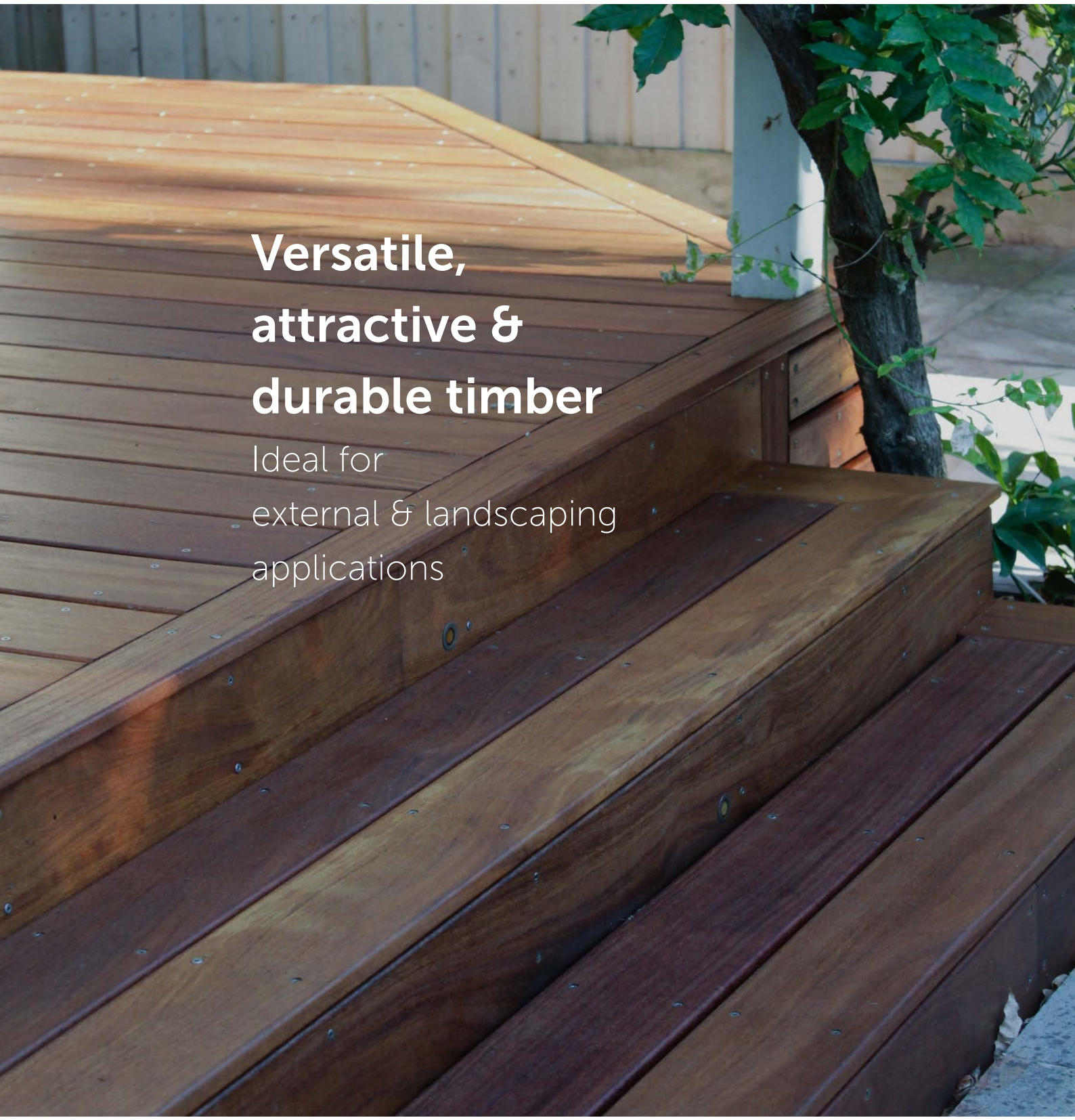
porta

know & love timber

PORTA CUMARU Residential Decks

Design, installation & maintenance guide



Versatile, attractive & durable timber

Ideal for external & landscaping applications

Design, installation and maintenance guide

We are Porta….the people who know and love timber!

We pride ourselves on being Australia's leading supplier of timber products, mouldings and custom moulding services to the home improvement, building, trade and commercial sectors.

An Australian-owned and operated company, Porta has a rich history spanning over 65 years proudly manufacturing and distributing a broad range of timber products using various local and imported certified timber specie.

Porta's milling and importing operations provide quality timber, moulding and design solutions to the construction, commercial and industrial sectors, for home improvement, and also to specifiers and designers. Porta leverages our expertise in timber to source and provide aesthetic and decorative products for the architectural, designer and specifier industries. Porta's timber product range offer innovation and unique designs for interior and external applications.

Porta's brand is built on the 4 pillars that govern how we operate internally and guide our interactions with you. Porta strives every day to be:

- Passionate & Dedicated
- Engaging
- Reliable & Trustworthy
- Experts

We are focused on helping to meet your timber needs and like us….know and love timber!

You can rest assured knowing Porta holds Chain of Custody under the three national and internationally recognised and accredited organisations:

- Forest Stewardship Council® (FSC®)
- Australia Forest Certification Scheme (AFS)
- Programme for Endorsement of Forest Certification (PEFC™)

These are the key bodies that promote stewardship of the world's forests so that you can be confident Porta's timber products in your home can be traced to certified sources.

Porta is committed to sustainable and renewable operations giving priority to sourcing timbers from certified sources. Backed by a team that is passionate about timber and with the expertise to meet your specific needs.

Contents

1. Scope 5
1.1. Benefits of using Timber 5
1.2. Benefits of using Porta Cumaru 5
1.3. Application of this guide 5
2. Design Considerations When Using Timber 6
2.1. Aesthetics 6
2.2. Strength 7
2.3. Sizes and Lengths 7
2.4. Natural Durability 7
2.5. Resistance to Termite Attack 7
2.6. Treated Timber 8
2.7. Tannin and Resin Bleed 8
2.8. Bushfire & Cyclone Regulations 9
3. Deck Design and Considerations 9
3.1. Requirements Around Pools 9
3.2. Deck Framing and Decking Boards Timber Selection 10
3.3. Termite Protection 11
3.4. Posts 12
3.5. Fixing to Existing Buildings 13
3.6. Connector and Fasteners Selection 14
3.7. Structural Joints and Connections 14
3.8. Minimum Height of Timber Decks 14
3.9. Selecting a Deck Board Profile 15
3.10. Ventilation 16
3.11. Close to Ground Decks 16
3.11.1. Selecting Timber 17
3.11.2. Design Considerations 17
3.12. Span Tables – Bearers and Joists 18
3.13. Access for Maintenance 19
3.14. Straightness and Size Tolerence 19
3.15. Handrailing and Balustrades 21
4 Setting Out and Construction 22
4.1. Preparation Under Deck 22
4.2. Storage of Timber 22

4.3. Preparation And Sorting Timber 22
4.4. Key Points To Setting Out 23
4.5. Spacing Deck Boards And Fasteners 23
4.6. Spacing Of Decking boards Close To Ground 24
5. Laying The Deck Boards 25
5.1. Joist Protection 25
5.2. Edge Boards 25
5.3. Face Fixing Deck Boards 25
5.4. Fixings to Steel Joists 25
5.5. Decking Board Joins 26
5.6. Hidden Fixings Systems 27
5.7. Coating decking prior to installation 27
5.8. Coatings 28
5.8.1. Types of timber finishes: 28
5.8.2. Coating Maintenance 29
5.8.3. Cleaning And Resealing the Deck 29
5.8.4. Slip Resistance 30
5.8.5. Wear of Coatings 30
5.8.6. Iron Stains 30
5.9. Resin Bleed 30
5.10. Objects on the Deck 31
5.11. Life Span 31
6. Warranty 31
7. Specifying 31
7.1. Timber 31
7.2. Framing 31
7.3. Fixing 31
7.4. Coatings 32
8. Product Information 33
9. References 33
10. Appendix One: Commercially Available Products 34
10.1. Post Supports 34
10.2. Coatings 34
10.3. End Grain Sealer 34
10.4. Deck Board Fasteners 34

1. SCOPE

This guide outlines key design, construction and maintenance issues for light domestic timber decks (that are exposed to the weather), in raised and close to ground construction locations, featuring the use of Porta Cumaru hardwood timber.

1.1. BENEFITS OF USING TIMBER

The benefits of using timber include:

- Tackles climate change and reduce new carbon emissions
- Stores carbon – reduces atmospheric carbon as trees grow
- Good for health and wellbeing – timber is great to be around
- Production and processing uses less energy
- Certified timber is renewable – trees will regrow
- Select the right timber and it will last – it’s durable
- Structurally strong – excellent strength to weight ratio
- A natural insulator – better to walk on
- Fast and efficient to build with
- Naturally beautiful – look after it

Source: www.makeitwood.org

1.2. BENEFITS OF USING PORTA CUMARU

Porta Cumaru offers many benefits as it is suited to a variety of external and internal applications across residential, commercial and structural/civil construction.

Porta Cumaru is an extremely hard-wearing hardwood perfect for decking, flooring, outdoor furniture, posts, and beams.

- Attractive: With a unique interlocking grain and mid-brown in colour or it will age to a lustrous grey.
- Minimal Bleed: Compared to some other hardwoods it has near zero tannin bleed.
- Certified: FSC certified as being responsibly harvested and processed using responsible forest management and practices and accredited by a third-party organisation.
- Strong: Extremely strong timber enables longer spans, stiffer decks, reduces number of posts.
- Hard: one of the hardest timbers, making it ideal for flooring applications.
- Fire Resistant: Due to its very high density it is suitable for BAL rated applications.
- Termite Resistant: Certified termite-resistant across Australia.

1.3. APPLICATION OF THIS GUIDE

Use this guide for residential decks defined by the National Construction Code (NCC) Volume 2, Class 1 structures (such as detached houses, villas and townhouses) and Class 10 structures (such as garages, sheds and swimming pools) for deem to satisfy requirements.

The guide considers the use of the deck is subject to uniformly distributed load upto 2.0 kPa, a point load of up to 1.5kN. Additionaly the load of the deck supported by the framing is limited to 20kg/m2.

For the design and construction of decks for commercial, industrial or marine applications or where the deck will be subject to loads such as tiles, spas or even vehicles, a structural engineer must be consulted.

