Dimensions:**
  - **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.

**Materials:**
- **Steel Plate:** ASTM A36 or ASTM A709 Grade 36
- **Steel Pipe (Support Post):** ASTM A501 Schedule 40
- **Aluminum Pipe:** ASTM B429 Alloy 6063-T6
- **Galvanized U-Bolts, Nuts and Plate Washers**
- **Anchor Rod:** ASTM F7554 Grade 55 fully threaded (for Adhesive Anchors)
- **Anchor Bolts:** ASTM F1554 Grade 55 Grade A Hex
- **Nuts:** ASTM A563 Heavy Hex Locking
- **Washers:** ASTM F436
- **Adhesive Anchor Bonding Material:** Specification 931 Type HF Adhesive.
- **Weld Material:** E70XX
- **Snap-In Post Cap:** UV and weather-resistant glass-filled polyester cap

**Coatings:**
- **U-Bolts, Threaded Rods, Nuts and Washers:** ASTM F2329
- **Other Steel:** ASTM A123
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 12" thick, through bolt 7/8" Heavy Hex Head Bolts with Nuts and Washers in lieu of Adhesive Bonded Anchors. Bolt heads shall not protrude more than 1/8" 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.

2. New Traffic Railings:
   A. Optional Couplers are shown for slipforming; keep Anchor Nut coupler threads free of concrete.
   B. For concrete parapets less than 10" thick, through bolt 7/8" Heavy Hex Head Bolts with Nuts and Washers in lieu of Adhesive Bonded Anchors. Bolt heads shall not protrude more than 1/8" 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.

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

4. Bridge Deck shown, Approach Slab and Retaining Wall are similar.
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 A449
     b. Hex Nuts, ASTM A 563 Lock Nuts
     c. Plate Washer: ASTM A 47 or ASTM A709 Grade 36 or 50
   - D. Galvanized Anchor Bolts, Nuts and Washers:
     a. Anchor Rod: ASTM F 1554 Grade 55 Fully Threaded (for Adhesive Anchors)
     b. Anchor Rod: ASTM A 490 Grade 50 Grade A Hex
     c. Nuts: ASTM A325 Heavy Hex Locking
   - E. Adhesive Anchor Bonding Material: Specification 937 Type IV Adhesive
   - F. Weld Material: E70XX
   - G. Snap-In Post Cap: UV and weather-resistant glass-filled polyester cap

4. Coating:
   - A. U-Bolts, Threaded Rods, Nuts and Washers: ASTM F2329
   - B. Other Steel: ASTM A123

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

6. Construction:
   - A. Locate Sign Support a minimum of 5 feet from an open joint or transition (sign stationing may be adjusted to accommodate this requirement)
   - B. Permanent Signs:
     a. Place permanently installed anchors 2 inches from the edge of an adjacent travel way
   - C. Anchors in Traffic Railings:
     a. Install Adhesive Anchors in accordance with Specification 416 except perform field testing on one anchor per sign support location
     b. Use template and cut anchors as necessary to maintain correct placement of C-1-P Embodied Anchors
   - 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 reinf orcement; use of metal detector not required.
   - F. Anchors in Traffic Railings:
     a. Locate Sign Support a minimum of 5 feet from an open joint or transition (sign stationing may be adjusted to accommodate this requirement)
     b. Base plate must be flush with top of Railing
     c. Do not drill into existing reinforcing
   - G. Temporary Signs on Permanent Traffic Railings:
     a. Install Adhesive Anchors in accordance with Specification 416 except perform field testing of anchors is not required
   - H. 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.

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 IV epoxy to prevent corrosion
     a. Extend coating 2 inches beyond edge of cut anchor rods
     b. Epoxy coating 1/16"thick minimum

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

### TABLE 1 - SIGN PANEL AND POST SIZING

<table>
<thead>
<tr>
<th>Temporary Signs</th>
<th>Max. Sign Area (SF)</th>
<th>Post (NPS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤ 13.5</td>
<td>≤ 30</td>
</tr>
<tr>
<td>Permanent Signs</td>
<td>&gt; 13.5 &lt; Sign &lt; 20</td>
<td>&gt; 30</td>
</tr>
</tbody>
</table>

[Index 521-001 Median Barrier shown; others similar]
1. Place anchor rods in a staggered or linear pattern as necessary to avoid reinforcing.
2. Use a staggered pattern for all temporary barriers.

<table>
<thead>
<tr>
<th>Base Plate Type</th>
<th>Anchor Rod Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1&quot;</td>
</tr>
<tr>
<td>B</td>
<td>1&quot;</td>
</tr>
<tr>
<td>C</td>
<td>3/4&quot;</td>
</tr>
</tbody>
</table>

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

- **Index**: 521-001
- **Type/Application**: Full Wall
- **Base Plate Type**: A
- **Anchor Rod Ø**: 1" (Staggered Anchor Rod Pattern shown)

**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.
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 B227, 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 A599, Grade 36
      b. Steel Weld Metal: F1521
      c. Shim: Brass ASTM B166 or Galvanized Steel
   C. Aluminum Bolts, Nuts and Washers:
      a. Flat Head and Button Head Bolts: ASTM F 468, Alloy 2024-T4
      b. Hex Nuts: ASTM F467, 2024-T4
      c. Washers: ASTM B221, 2024-T4
   D. Stainless Steel Bolts, Nuts and Washers Alloy Group 2, Condition A, may be substituted for the Aluminum bolts as follows:
      a. Bolts: ASTM F593, CW or SH1
      b. Nuts: ASTM F594
      c. Washers: ASTM B221, Alloy 2024-T4
   E. Galvanize all other steel items (excluding stainless steel): Hot-dip ASTM A123
   F. Concrete: Class I

4. Coatings:
   A. Aluminum Fasteners: Anodic coating (0.0002 inches min.) and chromate sealed
   B. Galvanize High Strength Steel Bolts Nuts and Washers: ASTM F2329
   C. Galvanize all other steel items (excluding stainless steel): Hot-dip ASTM A123
   D. Treat damaged galvanizing in accordance with Specification 562

5. Fabrication:
   A. All Base Connections and Stub Column materials are steel unless otherwise specified.
   B. Drill or sub-punch and ream holes in Fuse Plates and Hinge Plates
   C. Weld Base Plate to Post & Stub or if using the Alternate Connection Detail weld Base Plate and Stiffeners to Post and Stub (Sheet 2)
   D. Hot dip galvanize after fabrication. Remove all drips, runs or beads on base plate within washer contact areas (Including saw cuts)

6. Construction:
   A. Install the Sign Structure foundation in accordance with Specification 455. Orient Stub Post according to direction of traffic (Sheet 2).
   B. Tighten all high strength bolts except Base Bolts in accordance with Specification 700.
   C. Assemble Post to Stub with Base Bolts and three flat washers per bolt (See Base Connection Details, Sheet 2) Tighten Base Bolts in accordance with Instructions Notes on Sheet 2.
MULTI-COLUMN SIGN ASSEMBLY

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 at 6" pitch, with three flat turns in the washer area.

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 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 torque wrench to tighten Base Bolts to the maximum possible with a 12" wrench. See Assembly of Base Instructions.
   D. Burr threads at junction with nut to prevent nut loosening. Treat damaged galvanizing.

