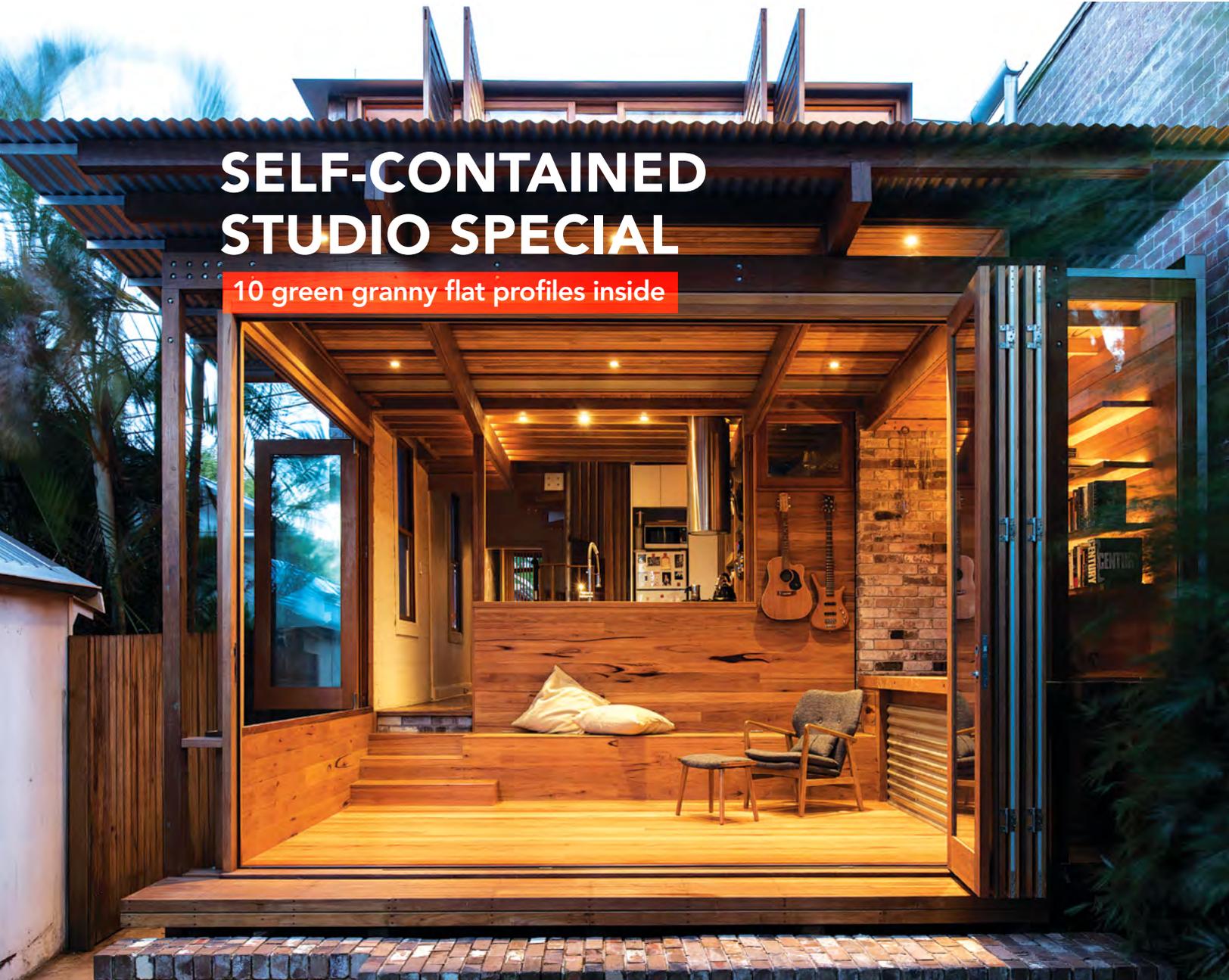


# MODERN GREEN HOMES Sanctuary

INSIDE ISSUE 35 Hydronic heating; skylights; birdscaped gardens; design for cold climates; green home ideas & products; renovating on a tight site; tiny backyard studios

