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CONCRETE ASSOCIATION AUSTRALIA

The Precast Industry - Looking Back and Looking Ahead

When one starts to think about where the precast industry will be in 10 years it helps to look back at where we have come from. At the turn of the new millennium we were consumed about the Y2K bug and what dire ramifications were going to befall us all on the stroke of midnight…

so what has happened since then? The precast industry has seen an exciting decade of change and here we explore some of the developments.

Flat panels

Hundreds of flat precast panels are now manufactured every day in Australia and for many designers it has become the building method of choice. A recent report showed that precast wall panels have grown over the last decade to now be the dominant choice of walling for non-residential buildings. Every state of Australia has many precasters that can offer building designers the unique advantages of precast flat panels. Precast insulated sandwich panels With more stringent energy efficient requirements demanded for BCA compliance, the precast industry has risen to the challenge with the now widespread availability of precast insulated sandwich panels. Sandwich panels consist of two layers of concrete held together by connectors, which sandwich an insulation layer. These panels have superior thermal and acoustic performance and can be fire rated to up to four hours. As well, they offer a fast, safe, durable, long-life, minimal maintenance construction solution.

Automation

Manufacture of hollowcore planks has always been automated. To add to that the last 10 years has seen some National Precast members investing heavily in manufacturing technology, and automated carousel manufacturing factories now exist in some states. These modern factories are extremely efficient and are able to manufacture a large number of panels quickly and in a very short lead time with less labour.

3D modelling

Precast manufacturers are increasingly adopting 3D modelling as a means of combating the poor documentation that is often presented for many projects. The trend by developers to partially document a project and go to tender to test the

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market conditions, has introduced some bad building practices into the construction industry. Maximising the benefits of precast (and the construction process generally) requires good documentation and the advantage of 3D modelling is that buildings are easily built in detail before any precast elements are made. This is an encouraging development.

Quality
The trend away from site-cast concrete elements has gained momentum over the last decade with many architects appreciating the improved quality that factory-cast, quality-tested precast can deliver.

Large infrastructure precast
We have seen an increase in the use of precast concrete for large infrastructure projects. In some instances dedicated factories have been built to manufacture the precast for a particular project.

Cranes and lifting
Over the last 10 years the boom in the availability of large mobile cranes in every state of Australia is staggering. These sophisticated machines are surprisingly manoeuvrable and relatively quick to set up. Their increased availability has resulted in a general increase of the average weight of individual precast elements on projects. Because a considerable portion of the cost of a precast element is based around the unit size and weight, this has led to a reduction in the manufacturing cost of precast concrete.

The on-going development of robust proprietary lifting systems has helped greatly in the safe erection of precast. The role of an erection engineer in some states has also improved the safe erection of precast concrete with this to become the norm for all states with the new National Code.

Knowledge
With the increased use of precast, there has been a corresponding improvement in the general knowledge of precast among specifiers and other stakeholders. Assisting this knowledge growth is the Precast Concrete Handbook. First released in 2002, the Handbook has been widely accepted, and the second edition was published in 2009.

To further enhance the growth of knowledge among specifiers and users, National Precast has run many seminars and workshops and has been actively involved in reviews of relevant Australian Standards.

Profile
The last 10 years has seen a significant shift in the precast industry's profile within the construction industry. A strong marketing and education focus has seen National Precast become a known brand within architectural, engineering and building offices alike. This has resulted in benefits for Association Members in terms of growing market share with its high quality precast being accepted as the 'material of choice' and the Association is now the first point of contact on all matters precast.

'Total precast' structures
More and more buildings are being designed and constructed as 'total precast' structures, as specifiers realise the benefits of using off-site manufactured precast walls, floors, beams and columns, and as the manufacturing capacity of the precast industry continues to expand. Many projects can have two or more manufacturers providing precast concrete to a project.

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Recognition that precast is sustainable
A better understanding among specifiers of why precast is more sustainable than alternative products and even cast in-situ concrete (less waste, locally supplied, less concrete used with precast vs in-situ concrete, long life, low maintenance, faster construction, safer sites, less noise and dust, thermal mass benefits etc) is seeing precast being used in sustainable design to its full effect. Specific initiatives can include use of sandwich panels, TermoDeck® and the use of recycled material in the precast concrete mix.

New techniques
With rising raw material costs (such as steel and cement), the precast industry has been driving advancements in the way concrete is mixed to better utilise raw materials. Use of supplements allows precast manufacturers to reduce water usage which in turn allows reduced cement usage… all at the same time as producing faster curing concrete with longer lifespans. Other newer techniques have added value to traditional grey wall panels. The increased availability and application of form liners and stains over the last 10 years, has provided designers with a vastly increased array of textures and patterns, and colour stains that are friendly to our environment require no on-going maintenance. And the finishes can be applied in the factory.

In summary…
Reflecting on the last 10 years in the precast industry highlights an exciting journey of successes and change. In that time National Precast members have kept up with the changing needs of their customers, have embraced larger and more complex projects, have embraced the need to produce a holistically sustainable product and have implemented new strategies and technologies. Investment into the industry by multinationals and competitive sector organisations in recent years recognises that precast concrete is now a mainstream building option for the construction industry that provides financial returns for shareholders.

And what of the next 10 years? We can expect more of the same… more change, more developments. Committed to producing ever increasing quality products, the precast industry is working more efficiently with better manufacturing systems and supplying value-added services. Today's clients are less tolerant of a marginal quality product and expect a lot more than they did 10 years ago and we expect tomorrow's clients to be even more so. The industry is up to the task.

What's new and innovative in the precast industry?

- Precast concrete sandwich panels – concrete/insulation/concrete held together by non-conductiveconnectors, with the bulk of the thermal mass on the inside of the structure (maximising use ofthermal mass) – high R-value, durable, fire resistant.
- Automation in many precast factories.
- Increased use of 3D modelling.
- Increased availability of large mobile cranes.
- Continued development of robust proprietary lifting systems.
- Increased design of 'total precast' structures.
- Use of recycled waste materials (e.g. flyash, recycled aggregate) in concrete mixes.

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- Optimising concrete mixes to reduce raw material use and for higher quality, more workable, fastercuring concrete.

- Form liners – increased availability & range, providing a myriad of cast-in patterns (e.g. brick,stone, geometric).

- Staining – 25 year guarantee, minimal maintenance needed, environmentally friendly product,providing translucent to opaque colours.

- TermoDeck® – using cores in hollowcore flooring and the high thermal mass of the concrete topump hot/cold air for energy efficient air-conditioning.