

# A case for cladding

## Timber cottage with a low-maintenance twist

*This house in Willunga, SA, uses timber cladding for a cottage feel, but adds low-maintenance Colorbond and magnesium oxide board for the hard-to-reach areas.*

Jason Garrood and Susan Greenwood are old hands at sustainable building. Having previously built three houses, they knew what features they wanted when it came to cladding their new home in Willunga in 2017, which Jason describes as their “latest/last home”. As they’re now retired, a priority was easy maintenance as they age. Equally important were sustainability (“we wanted a material with a fairly low carbon input”) and aesthetics (“we wanted our house to have a cottage appearance”).

For appearance they preferred timber, although, aware of its regular re-oiling requirements, they decided to use it only for the more visible walls with easy access. They initially sought to use the same salvaged cypress pine that they’d used in their previous house in Stirling, but it wasn’t available at the time. As a compromise, they sourced plantation Victorian silvertop ash,

which is designated as a fire-resistant timber, important as their house is located near the border of a bushfire zone. The timber is radially cut to reduce milling waste, and installed in a neat batten and board pattern, which they love the look of—it adds a warmth to the house finish. It’s protected with two coats of Intergrain natural oil, applied themselves (“we helped a lot with the build”) before the boards were installed.

For the less visible areas on the ground floor and lower level, they chose to use magnesium oxide board. “We thought that it would be good to try it for its low carbon manufacture,” says Jason. *[Ed note: Magnesium oxide boards need to be carefully selected to ensure they are water resistant, as they can degrade if exposed to humid air in the ventilation gap between boards and frame.]*

Their builder suggested using a specially thick paint (Dulux Acra-Tex) on the boards: “It came up well and looks just like a textured rendered wall.”

For the walls around the skillion roof which were too high for them to maintain at all, they decided on Colorbond ‘mini orb’—a corrugated iron look. “We were happy to discover a new version with wider ‘waves’ which looks less busy than the traditional profile, sort of a ‘midi orb,’” says Jason.

They’re very happy with the aesthetics of all their choices. Jason says, “Choosing colours is another whole story, but we think it has all turned out looking really good!” Having been there almost two years now, they’ve recently had to re-oil the timber, along with tightening up all the screws as the timber had shrunk (“it was put up basically green,” says Jason). They’re not expecting to need to re-paint the magnesium oxide board, but they’ll keep an eye on it.

As an aside, they also used the magnesium oxide board for their decking, combined with a Spa-N-Deck acrylic wood finish. “It’s terrific; there’s a bit of grain on the surface and people often mistake it for timber,” says



*Aware of its regular re-oiling requirements, they decided to use timber only for the more visible walls with easy access.*



Jason. They’ve just re-coated that as it does wear with the foot traffic—and they wanted it looking at its best for this year’s Sustainable House Day.

## Cladding connections

*This home in Melbourne has cladding made from beautiful 1960s timber, reused from the house that stood on the site before, combined with Colorbond and Shadowclad ply.*

For their green building development of three homes in Melbourne, Howard and Libby Elston selected cladding to best fit several requirements: low maintenance, recycled or recyclable materials, aesthetics and cost.

They relied a great deal on the experience and expertise of their builder David from Sustainable Building and Design. “He has a good eye for how to create an attractive finish as well as the necessary installation skills,” says Howard.

Dismantling the original house on the block produced a great deal of usable timber that they wanted to recycle rather than waste. “This is timber that was milled in the early 1960s from trees that were probably hundreds of years old and has beautiful textures and colours,” says Howard. Because the wood looked so good, they decided to use it in a board and batten design near the front door (which is also made from reclaimed timber). They also like that it gives the new house a connection to the old.

Their next decision was to use Colorbond steel in an “interesting profile” (one normally used for roofing rather than cladding) for the



Jason and Susan’s latest house uses timber cladding, Colorbond and painted magnesium oxide board.

eastern and western walls. They chose it as a long-lasting, low-maintenance option. "The western wall takes a fair bit of punishment from the summer sun and we wanted it to be 'set and forget'," says Howard. Steel also ticked the box of a product that can be easily recycled at the end of its life.

For the remaining sections of cladding, they chose Shadowclad, a plywood product, particularly for its ease of installation around the curved wall they'd designed for the second bedroom. "We also felt that using plywood made from plantation pine was a sustainable option," says Howard. Aesthetically, it provides a plain background to other standout features of the house such as the contoured look of the Colorbond and the honey colour of the reclaimed wood.

