

**Technical Specification**

**Transport and Main Roads Specification  
MRTS302 Fabrication and Construction of pontoons**

**July 2017**

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## 1 Introduction

This Technical Specification applies to the fabrication and construction of pontoons adjacent to boat ramps that are used for launching and retrieval of recreational trailer boats.

This Technical Specification shall be read in conjunction with MRTS01 *Introduction to Technical Specifications*, MRTS50 *Specific Quality System Requirements* and other Technical Specifications as appropriate.

This Technical Specification shall be read in conjunction with:

- *Design Manual for Floating Walkways and Pontoons*

This Technical Specification forms part of the Transport and Main Roads Specifications Manual.

This Technical Specification is not to be used for the fabrication and construction of pontoons used for public transport.

## 2 Definition of terms

**Table 2 – Definition of terms applicable to fabrication and construction of pontoons**

| Term          | Definition  |
|---------------|---|
| Design Manual | Design Criteria for Floating Walkways and Pontoons  |
| EMP (C)       | The Environmental Management Plan (Construction) prepared by the Contractor   |
| EMP (MP)      | The Environmental Management Plan (Marine Planning) prepared by the Principal for obtaining approvals and attached as a contract document |
| Pontoon       | A pontoon system that floats at all times, is separated from a boat ramp and needs a hinged gangway for access                            |
| RHM           | Regional Harbour Master (for the watercourse)   |
| Safety Plan   | A Work Health and Safety Management Plan in accordance with the <i>Work Health and Safety Act 2011</i>                                    |

## 3 Referenced documents

**Table 3 – Referenced documents**

| Reference            | Title   |
|----------------------|---|
| AS/NZS 1554.1:2014   | <i>Structural steel welding – Welding of steel structures</i> |
| AS/NZS ISO 9001:2008 | <i>Quality management systems – Requirements</i>              |
| Design Manual        | <i>Design Criteria for Floating Walkways and Pontoons</i>     |
| MRTS70               | <i>Concrete</i>   |
| MRTS78               | <i>Fabrication of Structural Steelwork</i>                    |
| MRTS79               | <i>Fabrication of Aluminium Components</i>                    |
| -                    | <i>Maintenance Services Manual</i>                            |

## 4 Quality system requirements

### 4.1 Hold Points, Witness Points and Milestones

General requirements for Hold Points, Witness Points and Milestones are specified in Clause 5.2 of MRTS01 *Introduction to Technical Specifications*.

The Hold Points, Witness Points and Milestones applicable to this Technical Specification are summarised in Table 4.1.

**Table 4.1 – Hold Points and Milestones**

| Clause | Hold Point                                       | Witness Point   | Milestone                           |
|--------|--|---|-------------------------------------|
| 5      | 1. Approval of design                            |   |                                     |
| 6.2    |  |   | Construction Plan                   |
| 6.4    | 2. Possession of Site                            |   |                                     |
| 6.6    | 3. Start of works                                |   |                                     |
| 7.3    | 4. Splicing of piles                             |   |                                     |
| 8.6    |  |   | Permanent pile marking band         |
| 10     | 5. Placement of concrete (for flotation modules) | 1. Concrete to be placed in the presence of the inspector |                                     |
| 11.2   | 6. Concrete design mix                           |   | Time for approval of the mix design |
| 11.3   | 7. Placement of concrete                         | 2. Concrete to be placed in the presence of the inspector |                                     |
| 13     |  |   | Supply of Handover Document         |

### 4.2 Manufacture by quality certified supplier

The major components of the pontoon shall be manufactured by a single supplier operating an AS/NZS ISO 9001 quality management system certified by a JAS-ANZ accredited certifier. The major components include:

- steel piling
- flotation modules, and
- fabricated aluminium and stainless steel components.

## 5 Design of pontoons

The pontoon shall be designed in accordance with the Design Manual. Fabrication of the pontoon shall not commence until the Design Drawings and Design Report have been reviewed and approved.

### **Hold Point 1**

## 6 Site Establishment

### 6.1 Scope of Works and extent of Contract

The scope of Works is defined in Clause 1 of Annexure MRTS302.1.

The Contract includes the supply of all plant, labour and materials necessary to complete the Works in accordance with the Particular and General Conditions of Contract, this Technical Specification, and the following contract documents:

**Table 6.1 – Contract documents**

| Contract document  | Reference   |
|--|---|
| Project specific drawings                                  | Drawings index on the:<br>Site Plan, Locality Plan and Cadastral Plan |
| Standard Drawings  | Drawings index on the:<br>Site Plan, Locality Plan and Cadastral Plan |
| Information Drawings                                       | Clause 2 of Annexure MRTS302.1.                                       |
| Statutory Approvals  |   |
| Geotechnical Investigation                                 |   |
| Environmental Management Plan (Marine Planning) (EMP (MP)) |   |

Information drawings (where provided) were prepared for purposes other than the Contract Works. The currency or accuracy of the information on these drawings has not been confirmed and shall be verified by the Contractor prior to commencing the Works.