## SELF-CONTAINED STUDIO SPECIAL

10 green granny flat profiles inside



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### WIN

A Daikin US7 super efficient 7-star rated reverse-cycle air conditioner

Offer open to Australian and New Zealand residents only, details p29

### PLUS

Rammed earth in Margaret River  
Japanese-inspired terrace  
Eco townhouse subdivision & more

# Big sky views

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Constructed from locally sourced materials and designed in the style of a traditional worker's shed, this new family home in Trentham is comfortable, thermally efficient and provides views in all directions.

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The location of the house on the 40-acre block was carefully selected to have views of town and the mountains: "We love sitting out on the deck and watching the big sky. The fabulous time for us is late afternoon, early evening, as the sun's setting and the clouds are rolling past Mount Macedon and the surrounding countryside."



**WORDS** Fiona Negrin  
**PHOTOGRAPHY** Peter Clarke

**THE AWARD-WINNING 700HAUS IS** home to Kane, Lea and their young family in picturesque Trentham, high in the Great Dividing Range about an hour's drive north-west of Melbourne. Named for the number of metres the house sits above sea level, 700Haus confidently unites a striking, minimalist aesthetic with a rigorous attention to thermal efficiency, making it an exemplar of good residential design for a sub-alpine climate.

The 40-acre Trentham block was vacant when the couple purchased it in 2010. Serendipitously, they met Tim Ellis, principal at Glow Building Design, at an Alternative Technology Association 'Speed date a sustainability expert' event. Kane recalls "turning up with photos of our block and saying, 'we're looking for somebody that can help us build our dream.' We spoke to a few architects there and we both felt that Tim was in tune with what we wanted to do, and he was the right person for us."

Their brief was to build a house that fits in with the landscape and reflects the region's history, using a minimal range of materials, locally sourced where possible. Tim designed a contemporary, elegant take on a working shed. True to the couple's intention to use few materials, the house's exterior uses only three: timber, steel and

stone, including corrugated iron cladding, locally quarried stone for the chimney, and blackbutt timber from local native plantation forests for the deck.

The house needed to have low ongoing energy use and be able to withstand the sub-alpine conditions of the region. The couple also wanted to take advantage of fine views out to the Macedon Ranges and Trentham township, which meant a straightforward northern orientation wasn't going to work. Tim's team "went back and forth between thermal rating software and 3D modelling software" to model every element of the design – plugging in CSIRO data and contour points to find the right spot for the house; modelling shadows to check how much light would hit the concrete slab; testing window locations to frame a desired view. The 3D modelling was indispensable in "bringing things to life," says Kane, and together with the thermal rating software, ensured 700Haus achieved dual outcomes of postcard-perfect views from every window plus thermal efficiency.

The quality of thermal efficiency, as important as a gorgeous view though not as visible, is attributable in part to the house's double stud timber walls.

→



↑  
Sourcing materials locally was an important design criterion for this house – the timber beams were reclaimed from an old schoolhouse, and the chimney rock was sourced from the nearby town of Castlemaine.

Moving from inside the house to the outside, Kane says, “you have a layer of plaster, then a stud wall; we then have an air gap, another stud wall, and then the finishing on the outside. So what we actually have is very, very heavily insulated walls with two layers of R2.5 insulation.” Combined with double- and triple-glazed windows and R6 insulation in the ceiling cavity, the house is exceptionally well insulated from the weather.

