

MODERN GREEN HOMES

Renovation Special

Sanctuary

INSIDE ISSUE 41 Summer shading ideas; tiny site big plans; focus on furnishings; 8.4 Star retrofit; SIPs tips; cool basement benefits; go up in style; purr-fect design; modular mountain magic + more

RENOVATIONS & ADDITIONS

9 REMARKABLE RENOS WITH
LOW BILLS FOR LIFE

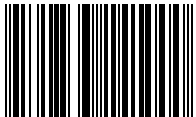
PLUS

Downsize by
design

Architectural
holiday stays

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FEATURES

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when the Stars align
Upcycled warehouse
Good orientation on
any site

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Contents

—Issue 41

HOUSE PROFILES



RENOVATIONS & ADDITIONS

SPECIAL

18

Going up in the world

Careful retrofitting of the original house results in a net-zero energy, 7.9 Star home for a Melbourne family.

24

Renovation automation

Equipped with automation tools that blend passive and active heating and cooling systems, an Adelaide cottage is future-ready.

30

Tasmanian twist

Good design, and a European-style thermal fit-out, turns the prospects around for a freezing Hobart bungalow.

36

Upcycled warehouse

After a long and industrious life, a Richmond warehouse is lovingly converted into an efficient modern home.

42

Bucking the trend

Architect Kurt Crisp creates a light-filled, passive solar home from a tiny house on an almost impossibly shaped block.

48

Downsize by design

Downsizing can be an emotional experience, but the move can be made easier when the new home is refurbished to last a lifetime.

53

Seismic shift

With coloured glass and reef views, an Auckland renovation and addition takes seismic resilience to the next level.

58

Pigeon pair

Two similar yet different Melbourne extensions show how clever design thinking can make the most of any orientation.

53



58



Contents

—Issue 41

66



FOCUS

72

Composite benefits: When are SIPs the right choice?

Many households factor construction time and expected energy bills into their project bottom line. Can structural insulated panels (SIPs) reduce both?

76

Financial 'sweet spot': When the Stars align

When do investments in green home improvements achieve a financial return? Three home efficiency experts find out.



OUTDOORS

84

Purr-fect design

Cats are a major threat to wildlife, but what design solutions are out there for keeping roaming moggies at home? Veterinarian Joanna Griffith investigates.

88

Sustainable architectural stays

Make your next getaway a stay in an eco home and pick up valuable ideas for your own green renovation or build. We ask Verity Campbell to check the holiday listings.



DESIGN MATTERS

16

The makings of a sustainable reno

Our top eight design considerations.

66

Keep your cool with external shading

Anna Cumming looks at the options for keeping the sun off your windows and heat out of your home this summer.



88



DESIGN WORKSHOP

80

Modular mountain magic

Architect Rowan Brown offers some advice and pros and cons for using shipping containers to build a remote modular mountain retreat.

92

Sustainable House Day wrap up

Almost 30,000 visits to 206 houses across Australia made 2017's event the most successful Sustainable House Day to date. We check in on some homeowners to see how their day went.

96

Ask our experts

10

Products: Focus on furnishings

14

Reviews

75

ATA update

93

Subscribe

94

Marketplace

96

Ask our experts



Renovation automation

It is possible to transform an old house with its temperature extremes into a comfy 8.4 Star home – and with the latest home automation tools, you can continue making improvements that reduce energy bills too.

WORDS Rachael Bernstone PHOTOGRAPHY Shane Harris, Arch Imagery



The distinctive use of both Corten steel and Maxline custom profile cladding provides an eye-catching result.

AS A DESIGNER WHO SPECIALISES IN sustainable buildings, and who spruiks their benefits to homeowners and university students at every opportunity, Paul Hendy is well acquainted with the fundamentals that make for a comfortable and efficient home. “I have a reputation for boring people senseless about this topic, but I choose to teach because I can influence more people that way,” Paul says. “If I can convince one or two students each year to fully embrace these ideas, that creates a positive effect going forward.”

Paul regularly presents to homeowners and renovators at events hosted by the Adelaide Sustainable Building Network – which he’s been involved with since it was established in 2008 – and he always highlights the importance of good solar orientation and passive ventilation opportunities. But when it came to buying his own home, Paul ignored his own advice.

