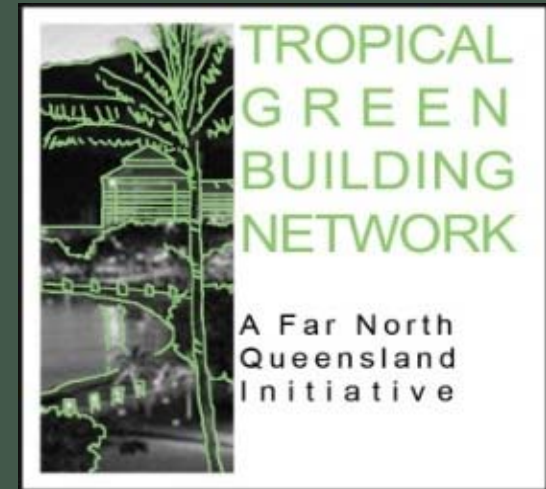


Photo:  
Tropical North Queensland TAFE  
BLOCK J HEALTH and  
SUSTAINABILITY PRECINCT  
Total Project Group Architects



ADVANCING TROPICAL GREEN BUILD



**presenter**

**Emma Thirkell**

Member Royal Institution Chartered Surveyors MRICS  
Bachelor Business Property & Land Economics University of Queensland

Director: Thirkell Consulting Engineers & Beachcomber Building Solutions  
Operator of [www.GreenBuild.com.au](http://www.GreenBuild.com.au) tropical and eco-living resource  
Tropical Green Building Network: Steering committee member

**greenbuild**.com.au  
tropical eco-building & living

The Tropical Green Building Network aims to encourage learning and leadership in sustainable tropical built environments.

The network also aims to promote information sharing and collaboration between individuals and organisations in the industry to improve practices that work towards sustainability.

The network has over 300 members from varied professions including builders, home designers, architects, government advisers, engineers, town planners, university lecturers, building technicians and building contractors and suppliers.

WILLIAM MCCORMACK  
PLACE STAGE 2

CA Architects and Cox Rayner Architects



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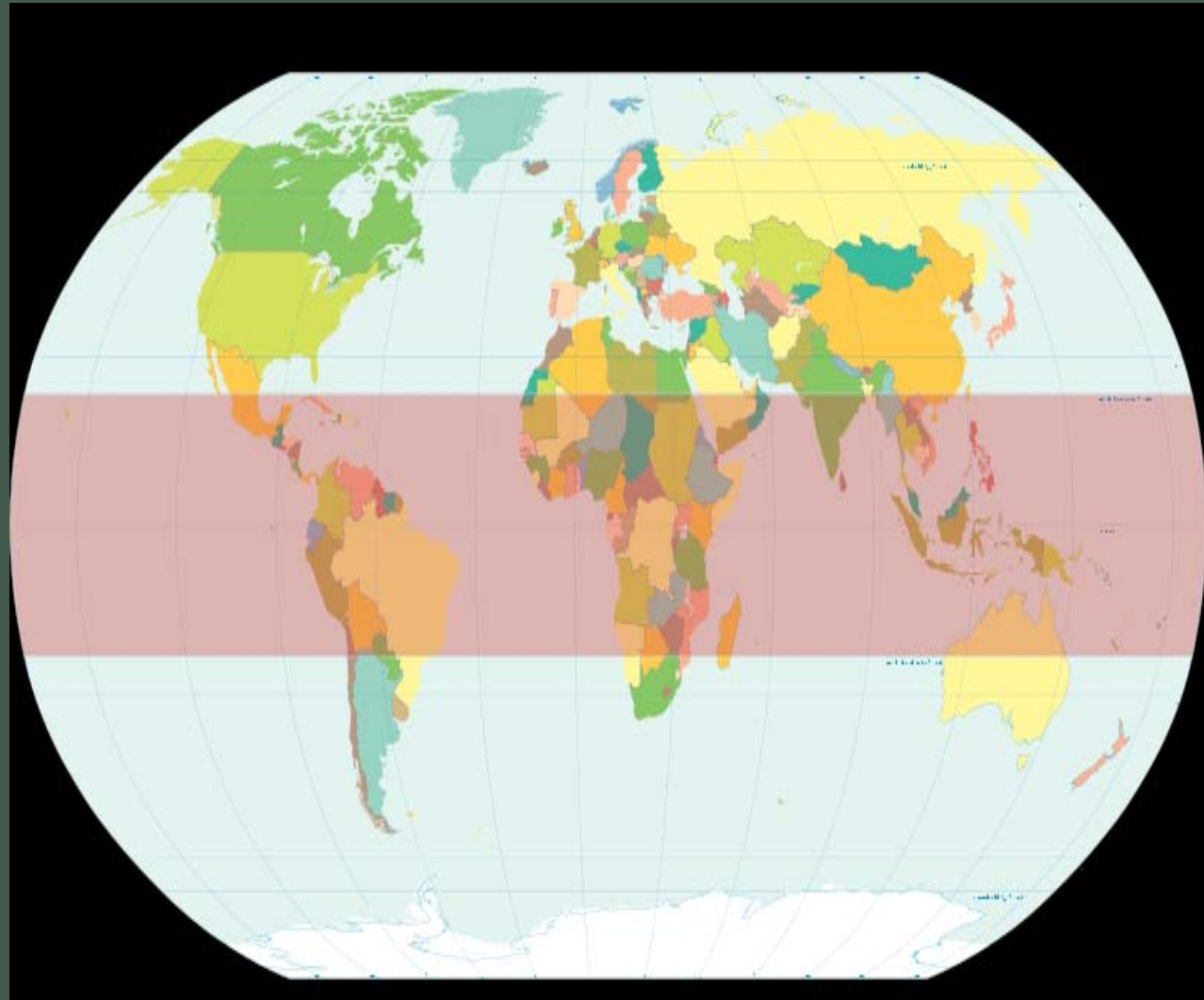
**Tropical Green Building is growing rapidly worldwide due to scarcities of natural resources, rising costs of fossil fuel energy, rising material costs and climate change concern.**

