Fiber optic boxes shall contain only Fiber Optic Cable, Conduit, and Locate Wire.

1. Boxes shall not be installed in roadways or driveways.
2. Boxes shall be on the Approved Product List (APL).
3. Boxes shall be installed flush with the finished grade surface.
4. Fiber optic splice boxes shall be provided with cable hanger racks designed to support cables and splice enclosures. Cost of racks to be included in cost of splice box.
5. Fiber optic boxes shall contain only Fiber Optic Cable, Conduit, and Locate Wire.

6. Conduit center line shall be aligned to top edge of box to facilitate cable pulling.
7. All boxes shall have 1'-0" wide (min) concrete apron. Concrete for concrete aprons shall be Class NS with a minimum strength at 28 days of Fc=2.5 Ksi. Aprons shall be sloped away from box. Cost of apron to be included in the cost of earth box.
8. Prevent the ingress of Water, Dirt, Sand, and other foreign materials into the conduit prior to, during and after construction using a foam-sealing material, rubber plug, or other device designed for this application and approved.
FOR USE IN AREAS NOT EXPOSED TO VEHICULAR TRAFFIC

**FIGURE A**

Note:
1. Sidewalk patches to match existing joints.
2. Entire sidewalk slab must be replaced when specified in the plans.
3. Backfill and tamp with material from trench except at driveways. At driveways, backfill a length of trench within the driveway entirely with flowable fill.

FOR USE IN ASPHALT ROADWAY ADJACENT TO GUTTER WHEN PLACEMENT OUTSIDE OF THE PAVEMENT IS NOT FEASIBLE

**FIGURE B**

Note:
1. Trench not to be open more than 250' at a time when construction area is subject to vehicular or pedestrian traffic.
2. Asphalt to be sawcut to leave neat lines at the pavement cut.
3. See note 3 Figure C.

*May be adjusted due to field conditions upon approval of project engineer.

FOR USE IN INSTALLING CONDUIT UNDER EXISTING ASPHALT PAVEMENT NOT ADJACENT TO GUTTER WHEN JACKING OR DIRECT BORING IS NOT FEASIBLE

**FIGURE C**

Note:
1. Rigid conduit must be used when jacking under existing pavement at 36" minimum depth.
2. Asphalt to be sawcut at the edges of the trench.
3. The removal and replacement of the additional pavement width (6") will not be required when the trench can be constructed without disturbing the asphalt surface on either side.

FOR USE IN INSTALLING CONDUIT UNDER A NEW ROADWAY PRIOR TO INSTALLATION OF BASE AND PAVEMENT

**FIGURE D**

**FOR USE IN INSTALLING CONDUIT UNDER SIDEWALK**

**FIGURE E**

**FOR USE IN INSTALLING CONDUIT UNDER SIDEWALK**

**FIGURE F**

**GENERAL NOTES:**

1. The contractor, with approval from the Engineer, may adjust the final burial depth of the conduit(s) in order to transverse nonmovable object conflicts.

2. Backfill with excavated material and compact the soil until firm and unyielding. Remove rock and debris from backfill material.

3. Where conduits are to be installed over existing underground structures (e.g., drain pipes or utility lines) which are less than 30" deep, the contractor shall encase the conduit in 2500 PSI Class I concrete for the entire length of conduit that is installed at a depth of less than 30".

4. If the amount of cover over the encasement is less than 6", the contractor shall install the conduit to pass below the underground structures (e.g., drain pipes).
NOTES:

1. Work with Index 17727 for grounding and span wire details. See the Plans for clamp spacing, cable sizes and forces, signals and sign mounting locations and details.

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

3. Materials: Split-lock washers and self-locking nuts are not permitted.
   a. Strain Pole and Backing Rings:
      i. Less than \( \frac{8}{8} \) in diameter, ASTM A1011 Grade 50, 55, 60 or 65
      ii. Greater than or equal to \( \frac{8}{8} \) in diameter, ASTM A572 Grade 50, 55, 60 or 65
   b. High Strength Bolts: ASTM A325, Type 1
   c. Washers: ASTM F1662 Type 1, one under turned element
   d. Anchor Bolts, Nuts and Washers:
      i. Anchor Bolts: ASTM F1554, Grade 55
      ii. Nuts: ASTM A325, Grade A Heavy-Hex (5 per anchor bolt)
      iii. Plate Washers: ASTM A36 (3 per bolt)
   e. Handhole Frame: ASTM A479 or ASTM A52, Grade 36
   f. Handhole Cover: ASTM A1011, Grade 50, 55, 60 or 65
   g. Aluminum Plate Caps and Nut Covers: ASTM B66 (319-F)
   h. Stainless Steel Screws: AISI Type 316
   i. Threaded Bars/Studs: ASTM A36 or ASTM A307
   j. Threaded Bars/Studs: ASTM A36 or ASTM A307
   k. Reinforcing Steel: Specification Section 415

4. Fabrication:
   a. Pole Taper: Change diameter at a rate of 0.14 inches per foot.
   b. All upright splices are not allowed. Transverse welds are only permitted at the base.
   c. Provide bolt hole diameters as follows:
      i. Bolts (except Anchor Bolts): Bolt diameter plus 1/4", prior to galvanizing.
      ii. Anchor Bolts: Bolt diameter plus 1/4", maximum.
   d. Locate handhole 180° from 2" wire entrance size.
   e. Identification Tag (Submit details for approval):
      i. Locate on the inside of the pole and visible from the handhole.
      ii. Secure to pole with 1/4" diameter stainless steel rivets or screws.
      iii. Include the following Information on the ID Tag:
         1. Financial Project ID
         2. Project name
         3. Pole height
         4. Manufacturers' Name
         5. FY of Install
         6. Base Wall Thickness
   f. Provide a 1' or 3' look at the top of the pole for signal wiring support (See Sheet 3).
   g. Perform all welding in accordance with Specification Section 460-6.4.
   h. Hot Dip Galvanize after fabrication.

5. Coatings:
   a. All Nuts, Bolts, Washers and Threaded Bars/Studs: ASTM F1554
   b. All other steel items ASTM A123

6. Construction:
   a. Foundation Specification Section 455, except that payment is included in the cost of the strain pole.
   b. After installation, place wire screen between top of foundation and bottom of baseplate in accordance with Specification Section 639-6.
1. Clamps have been sized for Design Cable Loads shown in the Clamp Thickness Table, and a Maximum Pole Diameter at the Clamp location of 2'-1". Use one clamp per cable.

