

THE FUTURE IS NOW

CLIENT : University of Technology Sydney
MAIN CONSTRUCTION COMPANY : Richard Crookes Constructions
ARCHITECT (UTS CENTRAL) : FJMT
ARCHITECT (ORIGINAL BROADWAY PODIUM DESIGN) : Lacoste + Stevenson with DJRD
CONSTRUCTION VALUE : \$300 million



UTS Central is a striking, 17-storey, glass encased building which includes the new UTS Library, Hive Superlab, and three large high-tech collaborative theatres. The double helix staircase provides an architectural focal point while providing access to the administrative and research spaces, reading room and learning commons.

Futuristic and luminescent, UTS Central is 10-storeys of glass, stacked and twisted, above a 5-level podium and 2-levels underground. It's another stunning addition to the collection of architectural marvels that create the UTS campus: the 'paper bag look' Dr Chau Chak Wing Building and the split aluminium plate façade of the Faculty Engineering and IT Building. UTS Central adds its contemporary presence to the streetscape of Broadway along with the tall 1960s UTS Tower and One Central Park across the road.

The new building holds a library, learning commons and reading rooms, a Hive Superlab, three large high-tech collaborative theatres, administration rooms, student hub and food court. Inside is a triple height atrium as well as terraces and gardens on a number of levels.

Richard Crookes Constructions (RCC) was engaged as managing contractor for the UTS Central project, which included a 12 month pre-construction phase starting in May 2015. RCC developed the design and construction methodology and carried out investigations on the existing structure and services. The construction phase began in July 2016 with design documentation reviewed to improve buildability.

"We put in additional columns to reduce beam depths; we reduced façade glazing panel sizes to ensure they could be manufactured, transported and installed more efficiently, we made sure there was a strategy for future replacement if required," said Project Director, Rob Lake. "The major challenge of the build was balancing the design outcomes requested by the architect within the budget parameters set by UTS as well as our own tight construction programme."

There was some very complex geometry with different façade types, a quantity of curved elements including the glass and aluminium, and many bespoke or oversized elements. "We had to untangle over 40 years of planned and unplanned growth within the university. Diverting and relocating the essential services found within Building 2 involved some complex procedures," explained Rob.

RCC utilised innovative construction methodologies to mitigate programme

constraints. Lift core construction and demolition of Building 2 occurred concurrently, and temporary columns and beams were built, as well as strengthening some existing columns, in order to remove sections of the existing structure.

"We developed bespoke edge protection and formwork systems as a result of the curved, twisting and cantilevered structure, which rendered traditional methods both time and cost prohibitive," said Rob.

UTS Central is targeting a 5 Star Green Star Design and As-Built rating and has BMS to monitor and control the internal environment. Recycled water, supplied by nearby One Central Park, is used for toilets and irrigation.

A showpiece is the intertwining double helix stairway, in the form of the DNA strand, made from steel and curved glass. The stairs were fabricated in individual 8 tonne sections, delivered to site, welded and painted in place.

"The UTS Central project is a landmark development for UTS and for Sydney. The complexity of the development and its delivery in an operational campus has made it an exciting milestone for the team. Delivery of tertiary education and student accommodation facilities in live environments has been a large part of our portfolio in the last few years. We have completed developments or are currently on site at the University of Technology Sydney, the Australian National University, the University of Sydney, the University of Newcastle and the University of Wollongong," said Rob.

RCC is a private, family owned company that has been building for government and private clients since 1976.

"Our people's depth of experience enables the company to deliver around 50 projects at any one time across all major industry sectors," said Rob.

For more information Richard Crookes Constructions, Level 3, 4 Broadcast Way, Artarmon NSW 2064, phone 02 9902 4700, email reception@richardcrookes.com.au, website www.richardcrookes.com.au



Permasteelisa Group is a worldwide leading Contractor in the engineering, project management, manufacturing and installation of architectural envelopes and interior systems. Permasteelisa Group specialises in the production of environmentally sustainable façade systems for complex forms such as the spectacular and unique structure of UTS Central.

In early 2016, Permasteelisa Group started concept design discussions with the University of Technology Sydney and Richard Crookes Constructions to create a high performance façade system.