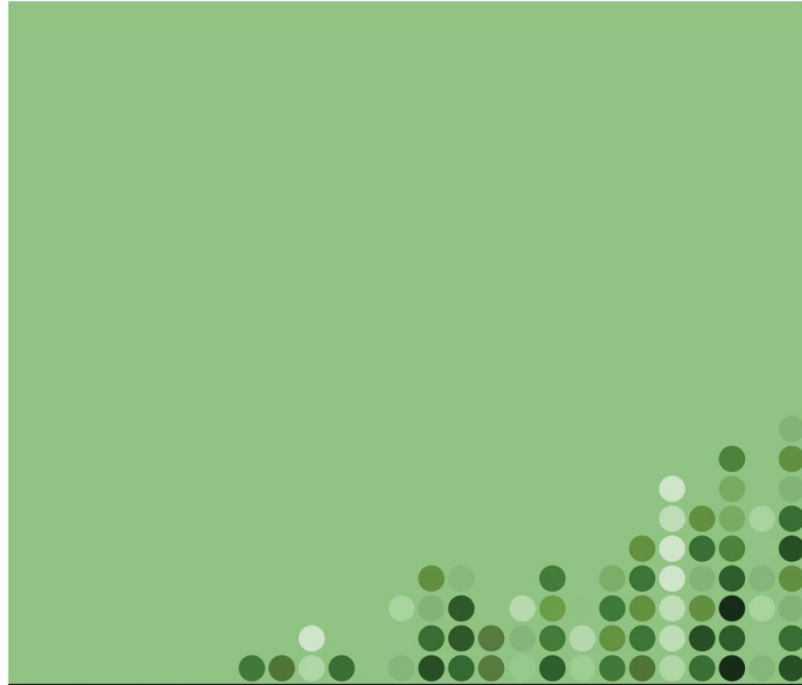
**The economic growth forecast for the tropical zone including India and South East Asia will lead to increased demand for innovative, climate resilient, energy efficient tropical green build technologies.**

