TRANSMITTAL LETTER

PUBLICATION: 148

DATE: 12/12/2011

SUBJECT: Traffic Standards - Signals (TC-8800 Series)

INFORMATION AND SPECIAL INSTRUCTIONS:

Project Development:
The accompanying revisions become effective December 21, 2011 or earlier as directed by the District Executive, for all projects with traffic signal supports as follows:
- All Department projects that have not submitted Plans, Specifications, and Estimate packages prior to effective date.
- All Highway Occupancy Permits or Municipal projects that do not have an approved Traffic Signal Permit prior to the effective date.

Shop Drawing Review:
In addition to the revisions made to the standards, , Publication 35, Bulletin 15 (Approved Construction Materials) Section 1104.02, will also be updated accordingly to indicate those manufacturers who have been recertified to provide traffic signal supports meeting the new criteria. Drawings for the approved manufacturers are available for Department representatives for reviewing and approving shop drawings. The approved manufacturer drawings are available at: ftp://ftp.dot.state.pa.us/transfer/TrafficSignals/TrafficSignalStructuralSupports/.

Maintenance:
If a traffic signal structural support needs to be replaced due to knockdown, the Department will allow the traffic signal structural support to be reinstated using the standard at the time of initial installation. If the foundation needs to be modified or replaced as part of a knockdown, then the 2011 updated standard should be followed.

CANCEL AND DESTROY THE FOLLOWING:

This will replace the 10/14/2010 Publication 148 (Traffic Standards - Signals (TC-8800 Series))

ADDITIONAL COPIES ARE AVAILABLE FROM:
- PennDOT SALES STORE (717) 787-6746 phone (717) 787-8779 fax ra-penndottsalesstore@state.pa.us
- PennDOT website - www.dot.state.pa.us Click on Forms, Publications & Maps
- DGS warehouse (PennDOT employees ONLY)

APPROVED FOR ISSUANCE BY:
Daryl St. Clair, P.E. /s

The following are changes from the October 14, 2010 update:

<table>
<thead>
<tr>
<th>Traffic Control Standard #</th>
<th>Sheet #</th>
<th>Description of the Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC-8800 Series</td>
<td></td>
<td>All of the sheets have been updated to reflect the PennDOT reorganization which is expected in the upcoming weeks.</td>
</tr>
<tr>
<td>TC-8801 Sheet 1</td>
<td></td>
<td>An additional general note has been added to indicate that a mitigation device should be placed on sign mast arms over 50-feet.</td>
</tr>
<tr>
<td>TC-8801 Sheet 1</td>
<td></td>
<td>An additional general note has been added to indicate the limitations of a dual mast arm installation.</td>
</tr>
<tr>
<td>TC-8801 Sheet 3</td>
<td></td>
<td>The anchor bolt lengths have been modified to reflect appropriate design lengths instead of a 6-foot anchor bolt for all situations.</td>
</tr>
<tr>
<td>TC-8801 Sheet 3</td>
<td></td>
<td>The foundation design criteria has been modified addressing concerns that the previous traffic signal foundations were too conservative.</td>
</tr>
<tr>
<td>TC-8801 Sheet 3</td>
<td></td>
<td>Traffic signal pedestal supports are permitted to have a 4-anchor bolt configuration. The Traffic Signal Support Mast Arm and Strain Pole will still require 6-anchor bolts for new installations.</td>
</tr>
<tr>
<td>TC-8801 Sheet 3</td>
<td></td>
<td>Three additional rock cases have been added and are more clearly defined on sheet 4.</td>
</tr>
<tr>
<td>TC-8801 Sheet 3</td>
<td></td>
<td>An additional foundation note has been added providing instructions if weak soil conditions are encountered.</td>
</tr>
<tr>
<td>TC-8801 Sheet 4</td>
<td></td>
<td>An additional Note has been added referencing the additional pedestrian pushbutton details in TC-8803.</td>
</tr>
<tr>
<td>TC-8801 Sheet 4</td>
<td></td>
<td>An additional note indicating the Alternate Type A foundation details has been added.</td>
</tr>
<tr>
<td>TC-8801 Sheet 4</td>
<td></td>
<td>The foundation depths and associated notes are provided on Sheets 5 and 6.</td>
</tr>
<tr>
<td>TC-8801 Sheet 4</td>
<td></td>
<td>Three additional Rock cases have been added to provide alternative foundation depths when rock is encountered.</td>
</tr>
<tr>
<td>TC-8801 Sheet 4</td>
<td></td>
<td>The closed tie detail has been updated to eliminate the hooks.</td>
</tr>
<tr>
<td>TC-8801 Sheet 5</td>
<td></td>
<td>All of the Mast Arm and Pedestal Foundation Type A depths are indicated for all of the standard cases.</td>
</tr>
<tr>
<td>TC-8801 Sheet 6</td>
<td></td>
<td>All of the Strain Pole Foundation Type A depths are indicated for all of the standard cases.</td>
</tr>
<tr>
<td>TC-8801 Sheet 7</td>
<td></td>
<td>A new sheet has been added addressing an alternative reduced foundation diameter. The Bureau of Maintenance and Operations approval would be required to use this foundation alternative.</td>
</tr>
<tr>
<td>TC-8801 Sheet 9</td>
<td></td>
<td>The aluminum Z dimensions have been updated.</td>
</tr>
<tr>
<td>TC-8801 Sheet 9</td>
<td></td>
<td>The galvanized steel U-bolt nuts and lock washers dimensions contained within Note 5 have been updated.</td>
</tr>
<tr>
<td>TC-8801 Sheet 10</td>
<td></td>
<td>The handhole detail has been updated.</td>
</tr>
<tr>
<td>TC-8801 Sheet 10</td>
<td></td>
<td>A mitigation device detail has been added.</td>
</tr>
<tr>
<td>TC-8803 Sheet 1</td>
<td></td>
<td>An additional Note referencing the pedestrian pushbutton mounting details has been added.</td>
</tr>
<tr>
<td>TC-8803 Sheet 1</td>
<td></td>
<td>The pedestrian push button height requirements have been updated.</td>
</tr>
<tr>
<td>TC-8803 Sheet 2 and 3</td>
<td></td>
<td>Two additional sheets with 6 types of pedestrian pushbutton pole installation details have been added.</td>
</tr>
<tr>
<td>TC-8803 Sheet 2 and 3</td>
<td></td>
<td>An additional Note defining the pedestrian pushbutton extension requirements has been added.</td>
</tr>
</tbody>
</table>