2. Install a properly sized Weather Head, fastened securely to the pole, Cap And Lifting Bar Welded To Underside Of Bar, Welded To Inside Of Pole, Grade Hot Rolled Bar, Grade Hot Rolled Bar.

3. Any combination of Option 'a' or 'b' may be used provided both lifting and wire entrance are accommodated.

### CLAMP THICKNESS TABLE

<table>
<thead>
<tr>
<th>Cable Diameter (in.)</th>
<th>Min. Breaking Strength (kip)</th>
<th>Plate Thickness (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>25</td>
<td>5/32</td>
</tr>
<tr>
<td>5/8</td>
<td>12.5</td>
<td>3/16</td>
</tr>
<tr>
<td>3/4</td>
<td>6</td>
<td>1/8</td>
</tr>
</tbody>
</table>

### HANDHOLE

- 11 Gage Handhole Cover
- 3/8" Hole (Typ.)
- 5/16" Hole (Typ.)

### WIRE ENTRANCE DETAIL

- 2 1/8" Holes For 2" Round Steel Passivated Cotter Pins
- 90° Bent Plate With Nut & Flat Washers (Typ.)
- 1/2" Bolt With Nut, Lock Nut & Flat Washers (Typ.)

### POLE ASSEMBLY

**NOTES:**

1. Catenary And Messenger Wire Clamps shown in the Clamp Thickness Table, and a Maximum Pole Diameter at the Clamp location of 2'-1". Use one clamp per cable.

2. Install a properly sized Weather Head, fastened securely to the pole, Cap And Lifting Bar Welded To Underside Of Bar, Welded To Inside Of Pole, Grade Hot Rolled Bar, Grade Hot Rolled Bar.

3. Any combination of Option 'a' or 'b' may be used provided both lifting and wire entrance are accommodated.
GENERAL NOTES:

1. Work these Index drawings with the Strain Pole Schedule in the Plans.
2. Shop Drawings: This Design Standard is considered fully detailed and no shop drawings are necessary.
3. Submit shop drawings for minor modifications not detailed in the plans.
4. Fabrication:
   a. Concrete: Class V Special or Class VI
   b. Prestress Strands & Spiral Reinforcing: Specification Section #41
   c. Hand and coupler cover plates: Non-corrosive material
   d. Screws: Round headed, chrome plated

5. Support locations are for strand release, storage, lifting and transport. Keep BF oriented downward until final erection.
6. Pick-up and support locations shown may vary within a tolerance of ±3".
7. Where required, field-drill the eyebolt hole prior to installation.
8. Two point attachment: provide an eye bolt hole for the messenger wire.
9. Tie ground wires to the interior of reinforcing steel to prevent displacement during concreting operations.
10. The design dimensions for Front Face (FF) and Back Face (BF) of the poles may vary transversely from the section shown by ± ¼" to assist with removal from forms. Balance addition and subtraction of the face widths to maintain section areas shown.
11. Cut the tip end of the prestressed strand first or simultaneously with the butt end.
12. Spiral Reinforcing: As shown, plus one turn for splices and two turns at both the tip and butt ends of the pole.
13. Concrete Cover: 1" minimum
14. Pole Taper for pole width, strands, reinforcing and void: 0.081 in/ft per face.
15. Pole Length (L)
   a. Financial Project ID:
   b. Pole Manufacturer
   c. Standard Pole Type Number
   d. Pole Length (L)
16. Provide Aluminum Identification Tags on the poles with the following information:
    a. Financial Project ID:
    b. Pole Manufacturer
    c. Standard Pole Type Number
    d. Pole Length (L)
17. Provide cover plates and screws for hand hole and couplers. Attach cover plates to the poles using lead anchors or embedded threaded inserts.
18. Design dimensions for Front Face (FF) and Back Face (BF) of the poles may vary transversely from the section shown by ± ¼" to assist with removal from forms. Balance addition and subtraction of the face widths to maintain section areas shown.
19. Tie ground wires to the interior of reinforcing steel to prevent displacement during concreting operations.
20. Concrete: 1" minimum
21. Pole Taper for pole width, strands, reinforcing and void: 0.081 in/ft per face.
22. Pole Length (L)
   a. Financial Project ID:
   b. Pole Manufacturer
   c. Standard Pole Type Number
   d. Pole Length (L)
SPIRAL REINFORCING ELEVATION
(Strands, Holes, and Fixtures Not Shown)

POLE ELEVATION
(Sequences and Reinforcing Not Shown)
(See Design Standard Index 17900 and Specification 744 for
Modifications to Type P-III Poles Used at Traffic Monitoring Sites)

NOTES:
- Prestressed Strand:
  0.5 in. ~ 31 kips Before Transfer (4 strands total)

STRAND LEGEND
- Prestressed Strand:

TIP END SECTION (TOP)

SECTION A-A
(Typical Square Section)

LIGHTING AND TRAFFIC MONITORING POLES TYPE P-III
#5 Gauge Spiral Reinforcing

Support Locations

POLE ELEVATION
(Vertical Pole)

POLE ELEVATION
(Strands and Reinforcing Not Shown)

NOTES:

* Dimension may vary from 3½" to 4½" to accommodate smaller radius of optional stepped (PVC) void. The void diameter shall not be less than 4.

Horizontal Pole

Vertical Pole

STRAIN POLE TYPE P-V
**DESCRIPTION:**

REVISED

SHEET NO.

INDEX NO.

NO. 17725

6 of 8

**CONCRETE POLES**

**DESIGN STANDARDS**

2016

**TRANSFER (8 strands total) 0.5 in. ~ 31 kips Before Prestressed Strand**

Support Locations (Horizontal Pole)

**STRAND LEGEND**

- Prestressed Strand
- Dormant Strand

**NOTES:**

Strands shown are continuous from Tip End to Butt End. Elevation view scale is exaggerated vertically for clarity.

For final erection, tilt pole upright with single point attachment located a distance 10% L from Tip End.

* Dimension may vary from 3" to 4½" to accommodate smaller radius of optional stepped (PVC) void. The void diameter shall not be less than 8½.