Where the moisture content of the selected timber is greater than 20% (for extended periods) extra consideration should made to the grade of corrosion protection of fixings and fasteners.

Local government authorities may have specific requirements relating to deck construction. The need for building approval may relate to size of the deck, its elevation above ground and whether the deck is attached to the dwelling and overviewing considerations.

Site conditions should also be considered to determine specific aspects of the deck design. Consider ventilation of sub-frame timbers, termite inspection access, multi-level steps, comfort and weathering aspects such prevailing winds, sunlight during the day, in addition to privacy and overviewing considerations.

The final appearance will be affected by timber selection and construction methods. Consider the final colour, texture, wear-ability and overall look including fixing method and coating choice when designing the deck.

When designing the deck consider long term care, inspection and maintenance of all components.

Terms used in domestic deck design and construction are illustrated in Figure 1.

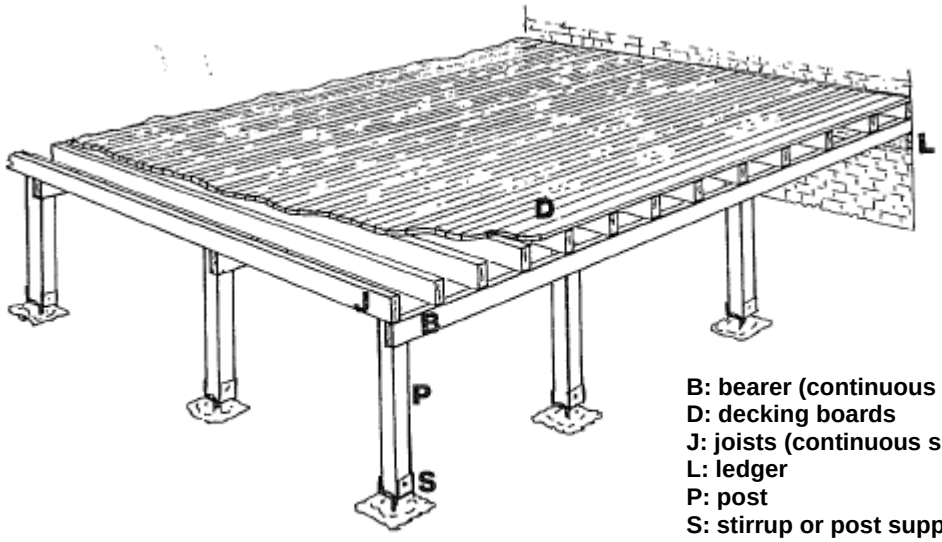


Figure 1 Components used to make up a timber deck

2. DESIGN CONSIDERATIONS WHEN USING TIMBER

There are many benefits and design aspects that need to be considered when using timber for the construction of a residential deck. Porta Cumaru provides aesthetics, strength, stiffness, durability and maintenance benefits of the deck.

With the correct timber selection, construction and maintenance a timber deck will be a valuable addition to the residence.

2.1. AESTHETICS

Porta Cumaru is naturally a good-looking timber. In addition to the natural appeal of timber, the application of a suitable surface finish will maintain the quality of the surface and provide long-term integrity of the timber.

2.2. STRENGTH

Structural bearers and joists timber are available in a variety of timber species, stress grades and sizes. Before designing a deck, check availability of sizes and strength (or stress) grades with local timber suppliers.

Structural timber is graded into stress grades or F-grades. The higher the F-grade the stronger and more rigid. Machine Graded Pine is assessed by machine to the same stress levels as F-grades, yet is shown as a MGP-grade.

Unseasoned (green) hardwood is available from F14, while typical seasoned hardwoods are available up to a stress grade of F27. Treated softwood is typically F7 stress grade. Structural pine is available from F5 through to MGP10.

Porta Cumaru kiln dried beams are rated as F34 which can be used for deck bearers and joists. This high strength and high rigidity timber beams will produce a rigid deck surface with less bounce than a lower stress grade timber. Alternatively, smaller section sizes and wider spans can be used for the same loading.

2.3. SIZES AND LENGTHS

Especially where decking boards are joined over the joist, the joist needs to be of a sufficient thickness to prevent splitting and enable the deck screw to be placed further from the end.

To avoid splitting when decking boards are screwed to them, joists need to be at least 45 mm thick for seasoned hardwood or 50 mm thick for softwood joists.

By using the longest practical bearer, joist and decking boards the number of cuts is reduced and construction time is improved.

Porta Cumaru structural beams are available in long lengths up to 5.4m.

Porta Cumaru decking boards are available in 1.8m through to 5.4m random length packs. Also available is 2.4m and 3.6m set length packs which will assist in reducing construction time and on-site wastage.

2.4. NATURAL DURABILITY

Natural durability refers to the resistance of uncoated heartwood timber to attack by fungal decay.

The broad categories of decay are brown (dry), white and soft rots. Once established brown rot can be very destructive. White rot is common yet less destructive. Soft rots are initiated from extended period of high moisture.

In general, surrounding moisture conditions above 20%RH (relative humidity) are required to promote fungi growth.

Natural durability classes used for decks are ‘above-ground’ (AG) and ‘in-ground’ (IG).

Natural durability refers only to the heartwood of the timber. Any sapwood should be chemically treated. If left untreated sapwood of any timber species is considered non-durable when exposed to the weather and susceptible to premature deterioration and loss of strength.

The natural durability of many timber species is listed in AS 5604 ‘Timber - Natural durability ratings for many species’. Also, reputable suppliers will be able to supply durability ratings.

Porta Cumaru solid hardwood has been tested and conforms to Class 1 above-ground with a life expectancy greater than 40 years. Porta Cumaru may be used in-ground with an expected in-ground natural durability expectation greater than 25 years.

2.5. RESISTANCE TO TERMITE ATTACK

All new houses, including extensions, built within areas designated by municipal councils, must have some form of management against termite attack.

In addition, it is prudent where there is a concern of termite attack, to use termite resistant timber species and design the deck to minimize the risk of attack.

Porta Cumaru is certified as a termite-resistant timber and can be confidently used in all locations across Australia.

2.6. TREATED TIMBER

Non-durable and sapwood in timber can be treated with preservatives to produce a durable timber for structural and decking timbers in construction.

The treatment method is defined in Australian Standard AS 1604 ‘Timber – Preservative-treated – Sawn and round’ which sets out the retention rates for various timber preservatives, different exposures and hazard levels.

There are several restrictions with the use of treated timber in construction.

- Timber treated with the preservative Copper Chrome Arsenate (CCA) is not allowed to be used in areas where children could come into frequent or intimate contact with it such as decking boards and handrails.
- CCA treated timber may be used in other locations of the deck, such as the bearers and joists.
- Timber treated with other preservatives such as ACQ (alkaline copper quaternary), copper azole or LOSP (light organic solvent preservatives) can be used as handrails and decking boards.
- Timber treated with LOSP is not suitable for in-ground use (H4 or H5 hazard level). Timber treated for additional resistance to termites (H2f, H2s and H2 hazard level) is not suitable for use in weather exposed applications.

Treated timber is commonly used for structural components and deck boards. In particular, Treated Pine is significantly less stiff and softer than hardwoods and can accelerate the corrosion of deck fasteners. While it is recommended to use Porta Cumaru for both structural components and deck boards for best performance, Porta Cumaru can be used along treated timber components.

Porta Cumaru is produced from heartwood fibre which does not require any further treatment to achieve its superior durability. Also, due to its superior stiffness, it produces a more rigid structure and deck surface.

2.7. TANNIN AND RESIN BLEED

Most hardwood timber species contain varying amounts of water-soluble extractives that provide colour and some natural decay resistance to the timber.

Water-soluble extractives, which includes tannin and resins, will progressively leach to the surface of the timber. These extractants will pass to and mark surrounding surfaces whenever moisture leaves the timber.

Tropical areas and other high humidity and exposed location, in splash zones around pools, are particularly susceptible.

Most of the extractant discolouration is water-soluble, therefore readily washes to other surfaces. This leaves an unsightly mark on brickwork, concrete or any paving underneath or around a deck, which can be either difficult to remove or will permanently stain the surfaces. The amount of bleeding and staining will reduce over time.

Apply and maintain a water-repellent finish to all surfaces including end grain seal on any freshly cut ends to reduce leeching of the extractants.

If the marking of surrounding surfaces is a concern, avoid the use of timbers which are known to leech. Merbau is notorious for this and even common hardwoods such as spotted gum, tallowwood and ironbark have been known to visibly mark surrounding light coloured surface when abutted to these. It is prudent to use a species with near zero leeching.

Porta Cumaru has been shown through previous field experience and controlled trials that it has near zero leeching and can be confidentially used in critical applications.

2.8. BUSHFIRE & CYCLONE REGULATIONS

In all parts of Australia are prone to bushfires. The local authority determines which area is prone to bushfire attack and the level of attack. In designated areas timber decks must meet the requirements of the relevant standard, AS 3959 ‘Construction of Buildings in Bushfire Prone Areas’.

A number of hardwoods are identified in the standard to meet the relevant Bushfire Attack Level (BAL) for various site conditions.

There are requirements such as maximum gaps between decking boards and enclosing beneath the deck, which is dependent on the BAL level for the site. Some states have some building requirements that differ from the national standard.

Check with the local authority as to the BAL for the particular site and the timber performance requirement.

Porta Cumaru is approved for use in residential decks up to Bushfire Attack Level 19.

3. DECK DESIGN AND CONSIDERATIONS

For maximum life and performance of the deck, Porta recommends that Porta Cumaru hardwood joists and bearers are used along with Porta Cumaru decking boards.

Porta Cumaru hardwood joists and bearers will maximise the service life for your deck. It is highly beneficial to use hardwood joists and bearers if the deck is highly exposed to weather.

The sub-structure transfers horizontal and vertical loads from the deck to the ground. This can include uplift forces especially where the deck is covered with a roof.

It is important that the sub-deck is sturdy and has high rigidity to produce a deck that is not only safe but firm under-foot, with minimal bounce. Due the superior strength and stiffness of Porta Cumaru, the bounce in the deck will be minimised, ensuring the deck has superior strength and security.

To maximise the life of the timber surface and the integrity of the timber, ensure all components are coated with an appropriate timber finish, and cut-ends and protrusions are correctly sealed prior to construction.

The cut ends of deck boards should be covered by a finishing end board, rather than leaving the end grain exposed.

