

A SUCCESSFUL WRAP UP

The \$88M Wrap Residences is modern Melbourne living with over 42 levels of style & quality comprising 298, one, two & three bedroom apartments.

Probuild utilised considerable engineering and logistical innovation to deliver the unique Wrap Residences project, working closely with all the interdependent trades and the consultant team to develop a methodology which was safe, buildable and efficient for the structure's unique 'Wrap Element'.

The project comprises 289 apartments over 31 levels, plus a 10 level podium with 9 apartments, retail space, and common resident's facilities, including a lounge, a bar with a full commercial-grade catering kitchen and a lobby area on ground level.

The first four levels of the building have an existing facade comprising a warehouse facade. Probuild's team developed a complex facade retention engineering solution to retain the facade when the rest of the pre-existing building was demolished. Aspects of this included the use of a retention gantry over the public footpath with counterweights during demolition and construction, and a permanent engineering solution including capping beams and corbels in the ground floor slab, and extensive ties and steel beams tying the facade to the suspended slab between levels 1-4.

The site itself posed some issues, being only 1350m² and surrounded by other high rise buildings. This limited access and caused unpredictable wind gusts which affected crane operations, challenging the critical path in terms of the installation of the Wrap Element sections and other program-critical activities.

In addition, there was the problem of undertaking excavation and piling for the project in contaminated soil (specifically, Cooke Island silt, which is very soft, often high in acid sulphate and is found in pockets throughout Melbourne) with very low bearing capacity.

The ground works encountered a number of soft spots, which required engineered fill to support the weight of construction equipment. 900mm continuous flight augur piles were constructed to an average depth of 41.2m, with the deepest pile 50.1m, which at the time of installation set a new piling world record.

And then there was the Wrap Element itself, fabricated from 6mm folded steel sheet, precast and in situ concrete; and finished with an International branded three coat Polysiloxane system.

The original design was in glass reinforced concrete (GRC), which Probuild redesigned into a more efficient system to improve construction tolerances, strength, and durability during construction and installation. The dimensions of the wrap section were also altered to suit a single standard sized steel sheet, to minimise off cuts and wastage.

Probuild engaged a 3D modelling specialist to prepare a fully coordinated 3D model which was used for creating fabrication shop drawings and rigging diagrams for lifting a complex geometry with differing balance points. Extensive as built surveying was undertaken and compared to the 3D model prior to steel installation, to ensure all fixings were prepared and in the correct locations. A system of pre-installation checks allowed for off-site steel fixing adjustments and minimised crane hook time delays.

Working concurrently with the project's structural engineers, Webber Design, Probuild also researched and selected an innovative fixture system, "Reid OrbiPlates", to connect the steel members back to the structure. These fixtures allow for 360 degree movement in one plane to provide sufficient construction tolerances.

Because the installation of the Wrap Element was on the critical path of the programme, the risk of delay was minimised by working behind encapsulated protection screens and installing the steel closely after the concrete pour for each level. This improved safety during installation, by minimising the risk of working on a 'live edge'.

The encapsulated protection screens covered five levels from the top of the live structure deck, allowing all the formwork installation and stripping, concreting, and installation of glazing to occur behind the screens. This edge protection system used a vertical lifting track and automatic locking system, which greatly reduced crane hook time and the risk of working on a live edge while 'jumping' the

MAIN CONSTRUCTION COMPANY : Probuild
PROJECT END VALUE : \$88 million
COMPLETION : March 2014
ARCHITECTS : Plus Architects



screens as the building progressed. Other initiatives which minimised the structure cycle time included post-tensioned floor slabs, double-height precast columns, Peri reusable formwork pans and prefabrication of the roof elements to minimise hook time. Components were made to the maximum allowable road transport sizes to minimise onsite work at height.

To ensure all the project's subcontractors were up to speed with the complexities of the program, particularly in relation to installing the wrap steel, Probuild engaged a 3D animation consultant to produce a short video of the construction sequence which was presented to subcontractors to clarify key sequencing challenges.

A "Target Zero Defects" Quality Assurance program was implemented, which incorporated the use of iAuditor and Aconex Field iPad applications. Probuild conducted a 300+ item audit checklist in each apartment to identify 'Outstanding Work' items and to minimise the risk of defects after practical completion. Using automatic and live electronic dissemination of outstanding work lists with 'marked up' photos, subcontractors used smart technology to view and close 'Outstanding Work' items.

From first award of the Design and Construct project in November 2011, through to final fitout of the apartments and common areas in March 2014, the Probuild team dedicated approximately 28 months to the project. Their on-site team of 11 included Project Manager, Contract Administrator, Site Manager, Project Coordinators, Site Foreman, Graduates and Labourers.

There were 43 subcontractor companies engaged on the project, with a total of 1,650 people inducted on site, which included members of the consultant group Plus Architecture, Webber Design, Murchie Consultants, Acoustic Logic, Thomas Nicolas and Gardner Group.

Probuild's expertise with demanding projects has given the company a stellar track record in delivering high-quality, iconic projects safely and efficiently. Other projects the company are currently working on include Eastland Shopping Centre Stage 5, South East Water Headquarters, Silver Skies (MY80), Swanston Square, Abode 318 and The Shrine: Galleries of Remembrance.

PROBUILD

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REACHING THE IMPOSSIBLE

CGE Hire Pty Ltd creates access solutions and supplies the equipment and manpower required. CGE Hire Pty Ltd's Access by Design Division supplied all external access requirements to the Wrap Tower project. The group offers specialist consultation, design and certification services as well as a skilled and varied workforce. "Reaching the impossible" is the motto that the company works by.

