

# RESIDENTIAL TIMBER DECKS CLOSE TO OR ON THE GROUND

RECOMMENDED PRACTICE // SEPTEMBER 2019

# 13

When designing and building timber decks where timber is less than 400 mm from or on the ground, considerations must be given to the following to ensure good long term performance:

- adequate ventilation • surface drainage • correct timber species selection
- access for future maintenance and termite control.

## TIMBER SELECTION

Where framing timbers are more than 150 mm above the ground timber should be termite resistant, Above Ground Durability Class 1 or better (with sapwood H3 treated) e.g. blackbutt, spotted gum, ironbark, cypress, forest red gum, Gympie messmate, or H3 or better preservative treated softwoods.

For lower decks or those on the ground, framing timber should be In-ground Durability Class 1 (sapwood treated to H5) or H5 preservative treated softwood.

Decking boards should be Above Ground Durability Class 1 (sapwood treated to H3), or H3 preservative treated softwood. Commonly available timber suitable for this purpose include - turpentine, spotted gum, ironbark, forest red gum, white mahogany, tallowwood, blackbutt, cypress, merbau (kwila), balau and preservative treated pine. These timbers are termite resistant.

*Note: CCA treated decking boards shall not be used in residential applications.*

## TIMBER SIZES

For sizes of bearers, joists and allowable joist spacings, refer to Tables 1 - 3. Other grades and sizes can be used in accordance with AS1684 - Residential Timber Framed Construction.

*Note: Tongue and Groove flooring should not be used in weather exposed situations.*

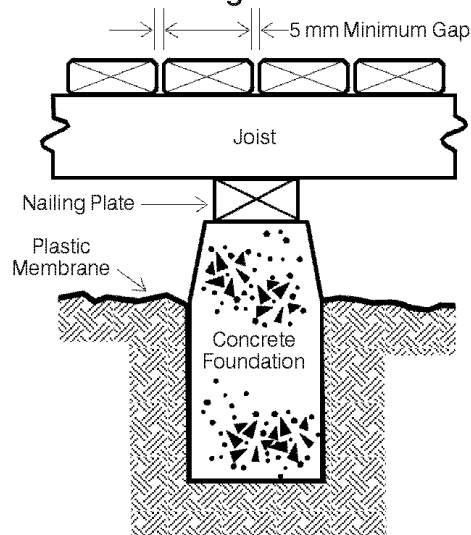
Where decks are built close to the ground, a considerable moisture gradient can occur through the thickness of decking boards which can result in cupping. For this reason it is recommended that the maximum width of standard thickness (19 - 22 mm) decking be limited to 100 mm (nominal). For other decking, the width should not exceed 4 times its thickness.

## BEFORE CONSTRUCTION

The ground beneath the deck should be graded away from adjacent buildings and the deck so that water does not pond. In some cases agricultural drainage pipes may be needed to ensure water is removed from under the deck.

It would also be good practice to lay down a plastic membrane under the deck (same as used under concrete slabs), covered with gravel or sand to keep it in place. This will help keep soil moisture from affecting the timber as well as preventing any vegetation growth.

Figure 1



## TERMITE MANAGEMENT

Only termite resistant timbers should be used for these decks. However, protection of the dwelling to which the deck adjoins must also be considered. This could be achieved by leaving an appropriate gap for inspection (refer figure 2). It may be necessary to provide a removable panel, to inspect physical management systems (e.g. metal caps) or to retreat where a chemical perimeter treatment to Australian Standard AS 3660.1 has been used on the dwelling.

## FINISHING BEFORE FIXING

For maximum serviceability and protection against weathering, timber decking should be properly finished and maintained. Before fixing, and to minimize the potential for development of unwanted dark stains occurring it is recommended that the following should be applied:

### (i) For Oil Based Stain Finishes

- Give all faces and edges of decking and top edge of deck joists one coat of water repellent preservative such as:
  - \* 10% copper naphthenate in a light organic solvent.
  - \* 20% zinc naphthenate in a light organic solvent and,
- The first coat of stain should be applied all round to decking and to top edge of deck joists before laying.

*Note: Some stains may not be compatible with water repellent preservatives. Seek stain manufacturer's advice before applying finish. Pale colours are best, dark colours can promote degrade, cupping and decay.*

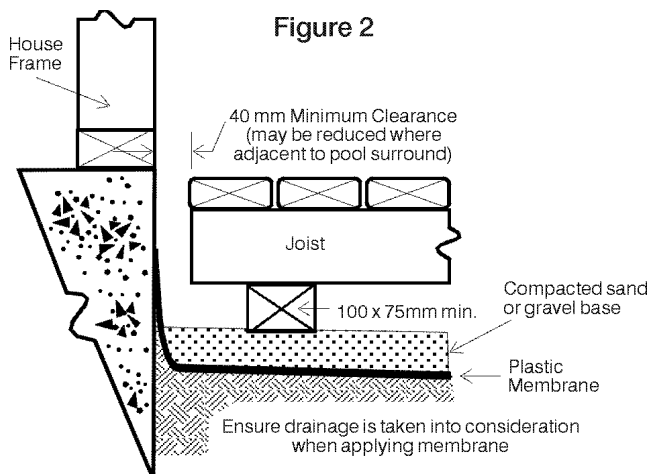
### (ii) For Acrylic Stains and Paint Finishes

All faces and edges of decking and top edge of deck joists should be primed with a good quality wood primer, followed by one coat of the selected decking paint (as per the manufacturer's specifications).

