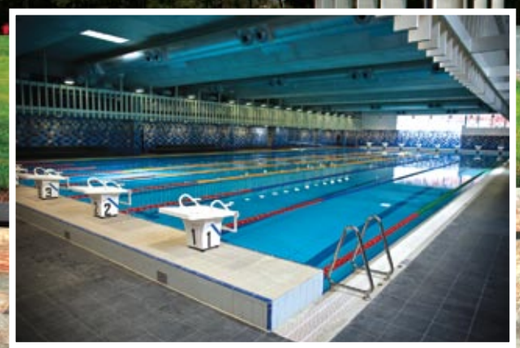
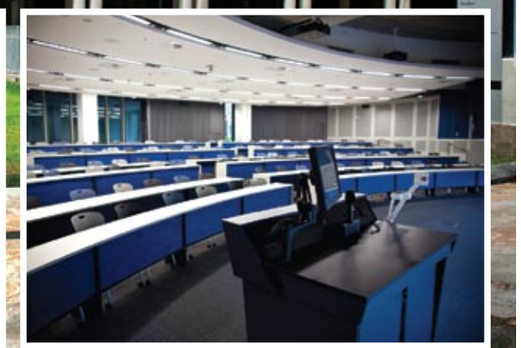
CONSTRUCTING THE FUTURE OF INNOVATIVE THINKING AT QUT





MANAGING CONTRACTOR : Leighton Contractors
PROJECT MANAGER : Thinc Projects
PROJECT END VALUE : $230 Million
COMPLETION : November 2012
STRUCTURAL AND CIVIL ENGINEERS : Aurecon Australia Pty Ltd

Higher learning and research is all about innovative thinking, and that's also been the key to the project management, design and construction task for the QUT Science and Engineering Centre (SEC). And to achieve the project with all its challenges, the talents of Thinc Projects and Leighton Contractors combined to deliver one of the Nation's first Five Star Green Star Education V1 university buildings in a manner which will inspire both students and researchers for many years to come.

Thinc's role was that of Project Manager, with overall responsibility for delivery, and Leighton Contractors undertook the Managing Contractor contract. Together they worked with the various stakeholders, including the staff and students, creating a culture of teamwork which had multiple benefits for the project.

Working closely with QUT, Thinc took a multifaceted approach to adding value to the project. "Firstly, our skills in complex stakeholder management meant the diverse community of users and stakeholders within the university were able to provide detailed input into the developing design to ensure the universities functional requirements were achieved," said Thinc Projects Director, Robin Sweasey. "Secondly, our strategic procurement advisory skills enabled us to assess the potential procurement forms for their suitability and determine which form best delivered the requirements of the Client.

"Third, our culture of rigorously managing our projects in a collaborative and cooperative manner, whilst focusing on clear obligations and accountabilities, meant the right culture of high performance within the team was created. "The entire project has been about innovation in the teaching and research activities within the University. Certainly the procurement form was a key aspect of this and the collaborative manner in which it was implemented. The inherent design of the spaces within the facility has also driven innovation in the way the occupants will work and interact. The collaborative spaces will transform the way the university community interact with each other – and this includes students, academics and industry partners through teaching and research activities."

The SEC comprises two multi-level buildings known as P and Y block constructed of concrete and curtain wall facade, linked by shaded and open green space.

P Block contains 10 levels including two levels of basement car parking, one level of retail space, two levels of teaching and learning and three levels of research in the disciplines of science, technology, engineering and mathematics, as well as project and laboratory spaces. Y Block contains retail, student support services, three levels of research space and a 200 seat function room on Level 10. The common podium area connecting the two buildings will help form the new campus heart. Beneath the podium area is a 50 metre FINA-approved pool, as well as a 1,300sqm gym. Other facilities will include a student bar, food court, bike centre, state of the art lecture theatres, laboratory and project spaces and bookstore. One of the unique features of the SEC is 'The Cube', an open-plan space over two levels in the main public area with a bank of fully interactive screens that showcase innovative technologies, and a Microsoft area, which allows sample use of the company's most recent products. SEC has been designed as a 'living building', and as an education tool which showcases the innovative and sustainable engineering techniques used in its construction, commented Leighton Contractors Project Manager, Stephen Jenkins. "This is evident in the absence of ceilings to enable students and other building users to see how the building operates, along with interactive and visually dynamic plant rooms and other building services systems throughout the centre," he said.

