

## The Patteson House - New / Project Home

This tropical house in a pavilion style stands out from the crowd with its contemporary design based on the concepts of a traditional Queenslanders.

The project home was built in 2000 by Andrew Patteson Quality Built Homes and based on a design by Troppo Architects (Qld) Pty Ltd, as part of the Fairfield Waters Display Village.

During the 12 month display period, approximately 10,000 North Queenslanders inspected the home, with positive feedback from visitors on a ratio of 4:1.

The home was built for \$235,000 and advertised at the end of 2001 for \$339,000.

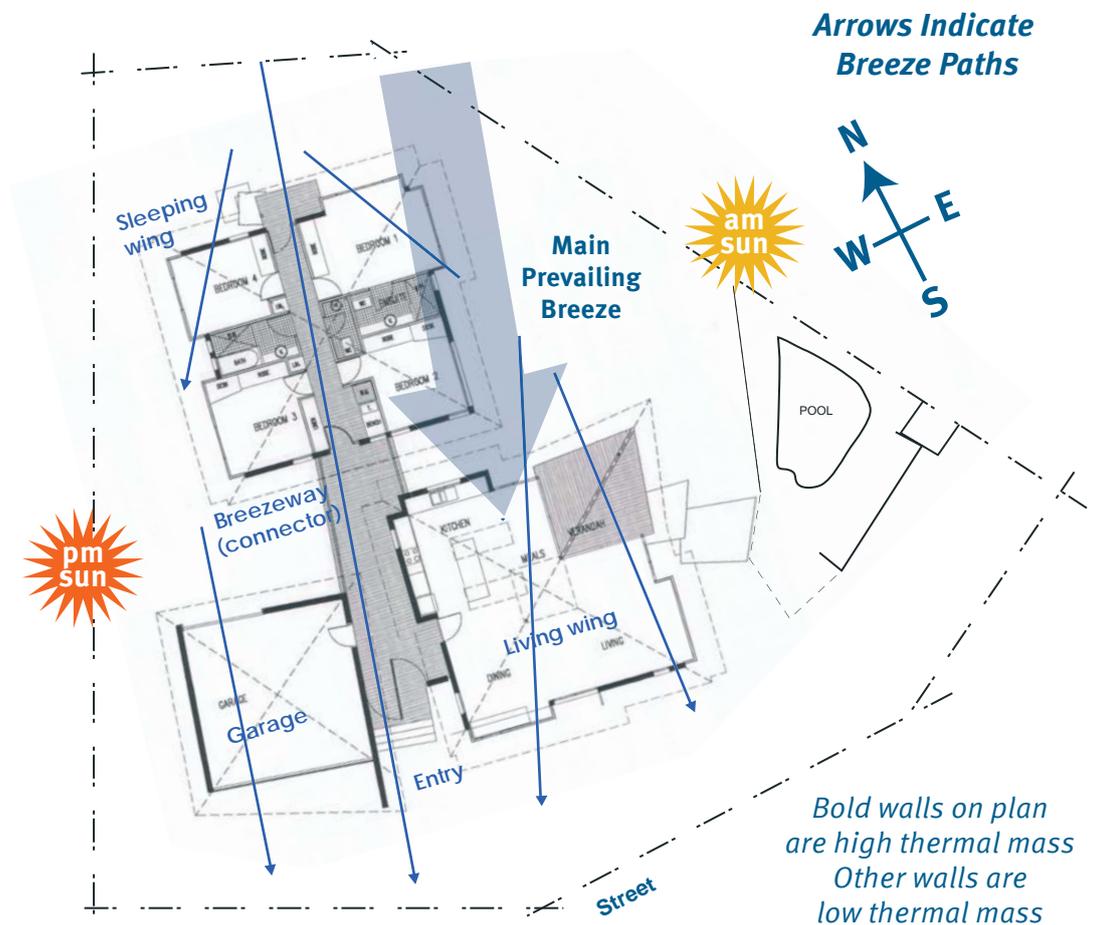


### The Patteson House: A project home designed for a tropical climate with a view to sustainability

At the time and even by current standards, the Patteson House is fundamentally different from other project homes, in both appearance and function.

