



SUSTAINABLEHOUSEDAY

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Tyler Home

(New Construction)

This architect designed, owner built, two-storey contemporary tropical eco-home is testimony to its owners talents, labour and passions. This new home is a tribute to craftsmanship, quality building, tropical design (thermal comfort, flooding and cyclonic winds), practicality, energy efficiency, solar power generation, feng shui, artistry (stained glass, flowing lines and steel work) and lifelong learnings of eco-design and sustainable living.

A tropical design exemplar, tropical design features include high levels of insulation to walls and roof including over decks; orientation of inside and outside living areas to benefit from access to prevailing breezes; plenty of openings to maximise cross ventilation; thermal mass for both warming (in winter) and cooling (in summer); an open stairwell that facilitates excellent natural day-lighting as well as, together sloping ceiling and partition walls - convective air-movement; a range of shading devices to keep the sun off windows; and shady rainforest plantings to pre-cool the air entering the home.

The home is also a beacon of energy efficiency (electricity bills range between \$20 and \$80 a quarter) – as a result of a suite of practical measures which include a 1kW solar panel and solar hot water, water efficiency, land efficiency (the block is only 380 square metres) and the home features environmentally responsible, low toxic material choices and finishes wherever possible.

Oh - and its on the market right now if anyone would like to move in!



Owners: Stuart & Jenny Tyler

Address: 20 Halloran Street, Hermit Park QLD 4812

Climate Zone: Townsville is located in the Dry Tropics – there are two seasons: a hot and humid (November to April) wet season, and a warm to hot dry season with low humidity for the other half of the year.

Construction type: Architect designed, by son, Sebastian Monroe, owner built two storey, portal steel and timber framed two storey tropical climate eco-home. Galvanised 10 degree pitch skillion roof, double insulation to walls and roof, concrete ground floor, timber 2nd floor, metal and fibre cement external cladding.

Sustainable elements featured at this home

Tropical Design Features

Tropical living is embraced with more than a third of areas under roof 'quasi' outdoor type rooms.

The slightly sloping galvanised metal roof (10 degree pitch, skillion style) over the house and deck has a very high level of insulation (R2.5 Air-Cell plus fibreglass batts) with ventilated cavity between layers.i

The principles of cross ventilation (air will flow between openings) and convection (hot air rises) are utilised to ensure that there is airflow in the home even on the most breathless of days. Cool air enters the home at the ground floor through extensive louvre banks with cool air coming in from prevailing breezes and also from the shady rainforest garden immediately outside.

The air is further cooled by the fully shaded thermal mass of the (tile covered) concrete floor downstairs.

An open staircase allows warmer air to rise upstairs, bifolding doors across both ends of the living area, where a sloping ceiling and celestory louvres encourage airflow and the exhaust of warmer air.

Thermal mass is used cleverly too, both cooling the house in summer and warming it in winter. Cleverly angled vertical shades (which keep the concrete floor totally shaded in summer) enable sunlight to flood inside in winter heating the floor and providing warmth throughout the day and into the night.

The occupants have absolute control over the interior temperature simply by opening or closing windows.

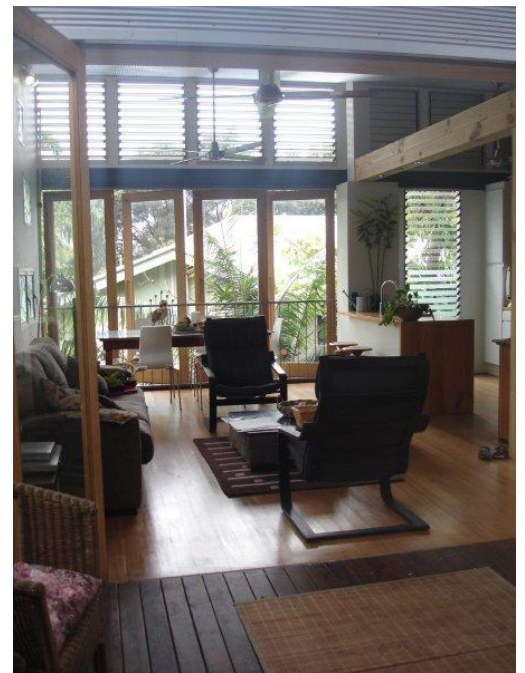
With a challenging orientation (the block is oriented at 45 degrees to solar north) the building has incorporated extensive insulation into all external walls so that shading of walls is augmented.

Wall framing is steel portal (I-beams) and plantation pine timber framing. Hardwood ply infills have been used for additional wall strength in cyclonic conditions. Walls are externally clad with painted fibre cement, galvanised mini orb or custom orb.