**STRAIN POLE TYPE P-VI**
SPIRAL REINFORCING ELEVATION
(Strands, Holes, and Fixtures Not Shown)

POLE ELEVATION
(Strands and Reinforcing Not Shown)

NOTES:
Strands shown are continuous from Tip End to Butt End.
Elevation view scale is exaggerated vertically for clarity.
For final erection, tilt pole upright with single point attachment located a distance 10% L from the Tip End.
* Dimension may vary from 3½" to 5" to accommodate smaller radius of optional stepped (PVC) void. The void diameter shall not be less than 6½."
NOTES:
1. With the approval of the resident engineer, the service head hole for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.
2. Lashing wire should normally be used for distances of 12' or greater.
3. All hardware for signal attachment shall be stainless steel.
4. Hole for eye bolt will require field reaming for 1" & 1 1/2" eye bolts.
5. Meet all grounding requirements of Section 620 of the Standard Specifications.
Notes:

1. This drawing is representative of a Proprietary Pivotal Adjustable Hanger Assembly listed on the Department's Approved Products List (APL). For specific details and requirements see the vendor drawings on the APL. The proprietary pivotal adjustable hanger assembly shall be assembled in accordance with the manufacturer's detailed drawings, procedures and specifications.

2. With the approval of the resident engineer, the service head hole for joint use poles may be drilled by the utility company at an angle of 90° but not less than 45° to the face of the pole.

3. Lashing wire should normally be used for distances of 12' or greater.

4. The overlapped connection of adjustable hangers shall use a minimum of 2 bolts with a minimum spacing of 4' between bolts.

5. Meet all grounding requirements of Section 620 of the Standard Specifications.

Field Drill Two 4" Drill Holes In Bottom Of Installed Signals To Allow Water To Drain.

Catenary Wire

Span Wire Clamp

Signal Cable

Pivotal Adjustable Hanger Assembly

Extension Bar(s) (Included with Pivotal Adjustable Hanger Assembly)

Upper And Lower Reinforcement Plates (Included with Pivotal Adjustable Hanger Assembly)

Signal Reinforcement Plate (Included with Pivotal Adjustable Hanger Assembly)

Detail A

Two Point Attachment

Signal Head

Louvered Backplates

The Vertical Clearance To The Bottom Of A Vertical Or Horizontal Vehicular Signal Head Shall Not Be Less Than 17'-6". And The Maximum Height Shall Be In Accordance With The Standard Specifications.

Pavement

Lashing Wire Should Normally Be Used For Distances Of 12' Or Greater.

8' to 12' Drip Coil Or Drip Loop

Lashing Wire Should Normally Be Used For Distances Of 12' Or Greater.

8' to 12' Drip Coil Or Drip Loop

8' to 12' Drip Coil Or Drip Loop

M in .
Interconnect Cable

Locking Cable Ties Or Lashing Wire

Crimp Type Electrical Connector

Cable Suspension Clamp

UL Approved Split Bolt Connector

Figure "8" Cable

Aerial Junction Box

Thimbble Bolt (5/8" Min.)

Notes:

1. The messenger wire of the interconnect cables shall be grounded to the copper ground wire of the pole or to the external wire extending down the pole.

2. When utilizing the external ground wire to the pole, a piece of 1/2" conduit shall extend up the pole externally to a point 8' above finish grade to protect the ground wire connecting the messenger wire to the ground rod.

3. Locking cable ties or lashing wire when used shall be placed no further than 12" apart except at the point where the cables separate from the messenger wire and another placed 4" (max) from that tie. When using figure "8" interconnect cable only the locking cable ties shall be used.

4. If accessible the internal ground wire of the support pole may be used to ground the messenger wire.

5. Lashing wire should normally be used for distances of 12' or greater.

6. Meet all grounding requirements of Section 620 of the Standard Specifications.
NOTES:

1. The lightning arrester can be located on the side or bottom of the service disconnect enclosure at the Contractor’s option.

2. Liquidtight flexible conduit is approved for use from the electrical disconnect to the cabinet when both are installed on the same pole.

3. Bond all elements together to form an Intersection Grounding Network in accordance with Section 620 of the Department’s current Standard Specifications for Road and Bridge Construction. The bond wire shall be run in conduit with the Electrical Service Wire or Signal Cable.

4. Meet all grounding requirements of Section 620 of the Standard Specifications.

5. The Service Disconnect shall be lockable by padlock and four keys provided to the maintaining agency. The door shall have a minimum of three hinges and be lockable. No screws to be used to attach door.

6. The Service Disconnect shall be Nema 3R or better.
### POLE SELECTION TABLE - SINGLE ARM - WITH & WITHOUT LUMINAIRE

<table>
<thead>
<tr>
<th>ARM TYPE</th>
<th>D1</th>
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<th>D5</th>
<th>D6</th>
<th>D7</th>
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<tbody>
<tr>
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<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
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<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<tr>
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<td>3</td>
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### POLE SELECTION TABLE - DOUBLE ARM - WITHOUT LUMINAIRE

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Arm 1 is listed first

### ARM DESIGN TABLE - ALL CASES

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<th>MAST ARM</th>
<th>ARM EXTENSION</th>
<th>ARM CONNECTION &amp; WELDS</th>
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Arm Camber Angle = 2 degrees

### POLE, CONNECTION AND SHAFT DESIGN TABLE - SINGLE & DOUBLE ARM

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<th>LB (ft)</th>
<th>LC (ft)</th>
<th>LD (ft)</th>
<th>LE</th>
<th>1F (ft)</th>
<th>LG (ft)</th>
<th>LH (ft)</th>
<th>LI (ft)</th>
<th>LK (deg)</th>
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Notes:
1. Work this Index with Index No. 17745.
2. Design Wind Speed = 150 mph with Signal Backplates.

### "D" MAST ARMS

<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>SHEET NO.</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>17743</td>
<td>1</td>
<td>STANDARD MAST ARM ASSEMBLIES</td>
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</tbody>
</table>

**17743**
# POLE SELECTION TABLE - SINGLE ARM - WITH & WITHOUT LUMINAIRE

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<th>E5</th>
<th>E6</th>
<th>E7</th>
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<tbody>
<tr>
<td>T1 &amp; T21 Lum</td>
<td>T2 &amp; T22 Lum</td>
<td>T3 &amp; T23 Lum</td>
<td>T4 &amp; T24 Lum</td>
<td>T5</td>
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</tbody>
</table>

Arm 1 is listed first.

