

Superseded

**Specification (Measurement)**

**Transport and Main Roads Specifications  
MRS300 Boat Ramps**

**July 2017**

Superseded

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## 1 Introduction

This Specification applies to the construction of recreational boat ramps.

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 of MRS01 *Introduction to Specifications*, the Standard Work Items incorporated in this Specification are listed in Table 2.1.

**Table 2.1 – Standard Work Items**

Standard Item No	Description	Unit of Measurement
<b>Boat Ramps</b>		
77101	Preparation and implementation of the Construction Plan	lump sum
77102	Establishment of plant and equipment (with exception of the piling equipment for floating walkway works)	lump sum
77103	Grubbing and clearing	lump sum
77104	Removal and disposal of existing ramp components, carpark components and/or furniture	lump sum
77105	Relocation of ramp or street furniture	lump sum
77106	Relocation of existing services	lump sum
77107	Excavate, trim and dispose of spoil	m <sup>3</sup>
77108	Treatment (PASS / ASS) of spoil	m <sup>3</sup>
77109	Supply and place geotextile	m <sup>2</sup>
77110	Supply and place geogrid	m <sup>2</sup>
77111	Supply and place 75 mm (nominal) crushed rock for ramp core and ungrouted shoulders	tonne
77112	Construct cast insitu concrete slabs and/or anchor beams Type 1	lump sum
77113	Supply and place precast plank [ <i>insert type</i> ]	each
77114	Supply and place precast plank special	each
77115	Supply and install Anchor Beams Type 2	each
77116	Core and modify existing boat ramp lane for floating walkway support lane (including abutment construction)	lump sum
77117	Construct floating walkway support lane – approach slab and abutment, ramp slab and precast planks	lump sum
77118	Supply and place retroreflective raised pavement markers	each
77119	Construct fully grouted shoulders	m <sup>3</sup>
77120	Miscellaneous civil works	lump sum

Standard Item No	Description	Unit of Measurement
<b>Boat Ramps</b>		
77121	Supply and install boat ramp information signs	lump sum
77122	As-constructed survey and handover documents	lump sum

## 2.2 Work Operations

### Item 77101 Preparation and implementation of the Construction Plan

Work Operations incorporated in the above item include:

- Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- preparation of the EMP (C), Safety Plan and Works Program
- amendments of the Safety Plan as advised by the Safety Officer to be deemed acceptable
- amendments of the EMP (C) and Works Program
- revision of the Works Program during construction to reflect the as progressed program, and
- monitoring, implementation and revision of the Safety Plan during construction activities.

### Item 77102 Establishment of plant and equipment (with exception of the piling equipment for floating walkway works)

Work Operations incorporated in the above item include:

- Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- transport to site and preparation of all plant and equipment with the exception of piling plant and equipment required for floating walkways
- establishment of a site compound if required
- supply and installation of signage required by approvals and permits
- establishment of traffic control (if required) and worksite delineation
- removal of the site compound, temporary set outs and signage as required by the permits and approvals, and
- repair or reinstatement of damage caused by the Contractor's operations.

### Item 77103 Grubbing and clearing

Work Operations incorporated in the above item include:

- Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- delineating limits of clearing
- removing trees and plants within the delineated area for clearing
- removing stumps and roots to a minimum 300 mm below ground surface
- other vegetation trimming or removal shown on Standard Drawings or in the Specification Annexure, and
- offsite disposal of grubbed and cleared vegetation.

**Item 77104      Removal and disposal of existing ramp components, carpark components and/or furniture**

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) identification, marking and set-out of components and items to be removed and disposed
- c) concrete or pavement sawcutting as required
- d) excavation as required
- e) management of stockpiles prior to removal from site, and
- f) removal from site and disposal.

**Item 77105      Relocation of ramp or street furniture**

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) identification, marking and set-out of components and items to be relocated
- c) concrete or pavement sawcutting as required
- d) disassembly as required
- e) excavation for removal and reinstallation as required
- f) secure and safe storage
- g) footing construction in accordance with relevant Standard Drawings, specifications or industry practice, and
- h) reassembly.