Wall insulation is laminated reflective foil then batts. North and west facing walls were built with an extra wide wall cavity (400mm) to additionally accommodate extra Air-Cell and fibreglass batt insulation.

Internally walls are lined with fibre cement sheeting (ground floor) and around louvre windows (to prevent any potential water damage to walls – from flooding or cyclonic rain). Internal walls upstairs (and ceilings) are lined with plasterboard. All internal walls have thermal and acoustic insulation.

Wall and door frames are made of treated pine timber.



Window shading was carefully considered with hoods, vertical blades, an eave on the southern wall, wing walls and patios all utilised to keep the sun off glass.

Living areas inside and out are optimally positioned to benefit from prevailing breezes which in Townsville come from the north, north-east, east and south-east.

Windows throughout include extensive full length louvre banks (glass and aluminium), bifolding doors, sliding doors, hopper and casement windows.



The bathroom windows are unusual in that they swing open at the top enabling cool air from the ground to be sucked in by the convection pull of warmer air rising inside the home.

Upstairs, partition walls encourage airmovement between rooms and a sloping ceiling upstairs leading to celestory louvres enables warm air to escape to the outside (when the windows are open).

The open staircase functions as a lightwell and ventwell for the entire home. Natural daylighting eliminates the need for electric lighting in the daytime for most rooms.

Solar Power Generation

A 1kW grid connected solar panel array on the roof. The system is designed to produce up to 7kW per day.

Hot Water Heating

Roof mounted solar hot water system with tank on roof. Electric boost is manually operated.

Energy Efficiency

Electricity bills in the home range between \$20 and \$80 a quarter.

The house has excellent natural day-lighting achieved through the extensive use of floor to ceiling louvre windows, stained glass feature windows (to living areas) and slumped glass window cubes (to bathrooms).

Lighting throughout is energy efficient and includes circular, linear and compact fluorescents as well as LED downlights.

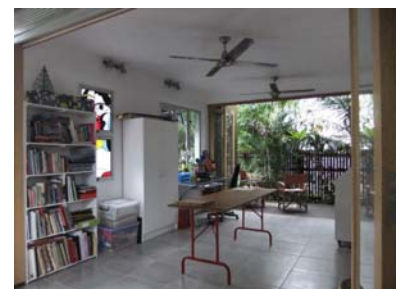
Appliances have been kept to a minimum and chosen for energy efficiency.

Cooking is with LPG (liquid petroleum gas).

Ceiling fans have four blades rather than three to achieve more air-movement at slower fan speeds. Extension drops maximise the distance between the fans and the ceiling. Material is marine-grade stainless steel to avoid corrosion.

Inverter air-conditioning has been installed but is rarely used apart from for maintenance.

The house has been fitted with a charging point for an electric car.



Water Efficiency

All fittings are minimum 4-star rated including 2 dual flush toilets, vanities, kitchen sink and shower mixers. Front loading washing machine is 4.5 star water rated and 3.5 star energy rated.

A 10,000 litre rainwater tank is installed and used for drinking and watering potplants.

Irrigation is battery (solar charged) rather than mains powered and is a water efficient micro system.

Use of recycled materials

Kitchen bench top is made of recycled pine.

Special Garden Features

A lush rainforest garden (which is now relatively self sustaining waterwise) immediately along the southern boundary provides screening from neighbours, creates a cool microclimate immediately adjacent the home and a green 'view' from inside.

Existing mature trees retained on the block.

Resource efficiency

The house is sited on only a 380 sqm block. Area under roof is around 185 sqm. Fingerlips on kitchen cabinets avoids need for handles. Large format floor and wall tiles promote easy cleaning.



Flood damage has been minimised by raising the concrete slab ground floor slightly above extreme flood levels. Walls have been strengthened to resist cyclonic projectiles and wall materials to resist water damage.

Art

Following the principle that there should be 5% artistic component in everything, artistic features of the home include: Timber boardwalk and external timber work to create a line of continuity around the building, Slumped glass window cubes to bathrooms; a variety of window shapes, including a large number of contemporary stained glass windows inspired by Picasso and Le Corbusier amongst others; tempered glass kitchen splashback featuring fern silhouettes, replicated in cutouts in ply timber above kitchen cabinets; steel whalebone spine to staircase and laminated plantation hardwood timber treads; art nooks and walls designed in at concept; welded steel artwork for safety rail adjacent stairs and for security grills on ground-floor windows.



Wellbeing

Feng Shui principles have been applied to avoid energy blockages and ensure air and energy flows and that it simply feels good. The result is a nurturing and beautiful home.

