

MELBOURNE WATER DIGITAL HARBOUR

CLIENT : Digital Harbour
MAIN CONSTRUCTION COMPANY : Equiset
Construction Melbourne
PROJECT MANAGERS : PSA Project Management
PROJECT END VALUE : \$60 Million
COMPLETION : May 2012
ARCHITECT : Woods Bagot
QUANTITY SURVEYOR : Rider Levett Bucknall



ANOTHER DOCKLANDS SUCCESS FOR EQUISET

In constructing a state of the art headquarters for the caretakers of Melbourne's water supplies, Equiset demonstrated an extremely high degree of innovation and efficiency, enabling the rapid completion of a stunning Six Star Green Star building for Digital Harbour to accommodate the Melbourne Water Headquarters at 990 LaTrobe Street in Melbourne Docklands.

The project comprises of 8 levels overall with 12,650m² of PCA A-Grade office space over 6 Levels, and an additional 225m² of storage space and 290m² of retail plus entry lobby over 2 lower levels. Car parking spaces for 64 vehicles and bicycle facilities for 150 cyclists are also accommodated in an extended podium to the north. The Woods Bagot design features a striking central atrium initially over three levels with interconnecting stairs between Ground and Level 2, then continuing above to connect Levels 3 and 4, then 5 and 6.

In terms of sustainability credentials, they don't come much higher, with a 5 Star NABERS rating (a 6 Star NABERS rating target within reach) and Six Star Green Star As-Designed already awarded by the GBCA. The internal fit-out has also been completed to a Six Star Green Star As-Built standard.

"By working very closely with the client and the design team, Equiset developed a multi-zoned workface approach to the construction logic. At a high level this involved dividing the project into four key zones for the base building, namely the car park/part office zone, the core/escape stairs zone, the part office /access road zone, and the in ground services zone" said Equiset Construction Manager, Steven Richardson.

Work commenced on the LaTrobe Street site in October 2010, with progressive completion to enable the handover of the building for tenancy fit-out during the later stages of the base building construction. Equiset was awarded the fit-out contract enabling fit-out works to be integrated within the base building works. The final stage was handed over on May 18, 2012.

Melbourne Water's new home is built around a reinforced in-situ concrete lift, stair and services core. To enable fast-tracking of the construction program, the original reinforced concrete beam and slab in-situ design was changed by Equiset to a hollow core slab supported on precast shell beams that are part reinforced, fully post tensioned in-situ, floors of hollowcore planks on post-tensioned band beams. This minimized the need for temporary propping and significantly reduced construction time. The hollow shell beams also enabled large slab spans.

The building has a fully glazed façade (except for sections of the west face of the core) with façade detailing featuring perforated metal free-form sunscreens that extend to provide a visual screen to the car park on the lower levels and north podium. The solid sections of the west facing core also feature perforated metal panels to match the sunscreens.

A steel truss supports one edge of the structure and spans 28 metres over an access road to Etihad Stadium. This very deep truss is an architectural feature both internally and externally with its top and bottom chords at Levels 3 and 1 respectively. The steel truss, due to its considerable weight and construction sequencing, was erected in sections with the

lower chord and diagonals first, allowing erection of the Level 1 slab to proceed followed by the top chord and then Level 3 and floors above followed. With limitations on the ability for pre-cambering the truss, significant consideration was given and great care was taken to address the self weight deflection during the splicing of the top and bottom chords. In addition allowances were made for incremental increases in deflection as the structure above the truss was progressively erected.

Equiset maintained the design loads but improved buildability by modifying the steel truss design. Consequently temporary steel supports were limited to a central prop within the roadway.

The lift and services core was erected using internal jump form boxes with external shutters that were lifted from level to level utilising one of the two Favco 1500 tower cranes on the project. These cranes were also used for the majority of the lifting of the precast concrete elements.

"This was not a predictable or typical construction process given that the end delivery date was fixed even though the starting date was later than originally anticipated. It became very clear that the alternative structural design driven by Equiset could and would deliver the project within the time required," said Steven Richardson.

"Each of the zones required a different structural solution, however we were required to maintain the structural profiles as originally designed to ensure that we maintained the flexibility required for the delivery of the integrated fit out".

