



Making the right choices

BY ZDENA SCHWANGMEIER

When we decided to build our dream home, we had no idea as to what the final product would be like. However, we had a number of objectives for this dream house: very little maintenance required, energy and water efficient, not expensive to run, and comfortable to live in. This proved to be quite a challenge, and a lot of compromises had to be made in order to achieve what we wanted. These are the choices we made at the time; we hope that they are useful to you.

Low maintenance

We did initially consider straw bale for our building, but after some research discounted it. This was mainly due to the fact that it worked out to be a lot dearer than we had expected, and the ongoing maintenance required on the render was not what we were looking for.

Rammed earth, in combination with corrugated iron, was our final choice of building materials, primarily because we liked the 'feel' and no painting and rendering was required – low maintenance objective sorted. For the building work itself, we chose Eco Sustainable Homes (formerly Rammed Earth Enterprises), a Victorian-based rammed earth specialist.

We were concerned about the low insulating properties of rammed earth, but hoped that its thermal mass

properties would compensate for the low R-value. We were no wiser after extensive research, because the issue is still open to debate.

Our personal experience is that it performs very well in hot weather. As for cold weather, we can only compare it with our old house – and that is far from 5 star rating! We have recorded the temperatures outside and inside the house over a period of time when the house was unoccupied and unheated, and the results show that even with sub-zero night time temperatures outside, the internal temperature never dropped below 11.5°C

We also incorporated passive solar design principles to enhance energy efficiency: true north orientation; big windows to the north, small to the south, medium to the east, and none to the west; eaves of the correct size to prevent any summer sun reaching the windows; deciduous vine-covered pergola over the only window without an eave.

Our house is in a high-risk fire area and we therefore had to install windows that have no flammable exterior frames. There were two options: composite frames where the external frame side is aluminium and internal is wood, or aluminium frames. The lack of cooperation from the composite window manufacture forced us to install aluminium frames with double-glazing using low-e glass with argon fill. Low-e

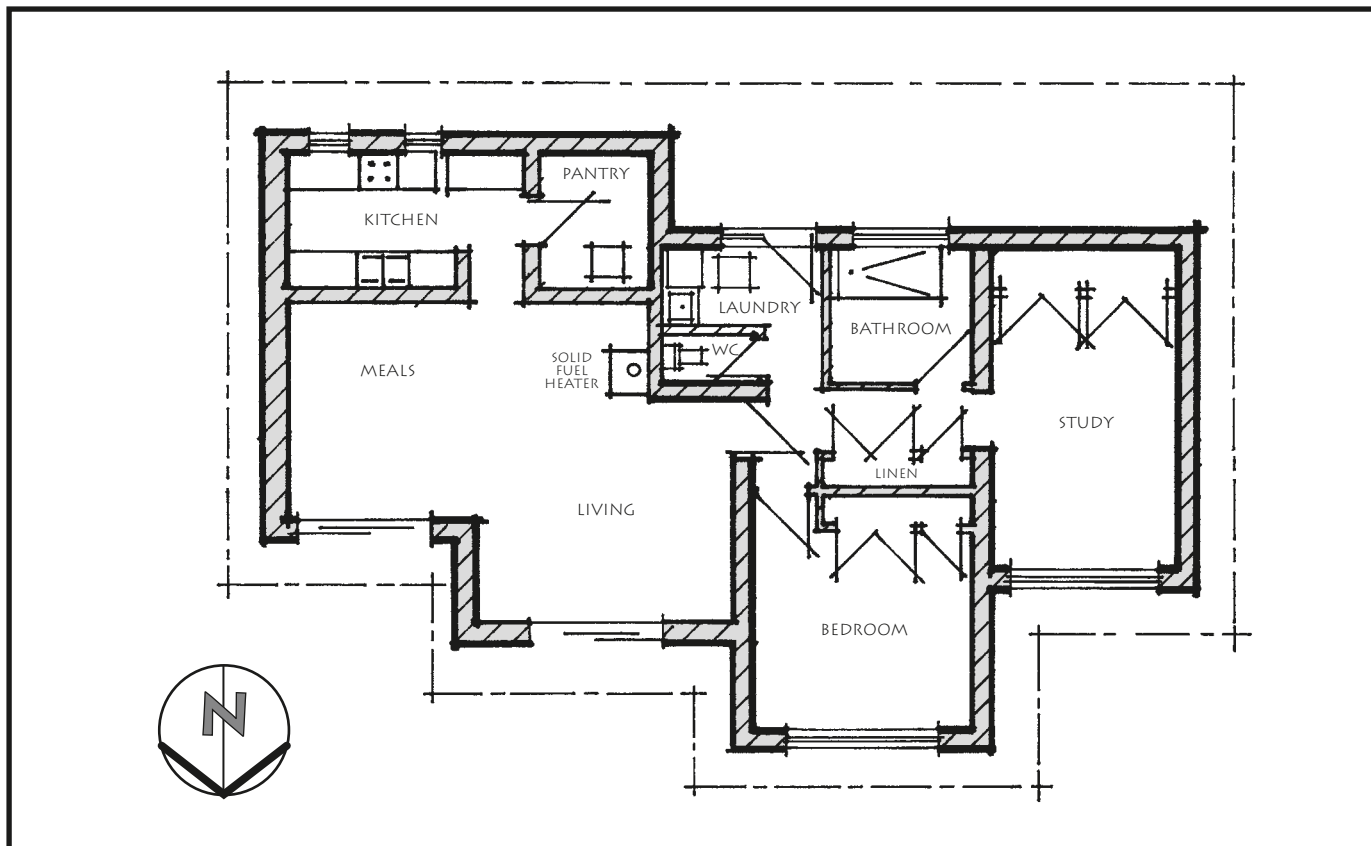
glass increases the insulating properties of a double-glazed window even further than using ordinary clear glass, while the argon gas fill results in a further reduction in heat loss.