2. H.S. Base Bolt L Tightening Instructions:
   A. Tighten Base Bolts to the maximum possible with a 12" wrench. See Base Plate Detail.
   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 torque wrench to tighten Base Bolts to the maximum possible with a 12" wrench. See Assembly of Base Instructions.
**STATE OF FLORIDA**

**WELCOME CENTER**

**TYPICAL SIGN FOR OVERHEAD TRUSS**

**WIND BEAM TABLE (Z 3 x 2 3/8 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>
</tr>
</thead>
<tbody>
<tr>
<td>D ≤ 5</td>
<td>1.0%</td>
<td>2.0%</td>
<td>2.2%</td>
<td>2.4%</td>
</tr>
<tr>
<td>5 &lt; D ≤ 10</td>
<td>1.5%</td>
<td>3.0%</td>
<td>3.3%</td>
<td>3.6%</td>
</tr>
<tr>
<td>10 &lt; D ≤ 15</td>
<td>2.0%</td>
<td>4.0%</td>
<td>4.4%</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

**HANGER TABLE (1 6 x 4.69 or Z 5 x 3 1/2 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>
</tr>
</thead>
<tbody>
<tr>
<td>100 mph</td>
<td>1.0%</td>
<td>2.0%</td>
<td>2.2%</td>
<td>2.4%</td>
</tr>
<tr>
<td>130 mph</td>
<td>1.7%</td>
<td>3.4%</td>
<td>3.7%</td>
<td>4.0%</td>
</tr>
<tr>
<td>150 mph</td>
<td>2.0%</td>
<td>4.0%</td>
<td>4.4%</td>
<td>4.8%</td>
</tr>
</tbody>
</table>

**GENERAL NOTES**

1. Work this Index with Index 700-040 and 700-041.

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

3. Spacing of Vertical Hangers:
   - A. Two Vertical Hanger = 21.0% L
   - Three Vertical Hanger = 25.0% L
   - Four Vertical Hanger = 29.0% L
   - Five Vertical Hanger = 33.0% L
   - Six Vertical Hanger = 37.0% L

4. Spacing of Wind Beams:
   - A. Two Wind Beams = 21.0% D
   - Three Wind Beams = 25.0% D
   - Four Wind Beams = 29.0% D
   - Five Wind Beams = 33.0% D
   - Six Wind Beams = 37.0% D

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

6. Materials:
   - A. Aluminum:
     - a. Bars, and Extruded Shapes: ASTM B 221, Alloy 6061-T6 or Alloy 6351-T5
     - b. Structural Shapes: ASTM B508, Alloy 6061-T6
     - d. Washers: ASTM B221, Al clad 2024-T4
   - B. Steel:
     - a. U-Bolts: ASTM A449 or ASTM A193
     - b. Nuts: ASTM A563, 2 per leg
     - c. Washers: ASTM F436, Al clad 2024-T4
   - C. Coatings:
     - a. Aluminum Bolts, Nuts and Washers: Anodic (0.0002 inches nickle and chromate sealed)
     - b. Galvanized Steel Bolts, Nuts and Washers: ASTM F2329

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

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

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

3. The Guide Sign Worksheet indicates the sign luminaire used for basis of design. The contractor may propose a different luminaire by submitting photometric calculations for each lighted sign for review by the Engineer.

SIGN LIGHTING INSTALLATION

Roadway Lighting included in contract:

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

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

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

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

Roadway Lighting not included in contract:

1. Signing contractor provides all electrical equipment necessary for connection of the sign lights.

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

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

1. Work this Index in conjunction with CANTILEVER SIGN STRUCTURE DATA TABLES in the Plans and Index 700-090.
2. Handholes are required at pole base for DNS Structures. Refer to Index 700-090 for Handhole Details.

3. Shop Drawings are required.

   Obtain Shop Drawing approval prior to fabrication. Include the following:
   A. Upright Pipe height (E) 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 of pole base (when required).

4. Materials:

   A. Sign Structure:
      - Upright and Chords (Steel Pipe): API 5L X42 PSL2, 42 ksi yield or ASTM A500, Grade B (Min.)
      - Steel Angles and Structural Plates and Bars: ASTM A500 Grade 36
      - Weld Material: E70XX
   B. Bolts, Nuts and Washers:
      - High Strength Bolts: ASTM F3125, Grade A325 Type 1
      - Nuts: ASTM A563 Grade DH Heavy-Hex
      - Washers: ASTM F436 Type 1, one under turned element
   C. Anchor Bolts, Nuts and Washers
      - Anchor Bolts: ASTM F1554 Grade 55
      - Nuts: ASTM A563 Grade A Heavy-Hex (1 per bolt)
      - Plate Washers: ASTM A36 (2 per bolt)
   D. Concrete
      - Spread Footing Concrete: Class IV
      - Drilled Shaft concrete: Class IV (Drilled Shafts)
      - Reinforcing Steel: Specification 415
   E. Coatings:
      - A. Bolts, Nuts and Washers: ASTM F2329
      - B. All other steel, including Plate Washers, hot dip galvanize: ASTM A123
   F. Handholes at pole base (when required).

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 TABLES. Minimum splice spacing is two truss panel lengths apart.
   C. Upright Splices: Not allowed
   D. Structural bolt hole diameters: Bolt diameter plus 1/16".
   E. Anchor bolt hole diameters: Bolt diameter plus 1/2"
   F. Hot Dip Galvanize after fabrication.
   G. Shop assemble the entire structure after galvanizing to validate/document alignment and clearance for bolted connections as well as contact between connecting plates. Take remedial action, if necessary, prior to shipment.
   H. Disassemble, as necessary, and secure components for shipment.

6. Coatings:

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

7. Construction:

   A. Construct foundation in accordance with Specification 455, except payment is included in the cost of the structure.
   B. Prior to erection, record the as-built anchor locations and submit to the Engineer.
   C. Place backfill above spread footings prior to installation of the sign panels. Do not remove or reduce backfill without prior approval of the Engineer.
   D. Tighten nuts and bolts in accordance with Specification 700.
   E. Cast-In-Place anchor bolts are not permitted.
   F. Hot Dip Galvanized: ASTM A123
   G. Splice connection at the top of the pipe 'F' before truss installation by using existing bolts at base plate.
   H. Disassemble, as necessary, and secure components for shipment.

8. Rebar:

   A. Upright and Chords (Steel Pipe): API 5L X42 PSL2, 42 ksi yield or ASTM A500, Grade B (Min.)
   B. Steel Angles and Structural Plates and Bars: ASTM A500 Grade 36
   C. Weld Material: E70XX
   D. Concrete:
      - Spread Footing Concrete: Class IV
      - Drilled Shaft concrete: Class IV (Drilled Shafts)
      - Reinforcing Steel: Specification 415

9. Materials:

   A. Sign Structure:
      - Upright and Chords (Steel Pipe): API 5L X42 PSL2, 42 ksi yield or ASTM A500, Grade B (Min.)
      - Steel Angles and Structural Plates and Bars: ASTM A500 Grade 36
      - Weld Material: E70XX
   B. Bolts, Nuts and Washers:
      - High Strength Bolts: ASTM F3125, Grade A325 Type 1
      - Nuts: ASTM A563 Grade DH Heavy-Hex
      - Washers: ASTM F436 Type 1, one under turned element
   C. Anchor Bolts, Nuts and Washers
      - Anchor Bolts: ASTM F1554 Grade 55
      - Nuts: ASTM A563 Grade A Heavy-Hex (1 per bolt)
      - Plate Washers: ASTM A36 (2 per bolt)
   D. Concrete
      - Spread Footing Concrete: Class IV
      - Drilled Shaft concrete: Class IV (Drilled Shafts)
      - Reinforcing Steel: Specification 415
   E. Coatings:
      - A. Bolts, Nuts and Washers: ASTM F2329
      - B. All other steel, including Plate Washers, hot dip galvanize: ASTM A123
   F. Handholes at pole base (when required).

10. 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 TABLES. Minimum splice spacing is two truss panel lengths apart.
   C. Upright Splices: Not allowed
   D. Structural bolt hole diameters: Bolt diameter plus 1/16".
   E. Anchor bolt hole diameters: Bolt diameter plus 1/2"
   F. Hot Dip Galvanize after fabrication.
   G. Shop assemble the entire structure after galvanizing to validate/document alignment and clearance for bolted connections as well as contact between connecting plates. Take remedial action, if necessary, prior to shipment.
   H. Disassemble, as necessary, and secure components for shipment.

11. Coatings:

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

12. 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. Cast-In-Place anchor bolts are not permitted.
   F. Hot Dip Galvanized: ASTM A123
   G. Splice connection at the top of the pipe 'F' before truss installation by using existing bolts at base plate.
   H. Disassemble, as necessary, and secure components for shipment.

13. Rebar:

   A. Upright and Chords (Steel Pipe): API 5L X42 PSL2, 42 ksi yield or ASTM A500, Grade B (Min.)
   B. Steel Angles and Structural Plates and Bars: ASTM A500 Grade 36
   C. Weld Material: E70XX
   D. Concrete:
      - Spread Footing Concrete: Class IV
      - Drilled Shaft concrete: Class IV (Drilled Shafts)
      - Reinforcing Steel: Specification 415
NOTES:
1. Construction joint allowed, roughen surface to 1/4" 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 drill shaft to the finished grade, unless specified otherwise in the plans.
4. The shaft length is based on 2'-0" height above finished grade.
5. Structural Grout Pad dimension may be modified to be less than 3" where the footprint of the Structural Grout Pad does not provide adequate clearance for accessibility considerations.
6. Wrap fillet weld around the stiffener termination on the tube wall.
NOTE:
1. Wrap fillet weld around the stiffener termination on the tube wall.
2. Truss Chord Bolts:
   A. Top and Bottom, Install ‘T’ hex head bolts.
   B. Back: Install ‘TB’ hex head bolts.

