

Outside the box

An energy-efficient addition to a charming double brick home in Melbourne's east bucks the trend for all new.

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MELBOURNE'S BOX HILL HAS A diminishing number of eclectic, post-war homes, increasingly replaced by knock-down-rebuilds, and the newly renovated McCarthy family home almost followed the same path. The family – Luke and Megan, and their two children – loved their double-fronted brick home, but they found most building designers and construction companies they approached didn't understand the attachment. "They often voiced the opinion that it'd be cheaper to bulldoze and rebuild," says Luke, "and after many failed attempts to get build quotes, we almost gave up".

Luckily the couple found a building designer up for the challenge. Simone Schenkel from Grün Eco Design prides herself on her hands-on approach and willingness to go the extra mile for her

projects. Her approach for this renovation and extension was driven by a philosophy that energy efficiency is achievable on any budget. "We had a very tight budget," says Simone, "but we integrated the cost of energy efficiency into the design, rather than designing something and trying to make it sustainable at the end".

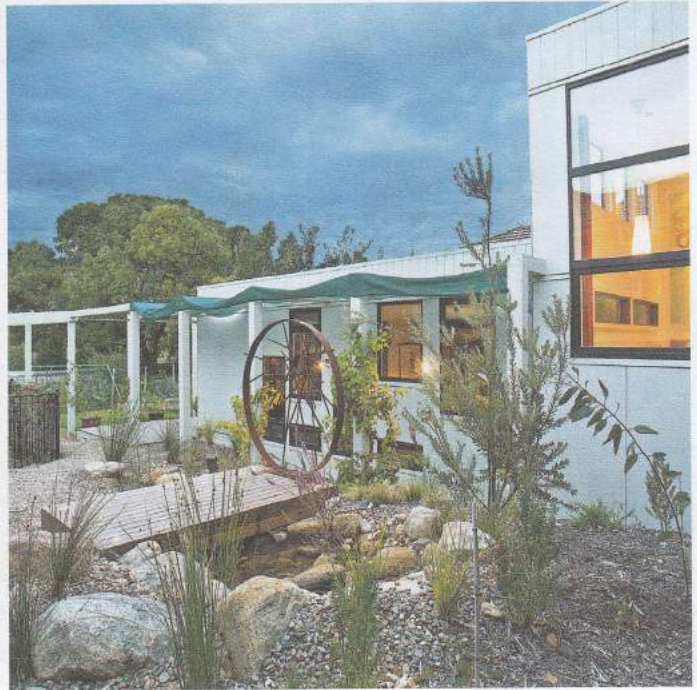
With Simone on board, it took the team six months to find a builder willing to join this hands-on, ESD collective. But once they did, they set to work matching the construction details to the modest budget.

For the build, Luke decided to be on site as much as possible – an approach he highly recommends. "I took long service leave," he says, "so I was on site when the work commenced. This meant any problems we encountered could be resolved quickly, and new opportunities could be realised.

4 Luke and Megan worked hard to preserve their double brick family home, while adapting it to suit their needs. They found that many builders and designers they spoke to didn't see the value in retaining it, suggesting instead they knock it down and start again.



5 The water feature was an idea of Luke's – a child-safe, but equally tranquil alternative to a pond, which also serves an ecological function. The 8.5-metre creek is powered by a low-voltage electric pump, which circulates the water beneath the surface through a below-ground storage system.



6 The open plan addition is passively warmed with north-facing double glazing and insulated concrete slab. An efficient Morso S10 wood stove replaced the existing gas ducted heating system.



7 The new bathroom replaces what was the original kitchen, and is full of lovingly restored secondhand items. The cabinet, a converted dresser, the Art Deco mirror and the resurfaced clawfoot bathtub were all sourced on eBay, while the sink was sourced from a demolition company. Most of the doorways were moved but the original doors and hardware were retained and repurposed.



Ⓔ The extension is sealed for comfort; the walls were built with larger studs to allow for R3.5 batts instead of the standard R2.5, and bigger rafters were used for the roof to fit R6 insulation batts. Furniture and fittings were reused wherever possible or sourced secondhand.



