

# Think local, act global

Native plantings and local building materials  
are the keys to this sustainable house

by Danielle Dunsmore



“The stunning rammed earth wall that runs along the southern entry side of the home utilises the dramatic red dirt in the area”



In little Woombye (pop 2094) on the Sunshine Coast hinterland, Queenslanders Norm and Betty Morwood concluded their search for the perfect site for their sustainable rural home. Ticking all the Morwoods' boxes, it faces north, is on the top of a hill and is only a 10-minute walk to a train station (and the pub).

Designed by Brisbane architect Neville Kurth of Sustainable Buildings, and constructed by the Morwoods' builder son Tony, the Morwoods' home is funky and modern with an angular roof and minimalist colours. It's a home you might pass and think, "that looks pretty cool". But this house is a lot

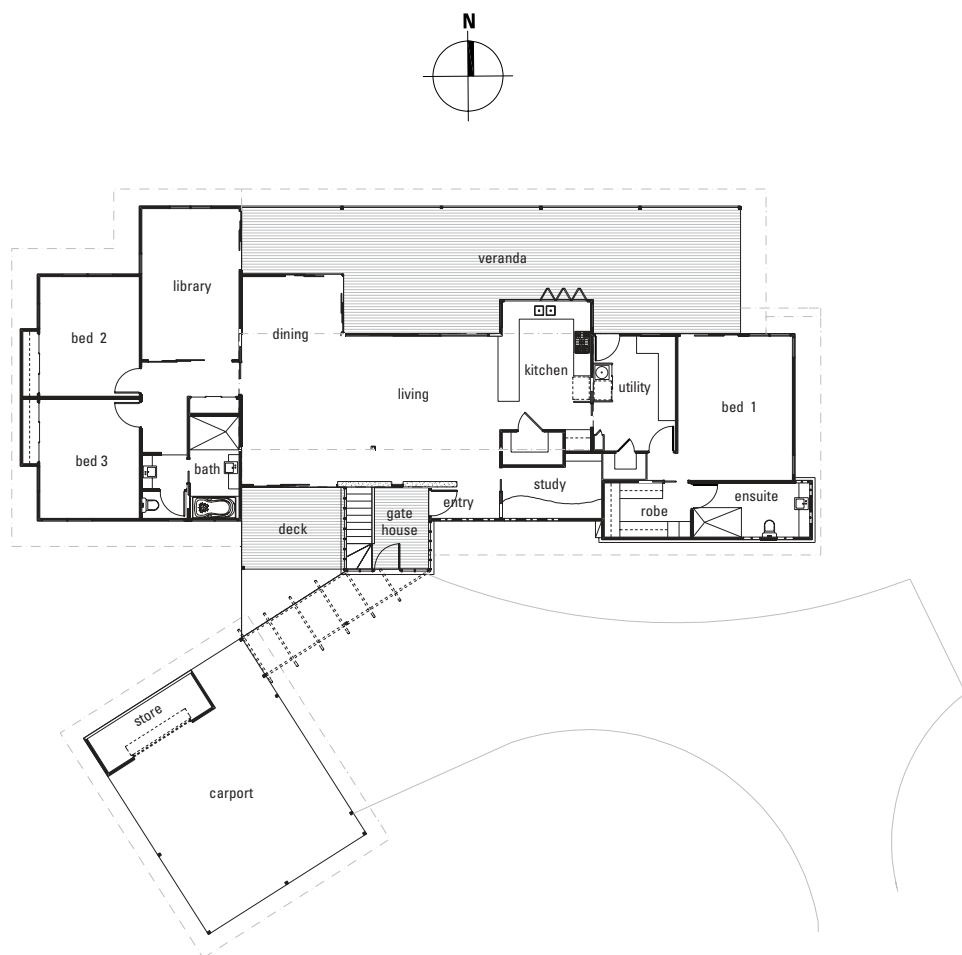
more than just eye candy.

Neville's design, over a single level, is perched in the elbow of a slope that was once part of a pineapple farm and falls away to a creek and small forest at the bottom of the hill. The home is wide along the slope, but only really one room deep. Almost the entire home is open to indirect sunlight and fabulous views of trees and rolling hills.

