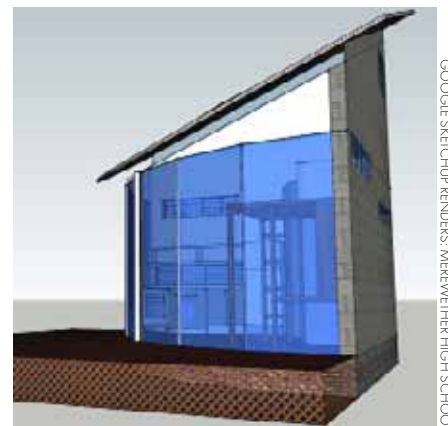
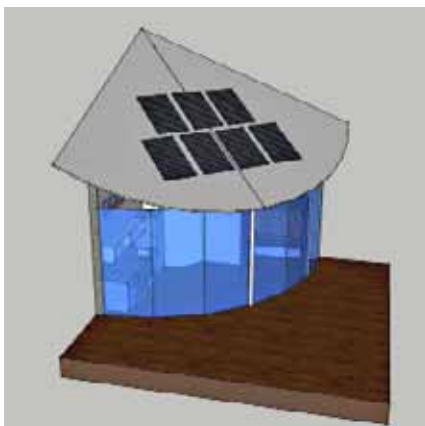




PHOTO: MEREWETHER HIGH SCHOOL



GOOGLÉ SKETCHUP RENDERS: MEREWETHER HIGH SCHOOL



# Future Homes 2010

*From a back pack to a space ship  
Open your mind, design outside the square*

BY LYNDA WILSON



GOOGLE SKETCH-UP RENDERS: MEREWETHER HIGH SCHOOL



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In recognition of the Year of Learning for Sustainability, the NSW Department of Education and Training, in conjunction with Living Green Designer Homes (LGDH), put the Future Homes 2010 (FH2010) design challenge to year 9 and 10 students.

### The competition

Craig Riddle of LGDH had been thinking about a way to educate young people to understand the impact their housing decisions could make on the environment. In August 2009, while building the house of Chris and Jerry Prietto of Stockton, he mentioned his idea. By October Chris, who works for the Department of Education and Training, had co-ordinated the idea into a working proposition that was launched in February 2010. LGDH donated the construction of the winning design as the main prize.

Craig said, 'It is based on the need to rethink our houses in the face of decreasing land availability, changing lifestyles and career options and increasing awareness of the need for a more sustainable future. Our environment is under pressure and we have a greater understanding of the need to conserve energy and materials. We need to design houses that are flexible and can adapt to a changing environment.'

Twelve teams from five schools entered. A joint committee of six narrowed it down to three finalists, before Merewether High School students Claire Burgess, Nina Long,

Macfarlane Amey and James McMurray were selected as the winners of the inaugural Future Homes competition.

The judges said the Merewether students 'provided an interesting design solution through its orientation, performance and innovation, while being sensitive to the environment.' The students' teacher, Andrew Donaldson, feels they won the competition because they considered multiple aspects to satisfy the brief including solar, water and wind.

### Completing the brief

The brief was to design a home with a maximum 20m<sup>2</sup> footprint that will harvest alternative forms of energy and water, has the ability to adapt to changing economic, social or environmental circumstances and makes use of sustainable materials. The students had to get their message across with a house design sketch and short description of not more than 150 words, accompanied by a text based folio of two pages.

An extract from the team's submission shows that these young minds have taken the task seriously and considered not only current circumstances but future requirements:

*'Humans need four concepts in a house: somewhere to cook/place to eat, a bed to sleep in, somewhere to go to the toilet/refresh, and entertainment and communication.'*

*'As the space is only small we have decided to design the house for a couple to live in. In addition to being designed to be usable by most people, the house has*