# POLE SELECTION TABLE - DOUBLE ARM - WITHOUT LUMINAIRE

<table>
<thead>
<tr>
<th>ARM TYPE</th>
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<th>E3 - E3</th>
<th>E5 - E5</th>
<th>E6 - E6</th>
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# ARM DESIGN TABLE - ALL CASES

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<tr>
<th>ARM TYPE</th>
<th>ARM LENGTH</th>
<th>MASS ARM</th>
<th>ARM EXTENSION</th>
<th>ARM CONNECTION &amp; WELDS</th>
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<td>36.0</td>
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# POLE, CONNECTION AND SHAFT DESIGN TABLE - SINGLE & DOUBLE ARM

<table>
<thead>
<tr>
<th>POLE TYPE</th>
<th>UA (ft)</th>
<th>UC (in)</th>
<th>UD (in)</th>
<th>UE (in)</th>
<th>UG (ft)</th>
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<tr>
<td>T1</td>
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# CONNECTION PLATE DATA

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# DRILLED SHAFT DATA

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<th>FC/SF</th>
<th>FD/SD</th>
<th>FE/SF</th>
<th>FF/SF</th>
<th>FG/SG</th>
<th>HF/SH</th>
<th>FK/SK</th>
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# LUMINAIRE AND LUMINAIRE CONNECTION

<table>
<thead>
<tr>
<th>LA (ft)</th>
<th>LB (ft)</th>
<th>LC (in)</th>
<th>LD (in)</th>
<th>LE</th>
<th>LF (ft)</th>
<th>LG (in)</th>
<th>LH (in)</th>
<th>LJ (in)</th>
<th>LK (in)</th>
<th>LL (deg)</th>
<th>UR (ft)</th>
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<tr>
<td>40</td>
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<td>0.25</td>
<td>37.5</td>
<td></td>
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</tbody>
</table>
GENERAL NOTES

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

2. Prior to Fabrication: Verify the installed foundation elevation will result in the required signal elevation and adjust the Pole height as needed.

3. Details for Signal and Sign locations, Signal Head attachment, Sign attachment, Pedestrian Head attachment, and Foundation Conduct are not shown for simplicity.

4. Materials: Split-lock washers and self-locking nuts are not permitted
   a. High Strength Bolts: ASTM A325 Type 1
   b. Nuts: ASTM A563 Grade 50, 55, 60 or 65
   c. Washers: ASTM F436 Type 1, one under turned element
   d. Anchor Bolts, Nuts and Washers:
      a. Anchor Bolts: ASTM F1554 Grade 55
      b. Nuts: ASTM A563 Grade A Heavy-Hex (5 per anchor bolt)
      c. Plate Washers: ASTM A595 Grade A (2 per bolt)
   e. Threaded Bars/Studs: ASTM A36 or ASTM A307
   f. Anchor Bars (Studs):
      a. Anchor Bar: ASTM A1011 Grade 50, 55, 60 or 65
      b. Anchor Bar: ASTM A572 Grade 50, 55, 60 or 65
   g. Aluminum Pole Caps and Nut Covers: ASTM B26 (319-F)
   h. Stainless Steel Screws: AISI Type 316
   i. Aluminum Identification Tag not to exceed 2" x 4". Secure to pole by 1/4" stainless steel rivets or screws. Fabricators to provide details for approval. Identification Tag located on inside of pole visible from handhole, or on outside of pole inside Terminal Compartment. Tag to be stamped with the following information:
      a. Manufacturer's Name
      b. Financial Project ID
      c. Standard Design
      d. Special Design
      e. Location of Foundation
      f. Location of Pole Base Plate
      g. Height of Pole from Base Plate
      h. Pole Wall Thickness
      i. Mast Arm Wall Thickness
   j. Reinforcing Steel: Specification Section 415
   k. Concrete: Class IV (Drilled Shaft) for all environmental classifications.
   l. Stainless Steel Screws: AISI Type 316
   m. High Strength Bolts: ASTM A325 Type 1
   n. Foundation: Specification Section 455 Drilled Shaft, except that payment is included in the cost of the Mast Arm.
   o. Mast Arm Tabulation Sheet.

5. Fabrication:
   a. Pole and Mast Arm Taper: Change diameter at a rate of 0.14 inches per foot.
   b. Upright splices are not allowed. Transverse welds are only permitted at the base.
   c. First and Second arm camber angle = 2°
   d. Provide bolt hole diameters as follows:
      a. Anchor Bolts: Bolt diameter plus 1/8", prior to galvanizing.
      b. Anchor Bolts: Bolt diameter plus 1/32" (Max.)
   e. Locate handhole 90° from arm on single arm poles or 90° from first arm of double arm poles facing away from traffic or see special instructions on the Mast Arm Tabulation Sheet.
   f. Provide 1/2" or deeper hole located at Bottom Of Arm. 7'-0" from Arm Base Plate.
   g. Perform all welding in accordance with Specification Section 460-6.4.
   h. Reinforcing Steel: Specification Section 415

6. Coatings:
   a. Finishes of Steel:
      b. Nuts: ASTM A563 Grade A Heavy-Hex (5 per anchor bolt)
   b. Stainless Steel Screws: AISI Type 316
   c. Reinforcing Steel: Specification Section 415
   d. Concrete: Class IV (Drilled Shaft) for all environmental classifications.
   e. Galvanizing: See Sheet 6
   f. Insulation: See Sheet 6
   g. Coatings of Steel:
      b. Nuts: ASTM A563 Grade A Heavy-Hex (5 per anchor bolt)
   b. Stainless Steel Screws: AISI Type 316
   c. Reinforcing Steel: Specification Section 415
   d. Concrete: Class IV (Drilled Shaft) for all environmental classifications.
   e. Galvanizing: See Sheet 6
   f. Insulation: See Sheet 6
   g. Pipe Cap: See Sheet 6
   h. Pipe Wall: See Sheet 6
   i. Pole Top: See Sheet 6
   j. Mast Arm: See Sheet 6
   k. Special Design:
      a. Manufacturer's Name
      b. Financial Project ID
      c. Special Design
      d. Location of Foundation
      e. Location of Pole Base Plate
      f. Height of Pole from Base Plate
      g. Pole Wall Thickness
      h. Mast Arm Wall Thickness
   l. Stainless Steel Screws: AISI Type 316
   m. High Strength Bolts: ASTM A325 Type 1
   n. Foundation: Specification Section 455 Drilled Shaft, except that payment is included in the cost of the Mast Arm.
   o. Mast Arm Tabulation Sheet.

7. Construction:
   a. Foundation: Specification Section 455 Drilled Shaft, except that payment is included in the cost of the Mast Arm.
   b. Install Pole vertically.
   c. Place structural grout pad with drain between top of foundation and bottom of baseplate in accordance with Specification Section 649-7.
   d. Attach Sign Panels and Signals centered on the elevation of the Mast Arm.
   e. Wire Access holes are 1/2" or less in diameter.