*Note: Pale colours are best, dark colours can promote degrade, cupping and decay.*

### (iii) End Sealing

All cut ends should be sealed with preservative, stain or primer, depending on the final coating, prior to being fixed in position.



## CONSTRUCTION

A number of methods are suitable depending on the design. For very low decks, "bearer less construction" could be used. i.e. joists are supported on a nailing plate on concrete beam walls (refer Figure 1). This method is acceptable as long as the concrete does not inhibit drainage. Likewise, timber bearers could be laid directly on a well drained gravel/sand or concrete base as long as they are of minimum in-ground Durability Class 1 or H5 treated softwood, and again do not inhibit the drainage of water. A panelised decking system could be used to allow for easy maintenance and inspection.

Due to the proximity to the ground, ventilation is very important. For this reason, the perimeter of the deck should be kept open.

For decking close to the ground, a minimum spacing between boards of 5 mm is recommended. For boards wider than 90 mm, gaps should be increased accordingly.

## FIXINGS

All bolts, screws, nails, brackets, framing anchors and other hardware should be **hot dipped galvanised or stainless steel**. Electroplated fasteners are not suitable due to early breakdown of the plating.

Refer to Timber Queensland Technical Data Sheet 35 – Corrosion Resistance of Metal Connectors for recommendations on corrosion resistance.

For recommended minimum nail size for fixing the decking refer to Table 1. Each board (over 68 mm wide) should be fixed at every joist crossing with two nails. Nails should be located at least 12 mm from board edges. The ends of boards should be predrilled prior to nailing to avoid splitting. Adjacent nails should be driven at slightly opposing angles. When bullet head nails are used with hardwood or cypress decking, they should be driven flush with the surface. Do not punch and fill.

*Special Note: Fixings within 1 metre of pool surround should be stainless steel or monel metal.*

## FINISHING AFTER INSTALLATION

Timber serviceability is enhanced by the application of a suitable finish, whether the surface be sawn or dressed. The finish may take the form of a clear external decking finish, a pigmented oil based stain, or a good quality paint system. The use of the finish should be in accordance with the finish manufacturer's recommendations. The retention of the timber's original colour cannot be guaranteed with the use of a clear finish.

## MAINTENANCE

The long term performance of timber decking in weather exposed situations is dependent on regular and effective maintenance. The frequency of maintenance will depend on the type of finish and the degree of exposure to the weather.

Before recoating, the decking should be thoroughly cleaned and the gaps between boards, particularly over joists, cleared of debris. Recoating should be carried out in accordance with the finish manufacturer's specifications.

The over-watering of pot plants standing on timber decks should be avoided. It is recommended that pots be placed in drip trays standing on small cleats. Where possible decks should be broom/ blower cleaned rather than cleaned by hosing.

**TABLE 1 - DECKING**

Species	Min. Grade	Thickness (mm)	Max. Joist Spacing (mm)	Nailing Requirements (see Note #)
Hardwood	Standard Grade (AS 2796)	19	500	50 x 2.8 Galv Bullet Head
		25	650	65 x 2.8 Galv Bullet Head
	F17 (AS 2082)	32	800	65 x 2.8 Galv Bullet Head
Cypress*	Standard Grade (AS 1810)	21	450	50 x 2.8 Galv Flat Head
	F5 (AS 2858)	34	700	65 x 2.8 Galv Bullet Head
Treated Pine (H3)	Standard Grade (AS 1782)	22	450	50 x 2.8 Galv Flat Head
	F7 (AS 2858)	35	750	65 x 3.15 Galv Flat Head or 75 mm Batten Screw
		45	950	75 x 3.15 Galv Flat Head or 75 mm Batten Screw

Notes:

\* Cypress containing sapwood should not be used closer than 250 mm from ground. Refer recommendations in AS 1810.

# Where joists are treated softwood, nails shall be deformed ring shank, or alternatively screws.

Recent comparative laboratory withdrawal tests carried out by Timber Queensland on a wide range of commercially available machine driven nails indicated a large variation in machine nail withdrawal resistance. Installers of decking should ensure that machine nails used have equal or better withdrawal resistance than the hand nails given above. Installers should obtain comparative withdrawal information from nail suppliers or conduct comparative trials (pinch bar) on test material before using a particular machine nail.

**TABLE 2 - BEARERS**

Species	Stress Grade	Spacing of Bearers to (m)	Size of Bearers (mm) for spans of		
			1.2 m	1.5 m	1.8 m
Cypress *	F5	1.8	100 x 75	125 x 75	125 x 75
Treated Pine (H5)	F7	1.8	90 x 70	120 x 70	120 x 70
Hardwood	F14	1.8	75 x 75	125 x 75	125 x 75

Note: Bearers lying directly on ground: 75 x 100 (on flat), in-ground durability Class 1 or H5 treated softwood.

\* Limit Sapwood

**TABLE 3 - JOISTS**

Species	Stress Grade	Spacing of Joists to (mm)	Size of Joists (mm) for spans of		
			1.2 m	1.5 m	1.8 m
Cypress *	F5	450	100 x 50	100 x 50	125 x 50
Treated Pine (H5)	F7	450	90 x 45	120 x 45	120 x 45
Hardwood	F14	450	75 x 50	100 x 50	100 x 50

\* Limit Sapwood

### SAFE WORKING

Working with timber produces dust particles. Protection of the eyes, nose and mouth when sanding, sawing and planing is highly recommended. Refer to tool manufacturers for safe working recommendations for particular items of equipment.

### DISPOSAL OF OFFCUTS AND WASTE

For any treated timber, do not burn offcuts or sawdust.

Preservative treated offcuts and sawdust should be disposed of by approved local authority methods.



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