

Urban lifecycle

LOCATION Fairfield, Victoria • WORDS Anna Cumming • PHOTOGRAPHY Emma Cross photographer

Sustainably sourced materials meet passive solar design in this custom renovation and extension of a period Melbourne cottage.

When Ella and Dave were planning the renovation and extension of their small, badly performing 1920s weatherboard cottage in Melbourne's inner north, they knew what they wanted in terms of function and feel. "We wanted a bit more space, flexibility, light, and a much better connection with the back garden," says Ella. "It was also important that the house was sustainable, energy efficient, easier to heat and cool."

They were less clear on the specific materials for their rejuvenated home, however, and instead chose to rely on the expertise of their designer, Shae Parker McCashen of Green Sheep Collective. "We chose Shae after seeing another of her projects," says Dave. "We knew sustainable design and specifying sustainable materials was the way she worked, so we were able just to trust her suggestions."

Considering materials from a whole-of-life embodied energy perspective,

including manufacture, transport required, expected lifespan, and post-use responsible disposal, is important to Shae, and an alignment of these values is part of how she selects builders to work with. "The first step is always, how little can we demolish?" she says. "For this project, it was just the lean-to bathroom and laundry, and the guts of the old kitchen. The builder Tim Martin recycled everything he could from the demolition, offering things for free on online marketplaces and so on." Tim also used Transcycle to dispose of general construction waste – this service recycles 95 per cent of materials.

Shae then went about designing the renovation with minimal intrusion into Ella and Dave's prized back garden, while protecting a mature magnolia tree. A new bathroom, toilet, and flexible room – currently a study, but it could be an extra bedroom – were tucked between the house and the southern boundary. The slightly enlarged kitchen now opens straight onto a large deck, accessible also from a new north-facing 'sunken' living and dining area with a soaring angled ceiling, that gives the family the extra space they were looking for.



At a glance

- Materials chosen based on full lifecycle assessment
- Engaged builder 'deconstructed' rather than demolished parts of the original house
- Period house revamped to extend its life and functionality and achieve 5.3 Star energy rating
- Pet-friendly design with dedicated cat run.



↑ The homeowners say that the high ceiling in the extension makes the space feel much bigger than it actually is, and Ella loves the view of the moon through the high level windows at night. As for materials, “we wanted a concrete slab floor for passive solar performance,” says Dave. “We hardly need to use the heating in winter if it’s sunny.” The recycled brick feature wall also works as thermal mass.

“The garden was beautiful, jungly, but we couldn’t even see it from inside,” says Ella of their old house. “We had to go out the side door and around, so we just didn’t use it at all.” Now, a large window with a wide, inviting window seat frames views of the magnolia. “It feels like you’re sitting in the branches,” says Shae, “and the views through the high window are stunning when the tree is flowering.” The deck provides an easily accessible extra play space for the couple’s two small children. It steps down gently to the garden, where Ella and Dave have saved and restored some of the stonework and landscaping done by the house’s previous owner, a garden designer.

Sustainable materials chosen for the build include recycled brick for the southern wall of the extension, radially sawn shiplap cladding, thermally improved aluminium framed double-glazed windows, plywood ceiling and an

“The builder Tim Martin recycled everything he could from the demolition, offering things for free online”

E-Crete concrete slab. “We modified the design to minimise the need for steel in the structure,” says Shae. “Steel is very recyclable but it has a high embodied energy, so we try to preference sustainably sourced timber.” She notes that it’s also important to think about not just what happens at the end of a material’s life, but what’s needed for its maintenance.

“Materials selection is complex and time consuming,” concedes Shae. “Our specifications develop over time; we do have some go-tos like radial timbers and recycled bricks, but we need to go back and research as new products come out, improvements are made, and things go off the market.” She explains that she relies on eco certifications such as Global GreenTag, Good Environmental

Choice Australia (GECA) and FSC to help avoid ‘greenwash’ products. Beyond this, she recommends having informal conversations with suppliers and manufacturers – which is much easier if you’re able to choose locally based enterprises – to ask about where the products come from and who and what is involved in their manufacture.

Material choice, design and careful execution by a dedicated builder have come together for a lovely result for this family home. “We now have a house and garden that wrap together,” says Ella. “I love the light, the openness, and the way the kids can be playing on the deck or in the living room and we can see them from the kitchen.” ⑤

