Traffic Signals
## Traffic Signals

<table>
<thead>
<tr>
<th>NO.</th>
<th>DATE</th>
<th>TITLE</th>
</tr>
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<tbody>
<tr>
<td>TS-102</td>
<td>04-19-22</td>
<td>Traffic Signal Pole Foundation</td>
</tr>
</tbody>
</table>

04/19/22
The Type A Foundation is the normally required foundation construction. Where rock is encountered, the Engineer may approve the use of the Type B or C Foundation. Prior to installing a foundation in rock, obtain a subsurface investigation certified by a geotechnical engineer licensed in the State of Iowa.

1. Shape top 11 inches with forms. See Detail 'A'.
2. Install rodent guard or non-shrink grout with weep hole.
3. Furnish nut, nut and plate, or nut and anchor bolt assembly ring plate on embedded end.
4. Provide conduits as per plans.
5. Install ground rod adjacent to foundation or in adjacent handhole.

<table>
<thead>
<tr>
<th>Max. Mast Arm Length</th>
<th>Foundation</th>
<th>&quot;V&quot; Bars</th>
<th>Tie Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;W&quot;</td>
<td>&quot;L&quot;</td>
<td>Count</td>
</tr>
<tr>
<td>35'-0&quot;</td>
<td>#8</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
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<td>#8</td>
<td>12</td>
<td>12</td>
</tr>
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<td>#8</td>
<td>12</td>
<td>12</td>
</tr>
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<td>#8</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>70'-0&quot;</td>
<td>#10</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>80'-0&quot;</td>
<td>#10</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>90'-0&quot;</td>
<td>#10</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>100'-0&quot;</td>
<td>#10</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

**Legend:**
- **1**: Shape top 11 inches with forms. See Detail 'A'.
- **2**: Install rodent guard or non-shrink grout with weep hole.
- **3**: Furnish nut, nut and plate, or nut and anchor bolt assembly ring plate on embedded end.
- **4**: Provide conduits as per plans.
- **5**: Install ground rod adjacent to foundation or in adjacent handhole.
Type B Foundation is applicable for traffic signal poles with mast arm lengths up to 60 feet.

1. If the excavation for a Type B Foundation is left open for more than 1 calendar day, install temporary barrier rail if any part of the excavation is located within the clear zone. Temporary barrier rail layout requires the Engineer’s approval.

2. Compliant rock has an average unconfined compressive strength of at least 2.0 ksi and rock quality designation of at least 90%.

3. When in contact with rock, place ground rods as specified in National Electrical Code or in adjacent handhole.

4. When in contact with rock, place ground rods as specified in National Electrical Code or in adjacent handhole.

5. Provide conduits as per plans.

6. Place 13 equally spaced #8 vertical bars. When in contact with rock, place ground rods as specified in National Electrical Code or in adjacent handhole.

7. Place 5 bars spaced at 8 inch maximum. Ties may be welded to vertical bars.

8. Compliant rock has an average unconfined compressive strength of at least 2.0 ksi and rock quality designation of at least 90%.


10. Install rodent guard or non-shrink grout with weep hole.

11. Furnish nut, nut and plate, or nut and anchor bolt assembly ring plate on embedded end.

12. A site specific design, or conditions not meeting minimum requirements will require either:


14. Clarified placement of ground rod.

15. Removed hooks from foundation reinforcing. Updated notes for conduit.
**FIGURE 8010.102**  
**SHEET 3**  

**TRAFFIC SIGNAL POLE FOUNDATION**

**TYPE C FOUNDATION**

<table>
<thead>
<tr>
<th>Max. Mast Arm Length</th>
<th>W (Min.)</th>
<th>W (Max.)</th>
<th>L (Min.)</th>
<th>L (Max.)</th>
<th>L*</th>
<th>L**</th>
<th>L***</th>
<th>L****</th>
<th>Count</th>
<th>Size</th>
<th>Length</th>
<th>Spacing</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3'-0&quot;</td>
<td>2'-6&quot;</td>
<td>12'-0&quot;</td>
<td>14'-0&quot;</td>
<td>4'-6&quot;</td>
<td>3'-0&quot;</td>
<td>13</td>
<td>#8</td>
<td>L - 6&quot;</td>
<td>6&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45'-0&quot;</td>
<td>3'-0&quot;</td>
<td>2'-6&quot;</td>
<td>16'-0&quot;</td>
<td>18'-0&quot;</td>
<td>4'-6&quot;</td>
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<td>13</td>
<td>#8</td>
<td>L - 6&quot;</td>
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<td>13</td>
<td>#8</td>
<td>L - 6&quot;</td>
<td>6&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60'-0&quot;</td>
<td>3'-0&quot;</td>
<td>2'-6&quot;</td>
<td>20'-0&quot;</td>
<td>22'-0&quot;</td>
<td>4'-6&quot;</td>
<td>3'-0&quot;</td>
<td>14</td>
<td>#9</td>
<td>L - 6&quot;</td>
<td>5½&quot;</td>
<td></td>
<td></td>
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<td>70'-0&quot;</td>
<td>3'-0&quot;</td>
<td>3'-0&quot;</td>
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<td>23'-0&quot;</td>
<td>5'-6&quot;</td>
<td>3'-6&quot;</td>
<td>14</td>
<td>#9</td>
<td>L - 6&quot;</td>
<td>5½&quot;</td>
<td></td>
<td></td>
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<td>3'-0&quot;</td>
<td>3'-0&quot;</td>
<td>22'-0&quot;</td>
<td>24'-0&quot;</td>
<td>5'-6&quot;</td>
<td>3'-6&quot;</td>
<td>14</td>
<td>#9</td>
<td>L - 6&quot;</td>
<td>5½&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90'-0&quot;</td>
<td>4'-0&quot;</td>
<td>3'-0&quot;</td>
<td>23'-0&quot;</td>
<td>25'-0&quot;</td>
<td>6'-0&quot;</td>
<td>4'-0&quot;</td>
<td>15</td>
<td>#10</td>
<td>L - 6&quot;</td>
<td>5½&quot;</td>
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<td>4'-0&quot;</td>
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<td>26'-0&quot;</td>
<td>6'-0&quot;</td>
<td>4'-0&quot;</td>
<td>15</td>
<td>#10</td>
<td>L - 6&quot;</td>
<td>5½&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Broken rock has an average unconfined compressive strength (q<sub>u</sub>) of at least 1.0 ksi and rock quality designation of at least 20%.

