Marine

Master Specification

MA-JW-C1 Timber Jetty Works

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DEPARTMENT FOR INFRASTRUCTURE AND TRANSPORT

Government of South Australia
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1	Transfer and updated from Part W30 Timber Work	April 2020
2	Minor amendments and demolition clauses added	August 2020
3	Update references to Standard Drawings	November 2023

Document Management

Contents

MA-JW-C1 Timber Jetty Works

1 General

1.1 This Part specifies the supply of timber and requirements to replace or repair decking, kerbing, bearers, girders, fishplates, crossheads, corbels, walers, and cross bracing of a timber jetty.

1.2 These elements shall be constructed in timber unless specified otherwise in the Functional and Operational Requirements or on the Drawings.

1.3 The Contractor shall replace or repair all members / elements of the jetty listed in the Functional and Operational Requirements and / or Drawings. If non-standard work is required, contract specific items will be described in the Functional and Operational Requirements.

1.4 Unless shown otherwise, where replacement of existing members is required, new members shall be of equivalent size and material. Rates submitted by the Contractor are deemed to include all associated work required for the repair or replacement of timber decking or jetty structural members.

1.5 Documents referenced in this Part are listed below:

a) AS 1111 ISO Metric Hexagon Commercial Bolts and Screws.

b) AS 1112 ISO Metric Hexagon Nuts.

c) AS 1148 Timber – Nomenclature – Australian, New Zealand and imported species.

d) AS 1214 Hot-dip galvanized coatings on threaded fasteners.

e) AS 1237 Flat Metal Washers for General Engineering Purposes (round washers).

f) AS 1604.1 Specification for Preservative Treatment.

g) AS 1627.4 Abrasive Blast Cleaning.

h) AS 1720 SAA Timber Structures Code – Design Methods.

i) AS 2082 Timber – Hardwood – Visually Stress Graded for Structural Purposes.

j) AS 2312 Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings – Paint coatings.

k) AS 2334 Steel Nails – Metric Series.

l) AS 2878 Timber – Classification into Strength Groups.

m) AS 4491 Timber – Glossary of Terms in Timber-related Standards.

n) AS 4680 Hot-dip Galvanized (zinc) Coatings on Fabricated Ferrous Articles.

o) AS 5604 Timber – Natural Durability ratings.

p) BS 3410 Metal Washers for General Engineering Purposes (square washers).

1.6 The work shall be undertaken in accordance with the drawings listed in Table MA-JW-C1 1-1.

Table MA-JW-C1 1-1: Reference Drawings

Drawing No. S-6997, Jetty Construction:	
Sheet 6	Typical Jetty Arrangement
Sheet 7	Typical Connection Details – Steel Pile
Sheet 8	Typical Connection Details – Timber Pile
Sheet 9	Steel Bracing Connection to Screw Pile Details
Sheet 10	Steel Bracing Connection to Screw Pile Details
Sheet 11	Typical Jetty Details
Sheet 12	Typical Jetty Details

1.7 These drawings are available from: https://www.dit.sa.gov.au/standards/standards_and_guidelines

2 Timber Supply

General

2.1 The Contractor shall supply all timber, unless otherwise specified in the Functional and Operational Requirements.

2.2 Timber supplied for jetty works shall meet the following minimum requirements:

a) natural durability rating Class 2 OAG (Outside above ground) in accordance with AS 5604;

b) strength group S3 (Unseasoned) in accordance with AS 2878;

c) structural grade No. 2 in accordance with AS 2082; and

d) visual stress grade F14 (Unseasoned) in accordance with AS 2082.

2.3 Timber supplied shall be free of:

a) loose gum and resin veins, unsound knots, shakes or splits;

b) sapwood or bark;

c) gum pockets on the upper surfaces of decking, kerbing or other timber designated for horizontal installation where that member is to be directly exposed to the weather; and

d) heart, except that sound heart is permitted in the central 1/3 of cross section of members with a least dimension greater than 175 mm.

2.4 Timber shall have both end surfaces coated with a suitable timber preservative or sealant in accordance with AS 1604. All timber ends (with at least dimension of 150mm) shall be fitted with a galvanised nail plate.

