

Specification (Measurement)

**Transport and Main Roads Specifications
MRS14 Road Furniture**

March 2021

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1 Introduction

This Specification applies to the demolition and re-erection of and the supply and construction of road edge guide posts, fencing, gates 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*, MRTS50 *Specific Quality System Requirements* 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.

Table 2.1 – Standard Work Items

Standard Item No.	Description	Unit of Measurement
50001	Demolition of road furniture, as listed in Clause 3 of Annexure MRTS14.1	lump sum
50002	Removal and salvage of road furniture, as listed in Clause 1.1 of Annexure MRTS14.1	lump sum
50003	Removal and re-erection of road furniture, as listed in Clause 4 of Annexure MRTS14.1	lump sum
Guidance and information systems		
50051	Road edge guide posts	each
50052	Supply of regulatory, warning and hazard sign faces, as listed in Clause 1.3 of Annexure MRS14.1	lump sum
50053	Supply of regulatory, warning and hazard sign faces, [<i>sign type</i>]	each
50054	Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14.1	lump sum
50055	Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14.1	m ²
50056	Installation of regulatory, warning and hazard signs, as listed in Clause 1.3 of Annexure MRS14.1	lump sum
50057	Installation of regulatory, warning and hazard signs, [<i>number of posts</i>]	each
50058	Installation of direction and information signs, as listed in Clause 2.3 of Annexure MRS14.1	lump sum
50059	Installation of direction and information signs, [<i>sign number</i>]	each
50060	Installation of direction and information signs, [<i>sign size</i>]	each
50061	Supply, erection and removal of project signs	lump sum
50062	Supply and install sight board as listed in Clause 1.3 of Annexure MRS14.1	lump sum

Standard Item No.	Description	Unit of Measurement
Roadside structures		
50151	Grid [<i>type</i>]	each
50152	Grid with vermin and dog fencing [<i>type</i>]	each
50153	Concrete traffic barrier, [<i>type</i>], [<i>with without conduit</i>], [<i>with without dowels</i>]	m
50154	Concrete traffic barrier at wall or pier, [<i>type</i>], [<i>with without conduit</i>], [<i>with without dowels</i>]	m
50155	Concrete traffic barrier median terminal, [<i>type</i>], [<i>with without conduit</i>], [<i>with without dowels</i>]	each
50156	Galvanised cover assembly at opening for light pole	each
50157	Galvanised cover assembly at opening for cable pit, number [<i>pit number type</i>]	each
50158	Split carriageway concrete traffic barrier, [<i>type</i>], [<i>with without conduit</i>], [<i>with without dowels</i>]	m
50159	Precast concrete barrier	m
50160	Steel beam guardrail, w beam	m
50161	Steel beam guardrail, thrie beam	m
50162	Steel beam guardrail, terminal type [<i>number</i>]	each
50163	Steel beam guardrail, transition type [<i>number</i>]	each
50164	Installation of tensioned wire rope barrier system including all necessary intermediate anchors	m
50165	Tensioned wire rope barrier system terminal anchors	each
50166	Barrier end treatment	each
50167	Fencing, [<i>height</i>] mm high, [<i>type</i>]	m
50168	Gates, [<i>height</i>] mm high, [<i>width</i>] mm wide, [<i>type</i>]	each
50169	Steel traffic barriers	m
Tactile Ground Surface Indicators (TGSi)		
50201	Supply and install [<i>discrete integrated</i>] [<i>directional warning</i>] [<i>material</i>] TGSi	m ²
50202	Removal of existing TGSi	lump sum

2.2 Work Operations

Item 50001 Demolition of road furniture, as listed in Clause 3 of Annexure MRTS14.1

Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) carrying out excavation where necessary
- c) demolishing existing road furniture as listed
- d) utilising or disposing of excavated and demolished material, and

- e) backfilling and finishing resulting excavations.