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**ELEVATION AND NOTES**

**MAST ARM ASSEMBLY**

---

**LAST REVISION:** 07/01/15

**DESCRIPTION:**

**2016 DESIGN STANDARDS**

**INDEX NO.:** 17745

**SHEET NO.:** 1 of 6
Mast Arm Assembly

**Foundation and Base Plate Details**

**Notes:**
1. The Grout Pad diameter may be reduced where the footprint of the Grout Pad does not provide adequate clearance for the sidewalk and/or accessibility considerations.
2. See Index No. 17743 and the plans for actual quantity of bolts.
3. The top hex nut may be substituted by a half-height jam nut. Provide individual nut covers (not shown) for each bolt.

**Foundation:**
- **Shaft Diameter:** 2'-2" Lap (Min.)
- **Center of Drilled Shaft:** #5 Tie Bar
- **CSL Tube (Typ.):** #5 Tie Bars Remaining Spaced @ 12" Max.
- **#6 Cover (Typ.):** #5 Tie Bars Equally Spaced

**Base Plate:**
- **Base Plate Diameter:** 4x#BC Anchor Bolts Equally Spaced (Typ.)
- **Bolt Circle Dia.:** #5 Tie Bars Equally Spaced @ #5 Tie Bars Remaining Spaced @ 12" Max.
- **Drilled (Wall Thick. + 1"")**
- **2x#BC**
- **2x#BC**
- **Grout Pad Diameter:** 16" (See Note #1)
- **#5 Tie Bars (Wall Thick. + 1")**
- **Spaced @ 6"**
- **Spaced @ 4"**
- **Spaced @ 3"**

**Plan:**
- **Center of Drilled Shaft:** Base Plate Dia.
- **Bolt Circle Dia.:** #5 Tie Bars Equally Spaced (See Note #2)
- **Center of Drilled Shaft, Base Plate, and Pole:** #5 Tie Bars Equally Spaced
- **Center of Drilled Shaft, Base Plate, and Pole:** #5 Tie Bars Equally Spaced

**Elevation:**
- **Center of Drilled Shaft:** Base Plate Dia.
- **Bolt Circle Dia.:** #5 Tie Bars Equally Spaced (See Note #2)
- **Center of Drilled Shaft:** Base Plate Dia.
- **Bolt Circle Dia.:** #5 Tie Bars Equally Spaced (See Note #2)

**Section A-A:**
- **Joint Weld Detail**
- **Detail A**
- **Foundation and Base Plate Details**
- **Notes:**
  - See Index No. 17743 and the plans for actual quantity of bolts.
  - The top hex nut may be substituted by a half-height jam nut. Provide individual nut covers (not shown) for each bolt.
  - The Grout Pad diameter may be reduced where the footprint of the Grout Pad does not provide adequate clearance for the sidewalk and/or accessibility considerations.

**Notes:**
1. The Grout Pad diameter may be reduced where the footprint of the Grout Pad does not provide adequate clearance for the sidewalk and/or accessibility considerations.
2. See Index No. 17743 and the plans for actual quantity of bolts.
3. The top hex nut may be substituted by a half-height jam nut. Provide individual nut covers (not shown) for each bolt.

**Foundation and Base Plate Details**

**Notes:**
1. The Grout Pad diameter may be reduced where the footprint of the Grout Pad does not provide adequate clearance for the sidewalk and/or accessibility considerations.
2. See Index No. 17743 and the plans for actual quantity of bolts.
3. The top hex nut may be substituted by a half-height jam nut. Provide individual nut covers (not shown) for each bolt.

**Foundation:**
- **Shaft Diameter:** 2'-2" Lap (Min.)
- **Center of Drilled Shaft:** #5 Tie Bar
- **CSL Tube (Typ.):** #5 Tie Bars Remaining Spaced @ 12" Max.
- **#6 Cover (Typ.):** #5 Tie Bars Equally Spaced

**Base Plate:**
- **Base Plate Diameter:** 4x#BC Anchor Bolts Equally Spaced (Typ.)
- **Bolt Circle Dia.:** #5 Tie Bars Equally Spaced @ #5 Tie Bars Remaining Spaced @ 12" Max.
- **Drilled (Wall Thick. + 1"")**
- **2x#BC**
- **2x#BC**
- **Grout Pad Diameter:** 16" (See Note #1)
- **#5 Tie Bars (Wall Thick. + 1")**
- **Spaced @ 6"**
- **Spaced @ 4"**
- **Spaced @ 3"**

**Plan:**
- **Center of Drilled Shaft:** Base Plate Dia.
- **Bolt Circle Dia.:** #5 Tie Bars Equally Spaced (See Note #2)
- **Center of Drilled Shaft:** Base Plate Dia.
- **Bolt Circle Dia.:** #5 Tie Bars Equally Spaced (See Note #2)

**Elevation:**
- **Center of Drilled Shaft:** Base Plate Dia.
- **Bolt Circle Dia.:** #5 Tie Bars Equally Spaced (See Note #2)
- **Center of Drilled Shaft:** Base Plate Dia.
- **Bolt Circle Dia.:** #5 Tie Bars Equally Spaced (See Note #2)

**Section A-A:**
- **Joint Weld Detail**
- **Detail A**
- **Foundation and Base Plate Details**
- **Notes:**
  - See Index No. 17743 and the plans for actual quantity of bolts.
  - The top hex nut may be substituted by a half-height jam nut. Provide individual nut covers (not shown) for each bolt.
  - The Grout Pad diameter may be reduced where the footprint of the Grout Pad does not provide adequate clearance for the sidewalk and/or accessibility considerations.
NOTE:
1. Install the "Slip Joint" splice with a tight fit and no change in the Mast Arm taper due to the splice.
2. Details shown on this sheet are for 12 sided pole sections. However, sections with more than 12 sides and round sections are permitted provided outside diameter and wall thickness are not reduced.
3. Match marks the Arm and Connection Plates to ensure proper assembly.

SINGLE ARM CONNECTION

SECTION B-B

DETAIL 'B'

SECTION C-C

DETAIL 'C'

SECTION D-D

DETAIL 'D'

NOTE:
1. Install the "Slip Joint" splice with a tight fit and no change in the Mast Arm taper due to the splice.
2. Details shown on this sheet are for 12 sided pole sections. However, sections with more than 12 sides and round sections are permitted provided outside diameter and wall thickness are not reduced.
3. Match marks the Arm and Connection Plates to ensure proper assembly.

