Specification (Measurement)

Transport and Main Roads Specifications
MRS206 Provision of Variable Speed Limit and Lane Control Signs

July 2017
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1 Introduction

This Specification applies to the requirements for the supply, installation, testing, commissioning and maintenance handover documentation (including the provision for operator training) of Variable Speed Limit and Lane Control Signs.

This Specification forms part of the Transport and Main Roads Specifications Manual and should be read in conjunction with MRS01 Introduction to Specifications and other Specifications as appropriate.

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>61701</td>
<td>Foundation Design for [Type A</td>
<td>Type B</td>
</tr>
<tr>
<td>61702</td>
<td>Installation of [Type A</td>
<td>Type B</td>
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<tr>
<td>61721</td>
<td>Supply of post-mounted support structure, [length] metres long, [with</td>
<td>without] cabinet brackets and [with</td>
</tr>
<tr>
<td>61722</td>
<td>Supply of [tunnel</td>
<td>gantry] mounting bracket, [length] metres long [with</td>
</tr>
<tr>
<td>61723</td>
<td>Installation of post-mounted mounting structure for [Type A</td>
<td>Type B</td>
</tr>
<tr>
<td>61724</td>
<td>Installation of [tunnel</td>
<td>gantry] mounted mounting bracket for [Type A</td>
</tr>
<tr>
<td>61725</td>
<td>Supply and installation of post-mounted support structure, for [Type A</td>
<td>Type B</td>
</tr>
<tr>
<td>61726</td>
<td>Supply and installation of [tunnel</td>
<td>gantry] mounted bracket for [Type A</td>
</tr>
</tbody>
</table>
### Variable speed limit signs

<table>
<thead>
<tr>
<th>Standard Item No.</th>
<th>Description</th>
<th>Unit of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>61741</td>
<td>Supply of ([Type A</td>
<td>Type B</td>
</tr>
<tr>
<td>61742</td>
<td>Installation of ([Type A</td>
<td>Type B</td>
</tr>
<tr>
<td>61743</td>
<td>Supply and Installation of ([Type A</td>
<td>Type B</td>
</tr>
<tr>
<td>61744</td>
<td>Supply of VSL / LC Controller</td>
<td>each</td>
</tr>
<tr>
<td>61745</td>
<td>Installation of VSL / LC Controller in an enclosure fixed to supporting structure or fixed to bridge structure or similar as detailed on referenced drawing</td>
<td>each</td>
</tr>
<tr>
<td>61746</td>
<td>Supply and Installation of VSL / LC Controller in an enclosure fixed to supporting structure or fixed to bridge structure or similar as detailed on referenced drawing</td>
<td>each</td>
</tr>
</tbody>
</table>

### Ancillary items

<table>
<thead>
<tr>
<th>Standard Item No.</th>
<th>Description</th>
<th>Unit of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>61761</td>
<td>Provision of ([VSL / LC]] spares ([as listed in the contract documents or on drawing reference])</td>
<td>item</td>
</tr>
</tbody>
</table>

### Removal of existing VSL / LC equipment

<table>
<thead>
<tr>
<th>Standard Item No.</th>
<th>Description</th>
<th>Unit of measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>61791</td>
<td>Removal of Existing VSL / LC equipment for re-use</td>
<td>each</td>
</tr>
<tr>
<td>61792</td>
<td>Removal of Existing VSL / LC equipment for disposal</td>
<td>each</td>
</tr>
</tbody>
</table>

#### 2.2 Work Operations

**Item 61701** Foundation Design for \([Type A | Type B | Type C]\) VSL / LC on a post-mounted support structure \([with | without]\) an enclosure fixed to support structure to house VSL / LC controller on a [PAD or bored Pile Foundation]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications, and
- b) design Drawings, Schedules, Calculations and TMR approvals in accordance with TMR standards.

**Item 61702** Installation of \([Type A | Type B | Type C]\) VSL/LC footing and including Anchor Cage for a Pad / Piled / Planted foundation \([insert dimensions and/or referenced drawing]\)

Work Operations incorporated in the above item 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 and/or communications pit as appropriate
g) supply and Installation of binding concrete to MRTS70
h) pouring, curing and finishing of concrete to MRTS70, and
i) stripping formwork, reinstatement of soil cover and general making good on site.

