

Specification (Measurement)

**Transport and Main Roads Specifications
MRS222 Electronic School Zone Signs**

July 2021

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1 Introduction

This Specification applies to the supply and installation of Electronic School Zone Signs for Intelligent Transport System (ITS) applications, associated with the Principal's Traffic Management System.

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications*, MRTS50 *Specific Quality System Requirements*, 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 Works

2.1 Standard Work Items

In accordance with the provisions of Clause 2 of MRS01 *Introduction to Specifications* and Technical 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
Preparation of site		
63401	Survey of Site to identify utilities below footpath	each
63402	Develop Site Establishment Plan for installation of Electronic School Zone Sign	each
63403	Design for supply and installation of Electronic School Zone Sign	each
Sign footings		
63431	Supply and installation of footing for [Size A Size B Size C] Electronic School Zone Sign pole	each
Guard rail		
63451	Supply and install [qty] metres Guard rail (D-1474)	metres
Sign poles and brackets		
63471	Supply of [Size A Size B Size C] Electronic School Zone Sign pole, [length] metres long, [with without] pole-mounted cabinet brackets	each
63472	Installation of [Size A Size B Size C] Electronic School Zone Sign hinge pole	each
63473	Supply and installation of [hinged] pole, [length] metres long	each
Signs		
63501	Supply of [Size A Size B Size C] [Type 1 Type 2 Type 3] Electronic School Zone Sign and ancillary components	each
63502	Installation of [Size A Size B Size C] [Type 1 Type 2 Type 3] Electronic School Zone Sign and ancillary components	each

Standard Item No	Description	Unit of measurement
63503	Supply and installation of [Size A Size B Size C] [Type 1 Type 2 Type 3] Electronic School Zone Sign and ancillary components	each
Removal of existing equipment		
63591	Removal of [Size A Size B Size C] Electronic School Zone Sign pole(s), [including not including] sign, [for salvage for disposal]	each
63592	Removal of [Size A Size B Size C] Electronic School Zone Sign pole footing(s)	each
63593	Removal of [qty] metres Guard rail (D-1474)	lump sum

2.2 Work Operations

Item 63401 Survey of Site to identify utilities below footpath

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) geographical survey work appropriate to the task
- c) all work associated with the provision of Electronic School Zone Sign, including site survey details of the exact location, height and alignment of the Electronic School Zone Sign, including pits and ducts
- d) conduct a thorough visual inspection of the proposed School Zone Sign location that it is clear of obstructions that would prevent oncoming motorists from readily discerning the sign face contents at the required visual range
- e) survey using a mechanism such as ground penetrating Radar to determine location of utilities
- f) conduct all necessary soil tests, and
- g) all work associated with the provision of the Electronic School Zone Sign location details from the survey in the Electronic School Zone Sign Design Drawing, including additional detail such as Transport and Main Roads chainage.

Item 63402 Develop Site Establishment Plan for installation of Electronic School Zone Sign

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) all work associated with the preparation, submission and amendment (where necessary) of a Site Establishment Plan, including relevant management plans, such as a project plan, workplace health and safety plan and Site acceptance plan, and
- c) specific safety plan allowance for any work left unattended, while children may pass or be present.

Item 63403 Design for supply and installation of Electronic School Zone Sign

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) design for all civil earth works and structural components
- c) all work associated with the preparation, submission and amendment (where necessary) of Support Structure design documentation and drawings for the Electronic School Zone Sign, including all relevant design calculations and certifications
- d) design all work associated with the preparation, submission and amendment (where necessary) of footing design documentation and drawings for the Electronic School Zone Sign Support structure
- e) design the required electrical works
- f) design the required Communications and control links, and
- g) design of ITS and associated ITS integration components.

Item 63431 Supply and installation of footing for [Size A | Size B | Size C] Electronic School Zone Sign pole

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 rag-bolt assembly as appropriate
- f) supply and installation of conduit to electrical and/or communications pit as appropriate
- g) supply, placement, installed and tested and finishing of concrete
- h) stripping formwork and cleaning up, and
- i) disposal of excavated material.

Item 63451 Supply and install [qty] metres Guard rail (D-1474)

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply and install guard rail.

Item 63471 Supply of [Size A | Size B | Size C] Electronic School Zone Sign pole, [length] metres long, [with | without] pole-mounted cabinet brackets

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 Electronic School Zone Sign 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, to include supplying and fabricating pole-mounted cabinet brackets.