Energy efficiency

We insulated ceilings with blown in sheep's wool, installed *DraftStoppa* to prevent air ingress through ceiling exhaust fans, and fitted *Isolite* covers to seal the down light fittings thus preventing air movement.

Our expectation for little need of cooling in summer has been fulfilled; the only mechanical device to cool the house is a fan.

Heating proved to be a much more difficult issue. There is no natural gas available in our area; therefore our choice of heating system was limited to those using expensive electricity or messy solid fuel. We investigated in-floor electric heating, but our electricity provider made the decision for us by not allowing us to draw the required wattage. In the end, we opted for a solid fuel heating, despite being well aware of the discussion about its environmental merits. Our decision was based on the fact that we live in a sparsely developed area, have easy access to wood and make triple use of our *Nectre* stove – heating, cooking and boosting our solar hot water system.



However, we discovered that the corridor/toilet/laundry/bathroom areas were very cold at night in winter, making a trip to the toilet very unpleasant. We solved the problem by installing a *Unidare* electric storage heater in the corridor, which is charged by off peak electricity, and an overhead heat lamp in the bathroom.

Unfortunately, it was not the end of our heating problems. Despite facing north, the study with its small window remained cooler than the rest of the house. We did not want to add yet another electric heater and so we looked at solar heating, as the room is used mainly during the day. We selected *SolarVenti*, which is light and very compact. Its main function is to introduce fresh dry air, resulting in a healthier inside environment. However, it also contributes towards heating. We have used data loggers to find out how efficient it is and, depending on the sunshine intensity and length, the temperature in the room is 1.5 - 3°C warmer than without the *SolarVenti* input.

Some may point out that if you have a well-designed house, which is properly insulated, then you shouldn't really

need heating. Apart from the effects of long periods of cold weather and no sunshine, it also depends on what one considers a comfortable temperature. For example, 18°C is not warm enough for us when sitting still and reading.

Electric power is available in our area. We considered grid connected solar power, but mainly due to financial constraints did not proceed with this project. Instead we subscribe to 100% green energy to reduce our contribution to greenhouse gases and pollution.