CANTILEVER ASSEMBLY

UPRIGHT-TRUSS CONNECTION DETAIL

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

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**TRUS F FRONT ELEVATION**

**SIDE ELEVATION**

**DETAIL 'D'**

**DETAIL 'E'**

**DETAIL 'F'**

**DETAIL 'G'**

**DETAIL 'H'**

**DETAIL 'I'**

---

**CANTILEVER SIGN STRUCTURE**

**STANDARD PLANS**

FY 2019-20

INDEX

700-040

LAST REVISION 01/01/17

DESCRIPTION:

REVISI ON

11/01/17

CANTILEVER ASSEMBLY

REV ISI ON

FA " Ø Hex Head Bolts

GA Ø x 6" See Upright-Truss Connection Detail (Sheet 3)

Truss Plug (Typ.) See Upright-Truss Connection Detail (Sheet 3)

Plate Is Skewed To Plane Of View

DA Ø x 6" See DETAIL 'G'

GB Ø Hex Head Bolts

GA Ø x 6" See DETAIL 'G'

GA Ø x 6" See DETAIL 'G'

8" OD/2 + 1" See DETAIL 'G'

0" OD/2 + 1" See DETAIL 'E'

Chord (Typ.) See DETAIL 'H'

Truss Plug (Typ.) See DETAIL 'H'

® Upright Pipe

® Upright Pipe

® Upright Pipe

® Upright Pipe

® Upright Pipe

® Upright Pipe

® Upright Pipe

® Upright Pipe
**SPICE 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'.

---

**CANTILEVER ASSEMBLY**

---

**SPICE CONNECTION DETAIL**

---

**TRUSS PLUG DETAIL**

---

**UPRIGHT CAP DETAIL**

---
NOTES:
1. Work this Index in conjunction with SPAN SIGN STRUCTURE DATA TABLES in the Plans and Index 700-020.
2. Handholes at the pole base are required for DMS Structures. Refer to Index 700-090 for Handhole Details.
3. Shop Drawings are required.
   Obtain Shop Drawing approval prior to fabrication. Include the following:
   A. Upright Pipe height ('C' & 'B') and foundation elevations: Verify
      minimum vertical clearances of the sign panel over the roadway.
   B. Height 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 A509 grade 36
   B. Bolts, Nuts and Washers:
      a. High Strength Bolts: ASTM F1554, Grade 55
      b. Nuts: ASTM A563 Grade A Heavy-Hex
      c. Washers: ASTM F436, Type 1, one under turned element
   C. Anchor Bolt, Nut and Washers:
      a. Anchor Bolt: ASTM A307 Grade A, Heavy
      b. Nut: ASTM A563, Grade DH Heavy-Hex (5 per bolt)
   D. Concrete:
      a. Class IV (Drilled Shaft)
   E. Reinforcing Steel: Specification 415
5. Fabrication:
   A. Welding: Specification 460-6.4
   B. Chord Splices: Minimum splice spacing is three truss panel
      lengths apart and three truss panel lengths from the uprights.
      Chord Splices may be either the Standard Splice or the Alternate
      Splice but not both on the same structure.
   C. Upright splice: Not allowed
   D. Structural bolt hole diameters: Bolt diameter plus 16".
   E. Anchor bolt hole diameters: Bolt diameter plus 16".
   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 F1554
   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 in accordance with Specification 649-6.
   F. After installation, place wire screen between top of foundation and
      bottom of baseplate in accordance with Specification 449-6.
NOTES:

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

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

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’ Ø.
3. Right Upright Truss connection shown, Left Upright Truss connection similar.
SPAN SIGN ASSEMBLY

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

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SPAN SIGN STRUCTURE

Section B-B (Section C-C Similar) (See Note 1)
Span Length, 'A', Comprised Of 'D' Equal Panels

DETAIL 'D'

DETAIL 'E'

DETAIL 'F'

DETAIL 'G'

DETAIL 'H'

DETAIL 'I'

DETAIL 'J'

DETAIL 'K'

DETAIL 'L'

DETAIL 'M'

DETAIL 'N'

DETAIL 'O'

DETAIL 'P'

DETAIL 'Q'

BACK-SIDE SIGN MOUNTING

3. Wrap fillet weld around plate termination on the tube wall.

2. Back truss chord and attached angles are not shown for clarity.

1. Out-of-plane members are not shown for clarity.

TRUSS

FRONT ELEVATION

SIDE ELEVATION

PROVISION DETAIL FOR ALL BACK MOUNTED SIGNS AT SIGN HANGER

See Note 1
See Note 2
See Note 3

See DETAIL 'K'

See DETAIL 'K'

FOR SIGN LUMINARIE MOUNTING DETAILS

MOUNTING DETAILS

2-1/4" U-BOLT WITH DOUBLE NUTS AND WASHERS (Typ.)

2-3/4" Ø BOLT WITH DOUBLE NUTS AND WASHERS (Typ.)

CENTERS OF ANGLES AND CHORDS INTERSECT (Typ.)

See DETAIL 'K'

FRONT ELEVATION (See Note 5)

SIDE ELEVATION

BASE PLATE IS SKewed TO PLANE OF VIEW

CHORDS INTERSECT (Typ.)

CENTROIDS OF ANGLES AND

See Upright-Truss Connection Detail (Sheet 3)

See Note 3

For Sign Luminaire Mounting Details

See Index 700-031

Aluminum Ze Sign Hanger (See Index 700-030)

See DETAIL 'L'

See DETAIL 'K'
FREE-SWINGING, INTERNALLY-ILLUMINATED STREET SIGN ASSEMBLIES

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. 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 Section 700 for "Acceptance by Certification".

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.

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 geometry.
   B. Catwalk design in accordance with AISC, AASHTO, and OSHA requirements as applicable.
   C. Do not start fabrication until the shop drawings are approved.
4. Extend Catwalk from DMS to outer edge of paved shoulder and not less than 4 feet in length.
5. If required, install guardrail at location shown in the Plans and in accordance with Index 536-001.
6. Materials:
   A. Sign Mounting Components:
      a. Aluminum Structural Shapes: ASTM B308, Alloy 6061-T6
      b. Vertical Hangers: ASTM A404, Grade 36
      c. U-Bolts: ASTM A449 or A193 B7
      d. High Strength Bolts: ASTM F3125, Grade A325, Type 1
      e. Nuts: ASTM F563
      f. Washers: ASTM F463 (Flat Washer)
   B. Coatings:
      a. All nuts, bolts and washers ASTM F2329
      b. All other steel items ASTM A123
      c. Bolt Hole Diameters: Bolt plus $\frac{3}{4}$ before galvanizing
7. 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 antral poles.
   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 hanger and horizontal mounting member attached to the sign enclosure. Field locate holes to allow vertical hanger placement as shown on the Plans with no conflicts with gusset or splice plates.
   E. Locate threaded couplings on sign side of upright above the sign truss.
   F. Connect grounding conductors to the steel framework that has been cleans 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 to accept a threaded connector is also an acceptable method.
   G. If steel framework is to be drilled and tapped to accept a threaded connector, the threaded connector shall be galvanized and have at least 3 threads fully engaged and secured with a jam nut to the steel framework.
   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.

