

MBA offices & display centre, Newcastle

Steel in Buildings CASE STUDY



Structural Steel Delivered:

- Lighter weight structure
- Faster construction
- Lower energy usage
- Flood-prone site stability
- Reduced on-site workforce



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■ MBA offices & display centre Broadmeadow, Newcastle

Fast and 'eco-friendly' way to build

When the Master Builders Association (MBA) presented the brief for their new three storey office and display centre for the Newcastle hub of Broadmeadow, they posed the challenge of creating an environmentally sustainable building whilst meeting tight budget constraints.

Steel was brought into the mix for the MBA offices rebuild mainly due to expected speed advantages.

The steel fabricator was able to beat an already tight program by one week to reward the builder's decision to go to steel framing, erecting the steel in four weeks.

Preliminary structural schemes were prepared by Lindsay and Dynan Engineers, one incorporating steel framing, metal formwork and pre-cast concrete, the other using a more traditional concrete frame and slab option.

The need to restrict the weight on foundations due to subsidence issues in the area influenced builders to embrace the advantages of steel construction.

A three storey hybrid construction of structural steel framing and composite deck, coupled with tilt-up lift and stair construction, was found to be most effective for this situation. The building design covers a sloping steel framed western-northern wall and atrium.

The seven metre grid spacings were achieved using unpropped spans of OneSteel Trussdek® II composite decking supported by 460 UB beams in composite with the slab in the secondary direction. Trussdek® II is an engineered system of composite panels designed for long spanning and light weight construction.

Designing engineer Brad Wilkes from Lindsay and Dynan said the options were reviewed by the builder and the steel frame one was found to be both cheaper and faster to build.

"Utilising steel framing, composite decking

and pre-cast construction minimised on-site labour requirements, also important in light of the construction industry's current skill shortages," he said.

"As formwork was virtually eliminated, brickwork and wet trades could start much sooner as there was no wait for formwork stripping."

The steel beams were designed to act in composite with the slab to reduce the floor depth and studs were factory welded to reduce on-site welding requirements.

When flood levels dictated that the ground floor needed to be higher than an existing slab at ground level, the best ways to utilise the sub floor space were considered.

The most attractive of the available options was to create air conditioner in-feed chambers of high thermal density within the sub-floor area to cool the intake air. This reduced thermal load to the air conditioner, reducing mechanical costs and leading to long term energy benefits.

The building also incorporates a roof water reuse facility and utilised an 'eco-friendly' permeable paving system for the outdoor car park areas, reducing the need for costly on-site detention tanks.

The fire engineers, NDY incorporated sprinklers that alleviate passive fire protection. However, the MBA as client requested fire rating to be included.

Project team

Builder: Kingston Builders
Engineers: Lindsay and Dynan
Architect: EJE Architects
Fabricator: McKanna Fabrications
Fire engineers: NDY



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