### 6.2 Construction Plan

The Contractor shall prepare and submit a Construction Plan for deemed approval prior to awarding Possession of Site. 10 business days shall be allowed for review by the Superintendent, and Extensions of Time (EoT) will not be granted for delays required by amendments. **Milestone**

The Construction Plan includes these elements:

- a) The Safety Plan
- b) The Works Program, and
- c) The Environmental Management Plan (Construction) (EMP (C)).

#### 6.2.1 Safety Plan

The Safety Plan will address the following general hazards related to construction of recreational boating facilities that have been identified in the design process:

- a) undertaking construction activities near publicly accessible areas
- b) working near, in, on or under water
- c) operating plant and machinery
- d) lifting, transporting and handling flotation modules, gangways and piling
- e) slips, trips and falls on wet surfaces or submerged objects

- f) dangerous marine animals (stingers, sharks, stonefish, crocodiles and so on), and
- g) conflict with Site services.

### **6.2.2 Works Program**

The Contractor shall provide a Works Program consistent with:

- a) the allowable working times
- b) tide cycles (when required)
- c) project specific ramp closure constraints or program requirements defined in Clause 3 of Annexure MRTS302.1, and
- d) the Contract duration.

The Works Program shall show:

- a) establishment
- b) Hold Points and Witness Points
- c) major construction activities (where required):
  - removal of existing facilities
  - excavation for abutment
  - cast insitu concrete slabs and abutment
  - driving piles
  - installation of flotation module(s), gangway and deck furniture
  - reinstallation of facilities, and
  - other works.
- d) Anticipated Date of Practical Completion, and
- e) disestablishment.

### **6.2.3 Environmental Management Plan (Construction)**

The Contractor shall amend the Principal's EMP (MP) to reflect its:

- a) project specific equipment and Works Program, and
- b) site practices that will meet the requirements defined in the EMP (MP) and conditions attached to the Statutory Approvals.

Where there are differences between the Principal's EMP (MP) and the Statutory Approvals the higher standard shall apply.

### **6.3 Site of Works**

The Site of Works shall include:

- a) the footprint of the Works shown on the General Arrangement drawing
- b) sufficient area to the sides, top and end of the Works to safely access, operate plant and machinery, and allow a delineation for safety between the Works and publicly accessible areas (subject to time and area constraints defined in Clause 3 of Annexure MRTS302.1)



- c) sufficient area for a fenced site compound
- d) temporary storage areas for construction materials outside the site compound (subject to implementation of a risk assessment defined in Clause 6.5 of this Technical Specification), and
- e) temporary use of unfenced publicly accessible areas during transfer or delivery of materials and plant (subject to implementation of appropriate traffic control defined in Clause 6.8 of this Technical Specification).

#### **6.4 Possession of Site**

Further to Clause 27.1 of the General Conditions of Contract, the Contractor shall supply the following deliverables prior to being granted Possession of Site: **Hold Point 2**

- a) security calculated in accordance with the General Conditions of Contract with the value for this project defined in the Letter of Acceptance
- b) WorkCover Certificate of Currency
- c) evidence of insurances required under the Contract (refer to Clause 21 of the General Conditions of Contract) with the values and name of the Principal defined in the Letter of Acceptance, and
- d) Construction Plan (including Works Program and Construction Safety Plan).

Establishment to Site (including preparation of the site compound) shall not commence prior to being granted Possession of Site.

#### **6.5 Site compound**

The site compound includes the Contractor's site facilities and fencing to delineate the work area from publicly accessible areas.

The Contractor shall make its own arrangements with the relevant managing authority for a site compound adjacent to the Works. The site compound shall be:

- a) securely fenced to prevent public access
- b) located to minimise disruption to ramp users and car/trailer parking (if applicable), and
- c) used for unloading and storage of materials for the Works. When materials are unloaded outside the compound, public vehicular and pedestrian traffic is to be controlled to avoid conflict with manoeuvring vehicles and loads.

Construction materials may be stored outside the site compound if:

- a) it is impractical to store the materials inside, and the storage area does not affect the use of facilities, and
- b) a risk assessment has identified and managed related safety hazards.