The next step was the preparation of tender drawings and Permasteelisa Group were awarded the contract in early March 2017. Over the next six months, the bulk of the design and engineering process was done with assistance from Permasteelisa's European and Chinese Offices led by the design and engineering team here in Sydney.

For UTS Central, Permasteelisa Group provided a turnkey façade package which included the design, engineering, procurement, manufacture, supply and installation of the semi-unitised curtain wall façade from Level 4 to the roof, all soffits of solid aluminium sheets as well as ledges to floor slabs for the 17-storey tower.

Permasteelisa Group also produced a glazed fixed louvre system to the Wintergardens as

well as 6m tall glazed panels and structural steel support columns for the roof terrace.

The glazing panels installed on the façade of UTS Central are a Permasteelisa Group design, the *mfree-S^{CCF}* a moisture-free sustainable closed cavity façade.

The Permasteelisa's proprietary CCF system allows a façade depth of only 225mm as well as contributing to a reduction in energy consumption, producing a sustainable glazed façade. The panels for UTS Central consist of an outer curved glass skin, a closed cavity with automated blinds controlled by the Permasteelisa Blind Control System (BCS) and double glazing to its inner surface.

"The automated blind system is controlled by Permasteelisa's BlindTech (BCS) which is connected at a high level, to the Building Management System (BMS). This system manages the thermal and solar loading requirements of the building," said head of Sales and Estimating, Kumaresh Thanapalan. "The closed cavity also provides excellent acoustic properties."

UTS Central is Permasteelisa Group's third project in Australia where Permasteelisa has installed this technology. However UTS Central is the first where a curved glass skin was used. Designing the panels for the façade was challenging due to the curve of the glazing as well as the overall geometry of the building.

The 1,034 glazing panels of various derivatives and configurations were manufactured in Permasteelisa Group's production facility in Thailand. "It's good for Permasteelisa Group to have a direct presence overseas," continued Kumaresh, "We are able to oversee the whole process from concept design, through manufacturing and on to final installation."

In fact Permasteelisa Group has a total of 10 manufacturing plants across Europe, Asia and America with 50 offices in 30 countries employing 5,000 staff. Over a quarter of that number are involved in design and engineering.

In Australia, Permasteelisa Group employs 60 at their office in Chipping Norton with successful projects including 200 George Street (EY Centre) where they installed 20,000m² of *mfree-S^{CCF}* glazing to the tower.

Also at 100 Mount Street, North Sydney, Permasteelisa Group's 17,000m² of *mfree-S^{CCF}* façade contributed to the 37-storey building achieving a 5 Star Green Star Design and As-Built rating as well as a 5 Star NABERS rating.

Permasteelisa is constantly involved in sophisticated architectural envelopes, such as the award winning Guggenheim Museum in Bilbao, Spain. Completed in 1997 using 36,000m² of titanium sheets. Currently Permasteelisa in Australia is working on The Ribbon project at Darling Harbour another free form structure.

Permasteelisa Group has a research and development division constantly working for future environmental and structural solutions to improve and innovate. These innovations include among others the *mfree-S^{CCF}* system and the Blast Resistant façade technology. "We hope to design glazed panels and fixings that will reduce the radius of damage created by explosions and minimise the spread of shattered materials," said Kumaresh.

For more information contact Permasteelisa Group, 13-15 Governor Macquarie Drive, Chipping Norton NSW 2170, phone 02 9755 1788, email info.au@permasteelisagroup.com, website www.permasteelisagroup.com



Below erbas™ provided master planning and design services for the hydraulics and fire services for UTS Central.



erbas™ is a leading engineering company specialising in providing designed and engineered building services including mechanical, electrical, hydraulic, fire and ESD services.

In early 2016, Director, Michael Slatter, along with the senior design team started work on the contract for the hydraulic and fire services for UTS Central. erbas™ provided master planning and design services for the project. “The challenge involved the investigation of existing hydraulic and fire services. There was a large web of services already within the building. We carried out detailed early works and enabling works investigations to ensure a smooth transition connecting to new services,” said Michael.