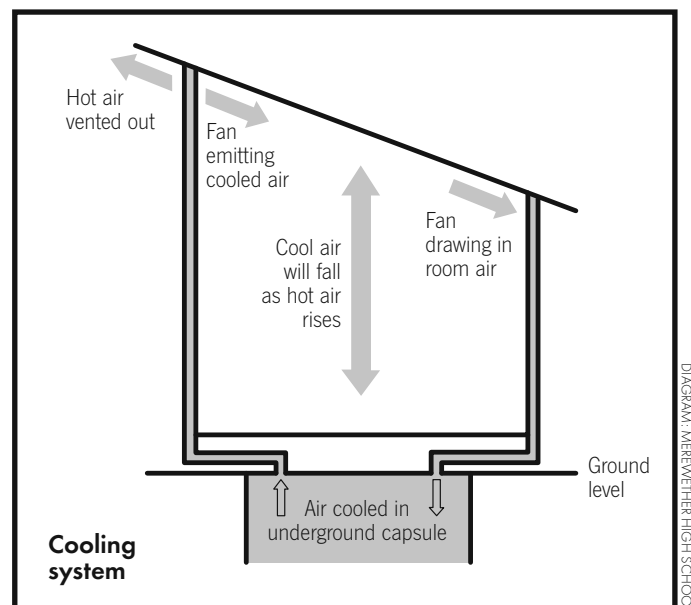
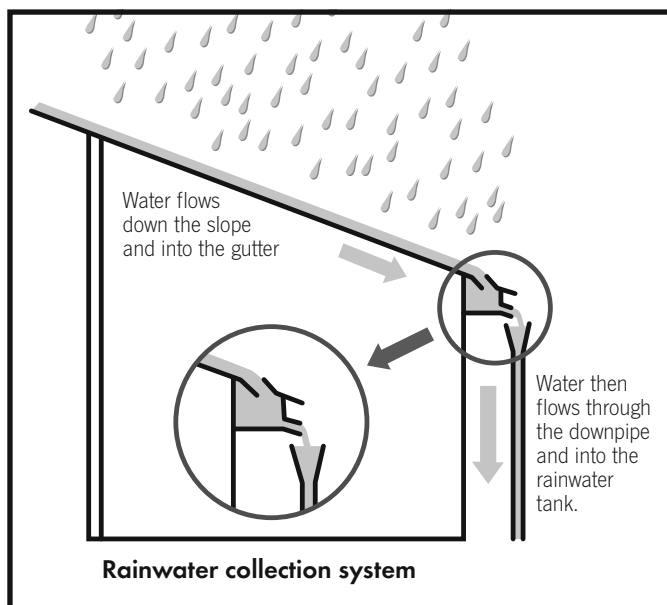
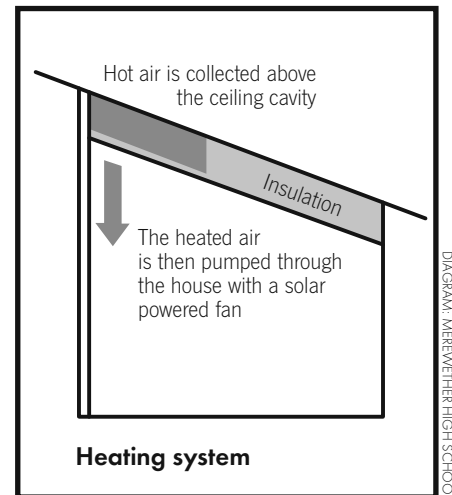
*provisions for additional modifications should they be required to meet specific needs of an occupant.'*

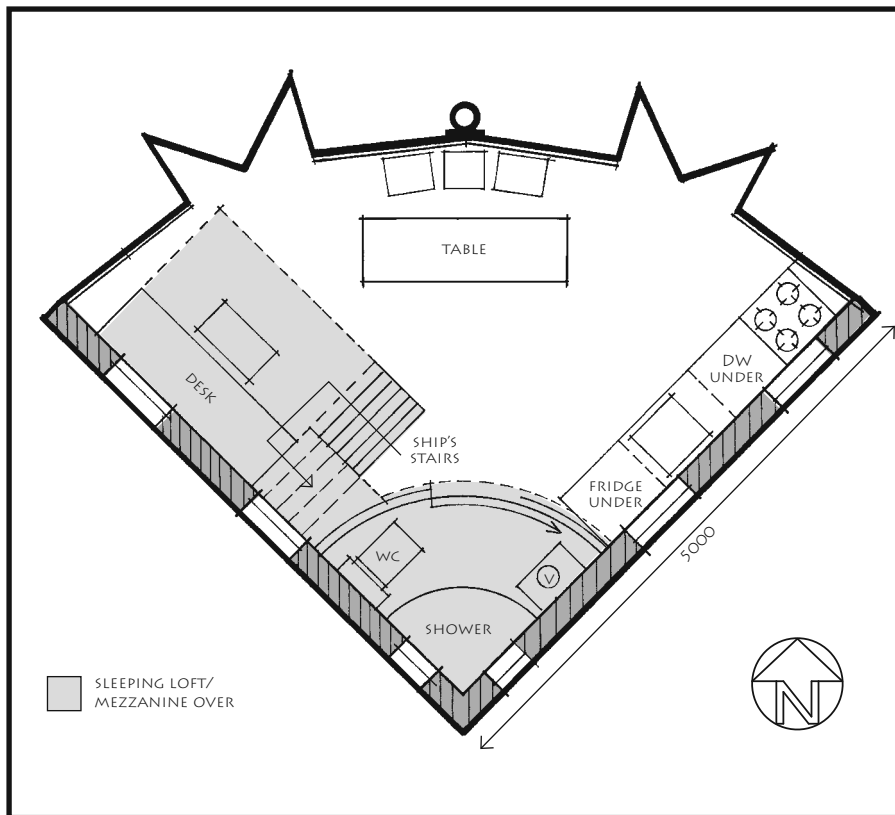
*'The placement of the house will be in Redhead, NSW ... because it is a minimally populated area, it is on the coast but high enough not to be affected by future sea level rises ... comparatively sunny and windy region with good yearly rainfall which makes it perfect for energy saving devices and appliances ...'*

