NOTES:

1. Work with Index 634-001 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:

   A. Strain Pole and Backing Rings:
      a. Less than or equal to $R_y$; ASTM A1011 Grade 50, 55, 60 or 65
      b. Greater than or equal to $R_y$; ASTM A325 Grade 50, 55, 60 or 65
      c. ASTM A500 Grade A (55 ksi yield) or Grade B (60 ksi yield)
   B. Steel Plates: ASTM A36
   C. Weld Metal: E70XX
   D. Bolts, Nuts and Washers:
      a. High Strength Bolts, ASTM F3125, Grade 125, Type 1
      b. Nuts; ASTM A325 Grade 50, 55, 60 or 65
   C. Washers; ASTM F436 Type 1, one under turned element
   F. Anchor Bolts, Nuts and Washers:
      a. Anchor Bolts; ASTM F3125 Grade 55
      b. Nuts: ASTM A325 Grade A Heavy-Hex (5 per anchor bolt)
      c. Plate Washers: ASTM A563 Grade 50
   G. Perform all welding in accordance with Specification 460-6.4.
   H. Fabricate longitudinal seam welds in pole with 60 percent minimum penetration or full-penetration fusion welds except, within 6" of the base plate connection use full-penetration groove welds.
   I. Handhole Cover: ASTM A1011 Grade 50, 55, 60 or 65
   J. Threaded Bars/Studs: ASTM A36 or ASTM A307
   K. Concrete: Class IV (Drilled Shaft) for all environmental classifications.
   L. Reinforcing Steel: Specification 415

4. Fabrication:

   A. Pole Taper: Change diameter at a rate of 0.14 inches per foot, round or 12-sided (Min.)
   B. Upright splices are not permitted. Transverse welds are only permitted at the base.
   C. Provide bolt hole diameters as follows:
      a. Bolts (except Anchor Bolts): Bolt diameter plus $R_y$/2, prior to galvanizing.
      b. Anchor Bolts: Bolt diameter plus 1/2", maximum.
   D. Locate handhole 30" from 2" wire entrance pipe.
   E. Identification Tag: (Submit details for approval.)
      a. 2" x 4" (Max.) aluminum identification tag.
      b. Anchor Bolts: Bolt diameter plus 1/2", prior to galvanizing.
      c. Secure to pole with 2" x 4" (Max.) aluminum identification tag.
   F. Fabricate longitudinal seam welds in pole with 60 percent minimum penetration or full-penetration fusion welds except, within 6" of the base plate connection use full-penetration groove welds.
   G. Not to be galvanized after fabrication.

5. Coatings:

   A. All Nuts, Bolts, Washers and Threaded Bars/Studs: ASTM F3129
   B. All other steel items including plate washers: ASTM A123

6. Construction:

   A. Foundation: Specification 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 base plate in accordance with Specification 449-6.
   C. Steel Plates: ASTM A36
   D. Upright splices are not permitted. Transverse welds are only permitted at the base.
   E. Anchor Bolts, Nuts and Washers:
      a. High Strength Bolts, ASTM F3125, Grade 125, Type 1
      b. Nuts: ASTM A325 Grade 50, 55, 60 or 65
      c. Washers; ASTM F436 Type 1, one under turned element
   F. Fabricate longitudinal seam welds in pole with 60 percent minimum penetration or full-penetration fusion welds except, within 6" of the base plate connection use full-penetration groove welds.
   G. Not to be galvanized after fabrication.

5. Coatings:

   A. All Nuts, Bolts, Washers and Threaded Bars/Studs: ASTM F3129
   B. All other steel items including plate washers: ASTM A123

6. Construction:

   A. Foundation: Specification 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 base plate in accordance with Specification 449-6.
   C. Steel Plates: ASTM A36
   D. Upright splices are not permitted. Transverse welds are only permitted at the base.
   E. Anchor Bolts, Nuts and Washers:
      a. High Strength Bolts, ASTM F3125, Grade 125, Type 1
      b. Nuts: ASTM A325 Grade 50, 55, 60 or 65
      c. Washers; ASTM F436 Type 1, one under turned element
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   G. Not to be galvanized after fabrication.

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   A. Foundation: Specification 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 base plate in accordance with Specification 449-6.
   C. Steel Plates: ASTM A36
   D. Upright splices are not permitted. Transverse welds are only permitted at the base.
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   G. Not to be galvanized after fabrication.

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   A. Foundation: Specification 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 base plate in accordance with Specification 449-6.
   C. Steel Plates: ASTM A36
   D. Upright splices are not permitted. Transverse welds are only permitted at the base.
   E. Anchor Bolts, Nuts and Washers:
      a. High Strength Bolts, ASTM F3125, Grade 125, Type 1
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   G. Not to be galvanized after fabrication.

