

**Specification (Measurement)**

**Transport and Main Roads Specifications  
MRS229 Electronic Traffic 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 Electronic Traffic Control Signs (eTCS).

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.

## 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
<b>Electronic Traffic Control Signs</b>		
64301	Supply and Installation of [ <i>Fix   Vehicle   Trailer   Concrete block</i> ] mounted eTCS [ <i>with   without</i> ] solar panels, [ <i>with   without</i> ] battery bank	each
64302	Supply and Installation of a 10 metre connecting cable between the [ <i>Trailer   Concrete Block</i> ] and the [ <i>LED Sign display   Solar Panel Array with Battery Bank Enclosure</i> ] Extension	each
64303	Supply and configuration of a hand-held communication device to control each eTCS	each
64304	Supply, Installation and configuration of eTCS Software on a [ <i>Laptop   PC</i> ]	each
64305	Supply, Installation and configuration of Configuration Software on a [ <i>Laptop   Other Compatible Device</i> ]	each
64306	Supply and configuration of a [ <i>3G   4G</i> ] mobile phone service to allow communications between a eTCS Site Controller and [ <i>eTCS Software   Mobile Phone Alerts</i> ]	each

### 2.2 Work Operations

#### **Item 64301 Supply and Installation of [*Fix | Vehicle | Trailer | Concrete block*] mounted eTCS [*with | without*] solar panels, [*with | without*] battery bank**

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 eTCS to MRS229, including (where applicable) to:
  1. site controller and associated components
  2. wireless UHF hand-held communications transmitter / receiver
  3. wired hand-held transmitter / receiver device
  4. wireless 3G / 4G Modem

5. solar panel array and associated mechanical support assembly and adjustment mechanism, where required
  6. batteries, charge regulator and all associated components, where required, and
  7. field processor to enable connection to STREAMS, if applicable.
- c) installation of the components listed in b) above fully integrated into a [*Fixed structure | Vehicle | Trailer | Concrete block*]
- d) risk analysis and contingency plans to ensure safety in the event of sign failure, and
- e) configuration and testing of [*Fix | Vehicle | Trailer | Concrete block*] mounted eTCS components listed in b) above in accordance with, MRST229.

**Item 64302      Supply and installation of a 10 metre connecting cable between the [*Trailer | Concrete Block*] and the [*LED Sign display | Solar Panel Array with Battery Bank Enclosure*] Extension**

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 Cabling Options below:
  1. supply of 10 metres of connecting ELV power and signal cables from the Trailer or concrete block mounted eTCS sign to the Sign Display Extension  
and/or
  2. supply of 10 metres of connecting ELV power cable from the Trailer or concrete block mounted eTCS sign to the Solar Panel Array with Battery Bank Enclosure Extension.
- c) supply of 10 metres of sufficiently sized corrugated steel conduit
- d) installation of the connecting cable within corrugated steel conduit
- e) supply of corrosion resistant IP67 rated connector (or Utilux type round seven pin plug and socket arrangement) for cable termination
- f) termination of both ends of the connecting cables with corrosion resistant IP67 rated connector (or Utilux type round seven pin plug and socket arrangement), and
- g) installation of the cable between the Trailer / Concrete Block and the LED sign display Extension or TVSL Solar Panel Array with Battery Bank Enclosure Extension.

**Item 64303      Supply and configuration of a hand-held communication device to control each eTCS**

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 two hand-held units with accompanying batteries, and
- c) configuration of the hand-held units to comply with MRTS229.

**Item 64304 Supply, installation and configuration of eTCS 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 eTCS Software
- c) installation of the eTCS Software onto a compatible Laptop or PC
- d) configuration of the eTCS Software for administration, user access management, diagnostics and alarm / event monitoring etc., and
- e) configuration of the eTCS Software to comply with the MRST229.

**Item 64305 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, and
- d) configuration of the Configuration Software for administration, user access management, diagnostics and alarm / event monitoring etc.

**Item 64306 Supply and configuration of a [3G / 4G] mobile phone service to allow communications between a eTCS Site Controller and [eTCS 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 3G or 4G mobile data (if required to suit designed eTCS sign data bandwidth requirements) and SMS communications through the engagement of a suitable mobile phone service provider
- c) configure the eTCS sign with the mobile phone service numbers requiring to receive the critical eTCS sign Alarm or Alert SMS based notifications, and
- d) configure the eTCS sign such that a secure wireless Ethernet communications channel such as a Virtual Private Network (VPN) is established between the eTCS sign and the eTCS Software.

**2.3 Method of measurement of electronic traffic control signs**

This Specification provides Standard Work Items for:

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

of Temporary Electronic Traffic Control Signs (eTCS). 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.

