



Ahead of the curve

Two landmark highrise apartment blocks that are now part of the famous Gold Coast skyline are testimony to teamwork, innovation and design that's literally outside the square.

The \$850 million Oracle luxury apartment development at Broadbeach comprises 'twin' 52-storey and 42-storey buildings set at 180 degrees from each other, the taller facing the beach, the other overlooking the hinterland.

One of the most striking features of these two buildings is their flowing, kidney-shaped curves formed with precast concrete panels, which clearly mark them out from neighbouring buildings.

According to Ian Coulter from Precast Concrete Products, which supplied the 1540 precast exterior panels used in the building facade, the graceful simplicity of these curves belies the extraordinarily complex planning, modelling and moulding required to achieve it.

Just one of the challenging features of this job was the unusual 'hammerhead' shaped panels. These comprised a 'shaft' and a 'head', a slender part and, within that, an elevation of 300, 600 or even 900 mm. Then there were the transition panels, which were an 'S' shape incorporating both concave and convex curves.

Precast Manufacturers

Precast Concrete Products
Asurco Contracting

Project Owner

Niecona

Architect and Project Superintendent

DBI Design

Service Engineer

Robert Bird Group

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A further degree of difficulty was that the bulk of the panels had subtly different shapes, due to the shaft and the head size changing on each level, requiring use of more than 20 moulds and calling for a mould change in one out of every three panels cast. In fact, the project called for a staggering 518 different panel shapes.

Meeting the program required casting

10 panels a day, a high enough work rate in itself, but also a huge logistics exercise, requiring tight teamwork with the builders and architects. Close collaboration was essential to decide the optimum order for transporting and erecting the panels. This in turn determined the sequencing of the casting and associated mould changes that were required to ensure construction was not interrupted.

“The complicated thing was that there were typical hammerhead panels up to a certain point and then the kidney shape of the structure began truncating as we got higher, which gave a third dimension to the panels,” says Ian. “This was not a job where you could cast and then store the panels, because their shapes meant they could not be stacked.”

The project’s constantly changing floor plan meant that at any given position in the building, the same place on the next floor was different. So while there was a uniform number of 18 panels per floor, this might require a vertical stretch of 10 identical panels in a row on one floor, then another stretch of 40 panels, each different from the next.”

In addition to creating the shapely façade of the building, the precast panels formed the edge of the structural formwork. These contained cast-in 600 mm galvanized starter bars which were used to attach the panels and form the perimeter of the building and the structural balcony elements.

The hammerhead panels, placed on a complicated stepped formwork, required specialised lifting gear to position them around the floor area. Once all was in place, the insitu concrete floor was poured.



Landmark GRC

Another striking feature of the buildings is the expanse of glass-reinforced concrete (GRC) walling which is lit with coloured lights to provide an iridescent landmark at night.

The GRC used in the project was supplied by Asurco Contracting. GRC was selected by the architects because of its light weight – at 100 kg per square metre, GRC panels were supported on the edge of the first level slab without large structural supports.

GRC features in the screen panels to the four-storied podium north building – the ones that are lit up at night. This comprised 24 panels 1.0 m high, 3.2 m wide and 0.2 m deep, which were fixed to the level one slab 0.6 m in front of the curtain wall to create an architectural feature and sun screen. The 12 mm GRC skin was overlayed over a hot dipped galvanized RHS steel frame that provided the structural support.

There are also 26 distinctive 'fins' made from GRC in the podium south commercial building. These hood-shapes are 9.0 metres high and 1 metre deep and have been painted in a vivid green to create a featured entrance to the commercial area.

"There was a real sense of collaboration and teamwork on this site, with every challenge addressed and overcome through creative thinking and planning each step to the finest degree," says Ian Coulter. "And I think the end result speaks for itself."