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**Specification (Measurement)**

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

**April 2016**

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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*, MRS62 *Bridge Substructure* and other Specifications and standards as appropriate, and the quality system requirements of the Contract.

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 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 Work Item No.     | Description                                                                                                                                                         | Unit of Measurement |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| <b>Bridge Substructure</b> |                                                                                                                                                                     |                     |
| 7301                       | Concrete Class [ <i>compressive strength</i> ] MPa/20 in pier footing                                                                                               | m <sup>3</sup>      |
| 7302                       | Concrete Class [ <i>compressive strength</i> ] MPa/20 in pier pile cap                                                                                              | m <sup>3</sup>      |
| 7303                       | 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 <sup>3</sup>      |
| 7304                       | Concrete Class [ <i>compressive strength</i> ] MPa/20 in pier headstock                                                                                             | m <sup>3</sup>      |
| 7305                       | Concrete Class [ <i>compressive strength</i> ] MPa/10 in pier pedestal                                                                                              | each                |
| 7311                       | Concrete Class [ <i>compressive strength</i> ] MPa/20 in abutment footing                                                                                           | m <sup>3</sup>      |
| 7312                       | Concrete Class [ <i>compressive strength</i> ] MPa/20 in abutment pile cap                                                                                          | m <sup>3</sup>      |
| 7313                       | 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 <sup>3</sup>      |
| 7314                       | Concrete Class [ <i>compressive strength</i> ] MPa/20 in abutment headstock excluding parapet terminal                                                              | m <sup>3</sup>      |
| 7315                       | Concrete Class [ <i>compressive strength</i> ] MPa/10 in abutment pedestal                                                                                          | each                |
| 7321                       | Steel reinforcing bar in abutments including parapet terminals and piers                                                                                            | tonne               |
| 7322                       | Precast Concrete Abutment Headstocks, Supply on Site, [ <i>depth</i> ] mm deep, [ <i>length</i> ] metres long                                                       | each                |
| 7323                       | Precast Concrete Pier Headstocks, Supply on Site, [ <i>depth</i> ] mm deep, [ <i>length</i> ] metres long                                                           | each                |
| 7324                       | Erection of Precast Concrete Abutment Headstocks [ <i>depth</i> ] mm deep, [ <i>length</i> ] metres long                                                            | each                |
| 7325                       | 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**

|                  |                                                                                                                                                          |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Item 7301</b> | <b>Concrete Class [<i>compressive strength</i>] MPa/20 in pier footing</b>                                                                               |
| <b>Item 7302</b> | <b>Concrete Class [<i>compressive strength</i>] MPa/20 in pier pile cap</b>                                                                              |
| <b>Item 7303</b> | <b>Concrete Class [<i>compressive strength</i>] MPa/20 in pier above [<i>cast-in-place pile   footing   pile cap</i>]</b>                                |
| <b>Item 7304</b> | <b>Concrete Class [<i>compressive strength</i>] MPa/20 in pier headstock</b>                                                                             |
| <b>Item 7305</b> | <b>Concrete Class [<i>compressive strength</i>] MPa/10 in pier pedestal</b>                                                                              |
| <b>Item 7311</b> | <b>Concrete Class [<i>compressive strength</i>] MPa/20 in abutment footing</b>                                                                           |
| <b>Item 7312</b> | <b>Concrete Class [<i>compressive strength</i>] MPa/20 in abutment pile cap</b>                                                                          |
| <b>Item 7313</b> | <b>Concrete Class [<i>compressive strength</i>] MPa/20 in abutment above [<i>cast-in-place pile   footing   pile cap</i>] excluding parapet terminal</b> |
| <b>Item 7314</b> | <b>Concrete Class [<i>compressive strength</i>] MPa/20 in abutment headstock excluding parapet terminal</b>                                              |
| <b>Item 7315</b> | <b>Concrete Class [<i>compressive strength</i>] MPa/10 in abutment pedestal</b>                                                                          |

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 7321 Steel reinforcing bar in abutments including parapet terminals and piers**

- a) Work Operations included in the above item include:
- b) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- c) supply of all materials, and
- d) fixing reinforcing steel in place.

**Item 7322 Precast Concrete Abutment Headstocks, Supply on Site, [depth] mm deep, [length] metres long**

**Item 7323 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 2.2.5 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 7324 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 2.2.5 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 7325 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 2.2.5 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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