

Specification (Measurement)

**Transport and Main Roads Specifications
MRS62 Bridge Substructure**

November 2023



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1 Introduction

This Specification applies to the construction of the substructure of bridges including abutments and piers from foundations to bearing pedestals.

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications*, MRS50 *Specific Quality System Requirements*, MRS62 *Bridge Substructure* 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
Bridge Substructure		
70301	Concrete Class [<i>compressive strength</i>] MPa/20 in pier footing	m ³
70302	Concrete Class [<i>compressive strength</i>] MPa/20 in pier pile cap	m ³
70303	Concrete Class [<i>compressive strength</i>] MPa/20 in pier above [<i>cast-in-place pile footing pile cap</i>]	m ³
70304	Concrete Class [<i>compressive strength</i>] MPa/20 in pier headstock	m ³
70305	Concrete Class [<i>compressive strength</i>] MPa/10 in pier pedestal	each
70306	Concrete Class [<i>compressive strength</i>] MPa/20 in abutment footing	m ³
70307	Concrete Class [<i>compressive strength</i>] MPa/20 in abutment pile cap	m ³
70308	Concrete Class [<i>compressive strength</i>] MPa/20 in abutment above [<i>cast-in-place pile footing pile cap</i>] excluding parapet terminal	m ³
70309	Concrete Class [<i>compressive strength</i>] MPa/20 in abutment headstock excluding parapet terminal but including wingwalls	m ³
70310	Concrete Class [<i>compressive strength</i>] MPa/10 in abutment pedestal	each
70311	Steel reinforcing bars in abutments and piers, including footing, pile cap, headstock, pedestal, restraint blocks, abutment wingwalls, parapet terminals excluding piles	tonne
70312	Precast Concrete Abutment Headstocks, Supply on Site, [<i>depth</i>] mm deep, [<i>length</i>] metres long	each
70313	Precast Concrete Pier Headstocks, Supply on Site, [<i>depth</i>] mm deep, [<i>length</i>] metres long	each
70314	Erection of Precast Concrete Abutment Headstocks [<i>depth</i>] mm deep, [<i>length</i>] metres long	each

Standard Item No.	Description	Unit of Measurement
70315	Erection of Precast Concrete Pier Headstocks [<i>depth</i>] mm deep, [<i>length</i>] metres long	each
70316	Concrete Class [<i>compressive strength</i>] MPa/20 in abutment and pier girder restraint blocks including dowels but exclude rubber spacers and cap	each

Standard Work Items for associated work are included in the following Technical Specifications:

- a) MRS03 *Drainage, Retaining Structures and Protective Treatments*
- b) MRS04 *General Earthworks*
- c) MRS63 *Cast-In-Place Piles*
- d) MRS65 *Precast Prestressed Concrete Piles*
- e) MRS66 *Driven Steel Piles*
- f) MRS68 *Dynamic Testing of Piles*
- g) MRS70 *Concrete*
- h) MRS71 *Reinforcing Steel*, and
- i) MRS83 *Anti-Graffiti Protection*.

2.2 Work Operations

- Item 70301** Concrete Class [*compressive strength*] MPa/20 in pier footing
- Item 70302** Concrete Class [*compressive strength*] MPa/20 in pier pile cap
- Item 70303** Concrete Class [*compressive strength*] MPa/20 in pier above [*cast-in-place pile | footing | pile cap*]
- Item 70304** Concrete Class [*compressive strength*] MPa/20 in pier headstock
- Item 70305** Concrete Class [*compressive strength*] MPa/10 in pier pedestal
- Item 70306** Concrete Class [*compressive strength*] MPa/20 in abutment footing
- Item 70307** Concrete Class [*compressive strength*] MPa/20 in abutment pile cap
- Item 70308** Concrete Class [*compressive strength*] MPa/20 in abutment above [*cast-in-place pile | footing | pile cap*] excluding parapet terminal
- Item 70309** Concrete Class [*compressive strength*] MPa/20 in abutment headstock excluding parapet terminal but including wingwalls
- Item 70310** Concrete Class [*compressive strength*] MPa/10 in abutment pedestal

Work Operations included in the above item 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

- e) placing and compacting concrete
- f) finishing and curing concrete
- g) removal of formwork and falsework
- h) dressing of concrete
- i) fillers and sealants, unless measured separately, and
- j) Embedded and attached items, unless measured separately.

Item 70311 Steel reinforcing bars in abutments and piers, including footing, pile cap, headstock, pedestal, restraint blocks, abutment wingwalls, parapet terminals excluding piles

Work Operations included in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply of all materials, and
- c) fixing reinforcing steel in place.

Item 70312 Precast Concrete Abutment Headstocks, Supply on Site, [depth] mm deep, [length] metres long

Item 70313 Precast Concrete Pier Headstocks, Supply on Site, [depth] mm deep, [length] metres long

Work Operations incorporated in the above item includes:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply all construction materials
- c) manufacture of precast concrete headstocks
- d) transport to Site, and
- e) storage at the Site.

Item 70314 Erection of Precast Concrete Abutment Headstocks [depth] mm deep, [length] metres long

Work Operations incorporated in the above item includes:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) provision of blinding concrete under the abutment headstock
- c) lifting the precast concrete headstock and placing in final position, and
- d) infilling the block-out voids with concrete.

Item 70315 Erection of Precast Concrete Pier Headstocks [depth] mm deep, [length] metres long

Work Operations incorporated in the above item includes:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply all construction materials

- c) design and fabrication of headstock support frame
- d) attach the headstock support frame to the steel columns
- e) provision of plywood panel and sealing the gap around steel pile
- f) lifting the precast headstock and placing in final position
- g) infilling the block-outs in headstocks with concrete, and
- h) removal of headstock support frame.

Item 70316 Concrete Class [*compressive strength*] MPa/20 in abutment and pier girder restraint block including dowels but exclude rubber spacers and cap

Work Operations incorporated in the above item includes:

- 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
- e) placing and compacting concrete
- f) supply and install dowels
- g) finishing and curing concrete
- h) removal of formwork and falsework
- i) dressing of concrete
- j) fillers and sealants, unless measured separately, and
- k) Embedded and attached items, unless measured separately.

2.3 Calculation of quantities

2.3.1 Concrete

The quantity of concrete shall be calculated in accordance with Clause 2 of MRS70 *Concrete*.

2.3.2 Steel reinforcing bar

The quantity of steel reinforcing bars shall be calculated in accordance with Clause 2 of MRS71 *Reinforcing Steel* and Clause 2 of MRS71A *Reinforcing Stainless Steel*.