Howard notes that when it comes to using reclaimed timber, although the product is free, there's quite a lot of manual labour involved. This starts with taking care to remove the timber without too much damage, not just knocking down the house.

There was no shortage of reclaimed timber for the three houses they're building: "Our builder commented that the old house must have been built by enthusiastic amateurs as there was way more timber in the frame than required by standard designs!" They avoided any issues with lead paint by only reusing unpainted framing timber and floorboards.

The cladding timber went offsite to the builder's workshop to be prepared for installation ("which adds to the cost," says Howard). The boards were denailed, cleaned and sanded: "We didn't make any attempt to iron out imperfections as this would remove the history and character, and nobody worried about rough edges on the floorboards as they are covered by the battens." Timbers for the battens were run through the 'thicknesser' to even them up. The boards were then oiled with Organoil to protect them and bring out the natural colours (one coat before installation and another once in place). They've since applied a top-up coat to bring out the full colour of the wood.

The resulting reclaimed timber is stunning, says Howard: "Visitors can't stop themselves from running their hands over it." Since the timber is on the south wall, it doesn't get much direct sunlight, so less maintenance is required. They think the timber will need a coat of oil every one to two years. "Oiling is much easier than repainting (and more forgiving) so this isn't a difficult job to do," says Howard. He adds: if a future owner didn't like the oiled appearance, they could allow the timber to weather and naturally grey.

They've found that the Colorbond is easy to maintain: "The wall just needs an occasional wash with the hose or a brush to clean off accumulated dust."

The Shadowclad ply is painted with Dulux Weathershield for protection. "According to the product warranty, we should get 15 years out of the paint before it needs to be redone," says Howard. However, there are some issues that they hadn't expected. They've found that the rough texture is harder to clean than a smooth surface.

"We have builders working nearby on the other houses so worksite dust blows over the cladding occasionally," says Howard. Trying to clean a patch of textured Shadowclad leaves a patchy finish, so they think it's likely that some sections will need to be repainted. Howard says that this isn't a problem with the integrity of the plywood, just an observation about maintenance.

Another issue they hadn't thought about is that the decorative timber features they added on the Shadowclad make repainting more challenging: "You have to paint around the timber, rather than just rolling paint over the entire wall."

Partly for these reasons and partly to avoid the 10 to 15 year repaint altogether, for their second house they decided to use only Colorbond and timber features. "Our builder worked out a way of curving Colorbond around the curved wall so this became our cladding of choice." They don't anticipate needing to do anything to the Colorbond apart from the occasional wash/clean.



Reclaimed timber from the original house, finished with Organoil, is used as a feature on the home. On the right, is the blue-painted Shadowclad—the decorative timber features look good, but make repainting more difficult.

## Interview with a designer: cladding in the sub-tropics

*Rain and heat mean different cladding and finishing choices in the sub-tropics, says Stephanie Skyring, an architect based in Brisbane. But a focus on sustainable materials is key, no matter the climate.*

### Q. Are there particular considerations for cladding in the sub-tropics?

In sub-tropical south-east Queensland, a climate-responsive approach is to use lightweight cladding material, so it doesn't hold the heat and it cools off fast at night, similar to what works in the tropics. This means lightweight boards or sheet materials fixed to a timber frame (with appropriate sarking and bulk insulation in the wall, of course).

Rain is an important consideration. Effective overlapping of joints is important so the rain can't get between them. Where possible, using roof overhangs to minimise the rain that gets onto the walls is also important, to stop rain tracking down the wall and into the top of window and door heads. Brisbane has some 1980s house designs that used diagonal timber wall boards; the water tracks diagonally down the cladding and causes all sorts of leaking disasters as it runs into the sides of windows and door frames and wall corners.

Wall colour is also important. Dark materials absorb heat and so expand and contract over the day. This amount of movement in timber causes boards to separate, showing gaps between paint and ultimately leaking—and causing the timber to break down more quickly. Builders have told me that they regularly return to fix and replace house cladding that uses black or dark painted wall boards. If you want to use dark colours, use them on the south or other areas where they don't get much sun; definitely don't use them on the west.

Also be careful when using Colorbond. The beautiful colour you choose today will likely be very tired and faded in 10 years. You can repaint Colorbond, but it's not a great solution. If you choose steel for longevity, you are better to choose Zincalume that will just lose its shine over time and improve with age.

