



## Melbourne water

The new Melbourne Water headquarters is located in Melbourne's rapidly developing "Digital Harbour" precinct, blending perfectly with the docklands area. The building - for one of Melbourne's most environmentally conscious occupants - has been a success, completed on time, on budget and achieving its essential green credentials.

The builder Equiset, approached Hollow Core Concrete to prepare a design that would meet both budgetary and programme targets, for what was an extremely short construction timeline. This 9 level structure was erected in just 8 months comprising a gross floor area of over 20,000m<sup>2</sup>. The structure is divided into two separate buildings connected by a central in-situ core.

The northern structure was constructed as an independent building; allowing early access for following trades and also taking the south build off the critical path. It incorporates a lower multilevel car park, with six levels of office space above. It is a more conventional precast skeletal-framed structure incorporating both precast and in-situ columns, precast/pre-stressed beams, hollowcore floor planks and precast solid slabs to create the cantilever areas, with beams cantilevering up to 4 metres. The car park levels provided challenges with limited column locations and tight head clearances particularly at

### **Project Owner**

Melbourne Water

### **Architect and Project Superintendent**

Woods Bagot

### **Service Engineer**

Irwinconsult

### **Builders**

Equiset Construction

### **Precast Manufacturer**

Hollow Core Concrete

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the ramps. This resulted in an ingenious solution to utilise the ramps' side barrier walls and stepped precast beams as structural support. This was achieved with the use of sophisticated 3D modelling software to model the entire structure, including the reinforcement within the precast components.

The southern wing adopted a different design solution, as this area was required to span over an operating public road leading to Etihad Stadium. To support the building structure over the road a two level steel truss, 54 metres in length was constructed. This truss supported hollowcore planks spanning 16 metres on levels one and three (level two did not exist on this side of the structure as the architectural design required a large open atrium on level one). On level three, the hollowcore planks cantilevered a further three metres, which in turn supported the perimeter precast edge beams that supported the extensive external glazing. Above level three, the structure was converted to a post-tensioned precast shell beam system supporting 200mm thick hollowcore planks spanning 8 metres. This design was able to provide a marginally lighter floor structure in order to reduce the loads on the steel truss, with temporary falsework required to support the shell beams during construction.

Part of the Digital Harbour design philosophy is to not only provide green buildings, but adaptable structures as well. As a result, the building not only had to meet all of the requirements of a 6 Green Star rated building, but also had to provide exposed soffits and achieve a class 2 'white painted' finish throughout - even in the car park. By using precast components this was easily achieved.

A further contract awarded to Hollow Core Concrete was for the design and construction of the trafficable elevated roadway from Latrobe Street to the entrance of the Melbourne Water building.

Again, due to the complex geometry and many restrictions due to vehicle movements, large pre-stressed precast beams supporting hollowcore were used. Precast barriers were fixed into the final structure with ramps and cross falls. In order to achieve the required geometry, 3D modelling was used to achieve the complexity and tight tolerances. The end result was just 10 days to install all the precast components for this complex area.

This structure utilised many different precast design solutions to provide a remarkable building. The end result is a stunning example of the flexibility of



precast concrete as a building material and of what is possible with a bit of imagination and support from the principle contractor and design team. The result is a beautiful mix of construction techniques achieving a remarkable result, showing that precast buildings do not need to be repetitive or modular. By simplifying the component geometry and standardising connection details, complex structures are easily achieved.