If treated pine bearers and joists are used, ensure the timber is well coated with sealer and not directly exposed to sunlight. If unsealed treated pine is directly exposed to an extended period of sunlight and weathering, the service life of the deck will be reduced. Treated pine will be less rigid than hardwood bearers and joists of the same size and spacing.

Ensure moisture sealing strips are included on top of joists (under the decking boards) to prevent water lying on top of the joists. Ensure the surface below the deck is free draining, well ventilated and water does not pool.

The most common cause of movement in timber decking, including cupping, is moisture under the deck. This can be caused by persistent wet soil under the deck. All decking timbers require adequate ventilation. It is recommended that decking be installed with ideally 400mm (a minimum of 150mm) above ground level to provide ventilation. Decking board gaps should be increased where ventilation is limited. Also additional ventilation under the deck should be provided.

3.1. REQUIREMENTS AROUND POOLS

Where installing adjacent or over pool areas, ensure good cross flow ventilation exits. Ensure all timber components are pre-finished before installation and end-grain of the timber is sealed.

The use of high durability (Class 1) hardwood bearers and joists, such as Porta Cumaru, is suitable for stirrup type post supports or concreting directly into the ground footings.

Allow for regular inspection of any deterioration in the sub-structure and deck board timber and coatings.

Especially where decking is enclosed, ensure adequate cross ventilation is provided or install vents on boundary walls. Where necessary increase the gap between deck boards to increase sub-floor ventilation.

3.2. DECK FRAMING AND DECKING BOARDS TIMBER SELECTION

Unless the deck is completely protected by a roof, the timber framing and boards will be highly exposed to the weather, so it is essential that the selected timber will provide an appropriate service life.

It is recommended that timber selected for used above the ground (framing, boards and posts on stirrups) is a hardwood with a AS 5604 Class 1 natural durability above-ground rating. Alternatively, if softwood is used, ensure it is preservative-treated to at least AS 1604 H3 hazard level. If the hardwood includes any sapwood then this should be either removed or preservative treated to at least H3 hazard level.

Hardwood with a natural durability above ground Class 2 rating is not recommended in an external fully exposed application. Softwood timber that is treated to H2, H2F or H2S hazard level is not suitable for use in the construction of decks.

If the timber is embedded in the ground (embedded posts) they should have an in-ground natural durability rating of Class 1 or be preservative treated to H5 hazard level.

A wide variety of engineered wood products are now available. These include glue-laminated timber, finger-jointed timber and LVL and CLT products. There are limits on the application of these products where they are exposed to the weather. Further advice should be obtained from the manufacturer as to their suitability.

Timber I-beams (treated or untreated) are not suitable for use in the construction of exposed decks.

Porta Cumaru is highly durable timber for deck framing and deck boards as it has the highest level rating as a Class 1 timber *(with a AS 5604 probable in-service life in excess of 40 years and expected in-ground service life in excess of 25 years)*.

3.3. TERMITE PROTECTION

If the deck is susceptible to termite attack protective measures must be taken to minimise potential risk. Tasmania is the only state where no protective measures are required.

This applies to new Class 1 buildings and additions which are required to be protected against termite infestation in accordance with the AS 3660.1 – Termite management - Part 1: New Building work, Class 10 or detached buildings such as a shed, garage or carport constructions are exempt.

Councils have the responsibility to designate areas, within their municipal district, in which buildings are likely to be subject to attack by termites.

Consult the local council to determine whether the area has been declared subject to termite infestation.

Where the area is known to present a potential risk to decks components construct from either:

- naturally termite-resistant timbers, in accordance with Appendix C in AS 3660.1, or
- constructed from preservative-treated timber in accordance to Appendix D of AS 3660.1; or
- have a termite barrier to protect the primary building elements installed in accordance with AS 3660.1.

Source: NCC Vol 1, Part 3.1.3 Termite Risk Management

Added termite protection can be achieved by placing all posts that support the deck framing on galvanized metal stirrups that have at least 75 mm clearance above the finished ground level.

Where there is a concern about the potential for termite infestation allow a 25mm gap between the subframe and perimeter house wall and 10mm gap between deck boards. Also consider introducing removable deck boards at the interface of a timber deck to house or design a removable panel system so adequate termite inspection can be achieved.

While it is prudent to use the above measures to protect against damage to other building components, Porta Cumaru is a naturally termite resistant timber and may be used for deck posts, bearers and joist and deck boards without the need for termite protection or termite inspection throughout Australia.

Note: The deck design should allow for assess to inspect all structural and decking board faces which may not be able to be readily inspected.

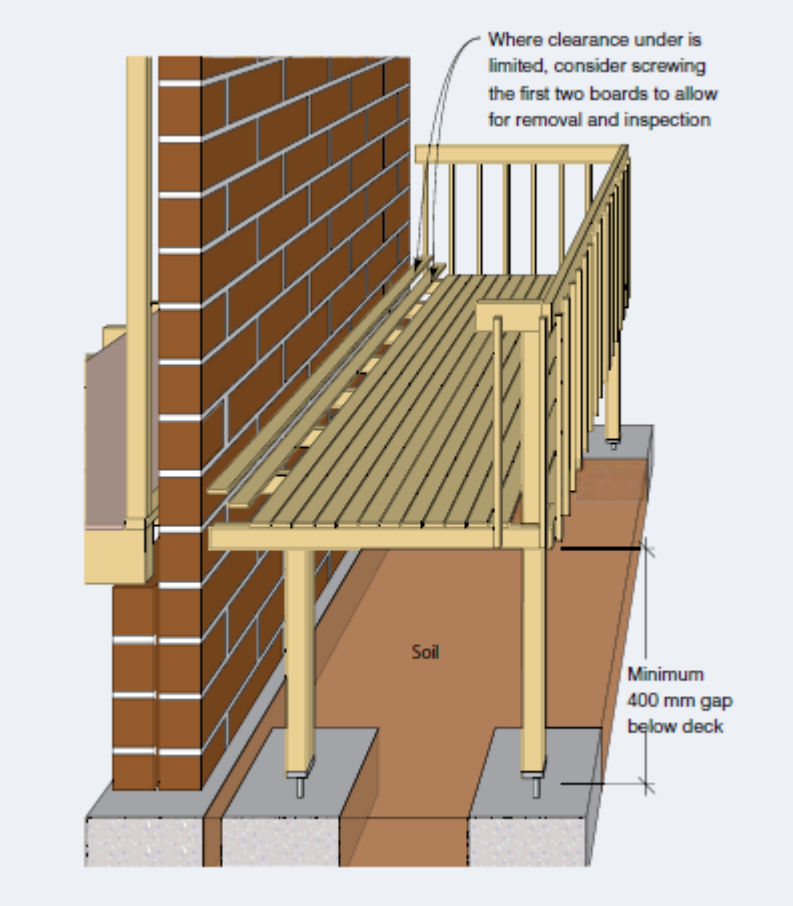


Figure 2 Strategy to improve inspections at the interface of a timber deck and the house envelope

3.4. POSTS

To achieve maximum durability performance, raise the base of any timber post above the ground level. This is to prevent water pooling, insect attack or the potential of decay. In addition, it enables the base of the post to be visually inspected for any deterioration.

Posts can be connected to concrete footings using a range of commercially available post stirrups or post supports.

Footings for supporting posts are usually designed in two ways. The most common method is concrete footings with galvanised stirrups embedded in footings or fixed to the footings to support the posts (Figure 4 Common metal stirrups for footings).

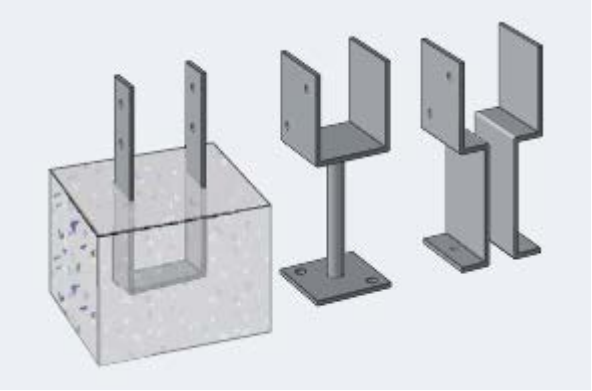


Figure 3 Common metal stirrups for footings

If post stirrups are not used, the deck post may be embedding directly into the concrete footings. Adequate concrete must me allowed under the post and slope the top of concrete footing away from the post to prevent water pooling.

AS 1684.2 Residential timber framed construction Part 2: Non-Cyclonic Areas, Clause 3.7 defines the size of posts. The required size of post is dependent on deck loading including deck area and roof area (if any), post height, wind loads, stress grade of the timber selected and footing type. Generally, 110x110mm posts will be sufficient.

If the deck is to be tiled or a spa or hot tub is built into and support by the deck, the size of timber provided AS 1684.2 Clause 3.7 is not applicable and a certified structural engineer should be engaged to provide an appropriate size of the posts and footings.

The commercially available cross-sectional sizes for posts range from 90 mm and upwards.

The minimum sectional size of post is governed by the distance between the ground and the underside of the bearers.

The maximum height of a deck above the ground without bracing (for a given post cross section size) is typically 15 times the face width of the post.

In accordance with the NCC and regulatory requirements freestanding deck above 1,800mm from the ground require cross bracing to reduce lateral movement. The bracing shall be in both directions with double diagonal braces between at least two pairs of posts at right angles. Where timber braces are used they shall be double diagonal 100 x 38 mm hardwood or 90 x 45 mm treated pine, halved at the crossing.

Decks attached to the house shall have double diagonal bracing either:

a. fixed to the underside of joists with each brace fixed to each joist with 75 mm No. 14 Type 17 batten screws or two 75 x 3.15 mm nails, or
b. for decks greater than 1800 mm high, fixed between a pair of posts, parallel to the wall, with the ends of braces bolted to posts with 12 mm dia. bolts.