Item 63472 Installation of [Size A | Size B | Size C] Electronic School Zone Sign hinge pole

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) supply and installation of pole-mounted surge / lightning protection equipment, if applicable
- d) for Electronic School Zone Sign poles with pole-mounted cabinets – supply and installation of all internal cabling from pole-mounted cabinet to spigot hatchway terminal strip and all connectors, bushings, lugs, bolts, nuts and washers, as appropriate
- e) for Electronic School Zone Sign poles with ground-mounted cabinets – supply and installation of all internal cabling from ground access hatchway terminal strip to spigot hatchway terminal strip and all connectors, bushings, lugs, bolts, nuts and washers, as appropriate
- f) installation of pole, including pole adaptor on footing
- g) mortar grouting of base plate
- h) flush finish and ground compaction of surrounding surface
- i) top dressing and turfing of the compacted surface
- j) supply of hinge pole operation instruction manuals, and
- k) testing of installation by raising and lowering the hinge pole when fitted with a test weight exceeding the maximum (moment) complete load weight of the sign.

Item 63473 Supply and installation of [hinged] pole, [length] metres long

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 Electronic School Zone Sign pole and pole adaptor
- c) supply of all fixing bolts, nuts and washers, as appropriate
- d) installation of pole on footing
- e) mortar grouting of base plate
- f) flush finish and ground compaction of surrounding surface
- g) top dressing and turfing of the compacted surface
- h) for a pole to be fitted with a pole-mounted cabinet, include the supply and fabrication of pole-mounted cabinet brackets
- i) supply and installation of spigot hatchway and ground access hatchway terminal strips, if applicable
- j) supply and installation of pole-mounted surge / lightning protection equipment, if applicable

- k) for Electronic School Zone Sign poles with pole-mounted sign control assembly box, supply and installation of all internal cabling from pole-mounted cabinet to spigot hatchway terminal strip and all connectors, bushings, lugs, bolts, nuts and washers, as appropriate
- l) for Electronic School Zone Sign poles with ground-mounted sign control assembly box – supply and installation of all internal cabling from ground access hatchway terminal strip to spigot hatchway terminal strip and all connectors, bushings, lugs, bolts, nuts and washers, as appropriate
- m) supply of hinge pole operation instruction manuals and supply of the cabling diagrams and test reports, and
- n) testing of installation by raising and lowering the hinge pole when fitted with a test weight exceeding the maximum (moment) complete load weight of the sign.

Item 63501 Supply of [Size A | Size B | Size C] [Type 1 | Type 2 | Type 3] Electronic School Zone sign and ancillary components

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Manufacture or supply of type approved [Type 1 | Type 2 | Type 3] and ancillary components
- c) factory acceptance test as functional testing of the electrical supply system
- d) factory acceptance tests as functional testing of the sign operation
- e) completion of the first maintenance performance records
- f) packaging and delivery of a type approved [Type 1 | Type 2 | Type 3] and ancillary components to site, and
- g) handover of all documentation and records to the Principal.

Item 63502 Installation of [Size A | Size B | Size C] [Type 1 | Type 2 | Type 3] Electronic School Zone Sign and ancillary components

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 a type approved [Type 1 | Type 2 | Type 3] and ancillary components as per the accepted design for that Site
- c) maintenance testing of installation by raising and lowering the hinge pole when fitted with complete load weight of the sign
- d) functional testing of the electrical supply system
- e) functional testing of the sign operation
- f) completion of the first maintenance performance records, and
- g) handover of all documentation and records to the Principal.

Item 63503 Supply and Installation of [Size A | Size B | Size C] [Type 1 | Type 2 | Type 3] Electronic School Zone Sign and ancillary components

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 a type approved [Type 1 | Type 2 | Type 3] School Zone Sign and ancillary components as per the accepted design for that site
- c) maintenance testing of installation by raising and lowering the hinge-pole when fitted with complete load weight of the sign
- d) for Type 3 sign, the installation and testing of the external radar unit
- e) functional testing of the electrical supply system
- f) functional testing of the sign operation
- g) completion of the first maintenance performance records, and
- h) handover of all documentation and records to the Principal.

Item 63591 Removal of [Size A | Size B | Size C] Electronic School Zone Sign pole(s), [including | not including] sign, [for salvage | 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) De-energisation and making safe power supply
- c) removal of Electronic School Zone Sign, including associated components, as appropriate
- d) removal of pole, pole adaptor and all internal cabling and associated components, as appropriate
- e) for equipment to be salvaged:
 - i. dismantling of equipment, where appropriate, and
 - ii. transporting of all components to designated storage facility, or another station for re-use.
- f) for equipment to be disposed:
 - i. disposal of components.

Item 63592 Removal of [Size A] [Size B] [Size C] Electronic School Zone Sign pole footing(s)

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
- d) backfilling of hole and ground compaction, and
- e) top dressing and turfing of the compacted hole.

Item 63593 Removal of [qty] metres Guard rail (D-1474)

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 guard rail and supporting posts
- c) disposal of guard rail and supporting posts
- d) backfilling of hole and ground compaction, and
- e) top dressing and turfing of the compacted holes to even stable surface.

2.3 *Method of measurement of Electronic School Zone Sign components*

This Specification provides Standard Work Items for:

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

of Electronic School Zone Sign components.

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 C6827 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 C6827 Principal Supplied Material List. Transport to the Site of all other materials shall be the responsibility of the Contractor.

