

MODERN GREEN HOMES

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BACKYARD
BUILDS SPECIAL

BACKYARD BONUS

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ALL DECKED OUT:

Design and material considerations for a long-lasting and sustainable deck

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Recycled timber, such as these remilled railway sleepers from Northern Rivers Recycled Timber, is the most sustainable choice for decking.

Essentially an outdoor living room, a well-designed deck offers a place to retreat, relax and entertain and provides connection between indoors and outdoors. As with any building project, careful material selection and detailing is important to ensure a long-lived, sustainable deck.



← Light House Architecture & Science specified FSC-certified Australian blackbutt (*Eucalyptus pilularis*) for the decking at this renovation and extension project in Curtin, ACT. Image: Ben Wrigley

PLANNING A DECK

Exposed to the extremes of the Australian climate, decking is one of the toughest applications for any material. Before planning a deck, consider the site's aspect and how it will be impacted by weather (sun, rain and wind). "Ideally, you want your deck to face north and if that's not possible, then to receive east or west sun. I always put in a nice high roof over a deck to ensure maximum durability and longevity and reduce ongoing maintenance," says architect Thomas Caddaye. (See our article on p60 for tips on getting your deck's roof right.)

Height is another crucial decision when designing – will the deck sit low to the ground, quietly nestled into the environment, or offer a grand view of the garden? The height of the deck will determine what planning permissions are required. The National Construction Code (NCC) requires that decks over one metre above ground have a minimum one metre high balustrade, and balustrades to decks in excess of four metres above the ground need to meet additional safety requirements. If your site is fire-prone, consult *AS3959: Construction of buildings in bushfire-prone areas* to determine the material and installation requirements for decks.

Budget and the space available will usually determine size, but also consider what you'd like to use the deck for. A deck that's 3 metres by 5 metres will comfortably accommodate a six-seat table, while 2 metres by 3 metres is enough for a couple of deckchairs and a small table. The former could cost \$10,000 to \$30,000 for labour and materials, with the smaller option around \$5,000.

BEFORE YOU BUILD, CONSIDER:

- Will the deck be freestanding or attached to the house?
- How will it impact your view, or that of your neighbours?
- What loads and stresses will it need to withstand?
- Will the deck have steps?
- Is it on a sloping block?

ROOM TO BREATHE

Adequate subfloor ventilation is an absolute necessity for timber decks. Without it, the underside of decking boards will absorb too much moisture, causing them to cup (or bow) and swell across the board's width.

According to the NCC there should be a minimum of 150 millimetres between the underside of the lowest timber element and the ground to ensure adequate ventilation. This also applies when constructing a deck over an exposed concrete slab if there's any risk of rainwater ponding there. The structure of timber decks in termite zones or in bushfire-prone areas up to BAL-29 requires a ground clearance of 400 millimetres.

Hayden Cronin from CERES Fair Wood in Melbourne says that getting the distance off the ground and the airflow right is incredibly important to the longevity of the build. "If you put a deck really close to the ground, it's going to be reactive and absorb moisture from below. And that doesn't have anything to do with the durability class of the timber; if it takes in moisture, it will swell and cup."

Sufficient gaps are also required between decking boards to allow for expansion when wet and for debris to drop through. Australian eucalyptus timbers are particularly reactive to seasonal and weather-related moisture variation. If not protected by a roof they can easily shrink and swell by 7 to 8 per cent, so standard 90-millimetre decking boards require a 7-millimetre gap between them.

Treated pine and composite woods have much less seasonal expansion, so can be installed with smaller gaps between boards. Hayden says the rule of thumb is the closer the deck is to the ground, the narrower the boards should be. “If you use a wide board close to the ground it will suck up the moisture, the gaps between the boards will close up, and your deck will turn into a lake.” For timber, regular oiling is vital to help reduce shrinking and swelling.

MATERIALS

As with all building materials, you’ll need to take into account a range of factors when selecting the material for your deck including cost, durability and appearance as well as where it comes from and how sustainable it is. How much time and money you’re willing to spend on maintaining the deck is a key factor: composite timber and fibre cement products offer the benefit of ‘set and forget’, while timber will have you on your knees refinishing it every six to 12 months or so.



