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# Sun catcher

When sustainable principles take the star role 18

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**FACT FILE**

**THE BRIEF**  
 To build a family home on a narrow block that maximises natural thermal comfort using recycled materials

**OWNERS**  
 Cameron Rosen and Daphna Tal

**THE ARCHITECT**  
 Caroline Pidcock, Pidcock Architecture + Sustainability

## Naturally beautiful

Sustainability is more than a buzzword in this workable, eco-friendly home, writes Ben Pike

When the opportunity to build a sustainable house presented itself to builder/project manager Cameron Rosen, he was determined the environmental decisions he made would resonate long into the future. With an acute awareness of the environmental impacts of building, Cameron prioritised design and thermal comfort principles in building the Rose Bay home for his wife and three children. The aim was to maximise the property's star rating under the CSIRO's AccuRate system – a software package developed for rating the energy efficiency of residential building designs.

To achieve this, architect Caroline Pidcock worked closely with Cameron and thermal modeller Graham Hunt from the moment the concept was finalised.

"Through thermal comfort simulation, an assessor was able to help model the home in a thermal way. That way, should that design be faulty, you pick it up at the concept stage," Cameron says.

"Without that process the design becomes too advanced and it becomes expensive to change further down the line. Sustainability is expensive with bad design."

Simple aspects of the house such as cross-ventilation and the zoning off of separate areas to control temperature were there from the beginning. Caroline says the home's ability to control its own temperature was an essential element from beginning to end.

"Thermal modelling should be done for every house because it gives you the tools to identify the actual value of changes you think about," she says.

"The home's eight-star rating is much more efficient than the minimum six stars. The most you can have is 10 stars. Initially we were aiming for the maximum, but discovered it was more efficient to put money into improving the solar energy system on the roof than anything else."

**Shine on**  
 Confronted with the issue of a long and skinny block (the front of which faced north), Cameron and Caroline realised they needed to get creative in order to get winter sunlight into the southern (and rear) part of the 440sq m property.

"With no windows possible on the eastern and western side of the living areas, the solution was a large courtyard and pergola on the western wing.

Roof-height shutters open up during the winter months when the sun is at an angle of 30 degrees, and are shut when the hot summer sun is at an 80-degree angle.

The hallway connecting the northern TV room with the kitchen and living area is walled with glass over two storeys.

With the winter sun shining on a thermally insulated concrete slab and vitrified tile floor, it's easy to see why the house survives without any reverse-cycle airconditioning system. "I've been able to use the \$35,000-

\$45,000 I've saved on airconditioning to spend on what I really need," Cameron says. "We focused on removing 38 per cent of our energy costs through good design and understanding the performance of that design through thermal simulation."

**Principled design**  
 The late Percy Allan is famous for designing the Pyrmont Bridge and Glebe Island Bridge, but one of the civil engineer's last projects was a footbridge in the Coffs Harbour region.

The 1922 construction has since been decommissioned, but Cameron managed to get hold of its wooden columns and use them to support a pergola in the backyard.

"Being old, the wood is dried out and thus becomes a more stable product," Cameron says. "This is like rock. It's also a good structural and aesthetic element and we're not pulling down new trees to get the material."

"We wanted to use materials that had a high amount of recycled product in them. The concrete uses industrial waste from the steel industry (fly ash) which would normally go to landfill.

"The gyprock has recycled product in it. It's made of old gyprock that has been broken down and remade. Outside we used a woodchip cladding which has a high amount of recycled product."

The sustainable theme was continued by installing a rainwater tank and recycling water from the showers and taps to wash clothes and supply the toilet water.



"We focused on removing 38 per cent of our energy costs through good design"

This recycling is made easier by having the upstairs and downstairs bathrooms vertically aligned, saving on plumbing costs. Grey water is used to maintain the property's citrus plants. A lemon myrtle hedge, olive trees and veggie garden are also there – complete with passionfruit, bananas, herbs and bay leaves.

**The second storey**  
 With the floating staircase and glass incorporated in the design, the home has high visibility both upstairs and down. But despite the open plan, there's plenty of division and privacy in the bedrooms.

Continuing with the downstairs design of linking two areas by a long hallway, the main bedroom suite is at one end and the three kids' bedrooms at the other.

The building's low level of volatile organic compounds is partly the result of using 100 per cent plush pile wool carpet on the upper floor.

Cameron opted for a Kingspan composite roof panel, comprising roof sheeting with insulation in a sandwich of metal linings top and bottom.

The roof's outer shell is light green Colorbond, to blend in with surrounding eucalyptus trees and maximise reflectivity.

"Put rainwater tanks, composting and LED lighting to the side and focus on designing the home for thermal control," Cameron says when asked what advice he has for anyone hoping to build a sustainable home from scratch.

"I can change lights when a new, better



design comes in, but I'm not going to change my insulation or windows, am I? The building products are there for life. You need an architect and thermal comfort assessor working with you from the beginning." ■ pikeb@dailytelegraph.com.au

**MORE INFORMATION**  
 Australian Living [australianliving.info](http://australianliving.info)  
 Pidcock Architecture + Sustainability [pidcock.com.au](http://pidcock.com.au)



A The front facade B Cameron Rosen and wife Daphna Tal at their environmentally sustainable Rose Bay home C The home has a very open design D A space for dining and living is adjacent to the kitchen E The courtyard allows sunlight into the rear of the property F Louvers help with cross-ventilation G Main bedroom H A floating wooden staircase enhances the natural feel. Water from the shower and taps is recycled to supply the toilet