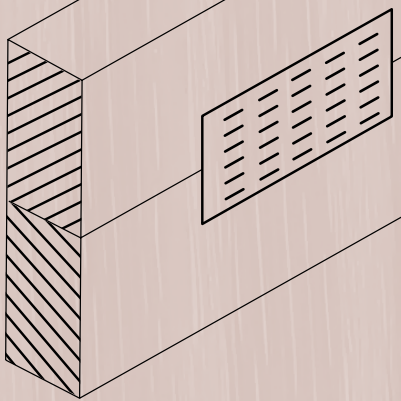
Technical Advisory Brochure

Structural Timber

PRODUCTS GUIDE



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Saleable Technical Publications

Pocket Span Table Book

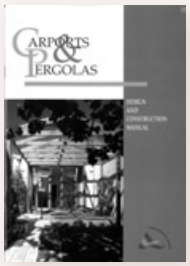
The 330 page PSTB is in an easy to carry pocket sized (A5), durable and spiral bound format and includes span tables for commonly used sawn structural timber grades as well as engineered LVL and I-beam floor joist tables.

The PSTB is designed as an easy to use supplement to AS1684.2 (Residential timber-framed construction).

Carports & Pergolas: Design and Construction Manual

An illustrated guide dealing with the design and construction of timber carports and pergolas. It enables the effective utilisation of commonly available timber species considering both structural performance and durability requirements.

It contains information for flat or skillion roofs as well as pitched roof structures with open or supporting sheet roof only.



Timber Decks: Design and Construction Manual

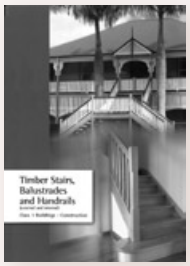
An illustrated guide to the design and construction of timber decks for domestic applications. Information is provided on commonly available framing and decking timbers in a clear, easy to read format with colour coded span tables. Additional detailed information such as footing requirements, stumps, stairs and handrails, fasteners and recommended timber finishes is also provided.

Timber Service Life Design package

Contains (i) Timber Service Life Design Guide addresses the predicted service life of timber construction subjected to: In-ground decay, Above ground decay, Weathering, Termites, Corrosion and/or Marine borers and the (ii) Timberlife (service-life prediction) software is intended to be used as an educational tool. It provides detailed estimates of service-life performance, with time, for an extensive range of hazards – both internal and external.

Timber Stairs, Balustrades and Handrails

A unique reference guide to the design, practices and construction of timber stairs, balustrades and handrails in domestic applications. The guide provides recommendations on timber species selection, member sizing, durability, finishing etc for internal as well as external stairs – open stairs (no risers) and closed stairs (with risers) are catered for. Additional design information such as the Building Code of Australia requirements, connection details, stair construction procedures as well as recommended timber finishes is also provided.



For a listing of publication distributors visit www.wpv.org.au and click on “design manuals” and then “list of distributors”.

Preface and Contents

Preface

This information has been prepared by Wood Products Victoria as a guide for designers, specifiers, builders and timber users in general.

This technical resource provides a comprehensive guide to the range of timber products for available structural applications. If there is any doubt concerning availability, your specific suppliers should be consulted before completing design documentation, specification or ordering.

Wood Products Victoria (WPV) supports sustainable timber and wood products, grown, harvested, processed, manufactured or sold within Victoria or by Victorian based businesses through informed research, technical publications, customer information, and product and market development.

General Data

Sawn Timber Products

Product Type		Typical Species	Approx Density (kg/m³)	Stress Grade	Supply
Seasoned Timber	Softwood	Radiata Pine	550	F5	Readily available
				F7	Available from selected suppliers
			510	MGP10	Readily available
			540	MGP12	Available from most suppliers
			580	MGP15	Available from selected suppliers
	Hardwood	Various Australian Hardwoods	650*	F17	Readily available
		Alpine Ash Mountain Ash	650	A17	Available from selected suppliers
Unseasoned Timber	Softwood	Douglas Fir* (Oregon)	700*	F5	Limited Availability
		White Cypress	850	F7	Readily available
	Hardwood	Various Australian Hardwoods	1050*	F8	Limited Availability
				F11	Available from selected suppliers
		Red Gum (River Red Gum)	1100*	F7	Available from selected suppliers

* Figures are approximate because of the likely range of species and/or moisture contents.

Additional Information

1. Seasoned timber is supplied with a moisture content not exceeding 15 per cent.
2. Stress grade is a strength classification for structural timbers, derived by means of either a visual or mechanical grading in accordance with the respective Australian Standards (see Australian Standards Relevant to Timber on page 19).

Engineered Beam Products

Product Type		Typical Species	Brands/ Grades	Approx Density (kg/m³)	Supply
Laminated Veneer Lumber (LVL)	Softwood	Radiata Pine	LVL 13.2	550	Available from selected suppliers
		Pinaster Pine	LVL 14.0	650	Available from selected suppliers
I-Beams	Softwood	Radiata Pine	Refer manufacturer's span tables	550	Available from selected suppliers
		Pinaster Pine		650	Available from selected suppliers
Glued Laminated Timber	Softwood	Slash Pine Radiata Pine White Cypress	GL8-GL21	550	Available from selected suppliers
	Hardwood	Victorian Ash	GL8-GL21	650	Available from selected suppliers

Engineered Panel Products

Product Type		Typical Components	Approx Density (kg/m³)*	Supply
Plywood	Softwood	Veneer	500 - 650	Readily Available
	Hardwood	Veneer	can exceed 900	Limited Availability
Particleboard	Softwood	Wood Chips	610	Readily Available
Oriented Strand Board (OSB)	Softwood	Timber Strands	640 - 700	Readily Available
Masonite	Hardwood	Timber Pulp Fibres	1050	Readily Available

* Density is approximately equivalent to the density of the timber species from which they are manufactured.

Sawn Timber Products

Seasoned Softwood

Seasoned softwood is widely used in residential frame construction (wall frames: studs, plates, headers; floor and roof truss components) and other internal fit-out elements. Structural seasoned softwood is usually sold with a dressed surface finish (planer-gauged). It may also be rougher headed which is a reeded finish. Radiata Pine is also available as preservative treated (see page 7). Factory manufactured finger-jointed and metal plate connector joined products are also available (see page 10).

Seasoned Softwood Size Range

BREADTH (mm)	DEPTH (mm)							
	42	70	90	120	140	190	240	290
35	◉	●	●	●	●	●	◉	◉
45		●	●	●	●	●	●	●
90			●					

● Commonly available sizes ◉ Available by order ○ Sizes in limited supply

1. Size stated is finished size (planer-gauged or rougher headed). Sawn sections are sometimes available on special order (particularly copper-chrome-arsenate C.C.A. preservative treated material). These sections are at least 6mm greater in width and 5mm greater in thickness than the size stated in the table.
2. Lengths up to approx. 5.4 metres are normally available in 0.3 metre increments.
3. Seasoned softwood is supplied at a moisture content not exceeding 15 per cent.

