The Kula House
Project type: Residential
Location: Kewarra Beach, Cairns, QLD, Australia
Year completed: 2009
- Owner-built house for a young family that is affordable, practical and comfortable
- ‘Longhouse’ design principles with a length to width ratio of 2.5:1
- Skillion roof systems yield a 20 meter central spine for clerestory windows

OVERVIEW

The client was a licensed builder and HIA Greensmart professional wanting an affordable, practical and comfortable family home that applied green building principles. The Kula house typifies the traditional ‘longhouse’ design, a climate responsive building type common to the cultures of the Pacific islands and Southeast Asia. The house is named after ‘Kula’ shells that are valuable in the PNG Trobriand Islands. Trobrianders believe that mere argument is unlikely to change someone’s mind and the art of persuasion through indirect and subtle means like the physical allure of gifts such as valuable ‘Kula’ shells are a vital part of negotiation. The ‘Kula’ barter system is an inherent part of this culture.

The Kula house is tropical and alluring with open spaces full of light and fresh breezes. Passive design subtly delivers occupant comfort. The value of the home for families interested in minimizing running and maintenance costs will always be relevant. The home does not need air-conditioning and the design and materials chosen are resilient to tropical weather conditions. Design principles based around traditional Pacific island ‘longhouses’ will last the test of time in the tropics.
PLANNING AND MANAGEMENT

The owner builder worked closely with the architectural engineer to devise and carry out the planning and management of the construction programme.

The steel frame was erected first along with the roof. This provided an undercover work area during the hot wet season. The timber floors were then laid throughout creating a large platform for the erection of walls and the remainder of the fit out in this low set raised home.

SITE

The site is situated at the end of a cul-de-sac in a beach suburb. It is gently sloping from the front to the rear and clear of vegetation.

The lot shape is irregular with a narrow front and long side boundaries that are perpendicular to the north west and south east.

The house is situated on the lot with the short sides of the house front facing north west and rear facing north east. The long walls of the house are set back from the side boundaries and there is a large backyard for children to play.

DESIGN
CASE STUDY: The Kula House

This contemporary low set design follows a ‘Beachcomber’ philosophy that typifies the traditional ‘longhouse’ design. The structural lines are simple with the main emphasis on the roof. The roof’s principle job is to protect the occupants from the tropical rain and heat whilst promoting natural light into the internals and visual appeal from the street front.

Like the traditional longhouse the Kula house is a post and beam construction type that has a 1:2.5 width to length ratio. A contemporary steel main structural frame is in-filled with timber wall and floor frames. The skillion roof system has a central split and an average height of 5.5 metres with a 20 metre spine. Clerestory windows run for three quarters of the central span delivering light and cooling breezes to the middle of the home.

Every room in the house has an external wall with large full height louvre galleries. The cooling breezes push hot air up into the high raked ceilings to the clerestory windows promoting passive cooling. Sea breezes and monsoon north easterly breezes can also be captured through the 7 metre opening onto the rear deck.

The work that the 900mm roof eaves perform is critical to comfortable tropical living by keeping the tropical sun off the walls. The roofs to all decks also have 900mm eaves to protect them from the sun and rain making the decks usable in all weather.

The deck on the north west side of the home is situated off the laundry and purpose designed for clothes drying.

The house is raised off the ground above sand fly level, allowing air to circulate under the floors keeping them dry and cool. The risk of water damage from floods or storm surge is reduced.

The carport is situated on the south east side of the house although has an open design to allow prevailing dry season south easterlies access to the house. There is covered access from the carport to the house to help take children and shopping from car to house during weeks of monsoonal rain.

The Kula house achieves desirable natural light and breeze for every internal space and no air-conditioning has been installed. During the weeks of very high rainfall in the hottest part of the year there is no part of the house that can trap mould.
The internal floor plan is only 180 m² although the house has four double sized bedrooms. The master bedroom has a full size ensuite and walk in wardrobe. There is also a large main bathroom, a laundry and storage room.

The children’s bedrooms have a ‘break-out’ area between them and the rooms are full of natural light and breezes.

Conscious of electromagnetic fields and safety all electronic equipment such as phones and computers has a dedicated docking and workstation room behind the kitchen.

The kitchen, dining and living area is open plan and has large openings to a deck overlooking the backyard. The deck is an extension of the living area and effectively doubles the size. The sides of the deck have shade screens to soften the impact of the east and west sun.

**MATERIALS**

The steel frame is fully recyclable and timber is an innate carbon store.

The roof is light coloured steel sheeting with an E-Therm reflective thermal insulation blanket under the roof sheeting in a 260 mm cavity with a raked ceiling achieving a R3+ rating.

The external walls are a combination of varying profiles of light weight fibre cement sheeting and board, painted in light colours. The cavity has reflective thermal insulation. The system deflects heat and any gained during the day quickly dissipates in the evening.

The Australian native yellow stringy bark timber floorboards are used throughout the home. They are sourced from a forest stewardship council (FSC) timber supply.

The floors are coated with a low VOC water based product. All paint is from the low VOC Wattyl ID range.
ENERGY

Most importantly, the passive design for natural cooling this house reduces the demand for electricity, in particular air-conditioners throughout the long summer months. Compact Florescent (CFL’s) or LED lights are used in 100% of the house, including the outdoor floodlights.

Ceiling fans with 1200mm blades are plentiful and strategically located. A Conergy solar hot water system is installed. The home also has energy efficient appliances and the future installation of a 5 kWh photo voltaic system would make this family house carbon neutral.

WATER AND WASTE

All water fittings have water saving flow restrictors. Plans are in place to install water tanks and a grey water system as time permits.

OWNERS/USERS STATEMENT

“Living in such a beautiful environment, it didn’t seem right to be stuck in a concrete box. We loved the idea of going back to the more traditional style which has always worked in the tropics. We had a passion for tropical design as the inspiration as well as needs around our family.

This is a really nice comfortable family home and we built it with the idea of promoting what can be done with a bit of innovative thinking so the more people that see it and educate themselves about the different styles, the better.” David and Emily Wood

PROJECT TEAM

Base building architect/ designer: Beachcomber Building Designs
Structural engineer: Thirkell Consulting Engineers
Energy efficiency rating consultant: Green at Heart
Builder: Edge Project Constructions PL

Photographs courtesy of Photography 4 real estate

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