

# Main Roads Specification

## **MRS14A**

### **Road Furniture (Steel Work)**

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# Road Furniture (Steel Work)

## 1 INTRODUCTION

This Specification applies to the supply and construction of road signs, grids, steel beam guardrail, tensioned wire rope barrier systems, steel traffic barriers and concrete traffic barriers.

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications* and other Specifications as appropriate.

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

## 2 MEASUREMENT OF WORK

### 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>Guidance and Information Systems</b>		
6121	Supply of regulatory, warning and hazard sign faces, as listed in Clause 1.3 of Annexure MRS14A.1.	lump sum
6122	Supply of regulatory, warning and hazard sign faces, [ <i>sign type</i> ].	each
6123	Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14A.1.	lump sum
6124	Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14A.1.	m <sup>2</sup>
6131	Installation of regulatory, warning and hazard signs, as listed in Clause 1.3 of Annexure MRS14A.1.	lump sum
6132	Installation of regulatory, warning and hazard signs, [ <i>number of posts</i> ].	each
6133	Installation of direction and information signs, as listed in Clause 2.3 of Annexure MRS14A.1.	lump sum
6134	Installation of direction and information signs, [ <i>sign number</i> ].	each
6135	Installation of direction and information signs, [ <i>sign size</i> ].	each
6136	Supply, erection and removal of project signs.	lump sum
<b>Roadside Structures</b>		
6141	Grid [ <i>type</i> ].	each
6142	Grid with vermin and dog fencing [ <i>type</i> ].	each
6151	Concrete traffic barrier, [ <i>type</i> ], [ <i>with   without conduit</i> ], [ <i>with   without dowels</i> ].	m
6152	Concrete traffic barrier at wall or pier, [ <i>type</i> ], [ <i>with   without conduit</i> ], [ <i>with   without dowels</i> ].	m
6153	Concrete traffic barrier median terminal, [ <i>type</i> ], [ <i>with   without conduit</i> ], [ <i>with   without dowels</i> ].	each
6154	Galvanised cover assembly at opening for light pole.	each
6155	Galvanised cover assembly at opening for cable pit, number [ <i>pit number</i>	each

Standard Item No.	Description	Unit of Measurement
	<i>type</i> ].	
6156	Split carriageway concrete traffic barrier, [ <i>type</i> ], [ <i>with   without conduit</i> ], [ <i>with   without dowels</i> ].	m
6157	Precast concrete barrier.	m
6161	Steel beam guardrail, w beam.	m
6162	Steel beam guardrail, thrie beam.	m
6163	Steel beam guardrail, terminal type [ <i>number</i> ].	each
6164	Steel beam guardrail, transition type [ <i>number</i> ].	each
6171	Tensioned wire rope barrier system.	m
6172	Tensioned wire rope barrier system.	each
6175	Barrier end treatment.	each
6186	Steel traffic barriers.	M

## 2.2 Work Operations

**Item 6121 Supply of regulatory, warning and hazard sign faces, as listed in Clause 1.3 of Annexure MRS14A.1.**

**Item 6122 Supply of regulatory, warning and hazard sign faces, [*sign type*].**

**Item 6123 Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14A.1.**

**Item 6124 Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14A.1.**

Work Operations incorporated in the above items include –

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Supply of all materials;
- c) Fabrication of the sign panels;
- d) Attachment of stiffeners, where applicable;
- e) Application of protective coatings, colour coatings, reflective coatings and messages;
- f) Reference marking of signs; and
- g) Delivery to the Site.

**Item 6131 Installation of regulatory, warning and hazard signs, as listed in Clause 1.3 of Annexure MRS14A.1.**

**Item 6132 Installation of regulatory, warning and hazard signs, [*number of posts*].**

**Item 6133 Installation of direction and information signs, as listed in Clause 2.3 of Annexure MRS14A.1.**

**Item 6134 Installation of direction and information signs, [*sign number*].**

**Item 6135 Installation of direction and information signs, [*sign size*].**

Work Operations incorporated in the above items include –

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Supply of posts;
- c) Supply of brackets, saddles and fixings;

- d) Supply and fabrication of sign frames, where applicable;
- e) Installation of the posts;
- f) Installation of frames, where applicable; and
- g) Installation of the sign faces to posts or frames.