His family, including wife Irina and

their 4-year-old daughter, had moved into a traditional single-storey cottage in Adelaide’s inner east as tenants in 2013; when the house was listed for sale in 2015, they bought it, thus avoiding the trouble of moving.

“When I do presentations, I outline all the reasons why you should buy a house, but here, where the street faces north, even in the middle of winter the verandah shelters that elevation completely: there is no solar gain whatsoever,” he says. “Inside, there was a traditional plan of two open rooms and two closed rooms, and a kitchen and bathroom in the lean-to at the back. Also, the house was in poor repair: it ticked all the boxes about why you wouldn’t buy a home, but my wife loved it, so we bought it.”

Admittedly, it was in a great neighbourhood – the couple had lived around the corner for several years before their daughter was born – where real estate is tightly held. Also, because the family



KEY FEATURES

- 8.4 Star energy rating achieved for the whole house, despite sub-optimal solar orientation
- KNX automation system installed to ensure the passive and active heating and cooling systems work in unison
- No more temperature extremes! New basement room and ‘earth tubes’ keep an even internal temperature
- Reduced energy bills achieved through better thermal performance, energy efficiency and gas disconnection.



Clerestory windows to the north flood the living area with natural light, despite it being located to the south. The ducts are part of the air transfer system which moves air (summer and winter) at high volume, slow speed. In addition, a KNX automation system monitors and controls summer ventilation.

Upcycled warehouse

After a long and industrious life, a Richmond warehouse is lovingly converted into a thermally comfortable home and extensive courtyard garden.

WORDS Verity Campbell
PHOTOGRAPHY Emma Cross

FROM THE MID-19TH CENTURY

Richmond was a manufacturing heartland with Bryant and May (Redheads matches), men's shirt manufacturer Pelaco, and Wertheim Pianos all calling the suburb home. But with Melbourne's inner suburb gentrification, over the past three decades Richmond has turned into a prized mix of converted warehouses and Victorian-era homes. Of Pelaco's twin factories on Richmond Hill, the taller factory is now apartments; its smaller sibling has housed a gallery since 1980.

When the gallery closed, owners Guy and partner Kim decided to convert it into their home. Exposed steel trusses, raw concrete floors and a striking sawtooth ceiling typical to these gritty industrial warehouses lent this building ample potential. Sieve-like windows and walls and spent drainage systems made realising the challenge all the harder. They wanted

to redress its shortcomings to make it habitable and thermally comfortable, to keep the beautiful feel and light of the space, and to adapt it to the requirements of two living-at-home daughters.

After meeting a number of architects, it was Zen Architects' approach that appealed most. Guy had spent a lot of time in the space with his mother, and then when it had become his own gallery. "Other architects saw the site as a clean slate, but Ric Zen came back with an almost 'what's the least we can do' approach because he could see that we really had an affection for the place."

Ric describes his approach as a desire to "do less, but do it better". Together with the clients they pared down the brief requirements. Reducing scope reduces budget but it also aligns with Zen's design philosophy of achieving more with less. Slashing a planned off-street carpark, for



KEY FEATURES

- A combination of materials has been used, including sustainably sourced new, reused and recycled
- A draughty factory is given a thermal makeover to transform it into a 6.1 Star energy rated house
- One-third of the factory roof is removed to create a private courtyard with productive garden
- A roof deck is accessible via the bedrooms, providing sunset city views.



One-third of the original sawtooth factory roof was removed to allow for a protected courtyard and a productive garden. Planter boxes on wheels enable the plants to be moved to chase the sun as it moves across the sky throughout the year.



Retaining the industrial character was important to owners Guy and Kim, but so was converting the uninsulated warehouse into a comfortable, 6 Star home. They achieved both by upgrading all windows, insulating the walls and ceiling, and utilising the thermal mass in the original concrete floors.



Windows looking across the roof deck and into the void above the living space help make this compact bedroom feel spacious. New FSC-certified plywood with a timber finish complements the recycled materials used for the majority of the renovation.



Keep your cool with external shading

With summers getting hotter in many parts of Australia, keeping the sun off your windows and out of your home is becoming even more important. Anna Cumming looks at the options for external shading, for both new builds and retrofits.