Timber

Timber is still the most popular decking material: it’s a renewable resource, sequesters carbon, and complements the natural environment. But the Black Summer bushfires of 2019–2020, combined with the ongoing issue of irresponsible logging, make timber a complicated choice. According to *Your Home*, the most sustainable option for decking is to reuse materials on site if possible, or other recycled or salvaged wood. If recycled timber is unavailable, use sustainably managed agroforestry or plantation timber, or opt for timber composite products, and avoid timbers from native forests. (Read more about responsible timber sourcing in *Sanctuary* 52.)

Timber decks will need to be resealed every six to 12 months and when this is calculated over the lifespan of a deck – up to 30 years – it’s a significant investment of time, money and resources. There is an argument for letting the timber weather naturally to a silver-grey, if you have the right durability of timber and a roof above the decking.

Hammered by the elements, timber decking without a roof typically requires hardwoods of Class 1 natural durability (or treated pine) above and below the ground. Class 1 Australian hardwoods include tallowwood, ironbark and Queensland spotted gum. Durability Class 2 timbers such as blackwood and southern spotted gum can be used if the deck is roofed and doesn’t receive too much wind-blown rain. If you live in a bushfire-prone area, Australian eucalyptus timbers of densities in excess of 750 kilograms per cubic metre are considered naturally fire resistant up to BAL-19. When sourcing hardwood timbers, look for FSC-certified timber from Australia and New Zealand. Avoid imported rainforest timbers such as merbau and cumaru – even with FSC certification, a large proportion of these timbers have been identified as coming from illegal and unsustainable logging practices.

The recent building and renovation boom has significantly impacted the availability and price of Australian hardwood. Expect to pay \$80 to \$130 per square metre for Australian hardwood decking (plus framing and installation).

Salvaged and recycled hardwoods are the most sustainable

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Composite timber decking products are a low-maintenance alternative to timber and are typically made from a mix of wood sawdust and recycled plastic material. Designer and homeowner Andy Lemann chose Ekodeck Classic for his renovation in Mittagong, NSW (top; image by Ben Wrigley). Australian-made ModWood (bottom) is another option.

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Beautiful blackbutt decks extend the living space at a family retreat designed by Paul Haar in Victoria's Strathbogie Ranges. The framing for the deck is LOSP-treated plantation radiata pine. Image: Paul Haar



timber choice, but can be expensive (averaging around \$110 per square metre) and difficult to source, and the grading does vary to that of new timber. If you're in Victoria, one option for salvaged timber is of course CERES Fair Wood (see 'Fair dinkum wood' in *Sanctuary 44* for more). "We have sugar gum available at the moment, which has been salvaged from trees that were planted as farm windbreaks around Victoria. It's a fantastic decking timber, highly durable and Class 1 for durability above and below ground," says Hayden. In Queensland, the Railway Sleeper Co. salvages beams, girders and railway sleepers from demolition, then mills them into decking boards – ironbark and spotted gum are the most common species.

Plantation softwoods (commonly radiata pine) are one of the most affordable materials for decking, and once treated to a minimum H3 hazard rating, are on par for durability with a Class 2 hardwood (above ground). Avoid timbers treated with copper-chrome-arsenate (CCA) and look for timbers treated with LOSP (light organic solvent preserve), ACQ (alkaline copper quaternary) or CuAz (copper azole). White cypress pine is another common softwood used for decking: grown in New South Wales and Queensland, it's a highly durable (Class 1) timber but it comes with a warning – quality can be highly variable. It's mostly milled from extremely small diameter logs and too often sold with unreasonably high amounts of sapwood included.

Despite being monocultures, pine plantations are fast growing and quick to absorb carbon, and reduce logging pressure on native forests provided they've been established on previously cleared land. "There's a good range of quality,

affordable plantation softwood decking products out there," says architect and sustainable materials expert Paul Haar. "Most people want the Australian hardwood look, but this is where we might have to review our aesthetic preferences, at least until native forest harvesting shifts from vast and often contiguous clearfell logging coupes to a widely spaced small-disturbance approach, informed primarily by the knowledge base of Indigenous Australians and the best of modern forest science, to address the existential climate and biodiversity crisis we're facing."