DYNAMIC MESSAGE SIGN ASSEMBLY

CANTILEVER ISOMETRIC VIEW

SPAN ISOMETRIC VIEW
NOTE: Actual number and direction of travel lanes varies.
Dynamic Message Sign (DMS) (See DETAIL "A")

- Ground Rod B (Typ.)
- Ground Rod C As Required
- Fiber Optic Pull Box (See DETAIL "B")
- Pole Mounted Cabinet
- Concrete Slab
- Handrail
- Pull Box (See DETAIL "B")
- Air Terminal
- Grating
- Removable Top Plate
- 2-1/2" Threaded Couplings

Dynamic Message Sign Grounding and Conduit Detail

Pole Mounted Cabinet

- Transition Conduit Outside Of Foundation (Typ.)
- 2" PVC Conduit with 3/8 ABS Tin-Plated Bare Solid Copper Ground Wire Bonded to DMS Structure and Ground Rod With Exothermic Weld
- Power Conduit (2" PVC)
- Fiber Optic Communications Conduits (2" PVC)
- (As Shown On Plans)
- No More Than 10" Below Cabinet
- Sign Structure
- Span Or Cantilever Structure and Ground Rod With Exothermic Weld
- Bonded to DMS Structure and Ground Rod With Exothermic Weld
- 2" PVC Conduit with #2 AWG Tin-Plated Bare Solid Copper Ground Wire (Class II) Surface Mount The Cabinet

Ground Mounted Cabinet

- Transition Conduit Outside Of Foundation (Typ.)
- 2" PVC Conduit with 3/8 ABS Tin-Plated Bare Solid Copper Ground Wire Bonded to DMS Structure and Ground Rod With Exothermic Weld
- Power Conduit (2" PVC)
- Fiber Optic Communications Conduits (2" PVC)
- (As Shown On Plans)
- No More Than 10" Below Cabinet
- Sign Structure
- Span Or Cantilever Structure and Ground Rod With Exothermic Weld
- Bonded to DMS Structure and Ground Rod With Exothermic Weld
- 2" PVC Conduit with #2 AWG Tin-Plated Bare Solid Copper Ground Wire (Class II) Surface Mount The Cabinet

11/01/17
**REVISION DESCRIPTION:**

The Base Of The Wire Continuous To Bare Solid Copper #2 AWG Tin-Plated Ground Mounted Cabinet Solid Copper Wire To #2 AWG Tin-Plated Bare

Exothermic Weld (Typ.) May Be Combined Required (Connections Rods B, C And D As Wire To Ground Bare Solid Copper #2 AWG Tin-Plated Ground Rod B Ground Rod D Ground Rod C Primary Ground Rod

3D Radius Each “Sphere of Influence”

Primary Ground Rod A

Ground Rod C

#2 AWG

90° (Typical)

Sign Structure Foundation

TYPICAL (20’ Rods, 40’ Spacing) GROUND ROD ARRAY DETAIL

DETAIL “D”

COVER

1/4” Hole (Typ.)

Thru Handhole 11 Gage Handhold Cover Clip (Typ.)

Threaded Hole For 1/4” Ø Hex Head Screw (Typ.)

Full Penetration Weld (Typ.)

FRAME

4” Ø Hex Head Screw (Typ.)

Tack Welded Cover (Typ.)

Handhold Frame

1/4” Ø Stainless Steel Hex Head Screw (Typ.)

SECTION A-A

DETAIL “E”

DYNAMIC MESSAGE SIGN WALK-IN
**HANGER LOCATION DETAIL**

_Cantilever Sign Structure Shown, Span Sign Structure Similar_

**SECTION B-B**

- **DMS Sign Enclosure:** Vertical Hanger Galvanized W6x9 (Typ.) Hanger @ 5' (Max.) Spacing
- **Top Truss Chord:** 2~2” Ø U-Bolts With Double Nuts and Washers
- **Vertical Hanger:** 2 – ½” Ø U-Bolts
- **Bottom Truss Chord:** Provide 2 – ½” Ø Bolts With Nuts and Washers
- **Field Drill Holes And:**
- **Vertical Hanger:** Ξ Holes For ½” Ø Bolts

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**SECTION C-C**

- **DMS Sign Enclosure:** Vertical Hanger Galvanized W6x9 (Typ.) Hanger @ 5' (Max.) Spacing
- **Top Truss Chord:** 2~2” Ø U-Bolts With Double Nuts and Washers
- **Vertical Hanger:** 2 – ½” Ø U-Bolts
- **Bottom Truss Chord:** Provide 2 – ½” Ø Bolts With Nuts and Washers
- **Field Drill Holes And:**
- **Vertical Hanger:** Ξ Holes For ½” Ø Bolts

---

**SECTION D-D**

- **DMS Sign Enclosure:** Vertical Hanger Galvanized W6x9 (Typ.) Hanger @ 5' (Max.) Spacing
- **Top Truss Chord:** 2~2” Ø U-Bolts With Double Nuts and Washers
- **Vertical Hanger:** 2 – ½” Ø U-Bolts
- **Bottom Truss Chord:** Provide 2 – ½” Ø Bolts With Nuts and Washers
- **Field Drill Holes And:**
- **Vertical Hanger:** Ξ Holes For ½” Ø Bolts

---

**DYNAMIC MESSAGE SIGN END VIEW**

**DYNAMIC MESSAGE SIGN WALK-IN**

FY 2019-20

STANDARD PLANS

INDEX 700-090

SHEET 5 of 5
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 illustration). Install shoulder mounted signs rotated counterclockwise and median mounted signs rotated clockwise. 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 the traveled 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 of the sign panel to a horizontal line extended from the edge of the traveled way or from the ground surface at the back of the curb. If the standard heights cannot be met, the minimum heights are as follows:
   - 7' - Expressway & Freeway Systems Other Roadway Systems
   - 9' - Urban (including residential with parking and/or pedestrian activity)

6. Do not install sign supports in the bottom of ditches.

7. Install sign supports so they do not reduce the accessible width of sidewalks or Shared Use Paths to less than 4 min. clear width.

NOTE: If median width does not allow standard offset from both roadway, center sign in median.

CASE I
Use On Mainline Freeways And Express Way Systems

CASE II
Use In All Rural Roads, Freeways And Expressway Ramps

CASE III
Use On All Roads With Signs Mounted Behind Sidewalk

CASE IV
Use On All Rural, Freeway And Express Systems

CASE V
Use In Business Or Residential Areas Only

CASE VI
Use On All Roadway With Signs Behind Guardrail

CASE VII
REST AREA AND EXIT GORE SIGNS
Use On All Rural, Freeway And Express Systems

CASE VIII
Use On Island Or Curbed Median

CASE IX
MILE POST MARKER
Use In All Interstate Rural Roads, Freeways And Expressway Systems

CASE X
WRONG WAY SIGNS
Use On Interstate Exit Ramps

NOTE: For more information refer to Section ZH of the MUTCD.
FLORIDA LITTER LAW
$100 MIN FINE FOR LITTERING
3'-6" X 4' 6" Radii 3/8" Border

SAFETY BELT
CHILD RESTRAINT
USE REQUIRED
BY LAW
9" X 6'
3" Radii 3/8" Border

RECYCLING
COLLECTION CENTER
3'-6" X 5'
4" Radii 4" Series C Legend
White Legend, Border and Symbol

WEIGHT LIMIT
RESTRICTION AHEAD
4'-6" X 4'
3" Radii 1/2" Border
4" Series D Legend
Yellow Background
Black Legend and Border

ADOPT-A-HIGHWAY
A Partnership For
Litter-Free
Florida Highways
4'-6" X 4'
3" Radii 3/8" Border
4" Series C Legend
White Background
Black Legend and Border

FLORIDA HIGHWAY
PATROL
DIAL \textregistered FHP
(347)
3'-0" X 4'
3" Radii 1/2" Border
Top 6" Series D Legend
Blue Legend and Border

SAFETY BELT
CHILD RESTRAINT
USE REQUIRED
BY LAW
9" X 4'
3" Radii 3/8" Border

BUCKLE UP
IT'S THE LAW
3'-6" X 2'
5" Radii 3/8" Border
3" Series D Legend
Blue Legend and Border

WEIGHT LIMIT
RESTRICTION AHEAD
3'-6" X 4'
3" Radii 3/8" Border
4" Series C Legend
White Background
Green Florida Symbol
Black Legend, Border and Man Belt Symbol

SAFETY BELT
CHILD RESTRAINT
USE REQUIRED
BY LAW
9" X 4'
3" Radii 3/8" Border

3'-6" X 4'
3" Radii 3/8" Border
4" Series D Legend
White Background
Green Florida Symbol
Black Legend, Border and Man Belt Symbol

WEIGHT LIMIT
RESTRICTION AHEAD
3'-6" X 5'-6"
3" Radii 3/8" Border
4" Series C Legend
White Background
Green Florida Symbol
Black Legend, Border and Man Belt Symbol
No Obstruction To Text Or Symbols From Holes Or Bolts.

Sign Mounting Holes Can Be Punched Or Field Drilled With No Obstruction To Text Or Symbols From Holes Or Bolts.

Spacing And Symbol Sizes.

** 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 700-020 for Type “A” breakaway or Index 700-010 for Type “C” Frangibility.

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

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

** One Post Service Signs See Detail "D" 

See Detail "B" Or Detail "C" 
See Guide Sign Supplemental 
Proposed Guide Sign 

Proposed Supplemental Guide Sign 
See Detail "A" 

NOTE
When approved for attachment to the advance guide sign, up to 3 services may be used for an exit. The symbol signs shall be suspended from the guide sign panel or existing wind beams. Symbol signs are not to be connected to existing sign posts. The mounting height of the advance guide sign shall be increased, where necessary, to provide 8' between the level of the pavement edge and the bottom of the guide sign, prior to mounting the supplementary panel.
FOR LIMITED ACCESS HIGHWAYS

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.

