TROPICAL SUSTAINABLE DESIGN CASE STUDIES

Rose Gums Wilderness Retreat

Project type: Residential

Location: Malanda, QLD, Australia
Year completed: 2010

- **Extensive use of passive design for shade and natural ventilation**
- **Sustainably sourced materials for durability and low maintenance in the tropical environment**

OVERVIEW

A high energy-rated 3 bedroom dwelling that was quickly constructed to minimize disruption to guests staying at the Rose Gums Wilderness Retreat. Using Jon Nott's newly patented wall fixing process FASTABUILD, the project was completed on-site in 3 weeks as the wall frames were assembled off-site the previous prior.

PLANNING AND MANAGEMENT

The FASTABUILD system helps design and build affordable and quick to assemble houses for remote areas. The innovation, a wall fixing process, allows sections of the building to be assembled off site then quickly fixed into position on site with minimal noise disturbance. The wall frames can be easily transported on site by semi-trailer. The panel design allows unskilled labour with minimal supervision to build the entire house. This chefs' house was designed to blend into the rainforest environment with best practice passive solar features. Jon Nott Building was selected due to their vast experience in tropical building and a reputation for innovative thinking.

SITE

Rose Gums Wilderness Retreat is a Nature Refuge with nine accommodation dwellings. The building site was a small non-forested, degraded area. The dwelling is situated on a slope near the existing restaurant for easy access and existing services. The slope enabled prevailing winds to cool the building in summer and the dwelling was faced north to take in the winter sun. The site allowed wet season stormwater to follow the natural contours of the land.

DESIGN

The dwelling exterior featured a Dutch gable roofline set on steel posts. The interior featured three bedrooms, one bathroom, lounge/dining area with cathedral ceilings with high louvres for cross flow ventilation, galley kitchen and large covered deck. It was sited on a slope allowing for an under floor carport. The bathroom pod, pre-manufactured off site with all bathroom fittings, was craned into position. Battening under the building created shade and allowed for cool air ventilation under the floor area and privacy. The building orientation allowed for maximum passive design function. The large deck area was faced away from the prevailing south-east rains and faced north for all year usage for comfortable outdoor living. Large window and sliding door openings maximised cross ventilation. There is only one gutter over the entrance door. All stormwater falls onto gravel pits and flows along natural contours.

MATERIALS

The subfloor and wall frames are steel. The roofing is sandwich foam Corropanel, a structurally insulated panel from a Queensland based company. It is fixed in long panels and forms the ceiling as well. The raking flat steel ceiling panels made the interior easy clean, mould resistant and very durable as it does not absorb moisture. The internal steel wall frames were assembled off site, with insulation, internal sheeting of Villaboard and all electrical wirings and fittings in place in the walls. The external

wall frames were also assembled pre-finished off site. Pre-painted Hardies feature board was used for the external cladding. These products provided long life use for the building and were more suited to the tropical environment.

ENERGY

This rural property only has SWER line electricity, hence renewable energy cannot be fed into the grid and mains power was a viable option. Gas was used for the hot water service and cooking. The gable window allowed good levels of natural light into the centre of the building. LED lighting was used in all areas of the dwelling. No mechanical cooling was needed.

WATER AND WASTE

The water was piped from an existing bore on the property and low volume water fittings were used. The landscaping requires little irrigation. Water collected off roofs in rainforest settings needs to be purified by carbon filters or a UV process. It was more efficient and safer to pump from the existing bore on the property to the central tank system in place.

OWNERS/USERS STATEMENT

"The Chef's house was built on-site in only 21 days with minimal disruption to in-house guests at the retreat. The house is very liveable, easy to maintain, very durable with no ill effects from recent cyclones. The high insulation value makes it very cool in summer, warm in winter and well insulated from road noise nearby. The chef and his family are so happy I don't think they'll ever leave – thank goodness!" Peta Nott

PROJECT TEAM

Project manager/ Architect/ designer: Jon Nott
Interior designer: Peta Nott
Structural engineer: Colefax Rodgers Consulting Engineers
Energy efficiency rating consultant: Own Home Designs
Builder: Jon Nott Building

For more information visit: **www.jcu.edu.au/tsd**
www.reenbuild.com.au

The project has been funded by the JCU Sustainability Fund and supported by the TGBN powered by GreenBuild.com.au.