"We have been specialising in external access to high rise constructions employing swing stages with custom designed and fabricated suspension systems since 1998," said John Onley, the group's Managing Director.

"Having been involved in the heavy rigging trade for many years previously (boiler erection in the power industry), we are able to bring innovative solutions to this work and intend to bring more to the trade in the next twelve months."

The right access design for a project reduces the cost of scaffold and labour and reduces the time required on the job. CGE Hire Pty Ltd's Access by Design Division used the Layher scaffold system to access the original Wrap Tower façade and provide a Gantry cover, as well as the complex atrium scaffold. One of the company's GEDA 300 Z material hoists was used to deliver the scaffold equipment externally. Additionally, Access by Design supplied 6 swing stages to the high rise building to paint, caulk and clean the exterior.

The Layher system is used to undertake difficult and complex access tasks. This system is designed and fabricated in Germany. While stronger than the traditional systems used in Australia, it is 30-35% lighter, depending on design. "Our Access by Design division has rapidly become our biggest division, especially since the procurement of the Layher Scaffold System and its many capabilities," said John Onley.

"It is supported by exhaustive engineering and superlative build quality, giving us full confidence in its ability to perform as designed. Scaffold, bridging, roofing and staging equipment are all carried at our Pakenham yard, while we have made our first deliveries to the Gladstone market in which we intend to develop a part over the coming months."

Another prominent residential tower project that CGE Hire Pty Ltd has worked on is Tower 5 at 90 Lorimer Street, Dockland (Mirvac). This project required a swing stage that could reach in some 2 metres from the wire line to get under the sunshade structures on the northern façade of the building.

One of the infrastructure projects that CGE Hire Pty Ltd has worked on involved heavy duty propping, to build a shared use pathway over the Maroondah Highway, Ringwood, Victoria (Fulton Hogan). "We used six Layher all round heavy duty propping towers to

support a total of eight deck sections weighing from 27t to 38t each," said John Onley.

The section over the highway itself was completed over a two day weekend closure. By the Sunday night, towers were wound down leaving the bridge suspended to design. The towers were then dismantled and removed from the carriageways prior to opening early Monday.

"We are proud to count among our present major clients such diverse groups as Brookfield Multiplex (Medibank Project, 720 Bourke Street, Melbourne), Pro-build Constructions (Abode Apartments), Thiess Balfour Beatty (Footscray Rail Station, temporary footbridge), Thiess (Sale RAAF Base), Siemens (Loy Yang A Turbines), Hitachi (Loy Yang B Turbines), Grocon (150 Collins St, Melbourne), Bovis (City West Police Complex), Kane Constructions (Owen Dixon Chambers) and Yuanda (Curtain Walls, BHB Building, 171 Collins Street, Melbourne)," said John Onley, of the company's other most recent projects.

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CGE Hire's work on Footscray Rail Station



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BEAUTIFUL WORKMANSHIP FOR WRAP TOWER

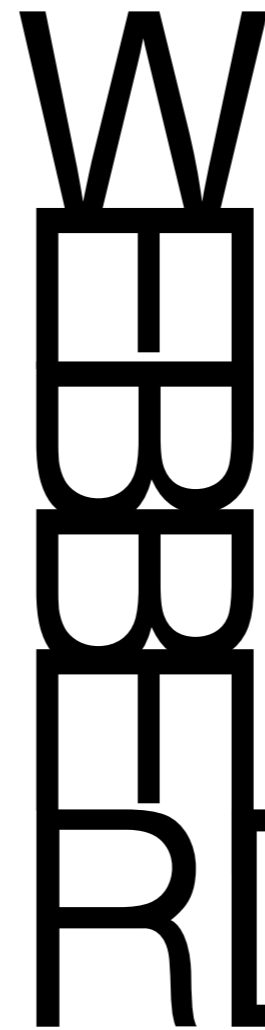
Quality joinery has built IJF Australia's business into being one of the country's leading firms, with the capacity to create beautiful workmanship for a project like Wrap Tower in Melbourne. IJF designed and manufactured all of the interior joinery for the 292 apartments, penthouses and common areas, including kitchens, bathrooms, shaving cabinets and vanities, laundries, front-frame wardrobes, storage.

The luxurious lobby features their craftsmanship in the form of solid timber tables, the bars and the architectural light fittings. In keeping with Wrap's distinctive aesthetic, a warm woodgrain laminate was used for the apartments and timber veneer for the penthouses.

IJF Australia relied on its' Adelaide manufacturing plant and its' overseas manufacturing partners to achieve the bench mark joinery required at the Wrap and to meet the project's timeframe from design through to installation.

IJF is a family-owned company which is dedicated to producing excellence in all fitout items. Sustainability, integrity and skilful execution of design are the core of its' approach to delivering items of lasting style and value for projects across all major construction sectors. Other recent projects have included Boheme at Bondi, the Fiona Stanley Hospital in Perth and Ilk Apartments in Melbourne.

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PAUL WEBBER AND THE WEBBER DESIGN TEAM

Structural Engineers for the Wrap Apartments would like to congratulate **PROBUILD AND THE CLIENT GROUP** on their landmark project.



Mackenzie Tower
Melbourne CBD



Lacrosse Apartments
Docklands



RAPTL Burnley Street
Richmond



Guilfoyle Apartments
South Melbourne



Emblem Apartments
Hawthorn



Art On The Park
Melbourne



A'Beckett Tower
Melbourne CBD



North Apartments
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