Unseasoned Softwood

The predominant unseasoned softwood used in Australian homes is White Cypress. It is a highly moisture-resistant material. The heartwood is durable with excellent termite resistance and is commonly used in outdoor applications. It is generally used as deck joists, beams or posts. Oregon (Douglas Fir) is also typically available in breadths up to and including 75mm.

Unseasoned Softwood Size Range

BREADTH (mm)	DEPTH (mm)							
	75	100	125	150	175	200	225	250
38	●	●	●	●	○	○		
50	●	●	●	●	●	○	○	○
75	●	●	●	●	●	○	○	○
100	●	●	○	○	○	○	○	○
125			●	◉		◉		
150				●				
200						●		

● Commonly available sizes ◉ Available by order ○ Sizes in limited supply

Treated Softwood

Softwood can readily be made resistant to decay, insect and fungal attack, as well as have its lifetime greatly increased through chemical treatment.

There are several levels of hazard treatment in the treated timber range.

Hazard Level	Exposure	Specific Hazard
H1	Inside / Above-Ground	Lyctid Borer
H2	Inside / Above-Ground	Termites
H3	Outside / Above-Ground	Moderate Decay
H4	Outside / In-Ground	Severe Decay

1. Most outdoor products are classified as H3, with H4 being commonly used for in-ground purpose timber i.e. 90x90 posts.
2. Whilst hazard levels range from H1 – H6, H5 and H6 are generally retained for specialist applications such as boat hulls and marine piles.
3. H2-F/H2-S is termite protection treated with a long acting synthetic pyrethroid insecticide. It is generally identifiable by its distinctive blue tint and available in most pine framing sizes.

CCA

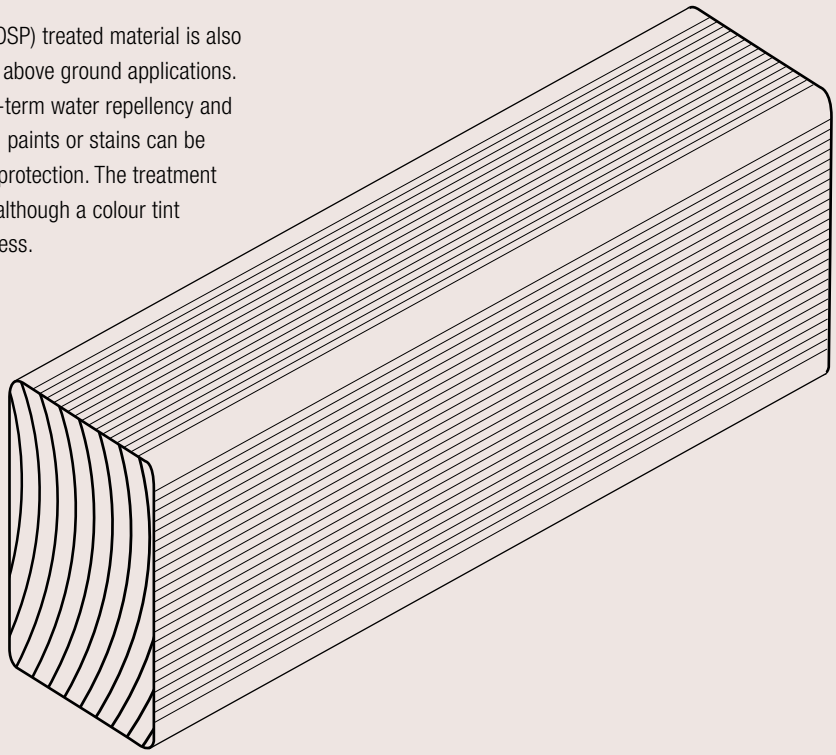
Copper Chrome Arsenate (CCA) is pressure-applied to timber until the active ingredients bond with the timber's cell structure. Copper protects from decay, arsenic repels insect attacks and chromium is the bonding agent. It is recognisable by its distinctive green tinge, and while it may appear more expensive than untreated softwood, its increased lifespan makes it a worthwhile investment. Products treated with CCA are redried (seasoned) after treatment.

CCA treated material presents no known hazards to humans or domestic animals under normal conditions of use, however, the following applications have been voluntarily excluded as a precaution: children's play equipment, garden furniture, picnic tables, external seating, domestic decking boards, handrails or burning.

An alternative treatment option (ACQ) is now widely used for most of these applications.

LOSP

Some light organic solvent preservative (LOSP) treated material is also available. This treatment is only for use in above ground applications. Where unprotected, LOSP gives only short-term water repellency and dimensional stability. As a primer to which paints or stains can be applied it provides long-term preservative protection. The treatment is not normally recognisable by its colour, although a colour tint may be incorporated in the treatment process.



Seasoned Hardwood

Australian seasoned hardwood is greatly valued in structural applications for its high durability and strength-to-weight ratio as well as its inherent beauty. Its structural applications commonly include high-strength floor and roof beams and joists, as well as support lintels over doors and window openings. Seasoned Australian hardwood is sourced from both plantations and sustainably managed native forests.

Structural seasoned hardwood products are usually sold in solid form, however finger-jointed material for applications such as wall studs, plates, etc., and factory manufactured products joined with metal plate connectors are available from some suppliers.

Seasoned Hardwood Size Range

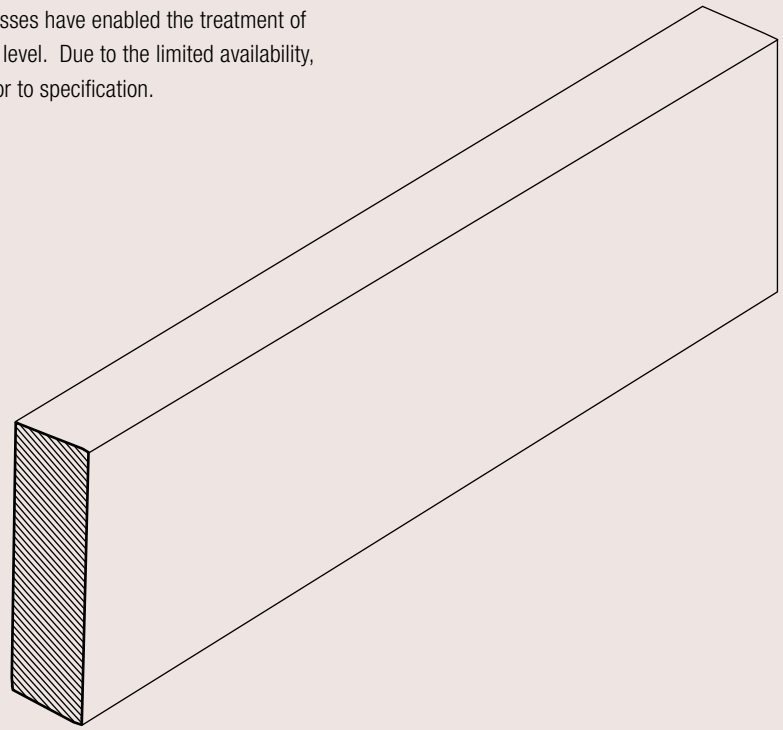
BREADTH (mm)	DEPTH (mm)								
	70	90	120	140	170	190	220	240	290
35	●	●	◉	◉	○	◉	○	◉	○
45	●	●	●	●	○	●	○	●	●

