

M² BUILDING & THE PLASSO

MAIN CONSTRUCTION COMPANY : Hansen Yuncken
CLIENT : University of South Australia
PROJECT END VALUE : \$42.7 Million
COMPLETION : November 2011
ARCHITECT : John Wardle Architect
SURVEYOR : Alexander & Symonds

HANSEN YUNCKEN COMPLETES UNISA'S MINERALS & MATERIAL RESEARCH HUB – THE M² BUILDING

To design and deliver a project dedicated to exploring new ideas, Hansen Yuncken approached the task with their own distinctive style of construction leadership. The M² Building, now nearing completion for the University of South Australia at the Mawson Lakes Campus, is intended to be a catalyst for innovative learning and teaching and high quality research in the materials and minerals science and engineering hub. The building facilitates the engagement between undergraduate and postgraduate coursework students, higher degree researchers and industry stakeholders in a flexible, open and creative space aimed at stimulating innovation in relevant areas. It will ensure the delivery of contemporary practice-based education programs and internationally significant research.

Hansen Yuncken was awarded the managing contract for the M² Building; which was briefed as a 5 star Green Star Design and Build Project, in July 2009. The team will soon complete the fast track delivery concurrent with design management, procurement and construction of this state-of-the-art facility.

From early 2012, the four storey building of 7,300m² will accommodate 55 academic staff, 45 higher degree research students and 120 honours level students studying the new Materials and Minerals Degree offered by the University of South Australia.

Included as part of the build, The Plasso offers a unique landscaped area that integrates the new M² Building into the broader University's Mawson Lakes Campus. The Plasso has been designed to accommodate a café with an alfresco style seating area. In addition to the Plasso, a network of linkways were constructed, offering a convenient and protected connection between parts of the Materials and Minerals Science Hub. An upper level link was also constructed, enabling users to travel from the main building to the Ian Wark Research Institute.

Upgrades were made to the façade of the adjacent building so there is a visual connectedness between the new and existing buildings. The façade of the new M² Building comprises Colour Controlled Precast Concrete Façade, integrated with high quality architectural finishes; Aluminium angles, Longline and Alpolic Façade Cladding materials. The broader team adopted a Collaborative Delivery philosophy and worked together to complete the finer construction detailing to deliver design intent without significant cost implications to the project.

The Hansen Yuncken team redesigned the construction methodology of the Plasso retaining wall elements in order to deliver the standard and quality required and intended by the design team. This redesign was accomplished within the budget parameters and without extending project timelines; the team managing to absorb additional costs and avoiding the initial 10 week delay to this element of the project.

Hansen Yuncken's Project Manager, Kevin Zammit, commented: "Through working in collaboration with multiple end users, the team learnt firsthand the University's operational requirements for the laboratories, theatres, and teaching spaces. Our team also led the process of procurement, supply and installation of all Furniture, Fittings and Equipment items, including loose furniture and laboratory equipment.

"The interior of the building encompasses a four storey Internal Atrium with architectural cantilevered internal stair. In keeping with the use of the building and to assist in achieving a 5 Star Design Rating under the Greenstar Education Tool, use of recycled plastic timber composite internal wall cladding, Trezini Wall finishes and recycled rubber floor finishes have been applied.

"Unique elements of the building include the coordination of an inordinate amount of multi layered services required to service a University teaching and research building of this type. These services are accessible and exposed within a Peristial space, along a corridor that runs the length of the building on all levels. The building design includes Physical Containment 2 (PC2) and Physical Containment 3 (PC3) Labs and the team successfully managed the demanding sterile cleans of the CT Suite's PC3 Area, prior to handover."

Mr Zammit added, "We provided dedicated administration resources to ensure that the subcontractor's variation submissions were not delayed and to ensure that the University received information of up-to-date Financial and Cost Position in a timely manner. The team of dedicated administration resources managed over 1200 instructions and 2000 requests for information during the 2 year construction period.

"Remarkably, we were successful in managing a \$4M budget overrun down to less than \$1M through value management processes, innovative construction methodology and management of major and significant design and scope changes within the Project time line.

"The team has adopted the CHAIR (Construction Hazard Assessment Implication Review) Safety Tool in Construction for this project and succeeded in establishing a comprehensive and robust assessment of all aspects of the build in terms of best practice in safety. "Our team comprises 12 Hansen Yuncken staff and 58 sub-contractors with a combined peak daily workforce of 152. Safety outcomes have been exceptional, with no lost time injuries recorded across the project to date."

