

PART W30**TIMBER WORK****CONTENTS**

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1. GENERAL

- .1 Decking and Support Structure of a jetty refers to all decking, kerbing, bearers, girders, cross heads, corbels, whalings and bracing. These elements must be constructed in timber unless specified otherwise in the Scope of Contract or on the Drawings.
- .2 The Contractor must replace or repair all members/elements of the jetty listed in the Scope of Contract and/or Drawings.
- .3 Unless shown otherwise, where replacement of existing members is required, new members must 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.
- .4 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 Galvanised 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 1650 Hot Dipped Galvanising Coating on Ferrous Articles
 - (i) AS 1720 SAA Timber Structures Code – Design Methods
 - (j) AS 2082 Timber – Hardwood – Visually Stress Graded for Structural Purposes
 - (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 5604 Timber – Natural Durability ratings
 - (o) BS 3410 Metal Washers for General Engineering Purposes (square washers)
- .5 The work must be undertaken in accordance with the following drawings:
 - (a) Drawing No. S-6997: Jetty Construction
 - .1 Sheet 1, Typical Jetty Layout
 - .2 Sheet 2, Steel Pile Connection Details, Amendment 1
 - .3 Sheet 3, Steel Bracing – Connection to Screw Piles
 - .4 Sheet 4, Typical Connection Details – Timber Pile
 - .5 Sheet 5, Alternative Corbel Bracket

These drawings are available from the following web site:
http://www.dpti.sa.gov.au/documents/marine_facilities2

2. TIMBER

- .1 Timber Quality

Unless detailed in the Scope of Contract the Contractor must supply all timber. Timber supplied by the Contractor must meet the following minimum requirements:

- (a) Durability rating Class 2 OAG (Outside above ground) or better in accordance with AS 5604;
- (b) Strength Group S3 in accordance with AS 2878;
- (c) Structural Grade No. 2 in accordance with AS 2082; and Visual stress grade F14 (Unseasoned) in accordance with AS 2082.

All 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.
- (d) Heart, except that sound heart is permitted in the central $\frac{1}{3}$ of cross section of members with a least dimension greater than 175 mm.

.2 End Treatments

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 150 mm) shall be fitted with a galvanised nail plate.

.3 Dimensions and Finish

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

.4 Timber Species

Supplied timber shall be either Karri or Blackbutt.

All timber species supplied shall be classified as hardwood and shall be independently inspected and verified for conformance to the relevant Australian Standards. Certificates of inspection shall accompany every load of timber supplied provision of each shall constitute a **HOLD POINT**.

3. **TIMBER REPAIR AND REPLACEMENT**

General

- .1 The Contractor must 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) badly corroded steel elements with sufficient loss of 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).
- .2 The Contractor must seek approval from the Principal before proceeding with repairs or replacement of this additional work and shall constitute a **HOLD POINT**.
- .3 Timber and timber work must comply with AS 1720, AS 1604.1, AS 2082, AS 2878 and AS 5604.
- .4 Where spacer blocks are required to be used to level timber elements the blocks must be as follows:
 - (a) For spacers greater than 50 mm thick hardwood timber or approved plastic blocks must be used; and
 - (b) For spacers less than 50 mm thick only approved plastic blocks must be used.

Cross Heads

- .5 On timber piles, cross heads must be installed in pairs and bolted either to timber piles directly, or landed on brackets welded to box steel piles.

- .6 On screw pile jetties, single crossheads must be installed directly onto the pile head plate. Note that a single crosshead may consist of two pieces of timber bolted together. The cross head must be connected to each screw pile base plate with four M20 galvanised bolts.
- .7 If attaching to a timber pile, the bolting of the cross head to the piles must be horizontal, fixing each pair of cross heads to head of pile. Two M24 galvanised bolts must be used per connection. Spacing must be diagonally opposed with respect to the longitudinal axis of the cross head member. Refer to Drawing No. S – 6997 Sheet 4 for details. Timber piles must be rebated out a minimum of 50 mm to provide seating for each cross head.
- .8 If attaching the crosshead to a steel pile, the Contractor must weld two landing brackets onto the two opposing faces of steel piles after driving, and seat the crosshead on the brackets. Welding and protective treatment must be in accordance with this Master Specification. Bolting to steel piles must be by one vertical M24 bolt through each landing bracket and through each cross head. Bolts must be countersunk flush with the top of the cross head. Refer to Drawing No. S – 6997 Sheet 2 for details.