**Item 77106      Relocation of existing services**

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) identification and marking of components and items to be relocated
- c) disassembly and cable termination as required (for electrical services)
- d) disconnection and temporary termination (for non-electrical services)
- e) concrete or pavement saw-cutting and excavation as required for removal and reinstallation
- f) secure and safe storage
- g) set-out and footing construction in accordance with relevant Standard Drawings, specifications or industry practice
- h) reassembly and new connections as required, and
- i) certification of testing and compliance in accordance with s227 of the Electrical Safety Regulation 2013 (for electrical services).

**Item 77107      Excavate, trim and dispose of spoil**

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) survey and set-out of lines and levels
- c) excavate for ramp core and shoulder footings as required, and
- d) transport and disposal at the approved disposal site.

**Item 77108      Treatment (PASS / ASS) of spoil**

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 the treatment area
- c) transport not included in Item 77007 above
- d) supply of lime at the nominated rate and mechanical mixing, and
- e) decommissioning the treatment area.

**Item 77109      Supply and place geotextile**

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 geotextile including allowance for lapping, and
- c) installation (including lapping, joining and trimming).

**Item 77110      Supply and place geogrid**

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 geogrid including allowance for lapping, and
- c) Installation (including lapping, braiding, joining and trimming).

**Item 77111      Supply and place 75 mm (nominal) crushed rock for ramp core and ungrouted shoulders**

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 75 mm (nominal) crushed rock
- c) placement in layers and compaction to lines and levels as required for contained rock, and
- d) placement as required for uncompacted, uncontained shoulder rock.

**Item 77112 Construct cast insitu concrete slabs and/or anchor beams Type 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 and placement of 10 mm blinding layer
- c) supply and placement of 0.2 mm membrane
- d) supply and placement of galvanised reinforcement and stainless steel link bars
- e) supply and placement of formwork
- f) supply and placement of construction joint materials
- g) supply, placement and compaction of concrete
- h) supply and application of curing compounds, and
- i) stripping of formwork.

**Item 77113 Supply and place precast plank [*insert type*]**

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) quality requirements defined in Clause 5.6 of MRTS72
- c) formwork requirements defined in Clause 10.4.1 of MRTS72
- d) supply and placement of galvanised reinforcement, and stainless steel lifters and link bars
- e) supply, placement and compaction of concrete
- f) supply and application of curing compounds
- g) stripping of formwork
- h) handling and storage requirements
- i) application of post-cast surface
- j) transport to site
- k) handling and installation, and
- l) supply of bolts, nuts, washers, anti-seize compound and tape.

**Item 77114 Supply and place precast plank special**

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) Work operations (b) to (l) in Item 77113.

**Item 77115 Supply and install Anchor Beams Type 2**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Work Operations (b) to (i) for Item 77113



- c) supply and fit stainless steel 20E5 round bars
- d) transport to site
- e) excavate and dispose of spoil for mass concrete beam
- f) supply and place mass concrete anchor
- g) handling and installation, and
- h) supply of bolts, nuts, washers, anti-seize compound and tape.

**Item 77116      Core and modify existing boat ramp lane for floating walkway support lane (including abutment construction)**

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) replacing or modifying existing precast planks as required for piles and abutment
- c) establishment and disestablishment of specialist coring plant not provided in Items 77002 or as part of the floating walkway piling
- d) coring existing ramp slabs as required for placement of floating walkway restraint piles
- e) modifying or replacement of existing planks (if required), and
- f) construction of abutment, abutment approach slab (if required) and abutment bollards.

**Item 77117      Construct floating walkway support lane – approach slab and abutment, ramp slab and precast planks**

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) cast insitu concrete works including construction of abutment, abutment approach slab (if required), and anchor beam Type 1 or Type 2 and broom finished ramp slab (if required), and
- c) supply and install of precast planks.

Components of the floating walkway support lane beneath the slabs and planks use Standard Work Items for Boat Ramps.

**Item 77118      Supply and place retroreflective raised pavement 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 materials
- c) abrasive preparation and cleaning of concrete surfaces, and
- d) placing raised pavement markers.

**Item 77119 Construct fully grouted shoulders**

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 materials
- c) sorting flat faced rock for surface finish
- d) construction of footings
- e) construction of shoulders and batters to the design levels and details, and
- f) cleaning of stone faces.