---

Tourist Information Center
NEXT RIGHT

Notes:
- 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).

---

INDEX 700-105 SHEET 1 of 2
STATE OF FLORIDA
WELCOME CENTER
1 MILE

STATE OF FLORIDA
OFFICIAL
WELCOME CENTER

1/2 MILE

SIGN FTP-15B-06

WELCOME CENTER SIGNING

SIGN FTP-12-06

SIGN FTP-15C-06

FTP-15A-06

FTP-15B-06

FTP-15C-06

FTP-12-06

FTP-12-06

2,240'

2,240'

50' Minimum For Rural Conditions

800' Maximum For Rural Conditions

Notes:
1. Signs and sign structures shall be erected in accordance with the details shown on Index 700-020.
2. Sign FTP-12-06 shall be located on the Welcome Center grounds in proximity to the building and as far from the Main Line Roadway as possible (2 signs back to back).
3. All legend to be Series E.
4. One sign FTP-15A-06 or FTP-06 should be used depending on speed, roadside development & geometric conditions.

FOR PRIMARY HIGHWAYS

STANDARD PLANS

WELCOME CENTER SIGNING

INDEX
700-105

SHEET
2 of 2
One-Way Traffic

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

2. If the bridge or the approach is on a curve, delineators shall be installed for a distance of 1570’ in advance of narrow bridge on the outside portion of the roadway. Spacing shall be 100’ between delineators.
   Delineators are to be placed not less than 2’ or not more than 4’ outside the outer edge of pavement.

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

4. The ON-3R & ON-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. 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.
WEIGH STATION SIGNING

TYPICAL SIGNING FOR TRUCK WEIGH AND INSPECTION STATIONS

INDEX
700-108

1 of 2
TYPE 1 OBJECT MARKER PLACEMENT

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

TYPE 4 OBJECT MARKER PLACEMENT

OBJECT MARKER DETAIL
NOTES:
1. Work with Index 700-030.

2. Materials (Aluminum):
   a. Sheets and Plates: ASTM B209 Alloy 6061-T6
   b. Standard Structural Shapes: ASTM B209 Alloy 6061-T6
   c. Extruded Shapes: ASTM B221 Alloy 6061-T6
   d. Bolts, Nuts, and Washers:
      a. Bolts: ASTM F468 Alloy 2024-T4 with minimum 0.002-inch-thick anodic coating, chromate sealed
      b. Washers: ASTM B221 Alloy 2024-T4
      c. Nuts: ASTM F467 Alloy 6061-T6 or 6262-T9

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

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

5. For left exits, install the Exit Numbering Panel to the top left side of the Highway Sign.
POWER CONFIGURATION 'A'
CONVENTIONALLY-POWERED
(Type A1 Shown)

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 B.
2. Install sign panel and wind beam in accordance with Index 700-010 and Specification 700.
3. Engage all threads on the transformer base and post unless the aluminum post is fully seated into base.
4. Meet the requirements of Specification 646 for aluminum poles and transformer bases.
5. Install a concrete slab around all flashing beacon 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 'B'
SOLAR-POWERED
(Type B1 Shown)

POWER CONFIGURATION 'B' NOTES:
1. Install a separate pole for mounting the solar panel, controller, and batteries for all flashing beacon 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 beacon 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.

TABLE OF CONTENTS:
<table>
<thead>
<tr>
<th>Sheet</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>General Notes and Contents</td>
</tr>
<tr>
<td>2</td>
<td>Conduit, Wiring, and Foundation Details</td>
</tr>
<tr>
<td>3</td>
<td>Roadside Sign Assembly-1</td>
</tr>
<tr>
<td>4</td>
<td>Roadside Sign Assembly-2</td>
</tr>
<tr>
<td>5</td>
<td>Roadside Sign Assembly-3</td>
</tr>
<tr>
<td>6</td>
<td>Roadside Sign Assembly-4</td>
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<td>7</td>
<td>Roadside Sign Assembly-5</td>
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<td>8</td>
<td>Roadside Sign Assembly-6</td>
</tr>
<tr>
<td>9</td>
<td>Overhead Sign Assembly</td>
</tr>
</tbody>
</table>

Sheet 2
See DETAIL "B", Sheet 2

Sheet 3
See DETAIL "B", Sheet 2
CONDUIT, WIRING, AND FOUNDATION DETAILS

DETAIL "A"

- Nominal 4" (Sch. 40) Aluminum
- Transformer Base
- #6 Ground Wire
- Strain Relief Fitting
- Footing Depth
- 2'-0" Dia.

DETAIL "B"

- Nominal 4" (Sch. 40) Aluminum
- Transformer Base
- #6 Ground Wire
- Strain Relief Fitting
- 2'-0" Anchor Bolts
- Conduit for Future Use
- Cap Conduit

ENHANCED HIGHWAY SIGNING ASSEMBLIES

REVIEW
REV 02/01/18

INDEX
SHEET
700-120
2 of 9
12" Yellow Flashing Beacon

Sign Panel (48" x 48")

WARNING SIGN

When Flashing

W-16-13P (24" x 18") Sign (when shown in plans)

Nominal 4" (Sch. 40) Aluminum

NOTE:
Type A1 Assembly (conventionally-powered) is shown.
Type B1 Assemblies (solar-powered) similar.
NOTE:
Type A2 Assembly (conventionally-powered) is shown. Type B2 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:**

20

OR

15

SCHOOL

SPEED LIMIT

20 OR 15

FINES

DOUBLED

SPEEDING

FINES

WHEN

FLASHING

55-1 (24" x 48") Highlighted Sign

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

Nominal 4" (Sch. 40) Aluminum

Highlighted Sign Controller

TO PULL BOX

FRONT VIEW

SIDE VIEW

NOTE:

Type B4 Assembly (conventionally-powered) is shown. Type B4 Assemblies (solar-powered) similar.
NOTES:

1. Type A5 Assembly (conventionally-powered) is shown. Type B5 Assemblies (solar-powered) similar.

2. Use electronic speed feedback sign with 15" high numerals for posted 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.
**Typical Placement of Raised Pavement Markers**

**LEGEND:**
- B/C = Back of Curb
- EOP = Edge of Pavement
- RPM = Raised Pavement Marker
- W/R = White/Red RPM
- Y/Y = Yellow/Yellow RPM
- MD/Y = Mono-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.

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

- **W/R RPMs (Typ.):** Install RPMs at 20' Center to Center
- **Y/Y RPMs (Typ.):** Install RPMs at 20' Center to Center

**RPM PLACEMENT AT TRAFFIC CHANNELIZATION AT GORE**

(Traffic Flows In Same Direction)

- **8" Solid White**
- **18" White**
- **6" White**
- **Gore Area**
- **6" Yellow**
- **Direction of Traffic**
- **Beginning of physical gore**

**RPM PLACEMENT AT TRAFFIC SEPARATION**

(Traffic Flows In Opposite Direction)

- **Y/Y RPMs (Typ.):**
  - **6" Double Yellow**
  - **18" Yellow**
  - **Direction of Traffic**
  - **Median Or Island**
- **6" Double Yellow**
- **6" Yellow**

**RPM PLACEMENT AT ROADSIDE CROSSHATCHING**

- **6" White**
- **Edge Of Pavt.**
- **W/R RPMs (Typ.):**
- **18" White**
- **15°**

**NOTE:**

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

**LEGEND:**
- **B/C:** Back of Curb
- **EPD:** 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

The pavement marking is yellow and oriented opposite hand.