700Haus’ I-shaped floor plan has the main living area in the northern end, where thermal mass from the polished concrete

slab floor and stone hearth (actually a fully rendered brick wall, built by a local stonemason from locally quarried stone) captures the daytime sun and slowly releases warmth to the rest of the house through the day. On exceptionally cold days the family gets a heat boost from the wood fire or hydronic panels connected to a heat pump. But even “with just a minimal wood fire on, our coldest day last year was minus six and we could walk around inside the house in shorts and a T-shirt”, says Kane. “The house has performed above expectation.” →



The 7.8 Star home is passively heated and cooled – the polished concrete slab in the north-facing, open plan kitchen and meals area helps keep internal room temperatures constant. Benchtops and cabinetry were milled from blackbutt found on site.



The master bedroom has three small, south-facing windows and double-glazed doors to the west which provide sunset views, but are protected by awnings to exclude direct summer sun.





Although construction was completed in just five months (Kane and Tim credit the builder, Rick Egan from Kyneton, for his can-do attitude) the house is still a work in progress. Fixed louvres are yet to be built on the north-west side of the house to block the summer sun but admit winter light. A large corrugated iron and timber work shed is in the throes of construction; it will house farming machinery as well as a solar array that will effectively allow the family to live off-grid. And there's native trees and vegetation to plant. But this is tinkering at the edges; the home is built and the family is delighted with it.

When asked about their favourite aspect of the house, Kane responds, "It's a really easy answer: we love sitting out on the deck and watching the big sky. The fabulous time for us is late afternoon, early evening, as the sun's setting and the clouds are rolling past Mount Macedon and the surrounding countryside. It's magic, and it makes it all worthwhile." 📍

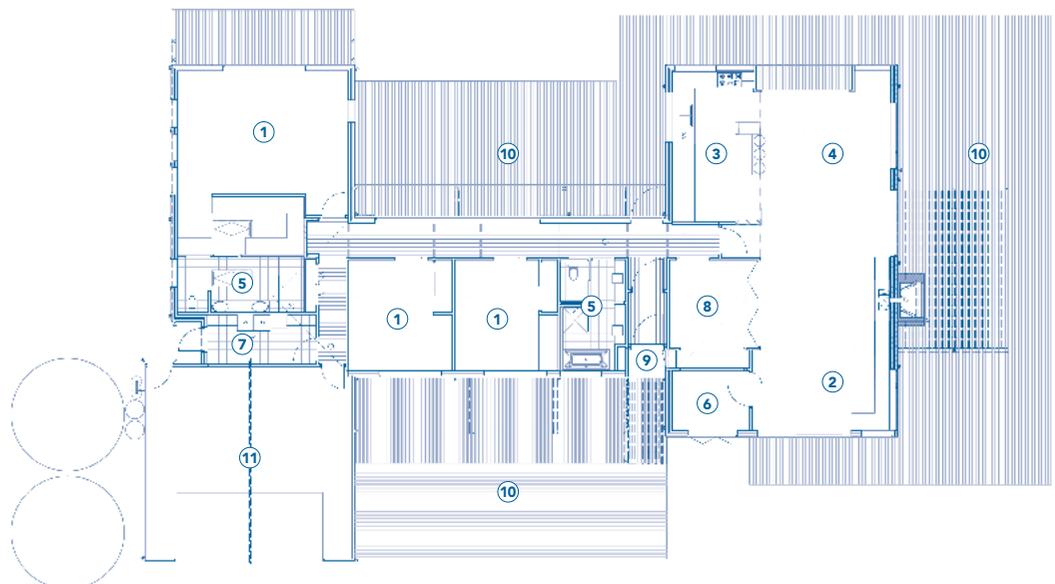
📍 Sliding barn-style doors in the hallway suit the style of this contemporary farmhouse, and allow for more flexible furniture placements in the bedrooms.



