

TROPICAL SUSTAINABLE DESIGN CASE STUDIES

Redlynch Valley Residence

Project type: Residential

Location: Redlynch, Cairns, QLD, Australia

Year of completion: 2008

- The whole house, shaped like a horseshoe, is only one room wide with a connecting verandah running past each room
- Breezes through the house keep the homeowners in touch with the temperature outside

OVERVIEW

Family activities are at the forefront for this young household, and are accommodated in a manner that allows parents to overview activities from any room in the house or central courtyard. Each room is connected by veranda space, which intertwines circulation, social and play areas.

The site is elevated and has other physical constraints although innovative tropical design expertise delivers solutions that exceed expectations.

Awards: Australian Institute of Architects Far North Queensland regional commendation award 2009



PLANNING AND MANAGEMENT

The home is situated in Redlynch Valley Estate, an estate with a high proportion of homes designed by builders. Typically most houses are placed towards the centre of a lot with minimal usable land. The owners of this project commissioned an architect to make the most of an elevated and sloping site for their young family.



The house was designed not only for thermal comfort but also for social comfort. The design makes it possible for parents to keep an eye on their young children from anywhere in the house, even when the kids are in the swimming pool.

The two bedroom pavilions are raised from the ground to promote breeze flow at activity level in the central courtyard, as well as offering a raised viewing platform towards the rear of the site. The house design is aimed to maximise useable area for a landscaped courtyard.

The project was designed and completed to a strict budget which required a number of compromises during construction, but the final project more than exceeded expectations.

SITE

The site is situated in the foothills of the Whitfield range and is elevated with a benched area and sloping banks to its perimeter. Panoramic views are situated to the North and the Western sun has a harsh impact although there is opportunity to bring about south easterly prevailing breezes from the south east.

DESIGN

The design of the house aims to accommodate an active young family. The level benched area is set aside primarily as an active play area for the children and the home is designed like a horse shoe circling a courtyard area.

The horse shoe shape is created by lightweight pavilions that skirt around the perimeter of the site and maintain the maximum usable area for the landscaped courtyard.

Many benefits come with planning a design that specifies lightweight construction and building materials. The elevated pavillions allows breezes to move both under and over the site into the courtyard to maximise the home's cross ventilation.

The roof system includes overhangs for verandahs and 800mm eaves. Ceiling heights are 2.7 metres.

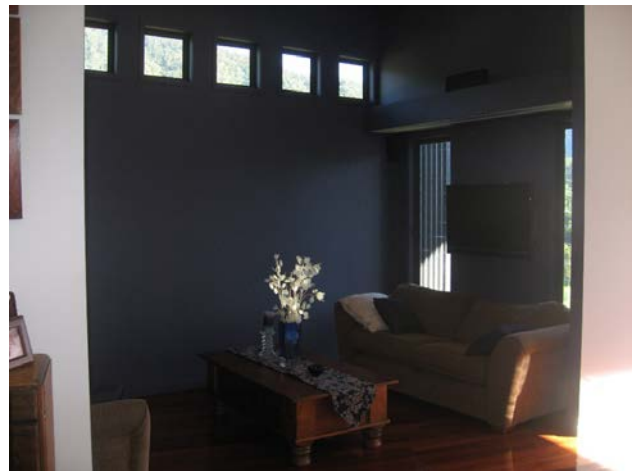
The single room width of the pavilions maximises the opportunity for breeze to penetrate to each room, also offering abundant daylight with spill-over into the adjacent verandahs.

The intensity of solar radiation, humidity and prevailing breezes were considered during design process. Connecting the home to its local environment was central to its design. Breezes through the house keep the homeowners in touch with the temperature outside.

The low-use rooms are on the west side of the house that receive harsh afternoon sun. The western wall has minimal windows and heat gain is combatted with the use of insulation.

The living area with a deck is on the north side of the home with views to the mountains. The hot summer monsoon breezes are from the north and breezes moving through the valley make this a comfortable outdoor living all year through.

There is a breezeway in the centre of the house to catch the south and south-easterly cooling breezes. A connecting verandah runs past each room.



Louvre panels enclosing the verandah can be opened to let breezes flow through the house. The verandah also provides extra space for family interaction and meant rooms could be small, saving on construction costs.

Windows are designed to maximise cross ventilation and protect from solar heat and rain. The pivoting louvres enclosing the verandah can be shut for security or when a cyclone approaches. During storms, air and rain is allowed to move through the louvres but any projectiles are stopped and the safety and resilience of the building to severe tropical weather events was taken into consideration.

MATERIALS

Materials are selected to suit light weight construction using experience and knowledge of their suitability and durability in tropical conditions.

The main frame is steel that is fully recyclable and infill framing is timber sourced from plantation growth and is a natural carbon store.

Custom orb steel sheeting is widely used as a cladding and light colours are used on the roof. Weathertex weatherboards have a smooth millwood profile with timber content they are a carbon store and highly durable for a tropical climate.



Timber screens and balustrading are a feature along with louvre systems. Quality hardwood timbers sourced from plantation forests are used in the decking and timber floors.

ENERGY

The air conditioner that was initially installed is hardly used, maybe three to four short bursts during the hot humid wet season. Power usage is also minimised due to natural lighting prevailing throughout the house. A solar hot water system is also installed.

WATER

Water saving devices are installed to comply with the codes and standards at the time including shower heads and dual flush toilet cisterns.

OWNERS/USERS STATEMENT

‘Most importantly, the house is lovely to be in; the verandah leads you around from space to space and the harsh light from the tropical sun is softened as it shines inside. I just can’t imagine ever moving out. It is the liveability that is just as fabulous a few years later.’ *The family’s mum*

PROJECT TEAM

Base building architect/ designer: Gordon Beath
 Interior designer: Amrita Kambo - Interior Documentation
 Julia Fulford Kirby - Colour Consultant

Photographs courtesy of Bruce Clarke

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