THERE'S BEEN QUITE A SHIFT FROM PRE-INDUSTRIAL TIMES

when glass was an artisan-crafted luxury item, and homeowners were taxed according to the number of panes they had. These days, our houses are getting bigger and so are our windows – often to the point of comprising entire walls. Windows and glazed doors frame views, admit natural light and breezes, and allow a connection with the outdoors.

However, from a thermal efficiency point of view, windows are the weak link in a home's building envelope. Internal thermal blinds or curtains can help a lot in preventing heat loss through windows in winter (see 'Not just window dressing' in *Sanctuary* 39), but to tackle unwanted radiant heat gain in the hotter months, it's far more effective to stop the sun hitting the glass in the first place with appropriate external shading.

LOCATION AND ORIENTATION

There is a huge variety of options for keeping the sun at bay, from carefully chosen deciduous plantings and simple solutions like a piece of shadecloth on a frame, to awnings, shutters, blinds, and even pergolas with sensor-operated louvre roofs. To choose the best solution, firstly it's important to consider your location and the orientation of your windows. In most of Australia, shading is

needed on windows on the north, and also the east (to prevent summer sun heating the house from early in the morning) and west (to block hot late afternoon sun). North of the Tropic of Capricorn, thought should also be given to shading windows on the south side of your house, as the sun's steeply angled path in summer means these windows will also receive direct sun.

Because of the angle of the sun through the day, one size does not fit all when it comes to shading for all of the windows in your house. For windows within about 25° east and west of solar north, it's easy to exclude summer and admit winter sun using simple horizontal devices, including eaves and awnings. This also applies to south-facing windows in the tropics. It's reasonably straightforward to calculate the optimal width and height of eave that will stop the higher-angle summer sun from hitting the window and yet allow welcome lower-angle winter sun to penetrate deeply inside the room; *Your Home* provides a rule of thumb (see www.yourhome.gov.au/passive-design/shading).

For east and west windows, however, a different approach is needed as the low-angle morning and afternoon summer sun is more difficult to block. Angled or vertical shading is most effective here, and often an adjustable solution is best so it can be deployed only when needed.

SHADING OPTIONS

External shading products and structures fall into two broad categories: fixed and adjustable. Fixed solutions have the advantage of simplicity, and with no moving parts, are usually easier to maintain and last longer. However, they need to be carefully designed to avoid compromising solar access in winter.

Adjustable shading allows the occupants much more control over how much direct sun to admit. Such systems can be manually operated or motorised; fitted with sensors to allow them to respond automatically to sun, rain and wind conditions; and even integrated with comprehensive smart home automation systems.

An energy rating scheme for window coverings, WincovER, has recently been developed by the Blind Manufacturers Association of Australia (BMAA) – see box at the end of this article for more information.

FIXED SHADING

Eaves and overhangs: Don't miss the opportunity to think about fixed shading at the design stage of your home or extension if you can. Perth-based architect Sid Thoo points out that including appropriately sized eaves or overhangs is a very straightforward, cost-effective solution. "External shading can also form part of the design aesthetic," he says.



For this holiday house in Shoreham, Victoria, architect Claire Scorpo used fixed horizontal and vertical silvertop ash battens to provide shading from northern and oblique western light. "I wanted to animate the space through the day with the shadows that are cast through the slatting," she says. The battens lining the breezeway also provide privacy and a sense of enclosure for guests. Photos by Tom Ross.

Fixed awnings: Another option for shading north windows (and south windows in the tropics) is a fixed horizontal or angled awning. These can be made from a wide variety of materials including steel, timber, corrugated sheet metal, cement sheet and rigid polycarbonate sheet. They should extend past the sides of the window to keep the sun off the glass for longer.

Fixed louvres/blades on windows: Usually made from metal or timber, louvres or blades are fixed in a frame against the window and can be placed running horizontally or vertically. They are particularly useful where privacy is needed or to comply with overlooking regulations.

Pergolas: Pergolas are an enduringly popular feature in Australian gardens, but striking the balance between having a great shady outdoor living space when it's hot, and still letting sunlight and warmth into your house when it's not, can be tricky. Roofing your pergola with fixed blades set at an angle designed to optimise winter sun access is one option; others include translucent but thermally effective polycarbonate sheet roofing, and simply growing a deciduous vine over it.

