STEEL STRAIN POLE

1) Designed in accordance with FDOT Structures Manual.


3) See Standard Index No. 17727 for grounding and span wire details.

4) Foundation Materials:
   a. Reinforcing Steel: ASTM A615 Grade 60.
   b. Concrete: Class IV, Drilled Shaft 4,000 psi (f') minimum Compressive Strength at 28-days for all environmental classifications.
   c. Anchor Bolts: ASTM F1554 Grade 55 with ASTM A563 Grade A heavy-hex nuts and plate washers (all galvanized in accordance with ASTM F2329).

5) Strain Pole Specifications:
   a. Pole: ASTM A1011 Grade 50, 55, 60 or 65 (less than 3⁄4") or ASTM A572 Grade 50, 55, 60, or 65 (1 1⁄2" and over) or ASTM A595 Grade A (55 ksi yield) or Grade B (60 ksi yield).
   b. Plate Flanges: ASTM A36.
   c. Weld Metal: E70XX.
   d. Bolts: A325, Type 1; Hole Diameter: Bolt diameter plus 0.125".
   e. Base Plate: Hole Diameter: anchor bolt diameter plus 0.125".
   f. Handhole: Frame: ASTM A615 Grade 60 or ASTM A36, Cover: ASTM A1011 Grade 50, 55, 60, or 63.
   g. Aluminum Caps and Covers: ASTM B-26139-F.
   h. Stainless Steel Screws: AISI Type 316.
   i. Galvanization: All nuts, bolts and washers; ASTM F2329, All other steel; ASTM A123.

6) Pole Notes:
   a. See the Signalization Plans for clamp spacing, cable sizes and forces, signal and sign mounting locations and details.
   b. Tapered with the diameter changing at a rate of 0.14 inch per foot.
   c. Transverse welds are allowed only at the base.
   d. Poles constructed out of two or more sections with overlapping splices are not permitted.
   e. Locate the handhole 180 degrees from 2-inch wire entrance pipe.
   f. Furnish each pole with a 2"x4" (max) aluminum identification tag. Submit details for approval. Secure to pole with 0.125" stainless steel rivets or screws. Locate identification tag on the inside of pole and visible from handhole. Include the following information: Manufacturer's Name, Fy of Steel and Base Wall Thickness.
   g. Base Plate: Hole Diameter: anchor bolt diameter plus 0.125".
   h. Stainless Steel Screws: AISI Type 316.
   i. Galvanization: All nuts, bolts and washers; ASTM F2329, All other steel; ASTM A123.

7) Financial Project ID, Pole Type, Pole Height, following information:
   a. Poles constructed out of two or more sections with overlapping splices are not permitted.
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   i. Galvanization: All nuts, bolts and washers; ASTM F2329, All other steel; ASTM A123.

8) Verify CSL access tubes will not interfere with anchor bolt installation before excavating the shaft. When CSL access tube locations conflict with anchor bolt locations, move the CSL access tube locations ± two inches along the inner circumference of the reinforcing cage. Notify the Engineer before excavating the shaft if the CSL access tube locations cannot be moved out of conflict with anchor bolt locations.
**TABLE OF STRAIN POLE VARIABLES**