Innovations in chemical treatments for plantation softwoods have greatly increased the durability and longevity of decking timbers. FLAMEfixx is a chemically treated radiata pine that's suitable for building in bushfire-prone areas up to BAL-29, and also offers resistance to fungal decay and termites. Abode manufactures a thermally modified timber called Vulcan Decking that's also treated with a water-based preservative to give the product outstanding durability with a 25-year warranty. Accoya is another innovator in the field, using a chemically benign pickling process (acetylation) to treat radiata pine to ensure it will never rot and be reusable for a very long time.

Composite timbers

A low-maintenance alternative to conventional timber, composite timbers are highly durable and resistant to rot, termites, warping and UV damage. Importantly for bushfire-prone areas, composite timbers can be manufactured to a fire-resistance rating of BAL-40.

Composite timbers are typically made from a mix of wood sawdust and recycled plastic material (such as polyethylene or polypropylene); depending on the brand they may also include fibreglass and fibre cement. The sustainability of these products depends on how the ingredients have been sourced and manufactured, which can be difficult to find out. Some contain virgin plastics and woods, so it's important to research a brand thoroughly before purchasing. ModWood is one composite timber entirely manufactured in Australia, and they state that each lineal metre of their decking product contains approximately 37 recycled plastic milk bottles and almost two kilograms of reclaimed sawmill waste.

Although often more expensive than hardwoods up front – around \$120 per square metre – composite timbers do not require staining, oiling or painting and when that is factored in, they can save owners significant time and money over the life of

the deck. However, the surface colour of composite timbers can fade over time. Designer and homeowner Andy Lemann has installed Ekodeck Classic on his property in Mittagong, New South Wales, and says: “It does have a bit of a manufactured aesthetic. It’s not as lovely as a new timber deck, but a timber deck doesn’t stay nice for long; after five years it tends to look shabby. But with Ekodeck, I just have to pressure wash it once a year.” (Read all about Andy’s project in *Sanctuary* 56.)

When choosing a colour for your composite timber decking, be mindful that darker coloured boards store and conduct heat more readily than timber so can feel hot under bare feet on a sunny day.

Cement composites

For bushfire-prone areas, a timber-look deck can be achieved with a product like Ubiq Inex decking, a highly durable low-carbon cement board. Tested to withstand the highest bushfire attack level of BAL-FZ, Inex is an engineered cementitious composite (ECC) material that contains 60 per cent post-industrial recycled materials. The boards are textured to give a natural timber appearance. “I used the boards on a project in a bushfire area and I was quite happy with them,” says Thomas.



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Accoya decking boards, used in this house in Portsea, Victoria, designed by Mitsuori Architects, are radiata pine treated with a chemically benign pickling process to render them impervious to rot. Image: Michael Kai



↑ Architect Thomas Caddaye opted for Ubiq Inex fibre cement boards for the deck at this house on a highly bushfire-prone site in Rosedale, NSW. The house survived the Black Summer bushfires that tore through the area in January 2020; read the full story in *Sanctuary* 51. Image: Ross Caddaye

DETAILING FOR A LONG LIFE

The benefits of selecting a sustainable material are reduced if it doesn't last long. Here are some tips from Paul Haar to increase the longevity of your deck:

- Lay 'Protectadeck', a flexible black polyethylene strip, over joists to protect them from rot and to seal around nail or screw fixings so moisture doesn't penetrate.
- Stagger your fixings (galvanised decking nails or stainless steel decking screws) to reduce the likelihood that they will collectively wedge open the upper surface of deck joists, which weakens the fixing and increases joist moisture.
- Nails will pop up over time due to cyclical swelling and shrinkage of timber decking, which is why screws are often preferred.
- If the upper surface of a timber deck becomes rough and fissured, you can pull the boards up and flip them over.

- If not leaving timber decking to go silver, pre-oil the boards on both sides prior to installation to minimise moisture uptake, which leads to cupping.
- Polyurethane-based finishes create a plastic skin on the surface of timber, which in the short term prevents water penetration, but when it inevitably breaks down the surface will crack and flake. A better option is to use a penetrating oil – one that 'chalks' off rather than flakes, such as Quantum timber finishes, which are vegetable derived resinated oils sourced entirely from renewable resources. 🌱

RESOURCES

- Mulum Creek Timber Products Guide: www.mulumcreek.com.au/timber
- *Your Home*: www.yourhome.gov.au