

**03 STRUCTURE**

**0381 Structural timber**

<b>0381 STRUCTURAL TIMBER</b>
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**1 GENERAL**

**1.1 RESPONSIBILITIES**

**General**

Requirement: Provide structural timber, as documented.

**Design**

Designer: Mott MacDonald Australia Pty Ltd

**1.2 CROSS REFERENCES**

**General**

Requirement: Conform to the following worksection(s):

- GENERAL REQUIREMENTS.
- ADHESIVES, SEALANTS AND FASTENERS
- TERMITE MANAGEMENT.
- TIMBER PRODUCTS, FINISHES AND TREATMENT.

**Specified in this worksection**

This worksection includes but is not limited to the works in the Schedules to this worksection and associated work as required and as shown on the architectural and structural drawings and as follows:

- Selected structural timbers and associated metalwork from the original Bay 5 timbers stored off site at White Bay for reuse in the reinstatement of the timber structure in part of Bay 5 as documented.
- Inspections with the superintendent and structural engineer where required.
- Transporting timbers from White Bay to the ASN building, protection while in transit and on site and the erection inside the building as detailed and as directed by the structural engineer and as shown on the drawings.
- Temporary support of the timber structure during erection.
- Schedule of timbers required for reinstatement of part of the timber structure in Bay 5 for the extent as shown on the drawings.
- All work as required to complete the installation of reinstated timber structure with existing and new materials to match the existing structure including timber columns, beams, joists and herringbone strutting and blocking between joists as required for new doors and partitions.
- Timber framing to perimeter edge to Level 3 floor void for glass balustrade as detailed.
- All structural timber required to complete the works as detailed and as scheduled.

**Associated worksections**

Refer to the following related worksections:

- DEMOLITION, for retention and protection of the existing remnant timber structure in Bay 5; for salvaging of removed timber where the new services duct is proposed through floors for repairs.
- JOINERY, for plywood balustrades to new ramps.
- LIGHT TIMBER FRAMING, for structural support to new plywood ramps.
- TIMBER FLOORING, for new timber floor boards to match the existing boards to reinstated timber floors;
- FLOOR SANDING AND FINISHING, for the sanding of the timber floor and for finishing treatments.
- Structural engineer and architectural drawings for the location and details of the reinstated timber structure.

## **SPECIFICATION**

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## **1.3 STANDARDS**

### **General**

All timber design, material and construction to comply with AS 1720.1 and AS 1720.2.

## **1.4 INTERPRETATION**

### **Definitions**

General: For the purposes of this worksection the definitions given in AS 1720.1 apply.

## **1.5 INSPECTION**

### **Notice**

Inspection: Give notice so that inspection may be made of the following:

- Inspection of original timbers salvaged from Bay 5 that are off-site in storage at White Bay.
- Structural timbers on site prior to erection to confirm locations for specific columns and beams.
- Structural timberwork after erection - timber columns, cast iron shoes and beams in place.
- On site preservative treated members before being concealed.
- Bolts after final tightening.

## **1.6 SUBMISSIONS**

### **Certification**

Design: If design by the contractor is required, submit independent certification by a professional engineer of the design and documentation, and of the erected work for conformance with AS 1720.1 and project performance criteria.

### **Reinstatement of salvaged timbers**

- Installation details for the reinstatement of the timber structure and programme of work.
- Details of how the salvaged original timbers will abut and join to existing timbers.
- Base fixing details of columns to the Level 2 concrete slab.
- Detail of wall pocket fixings for beams at the brick piers.

### **Materials**

Identification:

- Certification: Submit a supplier's certificate (which may be included on an invoice or delivery docket) verifying that the timber conforms to the specification, including moisture content.
- Inspection: Submit the inspection authority's certificate verifying that the timber conforms to the specification.

Moisture content: Submit records of moisture content.

### **Shop drawings**

General: Submit shop drawings showing the following:

- Marking plans.
- Arrangement of members.
- Location of the selected salvaged members.
- Species, stress grade, strength group and joint group of timber.
- Size of each member.
- Tolerances on member sizes.
- Joint details
- Lifting points and method of installation
- Method of fixing and bracing.
- Preservative treatment, if any.

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- Long term deflection.
- Moisture content at time of manufacture ( new timbers )

Contractor design: For items designed by the contractor, submit independent certification of shop details by a professional engineer for conformance to AS 1720.1 and the project performance criteria.

#### Note

No structural timbers are to be permanently marked as no applied finish is specified for structural timbers.

#### Subcontractors

General: Submit names and contact details of proposed suppliers and installers.

## 2 PRODUCTS

### 2.1 TIMBER

#### Structural timber

Conformance: As documented and as in the **Solid timber schedule**.

Appearance grade: Appearance grade if exposed to view in the finished work. Otherwise stud grade or lintel grade, as appropriate.

Timber grading methods:

- Hardwood: To AS 1720.1 Table H2.3 strength group classification.
- Softwood: To AS 1720.1 Table H2.4 strength group classification.
- F-grades: To AS 1720.1 Table H2.1.
- MGP grade: To AS 1720.1 Table H3.1.
- Visually graded F-grade: To AS 2082 or AS 2858.

Stress grade: minimum F14

Preservative treatment: None

Termite treatment: Required. Refer to TERMITE MANAGEMENT.

#### Recycled timber ( does not include the original structural timbers )

Grit blasted or re-machined: Remove all nails and screws.

Stress grade: minimum F14

#### Identification

Method: Identify timber using branding, certification or both.

