

AT A GLANCE

- 7.8-Star energy-efficient home for a comfortable retirement
- Designed for northern sun and privacy on a small block
- Great example of clever inner-urban infill



Urban retreat

All-electric with heat pump hydronic heating, this inner-city Adelaide home is designed for low bills and comfort.

Looking to downsize for their retirement, Adelaide couple Kevin and Bronwyn were delighted to find a small block close to the city centre that was perfect. “We can walk into the city, which was exactly what we wanted,” says Kevin, describing their new neighbourhood with its nearby cafes and a pub just 150 metres away. The subdivided site was a blank slate, allowing them to build their dream sustainable home from scratch. “Years ago, we lived in a house with great north-facing living areas, so we knew about the benefits of passive solar design.”

Cut from the backyard of the home to the north, the block is on a narrow

but busy city lane that has carparks and commercial premises on its other side. Designer Paul Hendy from TS4 Living describes the orientation as perfect for an energy-efficient home, with the ability to tuck the living area at the rear of the house, away from the street and taking advantage of the northern sun with no shading from nearby buildings or large trees.

The design, tailored for the compact 261-square-metre site and to suit the mixed residential and commercial area, avoids the cookie-cutter look of neighbouring homes. “Bronwyn and Kevin told me that they didn’t want a house



Above left Designed for its small inner-urban site, the house is finished with corrugated Colorbond cladding and features a recycled brick courtyard wall that connects with the area's brick manufacturing history. **Below** A generous mezzanine provides plenty of space for the main bedroom with ensuite. **Facing page** The living space is at the rear of the house, enjoying northern sun. Entry is via the eastern patio, which features a folding arm awning for shading when required.





like the project homes next door, and when I went to inspect the site, I quite agreed with them!" laughs Paul. Instead, the street facade of the finished home features corrugated Colorbond cladding, and a reclaimed brick courtyard wall that connects to the area's brick manufacturing history. The courtyard offers privacy from the busy thoroughfare and leads to the main entry at the side of the house.

The entry opens straight into the kitchen in the centre of the home, tucked under the mezzanine. Turning left leads to a bedroom, bathroom and study, and right brings you into the sun-filled, double-height living room with an open stairway to the upper level. Here, a main bedroom enjoys views to the north across the void, and there is a generous ensuite and built-in robe.

The two-level design frees up extra outdoor space on the small block for raised planters, a deck and a pergola built by Kevin. "We have planted pear trees for privacy and have a vine growing over the pergola. It's all looking very lovely," he says.

Kevin describes their new home as a "jeans and T-shirt house" in that it keeps

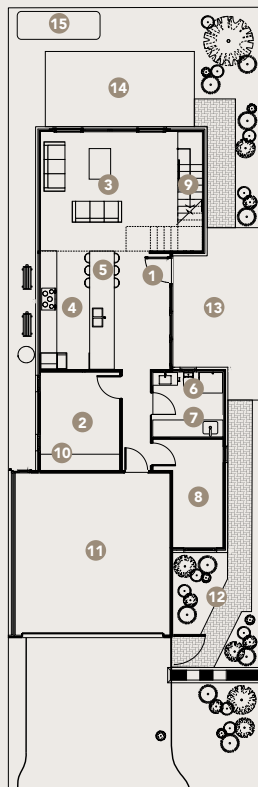
a consistent temperature year round, needing very little energy for heating in winter and staying cool during Adelaide's heat waves. This is due to the thermal mass of the concrete slab, plus the very airtight construction and a wall system developed by TS4 Living that pushes the insulative value of the walls over R5. This level of thermal efficiency is required to deal with Adelaide's temperature extremes, according to Paul. "It can be over 30 degrees [Celsius] for ten or twelve nights in a row in summer, and temperatures are increasing slowly each year."

The downstairs tilt-and-turn double-glazed windows and electrically operated high-level windows in the mezzanine create air movement throughout the house for natural cooling when desired. There are only two small west-facing windows, and a remote-controlled awning on the east protects that glass from direct summer sun at the push of a button. "In summer it stays lovely inside if we prevent any sun falling on the glass," says Kevin. A small reverse-cycle air conditioner upstairs helps cool the home on very hot days.