Shade sails and umbrellas: Made from knitted polyethylene fabric that's available in a range of different light blackout levels, shade sails can be bought off the shelf or custom designed for specific spaces – or even made at home. If some rain protection is required, sails and umbrellas also come in waterproof coated fabric. →





Sustainable stays

Make your next getaway a stay in an eco home and pick up valuable ideas for your own green renovation or build.

WORDS Verity Campbell

ONE OF THE GREAT THINGS ABOUT Sustainable House Day is that you get to see inside an ESD (environmentally sustainable design) home and quiz the owners about what they did, why, and how it's working out for them. This is particularly useful if you're considering an eco-renovation or new build, or have a particular interest in

a material or technology applied in that home.

But perhaps you'd like to go past the quick look-see, and get a better idea of the experience of living in the house? See what the natural light is like throughout the day, and how the house performs during summer, or winter? If you could experience

all these things, how might they translate into your own project?

Expert guidance from ESD architects, designers and consultants can help, but there is another possibility.

How about staying in an eco home? A weekend in a well-designed ESD home is welcome respite from the ubiquitous leaky



If dreaming alone could make it so, we'd be staying in this intriguing residence in the tiny Swiss mountain village of Vals, available for holiday rental via PlansMatter. Dutch architects SeARCH and CMA set out "to completely integrate the villa into the landscape to avoid disturbing the unspoiled nature." Behind the amazing inset facade, four bedrooms, kitchen and a cosy living room are spread over two and a half levels under the hillside. The interior design, furniture and fittings showcase the work of a range of Dutch designers, including Jeroen van Mechelen of Studio JvM whose cardboard vaulting for the downstairs bedroom-library is reminiscent of a cathedral, softening the concrete interior. Images: PlansMatter

holiday rental, and an inexpensive – and pleasant – way to research your project.

Putting aside 'green' hotels or resorts, which don't replicate the at-home experience, finding ESD holiday houses is becoming easier. And, of course, it all happens online.

While the biggest accommodation aggregate sites like Airbnb and Stayz don't allow you to search by eco-friendly terms (yet), they do have sustainable homes listed. Find them via your favourite search engine using terms like "earthhouse holiday house", "rammed earth holiday house", "sustainable holiday house", "eco holiday rental" and so on. You can restrict your search to a specific site by adding "site:airbnb.com.au" to the end of your search term (as an example). Alternatively, there are a growing number of specialist eco and design accommodation websites worth perusing. Some of our favourite sites include:

GREEN GETAWAYS AUSTRALIA

Australia's first eco-accommodation website directory aiming to recognise operators who take environmental sustainability seriously. Listing on the site is by selection only. Properties include: the Yondah Beach House on the Yorke Peninsula (SA), which is fully self-sufficient and registered as a butterfly site; the Trig (Tasmania), a recycled shipping container; Permanent Camping in Mudgee (NSW), a self-sufficient recycled timber mini tower; and the rammed-earth Wompoo Eco Retreat in the Daintree (QLD), air-con free and designed to catch breezes. www.greengetaways.com.au

RAMMED EARTH BUILDER

This site's 'Rammed Earth Holidays' page has a list of places throughout Australia where you can stay in rammed earth holiday rentals to try before you build. There's a flash looking rammed earth property at Seal Rocks (NSW) and a rammed earth and timber home in Pemberton (WA). www.rammedearthbuilder.com.au

ECO PROPERTY

This start-up site lists properties for holiday rentals, sale, and lease all around Australia. Holiday listings are few at this stage, but there's a good level of detailed eco information on each property. Worth keeping an eye on. www.ecoproperty.com

UNYOKED (TINY HOUSES)

An essential consideration for sustainable home builders is footprint, and the Tiny House movement champions teeny ones. To be considered 'tiny', homes need to be between seven and 35 square metres, generate their own electricity, and be transportable. Getting to experience a well-designed tiny home, if only for a night or two, could help you decide whether radically paring down is for you. At the very least you might pick up some tips you could apply to a standard-sized home. Unyoked offers tiny holiday home rentals set in the wilderness. At the time of print there are only six homes on offer, but they're planning many more. www.unyoked.co

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