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1 Introduction

This Specification applies to the construction of concrete footings and related works required for the installation of traffic signal controllers, traffic signal mast arms, traffic signal posts and Rates 2 and 3 road lighting installations.

This Specification shall be read in conjunction with MRS01 Introduction to Specifications and other specifications as appropriate.

This Specification forms part of the Transport and Main Roads Specifications Manual.

The additional work items 6707, 6708, 6709, 6710 and 6711 to this Specification to allow conformance and as constructed survey requirements for the installation of footings for poles post and mast arms during construction of road infrastructure projects. The added sections also allow for surveying requirements for any existing underground assets that may be fully or partly exposed during construction works.

2 Measurement of Works

2.1 Standard Work Items

In accordance with the provisions of Clause 2 of MRS01 Introduction to Specifications, the Standard Work Items covered by this Specification are listed in Table 2.1.

Table 2.1 - Standard Work Items

<table>
<thead>
<tr>
<th>Standard Item No.</th>
<th>Description</th>
<th>Unit of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>6601</td>
<td>Traffic signal post footing</td>
<td>each</td>
</tr>
<tr>
<td>6602</td>
<td>Traffic signal mast arm footing</td>
<td>each</td>
</tr>
<tr>
<td>6603P</td>
<td>Traffic signal mast arm footing extension for poor soil, 3000 mm long,</td>
<td>each</td>
</tr>
<tr>
<td></td>
<td>provisionally ordered</td>
<td></td>
</tr>
<tr>
<td>6604P</td>
<td>Excavation in excessively hard material, provisionally ordered for</td>
<td>m³</td>
</tr>
<tr>
<td></td>
<td>Work Items 6601, 6602 and 6603P</td>
<td></td>
</tr>
<tr>
<td>6605</td>
<td>Traffic signal controller base</td>
<td>each</td>
</tr>
<tr>
<td>6701</td>
<td>Road lighting pole footing, [diameter] mm diameter</td>
<td>each</td>
</tr>
<tr>
<td>6702</td>
<td>Road lighting pole footing in concrete median barrier, [diameter] mm diameter</td>
<td>each</td>
</tr>
<tr>
<td>6703P</td>
<td>Road lighting pole footing extension in poor soil, 3000 mm long, [diameter]</td>
<td>each</td>
</tr>
<tr>
<td></td>
<td>mm diameter, provisionally ordered</td>
<td></td>
</tr>
<tr>
<td>6704P</td>
<td>Excavation in excessively hard material, provisionally ordered for</td>
<td>m³</td>
</tr>
<tr>
<td></td>
<td>Work Items 6701, 6702 and 6703P</td>
<td></td>
</tr>
<tr>
<td>6705</td>
<td>Construction of retaining wall around footing</td>
<td>each</td>
</tr>
<tr>
<td>6706</td>
<td>Removal of road lighting pole footing</td>
<td>each</td>
</tr>
<tr>
<td>6707</td>
<td>Conformance and As Constructed survey for depth of footing</td>
<td>each</td>
</tr>
</tbody>
</table>
### Standard Work Items

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Unit of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>6708</td>
<td>Setting out and conformance for holding down bolts</td>
<td>each</td>
</tr>
<tr>
<td>6709</td>
<td>As Constructed survey for traffic signal post footing</td>
<td>each</td>
</tr>
<tr>
<td>6710</td>
<td>As Constructed survey for traffic signal mast arm footing</td>
<td>each</td>
</tr>
<tr>
<td>6711</td>
<td>As Constructed survey for road lighting pole footing</td>
<td>each</td>
</tr>
</tbody>
</table>

#### 2.2 Work operations

**Item 6601** Traffic signal post footing

**Item 6602** Traffic signal mast arm footing

**Item 6701** Road lighting pole footing, \([diameter]\) mm diameter

**Item 6702** Road lighting pole footing in concrete median barrier, \([diameter]\) mm diameter

Standard Work Item 6602 applies to 2,000 mm deep footings and Work Items 6701 and 6702 apply to 1,900 mm deep footings for average to good soil conditions in accordance with the Standard Drawings. Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) excavation for footing
- c) disposal of excavated material
- d) provision of formwork, where necessary
- e) supply and installation of anchor cage or ragbolt assembly, as appropriate
- f) supply and installation of conduit to electrical pit or concrete barrier ends, as appropriate
- g) supply, placement and finishing of concrete, and
- h) stripping formwork and cleaning up.

**Item 6603P** Traffic signal mast arm footing extension for poor soil, 3000 mm long, if ordered

**Item 6703P** Road lighting pole footing extension in poor soil, 3000 mm long, \([diameter]\) mm diameter, if ordered

Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) excavation for footing extension
- c) disposal of excavated material
- d) supply of anchor cage extension
- e) installation of anchor cage extension, and
- f) supply, placement and finishing of concrete.
Item 6604P  Excavation in excessively hard material, rate additional to rate for Work Items 6601, 6602 and 6603P (Provisional Quantity)

Item 6704P  Excavation in excessively hard material, rate additional to rate for Work Items 6701, 6702 and 6703P (Provisional Quantity)

Work Operations incorporated in the above items include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications, and
b) additional work associated with the excavation of footings in excessively hard material.

Item 6605  Traffic signal controller base

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) localised excavation
c) provision of formwork
d) supply of and installation of plinth with holding down bolts
e) supply and installation of conduit to electrical and communication pits, where necessary
f) supply, placement and finishing of concrete, and
g) stripping of formwork and cleaning up.

Item 6705  Construction of retaining wall around footing

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) carry out localised excavation
c) provision of formwork
d) supply, placement and finishing of concrete, and
e) stripping of formwork and cleaning up.

Item 6706  Removal of road lighting pole footing

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) removal of footing
c) disposal of footing, and
d) backfilling of hole.

Item 6707  Conformance and As Constructed survey for depth of footing

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 8.3.3 Depth of Footing of MRTS92 Traffic Signal and Road Lighting Footings

Item 6708  Setting out and conformance for holding down bolts

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 8.3.5.1 General of MRTS92 Traffic Signal and Road Lighting Footings
Item 6709  As constructed survey for traffic signal post footing

Work Operations incorporated in the above item include:

   a) Work Operations listed in Clause 9 of MRTS92 Traffic Signal and Road Lighting Footings

Item 6710  As constructed survey for traffic signal mast arm footing

Work Operations incorporated in the above item include:

   a) Work Operations listed in Clause 9 of MRTS92 Traffic Signal and Road Lighting Footings

Item 6711  As constructed survey for road lighting pole footing

Work Operations incorporated in the above item include:

   a) Work Operations listed in Clause 9 of MRTS92 Traffic Signal and Road Lighting Footings

2.3 Classification of material to be excavated

For the purpose of measurement and payment under Standard Work Items 6604P and 6704P, excessively hard material shall be classified as any natural material which, when using a large mechanical earth auger which is in good condition and which is recommended by the manufacturer of the earth auger for excavation of holes of the required diameter and depth, cannot be reasonably excavated without the use of explosives or pneumatic picks.

Material shall not be classified as excessively hard material unless explosives or pneumatic picks are actually used in its excavation.