#### Key differences are:

- The overall design will perform well on various blocks (with only minor variations), including flat sites and those with very limited access to breezes (as is typical in some residential estates).
- The home is naturally cool in our tropical climate due to adherence to climate responsive design principles appropriate to tropical zones.
- The pavilion style floorplan has three separate wings – a sleeping wing, living wing and a garage – with a central indoor/outdoor breezeway connecting the wings.
- The home design incorporates a complementary landscape plan to enhance overall performance.
- The home does not have or need air-conditioning which significantly reduces electricity use.
- Materials have been chosen for their environmental preference.



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### CLIMATE RESPONSIVE DESIGN

The home is naturally cool due to the incorporation of the following climate responsive design principles:

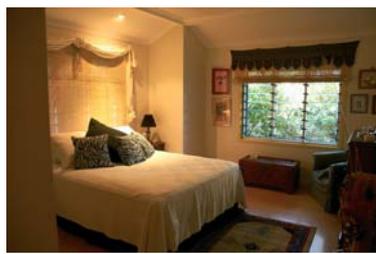
#### The promotion of cooling breezes

The orientation of the house plan on the block is such that the central corridor/breezeway is aligned with the prevailing breezes which are from the rear of this block.

The living pavilion is offset to exploit the breezes that bypass the bedroom wing.

Slight elevation helps to overcome breeze losses resulting from surrounding fences (the timber floors are raised on 500 mm steel posts).

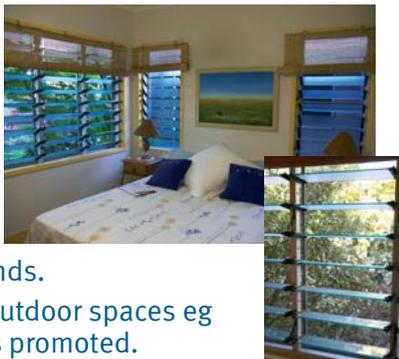
A pavilion style floor plan was chosen (despite additional upfront expenditure) to create a higher proportion of external walls to assist in achieving good cross ventilation.



All rooms, including bedrooms have at least three openings – typically a minimum of two windows and a doorway.

Window sills in the bedrooms are lower than usual at 700mm above the floor, enabling breezes to flow closer to the floor and better over the body when sleeping.

Frosted louvred windows are used exclusively throughout to ensure that breezes and privacy can be maintained at all times avoiding the need for curtains or blinds.



Interaction with cool outdoor spaces eg the garden and water is promoted.

Potential barriers are modified to enable airflow. For example, instead of solid walls along the breezeway, slatted screens are used that provide privacy and security yet maintain ventilation at all times. The backdoor at the end of the corridor is also fitted with a screen door.

Whirly birds on the roof mechanically assist the breeze to exhaust hot air from the spaces below.



### Ventilation by convection

Sloping ceilings enable warm air inside to rise up by convection along raked ceilings to be exhausted to the outside through roof vents.

#### Reducing radiation of heat

External surfaces are light in colour to reflect and reduce radiant heat. For example, the off-white colourbond roof.

The roof has reflective foil insulation. Avoiding the use of bulk insulation helps the house to cool down at night and after a tropical shower or seabreeze.

Two types of walling systems are utilised:

- low mass and light weight walls of timber frame stud walls with reflective foil insulation, clad with a light coloured colourbond, and
- high thermal mass walls of rendered concrete block

Heat gain through walls is reduced by ensuring that walls and openings are well shaded. Overhangs are 900mm wide and angled to provide low shading to the walls on all sides (pyramid roof form).

High mass walls are recessed 600mm behind low mass walls, effectively increasing the width of the overhang to 1500mm and maximising protection from solar gain.



