

# Irish Precast Concrete Association Seminar

by Brian O Murchú

The Irish Precast Concrete Association recently held a seminar in Citywest Hotel Dublin entitled 'The Future of Precast Concrete'. Presentations were made by some of the leading precasters, dealing with the most up-to-date developments in the sector. As part of the event the IPCA launched its new 'Precast Frames Guide' which outlines the various precast products on the Irish market with illustrations of the various construction techniques.

Precast is one of the rapidly developing sectors in the construction industry. In 1999 output from the sector represented approximately 25% of the concrete industry's turnover (excluding Agricultural and Civil Engineering). This figure rose dramatically to almost 50% in 2003 with the residential sector accounting for nearly 55% of the sectors output. Turnover for the Precast sector in 2003 was €250 million, representing over 10% of the concrete industry's €2 billion turnover. The precast industry employs almost 3,000 people.

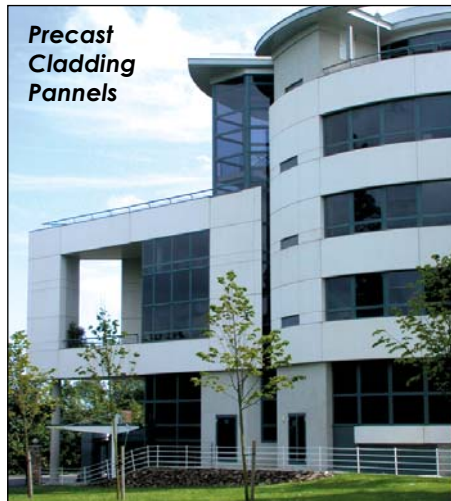
Speaking on behalf of the Irish Precast Concrete Association, Brian O Murchú outlined new developments in precast products, pointing out that precast was originally associated with industrial frames but is now associated with every building type. The presentation highlighted new developments in precast which allow greater flexibility so that even complicated 'organic shaped buildings' can now be constructed using precast techniques.

Precast is increasingly a mainstream construction method and is particularly suited to mixed construction because it is readily interfaces with virtually all other construction materials. With a wider range of new products and techniques now available, the previous 'all precast or no precast' approach to designing buildings no longer pertains.

Combining precast concrete with steel, cast in-situ concrete and glass maximises the benefits of each material. 'Mixed construction', which aims to maximise the physical properties of each material relative to the buildings function, is a developing side of the construction industry. Interest in mixed construction is growing with the wider availability of prefabricated elements which can be mixed and matched to produce new construction solutions, tailored to specific design requirements.

Precast is particularly well suited to take advantage of this growing sector for several reasons. Heavy investment in the sector in recent years has broadened the product

range, which now includes precast housing and apartment systems, attractive architectural cladding options for a range of building types and ancillary products such



as industrial wall panels, balconies, floor and stair units.

Concrete's inherent fire and sound resistance make it particularly suited to structural elements such as columns, beams, stair cores and flooring. Although combining different materials is the best option, care must be taken when substituting concrete structural elements with materials which perform poorly in fire. Steel can perform well as a structural element but requires extensive fire proofing.

There is growing awareness that precast realises more of the potential of concrete by greatly reducing the amount of formwork, scaffolding and wet concrete on site. It is also, more environmentally friendly in that the amount of construction waste on site is also greatly reduced.

With regard to future developments in precast, the development of Self Compacting Concrete (SCC) is of particular significance to the precast industry. SCC has incredible flow characteristics (low slump) and is particularly suited to applications where large amounts of steel reinforcing are present. Because of its low viscosity, SCC requires good quality shuttering to prevent leakage at joints and this can best be controlled in a factory environment. This form of concrete is currently used extensively by the precast industry in Holland where it has become the mainstream precast material.

The development of newer technologies such as 'nanotechnology' will impact on concrete, although not with immediate effect. Current studies show that 'nanotechnology', although still in its infancy, can be used to alter the hydration process in concrete. Interestingly, 'Self-Cleansing Concrete' is likely to be one of the first commercial applications to emerge from this new technology, although 'nanotechnology' is already commercially applicable in the form of 'Self-Cleansing Glass'.

Caroline Quinn of the Concast Precast Group gave a detailed presentation on a number of landmark projects in which the company is currently involved, including the ESB power station in Lanesboro which at 19 stories tall is Ireland's tallest ever Precast building. Concast are also leaders in the provision of precast housing & apartment dwellings and a detailed account and slide presentation was given on major precast housing developments currently under development in the Dublin area.

Other speakers included Vivian Hand, senior design engineer with Techrete Ltd. who gave an account of Techrete's impressive range of cladding panel products. Techrete is the leading provider of cladding panels in Ireland and the U.K., and the company is currently involved in major projects in this country and abroad. Techrete's range of products includes both load bearing and non load bearing panels as well as insulated sandwich panels for industrial buildings. Techrete are currently developing a self-supporting stacked sandwich panel which eliminates the need



for a supporting structure. Other products being demonstrated included a brick slip finish panel, and a terracotta anchored panel which is being used extensively as a cladding in the Dundrum Shopping Centre, an extensive retail development on the outskirts of Dublin which will soon be serviced by Dublin's new 'Luas' light rail system.

Peter Deegan of Banagher Concrete gave an account of Banagher's involvement in the Dublin Port Tunnell project. Banagher manufactured almost 13,000 precast concrete ring segments which are being assembled on site to form a tunnel lining. Each precast unit is manufactured to an extremely high tolerance involving the implementation of a strict regime of quality control measures and procedures.

To conclude the Seminar, OPW Architect Séan Moylan gave a presentation on Concrete & Sustainability. Séan, who is also a Council member of the Irish Concrete Society, made comparisons between the use of concrete and alternative materials. Making comparisons on the basis of detailed statistics, Séan argued that compared to alternative materials such as steel and timber, concrete performs particularly well -



despite the perception to the contrary of many in the architectural profession. He demonstrated that for a range of typical structures concrete gives a better than average performance at 1.5 to 2.5 GJ/m<sup>2</sup>, compared with structural steel which range from 2.6 to 2.9 GJ/m<sup>2</sup>. Most interestingly, Séan quoted figures from the recently completed Timber Frame Consortium Report which show that there is 10 times more embodied energy and 8 times more embodied Carbon Dioxide in a tonne of softwood than in a tonne of structural concrete, in the Irish Context.



Séan concluded his presentation by giving a detailed account of the BedZED (Zero Energy Development) in the U.K. This project is sited on a reclaimed brown field site and features high efficiency heat exchanger technology, combined with the use of the stack effect to circulate fresh air and the use of extensive glazing in the south facing elevation of the building to heat up the concrete structure which acts as a heat reservoir.

The seminar was attended by over 120 Engineers, Architects and Developers.