

The supply of structural steel sections for a new IT distribution centre in western Sydney high enough to contain an eight storey building is being kept to program through deft planning and handling.

Over 570 tonnes of structural steel is being used on the 3000sqm high bay storage building developed to house automated computer systems to store and retrieve items from 24-metre high racks. The over 100 metre long building comprises 13 portal frames approximately 28 metres high and wide to accommodate the tall storage racks.

According to the project's structural engineers at Opus International Consultants, **Pushpa Ratnayake** and **Chris Hackney**, functional constraints precluded internal columns so each frame had to be designed as an individual portal frame made entirely of custom fabricated 1000WB322 sections.

All told, that represents over a kilometre of steel length in the portal frames alone.

"We analysed the steel frames as a combination of simple 2D and more complex 3D frames using Microstran," Chris said.

"Various load combinations were considered to obtain the critical design action envelope. The final design was subjected to an internal design review and verification process in accordance with the Opus in-house quality system.

"Various stages of construction were reviewed to comply with the current Safety in Design legislation and the constraints were communicated to the builder."

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"We found that using a series of plate grabs to pick up the beams from their flanges when on their sides was the most safe and efficient handling method. Using overhead cranes with two hoists per crane rather than a single hoist also increased productivity as only one crane was needed to handle each member."

As project timeframes were reasonably tight and the site could have easily become congested by the sheer volume of steel required, he