#### **6.6 Start of Works**

##### **Hold Point 3**

Onsite Works shall not commence until all of the following activities have been completed:

- a) environmental management controls have been implemented

- b) notifications required in the Statutory Approvals have been issued with the required timeframes
- c) limits of work areas or limits of clearing (where defined on approvals and permits) have been identified and marked
- d) traffic control (if required) has been implemented and establishment of the site compound is complete
- e) the site compound has been established
- f) other public and worker safety management controls have been installed or implemented, and
- g) services that are part of the Works, may conflict with the Works, or will be hazardous to public or worker safety have been located and marked.

### **6.7 Disposal of waste materials**

Waste materials generated in the course of the Works include:

- a) existing structures requiring to be removed as part of the Contract
- b) packaging of materials used in the Works
- c) surplus construction materials generated or not used in the Works
- d) excavated spoil, and
- e) liquid or solid wastes generated from servicing or maintenance of plant and equipment used in the Works.

Waste materials shall remain or become the responsibility of the Contractor to be appropriately managed and disposed. Appropriate management and disposal includes:

- a) temporary storage that does not create safety or environmental hazards, and
- b) disposing offsite at a place selected by the Contractor that complies with all relevant legislation and local authority requirements.

Payment for management and disposal of waste materials is defined in the Specification MRS302.

### **6.8 Traffic control**

Public vehicular, vessel and pedestrian traffic and construction vehicles, plant and loads shall be controlled where required to avoid conflicts and maintain safe access to existing facilities outside the Site of Works.

For works near existing boat ramps which are to remain in service or partially in service during the Works, the Contractor shall:

- a) delineate the work area from the active boat ramp lanes
- b) leave adequate manoeuvring area for car/trailer units to access the active boat ramp lanes
- c) delineate vessel movements from the Works area with buoys, and
- d) demonstrate that all anchors for any floating controls have been removed at the completion of Works.

## 7 Supply of steel piles

### 7.1 Materials

Steel used in piles shall comply with the requirements defined in Clause 5.2 of the Design Manual.

### 7.2 Dimensional tolerances

Steel piles shall be supplied with the following tolerances defined in Table 7.2.

**Table 7.2 – Dimensional tolerances of piles**

| Parameter                                | Requirement  |
|--|--|
| Lateral bow                              | Less than 0.0007 x gross pile length.                            |
| Minimum length                           | Single (unspliced) gross length as shown on the design Drawings* |
| Squareness at the driven end of the pile | Less than 2 mm from the true cross section                       |

\* Spliced lengths shall be accepted only if the specified gross length exceeds the maximum single length for the section size as supplied by the mill.

### 7.3 Extension to piles (Splicing)

Extensions to piles shall be made as follows:

- a) the extension section shall have a section size and mass per unit length equal to that of the previously driven section
- b) the extension section shall be aligned accurately with the previously driven section of the pile
- c) the joint edges shall be prepared and the sections welded together using full penetration double vee butt welds, all in accordance with AS/NZS 1554.1:2014, and
- d) the welded joint shall be protected with a paint which is compatible with the original coating and applied in accordance with the manufacturer's recommendations.

Driving shall not recommence until the welded splice (including the protection coating) has been inspected and approved by the Administrator. **Hold Point 4**

### 7.4 Application of protective coating

The protective coating shall be applied in accordance with the manufacturer's specification.

Quality control testing shall be undertaken to demonstrate that the required paint thickness has been achieved. The quality control records shall be supplied with the pile driving records.

### 7.5 Handling, transport and site storage

The piles and the painted coatings shall be protected from damage during handling, transport and storage.

Piles shall be stored on flat, even, cleared ground on timber bearers of adequate bearing capacity that ensures they remain straight.

Damage to coatings during handling, transport or storage shall be rectified by the Contractor and approved by the Administrator. **Nonconformance**

Holes for lifting are permitted only in sections of the pile that will be trimmed after driving.

## 8 Driving of steel piles

### 8.1 Tolerances of pitching and driving

Piles shall be located in the positions shown in the drawings, within the following tolerances:

**Table 8.1 – Pile pitching tolerances**

| Parameter  | Requirement   |
|--|---|
| Maximum deviation from the specified rake (vertical) | 1 in 200 or as designated by the designer (whichever is lesser)               |
| Maximum lateral displacement of the pile head        | 50 mm radial (in plan) or as designated by the designer (whichever is lesser) |

If these tolerances are exceeded **Nonconformance**, the remedial actions shall include:

- a) modifying the flotation modules to match the as-driven pile positions, and
- b) extracting and re-driving the piles to the allowable tolerance.