“Documentation of existing services to be retained, and those to be removed, was critical to a successful foundation for the project. Both hydraulic and fire services documentation were provided in 3D/Revit. The unique documentation for the ECI (Early Contractor Involvement) phases shaped what is a very successful delivery.”

erbas™ have over 22 years experience in providing building services engineering and ESD solutions. Employing over 50 staff across multiple offices. erbas™ works across a range of sectors including

education, correctional, aged care, sports facilities, swim centers, residential and commercial sectors with some very diverse project involvements at Grafton Correctional Centre, Lindfield Learning Village and Gateway Residential.

erbas™ recent successful completion of all services engineering for the Lindfield Learning Village faced similar challenges as the UTS Central project and were approached in much the same way as Michael Slatter explains. “The challenges at Lindfield were similar to UTS Central by including accurately surveying the existing services to determine the reutilisation strategy and replacement methodology.”

erbas™ have a deep involvement in education and learning facilities in both private and public sectors. They are ever increasing value through early planning involvement and this can be seen through project success like UTS Central.

For more information contact erbas™, phone 02 9437 1022, email (general enquires) general@erbas.com.au, email (Michael) michael.slatter@erbas.com.au website www.erbas.com.au

Below G. James Facade Solutions designed, manufactured and installed the unique curving glass façades for the podium levels.

Below Nupress Group manufactured a bespoke point fixed tension rod system for the Alumni Green façade at UTS Central.



G. James Facade Solutions provides design and engineering, manufacture and installation of commercial façades using a vast range of glass, aluminium, steel and stone products. In early 2017, G. James FS were awarded the D&C contract for the design, manufacture and installation of the unique curving glass façades of the podium levels (including skylights and cladding) at UTS Central.

“The inhouse design team of engineers and drafters, spent over 12 months working on the design of the curving façades. Proudly fully manufactured in Australia with local materials and some imported glass and curved components. A team of 30 installed the façade across the podium levels,” explained Project Manager, Darshan Naik.

“It was a challenging design, the building has seven different types of façades; glass walls, window wall, shop fronts, skylights and cladding. In terms of the glazing, the UTS building was the largest scale podium job carried out by G. James FS with the size and radii of curved panels that approach the limits of manufacturing capabilities.”

The glass for UTS Central was entirely designed, engineered and manufactured in Brisbane. G. James FS worked with Nupress Group who supplied the S.S fittings for the spectacular façade.

Founded 1917, G. James FS employs 2,500 in offices and manufacturing facilities across Australia. They are a leading glass processor, aluminium curtain wall, window and door fabricator and contractor, supplying and installing for commercial projects as well as the residential and retail markets. The company produces fabricated components extruded aluminium profiles and castings as well as providing powder coating and anodising.

G. James FS’ expertise in providing quality contemporary façades is further showcased on Broadway, Sydney with the screened aluminium façade of the UTS Engineering Building, the glass façade of One Central Park and the curved façades of Duo Central Park.

Other recent bespoke projects by G. James FS include the Abian Tower by Sunland Group with a curving and warped curtain wall, 900 Ann Street and RNA K5 buildings in Brisbane.

For more information contact G. James Facade Solutions, 1084 Kingsford Smith Drive, Eagle Farm QLD 4009, phone 07 3877 2333, email admin@gjames.com.au, website www.gjames.com.au

Nupress Group started work for UTS Central in late 2017, working with G. James Facade Solutions to assist with designing, and the manufacture of the stainless-steel tension rod structural glass façade systems for the podium buildings.

“Our design team created a point fixed system using large custom spider fittings and a bespoke transom clevis system for the Broadway and Alumni Green, Jones Street façade’s,” explained BDM, Steven Ullness. “We worked in collaboration with G. James Facade Solutions to achieve a successful outcome, delivering a unique Australian structural glass project.”

With the latest design, engineering and manufacturing knowledge Nupress produce state-of-the-art, custom components for the most demanding façade designs. They specialise in advanced manufacturing and precision machining offering overall façade design, engineering and manufacture of structural glass façade systems. Providing a turnkey solution to any structural glass façade, wall, roof and canopy project.