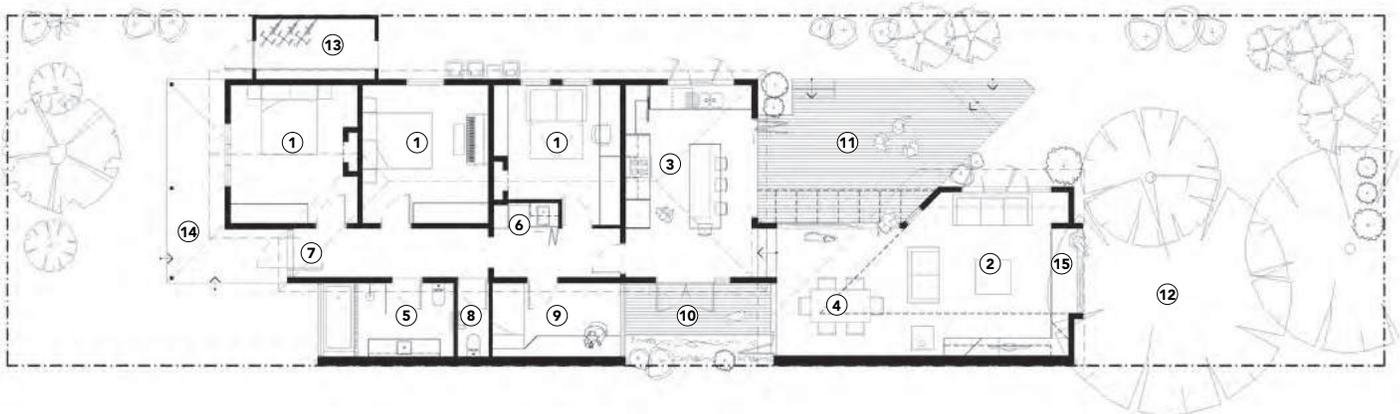


↑ The courtyard on the southern boundary fulfils various functions, letting light into the study, kitchen and living area and allowing visual connection and cross ventilation. It was also part of the design for a pet-friendly house, functioning as an enclosed outdoor cat run.



↑ Unlike the old kitchen which didn't even have a view of the garden, the new one opens right out to the back yard. Ella and Dave are working with Shae to plan some more shading for the deck and for this east-facing glazing.

FLOOR PLAN



- | | | | |
|-----------|------------|-----------------------|---------------------|
| ① Bedroom | ⑤ Bathroom | ⑨ Study/flexible room | ⑬ Bike storage/shed |
| ② Living | ⑥ Laundry | ⑩ Courtyard/cat run | ⑭ Verandah |
| ③ Kitchen | ⑦ Entry | ⑪ Deck | ⑮ Window seat |
| ④ Dining | ⑧ Toilet | ⑫ Magnolia tree | |

HOUSE SPECIFICATIONS

HOT WATER

- Rinnai Infinity 26, from Reece.

WATER SAVING

- 2000L Melro poly under-deck water bladder connected to laundry, toilet and garden taps.

PASSIVE DESIGN / HEATING & COOLING

- High angular ceilings provide stack effect ventilation
- A bamboo courtyard, which doubles as a cat run, brings planting close to the centre of the home, provides cross ventilation, evapotranspirative cooling and allows natural light into the adjacent living space, kitchen and study
- Building envelope and form are designed to accommodate a temperate climate. The building's orientation is the primary contributor to the thermal comfort and energy efficiency of the home
- Natural heating is provided in winter by means of north-facing windows, thermal mass, low-e doubling glazing and insulation to walls and ceilings
- Unwanted summer heat gain is prevented by appropriately designed eaves, a batten screen, blinds, cross ventilation, a pergola with deciduous planting and stack effect cooling aided by ceiling fans
- The design carefully considers the spatial requirements of internal spaces to reduce built form and maximise garden area.

ACTIVE HEATING & COOLING

- Heatilator wood stove from Wood Pecker
- Split system air conditioner
- Haiku ceiling fans to the living area from Big Ass Fans.

BUILDING MATERIALS

- E-Crete slab; blackbutt timber floors; silvertop ash decking
- Recycled red brick from Steven Raglan Bricks in Preston
- Lysaght Trimdeck from AWF Sheet Metal
- Timber cladding: tongue-and-groove shiplap from Hazelwood & Hill
- Insulation: new and existing timber floors fitted with Air-Cell Permifloor from Kingspan; new roof R4.0 Bradford polyester batts (50

per cent recycled) from Picton Hopkins plus Air-Cell reflective insulation; existing pitched metal roof retrofitted with additional insulation batts to create a minimum of R5.0; new lightweight wall system/cladding has R2.5 batts and Air-Cell reflective insulation; new brick veneer walls have R2.0 batts and Air-Cell reflective insulation; new brick cavity R1.9 (40mm) Kooltherm K8 insulation board from Kingspan; existing weatherboard retrofitted to R2.0; internal walls R2.0

- Plywood ceiling and eave lining and bathroom ply veneer from Plyco
- Plantation wormy chestnut and messmate timber cabinetry from Brittans; Caesarstone benchtops
- External timber batten screen: 'Screenboard' from Radial Timbers.

WINDOWS & GLAZING

- New aluminium-framed, thermally improved, argon-filled, clear low-e double glazing (Architectural Aluminium suite) from Rylock.

LIGHTING

- LED downlights from Brightgreen.

PAINTS, FINISHES & FLOOR COVERINGS

- Low to zero emissions paints from Dulux and Haymes
- Cutek oils used for timber cladding and deck
- Livos oils for timber interiors.

OTHER ESD FEATURES

- Existing house gaps sealed and insulated, including the chimney in bedroom 1 which was blocked off
- Lifecycle analysis, including post-use responsible disposal; preferred products such as GreenTag, GECA and FSC certification; ethical procurement, harvesting and work practices (such as radially sawn timbers)
- A reduction in building form due to flexible programming and clever joinery results in fewer construction materials, less maintenance, reduced heating and cooling costs and a lower overall footprint
- Any site waste was taken to Transcycle (truelocal.com.au/business/transcycle-resource-recovery/mordialloc) which has recycling rates of 95 per cent.

DESIGNER

Green Sheep Collective

BUILDER

Excelsior Master Builder

PROJECT TYPE

Renovation / extension

PROJECT LOCATION

Fairfield, Victoria

CONSTRUCTION COST

\$480,000

SIZE

House 150m²
Site 399m²

BUILDING STAR RATING

5.3 Star (whole house, improved from 1.8 Stars)

ENERGY RATER

Filter ESD

INSIGHTS

"They did much more to the house than what was required by the energy rating."

Shae Parker
Green Sheep Collective