Sustainability initiatives incorporated into the project include extensive roof mounted solar capture, with 198kw of photovoltaic cells. The SEC also has a 838KW tri-generation plant, which not only powers the building but also exports power back into the QUT microgrid and uses the waste heat to cool the building through absorption chillers. Water efficiency measures include 236KL water storage harvesting from the roof area and air handling unit (AHU) condensate; and reticulation of grey water from showers and basins for flushing toilets and urinals.

To ensure optimum delivery of outside air, and help keep everyone's minds fresh, sensors throughout the buildings provide response monitoring of carbon dioxide (CO2) and Volatile Organic Compound (VOC) levels. Additionally, all interior finishes were selected to minimise VOC levels. Challenges abounded, not least the Brisbane floods of January 2011. From the start, logistics were tricky when it came to protecting public safety, with the Gardens Point Campus a major gateway between the CBD and South Brisbane via the Goodwill Bridge, and the area's estimated foot traffic up to 60,000 persons per week.

Eleven Thinc staff were involved in the project, including the Senior Project Manager, Project Managers, Design Manager and Stakeholder Manager and Programmers. "When working with an informed Client, a project such as this required diverse skillsets at different stages. A key feature of Thinc is that this diversity exists within our project teams and wider pool of Project Management professionals so that we are able to meet the needs of complex projects such as the SEC," said Robin. "You can have all the management process under the sun. But unless the project operates in a collaborative environment with highly skilled and committed individuals making up the team, in which every party and individual genuinely cooperates with each other in good faith within their obligations, you're going to struggle to effectively deliver. On this project, the Client sponsored this approach from the outset and the team members aligned themselves to it despite some extremely challenging circumstances along the way.

"This is ultimately what Thinc is about – delivering the most challenging projects by creating high performance teams in which individuals work collaboratively with each other to deliver on behalf of our Clients. The QUT Science and Engineering Centre is the embodiment of this and we are proud to have played our part in its delivery." Leighton Contractors had up to 60 staff working on the project at various times, with 42 separate trade contractors, giving a peak daily workforce of approximately 320.

QUT and Leighton Contractors saw an opportunity very early in the construction phase for a hands-on educational experience for hundreds of students, through the 'Learning with Leighton Contractors' initiative. Opportunities for real-world experience were provided throughout the design and construction phases, and Leighton Contractors developed a lecture series in conjunction with QUT, where experts from their project team explored subjects including engineering, safety, environment and project management.

"Leighton Contractors is very proud to be delivering this significant project for QUT. Our company places significant effort into innovation and researching the latest building technology, which has resulted in many of the buildings we construct gaining 5 Star or 6 Star Green Star ratings from the Green Building Council of Australia. We have taken these learnings from other projects to ensure QUT's Science and Engineering Centre is a model for sustainability into the future, as well as being a focus for local community life," said Stephen.

For more information contact Leighton Contractors, phone 07 3215 4600, website www.leightoncontractors.com.au

For more information contact Thinc Projects, phone 07 3221 8425, website www.thinc.com.au

MECHANICAL, FIRE, HYDRAULIC, TRI-GENERATION & ENERGY MODELLING CONSULTANTS

Commencement Date : June 2010
Completion Date : December 2012
Client : Leighton Contractors Pty Ltd
Architect : Donovan Hill & Wilson Architects in Association
Builder : Leighton Contractors Pty Ltd
Capital Value : $230 million
Building Owner: Queensland University of Technology

The development of the QUT Science and Technology precinct will deliver a state-of-the-art educational facility to one of Queensland's leading universities. Consisting of two towers of 23,000m^2 useable floor area, the building will provide:

- research and teaching facilities
- multi-purpose laboratories and lecture theatres
- workshops and practical teaching areas
- collaborative student zones
- indoor 50m swimming pool & gymnasium
- café & retail outlets
- basement car parking

Boasting a capital value of $230 million, Floth Sustainable Building Consultants was appointed by Leighton Contractors as the mechanical, fire, hydraulic, tri-generation and energy modelling consultants. The two multi-level buildings will be linked by shaded and open green space, acting as a forecourt to the restored old Government House.