The Hansen Yuncken team completes in December 2011; successful in meeting all key objectives relating to time, quality and delivery within overall budget.

Hansen Yuncken, established for over 90 years, is Australia's largest private Commercial Building Contractor achieving annual turnover of \$1.2 billion across five states and a network of regional offices. It is widely recognised for the successful delivery of iconic and prestigious ESD credentialed projects around Australia.

It is also currently delivering the \$1.8 billion New Royal Adelaide Hospital, in partnership with Leighton, which is one of the largest social infrastructure building projects now under design and construction across Australia.

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HIGH TECH EXPERTS AT STEEL DETAILING

Combining engineering, fabrication and construction knowledge with the latest technology allows Concept DG Adelaide to provide the highest quality structural steel detailing services for major projects such as the M² and Plasso at the University of SA.

Three of the company's steel detailers and a checker worked on the structural steel requirements of the project for three months. Close coordination with the precast contractor and the builder, Hansen Yuncken, was required. This coordination was performed through IFC models, and a state of the art backup system for all the project-related data and shop drawings ensured everything proceeded efficiently.

"If a steel fabricator or Panel Fabricator is looking for a reliable firm to perform shop detailing, then Concept DG Adelaide is the team for you," said Company Director Mitesh Shah. "We utilize the industry leading 3D modeling software "Xsteel" with a depth of expertise in a wide range of construction disciplines. We have been using Xsteel since 1997 and can easily adapt the system to suit any requirement. "In process of creating drawings we first create 3D model for all the members and connect them together from Architectural and Engineering Details. We combine fabrication knowledge and also building knowledge, and three of our staff hold Masters Degrees, mine is in Industrial Information Technology from Swinburne University. We strive to maintain principles of excellence and utilize best of modern technology to achieve works of highest quality within tight deadlines."

Concept DG are an Australian Steel Institute Member and have been providing their specialist and professional structural detailing services for the construction industry since 1993. Winning the Global "Xsteel" modelling competition for the steel detailing of the Sikh Temple in Melbourne in 2001 is proof of their ability to deliver complex and unusual projects. Their skills are augmented by a solid understanding of how buildings work and thorough fabrication knowledge.

Other recent major projects include Ceduna Hospital (250t), H2O/Baja Apartments (200t), Northgate Aged Care (300t) and Mt Gambier Market Place (600t). Concept DG have also provided structural steel detailing for Affordable Eco Housing, Modbury Special Primary School, Techport Australia and Owen Spring Power Station.

Working nation-wide on major projects in every development sector, Concept DG forge links between Architecture, Engineering and Fabrication, providing the detailed fabrication workshop drawings for every piece of steel a project needs.

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AN EXCELLENT TRIFECTA IN ADELAIDE

Sending one of their professional crews across the border into South Australia gave Professional Plumbing Contractors (PPC) an opportunity to shine on three major projects. With a track record for roofing, cladding and other building work on award-winning Melbourne projects, PPC devoted the same level of attention to detail, dedication to program goals and supply and installation of the highest quality materials for the M² & The Plasso project.

Lead contractor Hansen Yuncken set high standards for safety, environmental credentials and workmanship, which PPC achieved in their installation of the project's metal deck roof, architectural external wall cladding and internal parapet lining. Their entire scope included three levels of roof, a link bridge, canopies and all the wall cladding for the new addition to the University of South Australia. The entire program took a crew of up to five PPC tradesmen eight months to complete.

PPC supplied Colorbond Kliplok roof and Colorbond Longline wall cladding for the project. All insulation PPC supplied and installed on the job has an Ozone depleting potential of zero, meeting the project's Green Star requirements. Both the builder and project architect were pleased with the good, clean finish PPC delivered, and the work passed the weather test without leaks or need for any rectification.

While in Adelaide for M², PPC also undertook works for two other Hansen Yuncken projects - the Adelaide Women's and Children's Hospital and the Adelaide Film and Screen Centre, giving these projects the same excellent results through diligent workmanship and program focused delivery.

PPC take pride in their ability to efficiently deliver quality work and meet project goals while also keeping safety a top priority, especially given the amount of their work carried out at heights.