World map with the  
inter tropical zone  
highlighted in red

## the tropics

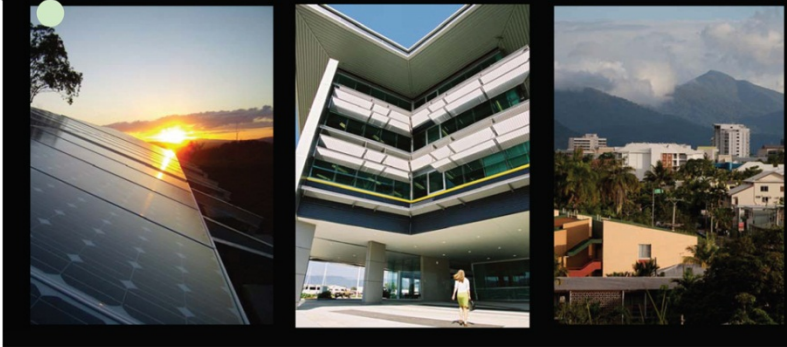
North Queensland,  
one of the worlds  
most developed  
tropical regions, has  
the expertise,  
technologies and  
solutions for building  
design and  
construction for  
tropical lifestyles





## Advancing Tropical Green Build

Connecting Tropical North Queensland Capacity to Market Capability Plan



greenbuild.com.au  
tropical eco-building & living

ed|SAVVY



Queensland Government

## Advancing Tropical Green Build:

- Business Directory

112 North Queensland businesses profiled in the directory.

- Connecting Tropical North Queensland Capacity to Market Capability Plan

117 businesses were surveyed to determine the composition, capability and economic value and to identify market opportunities and industry challenges for the future growth of the sector.

download from  
[www.greenbuild.com.au](http://www.greenbuild.com.au).

## What is tropical green building expertise?

- Cyclone/ Tornado and storm resilience.
- Planning, architecture and engineering for hot humid climates.
- Water supply and management for up to 1:8 dry/wet season volumes (temperate climates generally manage 1:3) .
- Climate change adaptation and resilience (including energy efficiency).
- Tropical health considerations including pest and disease control around buildings.
- Natural resource protection.
- Heating, ventilation and air-conditioning for hot humid climates.
- Smart building technologies suitable for use in hot humid climates.
- Reducing maintenance costs due to building and product failures in hot humid climates.
- Disaster management and recovery, de-construction and recycling.

The following slides are examples of tropical buildings in North Queensland

# MISSION BEACH HOUSE

Chris Van Dyke Building Designer

Pavilion Style building with single depth rooms for maximum cross ventilation.

Flexible boundaries between indoor and outdoor space

Openable sides and louvres for cross ventilation.

High ceilings for convection cooling.

Deep overhangs for sun & rain protection.

Roof ventilation to allow hot air to escape.

Raised platform maximise ventilation through and around the building.



# DISPLAY HOME PALM COVE

Total Project Group Architects

Pavilion Style building with flexible boundaries between indoor and outdoor space.

Raised platform to catch cooling breezes.

Flexible boundaries between indoor and outdoor space for flexible living.

High ceilings and openable sides for maximum natural ventilation.

Locally sourced stone



# HP HOUSE, CAIRNS

## MMP Architects

Oriented for minimum solar heat gain.

Pavilion Style building with flexible boundaries

Single depth rooms for maximum natural ventilation.

PV cells on roof. Solar hot water. Locally sourced stone. Sustainably harvested timber.

The building 'floats' on its galvanised steel support structure which carries through from the ground to the roof ensuring minimum site disturbance, low maintenance and structural integrity.

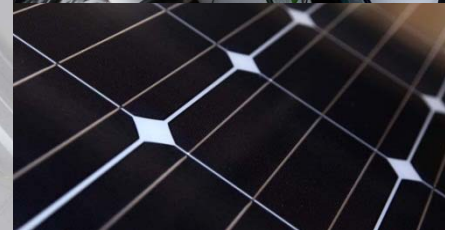
Completion of the roof early in the construction process afforded weather protection for the following trades

Photographer: Michael Martino

# KENICK CONSTRUCTIONS

Affordable Tropical Sustainable PROJECT HOME Redlynch Valley Designer: Green at Heart

Completed 2012  
Cost \$250,000  
Passive design  
3 bedrooms & 2 bathrooms  
Media Room & Open living  
Water saving  
Solar and Zero Energy  
No VOC paint or cabinetry  
Earthwool insulation  
Material recycling





## TEECE HOUSE EARLVILLE

Designers

Beachcomber Building Solutions

Thirkell Consulting Engineers

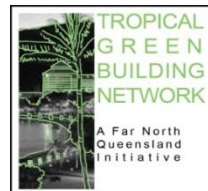
Builders

IFCM Constructions

Australian Finalist HIA GreenSmart



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tropical eco-building & living



