

AUSTRALIA'S TALLEST PREFABRICATED BUILDING CUTS CONSTRUCTION TIME BY 50%

Melbourne has become the home of Australia's tallest prefabricated building. Due for completion in November 2016, the \$50 million La Trobe Tower, a 133 metre, 42-storey residential building, has been developed using an innovative prefabricated construction method, dramatically improving construction time.

Constructed by Hickory Group using the Hickory Building System and designed by Rothelowman, the La Trobe Tower project has brought a lot of positive attention to all involved.

"The architect has noted that this type of build involves designers working much more closely alongside the construction team than in a traditional build. It also allows better project collaboration as the new system can be applied retrospectively to buildings which have already been designed without compromising the architect's original design," says Michael Argyrou, Hickory Group Managing Director.

HOW DOES THE SYSTEM WORK?

Previously Hickory used a different modular system with a panelised steel structure, but that was not capable of reaching the same building heights as the new system.

"We believe this new-patented Hickory Structural System for high-rise construction is one of a kind. Whilst there are other builders using prefabrication around the world the methods appear to be quite different and most are used for low to mid-rise buildings," Mr Argyrou says.

The Hickory Building System process begins with an engineered concrete floor, structural steel columns, integrated Sync bathroom pods and a building façade that is constructed offsite in a production line environment.

"Research has shown that our prefabricated construction process can reduce the amount of construction waste produced by between 30 to 90% depending on the project (and level of prefabrication). Because we model a lot of the project upfront we know the exact lengths and amounts of materials

required, so we order materials to the correct lengths, which significantly limits the amount of offcut."

"We also have more opportunity for material warehousing and reuse than on a conventional build where materials are ordered for one project and excess is often scrapped once the job is finished."

All manufacturing of the structure and bathroom pods takes place in Australia at Hickory's Melbourne factory.

"Most materials are locally sourced, but depending on availability some imported materials may be used. High spec



our work on the ground floor of a factory line and ensure defects are rectified before they are transported to site."

Furthermore, completing the majority of work on the ground floor of a factory and out of the elements makes for a much safer work environment. Since each floor of the building is erected with pre-attached façades there is very limited work on the live edge of a building, lowering the chance of falling people or materials.

WHAT ABOUT THE COST?

Mr Argyrou says they have found the cost to be comparable with conventional construction.

"Some low-spec modular systems offer a cheaper way to build but are often quite limited in application. Our system is completely flexible architecturally and the materials used are the same as those used in conventional building. So the savings really come through in the form of a faster return on investment as projects can be completed 50% faster, meaning developers will pay less interest and variations costs at the end of a project."

"Our system is also able to offer floor-to-floor height advantages, so we can often offer developers an added floor or two of saleable area without changing the apartment ceiling heights. This can be worth in the tens of millions on an inner city development."

LESSONS LEARNT

Since the La Trobe Tower was the first high-rise project of its kind in Melbourne, Hickory faced a challenge of the site being located on a busy street which meant bringing in oversized prefabricated elements during the day would be too disruptive.

"This was overcome by introducing an evening installation approach whereby deliveries of prefabricated structural units arrived to site when trams had ceased."

Hickory also learnt that they could be more adaptable in regards to the size of the modules.

"Because the system is flexible we can create smaller module sizes if need be that alleviate some trucking and logistic issues. We have also seen which elements of the system design can be further refined to offer greater material recyclability, which will be implemented on the next project."

projects often specify European appliances or Italian tiling, so it's a project-by-project basis depending on the development requirements," Mr Argyrou says.

QUALITY AND SAFETY THE KEY

The basic structural architecture has been designed to be scalable with occupancies that can span across multiple modules to generate generous floor spaces, and has the flexibility to provide almost limitless spatial layouts.

By using a series of pre-designed, interchangeable components, the Hickory System can be scaled from low rise to high rise, from large to small aspect ratio and to cyclonic and earthquake regions as required.

An interlocking and sealing system has been engineered into the technology, designed to minimise onsite work. This enables the building façade to be installed in the factory and precisely set to the building datum. This approach revolutionises the conventional building model by minimising onsite material handling and achieving lock-up as the modules are locked into place.

Mr Argyrou says quality is enhanced on these types of projects because quality control happens in their factory before prefabricated elements are taken to site.

"By managing the façade procurement in conjunction with the structure, risks associated with on time façade delivery are removed from the critical path of installation at the building site, and moved to the more manageable realm of the factory shop floor."

"Using a manufacturing model means we have greater consistency of product across the project as we can easily check

Images courtesy of Hickory Group
Photos by Craig Woodie