

Specification (Measurement)

**Transport and Main Roads Specifications
MRS77 Bridge Deck**

July 2019

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Contents

- 1 Introduction1**
- 2 Measurement of work1**
 - 2.1 Standard Work Items 1
 - 2.2 Work Operations 2
 - 2.3 Calculation of quantities 7
 - 2.3.1 *Concrete*7
 - 2.3.2 *Steel Reinforcing Bars*.....7

1 Introduction

This Specification applies to the construction of a reinforced concrete bridge deck constructed on prestressed concrete deck units, prestressed concrete girders or steel girders.

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 incorporated in this Specification are listed in Table 2.1. Standard Work Items for associated work are included in the following Specifications:

- a) MRS80 *Supply and Erection of Bridge Barrier*
- b) MRS82 *Bridge Deck Expansion Joints*
- c) MRS83 *Anti-Graffiti Protection*, and
- d) MRS84 *Deck Wearing Surface*.

Table 2.1 – Standard Work Items

Standard Item No.	Description	Unit of Measurement
Concrete and Reinforcements		
72001	Concrete Class S [<i>compressive strength</i>] MPa/20 in cross girder	m ³
72002	Concrete Class S [<i>compressive strength</i>] MPa/20 in deck	m ³
72003	Concrete Class S [<i>compressive strength</i>] MPa/20 in insitu kerb	m ³
72004	Concrete Class S [<i>compressive strength</i>] MPa/20 in parapet and parapet terminal	m ³
72005	Concrete Class S [<i>compressive strength</i>] MPa/20 in median	m ³
72006	Concrete Class S [<i>compressive strength</i>] MPa/20 in relieving slab	m ³
72007	Reinforcing steel in decks, cross girders, kerbs and parapets, excluding parapet terminals	tonne
72008	Reinforcing steel in medians, insitu kerbs and parapets	tonne
72009	Reinforcing steel in relieving slabs	tonne
72010	Mechanical reinforcing bar splice fittings for future widening, [<i>diameter</i>] mm diameter	each
72011	Mechanical reinforcing bar splices, [<i>diameter</i>] mm diameter	each
72012	Mechanical reinforcing bar splices for bar extension, [<i>diameter</i>] mm diameter	each
Cast-In Anchors		
72031	Anchors for bridge rail	lump sum
72032	Anchors for guardrail terminals	lump sum

Standard Item No.	Description	Unit of Measurement
72033	Anchors for lamp standard brackets	lump sum
72034	Sockets for expansion joints	lump sum
Miscellaneous Cast-In Items		
72061	Bridge date plate	each
72062	Permanent survey mark	each
72063	PVC scupper and spout, [<i>diameter</i>] mm diameter	each
Joints and Fillers		
72091	Bridging strips, compressible fillers and isolation inserts	lump sum
72092	Joint sealants	lump sum
Stainless Steel Cover Plates		
72121	Expansion joint cover plates, stainless steel	lump sum
72122	Junction box cover plates, stainless steel	lump sum
Footway		
72151	Stabilised sand in footway	m ³
72152	Precast concrete footway slab	each
Electrical and Telecommunication Items		
72181	Electrical conduit in [<i>kerbs parapets footway</i>], [<i>diameter</i>] mm diameter	m
72182	Flexible electrical conduit in [<i>kerbs parapets footway</i>], [<i>diameter</i>] mm diameter	m
72183	Lamp standard brackets	lump sum
72184	Navigation markers	lump sum
72185	Telecommunications conduit in [<i>kerbs parapets footway</i>], [<i>diameter</i>] mm diameter	m

2.2 Work Operations

- Item 72001** **Concrete Class S [*compressive strength*] MPa/20 in cross girder**
- Item 72002** **Concrete Class S [*compressive strength*] MPa/20 in deck**
- Item 72003** **Concrete Class S [*compressive strength*] MPa/20 in insitu kerb**
- Item 72004** **Concrete Class S [*compressive strength*] MPa/20 in parapet and parapet terminal**
- Item 72005** **Concrete Class S [*compressive strength*] MPa/20 in median**
- Item 72006** **Concrete Class S [*compressive strength*] MPa/20 in relieving slab**

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 concrete
- c) transport of concrete

- d) construction of formwork and falsework, including formwork for voids, block outs, junction boxes, recesses and cored holes
- e) placing and compacting concrete
- f) finishing of concrete
- g) application of evaporation retarding compound
- h) curing and protection of surface
- i) removal of formwork and falsework
- j) dressing of concrete
- k) fillers and sealants, unless measured separately, and
- l) embedded and attached items including electrical and telecommunication conduits, unless measured separately.