The company focuses on expert collaboration to design, shop draw and manufacture parts for structural glass façades. As the designer and the manufacturer Nupress oversees the whole process of façade

development. The company’s world class manufacturing facilities and technology distinguishes the Nupress Group. Using the latest 3D solid modelling software to support architects, project managers and installers, and they also provide mechanical structural analysis, onsite technical assistance and support.

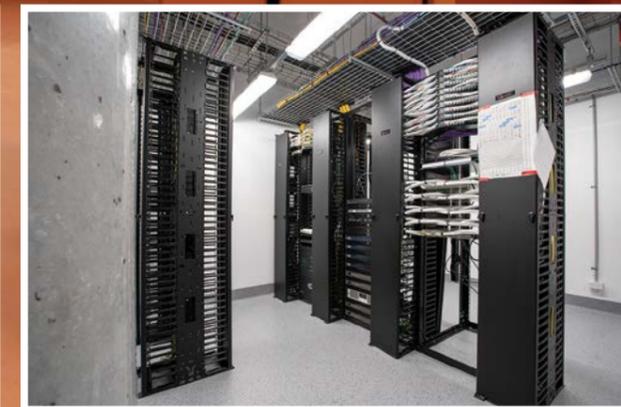
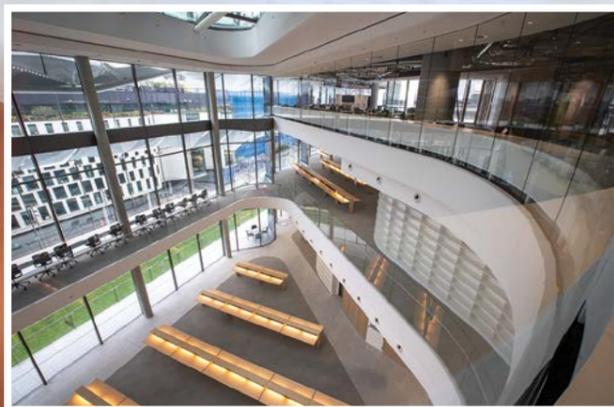
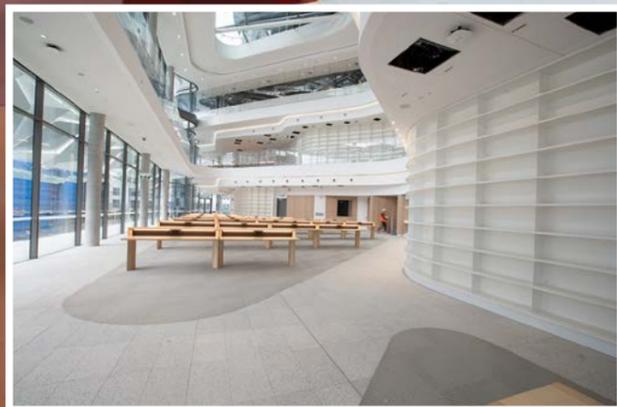
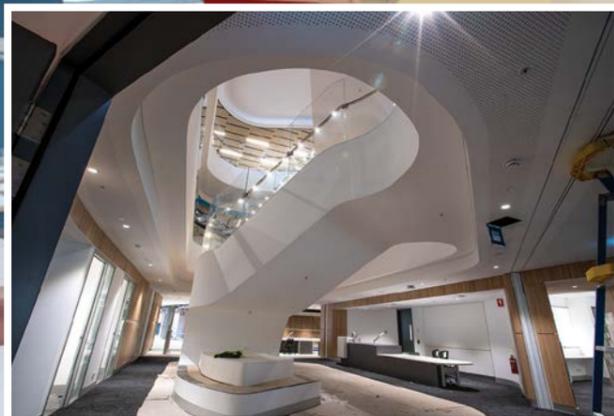
Established in 1972, the Nupress Group has years of experience supplying high quality components, assemblies and engineering services across a range of sectors including, aerospace, defence, energy, mining, medical and general engineering projects.

With their head office in Newcastle New South Wales, Nupress employs 50 staff across Australia and a specialist façades team based in North America, undertaking a range of work, including urban renewal projects such as the ‘Transbay’ transport hub in San Francisco and currently the design, engineering and fittings for the movable glass roof and façade systems for ‘Rams Stadium’ in Los Angeles.

