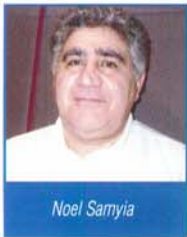


Precast from all Angles – A Team Effort

Marquet St, Rhodes NSW

One of the largest projects in Australia involving the use of precast in a multi-unit residential estate is currently being built in Marquet Street Rhodes, an inner western suburb of Sydney. The project is comprised of 11 buildings, some up to 7 storeys high and with spectacular view of Parramatta River. Some are medium rise 'typical rectangular cross-section' constructions whilst others are 'semi-circular' in cross-section. The project involves some 6000 units of precast concrete being manufactured off-site, then brought to site and erected quickly and safely. Balconies are one of the features of this project – obviously to capture the incredible view.



The Architect's Perspective

The architect for this project is Noel Samyia, Associate Director, PTW (previously known

as Peddle Thorp Walker Architects). Although Noel has been an architect for many years, his experience with precast had primarily been with one-off precast elements... but nothing on this scale where virtually the whole structure was precast. Having now been involved with a successful precast project of this scale, he says the key to the success was to examine the shop drawings in detail – a rigorous disciplined approach and as a result 'everything went like clockwork'.

With respect to the quality of work achieved by the precast manufacturers, he said "Even though we nominated Class 2 finish in the specification, the precaster virtually achieved Class 1 on nearly every panel. On site they were achieving rates of one floor per week with no wet trades and no formwork floor propping (when compared to conventional poured on-site floors)".

In conclusion Noel says "We felt it was value for money for the client and being very happy with the result we would be keen to do it again".



The Builder's Perspective

Baseline Constructions were engaged by

the developer to convert a traditional in-situ designed residential project to a modular precast built form. The design constraints were to 'not compromise' the architectural integrity of the design and still comply with pre-sales agreements and development consents.

Baseline took control of the modular system redesign and coordination in its 'design and construct' role without any delay to the contract start date. Their modular systems are easily adaptable to any project and the benefits are to be realised in time savings, a quality finished project and cost savings.

According to Project Manager Chris Shipway, "The major difference was that the site was cleaner and more efficient. It was good not seeing bricks and sand everywhere. The site had fewer workers, and these workers became crews designated to primary functions. The repetitive process of using precast floor to floor in a systematic fashion proved advantageous as the crews got a better knowledge of what to do 'quickly' on each floor. It became virtually just a 'panel on site erection process' rather than all the more complicated aspects of premixed concrete".

Chris' final words were "Having worked on this job, I am now convinced that precast is the way to go".

The Precaster's Perspective

Two major precast manufacturers were involved in the supply and erection of precast panels for floors and walls, namely Hanson Precast for the flooring and lift-well shafts, and Giroto Precast for the walling.



Precast Flooring Manufacturer

Hanson Precast's Marketing Manager Peter Webb, has seen precast become established as a mainstream building

system over the many years of his involvement in this industry. The flooring and liftwell units for this project were manufactured at two of their facilities, with the hollowcore flooring coming from their Mulgrave factory, and the liftwell units being produced at their Riverstone factory (both located in the north-western regions of Sydney).

According to Peter, the reason for the success of the project was communication. "Communication between all of the major players months in advance was crucial. The early decision to produce shop drawings gave us a fantastic opportunity to plan our production in a timely and cost effective manner".

Hanson Precast produced 3500 hollowcore floor panels ranging from 150mm deep to 300mm deep (a total area of 23,000 m²). Each panel was produced with a ± 3mm tolerance on thickness and strand location. The 28-day strength of these panels was a minimum 40 MPa. No supplementary cementitious materials (eg flyash or slag) were used in the production of the panels. Topping concrete was 32 MPa.

In addition to the flooring panels, they also supplied over 570 Transfloor panels (ie nearly 7000 m²) for balconies on this project. Due to the picturesque views of water from this Rhodes site, balconies were a key feature of

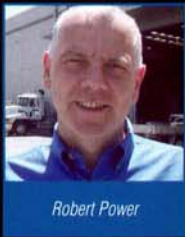
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Marquet St, Rhodes NSW

the design layout. These flooring panels are usually cast as a 75mm thick roughened slab with triangular shaped reinforcement already cast into the panel. An upturned beam at the edge, usually around 265mm high, forms the spandrel beam upon which balcony railing is provided (usually glazing). In-situ concrete (32 MPa grade) is then poured over the floor units to form a 'composite' action with the precast. The off-form finish of these panels is a Class 2 finish (i.e. a view which, in the words of the Formwork Code AS3610, would be 'subject to close scrutiny... where it can be repetitively achieved over large areas').



Robert Power

Precast Walling Manufacturer

All the precast walls were manufactured by Giroto Precast at their factory in Prestons, near Liverpool in New South Wales.

According to Robert Power, General Manager of Giroto Precast's NSW business, "it is hoped that this project would be the yardstick by which other similar projects would be judged and that once complete should convince other developers and builders of the merit of using precast on these multi-level, multi-unit developments".

The internal and external wall panels were 150mm thick and 180mm thick respectively. Panels had to satisfy a minimum 40 MPa compressive strength at 28 days. A high early strength Portland cement (in accordance with the cement code AS3972) was used but no supplementary cementitious materials (such as flyash or slag) were added. All external panels had shiplap joints (to prevent water ingress from outside).

Giroto Precast produced over 1600 wall panels with internal panels measuring 2.81m wide x 10m long and external panels measuring 3.10m wide x 10m long (both around 10 tonne in weight). All panels contained one layer of mesh, SL92 for the internal walls and RL918 for external wall panels. Craneage was strategically positioned to lift the large precast concrete panels into their final position on the structure.

Discussion and initial detailing on this project started at least 5 to 6 months before production commenced. We all worked well together (referring to the architect, the builder, the engineer and the other contractors) discussing all aspects of this job well before

even one panel was produced. Finally when panels were produced they remained in our factory under cover until required on site – panel quality being the essence of good precast", Robert Power said.



Rod Wong

The Structural Engineer's Perspective

The structural engineers for this project are Meinhardt & Partners and the main engineer

heading this project is Rod Wong (Associate Director). According to Rod, "there were initially three possible building systems being considered – (1) post-tensioned, (2) in-situ and (3) precast – the system eventually chosen being precast. In the end the client (Statewide) and the managers for the client (Integrated Project Services) achieved a significant time saving and competitive advantage by using precast concrete as the primary construction unit".

Meinhardt supplied the design live loads and specified the reinforcement for loadbearing walls. A key 'engineering' achievement of this project included the long span balconies. The two way span of some of the balconies of this project was around 3m (a large span using any building system). This span was even more of a challenge considering individual precast units had to achieve this objective.

According to Rod, the solution came in the form of Transfloor – precast units usually 75mm thick with reinforcement projecting from the concrete and with a Class 2 form finish on the soffit. Rod and his team took this essentially one-way precast unit and used them in a way to achieve a two-way spanning 'composite floor', thereby satisfying both short and long term Code deflection requirements.

In summary, it can be said that good communication and a team effort and using precast concrete as the primarily building component was the essence of the success on this project. This then will obviously become the benchmark for all subsequent multi-unit medium to high rise projects.



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