## LEGEND

- ① Bedroom
- ② Living
- ③ Kitchen
- ④ Dining
- ⑤ Bathroom
- ⑥ Study
- ⑦ Laundry
- ⑧ Playroom
- ⑨ Entry/airlock
- ⑩ Deck
- ⑪ Garage

## FLOOR PLAN



# 700Haus

—Specifications

## Credits

### DESIGN

Glow Building Design

### BUILDER

Rick Egan

### ENGINEER

Coulthard-Shim

Engineering

### PROJECT TYPE

New build

### PROJECT LOCATION

Trentham, Victoria

### SIZE

House: 253 sqm

Land: 157,595 sqm

Garage 49 sqm

### BUILDING STAR RATING

7.8 Stars

## Sustainable Features

### HOT WATER

– The electric hot water system, located in garage to assist insulation of the unit, is connected to the heat pump.

### RENEWABLE ENERGY

– The house is currently grid connected, but the owners are monitoring energy use to assist sizing the solar system to be installed to the northern aspect of shed, with the potential to include battery storage.

### WATER SAVING

– Self-sufficient with water; house located in one of Victoria's highest rainfall areas

– 62,000L Pioneer Tanks made of local BlueScope steel; includes 10,000L firefighting allowance; there is also a dam

– Gabled roof designed for efficient rainwater catchment, and to reduce problems with ember attack in the case of a bushfire

– Rainwater collected through a wet system to the house, with UPVC downpipes to allow hydrostatic pressure to fill tanks

– Water-efficient appliances including Caroma dual flush toilet; WELS 4-star Liano basin/mixer in bathroom.

### PASSIVE DESIGN

– Reverse brick veneer allows for thermal mass to balance interior temperature

– Polished concrete insulated slab with northern aspect, for additional thermal mass

– Awnings pitched to allow winter sun penetration, and exclude direct summer sun

– Battened air gap to corrugated steel reduces heat transfer;

additional external air barriers and insulation to roofing to reduce thermal differentiation and avoid condensation.

### ACTIVE HEATING & COOLING

– Haiku fan from Big Ass Fans, with winter mode

– Sanden heat pump hydronic heating, designed to be run on PV electricity.

### BUILDING MATERIALS

– Walls and roof: BlueScope Lysaght corrugated galvanised steel cladding

– Caesarstone 'Pure White' and blackbutt benchtop – the timber found on site and cut and polished at nearby mill

– Double-stud walls to allow additional insulation to be installed

– Timber frame-plantation pine prefabricated locally by Bendigo Truss to allow off-cuts to be re-used in factory setting.

– Insulation: Knauf Earthwool 2xR2.5 for walls; breathable, reflective wrap insulation; ceiling R6 plus R1.5 blanket wrap to top chord of rafters (also to decrease the risk of condensation problems)

– Timber beams reclaimed from an old schoolhouse; honed fire-resistant blackbutt timber and radially sawn blackbutt, sourced locally from Timber Search in Woodend

– Cabinets constructed by Evolve Interiors and Design using blackbutt veneers, some re-milled using blackbutt found on site

– Local Castlemaine rock for chimney, built by WJ Jones & Sons Stonemason

– Bathroom tiles from Re-Use, salvaged concrete and marble

re-used from industrial contexts/buildings

– Untreated Victorian ash barn-style internal doors from Binq, (Australian Forestry Standards).

### WINDOWS & GLAZING

– Double- and triple-glazed timber framed Victorian ash windows throughout (AFS); windows include a range of tilt turn and powered venting high awning windows, supplied by Binq.

### LIGHTING

– 7 watt LED lighting throughout, with individual switches to enable lighting of smaller zones; dimmers installed

– LED floodlighting externally.

### PAINTS, FINISHES & FLOOR COVERINGS

– Watty1 low-VOC paints

– Local woollen carpets – made from 100% wool Cavalier Bremworth

– Recycled blackbutt on battens over slab in hallway

– Polished slab: 32MPa.

### OTHER ESD FEATURES

– Use of local products and trades

– Efficient appliances used throughout, including 900mm freestanding electric oven, Ilve appliances; refrigerator from Electrolux is locally produced

– Revegetation: 270 eucalypts and acacias planted thus far

– On completion of the shed, the PV system will be installed

– All waste treated on site.