Item 72007 Reinforcing steel in decks, cross girders, kerbs and parapets, excluding parapet terminals

Item 72008 Reinforcing steel in medians, insitu kerbs and parapets

Item 72009 Reinforcing steel in relieving slabs

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) fixing reinforcing steel in place, and
- d) welding of steel reinforcing in cross girders and protective treatment of welds, where appropriate.

Item 72010 Mechanical reinforcing bar splice fittings for future widening, [*diameter*] mm diameter

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 mechanical reinforcing bar splice fitting
- c) attachment of coupler fitting to steel reinforcing bar by swaging or by threaded connection, and
- d) provision of a plastic cap in coupler fitting.

Item 72011 Mechanical reinforcing bar splices, [*diameter*] mm diameter

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 mechanical reinforcing bar splices
- c) attachment of coupler fittings to steel reinforcing bars by swaging or by threaded connection

- d) provision of a plastic cap in one coupler, and
- e) staged installation to form a coupled reinforcing bar.

Item 72012 Mechanical reinforcing bar splice for bar extension, [*diameter*] mm diameter

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 mechanical reinforcing bar splice fittings to match existing installation
- c) attachment of coupler fitting to steel reinforcing bar by swaging or by threaded connection
- d) removal of plastic plug and cleaning of existing thread, and
- e) installation to form a coupled reinforcing bar.

Item 72031 Anchors for bridge rail

Item 72032 Anchors for guardrail terminals

Item 72033 Anchors for lamp standard brackets

Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply and fabrication of anchor studs and/or sockets
- c) hot-dipped galvanising of anchor studs and/or sockets, and
- d) installation of anchor studs and/or sockets.

Item 72034 Sockets for expansion joints

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 anchor sockets
- c) installation of anchor sockets, and
- d) supply and installation of temporary plugs.

Item 72061 Bridge date plate

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 date plate, and
- c) casting date plate into concrete.

Item 72062 Permanent survey mark

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 permanent survey mark, and
- c) casting permanent survey mark into concrete.

Item 72063 PVC scupper and spout, [*diameter*] mm diameter

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 scupper, and
- c) casting scupper into concrete.

Item 72091 Bridging strips, compressible fillers and isolation inserts

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 fibre cement sheet bridging strip and installation of cement mortar
- c) supply and installation of bituminous impregnated fibre board, and/or
- d) supply and installation of closed cell expanded polyethylene sheeting.

Item 72092 Joint sealants

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) surface preparation
- c) supply of backing rod, where necessary, and
- d) supply and installation of hot applied bitumen based polyurethane elastomer and/or silicone joint sealants.

Item 72121 Expansion joint cover plates, stainless steel

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 sockets and set screws or bolts
- c) supply and fabrication of stainless steel cover plates
- d) casting in or drilling and installation of plate attaching sockets, and
- e) installation of cover plates and set screws or bolts.

Item 72122 Junction box cover plates, stainless steel

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 sockets and set screws or bolts and neoprene gasket
- c) supply and fabrication of stainless steel cover plates
- d) casting in or drilling and installation of plate attaching sockets, and
- e) installation of cover plate, neoprene gasket and set screws or bolts.

Item 72151 Stabilised sand in footway

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) cleaning the top surface of bridge deck or deck units
- d) placing and compacting stabilised sand, and
- e) finishing surface of stabilised sand.

Item 72152 Precast concrete footway slab

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) manufacture of precast concrete slabs
- d) transport to the Site, and
- e) erection on the bridge deck.

Item 72181 Electrical conduit in [kerbs | parapets | footway], [diameter] mm diameter

Item 72182 Flexible electrical conduit in [kerbs | parapets | footway], [diameter] mm diameter

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 conduit
- c) installation of conduit
- d) support of conduit during placement of concrete or stabilised sand, and
- e) installation of draw rope.

Item 72183 Lamp standard 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 lamp standard bracket
- c) hot-dipped galvanising of lamp standard bracket, and
- d) installation of lamp standard bracket.

Item 72184 Navigation markers

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 steel and/or aluminium components
- d) hot-dipped galvanising of mild steel components
- e) coating of navigation marker plate with appropriate material and colour
- f) casting in or drilling and installing anchor bolts
- g) installation of navigation marker
- h) supply and installation of luminaire and fittings
- i) supply and installation of connecting electrical conduit, and
- j) supply and installation of electrical cable from nearest junction pit.

Item 72185 Telecommunications conduit in [kerbs | parapets | footway], [diameter] mm diameter

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 conduit
- c) installation of conduit
- d) support of conduit during placement of concrete or stabilised sand, and
- e) installation of draw rope.

2.3 Calculation of quantities

2.3.1 Concrete

The quantity of concrete shall be calculated in accordance with MRS70 *Concrete*.

2.3.2 Steel Reinforcing Bars

The quantity of steel reinforcing bars shall be calculated in accordance with MRS71 *Reinforcing Steel* or MRS71A *Stainless Steel Reinforcing*, as appropriate.