● Commonly available sizes ◉ Available by order ○ Sizes in limited supply

1. Lengths up to approx. 5.4 metres are normally available. Lengths are typically supplied in 0.3 metre increments. Longer lengths of finger-jointed or metal plate connector jointed material is available, with some restrictions applying to use.
2. Size stated is 'finished' size (gauged).
3. Seasoned hardwood is supplied at a moisture content not exceeding 15 per cent.
4. Unless specifically requested, structural seasoned hardwood is graded for strength only and not visual appearance. Some suppliers will provide structural grades in combination with appearance grades where aesthetics are important (for example exposed beams). AS2082 provides for structural and appearance grades of seasoned hardwood where necessary. The respective grading requirements can be interposed.

Treated Hardwood

Due to the density of hardwoods, treated products are difficult to achieve and therefore not widely available. In recent years, advancements in treatment processes have enabled the treatment of some hardwoods to achieve a H2 level. Due to the limited availability, check with your local supplier prior to specification.



Unseasoned Hardwood

Unseasoned hardwood is marketed in Australia as a timber group comprising a range of different species, each having similar structural properties. Historically, unseasoned or 'green' hardwood was extensively used as both framing and large structural members in residential housing; it has now largely been replaced by seasoned softwood and hardwood. However, in rural areas, where availability is greater, it remains a viable option for joist and beam construction.

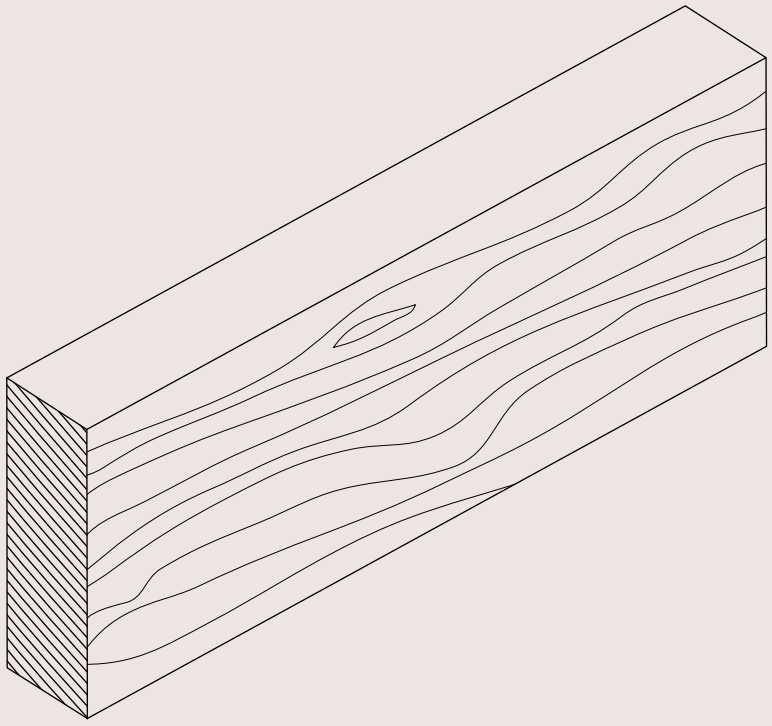
It should be noted that some merchants stock only a limited range of sizes and lengths, however, a complete range is generally available on order or directly from sawmills.

Unseasoned Hardwood Size Range

BREADTH (mm)	DEPTH (mm)									
	50	75	100	125	150	175	200	225	250	300
25	●	●	●	○	●	○				
38	●	●	●	●	●	●	●	●	●	●
50	●	●	●	●	●	○	●	●	●	●
75		◉	●	◉	◉	◉	◉	◉	◉	◉

● Commonly available sizes ◉ Available by order ○ Sizes in limited supply

1. Size stated is 'sawn' size (rough sawn finish).
2. Lengths up to 6.0 metres are readily available. Lengths above 6.0 metres and up to 7.5 metres are generally obtainable in larger sizes from most suppliers although advance orders may be required.
3. Tolerances:
   a. Size tolerance – finished width and thickness.
      For timber up to 6.0m in length and up to 200mm in width: ± 3mm
      For timber up to 6.0m in length and 200mm or more in width: + 9mm, - 3mm
      For timber 6.0m and over in length: as above, increased by one-third
      For sized or gauged timber: + 2mm, - 0mm.
   b. Length tolerance – not less than the ordered dimension.



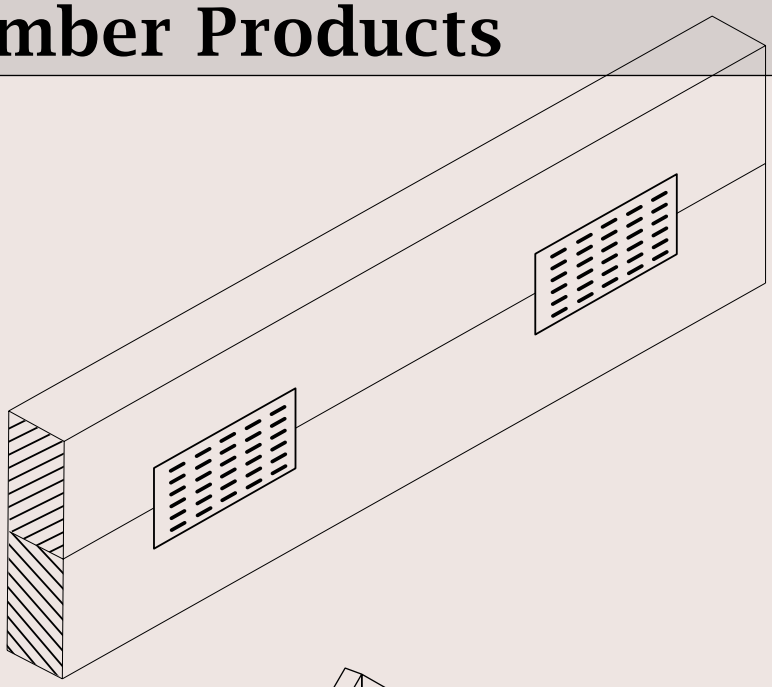
Nailplate Joined Timber Products

Structural Beams

Structural beams of long lengths and large sizes are factory-fabricated from smaller framing sized timbers using toothed metal nailplates. These nailplate joined members are generally made from seasoned hardwood, although Radiata Pine sections are also manufactured.

Long length components are manufactured by butt-jointing shorter sections, with lengths up to 12.0 metres possible. Larger section sizes are obtained by horizontally laminating small sections together. Beams fabricated by a combination of the two processes are also available.