### Q. When using timber for cladding, one way to source it sustainably is to use recycled timber. Do you do that?

We don't often use recycled timber cladding, unfortunately, because it is too difficult to find builders who are prepared to work with it. We specify new Araucaria cladding (hoop pine) from sustainable plantation suppliers like Finlayson. We only tend to use recycled timber for interiors, for hardwood flooring, walling and cabinetry. This timber ideally comes





In the Gaythorne renovation, the 'popout' from the kitchen is clad in boards reused from the demolition of parts of the house. Installed in a random pattern with a 10mm gap between boards, they're a cladding detail over a fibre-cement sheet for weatherproofing.

Image: Lara Masselos

from demolition yards so it's not remilled, or it comes from places like The Big Red Shed or Kennedys—they obtain large pieces of old hardwood from jetties and bridges and remill it to order into required sizes.

In one project, Gaythorne, we used timber from the demolition of parts of the house. This was easy logistically as the timber was on site and, by reusing it, we prevented the beautiful hardwood going to landfill.

There are a few issues reusing boards from your existing house, unfortunately. The first and major hurdle is finding a builder who is happy to do it. Most of them won't, as it's labour intensive; you have to pull the nails out and the boards are all random sizes rather than long lengths.

The boards also often have lead paint on them. In the case of Gaythorne, the boards were in very good condition, so the painter was able to paint over them with an undercoat to make the new water-based top coat adhere. This is standard practice for lead paint that's in good condition. The weatherboards were hardwood. Hardwood is harder to work (it's very hard!) and can be bowed. However, because the boards were very old, they were very dry so there were no issues from shrinkage after they were installed.

Usually the only people who reuse boards are those doing the work themselves. I find that when you start talking about reusing boards, most builders will say they are not interested or put a premium on it.

When you demolish parts of a house all the great old hardwood (wall cladding, studs and flooring) typically goes in the skip. However, there are a few furniture-makers in Brisbane that I know of who have connected with builders. They get the hardwood after a demolition and remake it into beautiful pieces of custom furniture. The ways to prevent

building materials going to landfill is a good story in itself!

**Q. With another property, Spring Hill, you used plantation pine. Do you look for certifications/which ones?**

New weatherboards used in construction are typically softwood—preferably Araucaria (hoop pine) because it's a native Australian plantation species or radiata pine if you get the cheap option (still grown in plantation locally, but not a native species; for Brisbane people, all those forests on the way to the Sunshine Coast are radiata). Softwood is typically straighter, easier to work and doesn't shrink after installation. New hardwood boards tend to shrink after installation, causing gaps where the boards overlap that have to be repainted.

The Spring Hill boards were Araucaria from a small local supplier. I do look for sustainable certification, but I prefer native trees grown locally in plantation over an imported species grown overseas with certification.



Spring Hill's shiplap boards are in three different sizes.

Image: Christopher Frederick Jones

Choosing sustainable materials is very hard; there are so many considerations. So with timber I try to keep it simple: reduce the distance it has travelled, use a plantation local Australian native species so it has provided habitat and a food source to local animals during its life and select plantation over managed forests (chopping down old hardwood trees removes too much wildlife habitat and nesting holes).

**Q. The random shiplap boards look great on the Spring Hill project. What made you choose that (and what is shiplap)?**

Shiplap, weatherboard and chamferboard are all timber boards that overlap each other for weather protection; they just have different profiles. Shiplap boards have a tongue and groove as well as overlap. I chose the random pattern for something new; I like interesting texture. The supplier had three different sizes, so I just used all of them!

We used a random pattern with the recycled weatherboards on Gaythorne, too—we split some in half to get a narrower board and placed them facing one way and the other. To get proper weatherproofing, the recycled weatherboards are a cladding detail over a fibre-cement sheet as there is a 10mm gap between boards.

**Q. What about painting boards in the subtropics?**

I always paint external cladding in Brisbane rather than clear finishing it like architects do in the southern states; our sub-tropical weather is just too harsh. With good quality paint in a light colour to avoid too much expansion and contraction, properly applied and kept clean with a regular house wash every five years, your external paint can last 20 years without a recoat.



Gaythorne's entry features decorative reused boards.

Image: Lara Masselos

## Charred for a long life

Quentin Irvine has been making and using charred timber cladding since 2015, both on his own house and for clients.