Source: Timber Queensland Tech Data Sheet 4 – Residential Timber Decks (Rev Mar-14)

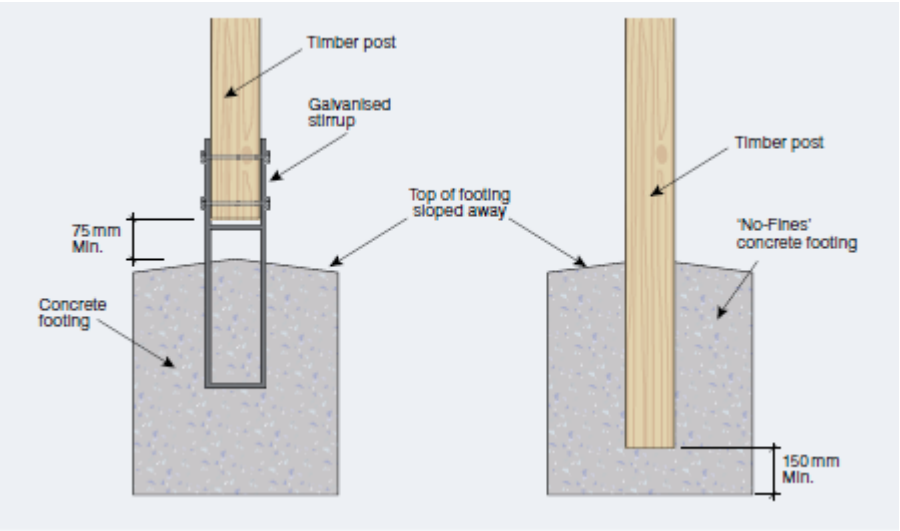


Figure 4 Post embedded into concrete footing

Porta Cumaru unseasoned (green) posts offer high strength and Class 1 durability performance. Porta Cumaru is also resistant to termite attack for sites across Australia to provide long term performance and durability.

3.5. FIXING TO EXISTING BUILDINGS

Care is required in the fixing of a deck sub-structure to existing structures as this is a common source of deck failure.

It is recommended that the deck is designed and constructed as a self-supporting (on its own posts or piers) and does not rely on a building ledger affixed to an adjoining building.

Where this is not possible, advice from a certified structural engineer should be sort to ensure adequate fixing.

Care is also required in the interaction and water proofing or flashing of the decks interface with the adjoining building exterior fabric. Assess the potential of water ingress into the adjoining building from the deck at the interface. An adequate rise to the adjoining floor should be provided to prevent ingress of water. Also consider transitions and suitable flashings to prevent moisture transfer.

3.6. CONNECTOR AND FASTENERS SELECTION

All connections should be of sufficient durability for the conditions and site. Wind effected, coastal and adjacent to pools require extra care due to the potential of high loads and aggressive corrosion.

All framing bolts, screws, nails, and other hardware should be hot dipped galvanised or stainless steel. Due to premature deterioration of the plating electroplated fasteners are not suitable.

Fixings within the splash zones of swimming pools (minimum 1.0 m from pool edge) or in coastal zones must be stainless steel.

Fixings for preservative-treated decking boards should be hot dipped galvanised, stainless steel or with a coating approved for use with treated timber decking.

Due to the potential for moisture to be trapped at the interfaces of crossing bearers and post connections, a protective membrane sheet is recommended to be used at these joints.

Where unseasoned timber is used an allowance should made to re-tighten screw and/or bolt fasteners after 6 months and 12 months.

3.7. STRUCTURAL JOINTS AND CONNECTIONS

The joints between posts, bearers and joists need to be able to transfer load efficiently through the structure.

Where bearers need to be joined, they must occur over supports and provide adequate bearing of at least the same amount as the thickness of each bearer.

Where joists are joined they must be made over a bearer and have a minimum of 30 mm of bearing for each joist.

Where possible, bearers and joists should be long lengths and continuous, spanning over at least three supports.

Porta Cumaru bearers and joists are available in long lengths. Where possible the length should be selected to either achieve a continuous length to minimise joins. This increases the integrity of the design and speeds construction – saving costs.

3.8. MINIMUM HEIGHT OF TIMBER DECKS

Additional considerations should be made for the design of decks where the deck board is within 400mm from the ground. This is shown in Figure 5 ‘Timber deck close to the ground’.

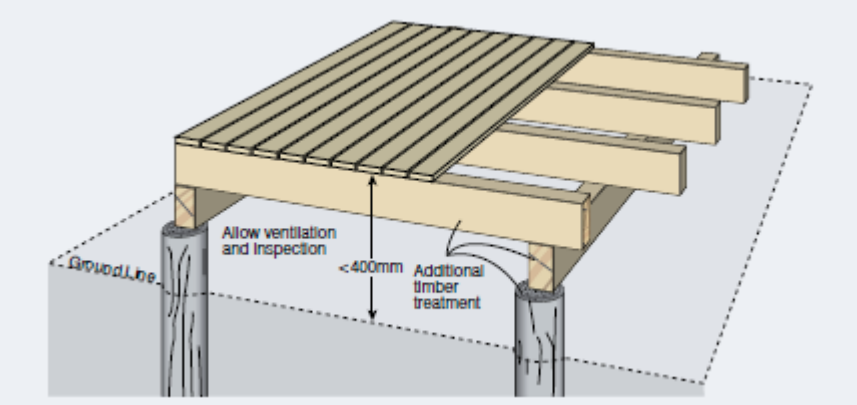


Figure 5 Timber deck close to the ground

These considerations should include:

- In termite prone areas specific removable panels included for termite attack inspection.
- Sufficient perimeter ventilation area and deck board gaps for sub-floor ventilation
- Sub-floor drainage and inclusion of ground membranes to minimising rising moisture
- Placing foundations and bearers so they don't restrict airflow or drainage of water
- Selection of only highly durable timber species

The height above ground may be reduced to 150 mm within 2m of external walls if termite management access is not required. Refer to NCC Volume 2, Part 3.1.3.4 (b) for further requirements.

3.9. SELECTING A DECK BOARD PROFILE

While there several profiles of decking board profiles available. Porta Cumaru is available in pencil round profile.

Figure 6 Porta Cumaru Decking board profile – narrow and wide

A pencil round deck board has significantly less chance of splintering at the edges compared to plain square boards. When using a deck board profile with two flat faces, the board can be reversed to use the preferred side.

Decking boards are available in various widths. The widths usually available are 85 mm or 90 mm widths with wider boards up to 145mm commonly used.

Narrower deck boards will more easily drain water from the deck, reduce the potential cupping and maximise sub-deck ventilation. When using wider boards, they should preferably use face fixed fasteners to reduce the possibility of cupping.

Generally, deck boards are 19 mm thick. Thicker deck boards will produce a stiffer and stronger deck surface.

A reeded (or ribbed) deck board is a common profile in some species. It is possible to use a ribbed deck board profile faced up or down. Yet when used face up there is potential for the reed to splinter and it has a greater potential to hold moist and build up mould which can make it slippery. If a reeded profile is used it should installed reed face down, which will allow moisture between the joist to escape and prevent cupping.

Tongue and grooved timber, plywood or particleboard sheet flooring products are not recommended for use as decking (in weather-exposed situations) unless there is low humidity and adequate ventilation under the deck.

Porta Cumaru decking boards are supplied in two widths; 90mm and 145mm. The generous 21mm thickness, high strength and hardness of the Cumaru will produce a stiff, hard and robust deck surface.

3.10. VENTILATION

Lack of subfloor ventilation is a major contributor to the deterioration and movement of timber. Also, this can result is cracking and cupping of deck boards.

These effects can be reduced by ensuring appropriate and effective drainage of water and adequate cross-flow ventilation under the deck. To maximise ventilation, ensure all building debris and vegetation is cleared from the under-deck area.

Surrounding site works, including garden beads and retaining walls, should be constructed to ensure there is ample cross flow ventilation under the deck.

Solid perimeter walls adjoining the deck may require additional venting in the walls. Where the available area for ventilation area is reduced, the ground below the deck should be sealed with an impervious membrane to increase drainage and prevent excessive moisture under the deck.

The requirement for cross-flow ventilation for decks should be regarded as the same as for raised timber floors in houses. For the minimum cross-ventilation design requirements refer to NCC Volume 2, Part 3.4.1, Sub-Floor Ventilation.

Where there is excessive damp or the area is subject to flooding, rectify drainage issues prior to construction and use durability Class 1 timbers for sub-frame and deck boards, such as Porta Cumaru.

3.11. CLOSE TO GROUND DECKS

If sufficient ventilation and moisture control can be achieved, an ‘on-ground’ (or actually near ground) deck may be possible.

At some sites, due to lack of drainage or excessive moisture, it is not possible to successfully design and install an on-ground timber deck. A fill, slab and tile surface may be considered a practical alternative.

There are two main ways these can be arranged (as shown below):

- Individual concrete beams, with battens fixed on top, with no need for bearers
- Battens placed straight on to a continuous concrete slab or compacted base

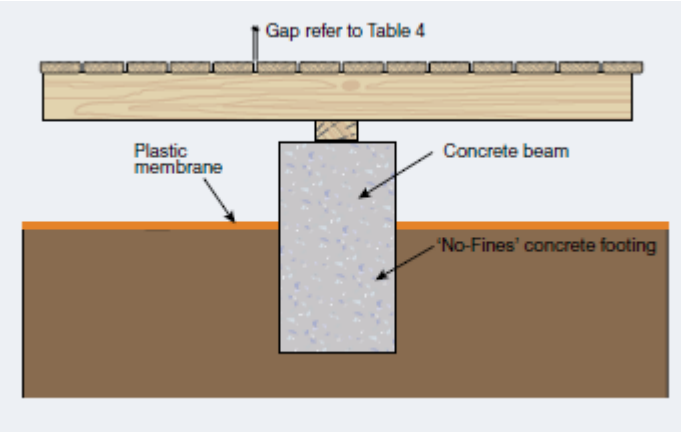


Figure 7 Concrete beam footing

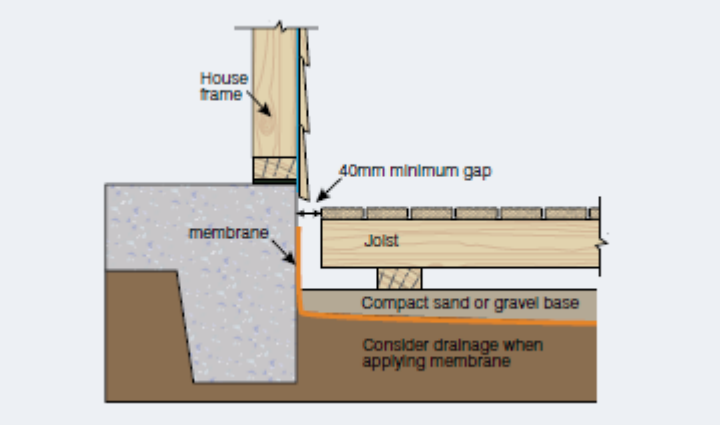


Figure 8 Bearer directly on to ground

3.11.1. SELECTING TIMBER

Timber used close to the ground should have the highest durability and ideally be termite resistance in all areas due to the high potential of a wide range of insect infestation and attack.

