



LOWY CANCER RESEARCH CENTRE



PROJECT MANAGEMENT / D & C : Bovis Lend Lease
CLIENT : UNSW
AREA : Sydney, NSW
PROJECT END VALUE \$ 100 Million
ARCHITECTS (CONCEPT + DOCUMENTING) : Lahznimmo Architects
ARCHITECTS (LABORATORY + LANDSCAPE) : Wilson Architects
STRUCTURAL ENGINEER : Taylor Thompson Whitting Pty Ltd
CIVIL SUBCONTRACTOR : Theos Bros

BUILDING A BEAUTIFUL

ANTI-CANCER BATTLEGROUND

A vital purpose like that served by the Lowy Cancer Research Centre for the University of New South Wales needs a building which inspires and reflects visionary ideals. Enter Bovis Lend Lease, who constructed the cutting-edge design by Lahznimmo Architects and Wilson Architects, incorporating both Green Star principles and the specialist needs of a medical research facility.

Both the Faculty of Medicine and the Children's Cancer Institute Australia will be using the Lowy Cancer Research Centre, the first time in Australia that both adult and childhood cancer research will be conducted in the same place.

As well as laboratories over four floors, administrative and dry research space, breakout and meeting spaces, staff common room and two basement levels of specialist plant and equipment, the Lowy Cancer Research Centre features a central atrium flooding the interior with natural light, and externally, embraces the Michael Birt Gardens, an important teaching resource and green space on the University campus.

"The building was designed to meet the existing Wallace Wurth building and wraps around an existing tree," explained Bovis Lend Lease Head of Design and Project Management, Jo Campbell. "In the post construction landscaping installation, we are going to where possible replace all the original plants from the Michael Birt Gardens, which are in and around the courtyard and will also form an underplanting of the building itself.

"The first stage of works was clearing and excavation. An ancient volcano had shattered rock around the area, and the site was a quarry which had been backfilled with refuse. We identified five environmental hotspots that required decontamination. When we excavated, there were groundwater issues due to the high water table in the area, so we ended up jet grouting the base at 3metre to 1metre centres."

The perimeter was fully piled and temporary whalers for the two basement levels were installed, once built, the structure provides support for the excavation. The structure is a post-tensioned concrete structure, leading edge protection was used, in the form of nets and handrails to prevent falls.

Other safety initiatives included trialling a portable access stair system by Combisafe, and also a new Plastic Reinforced shade cloth from Unispan, which is fixed to the inside of the scaffold, in lieu of the traditional chain wire mesh fixed externally.

It is a very interesting façade, a combination of precast, curtain wall and apolic façade with fixed sun shading. The precast was complicated to install, the pop-out on the Northern elevation used a purpose built gantry to lift underslung pre-cast panels into place. There are special touches throughout the building, such as the quartz carpet in the lobby on most floors. This is a homogenous pour of quartz chips in epoxy which is non-slip, easy-clean and extremely durable.

A Green Star rating for Design under the education tool has been sought, and all the interior solutions were driven by Green Star goals, such as low-VOC finishes, epoxies, and adhesives throughout.

There is a plant room on every floor for each lab and office area, this was chosen so the plant and equipment works most efficiently.

There has been a grouping of all noisy heat-generating pieces of equipment together to manage heat, and there is a co-generation plant going onto the roof, which will be hooked into the University's high voltage ring main, so the power will go back into the University's grid.

"The facility will collect stormwater to go into the University's stormwater system, which re-charges the aquifer below. We have built on the knowledge base of our work on the Royal North Shore Hospital Kolling Building. We had a lot of research knowledge already, and this project has now added a new dimension," said Jo.

Building further on this accrued experience, Bovis Lend Lease are currently working on the Liverpool Hospital Redevelopment, the North Shore Private Hospital extension, the Gold Coast University Hospital and the Royal Childrens Hospital in Victoria.

Work commenced on the Lowy in December 2007, and was completed within 23 months, despite the time-intensive jet grouting required at the start.

The Bovis Lend Lease Project Team of 17 included site engineers and other highly-skilled professionals. Approximately 1,860 workers were inducted on site, including the 85 separate subcontractors, consultants and suppliers, with an average of 270 workers onsite at any given point.