With a large workforce, PPC can undertake major projects Australia-wide. They are specialists in Kingspan, metal deck roof, architectural building, insurance work and Danpalon work, ensuring every project they contribute to is completed with the best materials and to the highest standards.

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TIMBER PESTS CAN'T STUDY AT UNISA

Termites are not welcome to enrol at the Uni of SA's Mawson Lakes campus, and Termimesh ensures they get turned away if they try and enter the new M² building or structures on The Plazzo. Since August 2010, Termimesh's installation team have been working onsite, protecting all service penetrations within the new structure, in excess of 200m of construction joints and up to 270m of external perimeter with the company's patented stainless steel mesh barrier system.

"The Termimesh System has long been recognised in the construction industry for its efficacy, quality and reliability as a non-chemical long life physical barrier," said Termimesh South Australia's Sales Manager, Mr Tracey Hendy. We have also completed work on the previous buildings on site, giving us invaluable knowledge on the particular construction requirements for this project. We have been able to design specific details to suit the builder's and client's needs but more importantly, the client has the peace of mind knowing that the whole project from start to finish has been protected by a market leading product and warranty."

Termimesh South Australia had a cohesive team working on the project, including their Senior Estimator and Commercial Contracts Manager, who prepared the tender for submission. The Contracts Manager also undertook pre start safety audits and documentation, and worked with the highly experienced technical team during construction to resolve any issues.

TMA (Termimesh Australia) Corporation which supplies the Termimesh System has strict quality systems with ISO 9001 accreditation and the product itself has a Codemark Certification.

"The Termimesh network is pleased to announce our exclusive Pledge Non-Residential Guarantee for all new installations of the Termimesh System in non-residential/commercial buildings. Like the Termimesh System it guarantees, Pledge offers a peerless level of protection and unique benefits," said Mr Hendy.

"Pledge provides trusted coverage of the Termimesh System including installation, materials and the ongoing effectiveness of the product. Pledge features no maximum dollar limit and the potential for continuous coverage subject to approved annual termite inspections. Pledge is unique to the Termimesh System and a genuine Australian first for termite control."

Nationally Termimesh have worked on a wide diversity of projects, from the Sydney Olympic Village through to Amberley Airforce Base Upgrade. In South Australia, recent major projects have included SACA Western Grandstand Redevelopment for Built Environs; a majority of all BER projects in the state; GP Plus Super Clinic for Hansen Yuncken; Anglicare All Hallows Court redevelopment for Sarah Construction; Wallara Birth to Year 7 Redevelopment for Badge Construction; Alice Springs Hospital New Emergency Dept & Medical Imaging Wing for Lahey Construction; and Anglicare SA- Elizabeth East for McCracken Homes.

Currently Termimesh employs in excess of 40 people in South Australia within both pre and post construction departments meeting the demands of architects, builders, developers, facility owners and public asset managers for a high quality, chemical-free, proven method of termite control.

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Innovation in engineering design is the key for Wallbridge & Gilbert (W&G), and their expertise has delivered some of South Australia's most impressive and sustainable major projects. The iconic new entry to the UniSA Mawson Lakes Campus, the M² building and The Plazzo, provides a highly visible showcase of these talents.

W&G provided structural and civil design for the building, designated as a research hub demonstrating sustainable methodologies and applications for industry. Unique ESD initiatives have been incorporated to achieve a 5 Star Green Star Building rating.

The M² building was designed as a fast-tracked project with staged release of documentation for the works packages including early works, footings, the concrete shell, steel roof and link bridge packages. This fast-tracked process allowed construction of earlier stages to commence while documentation for later stages was still being finalised.

The design, by John Wardle Architects, in conjunction with Swanbury Penglase Architects, features a complex precast facade and open central atrium with feature cantilever staircase. The intricate precast facade required considerable attention to detail and a high level of coordination between W&G, the architects, builders and their subcontractors.

The structure was modelled in 3D using Revit to assist with the challenging geometry, identify critical issues of constructability and facilitate coordination during construction.

W&G's design team consisted of civil design drafters, civil engineers, structural design drafters, structural and project lead engineers. The company has a strong focus on ongoing development of the technical capabilities of their staff in order to ensure they provide innovative solutions for challenging projects such as this one.