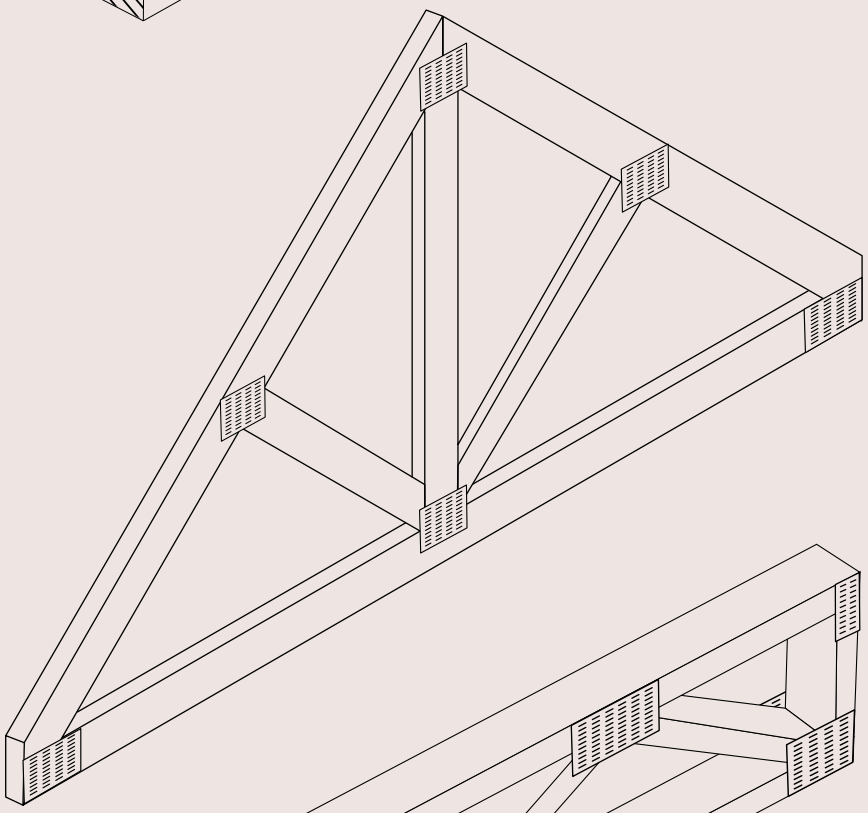
In some cases end use is limited to a specific application and therefore nailplate joined beams are not necessarily a substitute for solid timber. Some restrictions may apply to the notching and drilling of engineered nail-plated products. Suppliers should supply specific instructions. Manufacturers' span tables should be consulted to establish maximum beam spans before specifying.
Nailplated products should never be used as planks.



Roof Trusses

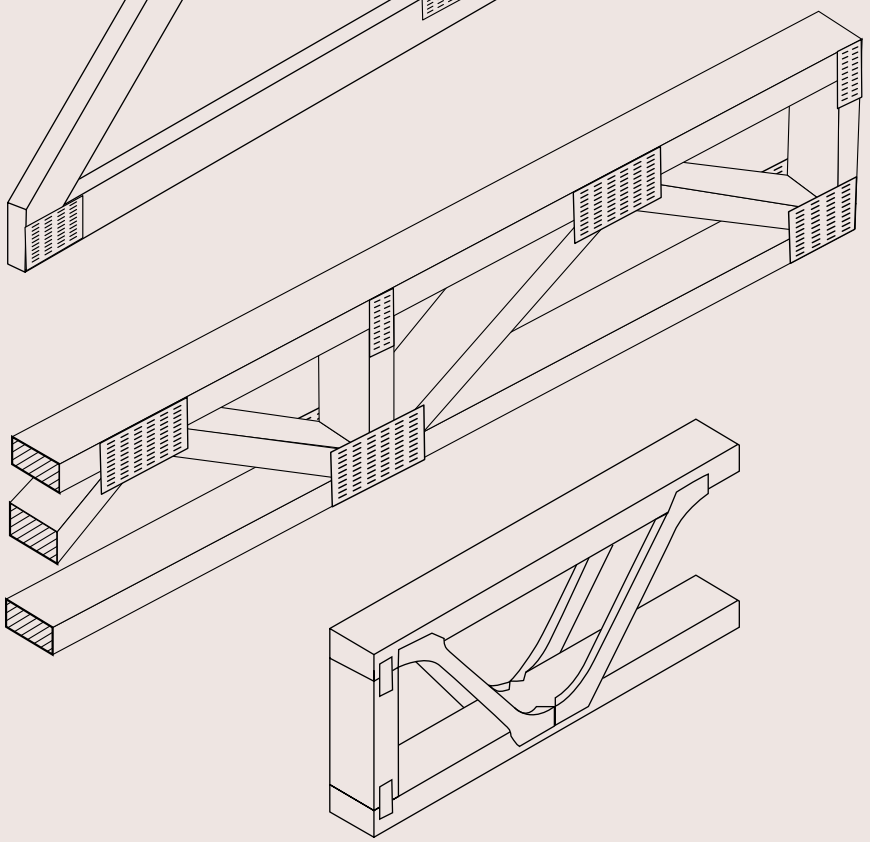
Trusses connect timber in triangular units. This design allows a unit to span a greater length than conventional beams and use smaller-sized pieces. A fully engineered product, timber trusses are usually factory fabricated, utilising nailplates to connect each member. Alternative connectors such as bolts are available for special truss applications.

Roof trusses are manufactured specifically to plan. Most trusses are fabricated from seasoned hardwoods and softwoods. Clear spans of up to 30 metres can be readily available. Prefabricated trusses may not only be more accurate and versatile, but can potentially use less timber than conventionally pitched roofs.



Parallel Chord Trusses

Parallel chord trusses have similar design functionality as I-Beams with a top and bottom flange, but a truss structure replacing the web. Parallel chord truss design advantages are similar to the roof trusses as they use less timber than a solid beam and can span a longer distance. They are widely utilised as floor joists and rafters due to their lightweight and the ability to rout services pipes and cabling through. In the past, one disadvantage of this truss design has been that specific member spans must be known in advance to allow for the member to be specially manufactured. This problem has been addressed by new products with either solid wood or OSB ends, allowing the floor trusses to be trimmed and adjusted on site, refer to manufacturer's details regarding installation.



LVL – Laminated Veneered Lumber

LVL is predominately used for residential and industrial building applications such as floor joists, rafters, girder beams, lintels and garage opening beams.

LVL is manufactured from rotary peeled softwood veneers (e.g. Pinus radiata, Pinus pinaster) which are dried and glued together under heat and pressure.