12/12/2011
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

TRAFFIC STANDARDS - SIGNALS
TC-8800 SERIES

BUREAU OF MAINTENANCE AND OPERATIONS

PUB. 148 (DEC. 2011)
# INDEX OF TRAFFIC STANDARDS – SIGNALS

<table>
<thead>
<tr>
<th>STANDARD DRAWING NO.</th>
<th>DATE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC-8801 (10 SHEETS)</td>
<td>DEC. 12, 2011</td>
<td>TRAFFIC SIGNAL SUPPORT</td>
</tr>
<tr>
<td>TC-8802</td>
<td>DEC. 12, 2011</td>
<td>CONTROLLER ASSEMBLY</td>
</tr>
<tr>
<td>TC-8803 (4 SHEETS)</td>
<td>DEC. 12, 2011</td>
<td>MISCELLANEOUS</td>
</tr>
<tr>
<td>TC-8804 (2 SHEETS)</td>
<td>DEC. 12, 2011</td>
<td>ELECTRICAL DISTRIBUTION</td>
</tr>
<tr>
<td>TC-8805</td>
<td>DEC. 12, 2011</td>
<td>SIGNAL HEADS</td>
</tr>
<tr>
<td>TC-8806 (2 SHEETS)</td>
<td>DEC. 12, 2011</td>
<td>DETECTORS</td>
</tr>
</tbody>
</table>
TRAFFIC OPERATIONS DIVISION

SECTION

TC-8801

CHIEF OF HIGHWAY SAFETY AND CHIEF, TRAFFIC OPERATIONS

TRAFFIC SIGNAL SUPPORT IS SIMILAR.

DETAIL FOR CASE 1 ON THIS SHEET.

CASE 1

4-ANCHOR BOLT CONFIGURATION FOR PEDESTAL POLE

5. FOR DETAILS NOT SHOWN, SEE TYPE A FOUNDATION MAST ARM & STRAIN POLE TRAFFIC SIGNAL SUPPORTS.

SHEET 4 OF 10

NOTE: 6-ANCHOR BOLT CONFIGURATION SHOWN IS FOR CASE 1 UNLESS DIRECTED OTHERWISE.

