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.

### MAST ARM POLE FOUNDATION IN SOIL

**TYPE A FOUNDATION**

**TS-102**

**REVISION**

**04-19-22**

**SHEET 1 of 4**

**TRAFFIC SIGNAL POLE FOUNDATION**

#### Details:
- **Ground Rod Clamp**
- **Conduits**
- **Anchor Bolts**
- **Upper Tie Bar Spacing ($S_U$)**
- **Lower Tie Bar Spacing ($S_L$)**
- **Expansion Material**
- **Finished Pavement Grade**
- **1" Dia. Ground Wire Duct**

### Table:

<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>W</td>
<td>L</td>
<td>Count</td>
</tr>
<tr>
<td></td>
<td>#</td>
<td>#</td>
<td># Spacing</td>
</tr>
<tr>
<td>35'-0&quot;</td>
<td>3'-0&quot;</td>
<td>12'-0&quot;</td>
<td>12</td>
</tr>
<tr>
<td>45'-0&quot;</td>
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<td>14'-0&quot;</td>
<td>12</td>
</tr>
<tr>
<td>55'-0&quot;</td>
<td>3'-0&quot;</td>
<td>16'-0&quot;</td>
<td>12</td>
</tr>
<tr>
<td>60'-0&quot;</td>
<td>3'-0&quot;</td>
<td>18'-0&quot;</td>
<td>13</td>
</tr>
<tr>
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<td>12</td>
</tr>
<tr>
<td>80'-0&quot;</td>
<td>3'-0&quot;</td>
<td>21'-0&quot;</td>
<td>14</td>
</tr>
<tr>
<td>90'-0&quot;</td>
<td>4'-0&quot;</td>
<td>22'-0&quot;</td>
<td>16</td>
</tr>
<tr>
<td>100'-0&quot;</td>
<td>4'-0&quot;</td>
<td>24'-0&quot;</td>
<td>18</td>
</tr>
</tbody>
</table>

**Notes:**
- "V" Bars
- Bar Size
- "V" Bars

**Plan View:**
- Pole Base
- Shape with Forms (Square or Circular)
- 3" Clearance (Typ.)

**Detail 'A':**
- Ground Rod
- Conduits
- Anchor Bolts
- Upper Tie Bar Spacing ($S_U$)
- Lower Tie Bar Spacing ($S_L$)

**Legend:**
- #5 Ties
- Ground Rod Clamp
- Ground Rod
- Conduits
- Anchor Bolts
- Upper Tie Bar Spacing ($S_U$)
- Lower Tie Bar Spacing ($S_L$)
- Expansion Material
- Finished Pavement Grade
- 1" Dia. Ground Wire Duct

*Figure 8010.102 standard road plan for traffic signal pole foundation.*

**SDDS: Iowa DOT**

*Signatures and approvals for the change in foundation design.*
Figure 8010.102

**Type B Foundation** is applicable for traffic signal poles with mast arm lengths up to 60 feet.

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.

Competent rock has an average unconfined compressive strength ($q_u$) of at least 2.0 ksi and rock quality designation of at least 90%. Conditions not meeting minimum requirements will require either:
- A site specific design, or
- Using the parameters for Mast Arm Pole Foundation in Soil.

1. Install rodent guard or non-shrink grout with weep hole.
2. Furnish nut, nut and plate, or nut and anchor bolt assembly ring plate on embedded end.
3. Provide conduits as per plans.
4. When in contact with rock, place ground rods as specified in National Electrical Code, current edition, adjacent to foundation or in adjacent handhole.
5. Cast foundation concrete against competent rock. If foundation is formed, place backfill with concrete cast against rock.
6. Place 13 equally spaced #8 vertical bars.
7. #8 bars spaced at 8 inch maximum. Ties may be welded to vertical bars.
FIGURE 8010.102  SHEET 3 of 4

**TRAFFIC SIGNAL POLE FOUNDATION**

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.

<table>
<thead>
<tr>
<th>Max. Mast Arm Length</th>
<th>&quot;V&quot; Bars</th>
<th>Tie Bars</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Size</td>
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<tr>
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<td>#10</td>
</tr>
<tr>
<td>100'-0&quot;</td>
<td>15</td>
<td>#10</td>
</tr>
</tbody>
</table>

*Broken rock has an average unconfined compressive strength (\(q_u\)) of at least 1.0 ksi and rock quality designation of at least 20%.
**Competent rock has an average unconfined compressive strength (\(q_u\)) 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 \(L_r\) 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 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.

*ALTERNATE PUSH BUTTON POLE SIDEWALK MOUNTING*

- No steel reinforcing required for pedestal foundation.
- Level base with steel shims and seal to sidewalk with epoxy.
- Provide bolts according to manufacturer’s recommendations.

**NOTES:**
- Include instructions for expanding, installing, and securing the pole in the ground.