**Item 6136 Supply, erection and removal of project signs.**

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 all materials except those materials supplied by the Principal;
- c) Transport of signs and supports;
- d) Installation of posts;
- e) Installation of the sign faces to posts or frames;
- f) Maintenance of project signs; and
- g) Removal of project signs and cleaning up.

**Item 6141 Grid [type].**

Work Operations incorporated in the above item include –

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Carrying out excavations;
- c) Utilisation or disposal of the excavated material;
- d) Supply of all materials;
- e) Fabrication and galvanising of grid frames;
- f) Construction of concrete abutments;
- g) Backfilling behind abutments;
- h) Construction of concrete slab;
- i) Installation of grid frames;
- j) Construction of grouted stone pitching at abutment wings;
- k) Installation of 4 guide posts and width marker, where necessary;
- l) Installation of two 2,400 mm wide, 1,650 mm high fence strainer panels and fencing between strainer panel and guide posts; and
- m) Reinstatement of any pavement, pavement surfacing, fencing and road furniture.

**Item 6142 Grid with vermin and dog fencing [type].**

Work Operations incorporated in the above item include –

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Carrying out excavations;
- c) Utilisation or disposal of the excavated material;
- d) Supply of all materials;
- e) Fabrication and galvanising of grid frames;
- f) Construction of concrete abutments and wing walls;
- g) Backfilling behind abutments and wing walls;
- h) Construction of concrete slab;
- i) Installation of grid frames;

- j) Installation of 4 guide posts and width marker, where necessary;
- k) Installation of 66 metres of 1 950 mm high vermin and dog fencing including 10 strainer panels;
- l) Installation of two 2 500 mm wide, 1 950 mm high gates; and
- m) Reinstatement of any pavement, pavement surfacing, fencing and road furniture.

**Item 6151 Concrete traffic barrier, [type], [with | without conduit], [with | without dowels].**

**Item 6152 Concrete traffic barrier at wall or pier, [type], [with | without conduit], [with | without dowels].**

**Item 6153 Concrete traffic barrier median terminal, [type], [with | without conduit], [with | without dowels].**

Work Operations incorporated in the above item include –

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Preparation of surface;
- c) Supply of all materials;
- d) Installation of electrical conduit and cable pits, where applicable;
- e) Installation of dowels, where applicable;
- f) Installation of steel reinforcing;
- g) Erection of formwork;
- h) Installation of guardrail anchor bolts;
- i) Placement of concrete;
- j) Installation of expansion joint; and
- k) Installation of delineators.

**Item 6154 Galvanised cover assembly at opening for light pole.**

**Item 6155 Galvanised cover assembly at opening for cable pit, number [pit number / type].**

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 all materials;
- c) Fabrication of cover assembly;
- d) Installation of fixing angles;
- e) Installation of cement mortar infill over conduit; and
- f) Installation of cover plates.

**Item 6156 Split carriageway concrete traffic barrier, [type], [with | without conduit], [with | without dowels].**

Work Operations incorporated in the above items include –

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Preparation of surface;
- c) Supply of all materials;
- d) Installation of electrical conduit and cable pits, where applicable;
- e) Installation of dowels, where applicable;
- f) Installation of steel reinforcing;
- g) Extruding or forming and casting of fibre reinforced concrete traffic barrier;

- h) Installation of compressible filler, where required;
- i) Installation of expansion joints and contraction joints; and
- j) Installation of delineators

**Item 6157 Precast concrete barrier.**

Work Operations incorporated in the above item include –

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Preparation of surface;
- c) Supply of all materials;
- d) Supply and transport of precast concrete barrier;
- e) Installation of barrier including permanent connectors as specified; and
- f) Fill stanchion holes.

**Item 6161 Steel beam guardrail, w beam.**

**Item 6162 Steel beam guardrail, thrie beam.**

Work Operations incorporated in the above items include –

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Supply of all materials;
- c) Fabrication of components;
- d) Galvanising of components;
- e) Installation of posts; and
- f) Erection of guard-rail.

**Item 6163 Steel beam guardrail, terminal type [number].**

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 all materials;
- c) Fabrication of components;
- d) Galvanising of components;
- e) Installation of posts;
- f) Installation of anchor cable assembly;
- g) Erection of guardrail; and
- h) Supply and installation of TC 1151 signs.

**Item 6164 Steel beam guardrail, transition type [number].**

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 all materials;
- c) Fabrication of components;
- d) Galvanising of components;
- e) Installation of connector brackets;
- f) Installation of posts; and
- g) Erection of guardrail.