2.5 Timber shall not exceed the dimensional and squareness tolerances in AS 2082 and supplied with an off saw finish.

Delivery

2.6 Where timber is being supplied to DIT, the Department will arrange unloading and the Contractor shall:

a) give at least 2 working days notice of deliveries to DIT;

b) deliver within the hours of 8:00am and 4:00pm weekdays excluding public holidays; and

c) deliver timber to:

Department for Infrastructure and Transport (DIT) Depot

1 Wright Road

WALKLEY HEIGHTS SA 5098.

2.7 Timber shall be tied with steel strapping in bundles not exceeding 3.5 tonne. Plastic or wire strapping shall not be used.

2.8 Individual bundles shall only include timber pieces of the same size and length.

2.9 Bundles of timber shall be supplied and stored on timber bearers with a minimum gap of 90 mm to facilitate handling by a forklift. All timber shall be stripped, such that there are air gaps between each timber piece.

2.10 All timber species supplied shall be classified as hardwood and shall be independently inspected and verified for conformance to the relevant Australian Standards.

2.11 Proof of Certification verifying timber species, origin, natural durability rating, strength group, structural grade, and visual stress grade shall accompany every load of timber supplied and be provided to the Principal prior to work commencing on site.

2.12 Submission and approval by the Principal of the Proof of Certification shall constitute a **HOLD POINT**. Timber jetty works shall not commence until the release of this HOLD POINT by the Principal.

3 Timber Repair and Replacement

General

3.1 The Contractor shall identify and report any additional elements that require repair or replacement that may be discovered during the course of the work. This identification should be based on the following visual criteria:

a) badly split or rotted timbers;

b) corroded steel elements and connectors with greater than 50% loss of original section rendering them unsafe or unfit for purpose;

c) loose connections / joints;

d) unstable / unsafe members / elements;

e) any elements which are sufficiently deteriorated to render them unsafe for their intended use; and

f) excessively corroded connectors (bolts, spikes).

3.2 The Contractor shall seek approval from the Principal before proceeding with repairs or replacement of any additional work.

3.3 Timber and timber work shall comply with AS 1720, AS 1604.1, AS 2082, AS 2878 and AS 5604.

3.4 All timber work shall be in accordance with this Part and Drawing No. S-6997.

3.5 Karri timber shall not be used at and below the splash zone.

3.6 All fasteners shall be cut to a maximum of 20 mm beyond the nut. The cut face shall be made free of sharp edges.

Levelling of Timber Elements

3.7 Spacer blocks may be used to level (by packing) timber elements.

3.8 Spacer blocks shall not be used when the packing height exceeds 80 mm.

3.9 Spacer blocks shall be HDPE plastic or equivalent.

3.10 Spacer blocks shall be black or charcoal in colour.

3.11 A minimum number of spacer blocks shall be used for each installation.

3.12 No more than 3 spacer blocks shall be used for each installation.

3.13 All spacer blocks shall be a single piece matching the bearing area and shall be bolted through the main fixing of the member.

Crossheads

3.14 Crossheads shall be bolted either to timber piles directly, or landed on brackets welded to steel box piles.

3.15 Where both steel and timber piles are present, crossheads shall be connected to both piles.

3.16 On screw pile jetties, crossheads shall be installed directly onto the pile head plate. A single crosshead may consist of two pieces of timber bolted together. The crosshead shall be connected to each screw pile base plate with four M20 galvanised hexagonal head bolts.

3.17 If attaching a crosshead to a timber pile, the following shall apply:

a) fixing bolts shall be horizontal by using two M24 galvanised hexagonal head bolts per connection;

b) spacing of the two bolts shall be diagonally offset from each other in accordance with Drawing No. S-6997 sheet 8; and

c) timber piles shall be rebated out a minimum of 50 mm to provide seating for each crosshead.

3.18 If attaching a crosshead to a steel box pile, the following shall apply:

a) the pile brackets shall be welded onto the two opposing faces of the steel pile;

b) welding shall occur after pile driving is complete;

c) the crosshead shall be seated on the pile brackets;

d) welding and protective treatment shall be in accordance with this Specification;

e) bolting of the crosshead to the pile bracket shall be one vertical M24 galvanised hexagonal head bolt through each pile bracket and through each crosshead; and

f) bolts shall be countersunk flush with the top of the crosshead in accordance with Drawing No. S-6997 sheet 7.

