

Fast and quiet

Hickory Group dramatically shortened the construction time at a luxury inner city condominium tower development in Australia.

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The 43-storey La Trobe Tower residential development in Melbourne being built by Australian construction company Hickory Group illustrates the challenge of making the right tower crane choice when using an innovative fast track construction method.

With its unusual glass façade inspired by a tuning fork and piano keys, the luxury 206-apartment building reflects the precinct's musical heritage.

The family-owned Hickory Group was established in 1991 and has become one of the leading high rise apartment construction companies in Australia. The company uses conventional building methods as well as 'Hickory Building Systems' (HBS). HBS describes an integrated structural methodology based on in-house prefabrication using proprietary façade systems and complete individually-designed bathroom pods to speed up construction. It also ensures the highest accuracy and quality, reducing on-site space requirements to a minimum and boosting safety by cutting noise and dust levels on site, the company says.

When the contract was awarded, La Trobe Street was heavily congested with other residential tower construction sites. Even a potential loading zone in front of the project was already occupied by a construction site next door.

So, in addition to the small site footprint, Hickory also had to cope with extremely limited site access. Bicycle lanes, trams and four lanes of traffic and existing high-rise buildings nearby added

The Jaso J380PA delivered by Australian tower crane rental specialist Titan Cranes offers a capacity of 36 tonnes at 18.8 m radius with its 30 m boom in a three-fall rigging condition.

Tie-in support of the crane tower could only be carried out at chosen locations as there was limited room to install the climbing crane



Noise and traffic were identified as areas of concern by Melbourne City Council. Hickory therefore opted for an electric luffing jib crane that is quieter than a typical diesel-powered unit, especially with the night work on the construction site in mind

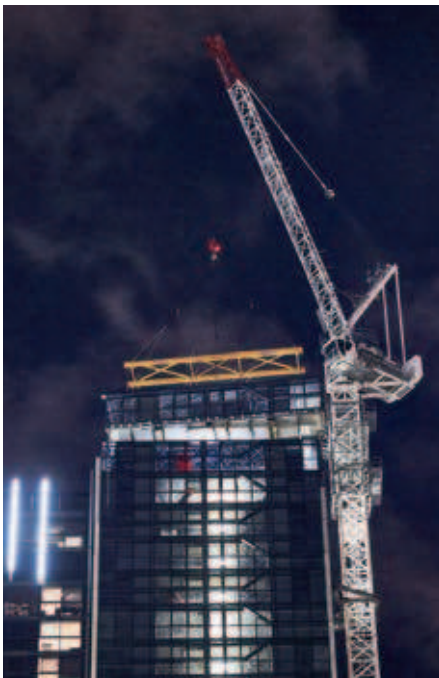
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Each level consists of seven or eight prefabricated structural units weighting around 26 tonnes being trucked to the site just in time after the trams cease operation in the evening

to the challenge. To reduce the impact on traffic and the neighbourhood, Hickory adapted its HBS method by delivering large prefabricated modules in the evening, when trams ceased operation between 19.00 hours and midnight.

Keeping quiet

Addressing community concerns about noise created by after-hours work, Hickory opted for an electrically-driven Jaso J-380PA tower crane. Before the 45 metre free-standing



luffer with 30 m jib could be installed, crane rental specialist Titan Cranes and Acoustic Logic engineers conducted extensive sound modelling to ensure that it would meet the council's strict noise limits.

The original intention was to place the tower crane with an internal climbing system into the building core. However, an Alimak construction hoist had to be installed within the building envelope to meet noise regulations and internal works requirements. The tower crane therefore had to be moved as close as possible outside the precast concrete outer wall of the building.

One reason for the minimum distance to the building was that even the counterweight of the crane was not allowed to slew over

The patented interlocking pre-attached façade system enables fit-out progress immediately after installation without the need of any scaffold work. Placing such extensive glazed modules depends on tower cranes with smooth micro-move operation. For safe access at night, the crane tower is illuminated inside

neighbouring property. The other reason was to remain within the lifting chart for the 26 tonne modules to be lifted.

Four specially-designed tie collars had to be used on the 137 m tall building. Space restrictions meant the high freestanding capacity possible with the combination of the Jaso TSR20 standard tower system with large base tower sections could not be used. The proximity of surrounding buildings meant that, until the climbing crane reached a height of 75 m, the 30 m short jib had a steep out-of-service position which required



The vertical reinforced steel cages creating a complete floor are lifted into place and locked together during the night by a team of riggers dedicated solely to this task



A bird's-eye view show that there is no room for loading or storage zone to be found at street level surrounding the La Trobe Tower project. Hence, prefabricated modules and a high capacity tower crane are essential for construction



One building module with pre-attached curtain wall facade being unloaded using a special spreader beam

of the building, making the site safer for workers and pedestrians.

Speeding construction

While the exterior structure of the modules has precast concrete panels, the inner formwork is shot-creted during the day. Two complete floors are already being constructed each week so the project is moving 30 to 40 percent faster than it would by using conventional construction techniques (19 months instead of 29).

If the delivery allowance is raised by the authorities from three to five nights a week, five floors could be added each week.

So the Hickory construction method will allow the building to be handed over to the developer earlier. Consequently, it will dramatically reduce rental time for tower cranes. Underlining the potential of HBS, Hickory has already secured its next iconic residential tower project in Melbourne – the 200 m tall, super-slim extensively glazed Collins House. ■

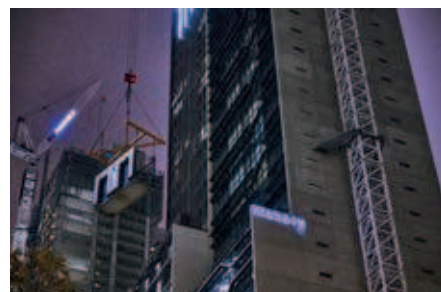


Evening operation starts. The Hickory construction methodology is reducing construction time – and therefore the time the tower crane will be required – by 30 percent

a specially designed weathervane sail at the end of the jib.

Each floor is made up of four oversized prefabricated units, four smaller units, modular bathroom pods and several precast concrete panels. As the elements arrive on site with windows and a patented interlocking façade system already attached, no work has to be carried out at the edge

The exterior structure has precast concrete panels and modules lifted into place using a Jaso J380PA tower crane at night. Thereafter, inner formwork can be shot-creted in between the units during the day



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