**Competent rock** has an average unconfined compressive strength (q<sub>u</sub>) of at least 2.0 ksi and rock quality designation of at least 90%.

**Total foundation length L must be sufficient to provide a 3 inch clearance between the bottom of the traffic signal pole anchor bolts and the bottom of the rock socket.**

*****The Rock Socket Length L<sub>s</sub> can be decreased if the total length of the shaft is L long as shown in the table.**

Conditions not meeting minimum requirements will require site specific designs or shall use theType A Foundation Soil parameters.

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**Diagram:** Mast Arm Pole Foundation in Rock Type C Foundation

- **Plan View:**
  - Conduits
  - Anchor Bolts
  - Ground Rods
  - Ground Rod Clamp
  - Drilled Shaft Tie Bars
  - Conduits

- **Top of Rock**

- **Detail 'A':**
  - Pole Base
  - #6 Ties
  - "V" Bars (See Table for Count)
  - 6" Clear Cover Drilled Shaft
  - 3" Clear Cover Rock Socket (Typ.)

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1. Shape top 11 inches with forms. See Detail 'A'.
2. Install rodent guard or non-shrink grout with weep hole.
3. Furnish nut, nut and plate, or nut and anchor bolt assembly ring plate on embedded end.
4. Provide conduits as per plans.
5. When in contact with rock, place ground rods as specified in National Electrical Code, current edition, adjacent to foundation or in adjacent handhole.

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**Notes:**

- Use the Type A Foundation Soil parameters.
- Conditions not meeting minimum requirements will require site specific designs or shall use the Type A Foundation Soil parameters.
PEDESTAL POLE FOUNDATION IN SOIL OR ROCK

1. Shape top 11 inches with forms. See Detail 'A'.
2. Install rodent guard or non-shrink grout with weep hole.
3. When in contact with rock, place ground rods as specified in National Electrical Code, current edition, adjacent to foundation or in adjacent handhole.
4. 12 to 24 inch diameter as shown in contract documents.
5. Provide 4 foot accessible path adjacent to push button pole.
6. Install four anchor bolts, washers, and nuts in new or existing concrete sidewalk by drilling and anchoring with epoxy adhesive. Provide bolts according to manufacturer's recommendations.

CONSTRUCTION:

1. Shape top 11 inches with forms. See Detail 'A'.
2. Install rodent guard or non-shrink grout with weep hole.
3. Use 11" diam. ground wire duct to ground rod (minimum 6" thickness) with epoxy. Provide bolts according to manufacturer's recommendations.
4. No steel reinforcing required for pedestal foundation.
5. Provide 4 foot accessible path adjacent to push button pole.
6. Install four anchor bolts, washers, and nuts in new or existing concrete sidewalk by drilling and anchoring with epoxy adhesive. Provide bolts according to manufacturer's recommendations.

FIGURE 8010.102
SHEET 4 OF 4

TRAFFIC SIGNAL POLE FOUNDATION

ALTERNATE PUSH BUTTON POLE SIDEWALK MOUNTING

1. Shape top 11 inches with forms. See Detail 'A'.
2. Install rodent guard or non-shrink grout with weep hole.
3. When in contact with rock, place ground rods as specified in National Electrical Code, current edition, adjacent to foundation or in adjacent handhole.
4. 12 to 24 inch diameter as shown in contract documents.
5. Provide 4 foot accessible path adjacent to push button pole.
6. Install four anchor bolts, washers, and nuts in new or existing concrete sidewalk by drilling and anchoring with epoxy adhesive. Provide bolts according to manufacturer's recommendations.