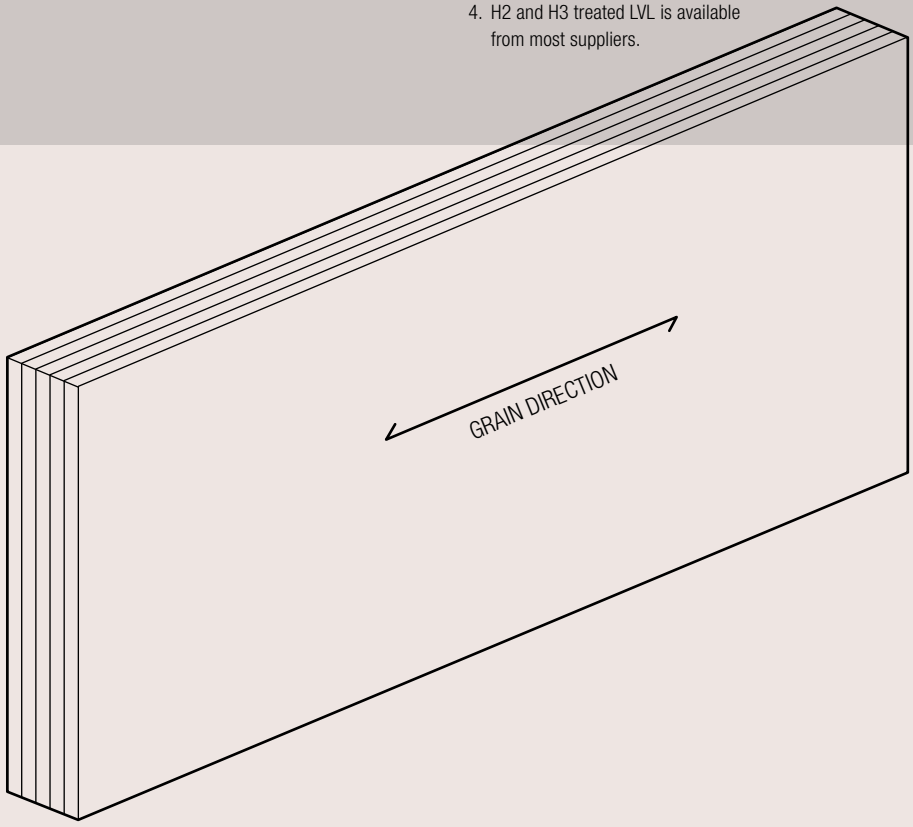
The grain of all veneers is oriented in the direction of the long dimension of the beam. The phenolic adhesive used gives a Type A exterior bond. Long lengths and large stable sections make the product ideal for domestic, commercial and industrial applications. Standard beam sections sizes are produced from large slabs in the factory.

LVL Size Range

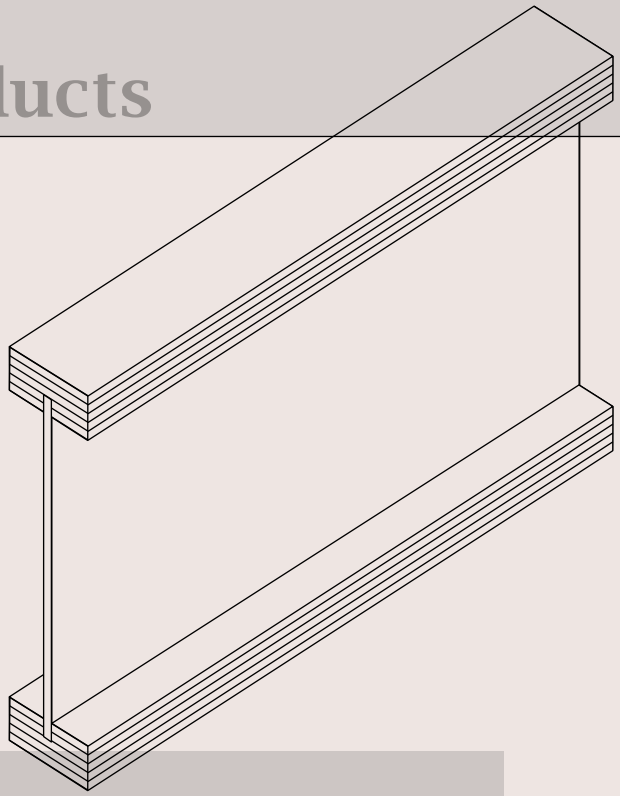
BREADTH (mm)	DEPTH (mm)												
	95	130	150	170	200	240	300	360	400	450	500	525	600
36	●	●	●	●	●	●	●						
45	●	●	●	●	●	●	●	●	●				
63	◉	◉	◉	◉	●	●	●	●	●	◉	◉		◉
75			◉	○	○	○	◉	○	◉	○		◉	◉

● Commonly available sizes ◉ Available by order ○ Sizes in limited supply

1. Greater depths are available on request to suit commercial and industrial applications.
2. 90mm and 245mm depths are also available from some suppliers.
3. Long lengths up to 12.0 metres are available. Lengths up to 8.4 metres are typically available in 0.3 metre increments and greater than 8.4 metres are available on order in 0.6 metre increments. Lengths over 12.0 metres can be sourced by special order and delays in delivery time may occur. Lengths are limited by transportation.
4. H2 and H3 treated LVL is available from most suppliers.



I-Beams



I-Beams are '**I**' shaped engineered wood structural members. They consist of top and bottom flanges which resist bending, tension and compressive stresses, these are generally solid timber or LVL; and a web which transfers shear forces between the flanges, generally structural plywood or oriented strand board (OSB).

Because I-Beams have a high strength-to-weight ratio and are lightweight, they are considered an ideal floor joist and rafter choice for many commercial and residential applications. A major feature is the ability to cut holes in the web, to accommodate services, without compromising structural integrity (refer to the manufacturer's advice regarding allowable sizes and positioning of holes).

I-Beam Size Range

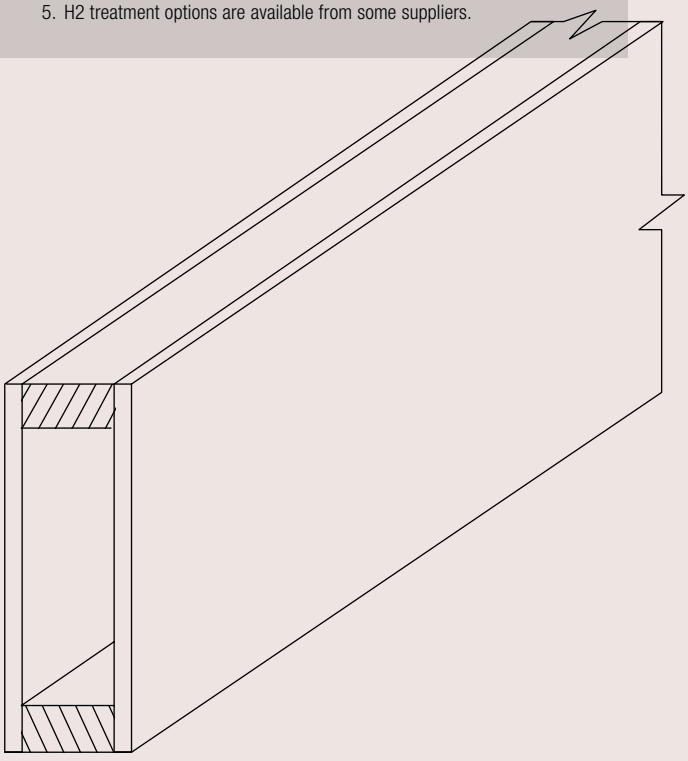
FLANGE WIDTH (mm)	DEPTH (mm)				
	200	240[2]	300	360	400
45	●	●	●		
51		◉	●		
63		●	●	●	◉
90		●	●	●	●