SECTION F-F

4. THE TOTAL CAISSON AND ROCK SOCKET DEPTH "H" (TYP.) 3" CL.

DESIGNS TO THE DISTRICT FOR REVIEW AND APPROVAL.

SERVICEABILITY. SUBMIT ALTERNATE FOUNDATION APPLICABLE CRITERIA FOR STRENGTH AND ARE VALIDATED AND THE FOUNDATION DESIGN MEETS THIS STANDARD.

- CASE 3: 5' < H1 < 10' (TYP.)
- CASE 2: 0' < H1 < 5'

3. THE ROCK SOCKET DETAILS PRESENTED WITHIN THIS STANDARD ARE BASED ON ROCK PARAMETERS PROVIDED THAT ACTUAL GEOTECHNICAL CONDITIONS MAY BE PERMITTED FOR DIFFERENT ROCK CONDITIONS.

CASES 3 AND 4, INCREASE CAISSON DIAMETER "D" BY 6".

NOTE: 6" CASING MAY BE PERMANENTLY LEFT IN PLACE OR REMOVED IN ACCORDANCE WITH PUB. 408, SECTION 1006.1(d). FOR CASES 3

WITH PUB. 408, SECTION 1006.1(d). FOR CASES 3pective

ROCK STRATUM IS DEFINED IN ACCORDANCE AS REQUIRED CONDUIT

ALL OTHER CONDUIT MESH OR GROUT

26" LAP SPLICE (INSIDE OF CASING)

5" BARS

#5 BARS

SPIRAL OR CLOSED TIE

#5 BAR

TOP OF BEDROCK

LEVELING NUT

NUT

D ** DIAMETER OF CASING (TYP.)

A I W" BAR

S O

H 2

D **

** DIAMETER IF CIRCULAR, OR CASING

* CASING NOTES

†" DIA.

34 FT STRAIN POLE,

10,000 LB (CASE 5)

32 FT STRAIN POLE,

10,000 LB (CASE 5)

8. [Diagram showing closed tie details for cases 1 and 2]

SECTION A-A

PLAN

" DIAMETER OF CASING (INSIDE OF CASING)

OR CLOSED TIE

#5 BARS, SPIRAL

" S1" C.C. (TYP)

#5 BARS,

CLOSED TIE

D

D + 6"

C

S

1" CHAMFER

NOTE:

@ 3" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS, SPIRAL

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

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" S1" C.C. (TYP)

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SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)

#5 BARS,

SPIRAL OR CLOSED TIE

" S1" C.C. (TYP)
1. Foundation design is based on standard structural loadings shown in the publication PF-1 and the following design assumptions:

   a. Centroidal height of signals and signs attached to the mast arm at 10' upstream from the top of foundation.

   b. A cabinet with a 4'-3" height, 2'-6" width, 1'-10" depth and a dead load of 281 lbs. The centroidal height is located 4'-6" from the top of foundation.

   c. A luminaire with a 15' arm length and a 30' mounting height from the top of roadway.

   d. A cabinet with a 6'-0" height, 2'-6" width, 1'-10" depth and a dead load of 281 lbs. The centroidal height is located 4'-6" from the top of foundation.

2. When the mast arm support has two arms which are perpendicular to each other, the foundation in the design table for the length of the top of foundation.

3. For definition of cases, see drilled shaft design criteria on sheet 5 and Sheet 4.

4. Additional structural analysis is required for two mast arms at acute or obtuse angles to each other. Additional structural analysis required if the centroidal height of unsupported arms is located 4'-6" from the top of the foundation.

5. Notes:

   ** INCREASE CAISSON DIAMETER BY 6" AS APPLICABLE IN DEPTH REQUIREMENTS.

   *** SEE ROCK SOCKET NOTE 4 ON SHEET 4 FOR TOTAL "H" REQUIREMENTS.

---

### Foundation for Traffic Signal Support, Mast Arm (Soil Condition)

<table>
<thead>
<tr>
<th>Mast Arm Length</th>
<th>QTY</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0' - 10'</td>
<td>12</td>
<td>#8</td>
</tr>
<tr>
<td>&gt;10' - 15'</td>
<td>12</td>
<td>#8</td>
</tr>
<tr>
<td>&gt;15' - 20'</td>
<td>12</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;20' - 25'</td>
<td>12</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;25' - 30'</td>
<td>12</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;30' - 35'</td>
<td>12</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;35' - 40'</td>
<td>14</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;40' - 45'</td>
<td>14</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;45' - 50'</td>
<td>14</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;50' - 60'</td>
<td>14</td>
<td>#9</td>
</tr>
</tbody>
</table>