This project is not only to be utilised as a building for students to study in, but for students to also study its engineering and design.

As leaders in co and tri-generation technology, Floth was required to create an energy and water efficient building, which can be researched and monitored by students and leading academics.

The brief from the client was to develop a precinct that combines 'teaching and research in science, technology, engineering and mathematics (STEM), using a world leading model, creating a dynamic hub.'

Floth Project Manager, Richard Hewitt said in order to create an energy and water efficient building, Floth implemented technology which can be used for multiple purposes, cutting carbon emissions and overall running costs. Floth installed a tri-generation plant which is run by a gas powered generator, rather than electrical supply from the grid, which is a first of this capacity to be put into QUT.

The incorporation of the 834kW capacity (generator rating) tri-generation plant will provide simultaneous heating and cooling for the precinct's domestic hot water, the indoor swimming pool heating, dehumidification and air conditioning demands. As a result the efficiency of the building is immediately improved due to the reuse of the inner waste heat from the generator.

Students will have the opportunity to study the mechanics of the tri-generation plant in a, hands on way. This practical aspect of the learning process will complement their theoretical studies and enable students to appreciate the complexity of the technology used in the building.

The buildings' expected greenhouse gas emission reductions have been calculated at 69.3 percent, equating to a CO_2 emissions reduction of 1,329,349 kg/per year when assessed under the Green Star Education V1 rating tool.

Floth assisted the project team in helping the project achieve a GBCA 5 Star Green Star design rating.

For more information contact Floth, phone 07 3252 0977, fax 07 3252 2499, website www.floth.com.au

AN INTEGRATED GREEN APPROACH TO WASTE MANAGEMENT

Transforming one of Brisbane's least attractive buildings had an inevitable consequence – the creation of thousands of tonnes of mixed demolition materials, followed by waste created during the construction of the new QUT Science and Technology Precinct. Leighton Contractors relied on Transpacific Resource Recycling to deliver a clean, green and cost-effective solution for the removal and redeployment of these materials.

Transpacific performed all on-site waste management from the very start of the project in 2010 and will be involved until final completion and handover, with their hook and skip team working in coordination with Transpacific's Cleanaway business to ensure waste is dealt with in an efficient manner.

"This has been an exciting project which has challenged us, and we are proud to be part of this development," said Transpacific Resource Recycling Operations Manager, Andy Heironymus. "We have provided engineered craneable bins, which have been built to twice the Australian Standards, to ensure maximum safety and durability on projects such as QUT Sci-Tech. We have also utilised our complete remote control system for the skip trucks.

"The driving force behind this initiative was to remove the driver from as much risk as possible, while maintaining constant visual contact with the surrounding environment," he said.

The major challenge for Transpacific throughout this project has been the steady flow of pedestrian traffic in close proximity, with the facility in use by QUT students throughout construction. As a Government-controlled University project, there are also extremely strict site rules to adhere to.

Transpacific's Resource Recycling business has been operating at the forefront of the waste industry for five years, meeting the needs of major construction contractors throughout the Brisbane Metropolitan area and surrounds. Their substantial track record includes another recent flagship Leighton project, 111 Eagle Street.

Transpacific Resource Recycling has approximately 100 staff including operators, drivers, management and technical experts in OH&S and Environmental Management. They are committed to environmentally sustainable development, and are members of the Green Building Council of Australia, with all operations carried out according to the ISO 9001standard. In addition to waste removal, recycling and redeployment, the company supplies recycled aggregates from their crushing plant, and has the capability to handle contaminated soils safely and effectively.