"Structural integrity was achieved by constructing the car park/office zone as a total structural precast solution, from the top of the pile caps, so that no propping was required. This allowed later access to the in-ground services trades and the construction of the ground level slab after the upper levels were built, therefore removing these works from the programmed critical path and giving early access to the façade on more than a third of the building" notes Richardson.

Equiset had a team including the project manager, site managers, design manager, contracts administrator, project engineer, three foremen, two assistant administrators and a documentation controller managing the project. This team supported a crew of 50 directly employed workers including formworkers, steel fixers, concrete placement labour, carpenters and crane operators. Including subcontractors, the project's daily workforce peaked at 240.

Results speak for themselves, and in the case of the Digital Harbour building for Melbourne Water, the completed project sets an example of sustainability in process and product which is both a credit to Equiset, and a fitting headquarters for an organisation that is now a leading advocate for careful resource use and recycling.

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A SIMPLER WAY TO THE STAIRS

Bao Engineering and Formdeck Constructions have added to their successful Docklands track record, with their products used by Equiset for the construction of the Melbourne Water Digital Harbour project.

Since 1996, the companies have been together providing custom engineered, effective and safe formwork solutions, including Composite Structural Steel Decking, all permanent stair formwork and Easystair, a registered design which combines integral handrails and stair formwork with risers, stringers, reinforcement and soffit. They can design a system to suit any geometry, and provide solutions which are rapidly installed, a real benefit for tight construction timeframes.

Director of Bao Engineering and Formdeck Constructions, Jim Hu, has been involved with the Victorian construction industry for 23 years. Other successful recent projects the companies have jointly contributed their expertise to include Freshwater, ANZ HQ, Doncaster Westfield Shopping Centre, CBus in the CBD and at Dockland, MAB Dockland and the QV building. Upcoming projects include Myer Emporium, the Quay, Prima, 72 storey, Upper West Stage 2 and Box Hill Hospital.

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Melbourne Water Digital Harbour, VIC



RICHSTONE DELIVERS A MAJOR ADVANCE IN WATER CONSERVATION

Scarcity creates innovation, and in the case of Melbourne Water's new Digital Harbour headquarters, Richstone Group have designed and delivered a hydraulics package which raised the bar for conserving our water supplies, and scored the project the maximum number of points for Water under the applicable Green Star ratings tool.

In the process, they have also achieved a modification to the Plumbing Code of Australia (AS3500), by gaining approval for 84 JETS vacuum drainage lavatories throughout the building. This will slash water usage from 4L/flush to just 0.8L, a vast reduction when viewed through the project lifecycle.

"There has been no market in the past for this vacuum technology because of the perception we had an abundance of water. It has been used in shipping and aircraft, and is standard in Europe, but to get it approved for this project required significant discussions with the Plumbing Industry Commission, and Melbourne Water and the manufacturer backed us with that," said Richstone Group Director, Shannon Egglestone.

"We are pushing the envelope with this, but if we don't push it, who will? This is our career as a company, promoting sustainability. At the moment this is innovative using the technology in a major commercial project, but we are hoping it won't be in the future."

The lavatories installed throughout the building include DDA compliant units, which required special modification by the Norwegian-based manufacturer, JETS.

Richstone's scope including roofing, which incorporates rainwater harvesting and storage. This is filter-treated and used to feed the basins, showers and lavatory flushing. All pipework on the project is either push-fit stainless steel (for the lavatories) or HDPE as part of Green Star V2 PVC minimisation. They also undertook the below ground drainage and sewer works.

The procurement for the project had to be scrupulously organised in order to co-ordinate with the integrated fitout undertaken by Equiset. A team of up to 10 trade-qualified Richstone Group plumbers worked on the project for close to twelve months.

"Because we have had rain, it is easy for people to forget about the limits on our water resources, but we are pushing for sustainable use. Five Star Green Star is now our standard job, and we are increasingly pushing for Six Star Green Star. Melbourne Water Digital Harbour is from our perspective, a very brave project. Melbourne Water are setting an example, and a lot of people will be watching to see how it goes."

Richstone Group are currently at work on the Six Star Green Star National Australia Bank offices at 700 Bourke Street for Multiplex, building on the company's excellent track record for providing innovation, quality and timely delivery in every aspect of hydraulics, from roof to drains and all points between.

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