

# A VERY SMART BUILDING

Watpac Limited is responsible for some of the most iconic buildings on the eastern seaboard of Australia, particularly in their traditional home of Queensland.

Projects such as the Brisbane Cricket Ground ('The Gabba') and Suncorp Stadium redevelopments are known world-wide, while other projects are better known within particular audiences.

One such project is the Queensland Brain Institute (QBI) at the University of Queensland, St Lucia campus, on the Brisbane River.

The \$56 million project is now one of the leading neuroscience institutes in the world, housing Brisbane's largest team of scientists dedicated to understanding the mechanisms regulating brain function.

This understanding will be applied in developing therapies for diseases such as Alzheimer's Disease and other mental illnesses, and promoting regeneration after brain and spinal cord injury.

The importance of the project was not lost on Watpac Construction (Qld) General Manager Errol Edwards.

"At Watpac, we're proud to be responsible for some of Queensland's landmark projects, and many of them often help to revitalise local communities," Mr Edwards explained.

"In the case of QBI, this facility is going to make a positive impact on people's lives, and it was a privilege to honour the work of these scientists by delivering a building of the quality the industry and our clients have come to expect of Watpac."

## Construction Specifications

Site preparations began in December 2005 with the demolition of several structures already on site, and construction began in March the following year.

QBI is designed to house 240 scientists and 60 support staff who have joined forces with the nearby bioscience and bioengineering facilities to form a precinct of over 1,000 specialists.

Given the nature of the work undertaken at the institute, it is fully equipped with laboratories, offices, and lecture theatres. The resulting design, by Wilson and Wardle Architects, covered a gross floor area of 13,765m<sup>2</sup> and comprises seven levels.

Level one includes a maintenance office and store rooms, change rooms, a chiller plant room, essential and non-essential transformers rooms, a communications room, aquaria holding tanks, and gas storage. Level two comprises an animal research facility, stand-by generator, offices, and plant rooms.

Levels four to six include state-of-the-art research laboratories, offices, work stations, and computer terminals, while a 200-seat auditorium on level seven provides ample space for lectures and seminars.





The laboratories have been designed to provide future flexibility in the event the configuration needs to be changed. This innovative design extends not only to the floor space, but also to the services within the ceilings.

The team also constructed links to existing walkways servicing other nearby buildings.

The building is a reinforced concrete structure with post-tensioned floor slabs and beams, with a unique façade incorporating coloured pre-cast concrete, curtain wall glazing, and feature sun louvres.

A tower crane was used for materials handling with a satellite boom handling the majority of the concrete floor pours, while mobile boom pumps were used for the in-situ coloured concrete pours.

The use of pre-cast concrete, with the variety of shapes the design called for, required extensive consultation between the architect, structural engineers, the window fabricators, and Watpac to ensure the look of the installation reflected the vision of the design team.

On the southern elevation, an area had been designed for a curtain wall with stainless steel brackets protruding through it, from which pre-cast blades, acting as sun shades, were to be affixed.

To compound the installation of the pre-cast fins, level six of the building cantilevered over this area, with the design being such that the pre-cast was installed after the cantilevered slab was poured.

Discussions were held over a period of six months with the architect, structural engineers, and the window fabricators/installer to ensure the look of the installation was what was envisaged by the design team.

The final product, Mr Edwards says, is a testament to the excellent communication between all the parties involved in construction.

“We strive to work closely with the client and consultants to foster a co-operative team approach, working towards a common goal.

“The end product is a superior quality facility that was finished on time and on budget, which has become a trademark of Watpac.”

#### Scientific Design

The building itself has a unique look and feel, brought about by well-thought-out design and building techniques.

Upon entering the building, you find yourself in a four-storey atrium with internal bridges and stairs providing access from one side to the other. Each of the stairs and bridges are clad with colour-anodised aluminium with a stainless steel handrail, and tinted glass balustrade.

Opposite the western curtain wall is a glazed art wall, which has a large ‘brain and eye’ art image on the interlayer of the glass. At 16 metres high and eight metres wide, the art wall dominates the atrium space, separating it from the main laboratory behind it on each floor it encompasses.

The result is that, through the bulk of the art wall, visitors are able to discern shapes moving, but through other partially transparent sections visitors are able to view an operating facility, bringing science to the community.