For more information contact Nupress Group, 11 Nelson Road, Cardiff NSW 2285, phone 02 4903 9300, email sales@nupress.com.au, website www.nupress.com.au

Below Brighton Australia supplied and fitted the internal plasterboard linings for walls and ceilings, and architectural finishes.

Below Nilsen designed and installed the electrical, communications, audio visual and security systems for UTS Central.



Brighton Australia is one of Australia's leading subcontractors in the installation of architectural finishes for ceilings, walls and façades.

Catering for the diverse needs of high end and progressive architectural design, no finish is too difficult for a company with a recent portfolio including Sydney's Convention and Exhibition Centre, Western Sydney Stadium, and eight stations on the Sydney Metro Northwest rail line.

UTS Central presents another string to Brighton Australia's bow. As one of the main subcontractors responsible for the architectural finishes on the project, Brighton Australia supplied and fitted internal and external linings for walls and ceilings in both podiums and the tower. This included plasterboard ceilings and partitions, acoustic tiles, timber linings, glazed partitions and doors, hermetic doors, curved glass, toilet partitions, FFE, fire curtains, raised floors, timber stairs, flooring and seating, operable walls, internal blinds, stainless steel reveals and aluminium soffits.

According to Contract Manager, Azra Purac, "The project presented extensive design and installation challenges, particularly for the curved elements including internal glass, aluminium soffits, wall panels,

bulkheads and timber stairs," she added. "Working with our high level Brighton site project team, no challenge was too difficult."

The PEFC/FSC accredited Brighton Australia has completed over 250 projects across Australia over the last 20 years. The company works in the residential, commercial and retail sectors as well as education, health and transport. With a state-of-the-art manufacturing facility at Taren Point, Brighton Australia has the capacity and expertise to deliver on the most challenging and large scale projects, the largest being the 175,000m² new Royal Adelaide Hospital project.

The company is continuing to deliver on high profile projects with current works including the Crown Casino and the Walsh Bay Precinct Redevelopment. With their dedicated team of professionals, Brighton Australia has the skills and expertise to deliver on the most difficult projects.

For more information contact Brighton Australia, 65 The Grand Parade, Brighton-Le-Sands NSW 2216, phone 02 9599 6230, email admin@brightonaustralia.com.au, website www.brightonaustralia.com.au

Nilsen were engaged by Richard Crookes and University of Technology Sydney for the design and construction of the electrical, communications, audio visual and security systems for UTS Central Building. Works included the establishment of new high voltage chamber substation, main electrical infrastructure, internal and external lighting and power, structured communication Siemon Cat6a system, audio visual and access control and CCTV security systems.

The installation is of an exceptionally high standard to meet the UTS design guidelines and specifications for the state-of-the-art technological and modern teaching facility. Nilsen applied value management and engineering to the design of the project to deliver the UTS with a high quality product with real value for money.

"Nilsen started onsite in August 2017, with up to 100 electricians and technicians onsite during peak periods with an accelerated services installation schedule to meet the challenging building programme," said Project Manager, Rob Dixon.

Founded in 1916, Nilsen is a family owned business with offices in all states, who specialise in quality design and engineering of electrical

services, and are a leading electro-technology company delivering design, installation, maintenance and electrical manufacturing services across Australia.

Nilsen offers sophisticated design engineering and strategic planning expertise to a range of industries that include commercial, health, education, data centers, infrastructure and resources as well as government contracts and defense.

Other projects Nilsen have completed on the UTS campus included the comprehensive installation of electrical services for the spectacular Engineering building on Broadway in 2012 and at the 8-storey Science Building two years later.

In 2016, Nilsen completed the five year project of electrical installations for Adelaide Hospital. The \$200 million contract included the installation of a vast array of electrical and data services including the nurse call and backup generator systems.

For more information contact Nilsen, Unit 26/38 South Street, Rydalmere NSW 2116, phone 02 9898 9355, email NilsenNSW@nilsen.com.au, website www.nilsen.com.au