Quentin Irvine is an electronic engineer turned designer-builder, based in central Victoria, where he runs residential design and build company Inquire Invent. It's his engineering background which has enabled him to add a sideline to his building business, making charred timber cladding for his own house (the Recyclable House, featured in 'Cradle to Cradle' in *Sanctuary 44*) and those of his clients.

The charred timber process comes from Japan, where it's known as 'yakisugi' or 'shou-sugi-ban'. Quentin first saw it used in a book by Japanese architect Terunobu Fujimori and was drawn to its "incredible look." But his interest in it goes far beyond that: "It's low in embodied energy, long lasting and sequesters carbon, but, above all else, it's recyclable."

With construction and demolition accounting for around 30% to 40% of Australia's total waste, Quentin is on a quest to improve the recyclability of the buildings he constructs. "This type of cladding doesn't require any glues or chemical finishes and we install it with stainless steel screws, so at the building's end of life the timber can be cut up for biofuel and the screws reused to install a new batch of cladding or sold for recycling."

Quentin and his company make the charred timber cladding using a machine he designed that's fuelled by cladding offcuts with "a little bit of electricity (from solar)." They tried using a blow torch as shown on internet videos, but

found that "incredibly slow and it used a hell of a lot of LPG." He says that they are still net sequestering carbon: "Some of the timber is turned into CO<sub>2</sub> during the burning process, but it's only around 10% to 20% of the product that is going back to CO<sub>2</sub>."

The lifespan of any timber product used for cladding will depend on the type of timber used, but Quentin notes that charring and oiling the timber can extend that life. He suggests the timber he uses (white cypress, *Callitris glaucophylla*) has a lifespan of about 40 years without any oiling or charring; "once charred, this life could be increased by as much as double according to some sources," he says.

Oiling also helps the timber hold its char layer for longer. "Use an all-natural timber oil to keep it safe for recycling," he says; they use a Bio Products decking oil.

Quentin sources Australian timber to avoid the transport miles and unknowns of overseas timber harvesting. The timber is selectively logged from Australian state forests with PEFC certification. [Ed note: FSC is the preferred certification.] He chose white cypress for its long life, but is doing tests with timbers that don't come from state forests to improve sustainability. One of the timbers he's testing is *Cupressus macrocarpa*, but this has a shorter lifespan of around 7 to 15 years, pre-charring.

There is natural variation in the timber as well as the depth of char and "you just need to embrace this natural aspect," says Quentin. He adds: "But most people who see it for the first time are surprised at how consistent the effect is." It also weathers at different rates: "You always get a few boards that react differently to the flame and have char fall off more quickly,



Charred and oiled timber on another of Quentin's projects (designed by Chiverton Architects), about 18 months after install.

but these areas soon 'grey off' and blend in."

He recommends avoiding using it in areas where people could lean against it as the char will rub off onto clothes. "It's better for a second storey or areas with garden beds providing some separation." However, at his own house, they have it on the wall next to their timber deck and haven't had any issues.

Being black, the cladding absorbs heat, so it can move more than other timbers. But, he says, installed in a board and batten style (as on their Beaufort house), the movement is not readily noticeable. He also mitigates the heat build-up (and therefore heat into the house) by installing it on battens which let air circulate behind.

Quentin suggests when selecting cladding, to consider not just the cost per square metre, but also the lifespan of the product and the cost of installation and maintenance—"the cost per square metre per year is the true cost!"

He gives some example cost ranges: "Charred timber cladding ranges from \$80/m<sup>2</sup> to \$174/m<sup>2</sup>, supply only. This compares to cedar cladding at around \$156/m<sup>2</sup>, supply only, but this would not last as long, around 15 to 40 years without a finish—although, similar to charred cladding, it doesn't require painting and could be recyclable. Another comparison is pre-primed weatherboards which cost, say, \$21/m<sup>2</sup> to \$26/m<sup>2</sup>, supply only, but these are high in embodied energy, usually coming from overseas, need two coats of paint and regular repainting, and they are not recyclable."

Finally, Quentin says to bear in mind that not all charred timber on the market is the same: "Some companies are using the wrong timber which results in the char falling off excessively and rapidly, and many are applying a Cutek CD50 decking oil, rendering it unrecyclable." He says, "We have visited manufacturers in Japan to make sure we are doing it right."



Quentin used charred timber cladding on his own house in Victoria, along with Z600 galvanised steel for long life.