## TAFE BLOCK J HEALTH and SUSTAINABILITY PRECINCT

- First educational building in Queensland to be designed to achieve a 5 star *GreenStar* rating in a tropical/ hot humid zone.
- 5 star rating recognises and rewards “Australian Excellence”



# WILLIAM MCCORMACK PLACE STAGE 2

CA Architects and  
Cox Rayner Architects

Photographs:  
Christopher Frederick Jones

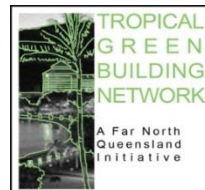
## Star Gazing

6 Star *Green Star*  
Office Design v2  
First office building in  
regional QLD and first  
in tropical climates!

Registered for  
GreenStar-Office AsBuilt v2  
GreenStar-Office Interiors v1.1



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tropical eco-building & living

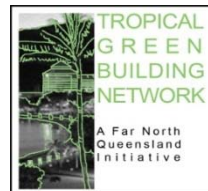




**Designers**  
**Beachcomber Building Solutions**  
**Thirkell Consulting Engineers**  
**Builders**  
**Dawsons Construction**



**Completed 2011**  
**Café & Gallery**  
**Art & Craft Workshop**  
**Set on the remote Bloomfield**  
**River, Wujal Wujal**



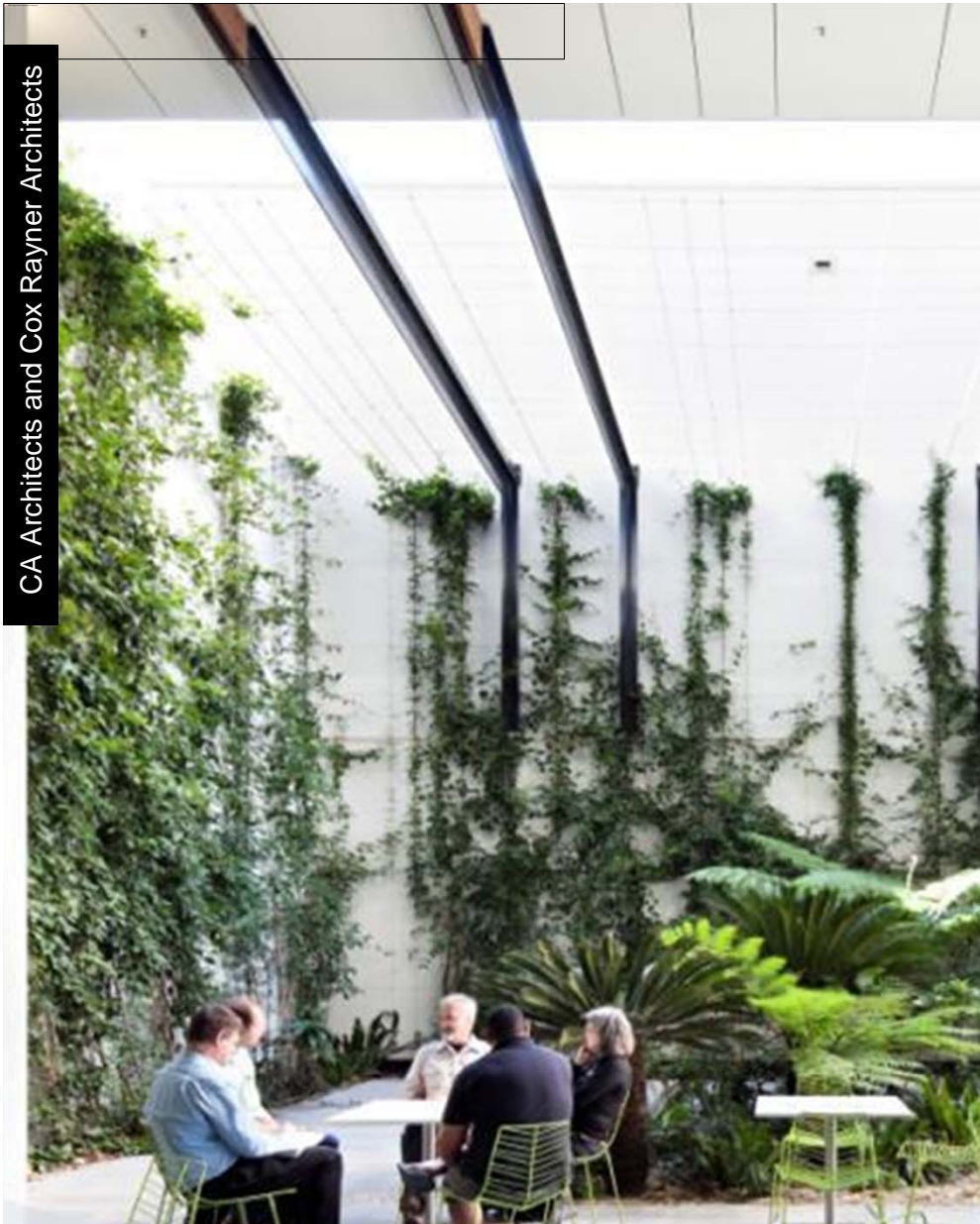
**School of Dentistry  
James Cook University  
Cairns Campus**