3.19 Crossheads shall not be spliced.

Corbels

3.20 Corbels shall be bolted onto the crossheads and, where bearing on crossheads, seated on bitumen impregnated water proofing tape (Malthoid or approved equivalent). Bitumen impregnated water proofing tape shall also be placed on top of and along the length of the corbels prior to placing girders. Bitumen impregnated water proofing tape shall cover the full bearing area.

3.21 Brackets shall not be used to connect the corbel to the crosshead.

3.22 Corbels shall be the same width and height as the girder.

3.23 Corbels shall extend in length a minimum of 750 mm from the centre of the pile.

3.24 Bolting to crossheads shall be made by using two vertical M24 galvanised hexagonal head bolts per corbel. Bolts shall be countersunk at least 15 mm below the top of the corbel.

Fishplates

3.25 Timber fishplates are used to splice together girders.

3.26 Timber fishplates shall be bolted horizontally by using two M24 galvanised hexagonal head bolts per connection to each girder. Bolts shall be spaced diagonally offset from each other.

3.27 One vertical M24 galvanised hexagonal head bolt shall also be used to connect the fishplate to each crosshead in accordance with Drawing No. S-6997 sheet 11.

3.28 Timber fishplates shall be the same width and height as the girder.

3.29 Timber fishplates shall extend in length a minimum of 750 mm either side of the joint.

Cross Bracing

3.30 Cross bracing shall not be clamped to piles.

3.31 Timber cross bracing shall be installed with the heart side facing the pile.

3.32 Timber cross bracing shall be attached to all load bearing and non-load bearing piles.

3.33 For timber cross bracing being attached to a non-load bearing timber pile, the following shall apply:

a) cross bracing members shall be checked into the piles;

b) each connection will use two horizontal M24 galvanised hexagonal head bolts; and

c) bolts shall be spaced diagonally offset from each other.

3.34 For timber cross bracing being attached to a load bearing timber pile, the following shall apply:

a) cross bracing members shall NOT be checked into the piles;

b) each connection will use two horizontal M24 galvanised hexagonal head bolts; and

c) bolts shall be spaced diagonally offset from each other.

3.35 For timber cross bracing being attached to a steel pile using a steel cross bracing bracket, the following shall apply:

a) the steel cross bracing bracket shall be welded to the edge of the pile in accordance with Drawing No. S-6997.

b) the protective coating on both the cross bracing bracket and the pile must be rectified after the welding is complete;

c) welding shall occur after pile driving is complete;

d) welding and protective treatment shall be in accordance with this Master Specification Part; and.

e) at each connection, two horizontal M24 galvanised hexagonal head bolt shall be used to attach the timber member to the bracket.

3.36 Steel cross bracing being attached to screw piles shall be installed in accordance with Drawing No. S-6997.

3.37 The replacement of existing cross bracing shall comply with the following:

a) the location of the top cross bracing connection point shall be directly below the crosshead; and

b) the location of the lower cross bracing connection point shall be located as close as reasonably practical to the existing location.

3.38 The installation of new cross bracing shall be determined in accordance with an engineering design and shall not compromise the cross bracing frame action of the pile bent.

Girders

3.39 Girders shall be seated on and bolted to corbels or crossheads directly and butted end to end over the centreline of pile bents.

3.40 Bitumen impregnated water proofing tape (Malthoid or equivalent) shall be laid on top of all girders (i.e. new girders and existing girders) as a flashing and as a separating medium between girders and decking. The tape shall be laid lengthwise along the girder.

3.41 Girder connections shall be in accordance with Drawing No. S-6997 sheets 7 and 8.

3.42 Where members bear on other structural elements, the bearing surfaces shall be sound and mate evenly across the bearing surfaces. Any members that are rotted or split within the bearing area shall be replaced.

3.43 Bolting to corbels shall be by two vertical M24 galvanised hexagonal head bolts per connection, or shall match the size and number of fixings of existing similar connections (whichever is the greater). Where bolts are placed in holes of existing timber, the bolt size shall not be less than the existing hole diameter minus 2 mm.