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

1. For Type "C" Curb, install RPMs along the pavement edge marking using the same spacing shown.

2. Orient traffic faces of RPMs in curb median radii to be parallel to direction of travel lanes.
**RPM PLACEMENT AT ISLANDS**  
(When called for in the Plans)

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

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

**LEGEND:**

<table>
<thead>
<tr>
<th>RPM Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B/C</td>
<td>BACK OF CURB</td>
</tr>
<tr>
<td>EOP</td>
<td>EDGE OF PAVEMENT</td>
</tr>
<tr>
<td>RPM</td>
<td>RAISED PAVEMENT MARKER</td>
</tr>
<tr>
<td>W/R</td>
<td>WHITE/RED RPM</td>
</tr>
<tr>
<td>Y/Y</td>
<td>YELLOW/YELLOW RPM</td>
</tr>
<tr>
<td>W/R</td>
<td>WHITE/RED RPM</td>
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<tr>
<td>MD/Y</td>
<td>MONO-DIRECTIONAL YELLOW RPM</td>
</tr>
<tr>
<td>MD/W</td>
<td>MONO-DIRECTIONAL WHITE RPM</td>
</tr>
</tbody>
</table>

**POSTED SPEED LIMIT RPM**

<table>
<thead>
<tr>
<th>SPEED LIMIT</th>
<th>RPM</th>
</tr>
</thead>
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<tr>
<td>20' OR LESS</td>
<td>10</td>
</tr>
<tr>
<td>30</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td></td>
</tr>
</tbody>
</table>

**FOR ILLUSTRATIVE PURPOSE ONLY**
RPM PLACEMENT FOR CROSSES ON LIMITED ACCESS ROADWAYS

- 3 Yellow RPMs
- 2 Yellow RPMs
- 1 Yellow RPM

See DETAIL "L"

Limited Access Facility

Shoulder

Edge of Crossover

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

6" Yellow Edge Line

Edge of Traveled Way

DETAIL "L"
Field Drum Revisions

DESCRIPTION:

Revisions of

Limited Access Roadway

Two-Lane Roadway

Multilane Roadway

Two-Lane Roadway with Turn Lane

Multilane Roadway at Intersection

Blue RPM Placement

Typical Placement of Raised Pavement Markers

FY 2019-20

Standard Plans

Index

706-001

Sheet 6 of 6
**NOTES FOR PAVEMENT MESSAGES:**

1. When an arrow and a pavement message are used together, locate the arrow a distance of 6' downstream from the pavement message. Measure the distance from the base of the arrow to the base of the pavement message. 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 509-070 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>
</thead>
<tbody>
<tr>
<td>25</td>
<td>34</td>
</tr>
<tr>
<td>30 - 35</td>
<td>40</td>
</tr>
<tr>
<td>40 - 45</td>
<td>56</td>
</tr>
<tr>
<td>45 - 50</td>
<td>72</td>
</tr>
<tr>
<td>50 - 55</td>
<td>88</td>
</tr>
</tbody>
</table>

---

**PAVEMENT MARKINGS**

**REVISED DESCRIPTION:**

**INDEX:** 711-001

**SHEET:** 1 of 13
PAVEMENT MARKING LINES

CONTRAST MARKINGS WITH ALTERNATING SKIP PATTERN
(10'-30' Skip Line Shown, Dotted Lines Similar)

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**
  - $X = \text{LANE WIDTH (FT.)}$
  - $Y = \text{BUFFERED BIKE LANE WIDTH (FT.)}$

**Striping for Buffered Bike Lane**

**Striping with Shoulder or Non-Buffered Bike Lane**

**Striping with No Shoulder or Bike Lane**

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

---

**Placement of Longitudinal Pavement Markings**

**Description:**

**Revision:**

- Last Revision
- FY 2019-20
- Standard Plans
- Pavement Markings

**Index:**

- 711-001
- 3 of 13
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. Express Lane markers and associated RPMs, see the Plans.
PLACEMENT OF LONGITUDINAL PAVEMENT MARKINGS

CURB AND GUTTER SHOWN
PLACEMENT OF LONGITUDINAL PAVEMENT MARKINGS

FLUSH SHOULDER SHOWN
NOTE:

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

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

3. Extend double yellow centerlines 100' back from intersection on all approaches or 50' for unmarked cross roads.
**DESCRIPTION:**

For use in congested urban areas where available storage length between intersections is limited and a permanent point of transition from the turn lane to the exclusive turning lane can not be determined.

For use in rural & suburban areas where an adequate exclusive turning lane can not be determined.

For use in congested urban areas where available storage lane length can be specifically determined.

**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**

**RIGHT TURN LANE AND ISLAND DETAILS**

**TRAFFIC CHANNELIZATION AT GORE**
LEFT ROADWAY CENTERED ON EXISTING ROADWAY

RIGHT ROADWAY CENTERED ON EXISTING ROADWAY

SCHEMES FOR TRANSITION - 2 LANE / 4 LANE ROADWAY

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

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

3. Refer to Index 522-002 when Curb Ramps are present.
** Queue Length **

*Stop Bar (If Required)*

6" White

Begin Lane Line

Begin Lane Line

Queue Length (Measured From Stop Bar Location)

Single Left Turns

** Queue Length is Measured From The Median Nose Radial Point Or, When A Stop Bar Is Required, From The Stop Bar.**

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Clearance Distance</th>
<th>Brake To Decel. Distance</th>
<th>Total Decel. Distance</th>
<th>Clearance Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>70'</td>
<td>150'</td>
<td>220'</td>
<td>170'</td>
</tr>
<tr>
<td>40</td>
<td>80'</td>
<td>160'</td>
<td>240'</td>
<td>190'</td>
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<td>45</td>
<td>90'</td>
<td>170'</td>
<td>250'</td>
<td>220'</td>
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<td>110'</td>
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<td>270'</td>
<td>260'</td>
</tr>
<tr>
<td>60</td>
<td>120'</td>
<td>200'</td>
<td>290'</td>
<td>290'</td>
</tr>
</tbody>
</table>

*NOTE:*

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.

** Arrow Spacing **

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

** Urban Conditions **

** Rural Conditions **

** Double Left Turns **

** 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.
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; public sidewalk curb rack locations refer to plan locations cited to JCPUC.
4. Tint blue pavement markings to match color 15180 of Federal Standards 596a.
5. Mount FTP-22-06 sign below the FTP-21-06 sign.

FOR ACCESSIBLE MARKINGS - SEE ABOVE

"DIMENSIONS"

<table>
<thead>
<tr>
<th>Angle</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>45°</td>
<td>19'</td>
<td>9'</td>
</tr>
<tr>
<td>60°</td>
<td>20'</td>
<td>9'</td>
</tr>
</tbody>
</table>

Use of pavement symbol in accessible parking spaces is optional; when used, the symbol shall be 3' or 5' 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
DESCRIPTION:

REVISION

LAST

REVISION

STANDARD PLANS

FY 2019-20

BICYCLE MARKINGS

INDEX

711-002

SHEET

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.
INTERCHANGE MARKINGS

TAPER - TYPE ENTRANCE

PARALLEL - TYPE ENTRANCE

Paved Shoulder
6" White
6" White (10'-30')

6" White (3'-9')

White/Red Raised Pavement Markers

Paved Shoulder
6" Yellow

Yellow/Red Raised Pavement Markers

Paved Shoulder

6" White

Ramp

6" White

White/Red Raised Pavement Markers

6" Yellow

White/Red Raised Pavement Markers

Maintain Full Ramp Width (12 Typ.)

Maintain Full Ramp Width (15' Typ.)

6" Yellow

6" White (3'-9')

White/Red Raised Pavement Markers

Yellow/Red Raised Pavement Markers

Shoulder Gutter

6" Yellow

Shoulder Gutter
INTERCHANGE MARKINGS

TYPICAL MARKINGS AT DUAL LANE EXITS

TYPICAL LANE DROP MARKINGS AT EXIT RAMPS

PARALLEL ACCELERATION AND DECELERATION LANE

DESCRIPTION:

REVISION

SHEET 3 of 7

INDEX

711-003

LAST REVISED 11/01/17

FY 2019-20

STANDARD PLANS
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.
Wrong Way Arrows
White/Red Raised Pavement Markers

6" White (10'-30')
6" Yellow
24" White
6" White (2'-4')
6" White (10'-30')
6" Yellow

Special Emphasis Crosswalk
(See Index 711-001)

8" White

6" White
6" Yellow

TYPICAL PARTIAL CLOVERLEAF/TRUMPET EXIT RAMP

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

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

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

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

4. All grids are 4" x 4".

---

**EXIT RAMP WITHOUT AUXILIARY LANE**

**EXIT RAMP WITH AUXILIARY LANE**

---

**MAT DIMENSIONS**

**MESSAGE SIZE AND SPACING**
**DESCRIPTION:**

**REV IS IO N**

**LAST**

**CONVENTIONAL LIGHTING**

**INDEX**

**715-001**

**SHEET**

**1 of 3**

**REVISION**

**STANDARD PLANS**

FY 2019-20

**NOTE S:**

1. Barrier wall or bridge mounted poles. The wiring shall be in accordance with Specification 196.

2. Provide cable length to remove fuseholders from transformer base, pole base or pull box for maintenance. Remove slack from the luminaire cable to provide tension on the fuseholders if the pole breaks away. Pull excess cable into pull box to tighten 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 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 Specifications 635 may be used.
5. Slabs to be placed around all Poles and Pull Boxes in rural locations. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
6. Concrete for slabs around pull boxes shall be included in the price of pull box.
NOTES:
1. Use compacted select material in accordance with Index 120-001.
2. Concrete shall be Class NS with a minimum strength at 28 days of f'c=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 for slabs around poles and pull boxes shall be included in the price of pole or pull box.