#### Environmental Principles

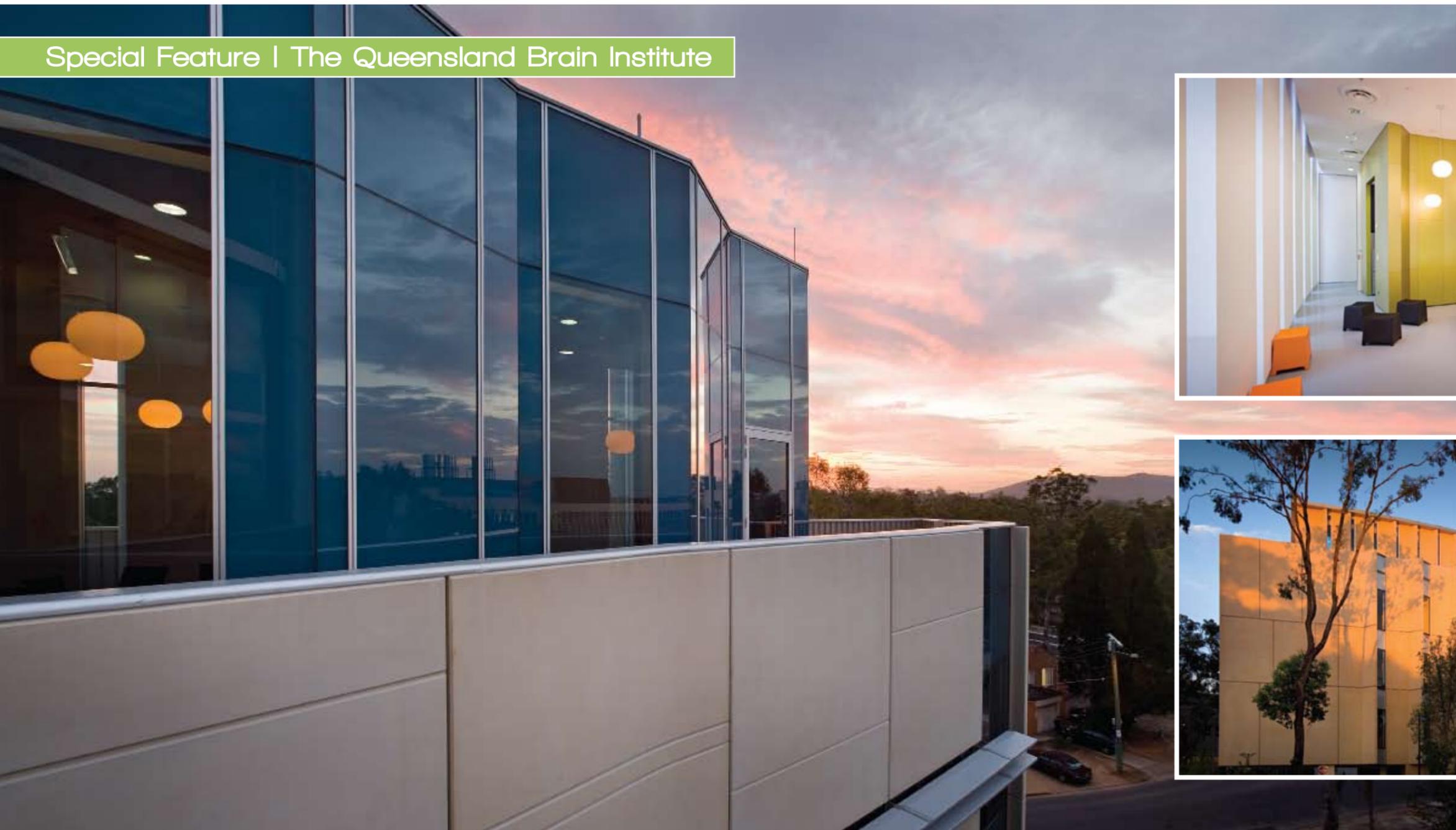
Mr Edwards said a key element to all of Watpac’s projects is a consideration for the community and the environment.

“We’re committed to being environmentally conscious, and that’s why we’ve worked hard not only to earn our membership of the Green Building Council of Australia, but also to achieve their standards.

“With this particular project we incorporated a sophisticated system of light sensors throughout the building to minimise power consumption. This system not only turns lights on and off as staff move through the building, but it also has the ability to reduce lighting levels to prolong the life of the lamps within each fitting, and thus reduce the consumption of electricity.

“We also took steps to protect existing trees and habitat that were on the site, and to manage sediment and erosion control for the overland flow of storm water, as we found out early on that the storm water was directed into the University lake,” Mr Edwards said.

## Special Feature | The Queensland Brain Institute



Storm water was not the only environmental issue—at the time of construction, Brisbane was on extremely high water restrictions, resulting in a challenge for the plumber who needed to undertake hydrostatic testing.

To combat this, a 5,000-litre water tank was installed on site that collected water run-off from a number of site sheds. This water was then piped through the building and used for testing.

The operation was a success, and the monthly audit reports from the Environmental Consultant engaged by the client spoke highly of Watpac's commitment to environmental principles.

### Challenges and Innovation

As with most projects, there were many more challenges to face.

“One of the challenges we encountered was the close proximity of the goods lift to an adjoining building,” Mr Edwards said.

“It was discovered the footings for the building were not at the depth they were expected to be, and the anchors that had been installed by the early works contractor protruded into the wall of the lift shaft.”

This problem was overcome through a redesign of the effected lift shaft wall, and the relocation of services away from the area.

In addition, the site surrounds also posed their own set of challenges.

“The biggest challenge, but one we are adept at handling, was undertaking construction in a live environment—that is, the university needed to operate as usual,” Mr Edwards said.

“As a result, we had to make sure disruption to the surrounding educational environment was minimal, but yet still adhere to the project's time, cost, and quality parameters.

“Importantly, we maintained clear and timely communication so that we could work with our clients to minimise any disruption.

“So the team developed a construction programme, in conjunction with our client, aimed at avoiding noise and vibration transmission to the connecting slabs, so as not to disrupt users and nearby neighbours.”

Clear communication resulted in excellent working relationships between all parties involved with the project, and a stellar outcome for Watpac.

QBI now stands proudly amidst its University of Queensland surrounds, and Mr Edwards says the building will continue to be an example of excellence in construction.

“We've received a lot of positive feedback on the project, from our partners and stakeholders, to the general public.

“We are truly proud to be part of the delivery process and look forward to hearing the results from the scientists in the future.”

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