### Foundation for Traffic Signal Support, Pedestal Pole (Rock Condition)

<table>
<thead>
<tr>
<th>Mast Arm Length</th>
<th>QTY</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>0' - 10'</td>
<td>12</td>
<td>#8</td>
</tr>
<tr>
<td>&gt;10' - 15'</td>
<td>12</td>
<td>#8</td>
</tr>
<tr>
<td>&gt;15' - 20'</td>
<td>12</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;20' - 25'</td>
<td>12</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;25' - 30'</td>
<td>12</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;30' - 35'</td>
<td>12</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;35' - 40'</td>
<td>14</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;40' - 45'</td>
<td>14</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;45' - 50'</td>
<td>14</td>
<td>#9</td>
</tr>
<tr>
<td>&gt;50' - 60'</td>
<td>14</td>
<td>#9</td>
</tr>
</tbody>
</table>

---

**Notes:**

* The arms are perpendicular to each other.* Additional structural analysis required if the centroidal height of unsupported arms is located 4'-6" from each other.

** Increase caisson diameter by 6" as applicable in accordance with rock socket note 4 on sheet 5 and Sheet 3.

*** See rock socket note 4 on sheet 4 for total "H" depth requirements.
### Foundation for Traffic Signal Support, Strain Pole - Soil Condition

<table>
<thead>
<tr>
<th>Design</th>
<th>** Additional Notes **</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
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<tr>
<td></td>
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<tr>
<td>Case 2</td>
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<tr>
<td>Case 3</td>
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</tr>
</tbody>
</table>

**STRAIN POLE FOUNDATION NOTES:****

1. Foundation design is based on standard structural loading and soil conditions.

2. A casement with a 4'-6" height and a 1'-6" depth is located 4'-6" from the top of the foundation.

3. A foundation with a 4'-0" height and a 1'-0" depth is located 6'-0" from the top of the foundation.

4. A foundation with a 3'-0" height and a 6'-0" depth is located 8'-0" from the top of the foundation.

5. A foundation with a 2'-0" height and a 8'-0" depth is located 10'-0" from the top of the foundation.

6. A foundation with a 1'-0" height and a 10'-0" depth is located 12'-0" from the top of the foundation.

**COMMONWEALTH OF PENNSYLVANIA**

**DEPARTMENT OF TRANSPORTATION**

**BUREAU OF MAINTENANCE AND OPERATIONS**

**STANDARD**

**TRAFFIC SIGNAL SUPPORT - STRAIN POLE**

**FOUNDATION TYPE A**

**TC-8801**

*Increase caisson diameter by 6" as applicable in accordance with rock socket note on Sheet C.*

**See rock socket note on Sheet C for total "H" (depth) requirements.*
CASE 1 ALTERNATE

TYPE A FOUNDATION

**NOTES:**
- Additional structural analysis is required for two mast arms at acute or obtuse angles to each other.
- Additional structural analysis is required for two mast arms at acute or obtuse angles to each other.
FOUNDATION FOR TRAFFIC SIGNAL SUPPORT, MAST ARM

<table>
<thead>
<tr>
<th>QTY.</th>
<th>SIZE</th>
<th>SIZE</th>
<th>SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>32'</td>
<td>32'</td>
<td>32'</td>
</tr>
<tr>
<td>150</td>
<td>30'</td>
<td>30'</td>
<td>30'</td>
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<tr>
<td>100</td>
<td>28'</td>
<td>28'</td>
<td>28'</td>
</tr>
<tr>
<td>50</td>
<td>26'</td>
<td>26'</td>
<td>26'</td>
</tr>
<tr>
<td>20</td>
<td>24'</td>
<td>24'</td>
<td>24'</td>
</tr>
</tbody>
</table>

*For masts positioned at acute or oblique angles to each other.*

SECTION A-A

**NOTES:**
1. Foundation design is based on standard structural layouts shown in the publication 149 and the following design assumptions:
   a) A structure with a 21'-11" height at any depth, with an anchor bolt diameter of 1-1/4" from the top to a point 3'-6" below the ground line.
   b) The foundation is at least 3'-6" above the top of the pavement.
2. See Section C-C for more details on the foundation design and installation.
3. For masts positioned at acute or oblique angles to each other, additional structural analysis is required.
4. See Sheet 3 for closed tie detail.
5. Foundation depth shall be increased for any condition where the full load is applied to the foundation.
6. See Sheet 3 for additional details on the foundation design.