Architects: **Suters**pgd

Completion: 2010

The most advanced dentistry  
facility in Australia.





## Connecting Tropical North Queensland Capacity to Market Capability Plan

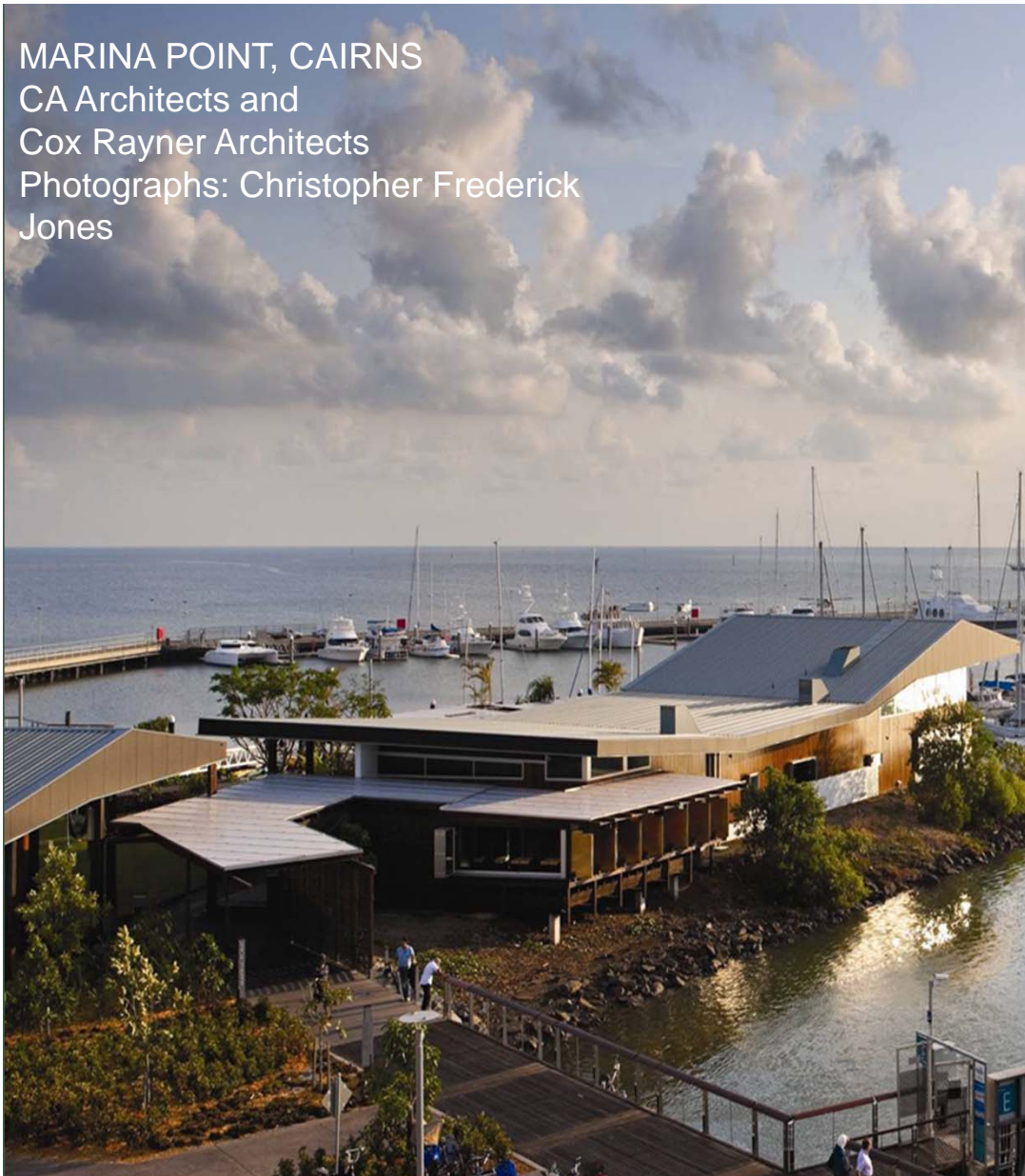
### REGIONAL ECONOMIC BACKGROUND

- North Queensland leads a large construction sector and \$12.5bn in total value of building approvals over the six years to 2010/11.
- Cairns & Townsville has almost 900 manufacturing businesses and over 5,200 construction and 2,100 professional, scientific and technical businesses.
- We are well positioned to service PNG and the Asia/Pacific area.

### CURRENT CAPABILITY

- Very strong in tropical design, smart technology, development and construction.
- Strong in water engineering, air-conditioning, consultancy, advice and climate resistant products.

MARINA POINT, CAIRNS  
CA Architects and  
Cox Rayner Architects  
Photographs: Christopher Frederick  
Jones



## Connecting Tropical North Queensland Capacity to Market Capability Plan

### VALUE OF THE TROPICAL GREEN BUILD SECTOR

- Gross earnings is estimated at \$170 M p.a.
- Exporting represents 14% of the sector with great opportunity.
- Total employment of businesses surveyed 2,300 people.
- Growing rapidly at an average of over 10% p.a. over the past 10 years.
- Businesses anticipating growth of 10% to 15% p.a.

## Connecting Tropical North Queensland Capacity to Market Capability Plan

### TRENDS, OPPORTUNITIES & IMPEDIMENTS

#### Key Growth influences include:

- Greater awareness of sustainable building benefits.