"We have a reputation for high response serviceability and professionalism. Transpacific is a one stop shop where the client can utilise our substantial experience in C&D waste management, general waste management and liquid waste removal while being at the forefront of environmental awareness and safety," said Andy.

For more information contact Transpacific Resource Recycling
Ph: (07) 3723 7600
Address: 343 Bowhill Road, WILLAWONG QLD 4110
Website: www.transpacific.com.au

MAKING A SPLASH AT QUT

Work-life balance is important for places of higher learning and research, which is why L & V Project Pools have contributed a refreshing element to the QUT Science and Technology Hub. They have constructed a 50-metre FINA-approved below ground level swimming pool for Level 2 (Ground Floor) of the project, which is also naturally illuminated by skylights to the forecourt above.

The Aquatic Centre also has views at the Southern end to the Brisbane Botanic Gardens, and is located adjacent to the gymnasium, push bike storage, showers and locker rooms. It will be operated by Healthstream, and be open for use in early 2013 by staff, students and the general public.

For two decades L & V Project Pools have constructed more than 4,000 swimming pools.

L & V Project Pools excel at constructing concrete pools, spas and water features for projects across the commercial, residential, recreation and public space domains. They are committed to best practice, and were awarded National Sustainable Pool of the Year 2010 by SPASA, Queensland Pool Builder of the Year 2011, the SPASA President's Award in 2011. They have been awarded more than 120 National & Queensland SPASA awards since 1994.

They are capable of providing the full scope of an aquatic project, from initial design consultations, through to project managing construction, installation and commissioning. Their own expert teams undertake the shell construction and installation of pool plumbing and equipment. Specialist solutions including acoustic springs or bearing pads, glass windows pose no issues for their skilled teams. Every project is given the highest level of personalised attention from start to finish.

From small water features, or penthouse lap pools, through to the major aquatic features at Palazzo Versace Hotel and Condominiums and Sun City Resort, L & V Project Pools have built a solid reputation as a leader in the field.

Other recent projects include Sunland's Q1 Project Building (over $3 million contract value); Riverstone Crossing for Stockland; Southern Cross University, Lismore for Glenzeil; and all the pools, spas and water features for 'The Oracle' at Broadbeach for Grocon. Their website incorporates commercial and domestic photo galleries with lists of projects undertaken, awards won and background information

For more information contact L & V Project Pools, phone 07 5597 4220, freecall 1300 552 465, fax 07 5597 4225, website www.lvprojectpools.com.au

A SERVICE-FOCUSED APPROACH TO SECURITY AND SAFETY

From the very start of the QUT SciTech project, Executive Security/Site Services Group (ESG-SSG) had personnel on site to keep everybody safe. Their first task for Leighton Contractors was to supply traffic management services for the extremely busy site, managing the challenge of both pedestrian and vehicular access around the area.

ESG-SSG supplied up to ten traffic controllers and one safety vehicle daily, plus up to two security guards at night and on weekends .

Executive Security Group/Site Services Group was formed in the early 90s by industry professionals, with the aim of meeting the increasing demand of major projects for a professional, reliable solution to security and traffic management needs.

"We are a new breed of services company - computer literate, and with a high level of customer service skills," said ESG-SSG Managing Director, Andrew Bourke. "Our company's combined field management team has in excess of over forty years experience in the security and traffic control industries. We believe our organisation has the infrastructure and policies required to lift our level of services above that of our competitors."

Ex-Service personnel comprise a large proportion of the ESG-SSG staff, and the management are hands-on, continually assessing the performance of field staff in order to provide a constantly improving level of service.

