

Specification (Measurement)

**Transport and Main Roads Specifications
MRS260 Temporary Variable Speed Limit Signs**

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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 Temporary Variable Speed Limit (TVSL) Signs.

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications*, MRS263 *Standalone Solar (PV) Power Systems* and other Specifications as appropriate.

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

2 Measurement of Work

2.1 Standard Work Items

In accordance with the provisions of Clause 2.1.3 of MRS01 *Introduction to Specifications*, the Standard Work Items covered by this Specification are listed in Table 2.1.

For Standard Work Items relating to Solar Power and Battery power, refer to MRS263 *Standalone Solar (PV) Power Systems*. For Standard Work Items for Mains Connection, refer to MRS210 *Provision of Mains Power*.

Table 2.1 – Standard Work Items

Standard Item No.	Description	Unit of measurement
TVSL Mounting footings		
67501	Supply and installation of Trailer mounted Type [A B C D] TVSL Sign including but not limited to site controller, [with without] LED sign display, [with without] flashing yellow alert light, [with without] gyroscopic sensor, [with without] directional compass, wheels and tyres, stabilisers and [with without] storage compartments	each
67502	Supply and installation of concrete block mounted Type [A B C D] TVSL sign including but not limited to site controller, [with without] LED sign display, [with without] flashing yellow alert light, [with without] GPS sensor, movement sensors and [with without] storage compartments	each
67503	Supply and installation of a Type [A B C D] TVSL LED Sign display extension with flashing yellow alert light on a post-mounted support structure and foundation	each
Short range controller (SRC)		
67531	Supply and configuration of a hand-held SRC device to control each TVSL Sign	each
Remote Sign control system (RSCS) software		
67541	Supply, installation and configuration of RSCS Software on a [Laptop PC]	each
Configuration software		
67551	Supply, installation and configuration of configuration software on a [Laptop Other compatible device]	each

Standard Item No.	Description	Unit of measurement
External communications		
67561	Supply and configuration of a [4G 5G] mobile phone service to allow communications between a TVSL Site Controller and [RSCS software Mobile Phone alerts]	each
Temporary Variable Message Signs		
67571	Supply and installation of static MUTCD compliant default [100 km/h 80 km/h 60 km/h 40 km/h] speed limit sign "WHEN SIGN ABOVE IS BLANK"	each

2.2 Work Operations

Work Operations included in the Standard Work Items are specified in the relevant clause adjacent to each Standard Work Item listed in Table 2.1.

Item 67501 Supply and installation of Trailer mounted Type [A | B | C | D] TVSL Sign including but not limited to site controller, [with | without] LED sign display, [with | without] flashing yellow alert light, [with | without] gyroscopic sensor, [with | without] directional compass, wheels and tyres, stabilisers and [with | without] storage compartments

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 fully integrated TVSL Sign components including, but not limited to:
 - i. site controller and associated components
 - ii. wireless UHF Communications transmitter/receiver
 - iii. wireless 4G / 5G Modem
 - iv. GPS Sensor
 - v. TVSL Trailer components including 2 x 185/14 tyres and 2 x 14" hubs, stabiliser struts / bars, standard trailer indicator lights, trailer cable / socket connections
 - vi. optional Gyroscopic Sensor
 - vii. optional Directional Compass
 - viii. optional flashing yellow alert light
 - ix. optional Type [A | B | C | D] TVSL LED sign display component, and
 - x. optional trailer storage compartments and accompanying keys.
- c) installation of the components listed in 'b)' above fully integrated into a trailer, and
- d) configuration of the trailer-mounted TVSL components listed in 'b)' above in accordance with the TGS, QGTM Part 10 and MRTS260.

