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INSIDE ISSUE 42 Courtyard basics; build without skip bins; PCM cost-benefit;
stairs with flair; easy home automation; reinvent your garden





An old jacaranda tree – the only non-native presence in the yard – is a striking focal point.

Photosynthesis house

A tiny beach cottage in Sydney's Manly Vale is sensitively renovated to bring all-day sunlight and year-round comfort to a family of five.

WORDS Fiona Negrin

PHOTOGRAPHY Simon Whitbread

PERVASIVE MILDEW, A SCANT 90M² OF floor space and just two bedrooms weren't providing the best environment for Ruth and Keith to raise their three young boys. On the other hand, the couple loved their modest 1950s beach shack in Manly Vale, Sydney; it had a 'nice feel' and loads of natural light. When their architect Matt Elkan shared their reservations about demolishing it to rebuild from scratch, the decision was made to renovate and extend.

The compact cottage, although dilapidated, had a humble character that they wanted to preserve. They kept its frame but stripped away the fibro cladding and interior walls to leave just "a skeleton of the old home on its foundations". The new external cladding is 8.5mm fibro with painted batten joints to provide a more robust, "slightly more thought-through" riff on the original version. The foundation, as it happened, was a sandstone rock shelf. Rather than excavate it, the couple have allowed the rock to govern the levels of

their extension and to become a feature in its own right.

The new house takes advantage of excellent orientation with full-length, low-e glass windows along the north face. In the central area of the house, where the old part joins the new, light pours in through an expansive skylight strip made of high-spec, double-glazed, low-e glass. It's Ruth's favourite space: "I find myself spending hours in the central zone of the house when I have the chance. With the louvres and the big skylight, it's a good feel." In fact, the house's incredible solar access has led the couple to dub it the Photosynthesis House.

While the light is welcome, the heat that accompanies it is not. The area's sandstone rock shelf acts as a heat sink and with minimal vegetation to offset it, summers in Manly Vale can be stifling. To shade the house and open it to cooling sea breezes there are "vast areas of louvres – we probably kept the louvre industry

in business," jokes Matt. External sensor-operated, smart Venetian blinds shade the northern and western sides of the house, and Keith and Ruth have already noticed the comfort these bring on hot days.

Locally sourced timber features inside and out, and this consistent material palette does an excellent job of integrating the old part of the house with the new. Hardwoods are used extensively, including on windows, with tallowwood on the decking because "it doesn't splinter or warp," says Matt. Internal floors are all blackbutt and there's extensive use of imported melamine board, made by TZ Austria. "It has VOC emissions one-fifth of what would classify as e0 in Australia; the standards in Europe are more stringent," says Matt.

He says the joinery was blackbutt veneer because of the more varied texture and lower waste. Matt credits Fine Earth Joinery and builder Greg Lofhjelm for their attention to detail on the custom build. "A



Ruth and Keith enjoy gardening but rarely find time for it. Their garden caters to this by being planted out with indigenous species that need little to no watering, and is watered from the 5000L rainwater storage tank. A green wall covers the south boundary and a green roof (passively watered by run-off from the old roof) provides welcome shade over the skylight during summer.



Rooftop PV “makes loads of sense on a place like this with great orientation”, says Matt, but the couple have deferred buying a battery, judging the technology to still be approaching its peak. Meanwhile, the electric hot water unit functions as a de facto battery for their 5kW PV system.



project like this is nothing without a good builder to bring it to life.”

Cleverly, all clear-finished doors and windows are at ground level where they’re easy to reach and oil, and the painted timbers are positioned higher up where less maintenance is required. The timber used for these parts was a mix of clear-finished blackbutt and Accoya pine, which Matt describes as a more durable alternative to Western Red Cedar. “Western Red Cedar takes 50 years to grow and windows made

from it will last 20 to 30 years; Accoya takes 20 to 30 years to grow but will last 50 years as windows.” Perhaps that’s why it’s finding favour among bespoke joiners.

With their original 90m² cottage now expanded to 163m² over two light-filled levels, the family are “sickeningly positive” about the renovation. Ruth speaks proudly of her sons’ newfound knowledge of solar power and environmentally sustainable design as a result of observing the 12-month build. Matt’s take on ESD encompasses

those solutions but goes beyond them: “Water tanks and orientation are relatively easy to achieve.” His goal is to use beautiful materials to create spaces that are “really joyful”, because that’s what inspires people to look after their houses through the years, even centuries.

If that’s the measure of sustainability, then Photosynthesis House is set for a very long life.