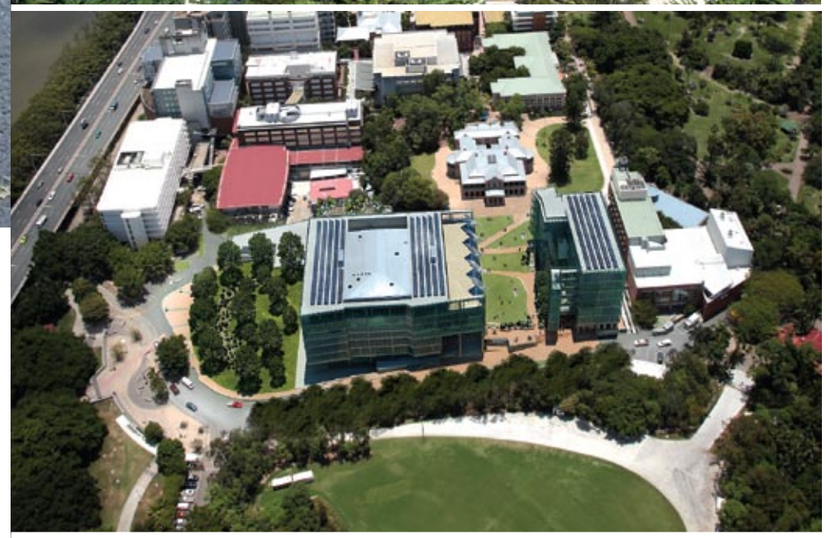
The management are also thoroughly experienced in both Workplace Health and Safety and Risk Management, giving their operation a leading edge. ESG-SSG has a $20,000,000.00 Public Liability policy, and full WorkCover protection, further ensuring the integrity of their clients.

Their capabilities and services include security guards, mobile patrols, alarm monitoring, canine units, traffic controllers, safety vehicles, traffic planning and permits.

"Due to our experience in this industry, we have acquired a focused, committed and professional approach to the security and traffic control industries, and perform efficiently and effectively under the demands of a challenging job," said Andrew.

"Security and Traffic Control are an important and integral part of any sizeable organisation, and with this in mind our management give their full personal attention to our clients and their needs. We pride ourselves on our ability to do the job quickly and quietly, and this philosophy is shown in all aspects of security and traffic control work undertaken by us."

For more information contact Executive Security Group / Site Services Group, Postal: PO Box 3362 Tingalpa DC QLD 4173, phone 07 3901 2333 fax 07 3348 8268, mobile 0413 748 029, OPS 0402 175 968 email ops@executivesecurity.com.au, website www.executivesecurity.com.au



Ai3D™
Virtual World Creation

Ai3D is proud to assist Leighton's and Queensland University of Science and Technology on the QUT SCITECH project. Our company specialises in industry leading 3D and 4D graphic communication solutions from concept through design, construction and litigation.

For the QUT SCITECH project, Ai3D created a fully interactive real-time model viewable from any position or angle in 3D. The data for initial construction came from various consultants' data - hand sketch, revit and dwg information at several design iterations as the design evolved.

High Resolution Renderings for Building Scaffolding printing and on-site project billboards were also commissioned. Additionally, pre-rendered animations were captured from the interactive real-time model.

Ai3D are regularly invited to work with consortiums and large tender submissions as we specialise in cutting edge processes and techniques which were applied to the SCITECH project. Ai3D efficiently deals with very large real-time data sets and models that are accurate and measurable; and are navigable with game pads / or touch screens / or keyboard and mouse.

The fully interactive real-time models can greatly assist the design communication processes; internal review and client briefings, particularly where there is a large client body and levels of approval. This type of product optimises the communication process.

Other projects Ai3D have recently completed are the Commonwealth Games Gold Coast 2018 bid, several successful Train Station and significant track works tender bids in Melbourne and Queensland, Correctional Facilities around Australia, Hospital design and construction, Mining Business Cases, LNG construction methodologies and 4D construction programming simulations.

Ai3D Pty Ltd's head studio is in Brisbane CBD, with a satellite studio in Melbourne CBD.

For more information contact Ai3D Head office, Metro Arts Building Level 1/109 Edward Street, Brisbane, QLD, 4000, phone 0415 997 911, website www.ai3d.com.au