

Specification (Measurement)

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

July 2018

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Contents

- 1 Introduction1**
- 2 Measurement of works1**
 - 2.1 Standard Work Items 1
 - 2.2 Work Operations 2
 - 2.3 Method of measurement of Variable Speed Limit and Lane Control Signs 8
 - 2.4 Supply of materials 8

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

Standard Item No.	Description	Unit of measurement
VSL/LC Mounting footings		
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]	each
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]	each
VSL/LC Mounting structure and brackets		
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	each
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	each
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	each
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]	each
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	each
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]	each

Standard Item No.	Description	Unit of measurement
Variable speed limit signs		
61741	Supply of [Type A Type B Type C] VSL / LC [with without] VSL / LC Controller	each
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]	each
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]	each
61744	Supply of VSL / LC Controller	each
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	each
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	each
Ancillary items		
61761	Provision of [VSL / LC] spares [as listed in the contract documents or on drawing reference]	item
Removal of existing VSL / LC equipment		
61791	Removal of Existing VSL / LC equipment for re-use	each
61792	Removal of Existing VSL / LC equipment for disposal	each

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 Transport and Main Roads approvals in accordance with departmental 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 *Concrete*
- 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
 - 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
- f) transport of all components and disposal.

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.