The result of all the applied effort and expertise is a spectacular workplace for those seeking answers to one of our darkest medical mysteries.

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ENGINEERING AN ARENA FOR THE FIGHT AGAINST CANCER



MAKING WORK SPACES FOR MEDICAL MIRACLES

work with architects on different issues, resulting in tailored systems separate to the Space Lab range altogether.”

In terms of the high ESD values embodied at Lowy, KPD systems proved a perfect fit. “All our fabrication is done with Green energy, and the system itself is recyclable in terms of its flexibility. Sustainability is the new Flexibility” said Leo. “We also use E-0 emission boards.”

Their excellence has been recognised: ‘Space Lab’ by KPD won the Australian Design Award. They have installed systems in award winning projects including the Institute of Health and Biomedical Innovation (RAIA Queensland Regional Awards 2007 Commendation), Waterview Laboratories Albury and APAF at Macquarie University (both won What’s New Magazines Laboratory of the Year).

KPD services medical and scientific establishments, not just nationwide but also in Asia and the Middle East, and has operations in Sydney, Brisbane, Melbourne, Perth and Dubai. Other major projects include Nestle R&D Laboratories, Beijing; Al Shaqab Academy Education City in Doha, Qatar; Royal North Shore Hospital, Kolling Institute; Pharmacy Australia Centre of Excellence, Brisbane; School of Chemistry, Curtin University, Perth; ANSTO Nuclear Reactor Laboratories, Sydney; Victor Chang Research Institute; Garvan Institute Laboratories; and the International Rice Research Institute in The Phillipines. They have also provided furniture to a multitude of hospitals around the country.

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Knox Advanced Engineering (KAE) had to meet the requirements of some of Australia’s most stringent legislation in their work on the Lowy Cancer Research Facility at the UNSW. They were contracted to design the mechanical systems, air-conditioning, specialist exhaust systems, ESD analysis, energy analysis, fume cupboards and cool rooms in addition to PC2 laboratory systems and PC2 animal housing.

KAE’s designs for the project included PC2 class laboratory air conditioning and ventilation systems, co generation with absorption chiller study, ESD and natural ventilation, BMCS for all services and varied ventilation for specialist areas.

All of this work was carried out within a design framework which aimed for a 4.5 Education Green Star rating, included floor by floor independent plant systems, and required reliable pressure and temperature controlled internal environments for highly sensitive research.

“KAE specialises in the provision of Health Care designs, and has drawn on its experience from other health care projects and deep understanding of relevant Australian standards and OGTR (Office of the Gene Technology Regulator) requirements to provide the design for this project. The design is flexible and robust and concentrates on allowing staff to perform their research in ideal conditions,” explained Designer and KAE Director Jorgen Knox. “KAE has utilised computerised calculations on all aspects of our design including building modelling for natural ventilation, energy usage and air quality calculations. Project

highlights included working as a team to create this important facility, solving technical challenges created from specialist research area requirements, provision of a step by step commissioning procedures manual for the project; and provision of critical services in a space confined building.”

Other challenges in the project included extreme building pressure and flow control, and the intrinsically complex nature of OGTR and PC2 compliant Cancer Research laboratories.

KAE are staffed by a multidisciplinary team of 24, and have been in the business of creating advanced building services designs since 1999. Their talents extend beyond medical and scientific developments into all building sectors including commercial and retail, as evidenced by their other current projects including Sussex Hay, Darling Park Tower 1, and Stocklands The Pines Shopping Centre in Melbourne.

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POWER TO PERFORM WONDERS



Downer EDI Engineering gave the Lowy Cancer Research Centre at University of NSW the spark of life, providing the complete electrical and communications services. They supplied and installed the 11kV substation, HV transformers and switchgear, Low Voltage (LV) power supply reticulation, Main switchboards and Distribution boards, Power Factor Correction, Castel Key Interlock Bus-tie switch, Lightning and Surge protection systems, all specialist lighting systems including exit and emergency lighting, general purpose and dedicated power, Communications, Audio Visual, Security, CCTV and Access Control systems.