**PLAN**

SECTION C-C

**COMMONWEALTH OF PENNSYLVANIA**

**DEPARTMENT OF TRANSPORTATION**

**STANDARD**

**TRAFFIC SIGNAL SUPPORT FOUNDATION TYPE B**

**SHEET 2 OF 16**
OVERLAP SLIP JOINT DETAIL

1. Backing ring must be fitted snugly to the mast arm or shaft and continuously fillet welded to the connection plate of base plate before the full penetration groove weld is made. Backing ring must be fabricated as a continuous ring.

2. For mast arms or shafts less than 4", this fillet weld is not required but stop is to apply before caulking to this location after assembly is calibrated.

3. For mast arms or shafts greater than or equal to 19", but less than 25", a minimum of 6 anchor bolts is required.

4. For mast arms or shafts greater than or equal to 25", the full penetration groove weld is made. Backing ring must be fitted snugly to the mast arm or shaft and continuously fillet welded to the connection plate of base plate before the full penetration groove weld is made. Backing ring must be fabricated as a continuous ring.

5. A minimum of 6 anchor bolts is required but shop is to apply silicone caulking to this location after assembly is calibrated.

6. For mast arms or shafts less than 18", this fillet weld is not required but stop is to apply before caulking to this location after assembly is calibrated.

7. For mast arms or shafts greater than or equal to 18", but less than 25", a minimum of 6 anchor bolts is required.

8. For mast arms or shafts greater than or equal to 25", the full penetration groove weld is made. Backing ring must be fitted snugly to the mast arm or shaft and continuously fillet welded to the connection plate of base plate before the full penetration groove weld is made. Backing ring must be fabricated as a continuous ring.

9. A minimum of 6 anchor bolts is required but shop is to apply silicone caulking to this location after assembly is calibrated.

10. For mast arms or shafts less than 19", this fillet weld is not required but stop is to apply before caulking to this location after assembly is calibrated.

11. For mast arms or shafts greater than or equal to 19", but less than 25", a minimum of 6 anchor bolts is required.

12. For mast arms or shafts greater than or equal to 25", the full penetration groove weld is made. Backing ring must be fitted snugly to the mast arm or shaft and continuously fillet welded to the connection plate of base plate before the full penetration groove weld is made. Backing ring must be fabricated as a continuous ring.

13. A minimum of 6 anchor bolts is required but shop is to apply silicone caulking to this location after assembly is calibrated.

14. For mast arms or shafts less than 18", this fillet weld is not required but stop is to apply before caulking to this location after assembly is calibrated.

15. For mast arms or shafts greater than or equal to 18", but less than 25", a minimum of 6 anchor bolts is required.

16. For mast arms or shafts greater than or equal to 25", the full penetration groove weld is made. Backing ring must be fitted snugly to the mast arm or shaft and continuously fillet welded to the connection plate of base plate before the full penetration groove weld is made. Backing ring must be fabricated as a continuous ring.

17. A minimum of 6 anchor bolts is required but shop is to apply silicone caulking to this location after assembly is calibrated.

18. For mast arms or shafts less than 19", this fillet weld is not required but stop is to apply before caulking to this location after assembly is calibrated.

19. For mast arms or shafts greater than or equal to 19", but less than 25", a minimum of 6 anchor bolts is required.

20. For mast arms or shafts greater than or equal to 25", the full penetration groove weld is made. Backing ring must be fitted snugly to the mast arm or shaft and continuously fillet welded to the connection plate of base plate before the full penetration groove weld is made. Backing ring must be fabricated as a continuous ring.

21. A minimum of 6 anchor bolts is required but shop is to apply silicone caulking to this location after assembly is calibrated.
NOTE:

Do not install controller assembly with anchor bolt inside the cabinet.

See Note 4 and Foundation. Base of cabinet compound between place caulking and foundation.

Conduit as required. Minimum. See Note 6.