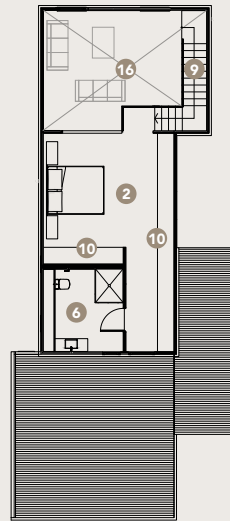
The solar PV array makes the most of the steep west-facing roof for afternoon sun. "We get solar gain on the panels late into the afternoon, almost to sunset," says Kevin, adding that the system generates more electricity than the house requires across the year. A home battery stores excess energy, making systems such as the heat pump hydronic heating economical to run. "Everyone that comes into the house comments on the heating because there's no noise, no air movement. It's just lovely and constant," says Kevin.

Bronwyn and Kevin appreciate the largely bill-free living, the proximity to the city, and the light and open ambiance of the house. "It's also very quiet when all the windows are shut," Kevin says. For Paul, it's a satisfying result that contributes to quality urban densification in Adelaide. "As with all projects like this, it was the diminutive size that attracted me to the project," he says. "Big houses on large blocks, with bouncing kangaroos and things like that in the background: they are easy, but when you have something like this, it's a good challenge." **S**

GROUND FLOOR PLAN



MEZZANINE FLOOR PLAN



LEGEND

- 1 Entry
- 2 Bedroom
- 3 Living
- 4 Kitchen
- 5 Dining
- 6 Bathroom
- 7 Laundry
- 8 Study
- 9 Stairs
- 10 Robe
- 11 Garage
- 12 Courtyard
- 13 Patio
- 14 Deck with pergola
- 15 Water tank
- 16 Void

BUILDING MATERIALS

- TS4 Living-designed wall construction: timber frame with bulk insulation, vapour-permeable membrane and polyisocyanurate (PIR) insulation to eliminate thermal bridging, plus an air cavity
- Colorbond cladding and roofing
- Concrete slab floor
- STRUCTAflor flooring to mezzanine
- Insulation: Bradford Anticon blanket to roof (R1.3); Bradford Gold batts to ceiling (R5), external walls (R2.5) and internal walls and mezzanine floor (R2); DCTech 50mm PIR boards to external walls (R2.32); Bradford SoundScreen acoustic batts to bathroom walls (R2); 25mm extruded polystyrene (XPS) insulation under slab and to slab edge where required (R1)
- Fibre-reinforced concrete (FRC) benchtops
- Cabinetry: Laminex low pressure laminates over E0 MDF (low formaldehyde)
- Recycled brick courtyard wall
- Reclaimed hardwood pergola and deck structure with new Australian hardwood decking boards

SPECIFICATIONS

DESIGNER

Paul Hendy, TS4 Living

BUILDER

Aria Homes

PROJECT TYPE

New build

LOCATION

Mile End, SA
(Karna Country)

COST

\$540,000
Completed 2020

SIZE

House 145m²
Land 261m²
Garage 35m²

ENERGY RATING

7.8 Stars

ENERGY ASSESSOR

Living Building Solutions

HOT WATER

- Sanden 250L heat pump for hot water & hydronic heating

RENEWABLE ENERGY

- 6.4kW solar PV system with Fronius inverter
- Tesla Powerwall 2 battery

LIGHTING

- Unios LED lights throughout

PASSIVE DESIGN, HEATING & COOLING

- Northern solar access to the main living area
- Insulated concrete slab for thermal mass
- Airtight and highly insulated building envelope (airtightness 3.22 ACH50)
- Opening windows placed for cross and stack ventilation
- External shading: pergola with slats and deciduous vine to north, and remote-controlled awning to east

ACTIVE HEATING & COOLING

- Heat pump-powered hydronic heating zoned to five areas
- Aeratron AE3 ceiling fans to main bedroom and living
- Daikin reverse-cycle air conditioner to main bedroom

WINDOWS & GLAZING

- uPVC-framed double-glazed tilt-and-turn windows and hinged and sliding doors from DoubleGlazed.com

WATER SAVING

- 2 x 1,100L rainwater tanks
- Grohe water-efficient tapware and showerheads

COOKING

- NEFF induction cooktop with downdraught extraction

PAINTS, FINISHES & FLOOR COVERINGS

- Dulux low-VOC paints

OTHER ESD FEATURES

- All-electric, small footprint home
- Minimum 100cm door openings and hobless showers for accessibility