● Commonly available sizes ◉ Available by order ○ Sizes in limited supply

1. Greater depths are available on request to suit commercial and industrial applications.
2. 245mm depths are also available from some suppliers.
3. Minimum flange widths and depths shown. Flange dimensions may vary slightly between manufacturers this affects spanning ability – check with supplier.
4. Long lengths up to 12.6 metres are available. Lengths up to 8.4 metres are typically available in 0.3 metre increments and greater than 8.4 metres are available on order in 0.6m increments. Lengths over 12.6m can be sourced by special order - delays in delivery time may occur. Lengths are limited by transportation.
5. H2 treatment options are available from some suppliers.

Box Beams

Box beams follow similar design principles to I-beams, but in this instance two web members are used, fixed to the sides of the flanges. This allows for the member to not only have a decorative face, but also enables wiring to be run through the middle of the beam and thus achieve a neater look. Box beam structures are especially ideal in areas that require a long span, such as open plan buildings like sports arenas and warehouses, as they are lightweight and can be used as a decorative feature. Box beams are designed to job-specific standards and are typically assembled off-site. There are no standard sizes to be purchased 'off-the-shelf'.



Glued Laminated Timber

Glued laminated (Glulam) components are fabricated by gluing together the horizontal faces of thin timber laminates so that the completed component functions as one structural unit (e.g. beams and columns).

Most glulam is fabricated with Radiata Pine although glued laminated hardwood and Oregon beams are also available. The size and length range is virtually unlimited as manufacturing can be tailored to suit design requirements.

Design of these members must be in accordance with the Australian Standard AS1720.1 Timber Structures - Design methods.

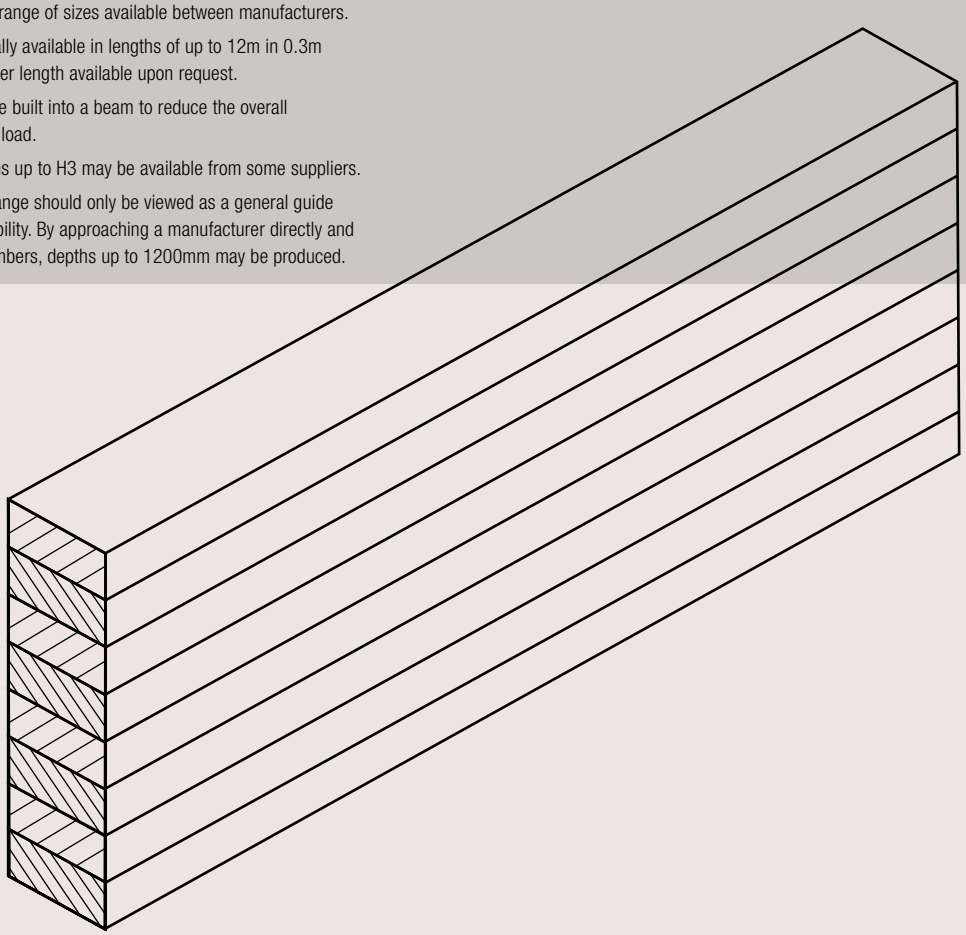
Manufacturing and quality control requirements are specified in AS/NZS1328: Glued laminated Structural Timber. As there is no system within AS/NZS1328 to assign mechanical properties to Glulam, the Glued Laminated Timber Association of Australia (GLTAA) established a performance guide. This guide generally assigns grades of structural Glulam from GL8 – GL18 with GL21 being available from selected suppliers as an appearance-grade product.

Glulam Size Range

BREADTH (mm)	DEPTH (mm)													
	120	150	170	180	200	230	240	270	300	330	360	380	400	420
65	●	●	◉	●	◉	●	●	●	●	●	●	○	◉	●
85	●	●	◉	●	◉	●	●	●	●	●	●	○	◉	●
115	●	●	◉	●	○	○	●	●	●	●	●		◉	●

● Commonly available sizes ◉ Available by order ○ Sizes in limited supply

1. Glued laminated (Glulam) timber sizes can vary between manufacturers and grades. Many depths in the table have been simplified due to the extensive range of sizes available between manufacturers.
2. Glulam is generally available in lengths of up to 12m in 0.3m increments, longer length available upon request.
3. A camber may be built into a beam to reduce the overall deflection under load.
4. Treatment options up to H3 may be available from some suppliers.
5. The listed size range should only be viewed as a general guide to Glulam availability. By approaching a manufacturer directly and using specific timbers, depths up to 1200mm may be produced.



Engineered Panel Products

Plywood

Plywood is produced by gluing together thin layers of wood veneer with the grain of adjacent veneers running perpendicular to each other. Once the veneers have been bonded, they create one structural unit that can be cut to any size to serve a variety of functions – structural or appearance.

As a very versatile structural product, plywood has a large number of applications including bracing, flooring and can be used as external cladding.

Plywood is typically manufactured from softwood veneers, though hardwood plywood is available if higher stress grade of appearance products are required.