<table>
<thead>
<tr>
<th>POLE TYPE</th>
<th>MAXIMUM ALLOWABLE MOMENT (kip-ft)</th>
<th>I (in)</th>
<th>K (in)</th>
<th>No. of Bolts</th>
<th>BA (in)</th>
<th>BB (in)</th>
<th>BC (in)</th>
<th>BF (in)</th>
<th>DA (FT)</th>
<th>DB (FT)</th>
<th>No. of #3 Bars</th>
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<tbody>
<tr>
<td>PS-IV</td>
<td>93.4</td>
<td>0.250</td>
<td>14</td>
<td>8</td>
<td>25</td>
<td>2.50</td>
<td>7.3/8</td>
<td>60</td>
<td>14</td>
<td>4</td>
<td>14</td>
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<tr>
<td>PS-V</td>
<td>138.9</td>
<td>0.313</td>
<td>16</td>
<td>16</td>
<td>28</td>
<td>2.50</td>
<td>7.12</td>
<td>60</td>
<td>15</td>
<td>4</td>
<td>14</td>
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<tr>
<td>PS-VI</td>
<td>263.6</td>
<td>0.313</td>
<td>18</td>
<td>18</td>
<td>32</td>
<td>2.50</td>
<td>7.12</td>
<td>60</td>
<td>16</td>
<td>4</td>
<td>14</td>
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<tr>
<td>PS-VII</td>
<td>320.3</td>
<td>0.313</td>
<td>21</td>
<td>21</td>
<td>33</td>
<td>2.50</td>
<td>7.12</td>
<td>60</td>
<td>16</td>
<td>4.5</td>
<td>16</td>
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<tr>
<td>PS-VIII</td>
<td>338.0</td>
<td>0.313</td>
<td>23</td>
<td>16</td>
<td>33</td>
<td>2.50</td>
<td>7.12</td>
<td>60</td>
<td>17</td>
<td>4.5</td>
<td>16</td>
</tr>
<tr>
<td>PS-IX</td>
<td>469.1</td>
<td>0.313</td>
<td>27</td>
<td>14</td>
<td>41</td>
<td>3.00</td>
<td>7.3/4</td>
<td>60</td>
<td>18</td>
<td>5</td>
<td>18</td>
</tr>
</tbody>
</table>

**BASE AND FOUNDATION DETAILS AND TABLE OF VARIABLES**

**STEEL STRAIN POLE**

| INDEX NO. | 17723 |
| SHEET NO. | 2 of 3 |

**FOUNDATION NOTES:**

The foundations for Steel Strain Poles are designed based upon the following conservative soil criteria which covers the great majority of soil types found in Florida:

- **Classification:** Cohesive soil (Clay, Fine Gravel)
- **Unit Weight:** Gph (assumed saturated) = 50 pcf
- **Coefficient of Friction Angle:** 30 Degrees (30°)
- **Cohesion:** 65 psf

Drilled Shafts are assumed for all soils at the specific site location to be of lesser strength properties should an analysis be required. SPR borings and CPT soundings may be utilized as needed to verify the assumed soil properties, and at relatively uniform sites, a single boring or sounding may cover several foundations. Furthermore, borings in the area that were performed for other purposes may be used to confirm the assumed soil properties.

- **PS-IV:**
  - Shaft Diameter: 6"_E_6"_E_6"_E_6"
  - Lap (Min.): 2'-2"_E_2'-2"_E_2'-2"_E_2'-2"

- **PS-V:**
  - Shaft Diameter: 6"_E_6"_E_6"_E_6"
  - Lap (Min.): 2'-2"_E_2'-2"_E_2'-2"_E_2'-2"

- **PS-VI:**
  - Shaft Diameter: 6"_E_6"_E_6"_E_6"
  - Lap (Min.): 2'-2"_E_2'-2"_E_2'-2"_E_2'-2"

- **PS-VII:**
  - Shaft Diameter: 6"_E_6"_E_6"_E_6"
  - Lap (Min.): 2'-2"_E_2'-2"_E_2'-2"_E_2'-2"

- **PS-VIII:**
  - Shaft Diameter: 6"_E_6"_E_6"_E_6"
  - Lap (Min.): 2'-2"_E_2'-2"_E_2'-2"_E_2'-2"

- **PS-IX:**
  - Shaft Diameter: 6"_E_6"_E_6"_E_6"
  - Lap (Min.): 2'-2"_E_2'-2"_E_2'-2"_E_2'-2"

**NOTE:**

- Number of bolts shown for illustration purposes only.

**PARTIAL ELEVATION**

- (Showing Base Plate, Anchor bolts and Handhole)

**SECTION A-A**

(Number of bars shown is for illustration purposes only)

**SECTION B-B**

(Showing Base Plate, Anchor bolts and Handhole)

**DRILLED SHAFT ELEVATION**

- #11 Bars equally spaced

**CENTER OF DRILLED SHAFT**

- Anchor Bolt (Typ.)

**BASE PLATE Details**

- Bolt Circle
  - Bolt Diameter (Typ.)
  - Bolt Cover (Typ.)