Ⓕ Glazing to the addition was carefully considered to maximise northern light while not compromising performance. Low-level windows allow cooler air to enter, further cooled by the natural pond and water feature along the wall boundary, while high-level windows help expel hot air.

It also gives the builder a chance to learn your preferences so they can better make assumptions when you're not there."

The extension features a large open-plan kitchen, dining and lounge area. It opens out to a pergola and is built down the hill to immerse the room in garden views. An insulated concrete slab floor helps keep the home warm through winter, while in summer the pergola is covered with shadecloth to keep the heat out; eventually this will be replaced by the still immature deciduous vines.

Corrugated iron roof and timber cladding, exposed vertical beams and a concrete floor give the extension a sleek industrial flavour. Double-glazed windows, installed in the extension and retrofitted in the old part, fill the house with natural light. The uPVC window frames, fairly standard in Simone's native Germany but relatively uncommon in Australia, were

chosen for their insulative qualities, ease of maintenance and comparatively low-cost, "if you want timber frames for the same performance you pay much more, in this case it would have been over \$10,000," says Simone.

The floorboards, cabinets, bricks, kitchen benchtops, appliances, taps, fixtures and fittings in the house were either reused or sourced secondhand. "We made the budget work by saving money on recycled fittings and materials," says Simone. "This meant we could spend more money on the shell of the house, and really good windows and insulation."

A creative approach to materials delivered insulation gains without fiscal pain: the walls and roof are standard timber construction but, says Simone, "we built the new walls with larger studs to allow for R3.5 batts instead of the standard R2.5, and we used bigger rafters on the roof to fit R6

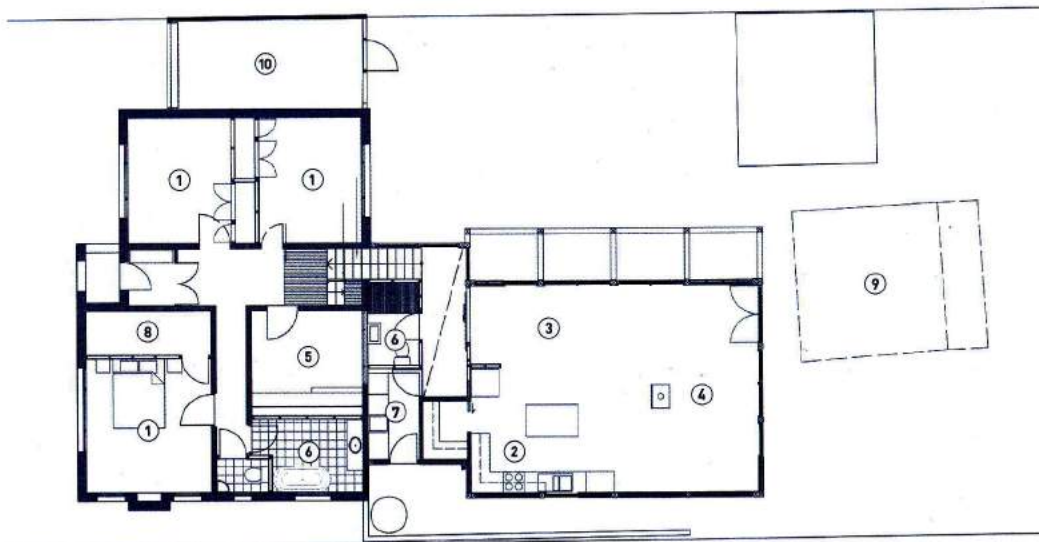
insulation batts".

Outside the home received similar love and care. The family enlisted Ryan Young Designs to create a delightful and functional landscape with natives, exotics, vegetable gardens and water features to support the home's cooling. "In the hotter months," explains Luke, "we can open the smaller lower windows by the water feature to provide a little passive cooling in the evenings".

The team's comprehensive effort certainly paid off, bringing the home up to 8.1 Stars. The renewed house is comfortable year-round and saves its delighted owners on bills. "I'm proud of its high house energy star rating," says Luke. "It has a higher rating than most new houses despite being a renovation and addition."

