TROPICAL SUSTAINABLE DESIGN CASE STUDIES

Clare Street

Project type: Residential

Location: Parramatta Park, Cairns, QLD, Australia
Year of completion: 2007

- **Modest, tropical 'upside-down' townhouse**
- **Exemplary infill development in a heritage precinct**

OVERVIEW

This is a modest tropical townhouse on a 195m² freehold block. It demonstrates exemplary infill development, both in its streetscape presentation and also as part of the broader development of the small inner urban subdivision.

It is a demonstration project to show alternative densification models suiting a heritage precinct in the inner city area of Cairns. The view was taken that the tenure of land was irrelevant to amenity. A faith that there was a gap in the inner city market between walk up units and old Queenslanders presented an opportunity for ingenuity, creativity and skill that resulted in an upside down townhouse, highly suited to a tropical climate.

Awards: Regional Commendation at the 2014 Far North Queensland Regional Architecture Awards

PLANNING AND MANAGEMENT

The inner city suburbs of Cairns have Queenslander style homes mixed in with 'nineties and noughties' three storey walk up unit developments. The Cairns Regional Council developed a Character Precinct Code to

preserve the remaining Queenslander houses.

The very small lot size is only 195 m² and, at the time, the Cairns planning scheme minimum lot size for residential homes was 800m². The development application argued on performance criteria and that the size of the lot clearly suited the proposed use. This was shown by designing a small house that fit this lot size. It satisfied streetscape, amenity and tropical living outcomes. In addition its existence as urban infill development supports wider urban sustainably through urban consolidation, reuse of existing buildings, and the added social sustainability of incremental infill versus rebuilding and repopulating whole suburbs.

From a development perspective, the townhouse is small in scale and has freehold tenure. It has limited exposure to risk versus large scale developments. It was believed the value of the house would improve exponentially over time. It is detached, modern, yet sits comfortably in its street. It is tropical, light filled and energy efficient. It is not a traditional Queenslander or a block of flats, and the difference will always hold its value.

The overall success of the project relied on the integration of allied disciplines including engineers, landscape architects, artists and other specialists.

SITE

The site is 195 m² and was originally part of a small subdivision in inner city Cairns. The small site was created out of larger irregularly shaped property. The original land parcel was an 'L' shaped site with a 30 metre frontage. It had an existing 1950's Queenslander style home to the front of a rambling single storey masonry extension with a neighbouring site added in the nineties.

DESIGN

The architects designed this upside-down townhouse, meaning living areas are unconventionally upstairs and bedrooms are downstairs. The proposal seemed obvious for the tropics. Living upstairs gets better breezes and outlook as well as the opportunity for elevated decks and high ceilings.

Contextualism is the defining parameter of the Cairns Plan Character Precinct Code and the house does everything to the book: lightweight construction, mixed claddings and window styles. In particular the front sloping roof and louvred wall reference the front verandahs of little 1940's workers cottages. Yet the townhouse subverts this subtly, with a spilt level roof, asymmetrical gable and front deck. It pushes forward as far as possible to retain a second off street car park, and lines up with the existing Queenslanders next door.

The design principles are traditional and fundamental. All habitable rooms have cross ventilation. The elevated deck sits over a car park and enjoys western mountain views. A study room is perfect for the louvred verandah effect and picks up left over space from a tight set of stairs.

Big sliding doors open up the deck to the interior with the kitchen relating to living, dining and deck areas equally.

Downstairs, two bedrooms benefit from the south easterly and north easterly prevailing breezes. Wet areas are broken up into a functional laundry, toilet and bathroom, using some hard argued for 'build to boundary' space to achieve the width for these spaces.

While the bedrooms get less breeze than upstairs, the compromise is that it is cooler at night and bedrooms are more likely to be air conditioned in summer. All habitable rooms are cross ventilated through lower openings to the north east and south east breezes.

Rising hot air vents to the north west through vaulted ceilings and high level openings. The bathroom and toilet are naturally ventilated.

Awnings shade windows and protect them from driving rain.

MATERIALS

Structural materials include plantation timbers and weathertex cladding.

Privacy windows include obscure glass and aluminium blades designed to allow them to be kept open for breeze while providing alternative orientations for privacy and driving rain.

The house is protected from heat gain by wall insulation, sun shading and eaves. The roof uses bulk insulation as well as a double layer reflective foil insulation plenum drawing air from the east slotted eaves, through to the ridge vent.

ENERGY

The home is designed to function well passively for the tropical climate to minimise the need for mechanical cooling. Ceiling fans are located with the aim to increase evaporative cooling and reduce reliance on air conditioning. The solar PV array and solar water heating are installed with the aim to take advantage of great solar access in tropical latitudes.

WATER

As a simple house, services were straightforward however the house manages to fit onsite a rainwater tank that collects 5000 liters of rainwater. It is plumbed into the toilet, laundry and irrigation system to water the garden. The tank is situated to the front of the property so that during the wet season and periods of very high rainfall any over spill will fall towards the street drains.

OWNERS/USERS STATEMENT

"Well-crafted and maximizing the use of a very small site, this compact upside down townhouse is an excellent alternative for densification and assists in maintaining the identity of a Cairns character suburb". *Jury citiation AIA FNQ 2014 regional commendation award*

PROJECT TEAM

Base building architect/ designer: Studio Mango
Energy efficiency rating consultant: Green At Heart

Photographs courtesy of Kym Joseph

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

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