**Item 77120 Miscellaneous civil works**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) Work Operations defined in the Annexure.

**Item 77121 Supply and install boat ramp information signs**

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) fabrication of signs
- c) supply of posts, and
- d) excavation for footings, concreting of posts and fitting signs.

**Item 77122 As-constructed survey and handover documents**

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) as-constructed survey, and
- c) delivery of survey files.

**2.3 Calculation of quantities****2.3.1 Item 77101 – Preparation and implementation of the Construction Plan**

This item shall be paid on meeting the performance criteria defined in Table 2.3.1.

**Table 2.3.1 – Preparation and implementation of the Construction Plan**

Amount to be paid for Establishment	Time for Payment
80%	Progress Payment 1 when the requirements for Work Operations (a) to (d) have been fulfilled
Balance	On issue of the Certificate of Practical Completion

### 2.3.2 Item 77102 – Establishment of plant and equipment (with exception of the piling equipment for floating walkway works)

Establishment shall be paid on meeting the performance criteria defined in Table 2.3.2.

**Table 2.3.2 – Establishment of plant and equipment (with exception of the piling equipment for floating walkway works)**

Amount to be paid for Establishment	Time for Payment
50%	Progress Payment 1 when the requirements for Work Operations (a) to (e) have been fulfilled
10%	For each subsequent progress payment until a total of 80% has been reached
Balance	When the requirements of Work Operations (a) and (f) to (g) have been fulfilled

### 2.3.3 Item 77103 – Grubbing and clearing

This shall be paid as a single Item when all of the Work Operations have been completed.

### 2.3.4 Item 77104 – Removal and disposal of existing ramp components, carpark components and/or furniture

This shall be paid as a single Item when all of the Work Operations have been completed.

### 2.3.5 Item 77105 – Relocation of ramp or street furniture

This shall be paid as a single Item when all of the Work Operations have been completed.

### 2.3.6 Item 77106 – Relocation of existing services

**Table 2.3.6 – Relocation of existing services**

Amount to be paid for relocation of existing services	Time for Payment
20%	Removal of existing services - when the requirements for Work Operations (a) to (f) have been fulfilled
Balance	Re-installation of services - when the requirements of Work Operations (g) to (i) have been fulfilled

### 2.3.7 Item 77107 – Excavate, trim and dispose of spoil

The scheduled volume is the design excavated volume calculated using a TIN Terrain Modelling System. The volume for payment is compacted insitu material and the tendered rates include a tolerance of 10% extra material. Extra quantity above the design volume (plus tolerance) shall only be approved where:

- the design excavated volume is incorrect, and
- extra excavation is ordered during construction.

Extra quantity shall not be approved for removal of unsuitable material or removal of material for the Contractor's convenience to suit the construction methodology.

Where dispute arises, the as-constructed survey may be used to calculate volume of cut with an allowance for constructed surfaces not exceeding the design thicknesses.

### **2.3.8 Item 77108 – Treatment (PASS / ASS) of spoil**

Unless noted otherwise, calculation of volumes for Item 77107 shall be used for this Item.

### **2.3.9 Item 77109 – Supply and place geotextile**

The scheduled area is the design calculated area. The tendered rate includes the allowance for lapping and a tolerance of 10% extra material. Extra quantity above the design area (plus tolerance) shall only be approved where:

- the design area is incorrect, and
- extra material is ordered during construction.

Extra quantity shall not be approved for inefficient use of material or material for the Contractor's convenience to suit the construction methodology.

### **2.3.10 Item 77110 – Supply and place geogrid**

The scheduled area is the design calculated area. The tendered rate includes the allowance for lapping and a tolerance of 10% extra material. Extra quantity above the design area (plus tolerance) shall only be approved where:

- the design area is incorrect, and
- extra material is ordered during construction.

Extra quantity shall not be approved for inefficient use of material or material for the Contractor's convenience to suit the construction methodology.

### **2.3.11 Item 77111 – Supply and place 75 mm (nominal) crushed rock for ramp core and shoulders**

The scheduled quantity is the design volume at an assumed relative density of two.