On entering the house you are immediately struck by the fabulous views. In only a few steps you cross the living area and are on the huge veranda that runs along almost the entire length of the house. Open to the living area and kitchen,



“Norm made it his policy to buy locally whenever possible for the building products”



the line between inside and out is a fuzzy one. The ground slopes away underneath and you have that wonderful sensation of being suspended in mid air.

**Sections of Vergola louvres run along the veranda roof, for the dual purpose of catching breezes and allowing in sunlight. Weather sensitive, they close at the first hint of wet weather.** The Morwoods say they virtually live out here.

In hindsight, Norm would have staggered the line of Vergolas to allow the Queensland winter sun on one part of the veranda instead of all being directed inside the house. Note to readers: if you can wait a full year before building, do it! Spend time on site

during the different seasons.

Inside, the main living room and kitchen open to the veranda, with the couple's private areas – bedroom, laundry/crafts room, bathroom and office – all to one side of the house. A suite of spare bedrooms and a bathroom lies at the other end. This section can be locked up and forgotten about, using little or no energy during its down time.

The home runs off a large solar photovoltaic system using amorphous panels. Low-energy compact fluorescent and LED lights were installed, and with only one fridge, no airconditioning and minimal heating for winter, the home's operational



High louvred windows on the north side allow in the winter sun, while picture windows and folding doors open onto the deck and stunning views



carbon footprint is virtually nil.

Giant, semi-submerged rainwater tanks feed the house and the garden. **Sewerage is taken care of on site with a Biolytix system – a process that acts as a giant worm farm (which means the Morwoods can use an insinkerator as well) and creates fertiliser for the garden.**

And the garden promises to be every bit as stunning as the house.

In his previous life as a mining company engineer, Norm was in charge of rehabilitating mining sites, as well as advising mining companies in countries such as Indonesia and the Philippines on practices



### Know your solar panel

Until a decade or so ago, amorphous (aka thin film) solar panels were lumbering giants, dwarfing their crystalline counterparts. They had an efficiency of around four per cent, so were large for their energy output. (Lower efficiency just means that a panel of a particular capacity is larger, not that it produces less energy than a higher efficiency panel of the same rating.) Then Uni-Solar pushed the efficiency to around eight or nine per cent, making for smaller panels. Other brands like Kaneka and Schott Solar followed suit.

The main advantage of amorphous panels is that they use about one per cent of the silicon that crystalline panels do, so their embodied energy is a lot less. They also perform better in hot conditions, partial shade and overcast conditions.

Many manufacturers are focusing on amorphous panels now due to the lower cost and simpler methods of manufacturing.



↑  
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to minimise the environmental effects of mining. So it comes as no surprise that on his own patch of dirt he has plans for a rainforest – “The One Acre Wood”.

**Norm’s plantings – much of it bought as tube stock – include bunya and hoop pines, six varieties of banksia, five of callistemon and nine of eucalypts. There’s also native frangipani, quinine bush, native guava and sarsaparilla, some peanut trees, a river cherry and a Wollemi pine. Just to name a few of the approximately 100 local native species planted so far.**

Not content to stop with native plantings, Norm made it his policy to buy locally whenever possible for the building products as well – meaning less transport as well as generating income for local services and tradespeople.

The stunning rammed earth wall that runs along the southern entry side of the home was built by Rammed Earth Constructions and utilises the dramatic red dirt in the area. Norm secured a pile of the stuff from nearby roadworks (with surplus going to the animal hospital at nearby Australia Zoo). They also included in the mix some soil excavated from under the home. 



Smaller openable windows on the south side minimise thermal loss while still permitting cross ventilation





Grasscrete grass/  
concrete hybrid.  
Limits runoff and  
makes for a cooler  
load-bearing surface

**The upper hillside wall made of rammed earth doubles as an aesthetic and a practical feature. Winter sun comes through high louvred windows on the northern side and strikes the rammed earth which acts as a heat sink, releasing its warmth at night. In summer the wall is shaded, helping to keep it – and the house – cool.**

Considering the Sunshine Coast hinterland is a bushfire prone area, the fire resistance of rammed earth serves another vital function.

As the hill slopes away underneath the home, some steel reinforcing was an engineering requirement, but otherwise the building has a timber frame made from locally sourced Cypress

pine. While termites are of a concern in Queensland, keeping the home and especially its structural base well ventilated helps deter pests, and Cypress is not on the termites' favoured lunch list.