### 8.2 Pile records

The following pile records shall be supplied as part of the quality records with the handover document at Practical Completion:

- a) the date and time of driving
- b) the pile identification number
- c) height of existing surface (reduced to Australian Height Datum (AHD) vertical datum)
- d) type and energy of the hammer
- e) number of blows per 0.5 metre during the entire driving and the number of blows per 25 mm over the last 300 mm of penetration
- f) total penetration in metres
- g) horizontal surveyed position of the pile centreline, and
- h) pile cut-off height (reduced to AHD vertical datum).

### 8.3 Trimming of pile head

Following completion of driving, the pile head shall be trimmed by cutting off the top of the pile to the correct level as shown in the drawings.

### 8.4 Temporary lights for freestanding piles

All freestanding floating walkway restraint piles shall be illuminated and marked so that they are clearly visible after dark from a minimum distance of 100 metres in all of the directions that they could be approached by vessel traffic.

The illumination and marking shall include:

- a) a flashing yellow navigation light
- b) 100 mm (minimum) full circumference band of yellow retroreflective tape, and
- c) any other requirement issued by the Regional Harbour Master (RHM).

### 8.5 Failure to achieve minimum penetration

The Designer shall be consulted where difficulty is encountered in achieving the required minimum penetration.

### 8.6 Permanent marking of piles

All piles shall have a 300 mm wide retroreflective band (3M Scotchlite Diamond Grade Yellow or equivalent) 300 mm below the pilecap.

The band shall be a single piece of sufficient length to allow 100 mm overlap for adhesion to itself.

The permanent band shall replace the temporary band and be fitted the same day that the pile sleeve is driven. **Milestone**

## 9 Fabrication of aluminium components

Fabrication of aluminium components shall comply with MRTS79 *Fabrication of Aluminium Components*. The requirements of Clause 5 (registered fabricator) do not apply.

## 10 Fabrication of flotation modules

Placement of concrete shall comply with Clause 19.1 of MRTS70 *Concrete*. **Hold Point 5**

Concreting shall be undertaken in the presence of the Inspector. **Witness Point 1**

## 11 Concrete for insitu works

### 11.1 General

All concrete supply, placement and curing for insitu works shall be in accordance with MRTS70 *Concrete* with the exception of the clauses defined following.

### 11.2 Concrete design mix

#### **Hold Point 6**

The concrete design mix shall comply with the requirements of MRTS70 *Concrete* and are summarised in Table 11.2.

**Table 11.2 – Design mix for boat ramp slabs and precast elements (planks)**

| Parameter  | Requirement            |
|--|------------------------|
| Items requiring use of registered suppliers and products | Table 1 of MRTS70      |
| Strength grade   | 50 MPa                 |
| Minimum cementitious content                             | 450 kg/m <sup>3</sup>  |
| Maximum water cement ratio                               | 0.4                    |
| Nominal maximum aggregate size                           | 20 mm                  |
| Target slump range                                       | 50 – 150 (cast insitu) |
| 100 – 150 (pumped)                                       |                        |
| Natural sand content of fine aggregates                  | Minimum of 40 %        |

The Contractor shall allow a minimum of 10 business days for approval of the mix design. **Milestone**

### 11.3 Placement of concrete

Placement of concrete shall comply with Clause 19.1 of MRTS70 *Concrete*. **Hold Point 7**

Concreting shall be undertaken in the presence of the Inspector. **Witness Point 2**

### 11.4 Concrete testing

This clause replaces Clauses 13.3.2 and 13.3.3 of MRTS70 *Concrete*.

The sampling frequency per batch is defined in Table 11.4.

**Table 11.4 – Sampling frequencies for 28-day strength**

| Use         | Sampling Frequency                           |
|-------------|--|
| Cast insitu | 1 sample per batch to a maximum of 4 samples |

## 12 Warranty

The pontoon manufacturer shall provide a written three-year warranty for repair or replacement of components caused by defects in materials, workmanship, design and installation originating from events within the defined project specific design loads and intended use and purpose.

## 13 Handover Document

The *Handover Document* shall be submitted within four weeks from the Date of Practical Completion.

### **Milestone**

The *Handover Document* shall include:

- a) the final design report and certified As Constructed Drawings
- b) piling records
- c) paint system quality control records
- d) *Maintenance Service Manual*
- e) Warranty Certificate
- f) Certified Declaration that the Works have been constructed in accordance with the design and the statutory approval conditions.

### **Maintenance Service Manual**

The *Maintenance Service Manual* shall include:

- a) a list of the supplied products and the supplier’s contact information, and
- b) routine maintenance requirements and schedule.

## 14 Supplementary requirements

The requirements of MRTS302 *Fabrication and Construction of pontoons* are varied by the Supplementary requirements given in Clause 4 of Annexure MRTS302.1.