Distance from underside of deck board to ground surface	Hardwood (AS 5604)	Softwood (AS 1604)
More than 400mm	Class 1 or 2	at least H3 treated
Less than 400mm	Class 1	H4 or better

Table 1 Selection of timber grade and treatment level

3.11.2. DESIGN CONSIDERATIONS

To successfully design, construct and maintain a deck ‘on-ground’, a number of considerations must be followed.

- Start with a load bearing and stable foundation surface with either concrete beams or continuous flat surface.
- Ensure there is an adequate drainage angle and impervious moisture membrane under the deck surface.
- All timber used must be a high durability Class 1 performance species. Also, preferably the timber should be termite resistant as there is a high risk of insect infestation near the ground surface.
- Ensure all batten and decking timber is pre-coated on all faces with a timber preservative and all cut grains are sealed with an end grain sealer to increase durability.
- Fixing bolts must be corrosion resistant with a galvanised coated steel or be stainless steel.
- Ensure there is enough available height to allow for the ground battens and the thickness of the decking boards, which suit outward swinging doors and prevailing adjoining floors.
- Battens need to be securely fixed to the foundation slab to provide a flat surface for the deck board, isolate the deck board from chemical and moisture transfer from the slab and allow for limited ventilation of the decking boards.
- Spacers or varying thickness battens will be required to level the drainage fall of the slab to a level deck. Steel battens may be considered. Also, short commercially stump posts with bolt down post shoes or brackets can be used if there is sufficient height in the design.

- Use an isolating plastic membrane between timber battens and the concrete slab.
- Fix the deck boards to the joists with the maximum possible gap between deck boards (minimum 5mm) and use a perimeter edge board to protect the end grain.
- Use suitable length and type of deck screw to suit the available height and batten material. Nails are not recommended.
- Maintain the deck board coating to prevent surface cracking due to moisture and protect against UV attack.

3.12. SPAN TABLES – BEARERS AND JOISTS

As referenced in the NCC, maximum allowable span distances are developed in accordance with AS 1684 and include load calculations from AS 1170.

Timber sizes are those available in Porta Cumaru, which is has a F34 structural performance.

Floor loads are based on typical 20Kg/m2 loading with a Floor Point load of 1.8kN. If the deck is designed with a higher loading due to for example an in-deck spa, a certified structural engineering will need to design a suitable structure.

Floor Load Width (FLW) for a simple single span bearer or evenly spaced posts is the distance between posts.

Bearer Size (mm) Qty/TxW	Single Span			Continuous Span		
Floor Load Width	1,200mm	2,400mm	4,800mm	1,200mm	2,400mm	4,800mm
2/90x45	2,400	1,900	1,500	3,200	2,200	1,500
2/140x45	3,600	3,000	2,300	4,500	3,500	2,400
2/190x45	4,500	3,800	3,200	5,700	4,700	3,300

Table 2 Maximum deck bearer span
Source: WoodSolutions AS1684 design software V2.2 to Class 1 Construction mode (NCC Vol.2, Clause 3.4.0.2)

Porta Cumaru beams used for joists offer the following maximum joist spacing, based on AS 1684.

Joist Size (mm) TxW	Single Span			Continuous Span		
Joist Spacing	300mm	450mm	600mm	300mm	450mm	600mm
90x45	2,300	2,100	2,100	2,800	2,600	2,500
140x45	4,000	3,900	3,600	4,600	4,400	4,200
190x45	5,400	4,900	4,500	6,200	5,900	5,700

Table 3 Maximum deck joist spacing
Source: WoodSolutions AS1684 design software V2.2 to Class 1 Construction mode (NCC Vol.2, Clause 3.4.0.2)

Note:

Selections for deck height greater than 1m. Refer to AS 1684 Table 5 for deck board heights less than one metre. Generally, decks with a height less than one meter do not require a building permit – check local council requirements.

Bearers are supported on posts, not counter-levered. 20Kg/m2 deck mass, Floor Point load 1.8kN. Bearers: 50mm end supports, 100mm internal support (continuous spans), Joists: 35mm end support, 70mm internal supports (continuous spans).

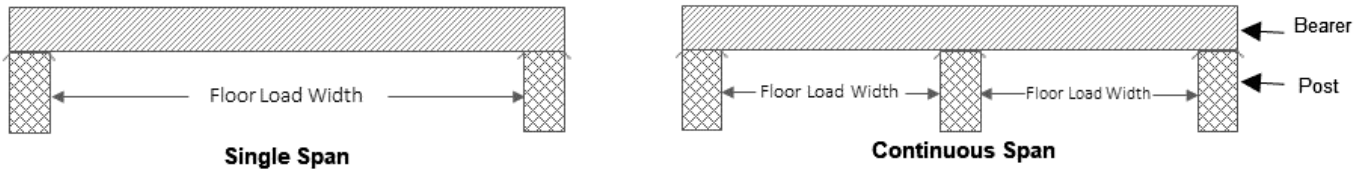


Figure 9 Single and Continuous spans

3.13. ACCESS FOR MAINTENANCE

The design of the deck should allow all surfaces to be kept clean to prevent surface build-up, debris or pooling of water.

Inspect all surfaces regularly and ensure structural members are in good conditions.

Inspections may need to be increased in a highly exposed or in damp conditions or environments.

Special fixing may be required to enable removal of deck boards or panels to enable the structure members to be inspected.

Maintain the deck surface coating regularly in accordance with the coating supplier's recommendations.

3.14. STRAIGHTNESS AND SIZE TOLERENCE

Porta Cumaru beams and posts are supplied within the requirements of AS 2082 'Timber Hardwood – Visually stress graded for structural purposes', with the following spring, bow, twist and dimensional tolerances.

Ensure the timber is adequately racked and protected to minimize straightness movement in transit and storage as Spring, Bow, Twist and overall dimensions can vary dependent on exposure, environment and site conditions.

Maximum allowable spring

Width (mm) Length	90mm	110mm	135mm	140mm	185mm	190mm
2.4	10.0	8.0	7.0	6.5	5.0	4.5
3.0	16.0	12.5	6.5	10.0	8.0	7.5
3.6	22.0	18.5	15.0	19.0	11.5	11.0
4.2	26.0	24.0	20.5	19.5	15.0	15
4.8	30.0	29.5	25.0	26.0	20.0	19
5.4	40.0	38.5	34.0	32.5	25.0	24

Table 4 Maximum Allowable Spring AS 2082

Note: Use spring for maximum tolerance of posts

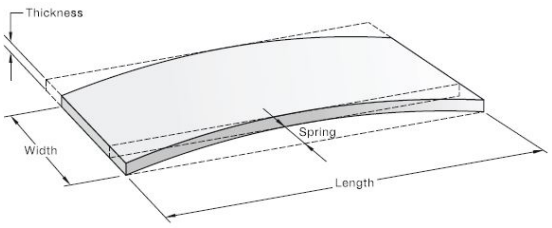


Figure 10 Measurement of Spring

Maximum allowable bow

Thickness (mm) Length	45mm
2.4	17
3.0	29
3.6	41
4.2	51
4.8	58
5.4	63

Table 5 Maximum Allowable Bow AS 2082

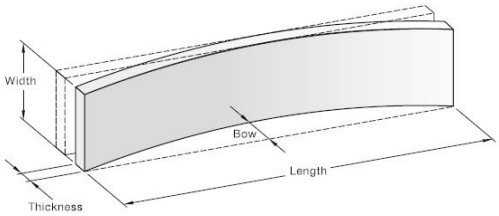


Figure 11 Measurement of Bow

Note: Refer to AS 2082 for maximum allowable Twist.

Dimensionally, Porta Cumaru posts (unseasoned) are supplied within a width and thickness tolerances of ±3.0mm and beams (seasoned) are supplied within +5.0mm -0.0mm of the nominal dimension.

The supplied length of Cumaru Beams and Posts is -0mm to +10mm of nominated length.

Porta Cumaru decking and machined profiles are supplied to the requirements of AS 2796 Sawn and milled Hardwood.

Maximum allowable spring

Width (mm) Length	90mm	145mm
2.4	13.0	4.5
3.0	20.0	7.5
3.6	30.0	11.0
4.2	40.0	15.0
4.8	50.0	19.0
5.4	65.0	23.0

Table 6 Maximum Allowable Spring AS 2796

Maximum allowable bow

Thickness (mm) Length	21mm
2.4	17.5
3.0	27.5
3.6	40.0
4.2	55.0
4.8	70.0
5.4	87.5

Table 7 Maximum Allowable Bow AS 2796

Section thickness and width is supplied within ±0.5mm of nominal dimension.

Refer to AS 2796 Appendix C for allowable straightness in other profile dimensions.

Length will not be less than the nominal length.

3.15. HANDRAILING AND BALUSTRADES

If the deck is more than one metre off the ground (at any point), handrails or balustrades are required.

The height of the handrail must be between 865mm and 1metre off the deck surface.

Openings in balustrades must not allow a 125mm diameter sphere to pass through.

The strength of the handrails system must restrain an impact of 60 kg (0.6kN).

The choice of appropriate handrails and balustrades will depend on the design and application and even location in relation to other structures.