3.44 Bolts shall be countersunk flush with the top of the girder.

Decking

3.45 Deck planks shall be laid with the heartwood face down.

3.46 Deck planks shall be laid with a gap between adjacent planks to allow for water to drain from the surface.

3.47 Gaps between adjacent deck planks shall not exceed the following:

a) 5 mm gap for unseasoned timber (to allow for further timber shrinkage); or

b) 10 mm gap for seasoned timber.

3.48 Deck planks shall be laid such that one piece can span the full jetty width.

3.49 Deck planks may only be permitted to be laid in shorter lengths where jetty widths exceed 7 m and end butt joints are staggered or offset from each other. Shorter planks shall span at least two girders and only butt over a girder.

3.50 Deck planks shall be fixed to the girders or under-bearers using stainless steel marine grade 316, 16 gauge bugle screws or approved equivalent. Galvanised fixings may be permitted when re-affixing existing loose planks.

3.51 Pre-drilled holes shall be made to prevent splitting for each plank fixing in accordance with manufacturer's instructions.

3.52 Deck plank fixings shall be driven countersunk 10 mm to the deck surface and penetrate a minimum of 75 mm into sound timber girder.

3.53 A minimum of two deck plank fixings shall be driven in planks at each girder support location. Deck plank fixings shall be spaced diagonally offset from each other.

3.54 Overhanging ends of deck planks shall be trimmed after fixing to be as consistent as practicable with that of the jetty and shall be within a tolerance of ± 5 mm over a 3 metre length of jetty.

Kerbing

3.55 Kerbing shall be 150 mm wide × 100 mm high timber unless otherwise specified.

3.56 The alignment of the kerbing shall be as consistent as practicable with that of the jetty and shall be laid within a tolerance of ± 5 mm over 3 metre length of jetty.

3.57 Kerbing shall have a 10 mm longitudinal chamfer along the two upper corners.

3.58 A minimum of one M16 galvanised hexagonal head bolt at 1500 mm centres shall be used where securing kerbing to the deck or into girders. Fasteners shall not be countersunk.

3.59 Where kerbing is to be located directly above the edge girder, the kerbing shall be bolted through the decking and the girder.

3.60 Where kerbing is to be located on the decking overhang only, the following shall apply:

a) kerbing shall be bolted to the deck planks;

b) one M16 galvanised cup head bolt shall be placed through the girder in line with the hexagonal head bolt on the kerbing, to secure the plank to the girder;

c) the cup head bolts shall be placed at a maximum spacing of 3000 mm; and

d) a minimum of two cup head bolts shall be installed per bay per side.

3.61 Kerbing sections shall be joined end-to-end utilising a "half lap splice" connection and secured together to the deck or girder with one M16 galvanised hexagonal head bolt.

Walers

3.62 Walers are timber members that span across the bottom of a pile bent (cross waling) or along the alignment of the jetty spanning between bents (side waling) in accordance with Drawing No. S-6997 sheet 6.

3.63 The walers shall be bolted to brackets welded to the steel box piles in accordance with Drawing No. S-6997.

3.64 The Contractor shall seat the walers on the steel brackets. Bolting to steel brackets shall be by one vertical M24 bolt through each crosshead bracket and through each waler. Bolts (top waler only) shall be countersunk flush with the top of the waler.

4 Fasteners

Materials

4.1 Bolts, nuts, washers, and nails shall be hot-dip galvanised in accordance with AS 1214.

4.2 Nuts shall comply with AS 1112.

4.3 Washers shall be provided to the heads and nuts of all fasteners.

4.4 Washers shall comply with AS 1237 and BS 3410.

4.5 Square washers shall be used throughout except where the holes are countersunk.

4.6 Round washers shall be used where the holes are countersunk.

The thickness and dimensions of round or square washers shall be determined according to the bolt diameter as per Table MA-JW-C1 4-1.

