

Specification (Measurement)

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

March 2024

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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
Boat Ramps		
77101	Preparation and implementation of the Contract Plan	lump sum
77102	Establishment of plant and equipment (excluding floating walkway piling equipment)	lump sum
77103	Clearing and grubbing	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 ³
77108	Treatment (PASS / ASS) of spoil	m ³
77109	Supply and place geotextile	m ²
77110	Supply and place geogrid	m ²
77111	Supply and place 75 mm (nominal) crushed rock for ramp core	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
77115	Install Anchor Beams Type	each
77116	Works - modify an existing boat ramp lane to a 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 ³
77121	Supply and install boat ramp information signs	lump sum
77122	As constructed survey and handover documents	lump sum

Standard Item No	Description	Unit of Measurement
77123	Supply and place rock [<i>nominal d50, d85, mass</i>] for [<i>location</i>]	tonne
77124	Ramp toe scour protection	lump sum
77125	Painted markings	lump sum

2.2 Work Operations

Item 77101 Preparation and implementation of the Contract Plan

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 Contract Plan
- c) amendments of the Contract Plan elements to be deemed suitable, and
- d) monitoring, implementation, and revision of the Contract Plan during construction activities.

Item 77102 Establishment of plant and equipment (excluding floating walkway piling equipment)

Work Operations incorporated in the above item include:

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

Item 77103 Clearing and grubbing

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) delineating limits of clearing
- c) removing trees and plants within the delineated area for clearing
- d) removing stumps and roots to a minimum 300 mm below ground surface
- e) other vegetation trimming or removal shown on Standard Drawings or in the Specification Annexure, and
- f) 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 sawcutting 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) intermediate transport to and from the treatment area prior to disposal included in another Item
- d) supply of lime at the nominated rate and mechanical mixing
- e) verification of treatment, and
- f) 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

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) supply of compaction equipment (if required)
- d) placement in layers to lines and levels as required, and
- e) compaction in layers (if required).

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 (where required)
- 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
- i) stripping of formwork, and
- j) supply of concreting quality records.

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

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 planks by a registered supplier as defined in MRTS72 *Manufacture of Precast Concrete Elements*
- c) supply and fit stainless steel 20E5 round bars to planks designated as Type 2 Anchor beam planks
- d) transport to site
- e) supply of bolts, nuts, washers, anti-seize compound and tape
- f) handling and installation, and
- g) grouting of all bolt recesses.

Item 77115 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) excavate and dispose of spoil for mass concrete beam
- c) supply and place mass concrete anchor
- d) handling and installation
- e) supply of bolts, nuts, washers, anti-seize compound and tape, and
- f) grouting of all bolt recesses.

Item 77116 Works - modify an existing boat ramp lane to a 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) Supply of special planks by a registered supplier as defined in MRTS72 *Manufacture of Precast Concrete Elements*, for pile and abutment locations, or
- c) Removal of existing planks, sawcutting to length, epoxy treatment and curing
- d) establishment and disestablishment of specialist coring plant not provided in Items 77102 or as part of the floating walkway piling
- e) coring existing ramp slabs as required for placement of floating walkway restraint piles
- f) supply of extra materials (link bars, mass concrete infill and other items as required)
- g) supply of bolts, nuts, washers, anti-seize compound and tape
- h) handling and installation of planks
- i) grouting of all bolt recesses
- j) install of mass concrete infills, and
- k) 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 the following as appropriate for precast planks:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Supply of standard planks and special planks at pile locations by a registered supplier as defined in MRTS72 *Manufacture of Precast Concrete Elements*
- c) transport to site
- d) supply of bolts, nuts, washers, anti-seize compound and tape
- e) handling and installation, and
- f) grouting of all bolt recesses.

Work Operations incorporated in the above item include the following as appropriate for cast insitu concrete:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) Supply of reinforcement by a registered supplier as defined in MRTS71 *Reinforcing Steel*, and supply of SS Grade 316 link bars and construction joint materials
- c) supply and placement of formwork
- d) supply, placement, and compaction of concrete
- e) supply and application of curing compounds

- f) stripping of formwork, and
- g) Supply of concreting quality records.