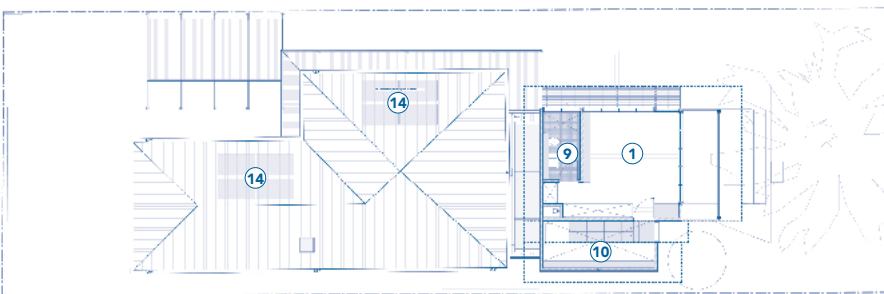


A custom-made glazed-skylight strip delineates the new part of the house from the old, and brings plentiful light into the heart of the house. It's double glazed and low-e coated.

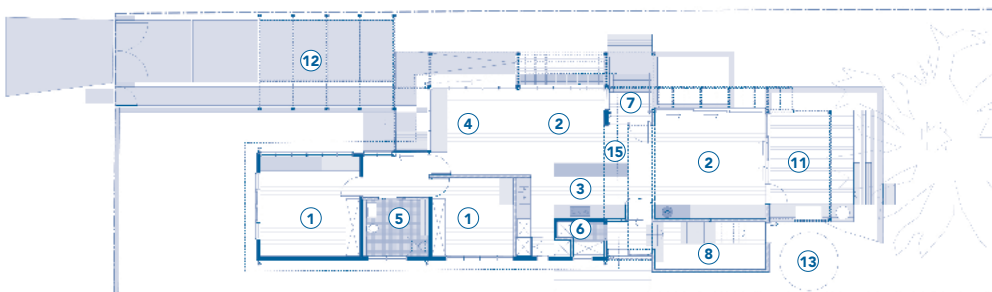


Large banks of Breezway louvres upstairs and down keep the home naturally ventilated through the area's hot summers.

FIRST FLOOR PLAN



GROUND FLOOR PLAN



LEGEND

- ① Bedroom
- ② Living
- ③ Kitchen
- ④ Dining
- ⑤ Bathroom
- ⑥ Laundry
- ⑦ Entry
- ⑧ Study
- ⑨ Ensuite
- ⑩ Void
- ⑪ Deck
- ⑫ Carport
- ⑬ Water tank
- ⑭ Solar panels
- ⑮ Skylight strip

Photosynthesis House

—Specifications

Credits

DESIGNER

Matt Elkan Architect

BUILDER

Bangalley Building,
Greg Lofhjelm

PROJECT TYPE

Renovation

PROJECT LOCATION

Manly Vale, NSW

SIZE

Land 464.5 m²;
House 163 m²
(original 90m²)

BUILDING STAR RATING

5.5 Stars (whole house)

Sustainable Features

HOT WATER

- 315L electric hot water, installed in conjunction with rooftop PV array.

RENEWABLE ENERGY

- 5kW PV array (Jinko 260W Panels) with SolaX Wifi monitoring, installed by SolarPro.

WATER SAVING

- 5000L Zinalume above ground tank connected to garden taps and laundry.

PASSIVE DESIGN / HEATING & COOLING

- North orientation to all living spaces and majority of bedrooms
- North-, east- and west-facing decks to be used according to time of day
- Cross ventilation from all orientations
- Large eaves to the north to prevent overheating in summer
- External Venetian blinds on north-, east- and west-facing windows.

ACTIVE HEATING & COOLING

- Hunter Pacific Concept 2 ceiling fans in living, dining and bedrooms
- Morso 7648 wood-burning heating.

BUILDING MATERIALS

- External cladding: 8.5mm James Hardie Easy Lap with 40mm TP batten joints painted in Colorbond 'Monument'
- Roof: BlueScope corrugated custom orb in Colorbond 'Windspray'
- Insulation: roof 55mm Autex foil-backed insulation blanket and R3.0 polyester ceiling batts; internal walls R2.5 polyester acoustic batts; external walls breathable sarking and R2.0 polyester batts
- Internal acoustic feature ceilings achieved with 19 x 42mm Blackbutt battens spaced 19mm apart for acoustic absorption
- Recycled demolition sandstone used for wall footings, stairs and landscape features.

WINDOWS & GLAZING

- Blackbutt and Accoya windows and doors by H2 Custom Joinery
- Breezway louvres
- Single-glazed low-e toughened 6mm and 8mm glass throughout
- Custom skylight strip with double-glazed low-e glass.

LIGHTING

- LED lighting throughout, by Tovo lighting
- Pendant lights made from recycled Venetian blinds by Adrian Lawson.

PAINTS, FINISHES & FLOOR COVERINGS

- All internal timber finished in Organoil
- 130mm blackbutt tongue and groove flooring with Synteko Natural Oil
- All external hardwood (doors/ windows/decking) finished in Cutek CD40 Grey Mist.

OTHER ESD FEATURES

- Green walls and self-watering green roof planting by The Greenwall Company
- Low water use native planting designed by Lindy Hulton Larson
- Small footprint.



Acoustic feature ceilings upstairs were formed using Blackbutt battens, spaced 19mm apart to aid sound absorption. Ceiling fans provide the only active cooling in the house.