Plywood thickness varies with manufacturer and product application, but typical structural panel thicknesses are: 3, 4, 4.5, 6, 7, 12, 13, 15, 17, 19, 21, 25 mm.

Plywood Size Range

WIDTH (mm)	LENGTH (mm)			
	1800	2100	2400	2700
900	◉	◉	◉	◉
1200	◉	◉	●	●

● Commonly available sizes ◉ Available by order ○ Sizes in limited supply

1. Lengths of 2440mm and 2745mm may be available for wall bracing to preserve 2.4m and 2.7m floor to ceiling height respectively.
2. Plywood may be CCA treated or available in Marine Ply. Marine Ply is a very high quality product with a higher strength rating and is specifically designed for boat hulls and other nautical applications.

OSB – Oriented Strand Board

Oriented Strand Board (OSB) is manufactured using timber (softwood) wafers that are oriented in one direction as they are combined. While most wafers are oriented in the long direction, a proportion are orientated at random angles. The thin rectangular wooden strips are compressed and bonded together with wax and resin adhesives. While OSB has similar properties to plywood, unlike plywood, it does not have a veneer finish and is not an appearance grade product as the wafers give the face a mottled appearance. Its applications are similar to plywood and it is generally used for cladding and bracing.

OSB Size Range

WIDTH (mm)	LENGTH (mm)		
	2440	2745	3050
900	◉	◉	◉
1200	●	●	◉

● Commonly available sizes ◉ Available by order ○ Sizes in limited supply

1. OSB generally comes in thicknesses of 9.5mm to 18.5mm.

Particleboard

Particleboard (otherwise known as chipboard) is manufactured from similar sized wood particles (or chips) hot-pressed together with a resin to create a large board which is then cut into required panels. Particleboards can be manufactured with a number of different finishes such as: raw sanded, wood veneer, vinyl or melamine white papers.

It is a high quality and price-effective panelling product, but can be prone to swelling and should not be used for exterior applications. Moisture resistant (MR) particleboard may be available for use in areas of high humidity and occasional wetness, such as bathrooms.

FLOORING

Large tongue-and-groove particleboard sheets are available for flooring applications. They are specially made with moisture-resistant synthetic resin with wax-sealed edges to allow for limited weather exposure (contact manufacturer for specific tolerances).

Particleboard flooring is used widely as a structural flooring substrate to form a platform for finishing overlays (carpet/vinyl). Different flooring particleboard products are available in this range, and are identified by the colour-coded wax (and tongue) around the edge.

Wax and Tongue Colour	Size (mm)	Thickness (mm)
Yellow/Green	3600 x 900	19
Red/Beige	3600 x 900	22
Blue	3600 x 600	25

1. Although particleboard flooring is generally treated for limited water exposure, it should be kept off the ground and covered prior to installation to avoid swelling and gaps upon installation.
2. Particleboard flooring can be treated to H2 for termite resistance.

Masonite

The Mason Method of producing hardboards involves taking hardwood sawmill residue and forest thinnings and blasting them into long fibres with steam and then forming them into boards using their naturally occurring wood glues to bind them together to form a board.

Masonite is considered environmentally friendly, as it does not contain synthetic glues or resins. The boards are highly flexible and have a smooth finish on one side. Masonite has a number of applications such as a flooring underlay and for wall bracing.

Masonite Size Range

WIDTH (mm)	LENGTH (mm)		
	2440	2745	3050
460	●	●	◉
610	◉	◉	◉
900	●	●	◉
1200	●	●	◉
1350	◉	◉	◉

● Commonly available sizes ◉ Available by order ○ Sizes in limited supply

1. Widths of 915mm and 1220mm may also be available from some suppliers.
2. Available thicknesses are 4.8mm and 6.4mm.

Ordering and Specification

There are three aspects to specifying timber

1 Timber Type

The first step is deciding the right timber type (hardwood, softwood) and timber grade (F17, MGP10) for the specific application. Full information on sizes and lengths available are listed in the relevant tables.

2 Timber Size

The unit of measure for size, or cross-section, is millimetres (mm).

Cross-section measurements are specified using the greatest dimension first, for example: 90 x 45, not 45 x 90. The size ranges are indicated in the relevant tables and can vary greatly from product to product.

3 Timber Length

The unit of measure for timber length is metres (m).

Timber is normally sold in standard lengths, beginning at 1.8 metres and increasing in 0.3m increments (i.e. 2.1, 2.4 up to 5.7 and 6.0, and in some cases above). Lengths may differ in availability depending on timber size, specification and location. Check the relevant table and notes.

Ordering

Structural timber should be specified by timber group, stress grade and size. Example:

F17 190 x 45 seasoned hardwood

MGP10 90 x 35 seasoned pine

The number of pieces required per length must also be given – 10/2.4 indicates 10 pieces at each 2.4m in length.

The correct lengths should be ordered for a specific application. For example, the practice for ordering studs in 4.8 m lengths and site docking to produce 2.4m studs is discouraged as it involves higher production costs and could cause problems with a large number of pieces in a frame being left unbranded.

Some merchants may use the phrase 'Kiln Dried' (KD) interchangeably with 'seasoned' ie: F17 190 x 45 KD hardwood.

Additional Information

Actual board size and length may differ slightly from the dimensions stated. Under Australian Standards there are certain millimetre amounts to which board size can differ, yet still be considered acceptable – this is called 'Tolerance'.

Tolerances:

a) Size Tolerance

Visual grading (F – Grades)

Dressed products (gauged): + 2mm, - 0mm with variation in size within a piece or a parcel not exceeding 2mm.

Cypress pine products: + 3mm, - 0mm with variation in size within a piece or a parcel not exceeding 2mm.

Sawn Products: + 5mm, - 0mm with variation in size within a piece not exceeding 2mm.

Machine grading: (MGP – Grade) + 2mm, - 0mm.

Engineered Wood Products: Refer Manufacturer's Information.

b) Length Tolerance – not less than the specified dimension.

Properties of Structural Timber

Species	Density kg/m³	Natural Durability Class of Heartwood		Strength group		Lyctid Susceptibility
	At 12% moisture content	In Ground Contact	Outside Above Ground	Unseas.	Seas.	
Ash, Alpine	650	4	3	S4	SD4	S
Ash, Mountain	650	4	3	S4	SD3	NS
Ash, Silvertop	850	3	2	S3	SD3	NS
Box, Brush	900	3	3	S3	SD3	NS
Box, Grey	1100	1	1	S2	SD2	S
Cypress, White	700	2	1	S5	SD6	NS
Fir, Douglas	550	4	4	S5/S6	SD5/SD6	NS
Gum, Blue, Southern	950	3	2	S3	SD2	S
Gum, Grey, Mountain	850	3	2	S3	SD2	S
Gum, Manna	750	4	3	S4	SD4	S
Gum, Red River	900	2	1	S5	SD5	S
Gum, Shining	650	4	3	S4	SD4	S
Gum, Spotted	1000	2	1	S2	SD2	S
Hemlock, Western	500	4	4	S6	SD6	NS
Ironbark, Red	1050	1	1	S2	SD3	S
Jarrah	800	2	2	S4	SD4	S
Kwilla (Merbau)	850	3	1	S2	SD3	S
Mahogany, Southern	900	3	2	S2	SD3	NS
Messmate	750	3	3	S3	SD3	S
Pine, Radiata	550	4	4	S6	SD6	NS
Stringybark, Brown	850	3	2	S3	SD3	NS
Stringybark, Red	900	3	2	S3	SD4	S
Stringybark, White	850	3 - 2	2	S3	SD3	NS
Stringybark, Yellow	900	3	2	S3	SD3	NS
Tallowwood	1000	1	1	S2	SD2	S