**Item 6171 Installation of tensioned wire rope barrier system including all necessary intermediate anchors.**

Work Operations incorporated in the above item include –

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Supplying all materials;
- c) Fabrication of all components;
- d) Application of all protective coatings;
- e) Installation of barrier system; and
- f) Installation of delineators.

**Item 6172 Tensioned wire rope barrier system terminal anchors.**

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 all materials;
- c) Fabrication of components;
- d) Application of all protective coatings; and
- e) Installation of terminal anchor complete.

**Item 6175 Barrier end treatment.**

Work Operations incorporated in the above item include –

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Preparation of site;
- c) Supply of all materials; and
- d) Installation of proprietary barrier end treatment.

**Item 6186 Steel traffic barriers.**

Work Operations incorporated in the above item include

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*;
- b) Preparation of Site;
- c) Supply of all Materials; and
- d) Installation of steel traffic barrier system.

**2.3 Method of Measurement**

**2.3.1 Supply of Regulatory, Warning and Hazard Signs**

The supply of regulatory, warning and hazard signs shall be measured by either Method A or Method B as stated as Clause 1.1 of Annexure MRS14A.1.

Where Method A applies, the supply of all regulatory, warning and hazard signs shall be included in a single Work Item measured as a lump sum. The signs included in the lump sum Work Item shall be as listed in Clause 1.3 of Annexure MRS14A.1.

Where Method B applies, the supply of regulatory, warning and hazard signs shall be assigned individual Work Items on the basis of sign type and measured as each sign.

**2.3.2 Installation of Regulatory, Warning and Hazard Signs**

The installation of regulatory, warning and hazard signs shall be measured by either Method A or Method B as stated in Clause 1.2 of Annexure MRS14A.1.

Where Method A applies, the installation of all regulatory, warning and hazard signs shall be included in a single Work Item measured as a lump sum. The signs included in the lump sum Work Item shall be as listed in Clause 1.3 of Annexure MRS14A.1.

Where Method B applies, the installation of regulatory, warning and hazard signs be assigned several Work Items on the basis of the number of support posts, and measured as each sign.

### **2.3.3 Supply of Direction and Information Signs**

The supply of direction and information signs shall be measured by either Method A or Method B as stated in Clause 2.1 of Annexure MRS14A.1.

Where Method A applies, the supply of all direction and information sign faces shall be included in a single Work Item measured as a lump sum. The signs included in the lump sum Work Item shall be as listed in Clause 2.3 of Annexure MRS14A.1.

Where Method B applies, the supply of direction and information sign faces shall be included in a single Work Item and measured as square metres of sign face. The signs included in the lump sum work Item shall be as listed in Clause 2.2 of Annexure MRS14A.1.

### **2.3.4 Installation of Direction and Information Signs**

The installation of direction and information signs shall be measured by either Method A, Method B or Method C as stated in Clause 2.2 of Annexure MRS14A.1.

Where Method A applies, the installation of all direction and information signs shall be included in a single Work Item measured as a lump sum. The signs included in the lump sum Work Item shall be as listed in Clause 2.3 of Annexure MRS14A.1.

Where Method B applies, the installation of direction and information signs shall be assigned individual Work Items on the basis of the sign number, and measured as each sign.

Where Method C applies, the installation of direction and information signs shall be assigned several Work Items on the basis of sign size, and measured as each sign.

### **2.3.5 Grids**

Specific Item Numbers for grids used in the Schedule of Rates shall be deemed to represent the work associated with the particular reference locations stated in Clause 3 of Annexure MRS14A.1.

## **2.4 Project Signs**

### **2.4.1 Items Supplied by the Principal**

Any project signs and support posts which are to be supplied by the Principal are shown on the Principal Supplied Material List (Form C6827). Such items will be supplied free on truck at the location listed on the Principal Supplied Material List.

### **2.4.2 Incidental Materials**

All materials not specifically included on the Principal Supplied Material List, but necessary for the assembly, erection and maintenance of Principal-supplied items, including saddles, fixings or other erection hardware shall be supplied by the Contractor.

### **2.4.3 Payment**

Sixty percent of any lump sum item included in the Schedule of Rates for project signs shall be paid following the erection of the signs. The balance of such lump sum item shall be paid following dismantling, reinstating footing holes and returning posts and signs to the nominated location.