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Specification (Measurement)

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

July 2017

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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</i> <i>footing</i> <i>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</i> <i>footing</i> <i>pile cap</i>] excluding parapet terminal	m ³
70309	Concrete Class [<i>compressive strength</i>] MPa/20 in abutment headstock excluding parapet terminal	m ³
70310	Concrete Class [<i>compressive strength</i>] MPa/10 in abutment pedestal	each
70311	Steel reinforcing bar in abutments including parapet terminals and piers	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
70315	Erection of Precast Concrete Pier Headstocks [<i>depth</i>] mm deep, [<i>length</i>] metres long	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 [<i>compressive strength</i>] MPa/20 in pier footing
Item 70302	Concrete Class [<i>compressive strength</i>] MPa/20 in pier pile cap
Item 70303	Concrete Class [<i>compressive strength</i>] MPa/20 in pier above [<i>cast-in-place pile footing pile cap</i>]
Item 70304	Concrete Class [<i>compressive strength</i>] MPa/20 in pier headstock
Item 70305	Concrete Class [<i>compressive strength</i>] MPa/10 in pier pedestal
Item 70306	Concrete Class [<i>compressive strength</i>] MPa/20 in abutment footing
Item 70307	Concrete Class [<i>compressive strength</i>] MPa/20 in abutment pile cap
Item 70308	Concrete Class [<i>compressive strength</i>] MPa/20 in abutment above [<i>cast-in-place pile footing pile cap</i>] excluding parapet terminal
Item 70309	Concrete Class [<i>compressive strength</i>] MPa/20 in abutment headstock excluding parapet terminal
Item 70310	Concrete Class [<i>compressive strength</i>] 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 bar in abutments including parapet terminals and piers

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 Standard 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 Standard 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 Standard 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.

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*.

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