W&G work at the forefront of ESD, with award-recognised expertise in Water Sensitive Urban Design (WSUD). Elements of their design for this project demonstrating WSUD include rain gardens, ephemeral vegetated ponds, permeable pavement and a 45 kL rainwater harvest tank. Rain gardens located adjacent the access road and carparking area will capture

stormwater runoff for treatment and passive irrigation, enhance the landscape and increase biodiversity in the area. The ephemeral ponds which operate in a similar manner will also slow and retain stormwater, assisting in overall stormwater management and reducing outflows.

Permeable pavements have been used on other carparking bays to allow direct infiltration of runoff. One permeable pavement area has sub-surface storage to allow capture of carpark runoff; roof runoff (via a diverted downpipe), and fire sprinkler test water. This subsurface storage is linked to a solar pump which will be used to irrigate the adjacent landscape, creating a sustainable garden operation. This innovative feature signals a new approach to sustainable capture and use of stormwater.

With a proud history and continuing involvement in critical infrastructure development across Australia, W&G have provided consultancy services on a diverse range of projects - spanning structural, civil, environmental, geotechnical and mechanical engineering disciplines. W&G operates in accordance with a Quality Assurance System third party accredited to AS/NZS ISO 9001:2009, audited by SAI Global.

W&G's highly skilled team of in-house environmental specialists are involved in a range of consulting projects, including Environmental Impact Assessments; Environmental Management Plans and Audits; Planning and Field Assessments; and Climate Change and Sustainability Planning. These services are complemented by the company's civil engineering capability, including specialist skills in urban development, stormwater management, urban and rural hydrology, water sensitive urban design, Aquifer Storage & Recovery Schemes (ASR) and Water Reuse.

Other recent noteworthy projects include the multi-award winning SA Water House; the multi-award winning Lyell McEwan Hospital; the outstanding Adelaide Zoo Entry Precinct and Panda Exhibit; the Waterproofing Salisbury project, winner of Award for Environmental Excellence, Urban Development Institute of Australia (SA) Awards 2010; and the award-winning Brooklyn Park Rain Gardens, a streetscape retrofit strategy and stormwater infrastructure renewal project for the City of Torrens encompassing WSUD techniques, including innovative street tree biofiltration pits.



A NEW MILLENNIUM APPROACH TO TIMBER

Having decades of experience working with timber, the latest in 3D shop drawing technology and a thorough understanding of materials gave Metro Joinery the ability to produce remarkable results for the M² & Plasso project. Metro Joinery's trade-qualified carpenters and cabinetmakers completed all the joinery requirements for the project. This included external and internal cladding; all lab benches; theatre seating; break out areas; and general storage areas including shelving and cupboards.

"There were a lot of specialised finishes, including solid timber with upholstery, vinyl, melamine with a PVC edge, timber veneer with aluminium and wall cladding," said Metro Joinery Owner and Managing Director, David Bonventre.

"The logistics of materials was a challenge. The laminate for example came from Italy. We put a lot of time into sourcing materials and estimating. One of the original specifications was the use of solid timber for the wall cladding. We proposed an alternative called 'Stablewood', which is made in South Australia. It is a combination of pulped timber and resin with a solid timber veneer 4.5mm thick. This had the benefits of being cost effective, stable and Green Star rated. It was extruded to a special shape and installed over battens on the walls" said David.

Solid timber used on the project included FSC rated American Rock Maple. Two thirds of the company's twenty-eight employees contributed to the project, as well as an installation team of up to seven on site. In order to maximise the efficiency of work, a significant proportion of the joinery items were manufactured offsite in Metro Joinery's 1,400 sq.m

workshop. Scheduling and takeoffs commenced in February 2011, with onsite work commencing in June 2011 and due to be completed at the end of 2011.

Metro Joinery is also currently working on joinery for Grocon at the HNA project, and will shortly commence over a million dollars worth of work for Baulderstone on the ATO in Adelaide.

"We have a large amount of software and are the South Australian leader in the use of computer software technology for joinery. This software was a major investment made as the first stage of growing the company" said David.

"We started using PTYHA software, developed specifically for the joinery industry, in 2000. Since then we have installed a variety of modules and complementary software to create added efficiency and control of manufacture. Our software produces 3D drawings which are utilised to create all the componentry required for the design and, in turn, the cutting list for the CNC machine and the flat bed nesting machine. The advantages of this technology include highly effective materials estimating, shop drawings second to none and a vast reduction in waste."

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