Table MA-JW-C1 4-1 Bolt and Washer Details

BOLT SIZE	WASHER THICKNESS (mm)	ROUND WASHER OUTER DIAMETER (mm)	SQUARE WASHER L × B (mm)
M16	5 (kerbing) 3 (steel hand rail connection)	36	65 × 65
M20	5	48	65 × 65
M24	5	54	75 × 75

4.7 Commercial “off the shelf” bolts shall comply with AS 1111.

4.8 In the event that commercial bolts are not available for the required thickness of fastening, the Contractor may use lengths of galvanised threaded rod with a nut welded to one end subject to approval. Bolts made this way shall comply with the following:

a) threaded rods to be ISO Class 4.6 hot dipped galvanised to AS 1650 and cut to the required length; and

b) welded areas shall be wire brushed cleaned and painted with 2 coats of zinc rich primer in accordance with ST-SS-S2 “Protective Treatment of Structural Steelwork” and applied in accordance with the manufacturer’s instructions.

4.9 Nails and decking spikes shall comply with AS 2334.

Installation

4.10 Bolts and other fixings shall be tightened so that joints and anchorages are secure at Practical Completion.

Re-Tightening of Nuts

4.11 Re-tightening of all bolts and nuts shall occur 12 months after installation.

5 Steel Work

Steel Brackets

5.1 Steel brackets shall be fabricated by the Contractor in accordance with the specification and in accordance with Drawing No. S-6997.

5.2 Steel brackets shall be welded onto the steel box pile after pile driving is complete.

5.3 Steel brackets shall have a protective coating treatment applied immediately after welding.

5.4 Steel brackets shall be grit blasted to Class 3 in accordance with AS 1627.4, and a protective coating applied in accordance with ST-SS-S2 “Protective Treatment of Structural Steelwork”.

5.5 After fixing to the pile, any damage to the protective coating shall be repaired in accordance with ST-SS-S2 “Protective Treatment of Structural Steelwork”.

6 Demolition

General

6.1 The Contractor shall carry out demolition work to the extent shown in the Contract Documents or on the Drawings.

6.2 The existing structure and services which are to remain shall be protected from damage. Any such damage shall be made good, to the satisfaction of the Principal, by the Contractor at the Contractor’s expense.

6.3 Demolished materials are defined as materials not re-used in the jetty.

6.4 Separate payment will not be made for demolition or the transportation of demolished materials.

Demolished Materials

6.5 Demolished materials are the property of the Contractor and shall be removed from the site.

6.6 Demolished materials shall not be allowed to encroach on adjoining property, including public places, unless approved by the Principal. The Contractor's responsibility in regard to disposal of surplus demolition materials is detailed in the Environmental Management Plan.

6.7 Subject to the approval of the Principal, materials which are sound may be re-used in the works.

Temporary Removal and Reinstatement of Miscellaneous Fixtures

6.8 During the course of the works, the Contractor may need to temporarily remove and then reinstate various existing fixtures to enable work on the structure to proceed. These may include, but are not limited to, any or all of the following: jetty lights, power outlets, electric cables, water services, signs, navigation beacons, handrails, lifebuoy boxes, cranes, railway lines, fuel lines and dispensers, ladders, steps, and bollards. If the fixture is not suitable for reinstatement, the Contractor shall bring it to the Principal’s attention as soon as practicable.

6.9 Payment will be made as an item for the temporary removal and reinstatement of all fixtures.

Pile Removal

6.10 **Jetty Piles**: Jetty piles shall be removed by applying a horizontal saw cut as close as practicable to the seabed level or ground level for onshore piles.

6.11 **Onshore Timber Piles**: Onshore timber piles that have concrete encasements shall be removed by applying a horizontal saw cut as close as practicable to the top of the concrete blocks.

6.12 **Slipway Piles**: Slipway piles shall be removed by applying a horizontal saw cut as close as practicable to the seabed level or ground level for onshore piles.

6.13 **Video Recording**: Upon completion of the work, a video recording shall be made of the seabed to demonstrate that the piles have been cut off at the seabed and that the site is clear of debris resulting from the works. This shall constitute a **Hold Point**.

This Clause does not apply to any fixture that is to be removed for the purpose of being repaired or replaced and is specifically listed in the Contract Documents.

7 Hold Points

The following is a summary of Hold Points referenced in this Part:

Table MA-JW-C1 7-1: Hold Points

Document Ref.	Hold Point	Response Time
2.12	Submission and approval by the Principal of Proof of Certification.	24 hours
6.13	Seabed video recording	2 working days