Corbels

- .9 Corbels must be bolted on to the cross heads and seated on a 200 mm wide strip of bitumen impregnated water proofing tape (Malthoid or equivalent) where bearing on cross heads. Bitumen impregnated water proofing tape must also be placed on top of and along the length of the corbels prior to placing girde
- .10 Bolting to cross heads must be by two vertical M24 bolts per corbel. Bolts must be countersunk flush with the top of the cross head.
- .11 Where it is impractical to vertically bolt through a corbel to attach to the crosshead, an alternative detail using a 75 mm x 75 mm x 10 mm galvanised angle may be used. Refer to Drawing No. S – 6997 Sheet 5 for details.

Bracing

- .12 Bracing must be installed only in pile bents where specified by the Principal.
- .13 Timber bracing must be installed with the heart side on the inward or pile face of the brace. Bracing must not be checked into piles. Two M24 galvanised bolts must be used per connection. Spacing of bolts must be diagonally opposed with respect to the longitudinal axis of the bracing member.
- .14 Where steel bracing is specified for connection to screw piles it must be installed in accordance with Drawing No. S – 6997 Sheet 3.

Girders

- .15 Girders must be seated on and bolted to corbels or cross heads directly and butted end to end over the centreline of pile bents.
- .16 Bitumen impregnated water proofing tape (Malthoid or equivalent) must 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 must be laid lengthwise along the girder.
- .17 Girder connections must be in accordance with Drawing Nos. S – 6997 Sheets 2 and 4.
- .18 Where members bear on other structural elements, the bearing surfaces must be sound and true. Any members that are rotted or split within the bearing area must be replaced.
- .19 Bolting to corbels must be by two vertical M24 bolts per connection, or must 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 must not be less than the existing hole diameter minus 2 mm.
- .20 Bolts must be countersunk 5 mm below the top of the girder.

Decking

- .21 Planks must be laid with the heartwood face down and with no gaps between adjacent planks. Where applicable, decking must be laid such that end butt joints are staggered or offset from each other.
- .22 Planks must be fixed to the girders or under-bearers using 10 mm galvanised steel deck spikes driven flush to the surface. Spikes must be driven into pre-drilled holes in the planks to prevent splitting and must penetrate a minimum of 75 mm into sound timber in the girders. Spike holes must be drilled with diameter 10% less than the spike diameter and 50 mm less in depth than the spike length. A minimum of two spikes must be driven in planks at each girder. Spikes must be staggered. Spikes can be supplied in lengths of 175 mm, 200 mm, 250 mm and 275 mm, use of each length being dependent on the thickness of decking being fixed and on the condition of the surface of the girder into which the spike is to be driven.

- .23 Overhanging ends of deck planks must be trimmed after fixing to be as consistent as practicable with that of the jetty and must be within a tolerance of ± 5 mm over 3 metre length of jetty.
- .24 Separate payment will only be made for decking replaced as specified in Clause 3.1 "General". Where decking has to be removed and replaced in order to gain access to other structural members, separate payment for this work will not be made.

