The Cairns Institute

Project type: Institutional

Location: James Cook University, Smithfield, Cairns, QLD, Australia
Year Completed: 2013

Imaginative and integrated design solution
Material choices are robust but also elegant for a university building with civic functions
The building is designed with passive solutions as wetobecome

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quality of environment, and will be in line with the university's aspirations to achieve a sustainable outcome for the building.

Funding for the project was provided by The Commonwealth of Australia through the Department of Innovation, Industry Science and Research, and further funding by James Cook University.

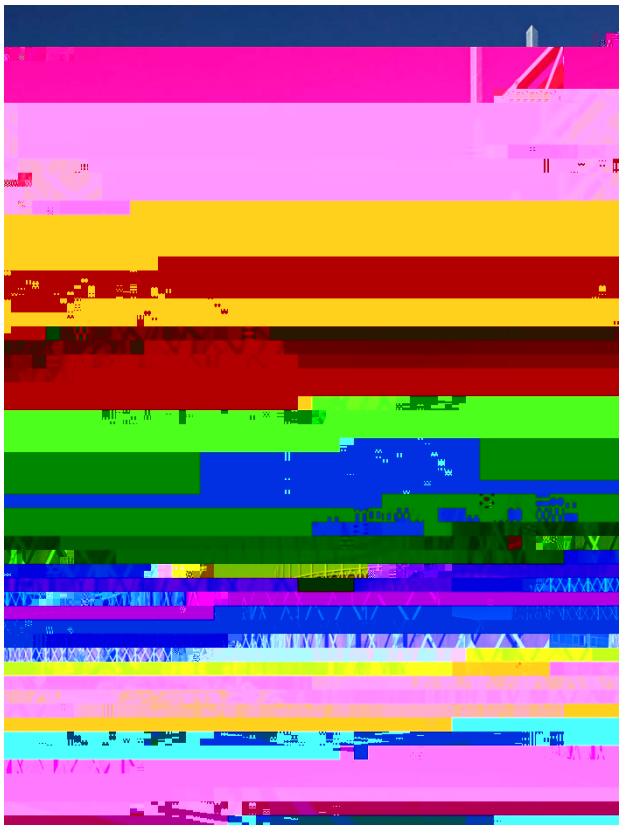
PLANNING AND MANAGEMENT

The building was planned as three distinctly different areas.

minimal planting. The major landscape element is turf, in two separate colours and selected for little or no mowing. Mulches are gravel and gibbers requiring very little maintenance. Soils are naturally moisture-retaining clays native to the site.

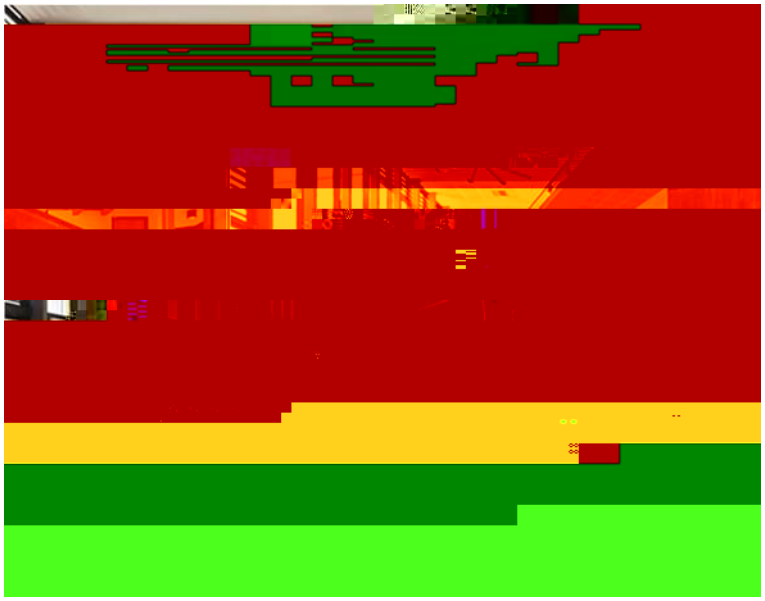
DESIGN

The most striking visual element is 'the trellis' that is selected as the building's most external feature. By scaling it up and 'draping' it around the building an overall building form that is legible from a distance also provides an armature for landscape interventions (eg creepers) should JCU decide to experiment with 'green wall' ideas later.



Another critical platform to the design was the steel 'knowledge wall' that forms an interface between the workspace and the foyer. The central idea was to create a building that anyone passing through could engage with – one can see knowledge and see it being created. This open

The base structure primarily consists of reinforced concrete columns and walls supporting ‘flat plate’ suspended concrete slabs. Composite concrete, pre-cast concrete and structural steelwork also contributes



The major public space in the building is able to be naturally ventilated when ambient conditions permit, via auto-opening louvers by Safetyline Jalousie JX adjustable louvers and motors. The large ceiling fans are 'Big Ass' fans.

ENERGY

The building is designed with passive solutions as well as a range of energy saving and management opportunities.

To reduce heat loads, the outer Cor-Ten steel panel façade is mounted on a sub frame with an air gap between the panels and the concrete walls to shield the concrete mass from the sun. In addition, the trellis also has a less effective shadowing effect. The steel elements cool quickly of a night-time.

To reduce heat gain glazed areas of the building are protected from sun by wide eaves and overhangs. The entry spaces are particularly wide to ensure that the threshold between outside and inside is wide and comfortable.

Building modelling ensured all facades glazing areas achieved BCA compliance of restricting at least 80% of the summer solar radiation. Low-e glazing is used in order to meet the BCA Section J glazing requirements. Certain building facades required double glazed sections to achieve compliance. This system provides JCU with extremely low thermal impact to the ongoing air conditioning operational costs.

Free daylight is provided by roof lights. Skylights by Dapalon use multicell polycarbonate with low solar heat- gain coefficient and low solar radiation transmission. Domelights are by Solartube.

A Lighting Automation System (LAS) is in place with energy efficient lights. The LAS provides readily controllable lighting modes to all multi-functional areas particularly the large theatre. The LAS also includes motion controlled lights in corridors, automatic shut off lights at a stated light level, daylight

switching of external lights, and the ability to programme master functions into any location. The analysed and modelled lights exceeded the BCA energy levels by 41%, providing the end user with optimum ongoing energy savings.

Energy meters were installed to each areas electrical distribution board for code compliance, but also to allow