Dense vegetation provides shade from low sun in the east or west.

Outdoor living areas are shaded with extended rooflines, colourbond sheeting, shade sails, slatted pergolas, and mobile umbrellas.



The polycarbonate light vent at the apex of each pavilion allows some natural day-lighting. Dark tinting reduces glare and timber slats reduce unwanted heat gain.

#### Sheltering walls and openings

900mm wide overhangs also protect from rain intrusion (including torrential and horizontal rain).



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### LIVEABILITY

Living areas inside and out are designed for a variety of activities, including relaxing, working, entertaining, and personal hobbies, as well as different levels of interaction with others in the house as well as neighbours and passers-by.

The living spaces offer physical comfort with different climatic conditions to the outside, with no mechanical filtering (ie no air-conditioning).

Indoor living areas transition smoothly to outdoor living. The main indoor living area is a very large, open plan room comprising the kitchen, formal dining and lounge room areas.



Extra wide sliding doors form a continuum between indoor areas and the covered deck dining area, landscaped garden, barbecue entertaining area and pool.

Another indoor/outdoor living area is located on the central breezeway adjacent the entrance of the home. Slatted, rotating panels maintain breeze, reduce glare, and maintain privacy and security.



The home has a strong relationship to its surrounding environment.

### MATERIALS AND FITOUT SELECTION



- Ventilation in the bathroom is achieved via a frosted louvre window and a ceiling exhaust fan to adequately ventilate and dry the room, limiting mould growth.

- In wet areas, glass and silicon are kept to a minimum to ensure easy maintenance that is less dependent upon chemical cleaning.

- Wall mounted cupboards in the bathroom prevent damage from water on the floor.

- Benchtops in the bathroom are polished solid bluegum.

- The adjustable height shower has a AAA-rated water efficient showerhead (9 litres per minute).



- A roller door at the rear of the double garage opens to a courtyard behind, allowing the prevailing breeze to blow through the garage/workshop/hobby area.



- An enclosed clothes line at the rear of the property receives full sun and is open to the breeze making it an environmentally responsible alternative to using an electric clothes dryer.

- Non-chemical termite protection is provided by termimesh in concrete walls and exposed steel stumps.

- All windows are insect screened.

- Oversized gutters manage tropical rain from some roof areas (over doorways /walkways), whilst the omission of gutters on other parts of the house enables rain to runoff directly into garden beds below.



- Decking including the internal breezeway is mixed hardwood timbers.

- Interior flooring is polished structural ply.

- Ply is also used for the doors of built in robes.

- Cupboards and some benchtops in the kitchen are laminate.

- Pantry doors have steel mesh inserts for ventilation.



- The planning and arrangement of the house ensures that each internal space has a corresponding, useful external space. This approach takes maximum advantage of the site and prevents uncomfortable corridors between this house and its neighbours. It also offers each internal room a relationship with the outdoors.



- Landscaping around the home includes leaf mulched garden beds; woodchip, crushed gravel and river stone ground-

covers, the use of some water wise plants and minimal lawn areas to reduce garden watering.

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• Passive security features at the front of the home include the use of implied barriers. A small fence and garden beds as well as different types of paving direct pedestrian movement to the front door.



### Comment from the owner

*"I love the house because it has plenty of natural light and fresh air which I love. It really is like living in a resort. The ply wood floors do look a bit different but they're easy to clean, are cool and durable and minimise breakages. I feel very lucky to live in this home".*

### Comment from the architect

*"A really good, environmentally responsible house is created from the ground up. Materials and fitting selection does not create a good house. 80%-90% of the climatic (and therefore power consumption) performance comes from considered orientation and general building arrangement to ensure maximum breeze in prevailing conditions. Such planning should never be undertaken without a corresponding landscape plan. The indoors and the outdoors work together to create a climatically responsive house."*



Casestudy compilation:



Photography:

Kelly Goodbun Design.