Kerbing

- .25 Edges of deck planking must be covered where specified with a solid edge strip of kerbing.
- .26 The Contractor must cut a 10 mm longitudinal chamfer along the two upper corners. Where kerbing lays on the decking overhang, the kerbing must be bolted to deck planks. Where kerbing lays directly above the edge girder, the kerbing must be bolted through the decking and the girder.
- .27 The alignment of the kerbing must be as consistent as practicable with that of the jetty and must be laid within a tolerance of ± 5 mm over 3 m length of jetty.
- .28 A minimum of one M16 hexagonal head bolt at 1500 mm centres must be used where securing kerbing to the deck or into girders. Fasteners must not be countersunk.
- .29 Where kerbing is secured to the deck, one M16 cup head bolt must be placed through the girder in line with the hexagonal head bolt on the kerbing, to secure the plank to the girder. The cup head bolts must be placed at a maximum spacing of 3000 mm, and a minimum of two cup head bolts must be installed per bent per side.
- .30 Kerbing sections must be joined end-to-end utilising a 'half lap splice' connection.

Cross-Ties or Under-Bearers

- .31 The size and spacing of cross ties or under bearers are variable. Where these occur they act as decking support members and are laid transversely to the direction of the main deck planks. Fixture details must be as per clause 3.22 or by bolting to girders, as dictated by existing fastening arrangement, or as directed by the Principal.

Whalers

- .32 The whalers must be bolted to brackets welded to the box steel piles as shown on Drawing No. S – 6997 Sheet 2.
- .33 The Contractor must seat the whalers on the brackets. Bolting to steel brackets must be by one vertical M24 bolt through each landing bracket and through each whaler. Bolts (top whaler only) must be countersunk flush with the top of the whaler.

4. FASTENERS

Materials

- .1 Bolts, nuts, washers and nails must be hot-dip galvanised in accordance with AS 1214.
- .2 Washers must be provided to the heads and nuts of all fasteners.
- .3 Nuts must comply with AS 1112.
- .4 Washers must comply with AS 1237 and BS 3410.
- .5 Square washers must be used throughout except where the holes are countersunk.
- .6 The thickness and dimensions of round or square washers must be determined according to the bolt diameter as presented in Table 4.1.

		<u>ROUND</u>	<u>SQUARE</u>
<u>BOLT DIAMETER</u>	<u>WASHER THICKNESS (mm)</u>	<u>OUTER DIAMETER (mm)</u>	<u>L x B</u>
M16	5 (kerbing) 3 (steel hand rail connection)	36	65 x 65
M20	5	48	65 x 65
M24	5	54	75 x 75

- .7 Commercial "off the shelf" bolts must comply with AS 1111. 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 must comply with the following:
- threaded rods to be ISO Class 4.6 hot dipped galvanised to AS 1650 and cut to the required length; and
 - welded areas must be wire brushed cleaned and painted with 2 coats of zinc rich primer in accordance with Part S35 "Protective Treatment of Structural Steelwork" and applied in accordance with the manufacturer's instructions.
 - Nails and decking spikes must comply with AS 2334.

Installation

- .8 Bolts and other fixings must be tightened so that joints and anchorages are secure at Practical Completion.
- .9 Where fasteners are to be countersunk or flush with the surface of the timber it is required that they are actually fixed 5 mm below the surface of the surrounding timber surface.

Re-Tightening of Nuts

- .10 Re-tightening of all bolts and nuts must occur 6 months after installation.
- .11 If an item for re-tightening of nuts is included in the Tender Schedules, the amount claimed must not be less than 2% of the Tendered Sum.

5. STEEL WORK

Crosshead Landing Brackets

- .1 Crosshead landing brackets must be fabricated by the Contractor in accordance with the specification and as shown on Drawing No. S – 6997 Sheet 2.
- .2 Brackets must be abrasive blast cleaned to Class 3, in accordance with AS 1627.4 and a protective coating applied in accordance with Part S35 "Protective Treatment of Structural Steelwork". After fixing to the pile any damage to the protective coating must be repaired in accordance with Part S35 "Protective Treatment of Structural Steelwork".

6. HOLD POINTS

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

<u>CLAUSE REF.</u>	<u>HOLD POINT</u>	<u>RESPONSE TIME</u>
2.4	Provision of inspection Certificates	
3.2	Principal's approval before proceeding with repairs or replacement	

Commented [D1]: Enter this in Conditions of Tendering Annexure C as well.