MODERN GREEN HOMES

Sanctuary

ISSUE
65

Cool design for hot climes; tips for FireWise gardens; Australia's best bushfire zone builds; Accoya eco-timber

Tropical delights



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WIN

A Stiebel Eltron hot water heat pump valued at $6,250, provided by Goodbye Gas.

Offer open to Australian residents. Details page 85

HOUSE PROFILE
Adelaide, SA

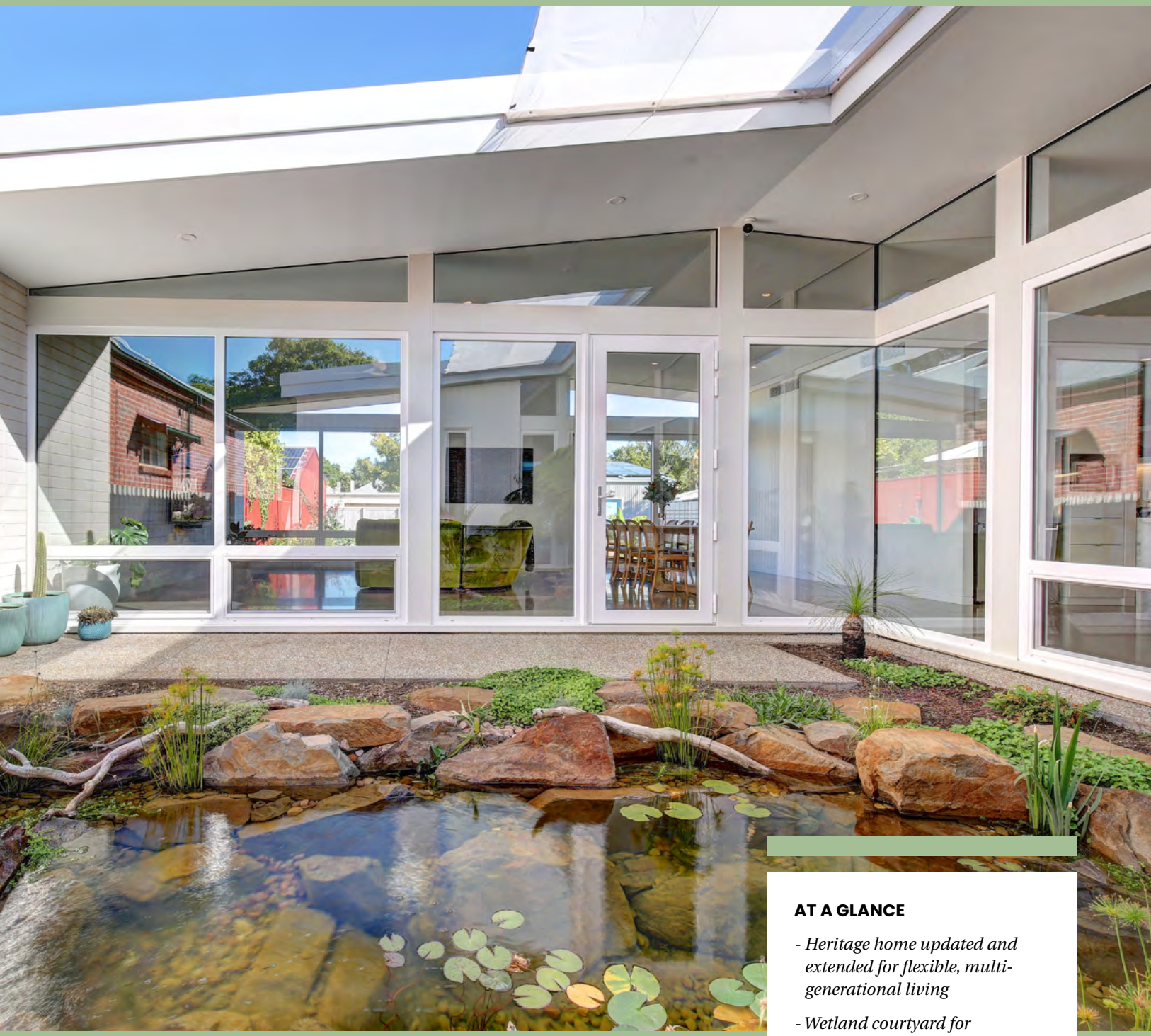
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Wetland wonder



Designed for Adelaide's hot summers and cool winters, this updated heritage home supports biodiversity in the city with its native wetland courtyard.



AT A GLANCE

- *Heritage home updated and extended for flexible, multi-generational living*
- *Wetland courtyard for biodiversity and passive thermal performance*
- *Highly airtight, all-electric home with 21kW solar PV system and EV charging*







Top left With its separate entry and small kitchenette, this room and its neighbour in the original house could be used as a self-contained apartment in the future if needed for multi-generational living. **Above** The extension wraps around the wetland courtyard, which brings glimpses of green as well as northern and eastern sun into the heart of the house. **Facing page** The lovely old home had been divided into three dwellings and was "a bit of a mess" when Jasper and Melissa bought it; it now has a new high-performing lease on life.