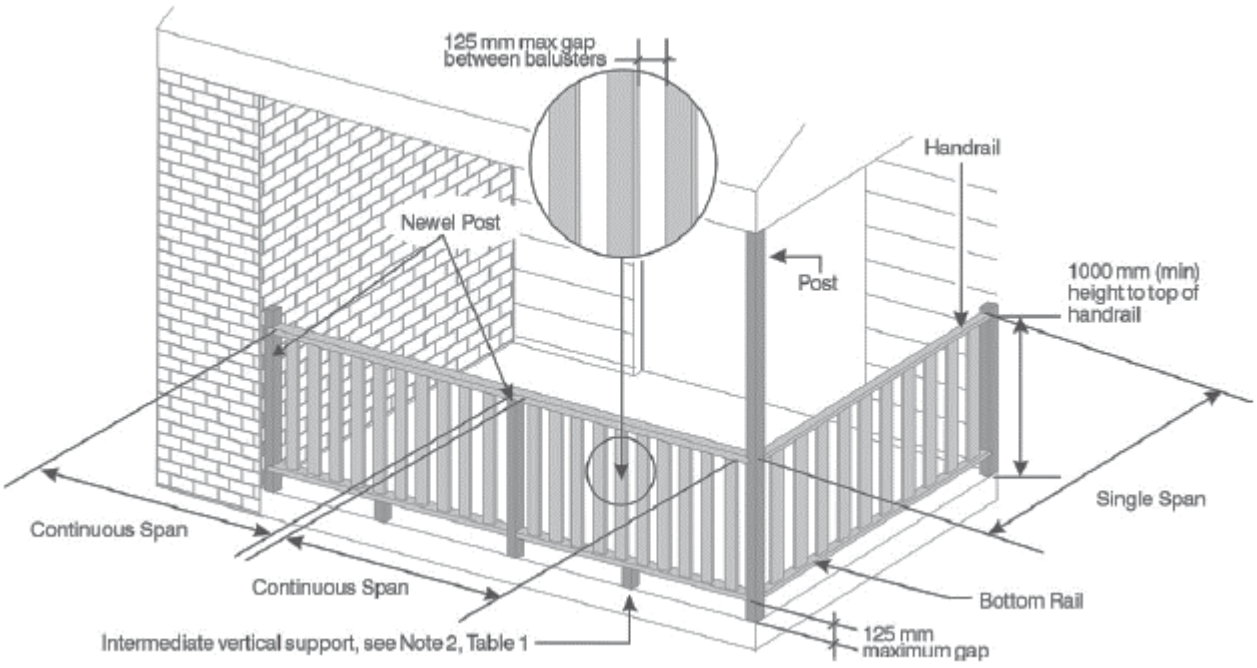


Figure 12 Terminology and dimensions

Figure 12 ‘Terminology and dimensions’ shows the various limiting dimensions for handrails around a deck.

Refer to the NCC Vol 2, Clause 3.9.2 for specific requirements. The required design of deck handrailing (and balustrades) is defined in AS 1170.1 Structural Design Actions.

In weather exposed situations handrails, posts, newels, balusters and infill must have the performance of AS 5604 Class 1 durable timber and Porta Cumaru is ideal for this application.

Handrailing and balustrades for decks next to swimming pools also require protection against impact. Refer to NCC Vol 2 Clause P2.5.3 for more information. Also, fasteners in close proximity to pools should be corrosion resistant.

Porta Cumaru is ideal for external handrail and balustrades as it is a high durability Class 1 timber. Porta offers several standard handrail profiles in Select grade Porta Cumaru. Porta offer a handrail fitting system in corrosion resistant stainless steel. This can be used with Porta Cumaru DOW43 handrail for a complete external handrail system.

4 SETTING OUT AND CONSTRUCTION

4.1. PREPARATION UNDER DECK

It is important that the ground beneath the deck is completely cleared of all building rubbish, garden debris and obstructions to water or air movement.

Water must not be able to pool under the deck and the ground must be sloped away from the foundations of the house or other nearby buildings. Agricultural drainage pipes may be required in some instances so water can properly flow away from beneath the deck.

Plastic sheeting acting as a waterproof membrane should be placed on the cleared ground. If timber bearers are to be placed directly on the ground, the plastic sheet should be covered with compacted gravel or sand to provide a solid base.

4.2. STORAGE OF TIMBER

Beams, posts and decking boards should be kept covered from direct sunlight, well ventilated and adequately supported with a maximum 1,200mm spacing, at least 100mm off the ground on a rigid, smooth, flat surface.

4.1. ACCLIMATISING

Timber should be allowed to acclimatise to the local environmental condition.

The length of time required to stabilise the timber is dependent on difference between warehouse and site conditions Acclimatisation will take between 48hrs and to at least two weeks. Keep the timber supported and protected from direct sunlight and high drafts during acclimatisation.

4.2. PREPARATION AND SORTING TIMBER

Some boards may contain natural defects that will require docking out. Sort the timber lengths to optimize usage.

Decking are typically cut square and butted together. Planning an angled 2-3mm chamfer of the end of each board which will be butted together, will mask any unevenness in height.

Ensure all decking boards joins are placed over a joist to support the join.

4.3. KEY POINTS TO SETTING OUT

- Locate posts around the perimeter of the deck. Space intermediate posts evenly, within an acceptable span distance. Typically posts are spaced 1,500 to 3,000mm apart dependent on size of bearer. The simplest footing for a posts is to use concrete pads and push a stirrup or post support into the wet concrete mix. Ensure the post is supported in a vertical orientation during the concrete cure. Concrete pads are typically 350x350mm, 450mm deep. The sizing of the footing is dependent on site conditions and deck loading. Alternately, post supported can be embedded into the concrete footing and posts bolted to these supports.
- Notch the posts to accept the bearers ensuring this produces a horizontal surface. Bolt bearers into position.
- Lay joists across bearers, within acceptable maximum span distance. A 450mm spacing of the joist across the bearer is typical. Fix joists into place with connecting plates.
- Lay decking boards using a suitable spacing suited to the timber, exposure conditions and amount of ventilation. A deck close to the ground or with little ventilation must be laid so the deck board after acclimatising to the prevailing conditions, have an acceptable gap spacing.
- Pre-drill and screw face-fix screws perimeter boards. Either face-fix or concealed fix (using pre-grooved) boards, with suitable length and quality screws.
- Where deck surface is close to the ground use the minimum possible width decking board width.
- Seal and maintain the surface in accordance with coating supplier’s directions. Boards can be pre-sealed on all faces prior to delivery to site. Ensure any cuts or holes are sealed on-site with end grain sealer.

4.4. SPACING DECK BOARDS AND FASTENERS

The purpose of spacing decking boards is to allow seasonal movement of the timber so a gap is maintained to allow water to drain freely. The gap must not be so far apart that it forms a trip hazard.

The size of the gap between the boards depends on:

- expansion / contraction rate relating to the timber specie or group (being a hardwood or softwood species)
- decking board cover width – the greater the width the wider the required gap
- moisture content of the timber at installation

High moisture content timber (from a wet location or environment) will contract as it dries to the conditions on-site; needing a smaller gap. Alternatively, dry decking boards (stored in say a dry moist controlled environment) will swell when installed in a highly moist (tropical) application, therefore will need a greater gap when installed.

A board gap of 5-6mm is ideal in the long term after acclimatising.

Fixing hardwood deck boards with nails is not recommended. Porta recommends to always predrill hardwood decking and use high quality screws for fixing.

Decking screws should penetrate joists twice the thickness of the hardwood decking board. Due to poor screw retention of pine joists, longer screws are required to improve holding capacity and long term retention.

Table 8 ‘Recommended decking gaps and screws’ shows the recommended spacing and fastening screw for optimum performance.

Decking Size W X T (mm)	Recommended gap at installation (mm) at 12% Moisture Content	Fastening Screw	
		Hardwood Joist	Softwood Joist
Porta Cumaru 90 x 21	5 mm or greater	50 mm length, Decking Screw 10 gauge 304SS Pre-drill with 3.5mm bit.	60 - 65 mm length, Decking Screw 10 gauge 304SS Pre-drill decking board with a 3.5mm bit.
Porta Cumaru 145 x 21	6 mm or greater		

Table 8 Recommend decking gaps and screws

Notes:

Hardwood joist will require pre-drilling. Softwood joists will not require pre-drilling. Pre-drill 3.5mm diameter for a 10 gauge screws.
Recommend board gap will need to be increased in low ventilation and extended high humidity environments.
In South Australia the NCC Volume 2 construction practices in bushfire-prone areas require a set gap between decking boards.

4.5. SPACING OF DECKING BOARDS CLOSE TO GROUND

The decking close to ground level should have a minimum spacing between boards (in the long term after the boards have acclimatised over an extended period) of at least 5 mm to allow water to flow between the boards and to ensure adequate ventilation.

Where the deck surface is close to the ground and the ventilation is restricted, increase board gap to the maximum that is practical for the application (6 to 8mm after acclimatised over an extended period). Also use the minimum possible width of decking board to reduce the potential of movement of the board.

Deck board may reduce in width (in prolonged dry conditions) or expand (in prolonged wet conditions).

5. LAYING THE DECK BOARDS

5.1. JOIST PROTECTION

Placing a layer of 110 mm dampcourse or proprietary protection strip on top of a joist prevents moisture being captured between the joist and decking board and will increase the service life of the joist and decking boards.

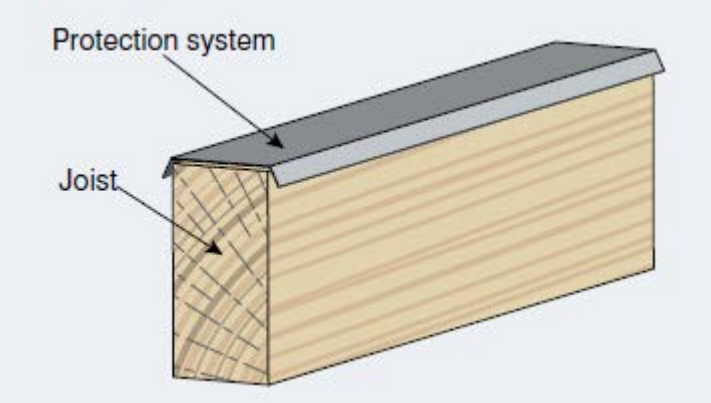


Figure 13 Protection strip over deck joists

5.2. EDGE BOARDS

Set first board at the edge of the deck and screw in place. If termite inspection is required the edge board will need to be removed.

Some designs can run the edge boards perpendicular to the main board to cover the end grain and add interest in the design.

5.3. FACE FIXING DECK BOARDS

Where face fixing of the boards ensure 2 screws are used on each board and at every supporting joist. At adjoining deck boards, ensure both boards are fixed with 2 screws. Ensure each screw location is pre-drilled to prevent splitting.

If using hardwood joist both the deck board and joist will need to be pre-drilled. If softwood joists are used, only the deck board should be pre-drilled.

Fixings location should be at least 15mm in from the side or end edge of each decking board.

Ensure screws are located only slightly recessed into the top of the decking board. This will enable final sanding of the deck surface without creating a recess where moisture will collect and deteriorate the timber. Alternatively, recess the deck screw and fix timber plugs inplace.

5.4. FIXINGS TO STEEL JOISTS

Screws normally used for fixing timber decks are not suitable for fixing timber decking to steel joists.

This is due to the seasonal and differential expansion and contraction of timber decking against the steel substructure that may cause the screws to fail in shear. It is recommended that a timber batten is affixed above or beside the steel joist so the decking board is nailed or screwed to this timber batten.

The size of any timber batten must allow adequate fixing for the decking to batten as well as the batten to the steel joist.