Item 67502 Supply and installation of concrete block mounted Type [A | B | C | D] TVSL sign including but not limited to site controller, [with | without] LED sign display, [with | without] flashing yellow alert light, [with | without] GPS sensor, movement sensors and [with | without] storage compartments

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 fully integrated TVSL sign components including, but not limited to:
 - i. site controller and associated components
 - ii. wireless UHF Communications transmitter / receiver
 - iii. wireless 4G / 5G Modem
 - iv. optional GPS Sensor
 - v. optional Gyroscopic Sensor
 - vi. optional Directional Compass
 - vii. optional flashing yellow alert light, and
 - viii. optional Type [A | B | C | D] TVSL LED sign display component.
- c) installation of the components listed in 'b)' above fully integrated onto the concrete block foundation, and
- d) of the concrete block-mounted TVSL components listed in 'b)' above in accordance with the TGS, QGTM Part 10 and MRTS260.

Item 67503 Supply and installation of a Type [A | B | C | D] TVSL LED Sign display extension with flashing yellow alert light on a post-mounted support structure and foundation

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 | B | C | D] TVSL LED Sign display enclosure
- c) supply of Type [A | B | C | D] TVSL LED Sign display support posts
- d) supply of foundation base to support the Type [A | B | C | D] LED Sign display enclosure, flashing yellow alert light and support posts
- e) supply of flashing yellow alert light
- f) installation of the flashing alert light on rear of the TVSL LED sign display enclosure, and
- g) installation of Type [A | B | C | D] TVSL LED Sign display enclosure on support posts and foundation.

Item 67531 Supply and configuration of a hand-held SRC device to control each TVSL Sign

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 2 SRC handheld units with accompanying batteries, and
- c) configuration of the SRC to comply with the TGS, QGTM Part 10, and MRTS260.

Item 67541 Supply, installation and configuration of RSCS Software on a [Laptop | PC]

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 a disk containing the RSCS software
- c) installation of the RSCS software onto a compatible laptop or PC
- d) configuration of the RSCS software for administration, user access management, diagnostics and alarm / event monitoring, GIS maps, etc., and
- e) configuration of the RSCS software to comply with the TGS, QGTM Part 10 and MRTS260.

Item 67551 Supply, installation and configuration of configuration software on a [Laptop | Other compatible device]

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 a disk containing the configuration software
- c) installation of the configuration software onto a compatible laptop or other compatible device
- d) configuration of the configuration software for administration, user access management, diagnostics and alarm / event monitoring, GIS maps, etc.

Item 67561 Supply and configuration of a [4G | 5G] mobile phone service to allow communications between a TVSL Site Controller and [RSCS software | Mobile Phone alerts]

Work operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply a 4G or 5G mobile data (if required to suit designed TVSL sign data bandwidth requirements) and SMS communications through the engagement of a suitable mobile phone service provider, such as Telstra, Optus or Vodafone
- c) configure the TVSL sign with the mobile phone service numbers requiring to receive the critical TVSL sign alarm or alert SMS-based notifications, and
- d) configure the TVSL sign such that a secure wireless Ethernet communications channel, such as a Virtual Private Network (VPN), is established between the TVSL sign and the RSCS software.

Item 67571 Supply and installation of static MUTCD compliant default [100 km/h | 80 km/h | 60 km/h | 40 km/h] speed limit sign “WHEN SIGN ABOVE IS BLANK”

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 a MUTCD compliant static default 100 km/h, 80 km/h, 60 km/h or 40 km/h speed limit sign for each TVSL Sign (TC1568), and
- c) installation of the ‘WHEN SIGN ABOVE IS BLANK’ default speed static sign on the TVSL sign trailer immediately below the TVSL sign LED display.

2.3 Method of Measurement of Temporary Variable Speed Limit Signs

This Specification provides Standard Work Items for:

- a) supply only
- b) installation only, and
- c) supply and installation

of Temporary Variable Speed Limit Signs (TVSL).

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 Form C7827.IC *Principal Supplied Material List*. 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 Form C7827.IC *Principal Supplied Material List*. Transport to the Site of all other materials shall be the responsibility of the Contractor.