Anchor bolt. See Note 4. (See Note 6)

4\(\frac{1}{2}\) in. x 3.75 in. Long expansion bolt or anchor bolts M12 x 4\(\frac{1}{2}\) x 12 in. or drill concrete to standard

Controller assembly on cement concrete foundation

Type I Mounting

Controller assembly on traffic signal support

Type II Mounting

Notes:
1. Provide ground rod as specified in Section 1101.11(J) of Publication 408.
2. Anchor bolt, nut and washer shall be galvanized, stainless steel, or stainless steel, equipment is specified.
3. Minimum clearance between bottom of cabinet and top of cabinet. No portion of any equipment, except fan, between the top of door opening and top of cabinet.
4. Minimum clearance, steel bottom of cabinet and terminals, equipment is specified.
5. Minimum clearance, steel bottom of cabinet and terminals, equipment is specified.
6. Ground rod size #1 x 12\(\frac{1}{2}\) in. shall penetrate to 48 in. Maximum. Ground rod size #2 x 12\(\frac{1}{2}\) in. shall penetrate to 48 in. Maximum. Ground rod size #3 x 12\(\frac{1}{2}\) in. shall penetrate to 48 in. Maximum. Ground rod size #4 x 12\(\frac{1}{2}\) in. shall penetrate to 48 in. Maximum. Ground rod size #5 x 12\(\frac{1}{2}\) in. shall penetrate to 48 in. Maximum.
7. See foundation and installation details.

Commonwealth of Pennsylvania
Department of Transportation

Bureau of Maintenance and Operations

Standard

Controller Assembly
PEDESTRIAN PUSHBUTTON MOUNTING DETAILS

**NOTES:**
1. REFER TO RC-67M FOR CURB RAMP AND SIDEWALK DETAILS.
2. MOUNT PEDESTRIAN PUSHBUTTON BETWEEN 40" TO 44" ABOVE TOP OF FOUNDATION WHERE SIGN MOUNTING PLANE MEETS SIDEWALK OR FINISHED GRADE.
3. ALL ACCESSIBILITY FEATURES MUST BE COMPLIANT TO PENNDOT CRITERIA AND PUBLICATION 72M (RC STANDARDS) CRITERIA AND PUBLICATION 149.
4. IN A PAVED AREA, PLACE THE TOP OF THE FOUNDATION PLANE WITH THE SURFACE OF THE ADJACENT PAVEMENT. PROVIDE A MOUNTING SURFACE WITH A 6" MINIMUM WIDTH AND 6" MAXIMUM LENGTH.
5. PEDESTRIAN PUSHBUTTONS SHALL BE OF A TYPE APPROVED BY THE DEPARTMENT AND LISTED IN PUBLICATION 156.
6. PEDESTRIAN PUSHBUTTONS SHALL BE A MINIMUM OF 2" DIAMETER AND A FORCE PER ACTUATION THAT CANNOT EXCEED 5 LBS.
7. PEDESTRIAN PUSHBUTTON EXTENSIONS ARE TYPICALLY MIUSTRUP UP TO 3" MAXIMUM LENGTH OF EXTENSION AND TO THE 1/4" EXTENSION AND SHALL BE TYPICALLY MAXIMUM 12" LONG TO MEET DISTRICT APPROVAL PRIOR TO INSTALLATION.
PEDESTRIAN PUSHBUTTON MOUNTING DETAILS

NOTES:

1. REFER TO RC-47M FOR CURB RAMP AND SIDEWALK DETAILS.
2. MOUNT PEDESTRIAN PUSHBUTTON BETWEEN 40" TO 44" ABOVE SIDEWALK OR歩道上に40"至44"高さに設置する。
3. ALL ACCESSIBILITY FEATURES MUST BE COMPLIANT TO PENNDOT CRITERIA AND PUBLICATION 149.
4. IN A PAVED AREA, PLACE THE TOP OF THE FOUNDATION FLUSH WITH THE SURFACE OF THE ADJACENT PAVEMENT. PROVIDE A PREMOLDED BLISTER CHEEKWALL OR FINISHED GRADE TO THE CENTER OF THE PUSHBUTTON AND 10" MAX LATERALLY FROM LANDING.
5. PEDESTRIAN PUSHBUTTONS SHALL BE OF A TYPE APPROVED BY THE DEPARTMENT AND LISTED IN PUBLICATION 35 (BULLETIN 15).
6. PEDESTRIAN PUSHBUTTONS SHALL BE OF A TYPE APPROVED BY THE DEPARTMENT AND LISTED IN PUBLICATION 35 (BULLETIN 15).
7. PEDESTRIAN PUSHBUTTONS SHALL BE OF A TYPE APPROVED BY THE DEPARTMENT AND LISTED IN PUBLICATION 35 (BULLETIN 15).