Norm researched his timber, a confusing process by any standards, to ascertain which timber had the best environmental properties, and decided that using products as close to home, sustainably grown, were the key elements.

His only concession to importation was the desk in his office and the timber used in the windows and doors – all a New Guinea Rosewood from a sustainable Greenpeace-endorsed operation in the Solomon Islands. ←

## Woombye residence

**Designer** Neville Kurth, Sustainable Buildings

[www.sustainablebuildings.com.au](http://www.sustainablebuildings.com.au)

**Builder** Tony Morwood

**Rammed Earth** Rammed Earth Constructions

**Location** Woombye, QLD

**Project type** New building

**Photography** Rix Ryan Photography



## Sustainable features

### HOT WATER SYSTEM

- 300L Solarhart solar hot water system

### RENEWABLE ENERGY

- 2.5 kW amorphous Uni-Solar solar power system connected to grid. Designed to produce excess to current requirements to allow for future needs

### WATER SAVING

- Land contoured to retain rainfall and excess roof runoff after collection in tanks
- 2 x Nylex Zone 3, 22,700L rainwater tanks (45,400 litres total) under house with pump to supply all outlets
- 2m-long Rainharvesting 300mm diameter stand-mounted first flush devices on tank inflow
- Sankey Australia "Smartflo" gutters with integral leaf exclusion
- Biolytix sewerage and greywater treatment system providing water and nutrients to garden
- All taps RAM Park Pin Lever ¼-turn arm/wrist operated for cleanliness and ease of use. No mixer taps to remove accidental use of hot water
- Toilets 5-star 4.5/3 litre flush systems – Caroma Profile suite to workshop, Imperialware Lucerne back to wall EVO suites for ensuite.
- Grasscrete grass-concrete hybrid for driveway near house to reduce runoff and provide a cool surface near the house ([www.enviroconcrete.com.au](http://www.enviroconcrete.com.au))

### PASSIVE HEATING & COOLING

- Openable Vergola roof sections on north veranda to allow sun entry or ventilation as required ([www.vergola.com](http://www.vergola.com))
- Oriented with living areas true north. Sun in kitchen/living in morning/winter
- House mostly only one room deep to minimise dark areas
- High south windows to catch SE breeze when desired
- R2 Glasswool batts and Green Insulation Reflecta Guard insulation under roof. Green Insulation Reflecta Shield to walls. R2 Acoustitherm glasswool batts between floors and in some internal partition walls
- Rammed earth heatsink wall in living room
- Openable clerestory windows provide winter sun to rear of house and heat rammed earth wall. Also provide summer convection ventilation when no breeze



### ACTIVE HEATING & COOLING

- Hunter Pacific ceiling fans – 2 x Concept and 3 x Typhoon in sleeping and work areas
- Fridge separately ventilated by a vent in the floor under the rear of the fridge

### BUILDING MATERIALS

- Rammed earth heat sink wall in living room by Rammed Earth Constructions



- Cypress pine naturally termite resistant timber as most of the frame
- Cladding a mix of Hardie's Linea cement-based weatherboard (long lasting and low maintenance) and Carter Holt Harvey Shadowclad Ecoply groove preprimed with Bluescope Custom Orb sheeting
- Kitchen and laundry floors are cork tile for soft feel and low environment impact
- Timber framed windows of New Guinea Rosewood sourced from The Woodage, certified by Greenpeace as sustainably harvested

### WINDOWS & GLAZING

- Openable clerestory window on upper north wall
- Fully opening shaded windows on north. Louvre windows where appropriate for ventilation
- Windows exposed to occasional sun are Viridian Comfortsave or Comfortplus clear glass

### LIGHTING

- All lighting is low energy with a mix of compact fluorescent and LED lights

### PAINTS, FINISHES & FLOOR COVERINGS

- Living room floor finished with Feast Watson China Wood Oil, a product that contains tung oil but comes without the high maintenance

### WASTE DISPOSAL

- All waste from construction segregated and disposed of sustainably – recycled and reused
- Insinkerator (ISE) model 45 for onsite disposal of biodegradable rubbish not suitable for mulching through Biolytix system

### OTHER SUSTAINABLE FEATURES

- Single-level house and carport for ease of access for persons of all ages and abilities
- Limited and low door sills for wheelchair access
- Small LG 9485SA Solardom Light Wave convection microwave oven for cooking small meals efficiently
- Native plantings to garden