Water efficiency

Although we are connected to town water, we also installed a 22,500-litre water tank connected to the house, which allows us to switch from one to the other depending on the water need and availability. To make sure that collected water is relatively clean and to eliminate cleaning gutters, we installed *Smartflo* on the house. However, when we later built the garage, we opted for standard gutters with *Leafbusters* mesh. This option was more expensive, but in our view works better.

We were looking for fittings with high water efficiency rating, however it was

not an easy task as not all fittings have this information readily available. We are particularly pleased with our *Oxygenics* showerhead, which is rated 4.2-9.5 litre per minute of water flow depending on the water pressure, and yet delivers enough water for a pleasant shower.

Our hot water system is a solar *Solco* Genius 300l, which has solid fuel and off peak electric boosting.

We are not connected to sewerage, so deciding on a wastewater disposal system was again a dilemma. We rejected the standard septic, because we wanted to reuse the treated water for irrigation. We eventually decided on the *Envirocycle 10NR*, as it uses only a single tank and would therefore result in less ground disturbance.

Compromise is key

No matter how environmentally friendly you want to be, there are always compromises to be made due to council regulation, cooperation of manufacturers when you require customised fittings, and finding tradesmen who are happy to do more challenging tasks. It is also a balancing act between available finances and desire to be environmentally responsible. In



our case, we would love to have grid connected solar energy, but we could not afford it so we compromised and went for green energy.

Have we achieved our objectives? As far as running costs are concerned, we could do better. What we save on gas bills we spend on wood, maintenance fees for the waste system replace sewerage charges, and despite virtually no water bills we spend more on electricity. This said, when compared to your suburban house, our home is more practical, comfortable and has a very pleasing ambience. And there is less maintenance!

Would we like to change anything? If there is a heating system, which does not require chopping wood, is simple to install, works even on cloudy days and is not electricity hungry, we would like to know about it. ■

EDITORS NOTE: The recommendations and choices made in this article are entirely independent of any product sponsorship, and were the correct ones for the circumstances at the time. The house is located in the Hepburn Shire area.



Some research sources

- TOB #94 Aug/Sep 1999, pg 25 - Efficient thermal mass walls by Gary Kruihof
- TOB #100 Aug/Sep 2000, pg 28 - R-rating of walls by Gary Kruihof
- Thermal mass - www.buildinggreen.com
- >Articles >Volume 7 >April 1998 (No 4)

- **Eco Sustainable Homes**
(formerly Rammed Earth Enterprises)
Specialist builders and designers.
03 5470 6579,
www.rammedearthenterprises.com.au

- **SolarVenti**
A solar powered system that heats and circulates air in buildings
03 9830 2161, www.ges.com.au

- **DraftStoppa**
A self-seal casing for ceiling exhaust fans.
02 6056 2822, www.draftstoppa.com.au

- **Envirocycle**
Recycles wastewater from the bathroom, kitchen and laundry using a natural treatment process.
1800 688 588, www.envirocycle.com.au

- **Nectre**
Cosy fires, both slow combustion and gas.
08 8349 8332, www.nectre.com

- **Solco**
A range of sustainable water and power products.
1800 454 161, www.solco.com.au

- **Unidare**
Off peak electric storage heaters.
03 6278 2277, www.derby-heatbanks.com.au

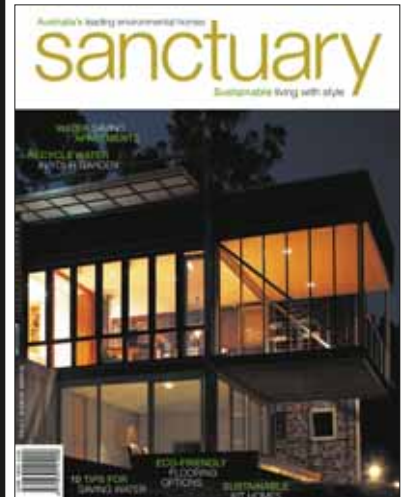
- **Leafbusters**
Meshes for use in gutter protection.
03 9757 7200, www.leafbusters.com.au

- **Smartflo**
Unique design offers leaf free guttering, low maintenance and longer gutter life.
1800 642 339, www.smartflo.com.au

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