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

STANDARD
MISCELLANEOUS
PEDESTRIAN PUSHBUTTON
MOUNTING DETAILS

DEC. 12, 2011
**RECOMMENDED PUSHBUTTON LOCATIONS**

- Where there are constraints that make it impractical to place the pedestrian pushbutton between 1.5' and 6' from the edge of the curb, shoulder, or pavement, it should not be further than 10' from the edge of curb, shoulder, or pavement.
- Where there are constraints that make it impractical to provide 10' separation between the two pedestrian pushbuttons, the pushbuttons may be placed closer together or on the same pole.

**LEGEND**
- - Pedestrian pushbutton
- - Detectable warning surface

**STANDARD**

**MISCELLANEOUS**

**TYPICAL PEDESTRIAN PUSHBUTTON LOCATIONS**

**COMMONWEALTH OF PENNSYLVANIA**
**DEPARTMENT OF TRANSPORTATION**
NOTE:
1. FOR DETAIL OF TRAFFIC SIGNAL SUPPORT FOUNDATION, SEE TC-8801.
2. FOR DETAIL OF CONTROLLER ASSEMBLY FOUNDATION, SEE TC-8802.
3. ALL GROUND RODS ARE ¾" DIA. LONG (MIN.).
4. INTERNAL SERVICE TYPES A, B, OR C AS APPROVED BY THE UTILITY COMPANY.
5. PROVIDE ALL SERVICE CONDUITS OF THE HDG RIGID METALLIC TYPE WITH WATERTIGHT CONDUIT HUBS.
6. PROVIDE SERVICE DISCONNECT INSIDE AN OPTIONAL ALUMINUM CABINET WITH #4 AWG (MIN.) BUS IN SERVICE DISCONNECT.
7. PROVIDE SERVICE DISCONNECT INSIDE AN OPTIONAL ALUMINUM CABINET WITH #4 AWG (MIN.) BUS IN CONTROLLER.
8. PROVIDE ADDITIONAL BREAKERS AS REQUIRED FOR LIGHTING LOADS.
9. INCLUDE SERVICE HEAD GROUND WIRE HELD 10' (MIN.) ABOVE GRATE.
10. INSTALL CONDUIT STRAP OR CONDUIT STRAP OR STAINLESS STEEL BAND.
11. SERVICE FROM UTILITY MAY BE PROVIDED INSIDE THE TRAFFIC SIGNAL ENCLOSURE, WHERE INDICATED.
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JUNCTION BOX, TYPE JB-26

CAST IRON OR STEEL

REINFORCED PLASTIC MORTAR / POLYESTER RESIN
HIGH-DENSITY POLYMER CONCRETE / POLYETHYLENE

JUNCTION BOX, TYPE JB-27

CAST IRON OR STEEL

REINFORCED PLASTIC MORTAR OR HIGH-DENSITY POLYMER CONCRETE

TYPICAL JUNCTION BOX INSTALLATION

SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SECTION F-F

JUNCTION BOX IN EARTH
JUNCTION BOX IN PAVED SURFACE
JUNCTION BOX IN EARTH
JUNCTION BOX IN PAVED SURFACE

NOTES:
1. JUNCTION BOXES -- PROVIDE COVER WITH A NON-SLIP SURFACE AND A MINIMUM OF TWO CORROSION RESISTANT FASTENERS.
2. JUNCTION BOXES -- USE JB-26 AND JB-27 ONLY IN AREAS NOT SUBJECT TO VEHICULAR TRAFFIC.
3. JUNCTION BOXES -- BOTTOM MAY BE OPEN OR CLOSED. IF CLOSED, PROVIDE A DRAIN HOLE 2" DIAMETER MINIMUM.
4. FOR DETAIL OF JUNCTION BOXES JB-1, JB-2, JB-11 AND JB-12, SEE STANDARD DRAWINGS, RC-81M AND RC-82M OF PENNDOT PUB. 72M.
5. GROUND EXPOSED METAL PARTS OF JUNCTION BOXES. USE GROUNDING LUGS. DO NOT CONNECT GROUND WIRE DIRECTLY TO LID.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