5.5. DECKING BOARD JOINS

Where it is required to join deck boards along the length, ensure the board is joined over a joist. Also where the deck boards need to be joined and fixed along the length, screws should be staggered across the joists to avoid the possibility of cracking the joist with movement in the decking.

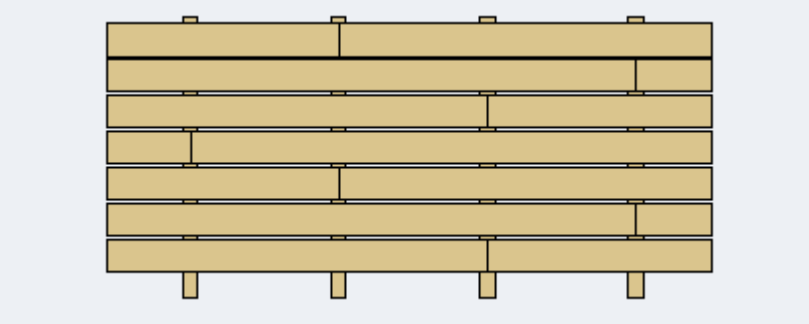


Figure 14 Illustration of staggered decking boards

Angle the end cut of the board slightly (under cutting) to ensure the top edge is neatly aligned.

To add style to a deck design, the deck boards can be laid in various directions or patterns. These include Parallel 45deg., Chevron (45deg joined along centreline) and Herringbone (45deg crossed along centreline). Example layouts are shown in Figure 15 Decking board patterns.

Ensure that joists are placed so that the deck boards are supported at the ends (and joins) and do not span further than the maximum allowed joist spacing.

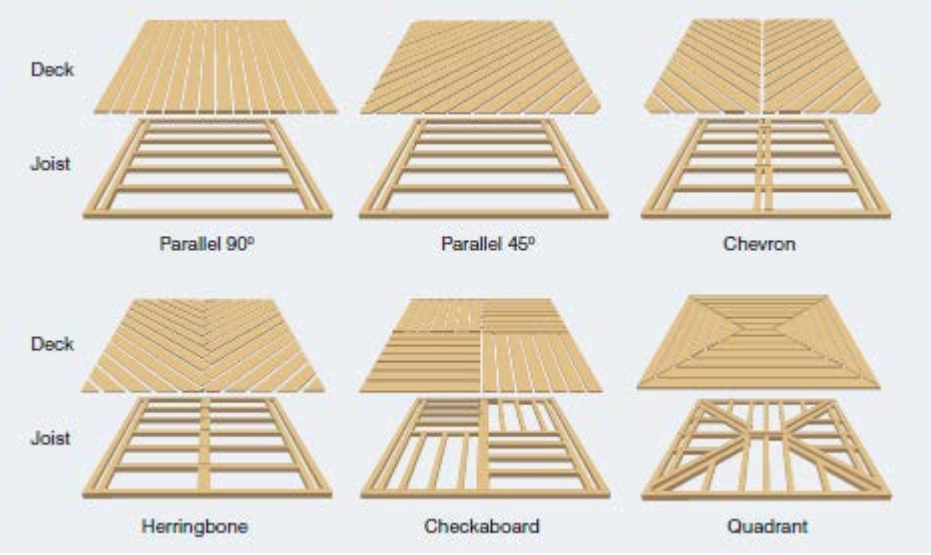


Figure 15 Decking board patterns

The edge deck boards should also be kept at least 10 mm clear of adjoining building walls to allow for drainage between the building wall and the boards (Figure 11 Deck board kept away from walls).

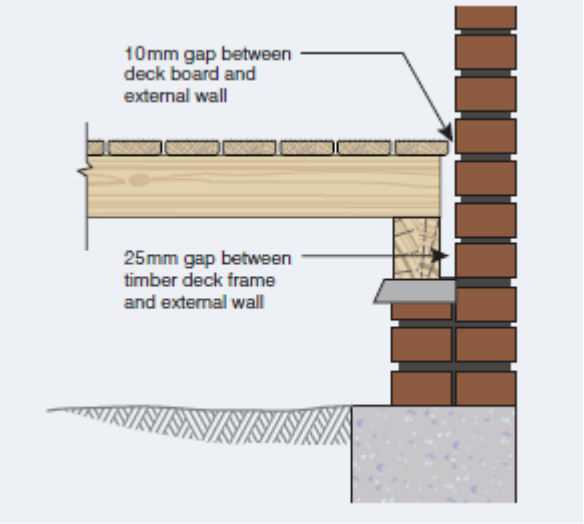


Figure 16 Decking Board kept away from walls

5.6. HIDDEN FIXINGS SYSTEMS

There are a number of proprietary systems available that fix the decking at the side of the board.

Most systems require a groove into the side of the decking for fixings while some use spikes. In all cases the fixing systems are proprietary and manufacturers' recommendations must be followed.

Porta Cumaru can be supplied with standard side grooving to suit standard concealed fix systems.

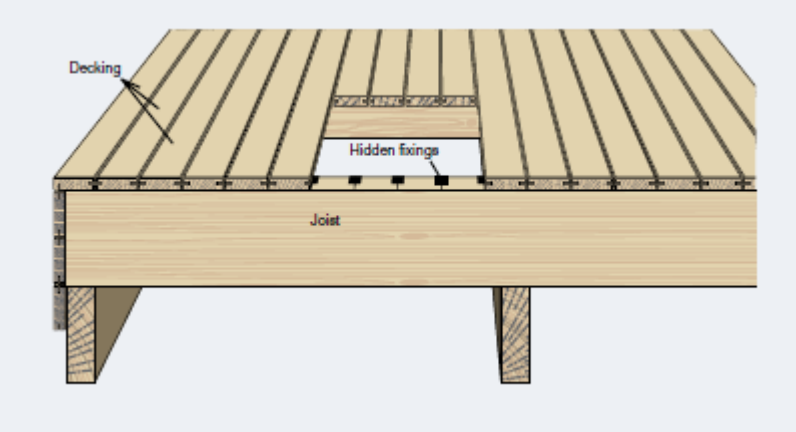


Figure 17 Hidden timber deck fixings

5.7. COATING DECKING PRIOR TO INSTALLATION

It is recommended that all timber components are coated prior to installation. Pre-coating or a factory applied finish protects the timber in-transit and at site, awaiting installation. The selection of coating will affect the initial and long-term look and required maintenance.

Factory applied pre-coating can achieve a higher quality finish than can be applied on-site. Factory applied pre-coating is consistently applied to each face and ends which can be difficult to achieve on-site.

Coating the decking boards all round will enhance the performance by reducing moisture uptake and loss. By reducing moisture uptake and loss, swelling and shrinking will be reduced and this will prevent checking (cracking) and movement (such as twist and cupping).

5.8. COATINGS

The main function of the coating is to protect the timber from UV attack and weathering and slow down the rate at which the timber will take up or lose moisture and to enhance the natural durability of the timber.

End grains are particularly susceptible to wetting, drying and leeching of extractants and should be coated with a specialised end-grain sealer. Additionally, all cuts holes, cut-outs and trimmed end of the timber should be coated with end-grain sealer on-site. Decking coating is less effective in protecting the end grain than a specialised end grain sealer.

The coating should contain a fungicide to prevent mould growing on any sugars or starches in the timber or that may be present in the finish.

Some finish systems recommend that some timber species be weathered for periods of 4 to 6 weeks and then cleaned prior to the application of the finish system. This is done to reduce the presence of extractants on the timber surface which may contaminate the finish.

Porta Cumaru has very low amounts of extractant and does not need to be weathered prior to the application of the desired finished.

It is recommended that final decking coated applied immediately following construction and the coating reapplied according to the manufacturers recommendations.

Timber surfaces affected by sea salt contamination or other on-site contaminations should be washed off with clear water and allowed to dry before commencing site coatings.

Ensure the timber surface is prepared by cleaning and sanding to achieve the required surface finish prior to coating. The required preparation is dependent on the timber grain, previous exposure and degree of smoothness required.

Typical preparation ranges from sanding with 60 grit, to reduce imperfections, through to a 180 grit sand, to smooth the surface.

5.8.1. TYPES OF TIMBER FINISHES:

A protective finish can be applied using products that penetrate the surface of the timber, products that provide a film or coating on the surface of the timber, or a combination of both penetrating and coating systems.

Film-forming finishes, such as paints, clear surface coatings and heavy-bodied stains appear as a layer on the surface of the timber, visually creating a smooth surface and do not penetrate significantly into the surface of the timber.

Penetrating finishes such as water repellents, decking oils and decking stains penetrate into the surface of the timber and do not form a robust surface film. While these finishes enhance the durability of the timber, they will require more frequent maintenance than film-forming finishes to protect against surface attack. Also, they may not be compatible with subsequently applied water based coatings. Check with the supplier for further details.

Translucent deck coatings and stains are typically a combination of film-forming and penetrating coatings with added preservatives, fungicides, and colourants. The degree of film formation and penetration varies with product and manufacturer.

As a minimum, a protective finish should be applied to all surfaces of each decking board and end grains sealed, prior to fixing to the joists.

Factory coating	Site maintenance	Outcome	Maintenance cycle
Water Repellent	Water Repellent	Allows timber to grey-off	Inspect and recoat when water doesn't bead on the surface
Penetrating Oils – Non tinted	Penetrating Oils – Non-tinted	Allows timber to grey-off	Inspect and recoat when water doesn't bead on the surface
Penetrating Oils – Tinted	Penetrating Oils - Tinted	Maintains darkened timber colour	Inspect and recoat when water doesn't bead on the surface
Deck Hybrid Coating	Deck Hybrid Coating	Maintains darkened timber colour or can be tinted	Inspect and recoat when water doesn't bead on the surface

Table 9 Recommended coating systems

Note:
Water based coatings may not be suitable for timber with oil content, such as Spotted Gum. Follow coating manufacturers recommendations. See Appendix One for suppliers' products.

5.8.2. COATING MAINTENANCE

Timber is a natural product and, as deck timbers weather, small cracks (or checks) are likely to appear on the surface of the boards. These cracks are caused by the intermittent wetting and drying of the wood. They are part of the character of wood and have no structural effect. This natural ageing process can be slowed by the use of finishes, as discussed above, which reduce moisture movements in timber.

All decks will benefit from regular maintenance, otherwise the decking boards will discolour and the surface will become rough and prone to splinters. A poorly maintained deck is also susceptible to mould which can make the surface slippery or reduce the service life of the decking boards.