Mast Arm Extension Base Plate

Pole Connection Plate

Edge Of Mast Arm Extension

Bottom Connection Plate (Top Conn. Plate Similar)

Top And Bottom Plates - (May Vary For Special Design)
MAST ARM ASSEMBLIES

DOUBLE ARM CONNECTIONS & SPLICE DETAILS

NOTE:
1. Install the ‘Slip Joint’ splice with a tight fit and no change in the Mast Arm taper due to the splice.
2. Details shown on this sheet are for 12 sided pole sections. However, sections with more than 12 sides and round sections are permitted provided outside diameter and wall thickness are not reduced.
3. Match mark the Arm and Connection Plates to ensure proper assembly.
4. ‘SP’ measured counter clockwise from 1st First Mast Arm Extension.
5. ‘SF’ measured counter clockwise from 1st Second Mast Arm Extension.
6. Adjust width of top and bottom Connection Plates to maintain minimum clearance shown.
NOTES:
1. Luminaire type and luminaire length may be found in the Lighting Plans.
2. Align Luminaire Arm with Single Mast Arm or First Arm of Double Mast Arm unless indicated otherwise in the plans.
3. The fabricator may substitute a 1/2" thick bent plate with the same flange width, height, and length as the MC 10x33.6 Channel section.
4. ‘LL’ measure counter clockwise from First Mast Arm.

1. Luminaire type and luminaire length may be found in the Lighting Plans.
2. Align Luminaire Arm with Single Mast Arm or First Arm of Double Mast Arm unless indicated otherwise in the plans.
3. The fabricator may substitute a 1/2" thick bent plate with the same flange width, height, and length as the MC 10x33.6 Channel section.
4. ‘LL’ measure counter clockwise from First Mast Arm.
NOTES:
1. Handhole covers may be omitted when Terminal Compartment is provided.
2. Terminal Compartment is optional. See Mast Arm Tabulation to see if required and for locations.
3. Terminal Compartment Frame Height 2'-6" minimum to 2'-9" maximum. Align bottom of Terminal Compartment a minimum of 1" below the bottom of the Handhole Frame.
4. Any combination of Option 'a' or 'b' may be used, provided both lifting and wiring is accommodated.

HANDHOLE AND POLE TOP DETAILS
NOTES:

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

2. Free-swinging, internally-illuminated street signs shall meet the requirements of Section 700 of the Standard Specifications for Road and Bridge Construction.

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 Section 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 Section 700 for "Acceptance by Certification" require the submission of structural calculations and Shop Drawings that have been prepared by and sealed by the Specialty Engineer.
Notes:

1. As an option, the contractor will be allowed to install pedestrian signals on concrete poles and pedestals with the use of lead anchors (two bolts same size per hub) in lieu of the stranded steel bands.

2. Holes drilled or punched in metal poles or pedestals shall be thoroughly reamed, cleaned of all burrs and covered with two (2) coats of zinc rich paint as specified in the standard specifications for road and bridge construction. Grommets or bushings shall be installed in holes.

3. Meet all grounding requirements of Section 620 of the Standard Specifications.
TWISTED PAIR AND LOOP LEAD-IN INSTALLATION WITH CURB & GUTTER

ALTERNATIVE 1
Drill A Hole Through The Curb At The Point Which The Required Saw-Cut Depth Is Obtained Just Prior To Cutting The Top Inside Edge Of The Curb. Slide A Section Of Flexible Conduit At Least 6" Into The Hole From The Back Side Of The Curb But Not Within 2" Of The Top Of The Hole. The Conduit Shall Be Tucked Within The Drilled Hole. Fill The Top Of The Hole With Loop Sealant To The Level Of The Roadway Surface. A Nonmetallic Material Should Be Used To Prevent Excessive Loop Sealant From Entering The Flexible Conduit.

ALTERNATIVE 2
Drill A Hole 1/2" To 1" Larger In Diameter Than The Rigid Conduit To Be Used Through The Roadway Asphalt (Or Concrete) Surface And Base At An Appropriate Angle To Intercept The Trench Or Pull Box Hole. Place A Predetermined Length Of Rigid Conduit In The Hole And Drive The Conduit Into The Trench Or Hole. Install A Molded Bushing (Nonmetallic) On The Roadway End Of The Rigid, Conduit. The Top Of The Rigid Conduit Shall Be Approximately 2" Below The Roadway Surface. Fill The Hole With Loop Sealant To The Level Of The Roadway Surface. A Nonmetallic Material Should Be Used To Prevent Excessive Loop Sealant From Entering The Rigid Conduit.

NOTE:
Other alternatives may be approved by the State Traffic Operations Engineer.

TWISTED PAIR AND LOOP LEAD-IN INSTALLATION WITHOUT CURB & GUTTER

Cut A Slot In The Edge Of The Roadway Of Sufficient Size And Depth To Snugly Place The End Of The Flexible conduit. The End Of The Conduit Shall Be At Least 6" Into The Roadway And approximately 2" Below The Top Of The Roadway Surface. The Departure Angle Of The Conduit From The Roadway Shall Be 30° To 45°.

GENERAL NOTES
1. If the loop lead-in is 75' or less from the edge of the loop detector to controller cabinet, continue the twisted pair to the cabinet. If the loop lead-in is greater than 75' continue the twisted pair to the specified pullbox, splice to shielded lead-in wire and continue to the controller cabinet.
2. The width of all saw cuts shall be sufficient to allow unforced placement of loop wires or lead-in cables into the saw cut. The depth of all saw cuts, except across expansion joints, shall be 3" standard with a maximum of 4".
3. On resurfacing or new roadway construction projects, the loop wires and lead-in cables may be installed in the asphalt structural course prior to the placement of the final asphalt wearing course. The loop wires and lead-in cables shall be placed in a saw cut in the structural course. The depth of the cables below the top of the final surface shall comply with note 2.
4. A nonmetallic hold-down material shall be used to secure loop wires and lead-ins to the bottom of saw-cuts. Hold-down material shall be placed at approximately 12" intervals around loops and 24" intervals on lead-ins.
5. The maximum distance between the twisted pairs of loop lead-in wire is 6" from the loop to 12" from the pavement edge or curb.
6. Splice Connections in pull boxes with UL listed, watertight, insulated enclosures. Place one enclosure over the end of each conductor and place a third enclosure over the exposed end of the shielded cable. As an alternate, a larger diameter enclosure that will accommodate both the splices of the conductors and the exposed end of the shielded cable may be used.
7. As an alternate, a larger diameter enclosure that will accommodate both the splices of the conductors and the exposed end of the shielded cable may be used.
8. The maximum area of asphalt to be disturbed shall be 6'x 6". This area shall be restored as directed by the Engineer.
Loop wires should not be installed in the same pull box with signal power cable.

1. The "number of turns" indicated at the specified point on the loop refers to the number of passes of loop wires which are placed in the saw-cut forming the complete loop.