Natural Durability – Probable Life Expectancy

Class	In - Ground (Years)	Above - Ground (Years)
1	25+	40+
2	15 - 25	15 - 40
3	5 - 15	7 - 15
4	0 - 5	0 - 7

Strength Groups

Timber is classified into strength groups based on its mechanical properties. The groups are (in descending order) S1-S7 for unseasoned and SD1-SD8 for seasoned timber.

Lyctid Susceptibility
(Susceptibility to attack by Lyctid borer)

S – Susceptible

NS – Not susceptible

Timber Certification

Increasingly around the world, companies, governments and consumers are seeking assurances that the timber products they purchase are sourced from legally and sustainably managed forests. Third party timber certification provides an independent means of providing this assurance.

Timber certification involves both forest certification and chain of custody certification.

Forest Certification

is the voluntary process by which planning, procedures, systems and performance forestry operations are audited by an independent third party against a predetermined standard. Forest operations found to be in conformance with the given standard are issued a certificate [hence certification].

Chain-of-Custody Certification

provides a system to track a specific wood product from an exact source of certification through the processing and marketing channels to the final user.

Certification is much more than a self-justified marketing claim. Rigorous, independent assessment by third-party auditors must be carried out before organisations can claim certified products.

Timber certification is available in Australia through two schemes:

The Australian Forest Certification Scheme (AFCS)
www.forestrystandard.org.au

Australian Forestry Standard Ltd is a not-for-profit public company registered in July 2003. The company manages the elements of the Australian Forest Certification Scheme. The scheme utilises the Australian Forestry Standard (AS4708) which has been developed utilising the formal Australian Standards process and designed to suit Australian forests, legal systems and community expectations. It is based on internationally recognised frameworks, such as ISO 14000 environmental management standards and criteria of the 'Montreal Process' for sustainable forest management. While the AFS is specifically an Australian Standard, it has been given international standing through its mutual recognition by the Programme for the Endorsement of Forest Certification Schemes (PEFC). In Australia, AFCS certifies over 8.7 million ha of Australian native forests and plantations.

Forest Stewardship Council (FSC)
www.fscaustralia.org

The Forest Stewardship Council is an independent, non-government, not-for-profit organisation established in 1993 to promote the responsible management of the world's forests. FSC is a certification system that provides standard-setting, trademark assurance and accreditation services to companies, organizations, and communities. FSC utilises 10 international principles adapted as per the country of implementation. In Australia two FSC based schemes are available (Woodmark and Smartwood) which utilise 'interim standards' based on FSC principles & criteria; FSC Australia is currently working on a specific Australian FSC Standard. In Australia, FSC certifies over 500 thousand ha of Australian plantations.

Market Availability of Certified Structural Products

Most Australian forests growers have now implemented forest certification to either AFCS or FSC. A wide range of companies along the supply chain are also now implementing chain of custody certification and hence the volume of certified branded structural timber is steadily increasing. If you require certified timber, look for the AFCS or FSC brand on the product or contact the above organisations for a list of accredited suppliers.

Australian Standards Relevant to Timber

General

AS/NZS	1148	Timber – Nomenclature – Australia, New Zealand and imported species	AS	2796	Timber – Hardwood – Sawn and milled products
AS	1577	Scaffold Planks	AS/NZS	4491	Timber – Glossary of terms in timber related Standards
AS	1810	Timber – Seasoned cypress pine – Milled products	AS	4785	Timber – Softwood – Sawn and milled products

Stress grading

AS	1613	Colours for marking F-grades	AS	2858	Timber – Softwood – Visually stress- graded for structural purposes
AS/NZS	1748	Timber – Mechanically stress-graded for structural purposes	AS	3519	Timber – Machine proof grading
AS	2082	Timber – Hardwood – Visually stress-graded for structural purposes	AS/NZS	4063	Timber – Stress-graded – In-grade strength and stiffness evaluation

Design

AS/NZS	1170	Structural Design Actions	AS	2870	Residential slabs and footing - timber members
AS	1684	Residential timber-framed construction			
AS	1720	Timber structures	AS	4055	Wind loads for housing

Preservatives and treatment

AS	1604	Specifications for preservative treatment	AS/NZS	1605	Methods for sampling and analysing timber preservatives and preservative-treated timber

Engineered wood products

AS/NZS	1328	Glued laminated structural timber	AS/NZS	4357	Structural laminated veneer lumber
AS/NZS	1860	Particleboard flooring	AS	4440	Installation of nailplated timber roof trusses
AS/NZS	2269	Plywood – Structural	AS	5068	Timber – Finger joints in structural products – Production requirements

Miscellaneous

AS/NZS	2878	Timber – Classification into strength groups	AS	3660.1	Termite management – New building work
			AS	5604	Timber – Natural durability ratings

Timber Information and Advice

Authoritative advice on timber related subjects is available:

Pine Line
(Toll Free) **1800 007 463**

Timber Merchants
Association Advisory Service
(03) 9875 5010

Or visit:
Timber Advice and Display Centre
Ground Floor
180 Whitehorse Road,
Blackburn, Victoria

Useful Websites

timber.org.au

National Timber Industry Website (supported by FWPA)

This site is packed with an enormous amount of timber related information on a wide range of topics, most of it available in a downloadable pdf format – refer to the 'site map' to get a feel for all the information available.

A3P - Australian Plantation Products and Paper Industry Council
a3p.asn.au

Australian Hardwood Network
australianhardwood.net

Australian Timber Flooring Association
atfa.com.au

Australian Timber Importers Association
atif.asn.au

Australian Wood Panels Association
woodpanels.org.au

Engineered Wood Products Association of Australasia
paa.asn.au

Forest and Wood Products Australia
fwpa.com.au

Frame & Truss Manufacturers Association Australia
ftmaaustralia.com.au

Glued Laminated Timber Association of Australia
gltaa.com

National Association of Forest Industries
nafi.com.au

The Australian Timber Database
timber.net.au

Timber Building in Australia
oak.arch.utas.edu.au

Timber Merchants Association / Timber Advisory Centre
timber.asn.au

Victorian Association of Forest Industries
vafi.org.au

Wood Products Victoria Ltd
wpv.org.au

Wood Products Victoria Ltd.

a founding member of

WOOD COUNCIL Australia