### Design elements

*'We decided on a quadrant of a circle as the shape for our house, as it would let a vast amount of sunlight in on the northern curved wall. It would also save the unnecessary spaces wasted in the corners of a square shaped building.'*

*'The roof pitch (of 30°) was chosen ... the best angle for a solar panel to lie to gain maximum sun.'*





PLANS COURTESY MEREWETHER HIGH SCHOOL

The large glass doors on the north-facing curved wall add to the spacious feeling of the indoor/outdoor living experience.

We chose louvres for all our window sections, as they have easy control of ventilation. The placements of the windows were: above the bed, so ventilation can come across the bed on hot summer nights; above the kitchen bench tops, for natural light and ventilation to come onto the kitchen work area; above the shower in the bathroom, for steam to go out and natural light to come in; very top south corner window, for hot raised air to ventilate out of the house; and lastly high above the kitchen shelves, for symmetry with the window above the bed, and also to create a cross ventilation path.'

### Materials and choices

The submission stated the use of the following materials, bearing in mind that the house was designed to be a transportable kit home:

**Bamboo** – for flooring and decking, as it is cheap, strong, lightweight and easy to build with.

**Hebel Thermoblock** – for the walls: good insulation, lightweight, strong, easy to build with, fire resistant.

**Brick** – for the underfloor cooling

passageways because it has good thermal mass.

**Double glazing** – because there is a large amount of heat loss through windows and double glazing is a very good barrier to heat and sound.

Eco-friendly choices were also highlighted:

**Passive energy collection** – using a series of passageways in the roof and floor, with a small solar panel on the roof to power the fans used in the heating and cooling system.

**Airflow** – can be achieved by things as simple as having vents in the house or placing windows in places where there are often breezes.

**Natural light** – designed to use as much natural light as possible. The north facing wall being one giant window.

**Recyclability** – being recyclable is important because in the future there may not be as many resources so reusing old things will be better cost wise and planet wise.

### Heating and cooling

Passive systems have been used. Cool air from an in-ground air capsule beneath the house is circulated through the house using a series of vents and

solar powered fans. The roof pitch causes hot air to accumulate at the apex where it is vented outside. There is an air pocket in the upper section of the roof, just below the roof sheets and above the ceiling, well insulated on the ceiling side. Heated air is pumped into the house.

### Construction

Craig worked with the students in the LGDH factory and on site to bring their design to life as a portable structure. The team spent 10 days over a few months becoming involved in all aspects of the build, including having to get their OH&S Green Cards.

Apart from learning a lot about researching, designing and building, they also learned how to work effectively as a team. Three of the four team members are now considering related careers – engineering, environmental studies and architecture.

The building was relocated and finished in the school grounds, with the official opening on 25 February 2011. It will remain in the school grounds as a demonstration building and an ongoing testament to the forward thinking abilities of the next generation of home owners – and potential owner builders. ■

*Future Homes has been a true partnership between education and industry and demonstrates education at its best. In 2012 a new Future Homes Design Challenge will be launched to students, with a recognition event planned to showcase all of the students' designs that result from the competition. During 2011 the Department wants to engage additional industry partners in taking the Future Homes project forward.*

*The students' full submission documentation is available to download on our website*

**www.theownerbuilder.com.au >Extracts >Future Homes 2010, #167.**



### • Living Green Designer Homes

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