2. Loop Types or Details not drawn to scale.

3. Loop Types are centered in a single lane except Type E which is centered on two lanes.

4. The number of individual loops in the Type G loop may vary up to a maximum of four (4).

5. Lead-in may be connected to either end of loop.

6. The leading edge of loop Types A, C, D, & F may extend past the stop line a maximum of 30'. The length of those loops may be extended to a maximum of 60'. Each intersection should be individually designed and if modifications noted above is required it must be noted or detailed in the plans.

7. Loop lead-in wires should not be installed in the same pull box with signal power cable.
**Notes:**

1. Payment for sign is included in the price for the pedestrian detector.
2. Signs shall be mounted above detectors, explaining their purpose and use.
3. The positioning of pedestrian push button should clearly indicate which crosswalk signal is actuated by each push button.
4. Push buttons and signs are to be mounted in accordance with Standard Specifications, section 665.
5. Meet all grounding requirements of Section 670 of the Standard Specifications.
6. A 30"X48" maneuvering area is required on each push button.

**Note To Designers:**

The designer should ensure the distance to the Push Button in Figure A & B is maintained. This distance can vary depending on post or pedestal type or whether a frangible base is used and sidewalk configuration. This is specified to meet Americans with Disabilities Act.
NOTE:
1. Refer to the MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES figure 2B-26 Pedestrian Signs. The STANDARD HIGHWAY SIGNS MANUAL (English) Sign R10-3b for Text Size, Spacing and Symbol size. Also see DESIGN STANDARDS Index 17353 for details of FTP signs.
Liquidtight flexible conduit is approved for use from the electrical disconnect to the cabinet when both are installed on the same pole.

If holes for cabinet mounting require relocation, original holes shall be filled in with concrete or covered with a noncorrosive cover plate.

Notes:
1. The number, size and orientation of conduit sweep will vary according to site condition or locations. Two spare 2" PVC conduits shall be provided in all bases. The spares shall exit in the direction of the center rear of the cabinet base, into a pullbox and capped with a weatherproof fitting. If obstructions prevent the spare conduit from exiting to the rear, or the rear of the cabinet is located on the R/W line, a side exit of the spare conduits will have to be approved by the project engineer. All spare conduit sweeps shall be capped with a weatherproof fitting.
2. Meet all grounding requirements of the Standard Specifications 620.
3. New Controller Cabinet installation shall meet the requirements of the Standard Specifications 676.

1. Existing controller cabinets to be retrofitted shall meet the requirements of the Standard Specifications 676.
2. The signalized intersection controller cabinet retrofits installation procedures are located at: http://www.dot.state.fl.us/TrafficOperations/Doc_Library/Doc_Library.htm for Generator Power for Signalized Intersection
Vehicle movements & signal head number assignments are not directionally oriented but shall maintain their relative orientation about the intersection (i.e., movements 7 and 8 are always to the right of movements 1 and 6 etc.).
LOCATION OF THE ADVANCE WARNING SIGN

The Distance Is Measured Along Right Edge Of Pavement From RR Stop Bar To Sign Advance Warning Sign.

TYPICAL PLAN

FUNCTIONAL BLOCK DIAGRAM

PASSIVE STATE
(TRAIN CIRCUIT NOT ACTUATED)

ACTIVE STATE
(TRAIN CIRCUIT ACTUATED)

NOTE:
1. "STOP AHEAD" is standard and preferred sign message. Another message may be approved when appropriate for specific situations.

NOTE:
Conduit and cable from the normally closed relay of RR controller cabinet to the junction box shall be furnish & installed by RR.

NOTE:
RR Control Cabinet To Contain Normally Closed Relay. (Furnished By RR)

WARNING:
Pull Boxes 200' Nominal Spacing

TYPICAL PLAN

FUNCTIONAL BLOCK DIAGRAM

PASSIVE STATE
(TRAIN CIRCUIT NOT ACTUATED)

ACTIVE STATE
(TRAIN CIRCUIT ACTUATED)
General Notes:
1. No guardrail is proposed for signals; however, some form of impact attenuation device may be specified for certain locations.
2. Advance flasher to be installed when and if called for in plans or specifications.
3. Top of foundation shall be no higher than 4" above finished shoulder grade.
4. Type of traffic control device
   I. Flasing signals
   II. Flasing signals with cantilever
   III. Flasing signals with gate
   IV. Flasing signals with cantilever and gate
   V. Gate
5. Class of traffic control devices
   I. Flasing signals-one track
   II. Flasing signals-multiple tracks
   III. Flasing signals with cantilever
   IV. Flasing signals and gates-one track
   V. Flasing signals and gates-multiple tracks

Note:
Two separate foundations may be required (one for signals, one for gate), depending on type of equipment used.

* When 10' is deemed impractical the control device can be located as close as 2' from the edge of a paved shoulder but not less than 6' from the edge of the near traffic lane.

** See FIGURE 1

- Median
- 2' Min. 4" Max.
- 10' Min.
- 10' Min.*

- 27" Max.
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GENERAL NOTES

1. The location of flashing signals and stop lines shall be established based on future or present installation of gate with appropriate track clearances.

2. Where plans call for railroad traffic control devices to be installed in curbed medians, the minimum median width shall be 12'-6".

3. Location of railroad traffic control device is based on the distance available between face of curb & sidewalk. 0' to 6' - Locate device inside sidewalk. Over 6' - Locate device between face of curb and sidewalk.

4. Stop line to be perpendicular to edge of roadway, approx. 15' from nearest rail; or 8' from and parallel to gate when present.

5. When a cantilevered-arm flashing-light signal is used, the minimum vertical clearance shall be 12'-6" from above the Crown of Roadway to the Lowest Point of the Overhead Signal Unit.

SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 LANES, CURB & GUTTER)

SIGNAL PLACEMENT AT RAILROAD CROSSING
(2 LANES, CURB & GUTTER)
NOTES:

1. When computing pavement message, quantities do not include traverse lines.

2. Placement of sign W10-1 is in a residential or business district, where low speeds are prevalent, the W10-1 sign may be placed a minimum distance of 100' from the crossing. Where street intersections occur between the RR pavement message and the tracks an additional W10-1 sign and additional pavement message should be used.

3. A portion of the pavement markings symbol should be directly opposite the W10-1 sign.

4. Recommended location for FTP-61-06 or FTP-62-06 signs, 100' urban and 300' rural. See Index 17355 for sign details.

5. Gate Length Requirements:
   a. For Two-way unlimited sections:
      The gate should extend to within 1' of the center line. On multiple approaches the maximum gate length may not reach to within 3' of the center line. For such cases, the distance from the gate to the center line shall be a maximum of 4'.
   b. For one-way or divided sections:
      The gate shall be of sufficient length such that the distance from the gate tip to the inside edge of pavement is a maximum of 4'.