**Item 61721 Supply of post-mounted support structure, [length] metres long, [with | without] cabinet brackets and [with | without] an enclosure fixed to support structure to house VSL / LC controller for installation of [Type A | Type B | Type C] VSL / LC**

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) supply and fabrication of VSL / LC pole and pole adaptor
c) supply of all fixing bolts, nuts and washers as appropriate, and
d) for a pole to be fitted with a pole-mounted cabinet:
   i. supply and fabrication of pole-mounted cabinet brackets
   ii. supply of pole-mounted enclosure for VSL / LC controller.

**Item 61722 Supply of [tunnel | gantry] mounting bracket, [length] metres long [with | without] an enclosure to mount VSL / LC controller [fixed to bridge structure or similar as detailed on referenced drawing] for installation of [Type A | Type B | Type C] VSL / LC**

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) supply and fabrication of tunnel/gantry-mounted VSL / LC bracket
c) supply of all fixing bolts, nuts and washers as appropriate
d) supply of mounting bracket for the enclosure, and
e) supply of enclosure cabinet

**Item 61723 Installation of post-mounted mounting structure for [Type A | Type B | Type C] VSL/LC [with | without] an enclosure fixed to support structure to house VSL / LC controller**

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) supply and installation of spigot hatchway and ground access hatchway terminal strips if applicable
c) installation of pole, including pole adaptor on footing
d) for a pole to be fitted with a pole-mounted cabinet:
   i. installation of pole-mounted cabinet brackets

Superseded
ii. Installation of pole-mounted enclosure

e) mortar grouting of base plate

f) supply of hinge pole operation instruction manuals, and
g) testing of installation.

Item 61724  Installation of [tunnel | gantry] mounted mounting bracket for [Type A | Type B | Type C] VSL / LC [with | without] an enclosure to mount VSL / LC controller [fixed to bridge structure or similar as detailed on referenced drawing]

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications

b) installation of bracket to structure including masonry anchors
c) for an enclosure to be fitted to in the bridge structure or similar as detailed on the reference drawing:
   i. installation of cabinet brackets
   ii. installation of the enclosure
d) Testing of installation.

Item 61725  Supply and installation of post-mounted support structure, for [Type A | Type B | Type C] VSL / LC [length] metres long, [with | without] mounting brackets and [with | without] an enclosure fixed to support structure to house VSL / LC controller

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications

b) supply and fabrication of VSL / LC mounting structure and pole adaptor
c) supply of all fixing bolts, nuts and washers as appropriate
d) for a pole to be fitted with a pole-mounted cabinet:
   i. supply and fabrication of pole-mounted cabinet brackets and enclosure cabinet
   ii. installation of the enclosure cabinet
e) supply and installation of spigot hatchway and ground access hatchway terminal strips if applicable

f) installation of pole on footing
g) mortar grouting of base plate

h) supply of hinge pole operation instruction manuals, and

i) testing of installation.
Item 61726  Supply and installation of [tunnel | gantry] mounted bracket for [Type A | Type B | Type C] VSL / LC, [length] metres long [with | without] an enclosure to mount VSL / LC controller [fixed to bridge structure or similar as detailed on referenced drawing]

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) supply and fabrication of mounting brackets
c) supply of all fixing bolts, nuts and washers as appropriate
d) installation of bracket to structure, including masonry anchors
e) for an enclosure to be fixed to bridge structure or similar as detailed on referenced drawing:
   i. supply and fabrication of cabinet mounting brackets and enclosure cabinet
   ii. installation of the enclosure cabinet
f) testing of installation.

Item 61741  Supply of [Type A | Type B | Type C] VSL / LC [with | without] VSL / LC Controller

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) supply of [Type A | Type B | Type C] VSL / LC complete with necessary mounting/installation accessories
c) supply of communication and power cables between VSL / LC and VSL / LC controller, and
d) supply of VSL / LC controller, complete with necessary mounting/installation accessories as applicable.