The tendered rates include an allowance for 10% extra material. Extra quantity above the design quantity (plus tolerance) shall only be approved where:

- the increase is due to consolidation of base material.

Extra quantity shall not be approved for over-excavation, removal of unsuitable material or removal of material for the Contractor's convenience to suit the construction methodology.

Where agreed, extra quantity will be assessed on weighbridge dockets.

### **2.3.12 Item 77112 – Construct cast insitu concrete slabs and/or anchor beams Type 1**

This shall be paid as a single Item when all of the Work Operations have been completed.

**2.3.13 Item 77113 – Supply and place precast plank [insert type]****Table 2.3.13 – Supply and place precast plank [insert type]**

<b>Amount to be paid for Supply and Installation of Precast Planks</b>	<b>Time for Payment</b>
70%	Fabricated offsite - when the requirements for Work Operations (a) to (i) have been fulfilled.
10%	Transported to site but not incorporated into the Works – Work Operation (j)
Balance	Incorporated into the Works – Work Operations (k) to (l)

Items not incorporated into the Works shall only be paid if supported by the additional security requirements.

**2.3.14 Item 77114 – Supply and place precast plank special****Table 2.3.14 – Supply and place precast plank special**

<b>Amount to be paid for Supply and Installation of Precast Planks.</b>	<b>Time for Payment</b>
70%	Fabricated offsite - when the requirements for Work Operations (a) to (i) have been fulfilled.
10%	Transported to site but not incorporated into the Works – Work Operation (j)
Balance	Incorporated into the Works – Work Operations (k) to (l)

Items not incorporated into the Works shall only be paid if supported by the additional security requirements.

**2.3.15 Item 8825 – Supply and install Anchor Beams Type 2****Table 2.3.15 – Supply and install Anchor Beams Type 2**

<b>Amount to be paid for Supply and Installation of Anchor Beams Type 2.</b>	<b>Time for Payment</b>
60%	Fabricated offsite - when the requirements for Work Operations (a) to (c) have been fulfilled
10%	Transported to site but not incorporated into the Works – Work Operation (d)
Balance	Incorporated into the Works – Work Operations (e) to (h)

Items not incorporated into the Works shall only be paid if supported by the additional security requirements.

**2.3.16 Item 77116 – Core and modify existing boat ramp lane for floating walkway support lane (including abutment construction)**

This Item shall be paid as a single Item when all of the Work Operations have been completed.

**2.3.17 Item 77117 – Construct floating walkway support lane – approach slab and abutment, ramp slab and precast planks**

This Item shall be paid on meeting the performance criteria defined in Table 2.3.17 below.

**Table 2.3.17 – Construct floating walkway support lane – approach slab and abutment, ramp slab and precast planks**

Amount to be paid	Time for Payment
30%	On completion of abutment, approach slab, ramp slab and anchor beam in Work Operations (b)
70%	Remainder of floating walkway support lane (precast planks) below the anchor beam – Work Operations (c)

Precast planks that are onsite but not incorporated into the Works can be claimed for 50% of the pro-rata planked length below the anchor beam, subject to the additional security requirements.

**2.3.18 Item 77118 – Supply and place retroreflective raised pavement markers**

This item shall be paid in a single progress payment when all of the pavement markers have been installed.

**2.3.19 Item 77119 – Construct fully grouted shoulders**

The scheduled volume is the design volume calculated at the design thickness. The tendered rates include an allowance for 10% extra material. Extra quantity above the design volume (plus tolerance) shall only be approved where:

- the design volume is incorrect, and
- extra length of stone pitching is ordered during construction.

The volume payable for extra stone pitching shall be calculated using the lesser of:

- the design thickness of 400 mm, and
- the as-constructed thickness.

**2.3.20 Item 77120 – Miscellaneous civil works**

This shall be paid as a single Item when all of the Work Operations defined in the Annexure have been completed.

**2.3.21 Item 77121 – Supply and install boat ramp information signs**

This shall be paid as a single Item when all of the Work Operations have been completed.

**2.3.22 Item 77122 – As-constructed survey and handover documents**

This shall be paid as a single Item when all of the Work Operations have been completed.

Superseded