Energy Monitoring and Control System (EMACS) for electrical, gas, and water, and dimming and energy saving systems for lighting were also part of the package. “The electrical systems adopt the latest in energy saving technology, utilising daylight harvesting dimming systems, energy efficient DALI electronic ballasts for light fittings, motion detectors, PE cells, and a selective range of lamp types to reduce energy consumption and maintenance costs,” said Downer EDI Engineering Project Manager, Jim Anasis.

The building’s rooftop 770kW co-generation plant will continuously supplement power to the electrical reticulation for the building. Surplus power will be fed back into the UNSW ring main system and High Voltage grid.

With over 7,500 employees working across Australia, New Zealand and Asia, Downer EDI Engineering is one of Australia’s largest providers of engineering and infrastructure services. They provide design,

delivery and maintenance expertise for electrical, instrumentation, and mechanical services across the Resources, Energy, Oil/Gas/Petrochemical, Transport, Water and Environment, Commercial and Public Buildings and Technology market sectors, generating over AUD 1.7 billion in revenue.

Accreditations include AS/NZS ISO 14001:2004 for Environmental Management Systems, AS 4801:2001 for Occupational Health and Safety Management System and ISO 9001:2008 Quality Management System.

“Downer EDI Engineering has a policy of ‘Zero-Harm’ regarding the health and safety of our employees, clients and the communities within which we operate, and this is central to everything we do,” said Jim. “We expended over 32,000 LTI free man-hours on the C25 project and provided the benchmark for safety culture amongst all contractors on-site.”

Downer EDI have won NECA Excellence Awards every year this decade, for projects including Bathurst Hospital, Greater Union Cinemas and Ryde Pumping Station (NSW State Winners 2008), ANSTO (National winner 2005), Resmed Stage 1 (National/Gold winner 2004) and Brito Mart Station NZ (National winner 2003).



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When researchers get down to business at the Lowy Cancer Research Facility, they will know their essential systems work, Commtech Asia made sure of it. As independent Commissioning Managers, their role was to independently verify the functionality of the systems including the power, electrical, air conditioning, medical gases, fire and BMS systems work before the systems were handed over to the client. Commtech Asia ensured that equipment worked as stand alone items and also as a holistic system.

“The reason for engaging us is firstly, the client has confidence everything will work properly and that everything has been checked. In a medical facility this is very important. Secondly, we check the resiliency of all the systems, for example, chillers, the emergency generator, we make sure that they will kick in when they should,” explained Commtech Asia Country Manager Nic Mills. “We carry out numerous failure scenarios on the completed systems, such as switching off the power, to make sure that everything works as it should when a real emergency happens. We also put the systems under high load to make sure they can cope with the demand.” This process minimises the problems for tenants once they move into the building.

“And from an ESD point of view, owners and tenants know the building works efficiently; one of our deliverables is to make sure the building meets all the benchmarks for energy set out for its Green Star rating. We initially check the early design concepts and work with the design team and contractor to manage the process of the subcontractors doing the tests, we make sure they are using the right technology and tools, that everything is calibrated properly, and ensure that right tests are done throughout the installation of the works, we witness those tests and verify the systems work as per the design. Being a research centre there

is quite a lot of technology in it. There were some unique processes and procedures adopted in this complicated project.”

Throughout the entire process, which saw Commtech Asia staff onsite for much of the time during the project, they produced hard copy test reports, went through all the test sheets produced by subcontractors and verified the results, and monitored the progress of works, delivering regular reports, monthly reports and then a final report.

Commtech Asia will also be part of the Green Star requirement for building tuning which occurs every three months for the first twelve months of occupancy to ensure the building continues to function efficiently.

Commtech Asia (Australia) is part of an International Company with offices throughout Europe and Asia. In addition to Commissioning Management, their engineering expertise is available for due diligence surveys, maintenance management, energy audits and retro-commissioning. They specialise in the critical environments arena.

Their Australian projects range from some of the most recent Green Star constructions like The Bond and King St Wharf, they also do a lot of work with Data Centres and Medical facilities as well as other major commercial, government, and banking projects.

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