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

Outside edge of slab shall be cast against formwork.

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

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

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

The expansion joint shall consist of 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 f'c=2.5 ksi.

Outside edge of slab shall be cast against formwork.

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

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

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

The expansion joint shall consist of 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 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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.
GENERAL NOTES:

1. Poles are designed to support the following:
   a. Luminaire Effective Projected Area (LPA): 1.55 SF
   b. Weight: 55 lb.

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

3. Materials:
   a. Pole, Pole Connection Extrusions and Arm Extrusions: ASTM B221, Alloy 6063-T6 or Alloy 6061-T6
   b. Bars, Plates, Stiffeners and Backer Ring: ASTM B221, Alloy 6063-T6
   c. Caps and Covers: ASTM D-26, Alloy 319-
   d. Steel Bearing Plate: ASTM A709 or ASTM A36 Grade 36
   e. Aluminum Weld Material: ER 4043
   g. Bolts, Nuts and Washers: ASTM F593 or ASTM F3125, Grade A35, Type 1
   h. Nuts: ASTM F1554 Grade 55
   i. Washer: ASTM A36
   j. Stainless Steel Fasteners: ASTM F593 Alloy Group 2, Condition A, CW1 or SH1
   k. Concrete: Class 1
   l. Reinforcing Steel: Specification 415
   m. Nut Covers: ASTM B-26, Alloy 319-F
   n. Caps and Covers: ASTM B221, Alloy 6063-T6 or Alloy 6061-T6
   o. Bars, Plates, Stiffeners and Backer Ring: ASTM B221, Alloy 6063-T6 or 6061-T6
   p. Caps and Covers: ASTM B36
   q. Washer: ASTM A36

4. Fabrication:
   a. Weld Arm and Pole (Alloy 6063) in the T4 temper using 4043 filler. Age the Arm and Pole artificially to the T6 temper after welding.
   b. Welds are continuous, except as noted.
   c. Roadway Light Pole Taper: Taper as required to provide a round top O.D. of 6" and a base O.D. of 10". Portions of the pole near the base shoe and at the arm connections may be held constant at 10" and 6" respectively 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 shoe and at the arm connections may be held constant at 11" x 7" oblong and 6" round respectively to simplify fabrication.
   e. Weld all seams continuously and grind smooth.
   f. Do not erect pole without Luminaire attached.
   g. Perform all welding in accordance with AWS D1.2.
   h. Weld all seams continuously and grind smooth.
   i. Plate Washer: ASTM A36
   j. Washer: ASTM A36
   k. Anchor Bolts: ASTM F3125, Grade A325, Type 1
   l. Embeds 4" x 6" handhole located 1'-6" above the base plate.
   m. Pedestal mounted luminaires: Do not erect pole without Luminaire attached.

5. Coatings/Finishes:
   a. Pole and Arm Finish: 50 grit satin rubbed
   b. Galvanize Steel Bolts, Screws, Nuts and Washers: ASTM A123
   c. Hot Dip Galvanize EJB and other steel items included in the cost of the pole.
   d. Galvanize Steel Bolts, Screws, Nuts and Washers: ASTM A123

6. Construction:
   a. Foundation: Specification 655, except payment for the foundation is included in the cost of the pole.
   b. Frangible Base, Base Shoe, and Clamp:
      i. Certify that the clamp, frangible transformer base, and base shoe design are capable of providing the required 200 psi capcity.
      ii. Certify the base conforms to the current FHWA required AASHTO Frangibility Requirements, tested under NCHRP Report 350 Guidelines (e.g. Akron Foundry TB1-17).
      iii. Do not erect pole without luminaire attached.

7. Embedded Junction Box (EJB): Install EJBs per Note 4 and in accordance with Specification 635, as shown on the following sheets.

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

STANDARD PLANS

INDEX

715-002

1 of 8
ARM CONNECTION DETAIL

ARM SECTION

SECTION A-A
(Connection at Lower Arm Similar)

VIBRATION DAMPER ELEVATION

HIGH TEMP VINY CAP DETAIL

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

The fabricator may substitute elliptical cross sections other than those tabulated, provided the section properties about the vertical axis and the area of the section equal or exceed that of the required section, and provide minimum wall thickness of 1/16" nominal and within the Aluminum Association Tolerances.

The outside diameter about the minor axis should be held at 2-1/8" nominal and within the Association Tolerances.

ARM & DAMPER DETAILS
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.

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.
**EQUIPMENT:**

- **Light Pole:**
  - 16 ~ #4 Bars @ 8" (Typ.)
  - 1" Ø Conduit
  - Bearing Plate
  - 2" Ø Conduit
- **Working Pedestal:**
  - 4 ~ 1½" Ø Anchor Bolts
  - 9½" x 20'-0" Grounding Rod
  - 3½" Cover (Typ.) / 4" Cover (Bottom)
  - 4" Cover (Typ.)

**CONSTRUCTION:**

- **Foundation:** 20'-0" Min. Spacing Bars 5V & 5W1
- **Bars:** Bars 5W1 (Typ.) @ 8" (Typ.)
  - Bars 5V (Typ.) @ 8" (Typ.)
- **Junction Box:** Optional Const. Jt. (See Note 2)
- **See Roadway Plans:**
  - Construction Joint (Typ.)
  - Junction Box
  - Embedded w/ Rigid Material
  - 1" Exp. Jt.

**NOTES:**

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

**REFERENCES:**

- STANDARD PLANS
- FY 2019-20
- STANDARD ALUMINUM LIGHTING
- INDEX 715-002
**NOTES:**

1. For Base Plate Details, Bearing Plate Details, and Detail 'A', see Sheet 5.

2. See Index 521-426 for details of adjacent Traffic Railing (Median 36" Single-Slope)
   and for angles A and B.

3. See Index 630-010 for Conduit, EJB and supplemental reinforcing details.

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**ELEVATION**

(Longitudinal and transverse deck reinforcing steel not shown)

**PLAN**

(Reinforcing steel and 2" Ø Conduit not shown)

**SECTION D-D**

(Longitudinal and transverse deck reinforcing steel not shown)

**DESCRIPTION:**

STANDARD ALUMINUM LIGHTING

FY 2019-20

STANDARD PLANS

INDEX 715-002

SHEET 8 of 8
HIGHMAST LIGHTING NOTES:

1. Poles are designed to support the following:
   a. One (1) cylindrical head assembly with a maximum effective projected area of 6 sf and 140 lbs (Max.)
   b. Eight (8) cylindrical luminaires with a maximum effective projected area of 3.5 sf and 75 lbs each.

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

3. High Mast Structure Materials:
   a. Poles and Backing Rings:
      - Less than \( \frac{1}{4} \)" ASTM A1011 Grade 50, 55, 60 or 65
      - Greater than or equal to \( \frac{1}{4} \)" ASTM A36 Grade 50, 55, 60 or 65
      - ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield)
   b. Sheet Plate: ASTM A500 or ASTM A36
   c. Pole Caps: ASTM A1011 Grade 50, 55, 60, or 65 or ASTM A500
   d. Bolt: Grade 5
   e. Stainless Steel Screws: AISI 316
   f. Anchor Bolts, Nuts and Washers:
      - Anchor Bolts: ASTM F1554 Grade 55
      - Nuts: ASTM A563 Grade A Heavy-Hex (5 per anchor bolt)
      - Plate Washer: ASTM A36 (4 per anchor bolt)
   g. Nut Covers: ASTM B16 (319-F)
   h. Concrete: Class IV (Dressed Shaft)
   i. Reinforcing Steel: Specification 415

4. Fabrication:
   a. Welding:
      - Specification Section 460-6.4 and
      - AASHTO LRFD Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals Section 14.4.4
   b. Poles:
      - Round or 16-sided (Min.)
      - Taper pole diameter at 0.14 inches per foot
      - Pole shaft may be up to three sections using telescopic field splices
      - Circumferentially welded pole shafts and laminated pole shafts are not permitted
      - Fabricate pole longitudinal seam welds with 60 percent minimum penetration or fusion except as follows:
        - 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.
      - Use full-penetration groove welds on the female end section of telescopic (i.e., slip type) field splices for a minimum length of 42 inches.
      - Identification Tag: (Submit details for approval)
        - 2” x 4” (Max.) aluminum tag
        - Locate on the inside of the pole and visible from the handhole
        - Secure with 1/8” diameter stainless steel rivets or screws.
      - Include the following information on the ID Tag:
        - Financial Project ID
        - Pole Type
        - Pole Height
        - Manufacturer’s Name
        - Tapped Length (ly of Steel)
        - Base Wall Thickness
      - Exact for Anchor Bolts, bolt hole diameters are bolt diameter plus 1/16” and anchor bolts holes are bolt diameter plus 1/8” (Max.) prior to galvanizing
      - Hot Dip Galvanize after Fabrication
   c. Coating:
      - Anchor Bolts, Nuts and Washers: ASTM F2329
      - 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 withSpecification 649-6.