<table>
<thead>
<tr>
<th>SPEED (mph)</th>
<th>A (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>400</td>
</tr>
<tr>
<td>55</td>
<td>325</td>
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<tr>
<td>50</td>
<td>250</td>
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<td>40</td>
<td>125</td>
</tr>
<tr>
<td>35</td>
<td>100</td>
</tr>
<tr>
<td>URBAN</td>
<td>85 Min</td>
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See Note 5

For Use Near Signalized Intersections

Probable Location for FTP-61-06 or FTP-62-06 Signs, 100' urban and 300' rural. See Index 17355 for sign details.
**RAILROAD GATE ARM LIGHT SPACING**

<table>
<thead>
<tr>
<th>Specified Length Of Gate Arm</th>
<th>Dimension &quot;A&quot;</th>
<th>Dimension &quot;B&quot;</th>
<th>Dimension &quot;C&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 Ft.</td>
<td>6'</td>
<td>30'</td>
<td>3'</td>
</tr>
<tr>
<td>15 Ft.</td>
<td>18'</td>
<td>30'</td>
<td>3'</td>
</tr>
<tr>
<td>16-17 Ft.</td>
<td>24'</td>
<td>30'</td>
<td>3'</td>
</tr>
<tr>
<td>18-19 Ft.</td>
<td>30'</td>
<td>45'</td>
<td>3'</td>
</tr>
<tr>
<td>20-23 Ft.</td>
<td>36'</td>
<td>4'</td>
<td>3'</td>
</tr>
<tr>
<td>24-28 Ft.</td>
<td>36'</td>
<td>5'</td>
<td>3'</td>
</tr>
<tr>
<td>29-33 Ft.</td>
<td>36'</td>
<td>6'</td>
<td>3'</td>
</tr>
<tr>
<td>34-36 Ft.</td>
<td>36'</td>
<td>7'</td>
<td>3'</td>
</tr>
<tr>
<td>37-39 Ft.</td>
<td>36'</td>
<td>9'</td>
<td>3'</td>
</tr>
<tr>
<td>38 And Over</td>
<td>36'</td>
<td>10'</td>
<td>10'</td>
</tr>
</tbody>
</table>

NOTES:
1. A bypass switch shall be installed to override each timing interval in case of a malfunction.
2. "STOP HERE ON RED" is omitted in Type I operation and "TRAFFIC SIGNALS" are omitted in Type II operation.
3. The time between beginning of flashing yellow on "Drawbridge Ahead" sign and the clearance of traffic signal to red, or beginning of flashing red should not be less than the travel time of a passenger car, from the sign location to the stop line, traveling at the 85 percentile approach speed.
4. Beginning of operation of drawbridge gates shall not be less than 15 seconds after steady red or 20 seconds after flashing red (actual time may be determined by the bridge tender.)
5. Time of gate lowering and raising is dependent upon gate type.
6. Time of bridge opening is determined by the bridge tender.
7. Each gate shall be operated by a separate switch.
8. On each approach (Type II), all four red signals shall be on the same two circuit flashers, with the two top signals on one circuit, and the two bottom signals on the alternately flashing circuit.
9. A Drawbridge Ahead sign is required for both types of signal operation. However, a flashing beacon shall be added to the sign when physical conditions prevent a driver traveling at the 85% approach speed from having continuous view of at least one signal indication for approximately 10 seconds.
10. Requirements on gate installation are contained in Section 4I of the "Manual on Uniform Traffic Control Devices".
11. In accordance with Traffic Engineering Manual (Topic Number 750-000-005) Section 2.1, "SLIPPERY WHEN WET SIGNS shall be placed in advance of all MOVABLE and NONMOVABLE STEEL DECK BRIDGES."

LEGEND:
- TRAFFIC SIGNALS
- DRAWBRIDGE SIGN
- Monotube Support Mounted (On Bridge)
- DRAWBRIDGE AHEAD SIGN WITH YELLOW FLASHING BEACON
- STOP HERE ON RED SIGN WITH YELLOW FLASHING BEACON
- ENTRANCE GATE
- EXIT GATE
- 24" THERMOPLASTIC STOP BAR

SEQUENCE CHART:

<table>
<thead>
<tr>
<th>SIGNAL SWITCH</th>
<th>DRAWBRIDGE AHEAD SIGN</th>
<th>TRAFFIC SIGNALS</th>
<th>ENTRANCE GATE</th>
<th>EXIT GATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLACK</td>
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<td>BLACK</td>
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<tr>
<td>GREEN</td>
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<tr>
<td>OFF</td>
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<td>OFF</td>
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<tr>
<td>FLASHING</td>
<td>FLASHING</td>
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<td>RED</td>
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<td>RED</td>
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<tr>
<td>YELLOW</td>
<td>YELLOW</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TIMING</th>
<th>Variable Time</th>
<th>Variable Time</th>
<th>Variable Time</th>
<th>Variable Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td>(See Note No. 4)</td>
<td>(See Note No. 5)</td>
<td>(See Note No. 6)</td>
<td>(See Note No. 7)</td>
</tr>
<tr>
<td>Normal Operation During Bridge Preemption</td>
<td></td>
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</tbody>
</table>

* Field conditions may require adjustment of this standard distance.
**FIGURE - A**
MONOTUBE SUPPORT MOUNTING

**FIGURE - B**
SIGN PANEL MOUNTING ASSEMBLY

**FIGURE - C**
STOP HERE ON RED

**FIGURE - D**

**FIGURE - E**
Pole Clamp With Wire Entrance

**FIGURE - F**

**FIGURE - G**
DRAW BRIDGE AHEAD

*Measured from the bottom of the sign to the near edge of the pavement. Horizontal distance between edge of the pavement and inside edge of sign will vary with condition at job site.*
BLACK OPAQUE LEGEND AND BORDER ON REFLECTORIZED YELLOW BACKGROUND
TO BE USED WITH TYPE 1 OPERATION, AS SHOWN ON PREVIOUS SHEET
MONOTUBE SUPPORT MOUNTING

NOTES:

1. 12 volt flashing red lights shall be mounted on gate arm and shall operate in the flashing mode only when gate arm is in the lower position or in the process of being lowered. The number of lights shall vary accordingly to length of the gate arm.

2. Alternating 16" pattern of fully reflectorized red and white stripes.