Cleaning your deck will help prolong its life. The deck should be cleaned regularly. When cleaning the deck, avoid hosing it down; use a broom or a blower instead. Avoid using high pressure water blasters or harsh chemicals. Clean using a light detergent that contains an anti-fungal agent in accordance with manufacturers recommendations.

When washing-down the deck, observe the water on the deck. If water does not bead on the deck surface, it's time to re-apply the protective coating system. Follow the manufacturers maintenance recommendations.

5.8.3. CLEANING AND RESEALING THE DECK

It is important that the timber is properly maintained to protect the timber. The maintenance should be performed in accordance with the coating supplier's recommendations. Any coating or oil applied will require subsequent recoating. The period between recoating will be dependent on-site conditions. Inspect the surfaces regularly and ideally recoat when water ceases to bead on the surface. Follow the supplier recommendations as some coatings may be incompatible with other systems.

Dependent on severity of site conditions the deck should be regularly and thoroughly inspected, cleaned, and resealed or stained. The cleaning process may involve the removal of dirt, algae, moss and other organic matter from all components of the deck and possibly a re-sand to smooth the surface.

Inspect the complete deck include sub-structure for any deterioration. Clean any debris under the deck to prevent the build-up of moisture.

Clean the deck boards by brooming down with an appropriate deck-cleaning solution. Following this, the deck should be scrubbed and rinsed with clean water. Assess whether the boards need to be re-finished with a light sand.

During this process, check for loose boards and nails or screws that stick up and make any necessary repairs. Also examine all areas where deck boards come into contact with any joists or any point that comes into contact with the ground. These areas are particularly susceptible to moisture damage.

Allow the deck to dry and reseal it with the sealer or stain originally applied. Where a different finish is used to the original finish, check with the manufacturer about using different types of sealers or stains, as mixing them may prevent adhesion of the new coating.

5.8.4. SLIP RESISTANCE

The deck should be kept clean and brushed regularly to prevent the growth of mould on the surface which increases the risk a slipping of the deck.

Where there is a risk of the deck becoming slippery when wet, the slip resistance can be increased by a suitable anti-slip additive coating system or the addition of slip-resistant strips.

Some coating manufactures have products with anti-slip particles already included, while others have particles that can be added to common standard coating products.

5.8.5. WEAR OF COATINGS

High traffic area and exposed areas will require a shorter time between re-coating.

If the deck will experience high traffic load, a timber with a higher surface hardness will resist damage.

Porta Cumaru has one of the highest surface harness of any timber to resist high wear damage.

5.8.6. IRON STAINS

Avoid using any power tools on or above an uncovered deck that may deposit fine iron filings or dust on the timber surface. Particular care should be taken when cutting metal, masonry, brick or ceramics with an angle grinder. Cutting bricks or tiles with an angle grinder creates iron filings from the metal mesh that forms the base of the cutting disk.

Any iron filings that are not cleaned from the surface are likely to react with moisture and timber extractives to create unsightly and permanent black staining on the timber deck. This is particularly important if the board have not been pre-sealed or coated.

Storing or leaving metal on the deck for long periods of time also may cause a permanent stain on the deck.

If the deck is permanently stained, remove the coating, prepare the area and re coat in accordance with the coating supplier’s recommendations.

5.9. RESIN BLEED

Some softwood timber species boards such as radiata and slash pine can be prone to resin bleed. Hardwood such as Merbau have shown to exhibit a high amount of tannin leeching which can permanently mark surrounding pavers and walls and surrounding pools.

Ideally, if the species has been known to create tannin and extractant leeching it is preferable not to use that species in areas where there is a risk of staining.

Sometimes it may not be obvious that a board is prone to resin bleed until after the finished deck has been exposed to a period of hot weather. In such circumstances, the resin can be cleaned up or the offending board should be replaced.

Porta Cumaru has been shown to have negligible leeching and marking, making it suitable for a range of applications.

5.10. OBJECTS ON THE DECK

Raise any items off the decking which will trap water underneath (furniture, pot plants, etc).

Pot plants or other items that are not moved regularly should be elevated off the deck. Pot plants should be placed in drip trays. To minimise uneven weathering of the deck, all items should be moved regularly.

5.11. LIFE SPAN

With regular inspection, cleaning, coating maintenance the life of the deck will be extended and the appearance will be significantly extended.

6. WARRANTY

Porta warrants that timber supplied by Porta will perform in accordance with claims stated in the written literature.

Timber is a natural material which may crack, expand and contract due to climatic conditions.

When the timber surface is exposed it undergoes a natural process of oxidation which will affect the colour. The grain of the timber may rise under climate exposure producing a roughness of the surface. This is normal characteristic of timber and does not constitute a failure of the product.

Except where Porta has agreed in writing to the contrary, this warranty does not apply unless the timber product is supplied in its final shape and form and has been stored, protected and maintained in accordance with written recommendations.

This warranty does not apply if the timber supplied by Porta has been used for a purpose other than that intended use and installed other than in accordance with Porta recommendations and relevant building codes.

This warranty does not exclude any provisions that cannot be excluded under the Australian Consumer Law.

7. SPECIFYING

7.1. TIMBER

Deck timbers (posts, bearers, joists and/or deck boards) shall be Porta Cumaru (Dipteryx odorata) supplied with FSC certification with a density of 1,085 Kg/m3, minimum harness of Janka 14.8kN, certified Class 1 durability to AS 5604 natural durability above ground and resistant to Australian termites. Timber supplied for structural purposes such as posts, bearers and/or joists shall comply to AS 2082 and deck boards timber shall comply with AS 2796.

7.2. FRAMING

Bearer and Joist width must not be less than 45mm.

Where unseasoned hardwoods are used, appropriate construction procedures must be adopted to compensate for the shrinkage.

7.3. FIXING

Pre-drilled pilot holes must be provided for all fasteners.

Fixings within the swimming pools splash zones or in coastal zones must be stainless steel.

7.4. COATINGS

Pre-coat all timber components in accordance to manufacturer recommendations.

Applied first on-site coating immediately following construction in accordance to manufacturer recommendations

Coat all end-grains with an appropriate end grain sealer.

Any on-site protrusions are to be coated with end grain sealer.

8. PRODUCT INFORMATION

For further product information the following documents are available from Porta.

a. See Porta Product Specification Sheet – Cumaru 1604, which is available from www.porta.com.au

b. Method of Overall Strength Group Assessment shown in AS/NZ 2878:2012 classifies Cumaru (Dipteryx Odorata) as SD2. AS 2082:2007 Table B1 classifies SD2 in No.1 structural grade for seasoned timber as F34. *Source: Breitinger Consulting May-2016*

c. Natural durability of Cumaru (Dipteryx Odorata) heartwood against Hazard Class H3 attack (outside, above-ground) was found to be comparable to a Class 1 performance. *Source: Australian Forest Research Company (AFRC) Jun-2017*

d. Cumaru (Dipteryx Odorata) was found to be resistant to both Coptotermes acinaciformis and Mastotermes darwiniensis termites in Northern Australia using standard exposure techniques based on those published by the Australasian Wood Preservation Committee (AWPC) “Protocols for assessment of wood preservatives” (AWPC, 2015). *Source: Australian Timber & Pest Research Jul-2017*

9. REFERENCES

a. Forest and Wood Products Australia Limited, #21 Domestic Timber Deck Design (originally produced by Timber Development Association NSW Limited with support from Boral Timber) © 2015

b. NCC National Construction Code Series 2015 Vol.2

c. AS 1684.2 Residential timber framed construction Part 2: Non-Cyclonic Areas

d. AS 2082 Timber Hardwood Visually stress graded for structural purposes

e. AS 2796 Timber Hardwood Sawn and milled products

f. AS 1604 Timber – Preservative-treated – Sawn and round

g. AS 3959 Construction of Buildings in Bushfire Prone Areas

h. AS 3660.1 Termite management - Part 1: New Building work

i. AS 5604 Timber - Natural durability ratings for many species

File:

G:\MARKETING\Product\Specifications\APPLICATION GUIDE\Decking Residential\Porta Cumaru Guide to Residential Decking FINAL DRAFT v4 with Covers.docx

Revision: 22-Jan-18

10. APPENDIX ONE: COMMERCIALLY AVAILABLE PRODUCTS

The following commercially available products are available for the construction and maintenance of the deck. These are provided as guidance only.

10.1. POST SUPPORTS

A broad range of post supports are available from Pryda or McIntrye Steel and Maxi Metals.

10.2. COATINGS

Factory coating	Site maintenance	Outcome	Maintenance cycle
CuTek CD50 Industrial	CuTek CD50 - natural	Allows timber to grey-off	Inspect and recoat when water doesn't bead on the surface
CuTek CD50 Industrial	Cutek CD50 - tinted	Maintains selected darkened timber colour	
Feast Watson Water Repellent - Clear	Feast Watson Water Repellant - Clear	Allows timber to grey-off	Inspect and recoat when water doesn't bead on the surface
Feast Watson Timber Oil	Feast Watson Timber Oil	Maintains darkened timber colour	Inspect and recoat when water doesn't bead on the surface
Feast Watson Matt look Deck	Feast Watson Matt look Deck – natural	Maintains timber colour – with a slight tint	Inspect and recoat when water doesn't bead on the surface
Feast Watson Matt look Deck	Feast Watson Matt look Deck - tinted	Maintains selected darkened timber colour	

10.3. END GRAIN SEALER

It is recommended that Porta EndSeal 4000 (Teknos End Grain 4000) or equivalent is used.

10.4. DECK BOARD FASTENERS

Decking Size W X T (mm)	Recommended gap at installation (mm) at 12% Moisture Content	Deck Board Fastening Screw	
		Hardwood Joist	Softwood Joist
Porta Cumaru 90 x 21	5 mm or greater	50 mm length Spaxx-D Decking Screws 10 gauge 304SS, or equivalent Spaxx T-Star plus 4.5mm 50mm 304SS, or equivalent Pre-drill with 3.5mm bit.	60 - 65 mm length Spaxx-D Decking Screws 10 gauge 60mm 304SS, or equivalent Spaxx T-Star plus 4.5mm 50mm 304SS, or equivalent Pre-drill decking board within 15mm of edges of board.
Porta Cumaru 145 x 21	6 mm or greater		

For more information on Spax fasteners refer to: *www.spaxpacific.com/products/spaxd.html*

porta

know & love timber

1300 650 787
sales@porta.com.au
porta.com.au

people who know & love timber