7. Wind Speed by County:
   - 170 MPH: Broward, Brevard, Charlotte, Collier, Escambia, Indian River, Lee, Martin, Miami-Dade, Monroe, Palm Beach, Sarasota and St. Lucie Counties.
**BASE PLATE AND ANCHORAGE ELEVATION**

(Conduits Not Shown)

**SECTION A-A**

- **Base Diameter**
  - Tip Diameter = Base Diameter
  - Partial Penetration Joint
  - Full Penetration Joint
  - Center of Drilled Shaft
  - Base Plate
  - Anchor Bolts

**SECTION B-B**

- **Drilled Shaft**
  - 6" Cover (Typ.)
  - 2 X Bolt Diameter
  - 2/8" Backing Ring
  - Silicone Caulk
  - 1/8" Plate Washer
  - Base Plate Thickness
  - Drilled Shaft
  - Leveling Nuts
  - Anchor Bolt

**SECTION C-C**

- **Drilled Shaft**
  - Base Diameter
  - Tip Diameter or Base Diameter Measured Flat to Flat
  - Wall Thickness
  - 0.6 x Wall Thickness
  - Seam Weld (Typ.)
  - Center of Arm
  - Inside Bend Radius
  - 0.6 x Wall Thickness
  - (See Welding Note Sheet 1)
  - Center of Drilled Shaft
  - Base Plate

**SECTION E-E**

- **Foundation Plan**
  - Shaft Diameter
  - 5" x 6" Ring
  - Full Pen.
  - Padlock Tab
  - Hinge Mount (Typ.)
  - 1/2" Thick Handhole Door

**HANDHOLE RING**

- **Handhole Ring**
  - 2 X Bolt Diameter
  - Full Pen.
  - 1/8" Plate Washer
  - Base Plate Thickness
  - Drilled Shaft
  - Leveling Nuts
  - Anchor Bolt

**Pole Foundation**

**Foundation Plan**

- **Shaft Diameter**
  - #5 Tie Bars
  - CSL tube (Typ.)
  - Longitudinal Reinforcement (See Table for Reinforcement)

**Handholt Door**

- **Handholt Door**
  - 2 X Bolt Diameter
  - Full Pen.
  - 1/8" Plate Washer
  - Base Plate Thickness
  - Drilled Shaft
  - Leveling Nuts
  - Anchor Bolt

**High Mast Lighting**

**Standard Plans**

**FY 2019-20**

**Sheet 3 of 6**

**Index 715-010**

**Last Revision 01/01/18**

**Description:** Base Diameter

**Last Revision:**

- **Topic:** High Mast Lighting
- **Revision:** 01/01/18
- **Description:** Base Diameter
- **Revision:** Standard Plans
- **FY:** 2019-20
- **Sheet:** 3 of 6
- **Index:** 715-010

**Base Diameter**

- **Sizing:** Five Times Pole Wall Thickness or 1 Inch
  - Min. Inside Bend Radius = Larger of Inside Bend Radius
  - #3018 P M

**DESCRIPTION:**

- **Topic:** High Mast Lighting
- **Revision:** FY 2019-20
- **Sheet:** 3 of 6
- **Index:** 715-010

**LAST REVISON:**

- **Topic:** High Mast Lighting
- **Revision:** 01/01/18
- **Description:** Base Diameter
- **Revision:** Standard Plans
- **FY:** 2019-20
- **Sheet:** 3 of 6
- **Index:** 715-010
NOTES:

1. All pull boxes and pole bases shall be sealed in accordance with Section 630 of the Standard Specifications For Road And Bridge Construction.
2. Slabs to be placed around all poles and pull boxes.
3. For pull boxes between poles refer to Index 715-001.

WIRING DETAILS

1/0 AWG stranded Cu bare ground wire connected to grounding lug inside pole.

4/0 Cu bare ground wire connected to grounding lug inside pole.

Minimum of (6) " x 20' approved ground rods.

Interrod distances must be a minimum of 10".

Schedule 40 PVC conduit. Circuit conductors and conduit size as shown in plans (Typical).

Circuit Breaker Panel Box with Surge Arrester mounted to Top of Circuit Breaker Panel Box for easy access. Service entrance fittings shall be used on all conductors entering Circuit Breaker Panel Box.

Wire Screen see Spec. 649-6

Schedule 80 PVC conduit

4/0 ground

#6 Bonding Ground

12" bed of pearock or crushed stone for drainage.

UL approved ground rod 3/4" diameter 20' long copper clad with approved ground connection.

Schedule 40 PVC conduit. Circuit conductors and conduit size as shown in plans (Typical).

Pigtail Cord Wi/ Female Receptacle

Male Inlet

Attach Copper Lugs (Two-Hole, Straight Tongue, Two-Barrel) to which support plate to accommodate 2 4/0 and 2 #6 conductors for grounding.

Twistlock disconnect

Circuit Breaker Panel Box.
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 Circuit Breaker Cable. Size of conductors to be determined by luminaire load.

600 Volt rated Pole Cable. Size of conductors to be determined by luminaire load.

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

2½ heavy duty reversible or 1 HP Portable Motor(1) 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.

SCHEMATIC OF REMOTE AUXILIARY POWER UNIT

LOWERING DETAILS
NOTES:

1. Use compacted select material in accordance with Index 120-001.
2. Concrete shall be Class KS 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 13' x 24'; others approved under Specification 635 may be used.
5. Slabs to be placed around all Poles and Pull Boxes. In urban areas or where space is limited slab dimensions may be adjusted as shown in the plans.
6. Concrete for slabs around poles and pull boxes shall be included in the price of pole or pull box.
7. The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" 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 for slabs around poles and pull boxes shall be included in the price of pole or pull box.

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

The expansion joint shall consist of 1/2" of closed-cell polyethylene foam expansion material. The top 1/2" of expansion material shall be removed after pouring the slab and sealed with 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.

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

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

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
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<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>
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STOP ZONE FOR RUBBER CROSSING

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Zone Length (Distance From Stop)</th>
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<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 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.
Crossing Shoulder Pavement
(Except Area Occupied By Crossing Surfacing Material):
- To Shoulder Line For Outside Shoulders Less Than 8' Wide.
- To Shoulder Line For Outside Shoulders 8' Or Wider
(Regardless Of Approach Shoulder Pavement Width).
- 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.

**Roadway with Flush Shoulders**

- Shoulder Pavement
- Pavement
- Shoulder Line
- Pavement
- Edge Of Travel Way
- Pavement
- Overbuild
- Type SP Asphalt (500 lb/SY)
- Curb Transition
- See 'Crossing Shoulder Pavement' Above

**Flexible Pavement**

- Beveled Edge (1:4 Slope)
- Overbuild
- Type SP Asphalt (500 lb/SY)
- Sidewalk
- Shoulder Pavement
- Concrete Curb And Gutter

**Concrete Curb And Gutter**

- Sidewalk
- Shoulder Pavement
- Utility Strip

**Utility Strip**

- Shoulder Pavement
- Edge Of Travel Way

**Crossing Shoulder Pavement**

- Pavement
- Ballast
- Friction Course

**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 superelavation 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 superelavated, or a roadway approach section that is not level, will necessitate a site-specific analysis for rail clearances.

**Typical Crossing Material Replacement at RR Crossings**

- Cap Or Expansion Material (When Required By Crossing Type)
- Type SP Asphalt (500 lb/SY)
- Filter Fabric (Optional With RR Company)

**Note:** For location of railroad signals, gates or signals and gates see Index 509-070.