Although their original plan was to move back to Sydney one day to be closer to family, when the time came to buy property, Melissa and Jasper realised that staying in Adelaide gave them a better shot at creating a self-sufficient family home near the city. They found a traditional sandstone-fronted home just one suburb from central Adelaide, which had been turned into a boarding house with three separate dwellings inside.

"It was a bit of a mess. People said it would need too much work, but it gave us a blank slate for realising what we had dreamed about doing for many years," says Jasper. "The large block allowed for the garden and outdoor connection we wanted."

A friend stayed in the "least smelly" of the apartments shortly after the couple bought the house and clocked up 40 kilowatt-hours in daily electricity use to keep the space warm in winter. Despite being cold and draughty, the couple saw the value in preserving the original house with its four rooms divided by a central hallway and double-brick construction well suited to Adelaide's hot summers.

The "messy" collection of three kitchens and three bathrooms in what Jasper describes as "a lean-to on a lean-to" made way for a modern, energy-efficient and light-filled extension, with a new side entry marked with a sandstone wall to complement the original house. "As soon as we stripped away all that stuff, we were left with the bones of a really nice old house," says architect Martin Williamson of Mountford Williamson Architecture.

The mid-century inspired addition wraps around an internal courtyard and native wetland, designed to make the most of the north-to-the-front orientation of the property. "What drove the design of the extension was how we were going to let sunlight in at the right times of the day," says Martin, "and how we were going to connect our clients to the outdoors – they are very much into their productive garden and being outside."

The wetland idea evolved over time, stemming from Melissa and Jasper's original plan for a pool, and then balanced by their desire to support the natural environment. "I realised I didn't want to be skimming leaves out and adding chemicals," says Jasper. "Adelaide has dry weather and droughts, particularly when the El Niño phase of the climate cycle is in full swing, so I figured what's needed for native birds and insects is a constant water source. We've got fish and frogs and all sorts of creatures living in our little wetland, which is delightful."

The courtyard is integral to the passive heating and cooling of the extension, admitting north and east sunlight into the new living space that otherwise faces south. The design brings "good sun" to the living areas from 7am until around 3pm in winter, says Jasper, and blocks the less-desirable western sun all year round.

Plenty of operable windows allow cross ventilation, typically from the afternoon sea breeze, and the wetland helps by cooling the air flowing across it. “If we come home on a hot day and the house has been shut up, we can purge the warm air in the evening and the temperature comes down very quickly,” says Jasper.

Upgrades to the original house have made it more airtight, surpassing many new homes in blower door tests. Following a Passive House approach, the team at Enduro Builders meticulously sealed potential weak points and gaps in insulation. “There were just a couple of pieces of insulation in the roof to start with,” says Enduro’s Jackson Digney. “Blowing insulation into the cavity between the two masonry layers of the walls made for a massive improvement to thermal efficiency, along with draughtproofing – especially around the edges of the old floors – and adding DIY secondary glazing to the windows.”

Jackson’s ‘no compromise’ attitude towards insulation and airtightness carried throughout the build. The construction of the rear extension was fast-tracked by using prefabricated building panels, made airtight offsite with a vapour-permeable wrap. “The chance of onsite mishaps like carpentry miscalculations, or introduction of new air leaks, is pretty much eliminated with the panels. And that’s something I really appreciated,” says Jasper.

Jackson says the owners’ water strategy stands out compared to his other building projects. A wall of rainwater tanks on the western side of the house provides some protection from the harsh Adelaide sun, and supplies the toilets, vegetable patch, fruit trees and native wetland. There is also a greywater drip irrigation system that waters the native front garden when there’s less rain. “They’re reusing their water in the garden, and also for keeping the front corner of the original house damp, as that area is a bit susceptible to cracking if the ground dries out too much. It’s smart reuse of water,” Jackson explains.

Jasper and Melissa have no plans to move again, and made sure they future-proofed the house. “While it’s now a relatively large home, we designed it that way to accommodate regular visits from Sydney family and to allow multi-generational living and ageing in place,” says Jasper. “It’s logical to design for accessibility – so no steps, and wide accessible doors and spaces. I joked to Jackson and Martin that the only way we were leaving this house was to be carted out.” The floor plan has been designed so that the north-western part of the house could be used as a self-contained two-room apartment with its own entry if required down the track. “It could well come in handy for our parents to live in as they require more care, or for our son as he gets older and wants more independence,” says Jasper. “It would be a nice way to coexist.” S

Below A neighbourhood permablitz shortly before moving in helped the family get their vegetable beds started.