- Center of Drilled Shaft: Base Plate and Pole
  - Anchor Bolt (Typ.): #5 Tie Bars
  - CSL Tube (Typ.): Equally Spaced #11 Bars
  - Nut Cover (not shown) for each bolt
  - Nut (Typ.): #5 Tie Bars
  - Double Nuts, Top Nut may be half height, #11 Bar: Provides individual Nut Cover (not shown) for each bolt
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**SECTIONS**

- A-A
  - Base Ø BA (in)
  - Drilled Shaft: #5 Tie Bars
  - Center of Drilled Shaft: Base Plate and Pole
  - Edge of Base Plate
  - #11 Bars equally spaced

- B-B
  - Center of Handhole & Pole
  - Chamfer 1" x 1" (Top)
  - Chamfer 1" x 1" (Bottom)
  - Wire screen 8" min. each end

**DETAIL C**

- Bolt Circle
  - Bolt Diameter (Typ.)
  - Bolt Cover (Typ.)

- Leveling Anchor Bolt (Typ.)
  - #5 Tie Bars
  - CSL Tube (Typ.): Equally Spaced #11 Bars
  - Nut Cover (not shown) for each bolt
  - Nut (Typ.): #5 Tie Bars
  - Double Nuts, Top Nut may be half height, #11 Bar: Provides individual Nut Cover (not shown) for each bolt
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- **PS-IV:**
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  - Lap (Min.): 2'-2"_E_2'-2"_E_2'-2"_E_2'-2"

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  - Shaft Diameter: 6"_E_6"_E_6"_E_6"
  - Lap (Min.): 2'-2"_E_2'-2"_E_2'-2"_E_2'-2"

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  - Lap (Min.): 2'-2"_E_2'-2"_E_2'-2"_E_2'-2"

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  - Shaft Diameter: 6"_E_6"_E_6"_E_6"
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  - Shaft Diameter: 6"_E_6"_E_6"_E_6"
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**NOTE:**

- Number of bolts shown for illustration purposes only.
POLE TOP NOTE:
Any combination of the above two options may be used, provided both lifting and wiring is accommodated.

POLE TOP CUT-AWAY (Option 'b')

Cast Aluminum Pole top cap
1/4" min. thick held in place with 3 stainless steel screws

C Hook for wiring and lifting. 1/4" commercial grade hot rolled bar welded to inside of pole

POLE TOP CUT-AWAY (Option 'a')

1/2" x 2" lifting bar with ( bolt size + 1/8") 1/2 hole
and matching nut, tack welded to underside of bar

TOP VIEW

4" x 1/4" Hand
2 Hole for wire-hole frame made
1/4" commercial. Continuous with a grade hot rolled bar welded to inside of pole

HAND HOLE FRAME

FULL PENETRATION WELD

1/2" Stainless Steel Hex Head Screw

HAND HOLE COVER

45° WELD

Wire entrance details

 sectional view D-D (thru Hand Hole)

Catenary and Messenger Wire Clamps

NOTE: Clamps have been sized for Design Cable loads shown in the Table, and a Maximum Pole Diameter at the Clamp location of 2'-1".

SECTION D-D

W-Bolt Plate with hole and slot for 1/2" Bolt

W-Bolt with Nut, lock nut and Flat Washers (Typ.)

W-Bolt with Nut, lock nut and Flat Washers (Typ.)

Steel Clamp, ASTM A709 Grade 50, see Table for thickness

2 1/2" @ Holes for 2 1/2" x 3" Steel Passivated Cotter Pins

Cover, 1/4" thick

ASTM A709 Grade 50

Tack welded to underside of bar

Cover Clip (Typ.)

ASTM A500 Grade B

Hand Hole Frame

11 Gauge Hand Hole Cover

Hand Hole Cover 11 Gage

1/2" Stainless Steel Hex Head Screw

Full Penetration Weld

Threaded hole in tack welded cover clip (Typ.)

WIRE ENTRANCE DETAILS

Hand Hole Cover 11 Gage

1/2" Stainless Steel Hex Head Screw

Full Penetration Weld

Threaded hole in tack welded cover clip (Typ.)

POLE TOP NOTE:
A properly sized Service Head (Weather Head) shall be installed and fastened securely on to the standard pole for each pole location. At locations other than service entrance, the service head face is to be left closed to outside atmosphere. Service entrance installation per Index No. 17727.