Branding: Brand structural timber, under the authority of a recognised product certification program applicable to the product. Locate the brand mark on faces or edges which will be concealed in the works. Include the following data for timbers not covered by branding provisions in Australian standards or regulations for which branding is required:

- Stress grade.
- Method of grading.
- If seasoned, the word, SEASONED or DRY, or an abbreviation of seasoned, such as SEAS or S.
- The certification mark of the product certification program.
- The applicable standard.

Certification: Forest certification, chain of custody and product labelling to the TIMBER PRODUCTS, FINISHES AND TREATMENT worksection.

### 2.2 FASTENERS

#### Materials

Conformance: To the fasteners requirements in the *Adhesives, sealants and fasteners* worksection.

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#### **Fastener type**

Metal fasteners: Select fastener as appropriate for the documented atmospheric category and the life of the structure.

Fastener configuration: If timber elements experience tension perpendicular to the grain, use the appropriate fastener configuration.

#### **Nails and screws**

Coach screw diameter: M16 U.N.O. on drawings.

#### **Bolts**

Thread: Provide thread length at least four times the bolt diameter.

Holes: Drill bolt holes 2 mm larger than the bolt diameter.

#### **Washers**

Standard: To AS 1720.1 Table 4.11.

## **3 EXECUTION**

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### **3.1 TRANSPORT AND DELIVERY**

#### **General**

Handling and protection: Do not distort or damage timber or timber products.

Moisture content: Maintain the equilibrium moisture content of seasoned timber.

Appearance products: Store under cover.

### **3.2 STRUCTURAL TIMBER**

#### **General**

Preservative treatment: If holes are drilled in treated timber, apply a saturation coating of preservative to the sides of the holes before inserting fixings.

#### **Outdoor structures**

Sealing: Seal the ends of members with wax emulsion or petroleum jelly immediately after sawing.

Anti-splitting plates: Plate the ends of members 250 x 75 mm or larger with pressed or hammer-on galvanized nail plates equal to 50% of the cross-sectional area.

Bolt holes: Treat bolt holes with a protective treatment before inserting the bolt.

Coating: After completion of fabrication, notching and machining, coat joints, holes and notches with a protective coating.

Heart: Place the heart side of bracing members on the inside of joints. Place the heart side of other members on the downside wherever possible.

Minimum bolts size: M20.

Minimum washer size: 5 mm thick and 65 mm square or 75 mm diameter.

Bolt protection: Coat bolts with a bituminous coating before insertion in the bolt hole.

Recessed fixing: For fixings punched or sunk below the surface, fill the recess with a suitable wood filler or mastic.

Finishing: If a protective or decorative finish is required apply one coat of primer and one finishing coat all around before fixing.

### **3.3 COMPLETION**

#### **Tightening**

Initial: Tighten bolts, screws and other fixings so that joints and anchorages are secure at the date for practical completion.

Subsequent: If unseasoned timber is used, retighten after 6 months all bolts, screws and other fixings.

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## 4 SELECTIONS

### 4.1 SCHEDULES

#### Solid timber schedule

Refer to the structural engineer's drawings for location of the members in the table below.

Salvaged timbers vary in size and the dimensions provided in the table are approximate.

Item	Location	Cross - section (mm)	Length (mm)	Moisture content	F-grade	Treatment	Species
Floor boards *	All	35x140	Varies	Max 15%	Min F11	None	Recycled hardwood - species by Architect
Joists TC1 TC2	All	280x75	Varies	New timber Max 15%; Salvaged - Existing	Min F14	None	Salvaged [Existing], or recycled – new (species by Architect)
Beams TB1 TB2	All	290x290	Varies	Existing	Min F14	None	Salvaged timber
Columns TC1 TC2	All	290x290	Varies	Existing	Min F14	None	Salvaged timber

Original cast iron shoes for beam supports over columns to be used in the reconstruction,

\* Refer TIMBER FLOORING worksection for new floor boards to match existing.

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#### 4.2 SCHEDULE OF SALVAGED TIMBERS FOR REINSTATEMENT

Refer to the structural engineer's drawings for the location of the members in the following table.

Member Sizes							
Floor Level	Member	Tag	Quantity	Width (mm)	Depth (mm)	Length	Comment
Level 1	Timber Trimmers		2	75	250	1490	
Level 2	Timber Post	TC1	2	290	290	3650	Floor to Floor
Level 3	Timber Post	TC1	2	290	290	3680	Floor to Floor
	Timber beam	TB1a	1	290	290	2950	
		TB1b	1	290	290	3010	
		TB1c	1	290	290	2940	
		TB1d	1	290	290	2950	
		TB1e	1	290	290	2950	
		TB1f	1	290	290	3010	
		TB1g	1	290	290	3010	
		TB1h	1	290	290	2940	
	Timber joist	TJ2a	10	75	280	3020	
		TJ2b	10	75	280	2910	
		TJ2c	14	75	280	3530	
		TJ2d	6	75	280	3530	
		TJ2e	4	75	280	1757	
		TJ2f	4	75	280	1757	
		TJ1a	2	75	280	2630	
		TJ2b	2	75	280	2630	
Level 4	Timber beam	TB1a	1	290	290	3220	
		TB1b	1	290	290	3300	
		TB1c	1	290	290	3210	
		TB1d	1	290	290	3220	
		TB1e	1	290	290	3300	
		TB1f	1	290	290	3210	
	Timber Joist	TJ1a	27	75	280	2775	
		TJ1b	27	75	280	2910	
		TJ1c	14	75	280	3530	
		TJ1d	6	75	280	3530	
		TJ1e	4	75	280	1757	
		TJ1f	4	75	280	1757	

All lengths to be confirmed on site.