LEGEND

1. Entry
2. Bedroom
3. Living
4. Kitchen
5. Dining
6. Bathroom
7. Toilet
8. Laundry
9. Study
10. Pantry
11. Walk-in robe
12. Kitchenette
13. Verandah
14. Wetland courtyard
15. Water tanks

SPECIFICATIONS

DESIGNER
Mountford Williamson Architecture

INTERIOR DESIGNER
Cimone Lam

BUILDER
Enduro Builders

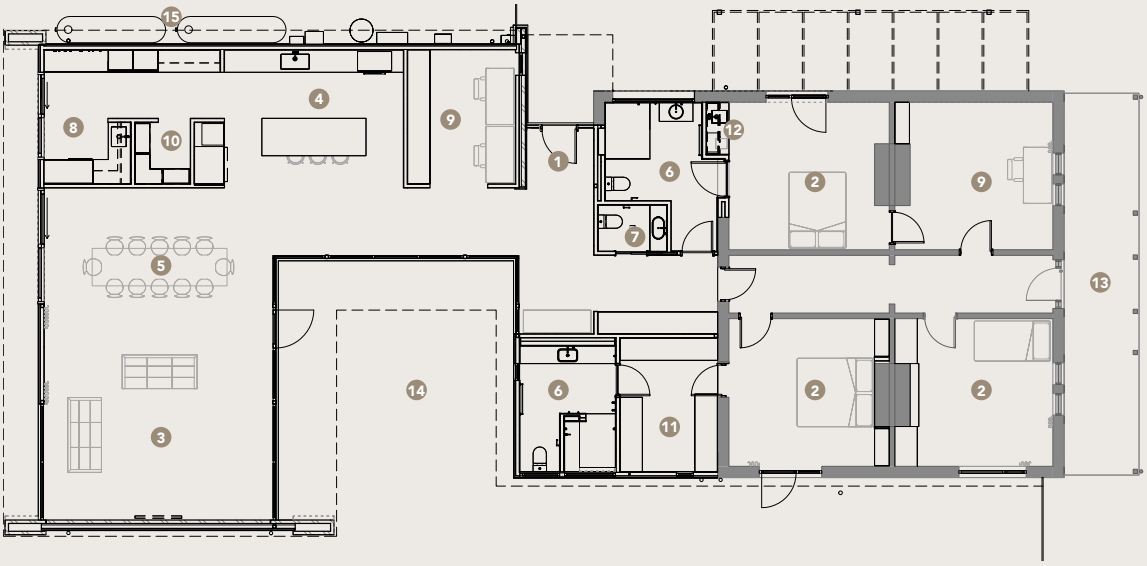
PROJECT TYPE
Renovation & extension

LOCATION
Adelaide, SA
(Kaurna Country)

COST
$1.3 million including landscaping, solar PV & EV infrastructure

SIZE
House 266m^2
Garage 56m^2
Land 927m^2

FLOOR PLAN



HOT WATER
– Reclaim CO_2 heat pump

RENEWABLE ENERGY
– 21kW solar PV system (Trina panels with Enphase microinverters)
– Tesla Home Connector and Zappi Solar Diverter for EV charging
– Three-phase electricity connection

WATER SAVING
– 18,000L ThinTanks supplying water to toilets and vegetable garden
– Water Wally greywater drip irrigation
– Efficient tapware and fixtures including Methven Kiri Satinjet 4.5L/min showerhead

PASSIVE DESIGN, HEATING & COOLING
– North- and east-facing courtyard for passive solar gain to extension
– Polished concrete slab and reverse block veneer wall to extension for thermal mass
– Eaves designed to admit winter sun and block summer sun
– No west-facing windows to extension
– Pergola with grapevine to shade western wall of existing house
– Trellis to courtyard planted with deciduous vines for summer shading; shadecloth installed in the meantime

ACTIVE HEATING, COOLING & VENTILATION
– Fujitsu ducted reverse-cycle air conditioning system to extension
– Fujitsu reverse-cycle air conditioners to rooms in original house
– Eglo Noosa ceiling fans to living room and bedrooms
– Aerofresh decentralised mechanical ventilation with heat recovery (MVHR)

BUILDING MATERIALS
– Existing double-brick house with suspended timber floor retained; Colorbond roof retained and repainted
– Extension:
  - Prefabricated lightweight timber-framed panel construction
  - Weathertex cladding
  - Pro Clima Extasana vapour-permeable wrap
  - Colorbond roof in Surfmist to minimise heat absorption
  - Polished concrete floor
  - Sandstone feature wall in living room using locally quarried stone from Carey Gully Sandstone
– Insulation: Knauf glasswool batts to whole house ceiling (R6) and new walls (R2.7); Knauf Supafil blow-in insulation to wall cavity of original house (R1.2)

WINDOWS & GLAZING
– Australian Window Solutions uPVC-framed double-glazed windows and doors
– DIY acrylic secondary glazing on original sash windows and stained glass

LIGHTING
– Airtight LED downlights and fittings from The Lighting Impact

COOKING
– Westinghouse induction cooktop
– Asko electric combo steam oven

PAINTS, FINISHES & FLOOR COVERINGS
– Dulux low-VOC paints
– Bremworth Troika carpet to bedrooms

OTHER ESD FEATURES
– Productive garden with five raised beds, citrus and stonefruit orchard, native edibles, grapes and olive trees
– Birdbox, native bee hotel and pollinator garden
– Native wetland by SA Waterscapes
– Permaculture garden design by Lachlan McKensie, Permatil Global
– Landscaping by Chris Day, Everyday Sustainable Living
– Tesla Model Y electric vehicle charged mostly with onsite solar generation