Item 50002 Removal and salvage of road furniture, as listed in Clause 1.1 of Annexure MRTS14.1

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 excavation where necessary
- c) careful dismantling and removal of existing road furniture as listed
- d) demolition of any agreed non-salvageable part of the existing installation
- e) utilising or disposing of excavated and demolished material
- f) transporting salvaged material to storage site
- g) safe storage of salvaged material at storage site, and
- h) backfilling and finishing resulting excavations.

Item 50003 Removal and re-erection of road furniture, as listed in Clause 4 of Annexure MRTS14.1

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 excavation where necessary
- c) careful dismantling and removal of existing road furniture as listed
- d) demolition of any agreed non-salvageable part of the existing installation
- e) utilising or disposing of excavated and demolished material
- f) backfilling and finishing resulting excavations
- g) safe storage of salvaged material until required for re-erection
- h) supply of new materials necessary for re-erection, and
- i) re-erection of salvaged material.

Item 50051 Road edge guide posts

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 guide posts
- d) application of all coatings
- e) affixing delineators, and
- f) installation of posts.

Item 50052 Supply of regulatory, warning and hazard sign faces, as listed in Clause 1.3 of Annexure MRS14.1

Item 50053 Supply of regulatory, warning and hazard sign faces, [*sign type*]

Item 50054 Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14.1

Item 50055 Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14.1

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 50056 Installation of regulatory, warning and hazard signs, as listed in Clause 1.3 of Annexure MRS14.1

Item 50057 Installation of regulatory, warning and hazard signs, [*number of posts*]

Item 50058 Installation of direction and information signs, as listed in Clause 2.3 of Annexure MRS14.1

Item 50059 Installation of direction and information signs, [*sign number*]

Item 50060 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 50061 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 50062 Supply and install sight board as listed in Clause 1.3 of Annexure MRS 14.1

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, and
- e) installation of the sign faces to posts or frames.

Item 50151 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 four guide posts and width marker, where necessary
- l) installation of two 2400 mm wide, 1650 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 50152 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 four guide posts and width marker, where necessary
- k) installation of 66 metres of 1950 mm high vermin and dog fencing including 10 strainer panels
- l) installation of two 2500 mm wide, 1950 mm high gates, and
- m) reinstatement of any pavement, pavement surfacing, fencing and road furniture.

Item 50153 Concrete traffic barrier, [type], [with | without conduit], [with | without dowels]

Item 50154 Concrete traffic barrier at wall or pier, [type], [with | without conduit], [with | without dowels]

Item 50155 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 50156 Galvanised cover assembly at opening for light pole

Item 50157 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 50158 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 50159 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 50160 Steel beam guardrail, w beam

Item 50161 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 50162 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 50163 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 50164 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 50165 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 50166 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 50167 Fencing, [*height*] mm high, [*type*]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) localised clearing
- c) supply of all materials
- d) installation of posts, pickets and stays
- e) running, fixing and straining fencing wire, and
- f) installation of chainwire, wire netting and/or welded mesh.

Item 50168 Gates, [*height*] mm high, [*width*] mm wide, [*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 gates, and
- d) installation of the gates.

Item 50169 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.

Item 50201 Supply and install [*discrete* | *integrated*] [*directional* | *warning*] [*material*] TGSi

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) all activities and materials for the supply and placement of the TGSi in line with the manufacturer's recommendation

- c) preparation of installation location
- d) installation of TGSi in accordance with design requirements and manufacturer's recommendation, and
- e) quality documentation submitted.

Item 50202 Removal of existing TGSi

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 necessary to carefully dismantle and remove the existing TGSi
- c) demolition of any agreed non-salvageable part of the existing installation, and
- d) disposing of excavated and demolished material.

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 MRS14.1.

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 MRS14.1.

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 MRS14.1.

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 MRS14.1.

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 MRS14.1.

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 MRS14.1.

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 MRS14.1.

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 MRS14.1.

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 MRS14.1.

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 MRS14.1.

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 C7827). 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.