Item 61742  Installation of [Type A | Type B | Type C] VSL / LC and [with | without] VSL / LC Controller install in an enclosure [fixed to support structure] [and | or] [fixed to bridge structure or similar as detailed on referenced drawing]

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) installation of VSL / LC
c) installation of VSL / LC controller as applicable
d) installation and securing of cables and making necessary connections
e) the setting out of the VSL / LC, including confirmation of horizontal alignment, headroom and set-back from edge of carriageway and working width from vehicle restraint systems
f) testing of VSL / LC in accordance with MRTS206
g) update necessary diagrams and supply of test results
h) operator training if applicable, and
i) supply of documentation in accordance with MRTS206.
Item 61743  Supply and Installation of [Type A | Type B | Type C] VSL/LC [with | without] VSL/LC Controller install in an enclosure [fixed to support structure] [and | or] [fixed to bridge structure or similar as detailed on referenced drawing]

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) supply of [Type A | Type B | Type C] VSL / LC, complete with necessary mounting/installation accessories
c) supply of communication and power cables between VSL / LC and VSL / LC controller
d) supply of VSL / LC controller, complete with necessary mounting/installation accessories as applicable
e) installation of VSL / LC
f) installation of VSL / LC controller as applicable
g) installation and securing of cables and making necessary connection
h) the setting out of the VSL / LC, including confirmation of horizontal alignment, headroom and set-back from edge of carriageway and working width from vehicle restraint systems
i) testing of VSL / LC in accordance with MRTS206
j) update necessary diagrams and supply of test results
k) operator training if applicable, and
l) supply of documentation in accordance with MRTS206.

Item 61744  Supply of VSL / LC Controller

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) supply of VSL / LC controller, complete with necessary mounting/installation accessories, and
c) supply of necessary documentation in accordance with MRTS206.

Item 61745  Installation of VSL / LC Controller in an enclosure fixed to supporting structure or fixed to bridge structure or similar as detailed on referenced drawing

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) installation of mounting accessories and VSL / LC controller
c) installation and securing of cables and making necessary connections
d) testing of VSL / LC in accordance with MRTS206
e) update necessary diagrams and supply of test results, and
f) supply of documentation in accordance with MRTS206.
Item 61746  Supply and Installation of VSL / LC Controller in an enclosure fixed to supporting structure or fixed to bridge structure or similar as detailed on referenced drawing

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) supply of VSL / LC controller, complete with necessary mounting/installation accessories
c) installation of mounting accessories and VSL / LC controller
d) installation and securing of cables and making necessary connections
e) testing of VSL / LC in accordance with MRTS206
f) update necessary diagrams and supply of test results
g) operator training if applicable, and
h) supply of documentation in accordance with MRTS206.

Item 61761  Provision of [VSL / LC] spares [as listed in the contract documents or on drawing reference]

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) provision of Spares in accordance with the requirements of MRTS201 and as listed in the Scheme Documentation
c) transport of all components to the Principal’s storage facility.

Item 61791  Removal of Existing VSL / LC equipment for re-use

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) disconnection of Electrical Supply, including termination and ‘making safe’ of supply cable
c) disconnection of Telecommunications connection
d) removal of VSL / LC and supporting pole and associated cabinet enclosure
e) reinstatement of soil cover and general making good on site, and
f) transport of all components to Principal’s storage facility or designated site storage area for re-use.

Item 61792  Removal of Existing VSL / LC equipment for disposal

Work Operations incorporated in the above item include:

a) Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications
b) disconnection of Electrical Supply, including termination and ‘making safe’ of supply cable
c) disconnection of telecommunications connection
d) removal of VSL / LC and supporting pole and associated cabinet enclosure
e) reinstatement of soil cover and general making good on site, and
2.3 **Method of measurement of Variable Speed Limit and Lane Control Signs**

This Specification provides Standard Work Items for:

a) supply only

b) installation only, and

c) supply and installation of Variable Speed Limit Signs (VSL / LC).

Any combination of Standard Work Items relating to these methods of measurement may be used in the Schedule of Rates. However, where a Standard Work Item for supply and installation of a particular component or group of components is included in the Schedule of Rates, no supply only nor installation only Standard Work Item shall also apply to that component or group of components as applicable.

2.4 **Supply of materials**

Any materials to be supplied by the Principal will be as stated in the Principal Supplied Material List, Form C6827. All other material shall be supplied by the Contractor.

The responsibility for transport to the Site of materials supplied by the Principal shall be as stated in the Principal Supplied Material List, Form C6827. Transport to the Site of all other materials shall be the responsibility of the Contractor.