STANDARD
ELECTRICAL DISTRIBUTION

DEC. 12, 2011
DEC. 12, 2011
CUT-AWAY VISOR  TUNNEL VISOR  FULL-CIRCLE VISOR

VISOR TYPES FOR VEHICULAR SIGNAL HEAD

LIGHT CENTER

LOWERS TO PROVIDE CUT-OFF REQUIRED

DIMENSION A AS REQUIRED

DIMENSION B = DIMENSION A

VANDAL PROTECTION

SPACED TO PROVIDE SUN AND DIAGONAL LOUVERS EQUALLY

LOUVER FOR VEHICULAR SIGNAL HEAD

TO PROVIDE CUT-OFF REQUIRED

DO NOT USE WITH CUT-AWAY VISOR

DULL BLACK COLOR

BLACK FINISH

NON-REFLECTIVE

SIGNAL HEAD ONLY)

NOTE:

PEDESTRIAN SIGNAL HEAD

LANE-USE TRAFFIC CONTROL SIGNAL HEAD

BACKPLATE FOR VEHICULAR SIGNAL HEAD

LANE-USE TRAFFIC CONTROL SIGNAL HEAD

NOTE:

1. PEDESTRIAN SIGNALS MAY INCLUDE A COUNTDOWN TIMER THAT OPERATES DURING THE "FLASHING UPRaised HAND" PHASE.

PEDESTRIAN SIGNAL HEAD

TUNNEL VISOR  CUT-AWAY VISOR  LOUVER VISOR

VISOR TYPES FOR PEDESTRIAN SIGNAL HEAD AND

LANE-USE TRAFFIC CONTROL SIGNAL HEAD

ONE-SECTION  TWO-SECTIONS

TYPE A

TYPE B

VISOR TYPES FOR PEDESTRIAN SIGNAL HEAD

LANE-USE TRAFFIC CONTROL SIGNAL HEAD

ONE-SECTION  TWO OR THREE SECTIONS

BACKPLATE FOR VEHICULAR SIGNAL HEAD

LANE-USE TRAFFIC CONTROL SIGNAL HEAD

NOTE:

* COUNTDOWN PEDESTRIAN SIGNALS SHALL CONSIST OF PORTLAND ORANGE NUMBERS THAT ARE AT LEAST 6" IN HEIGHT. THE DESIGN SHALL PROVIDE THE PEDESTRIAN WITH THE LONGEST VIEW AND TIME TO ACCESS THE CROSSWALK IN THE MAIN STREAM OF TRAFFIC.

** FOR CROSSWALKS WHERE THE PEDESTRIAN ENTERS THE CROSSWALK MORE THAN 100' FROM THE PEDESTRIAN SIGNAL HEAD INDICATIONS, DIMENSION "A" SHOULD BE AT LEAST 9" HIGH.

NOMINAL. ACTUAL DIMENSIONS ARE AS REQUIRED TO PROVIDE SYMBOLS IN ACCORDANCE WITH ITE STANDARD FOR "LANE-USE TRAFFIC CONTROL SIGNAL HEADS" AND CURRENT ADDITION OF MUTCD.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS
STANDARD
SIGNAL HEADS

TC-8605
DEC. 12, 2011
DEC. 12, 2011
AS REQUIRED TO INSTALL SENSOR
ROADWAY PAVEMENT (SEE SECTION A-A)
SAW SLOT
COMPACTED SAND
MAGNETOMETER SENSOR BY MANUFACTURER.
AS RECOMMENDED INSTALLATION DEPTH
SEALANT
INSTALLATION OF SENSOR
DRILL HOLE IN PAVEMENT FOR DETECTION ZONE
CONDUIT CAP
MAGNETIC SENSOR DETECTION ZONE PAVEMENT EDGE OF SHOULDER OR GUTTER ROADWAY PAVEMENT JUNCTION BOX SEE DETECTOR SPLICE. SPLICE TO LEAD-IN CABLE.

SECTION C-C
TYPICAL SENSOR INSTALLATION - MAGNETOMETER DETECTOR

SECTION E-E
TYPICAL SENSOR INSTALLATION - MAGNETIC DETECTOR

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS
STANDARD DETECTORS

DETECTORS

DEC.12, 2011
DEC.12, 2011