- Rising energy costs.
- The need to combat hazards
- New improved technology.
- The increasing capability of local firms in the field.

#### Major impediments to growth include:

- Lack of understanding of sustainable built environments suited to the tropics.
- Costs associated with building 'worlds best practice' to meet Australian Standards and Construction Codes.

# Connecting Tropical North Queensland Capacity to Market Capability Plan

## Our Competitive Advantage:

- Quality, experience and track record .
- Close proximity to S.E. Asia

## Our Competitive Disadvantages:

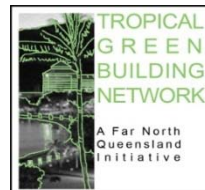
- Most business structures small to medium size.

## New Market Opportunities:

- Focus on domestic markets.
- Start out on the path of penetrating overseas markets.



Designers  
Beachcomber Building Solutions  
Thirkell Consulting Engineers Builders  
Dawsons Construction





## Connecting Tropical North Queensland Capacity to Market Capability Plan

### INVESTMENT, EQUIPMENT & TECHNOLOGY NEEDS

- Specialised equipment and technology.
- The construction sector has difficulties financing it.

### RESEARCH, DEVELOPMENT & CERTIFICATION

- Accelerated testing and certification.
- 'Whole of Life' performance.
- Review of codes, certifications and ratings for tropical application and calibration with international applications in tropical climate zones.