The home has been recognised for its achievements too, shortlisted in the Premier's Sustainability Awards 2015. 5

FLOOR PLAN



LEGEND

- ① Bedrooms
- ② Kitchen
- ③ Dining room
- ④ Living room
- ⑤ Studio
- ⑥ Bathroom
- ⑦ Laundry
- ⑧ Walk in robe
- ⑨ Outdoor dining
- ⑩ Garage



④ The same careful consideration which sealed the renovated home for comfort was paid to the outside of the property, with Ryan Young Designs creating a low-maintenance indigenous native garden. "We try to include 90 per cent indigenous natives for the local habitat in all our projects," says Ryan.

Box Hill South residence

—Specifications

Credits

DESIGN

Grüen Eco Design

BUILDER

Silkwood Constructions
Pty Ltd

LANDSCAPE DESIGN

Ryan Young Designs

PROJECT TYPE

Renovation and addition

PROJECT LOCATION

Box Hill South, Victoria

COST

\$260,000
(incl. professional fees)

SIZE

Land 765 sqm
House 164 sqm

BUILDING STAR RATING

8.1 Stars

Sustainable Features

HOT WATER

– Existing gas hot water system retained, to be upgraded at the end of its lifespan.

RENEWABLE ENERGY

– Wiring has been installed ahead of a suitable PV system being selected.

WATER SAVING

– 2 Zincolume tanks by Tankworks: a 5000L tank collects water from the existing roof and a 10,000L tank collects water from the extension roof

– Taps and mixers have been reused from the existing part of the house or sourced secondhand where possible

– Any new taps or mixers have a WELS rating of at least 3 stars.

PASSIVE DESIGN

– New living areas orientated to the north for good solar access

– Insulated concrete floor reduces heat loss and gain and acts as thermal mass

– Original external brick left exposed in the new double-storey staircase for additional thermal mass, feature and to clearly identify the old and the new

– A pergola around the living/kitchen/dining areas offers summer shade with wire-supported deciduous vines

– Windows in the double-storey void help to purge hot air and low-level windows in the living room allow cooler air into the building, further aided by a water feature outside the windows

– A small opening has been installed on the southern side of the kitchen to allow for direct cross-ventilation.

ACTIVE HEATING & COOLING

– The existing ducted heating was disconnected and replaced with a Morso S10 series slow combustion wood heater in living/kitchen/dining room from Wignells

– New Nobo electrical heaters have also been installed in the bedrooms, but are rarely needed.

BUILDING MATERIALS

– Existing kitchen cabinets, floorboards, bricks, benchtops, appliances, fixtures and fittings were refurbished if necessary and reused throughout the house or sourced secondhand

– R1.9 Kingspan K10 Kooltherm insulation underneath and at edges of new concrete floor

– Stramit corrugated zinc-aluminium alloy coated steel roof selected for ease of maintenance and longevity

– Carter Holt Harvey Shadowclad pine plywood exterior cladding

– Mastashield Knauf plasterboard, a core of gypsum sandwiched between two layers of heavy duty recycled paper

– Ecofoam sprayed polyurethane foam insulation to existing walls and floors, R3.5

– Ausmalt polyester batts to new walls, R3.5; R6 to roof.

WINDOWS & GLAZING

– EuroTech double-glazed windows with uPVC framing, u-value 1.9.

LIGHTING

– LED and fluorescent lighting used throughout the extension

– No downlights are used within the house to avoid potential loss of ceiling insulation.

PAINTS, FINISHES & FLOOR COVERINGS

– Non toxic finishes used throughout the house

– Zero-VOC, EcoStyle low-sheen acrylic paints by Rockcote

– Timber and concrete floors finished with KUNOS 244 by Livos.

OTHER ESD FEATURES

– An exhaust fan has been installed behind the fridge to extract hot air and optimise the efficiency of the fridge

– The door towards the pantry has been sealed, while an exhaust fan allows for better temperature control, reducing the heating effect of appliances, and assisting in food preservation. A lower vent in the pantry to the south side of the building lets in cool air from the naturally shaded adjacent slope.

– Landscape design includes a productive vegetable garden, including an orchard, worm farm and composting system as well as indigenous natives to support local wildlife.