Specification (Measurement)

Transport and Main Roads Specifications
MRS14 Road Furniture

July 2020
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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 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>
<thead>
<tr>
<th>Standard Item No.</th>
<th>Description</th>
<th>Unit of Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>50001</td>
<td>Demolition of road furniture, as listed in Clause 3 of Annexure MRTS14.1</td>
<td>lump sum</td>
</tr>
<tr>
<td>50002</td>
<td>Removal and salvage of road furniture, as listed in Clause 1.1 of Annexure MRTS14.1</td>
<td>lump sum</td>
</tr>
<tr>
<td>50003</td>
<td>Removal and re-erection of road furniture, as listed in Clause 4 of Annexure MRTS14.1</td>
<td>lump sum</td>
</tr>
<tr>
<td>50051</td>
<td>Road edge guide posts</td>
<td>each</td>
</tr>
<tr>
<td>50052</td>
<td>Supply of regulatory, warning and hazard sign faces, as listed in Clause 1.3 of Annexure MRS14.1</td>
<td>lump sum</td>
</tr>
<tr>
<td>50053</td>
<td>Supply of regulatory, warning and hazard sign faces, [sign type]</td>
<td>each</td>
</tr>
<tr>
<td>50054</td>
<td>Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14.1</td>
<td>lump sum</td>
</tr>
<tr>
<td>50055</td>
<td>Supply of direction and information sign faces, as listed in Clause 2.3 of Annexure MRS14.1</td>
<td>m²</td>
</tr>
<tr>
<td>50056</td>
<td>Installation of regulatory, warning and hazard signs, as listed in Clause 1.3 of Annexure MRS14.1</td>
<td>lump sum</td>
</tr>
<tr>
<td>50057</td>
<td>Installation of regulatory, warning and hazard signs, [number of posts]</td>
<td>each</td>
</tr>
<tr>
<td>50058</td>
<td>Installation of direction and information signs, as listed in Clause 2.3 of Annexure MRS14.1</td>
<td>lump sum</td>
</tr>
<tr>
<td>50059</td>
<td>Installation of direction and information signs, [sign number]</td>
<td>each</td>
</tr>
<tr>
<td>50060</td>
<td>Installation of direction and information signs, [sign size]</td>
<td>each</td>
</tr>
<tr>
<td>50061</td>
<td>Supply, erection and removal of project signs</td>
<td>each</td>
</tr>
<tr>
<td>50062</td>
<td>Supply and install sight board as listed in Clause 1.3 of Annexure MRS14.1</td>
<td>lump sum</td>
</tr>
<tr>
<td>Standard Item No.</td>
<td>Description</td>
<td>Unit of Measurement</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>50151</td>
<td>Grid [type]</td>
<td>each</td>
</tr>
<tr>
<td>50152</td>
<td>Grid with vermin and dog fencing [type]</td>
<td>each</td>
</tr>
<tr>
<td>50153</td>
<td>Concrete traffic barrier, [type], [with</td>
<td>without conduit], [with</td>
</tr>
<tr>
<td>50154</td>
<td>Concrete traffic barrier at wall or pier, [type], [with</td>
<td>without conduit], [with</td>
</tr>
<tr>
<td>50155</td>
<td>Concrete traffic barrier median terminal, [type], [with</td>
<td>without conduit], [with</td>
</tr>
<tr>
<td>50156</td>
<td>Galvanised cover assembly at opening for light pole</td>
<td>each</td>
</tr>
<tr>
<td>50157</td>
<td>Galvanised cover assembly at opening for cable pit, number [pit number</td>
<td>type]</td>
</tr>
<tr>
<td>50158</td>
<td>Split carriageway concrete traffic barrier, [type], [with</td>
<td>without conduit], [with</td>
</tr>
<tr>
<td>50159</td>
<td>Precast concrete barrier</td>
<td>m</td>
</tr>
<tr>
<td>50160</td>
<td>Steel beam guardrail, w beam</td>
<td>m</td>
</tr>
<tr>
<td>50161</td>
<td>Steel beam guardrail, thrie beam</td>
<td>m</td>
</tr>
<tr>
<td>50162</td>
<td>Steel beam guardrail, terminal type [number]</td>
<td>each</td>
</tr>
<tr>
<td>50163</td>
<td>Steel beam guardrail, transition type [number]</td>
<td>each</td>
</tr>
<tr>
<td>50164</td>
<td>Installation of tensioned wire rope barrier system including all necessary intermediate anchors</td>
<td>m</td>
</tr>
<tr>
<td>50165</td>
<td>Tensioned wire rope barrier system terminal anchors</td>
<td>each</td>
</tr>
<tr>
<td>50166</td>
<td>Barrier end treatment</td>
<td>each</td>
</tr>
<tr>
<td>50167</td>
<td>Fencing, [height] mm high, [type]</td>
<td>m</td>
</tr>
<tr>
<td>50168</td>
<td>Gates, [height] mm high, [width] mm wide, [type]</td>
<td>each</td>
</tr>
<tr>
<td>50169</td>
<td>Steel traffic barriers</td>
<td>m</td>
</tr>
</tbody>
</table>

### 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
- 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

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

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

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
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
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

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

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
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
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
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
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
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
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
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
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
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
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

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

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

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

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

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 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 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.