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   B. All other steel items including plate washers: ASTM A123

6. Construction:

   A. Foundation: Specification 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 base plate in accordance with Specification 449-6.
**STEEL STRAIN POLE**

**FOUNDATION AND BASE DETAILS**

**SECTION A-A**
- **Center of Drilled Shaft & Ø Pole**
- **BC Dia. Anchor Bolt**
- **Threaded Each End (Typ.)**
- **1" x 1" Chamfer**

**SECTION B-B**
- **Center of Handhole & Ø Pole**
- **Edge Of Foundation**
- **Inside Radius Measured Center to Flat**
- **Wall Thickness**

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### POLE ASSEMBLY

**NOTE:**
1. Double Nuts: Bottom nut may be half-height "jam" nut. Provide individual nut covers (not shown) for each bolt.

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### POLE DATA TABLE

| POLE TYPE | POLE (in.) | BASE CONNECTION | SHAFT | NO. of DB (FT) | DA (FT) | BB (in.) |  |
|-----------|------------|----------------|-------|----------------|---------|---------|--
| PS-IV     | 0.250      | 14             | 8     | 25             | 2.50    | 1 3/8   | 60 |
| PS-V      | 0.313      | 16             | 10    | 28             | 2.50    | 1 3/4   | 60 |
| PS-VI     | 0.313      | 18             | 12    | 30             | 2.50    | 1 3/4   | 60 |
| PS-VIII   | 0.313      | 21             | 14    | 35             | 2.50    | 1 3/4   | 60 |
| PS-VG     | 0.313      | 23             | 16    | 35             | 2.50    | 1 3/4   | 60 |
| PS-XVIII  | 0.313      | 25             | 18    | 40             | 2.50    | 1 3/4   | 60 |

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### STEEL STRAIN POLE

**Foundation**
- Base Plate
- Foundation

**Base Plate**
- Double Nuts (See Note 1)
- Anchor Bolt

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**Foundation and General Note 4.D)**

- See DETAIL 'A'
- Base Plate Opening
- Silicone Caulk
- 2 x 1/2 Backing Ring

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**Description:**
- **REVISION INDEX:**
- **FY 2020-21 STANDARD PLANS**
- **SHEET:**
- **LAST REVISED:**
- **MATERIALS:**
- **DIMENSIONS:**
- **NOTES:**
**POLE ASSEMBLY**

**NOTES:**

1. Clamps have been sized for **Design Cable Loads Show 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 standard pipe for each pole location). At locations other than the wire entrance, the **Weather Head Face** is to be left closed to outside atmosphere. Wire entrance installed per Index 634-001.

3. Any combination of Option 'a' or 'b' may be used provided both lifting and wiring is accommodated.

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**CLAMP THICKNESS TABLE**

<table>
<thead>
<tr>
<th>Cable Diameter (in)</th>
<th>Minimum Bending Strength (kip)</th>
<th>Plate Thickness (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8</td>
<td>18</td>
<td>7/8</td>
</tr>
<tr>
<td>1/2</td>
<td>28</td>
<td>3/8</td>
</tr>
</tbody>
</table>

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**CATEenary and Messenger Wire Clamps**

**Handhole Details**

- **Tack Weld Cover Clip**
- **Handhole Frame**
- **11 Gage Handhole Cover**

**Wire Entrance Detail**

- **2 1/2" Holes For 2 - 1/2" Pipe**
- **Steel Passivated Cotter Pins**
- **Automatic Compression Type Clamp (Feed Through Bolt)**
- **1/2" Thick Clamp**
- **ASTM A500 Grade 50**

**Wire Entrance**

- **Wire Clamps**
- **Messenger Catenary and Wire**
- **Clamp Wire**
- **Entrance Wire**
- **1/2" Bolt With Double Nuts And Washers**
- **1/2" Hex Head Screw**
- **ASTM A500 Grade 50**

**Section C-C**

- **Threaded Hole for 1/2" Hex Head Screw (TYP.)**
- **Partial Penetration Weld (TYP.)**
- **Tack Weld Cover Clip (TYP.)**

**CUT-AWAY (Option 'a')**

- **C Hook For Wiring. 1/2" Commercial Grade Hot Rolled Bar Welded To Inside Of Pole**

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**ATTACHMENT DETAILS**

**Pole Cap**

- **1/2" Bolt With Double Nuts And Washers**
- **1/4" Hex Head Screw (TYP.)**
- **ASTM A500 Grade 50**

**Lifting Bar**

- **1/2" Overhang (Min.)**
- **Steel Clamp, ASTM A500 Grade 50 (See Table For Thickness)**

**Pole Cap Plate**

- **1 1/4" Bolt With Double Nuts And Washers**
- **1/2" Stainless Steel Hex Head Screw (TYP.)**

**Pole Cap**

- **C Hook For Wiring. 1/2" Commercial Grade Hot Rolled Bar Welded To Inside Of Pole**

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**REVISION**

- **LAST REVISED:** 01/01/17
- **STANDARD PLANS**
- **FY 2020-21**
- **INDEX:** 649-010
- **SHEET:** 3 of 3

**DESCRIPTION:**

- **POLE ASSEMBLY**
- **Pole Diameter at the Clamp location**
- **Catenary and Messenger Wire Clamps**
- **Wire Entrance**
- **Handhole Details**
- **1/2" Bolt With Double Nuts And Washers**
- **1/2" Hex Head Screw**
- **ASTM A500 Grade 50**
- **Lifting Bar**
- **Pole Cap Plate**