This Work Item applies only to the concrete components. These earthworks below the concrete components of the floating walkway support lane are included in the Standard Work Items for Boat Ramps:

- excavation
- geogrid and geotextile, and
- crushed rock core.

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 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.

Item 77123 Supply and place rock [nominal d50, d85, mass] for [location]

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 designated rock, and
- c) placement to lines and levels.

Item 77124 Ramp toe scour protection

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications, and*
- b) supply of materials, plant and specialist labour for installation.

Item 77125 Painted markings

Work Operations incorporated in the above item include:

- a) Work operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) pressure cleaning surfaces of cast insitu concrete slabs
- c) blower cleaning of other surfaces, and
- d) supply of materials and labour for application of painted markings.

2.3 Calculation of quantities

2.3.1 Preparation and implementation of the Contract Plan

Item 77101 shall be paid on meeting the performance criteria defined in Table 2.3.1.

Table 2.3.1 – Preparation and implementation of the Contract 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 Establishment of plant and equipment (excluding floating walkway piling equipment)

Item 77102 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 Clearing and grubbing

Item 77103 shall be paid as a single item when all Work Operations have been completed.

2.3.4 Removal and disposal of existing ramp components, carpark components and/or furniture

Item 77104 shall be paid as a single item when all Work Operations have been completed.

2.3.5 Relocation of ramp or street furniture

Item 77105 shall be paid as a single item when all Work Operations have been completed.

2.3.6 Relocation of existing services

Item 77106 shall be paid on meeting the performance criteria defined in Table 2.3.6.

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 Excavate, trim and dispose of spoil

For Item 77107 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 Treatment (PASS / ASS) of spoil

Unless noted otherwise, calculation of volumes for Item 77107 shall be used for Item 77108.

2.3.9 Supply and place geotextile

For Item 77109 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 Supply and place geogrid

For Item 77110 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 Supply and place 75 mm (nominal) crushed rock for ramp core

For Item 77111 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 Construct cast insitu concrete slabs and/or anchor beams Type 1

Item 77112 shall be paid on meeting the performance criteria defined in Table 2.3.12.

Table 2.3.12 – Construct cast insitu concrete slabs and/or anchor beams Type 1

Amount to be paid for Construct cast insitu concrete slabs and/or anchor beams Type 1	Time for Payment
80%	Completion of concrete pour - when the requirements for Work Operations (a) to (i) have been fulfilled.
20%	Supply of approved quality records - Work Operation (j)

This shall be paid as a single item when all Work Operations have been completed.

2.3.13 Supply and place precast plank [insert type]

Item 77113 shall be paid on meeting the performance criteria defined in Table 2.3.13.

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

Amount to be paid for Supply and Installation of Precast Planks	Time for Payment
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 Install Anchor Beams Type 2

Item 77115 shall be paid as a single item when all Work Operations have been completed.

2.3.15 Works - modify an existing boat ramp lane to a floating walkway support lane (including abutment construction)

Item 77116 shall be paid as a single item when all Work Operations have been completed.

2.3.16 Construct floating walkway support lane – approach slab and abutment, ramp slab and precast planks

Item 77117 shall be paid on meeting the performance criteria defined in Table 2.3.16 below.

Table 2.3.16 – 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.

2.3.17 Supply and place retroreflective raised pavement markers

Item 77118 shall be paid in a single progress payment when all pavement markers have been installed.

2.3.18 Construct fully grouted shoulders

For Item 77119 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.

2.3.19 Supply and install boat ramp information signs

Item 77121 shall be paid as a single item when all Work Operations have been completed.

2.3.20 As constructed survey and handover documents

Item 77122 shall be paid as a single item when all Work Operations have been completed.

2.3.21 Supply and place rock [*nominal d50, d85, mass*] for [*location*]

Item 77123 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.

2.3.22 Ramp toe scour protection

Item 77124 shall be paid as a single item when all Work Operations have been completed.

2.3.23 Painted markings

Item 77125 shall be paid as a single item when all Work Operations have been completed.