## Connecting Tropical North Queensland Capacity to Market Capability Plan

### LABOUR SKILLS & TRAINING

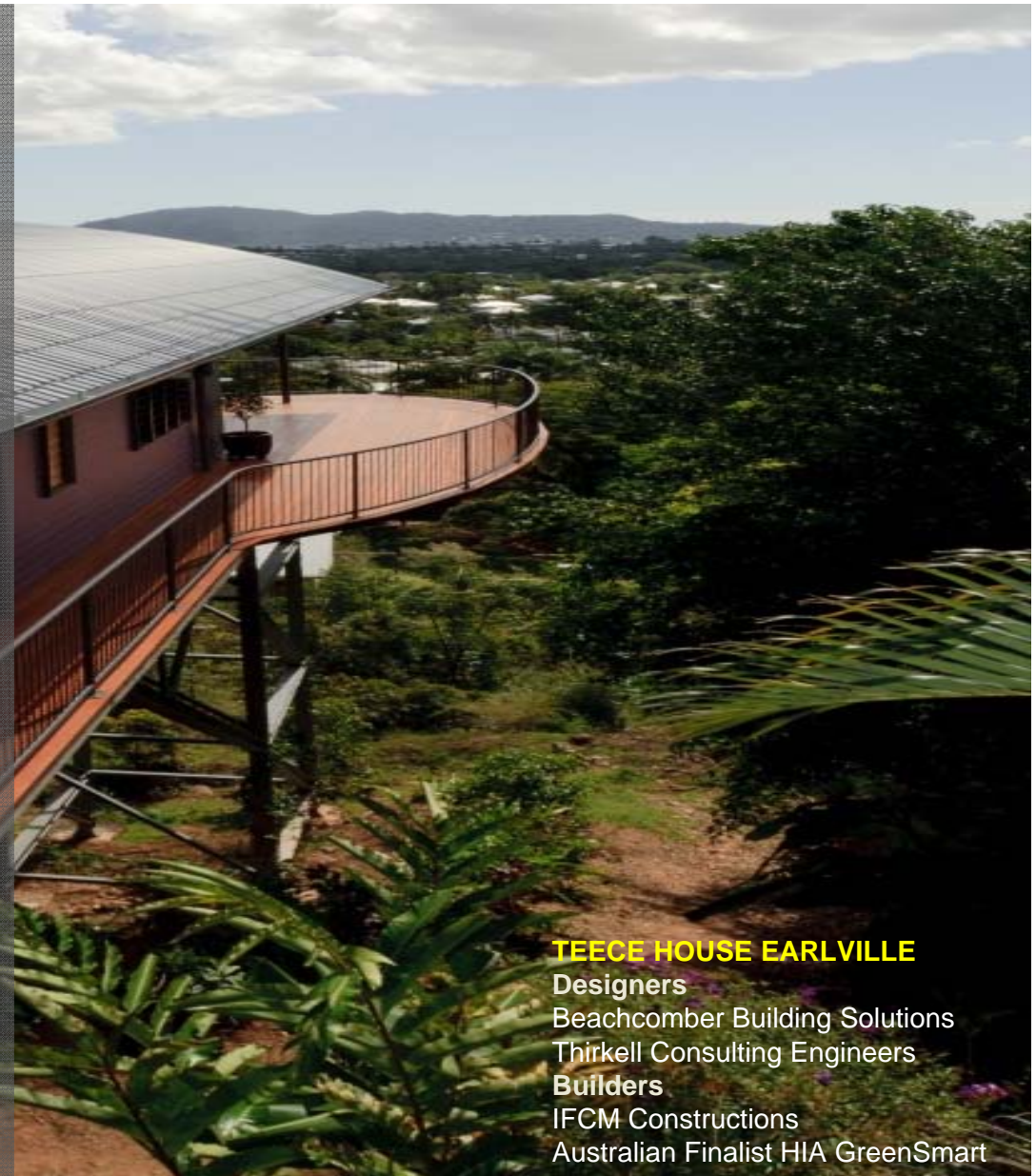
- Strengthen local availability.
- Tropical zone collaboration.
- JCU School of Tropical Architecture and Design.
- Continuing Professional Development as well as technical and trades skills based courses.
- Focus on emerging technology and tropical applications.

TAFE BLOCK J HEALTH and  
SUSTAINABILITY PRECINCT  
Total Project Group Architects

# Connecting Tropical North Queensland Capacity to Market Capability Plan

## ACTIONS TO PROMOTE GROWTH

- Accelerate development of specialist knowledge and skills.
- Strengthen relationships throughout the tropical zone.
- Raise awareness to assist export development.
- Assist developing products.
- Support recycling of building material waste.



### **TEECE HOUSE EARLVILLE**

Designers

Beachcomber Building Solutions

Thirkell Consulting Engineers

Builders

IFCM Constructions

Australian Finalist HIA GreenSmart

MARINA POINT, CAIRNS  
CA Architects and  
Cox Rayner Architects  
Photographs:  
Christopher Frederick Jones

## CONCLUSION

There are multiple challenges associated with the planning, design, construction and operation of sustainable buildings and infrastructure in tropical environments as compared to other climatic environments.

Far North Queensland as one of the few developed tropical regions in the world is poised to share its expertise with the rest of the world .

Inspirational and  
creative spaces  
encourage sharing