

Safer and faster construction



Smaller skilled teams are tasked with the installation of the precast concrete structure.

By Willie de Jager

One of the advantages of hybrid concrete construction (HCC) is that it is a safer alternative to conventional in situ building techniques.

The modular precast concrete system is manufactured off site and then transported on a just-in-time basis to site where they are installed. Sections or portions of a construction project are undertaken off site in a controlled factory environment, while only skilled teams are required to install the modular precast concrete system on site.

The modular precast concrete system comprises beams and columns, as well as slabs, including hollow-core and rib-and-block systems. They are manufactured in a factory and then transported on a just-in-time basis to site where they are installed. Manufacture of the individual precast concrete items is extremely labour intensive, and operations are reliant upon skilled workers.



Working on multiple projects simultaneously, their work is repetitive in nature and they do not have to contend with the many variables that are encountered on site. This has also played a prominent role in the high levels of accuracy and quality that have been achieved on many HCC projects, while also contributing towards their buildability.

Different techniques are deployed in the manufacture of precast concrete items.

They vary from steel fixing and placing concrete in conventional moulds, through to extrusion that entails mechanically placing the construction material on a long pre-stressing line.

Both manufacturing techniques are undertaken at ground level and do not require temporary support work and scaffolding, as is the case on a conventional in situ building programme. In addition to providing safer working conditions, this approach promotes higher productivity levels, with fully cured precast concrete elements able to be manufactured in as little as 24 hours from the placement of the steel reinforcement in the moulds.

In situ construction conventionally requires three separate teams. Following on the earthworks, workers place and fix the steel reinforcement for the foundations while another team then establishes the formwork. These teams, comprising mainly moderately skilled people, may be required to work in awkward positions and at heights, compounding safety risks on construction projects.

The placement and finishing of the concrete is then undertaken by a combination of skilled and unskilled workers.

Depending on the type of elements being used, a team comprising only about seven people is required to install a precast modular system. It includes a specialist mobile crane operator who can safely handle the lifting and placement of the heavy precast concrete elements as they arrive on site. In addition to timely transportation of the items from the factory to the site, rigging capabilities are critical for a successful HCC project. Not only do professional teams demand high levels of efficiencies, they want to be reassured that the handling of the heavy items will be undertaken safely.

One of Corestruc's strengths has always been its own in-depth expertise and capabilities in all components of the precast concrete supply chain, starting

with design through to full project management during the installation phases. Its teams work alongside those tasked with the in situ component of the project.

The crane operator is accompanied by a rigger. The number of workers accompanying the crane operator and rigger depend on the type of project, and they work at heights with man-access platforms, as opposed to scaffolding.

Precision in the casting process and sound upfront planning also mitigate inaccuracies and over-handling of the various precast concrete elements. The role that precast concrete plays in providing a cleaner site is noticeable, minimising the need for heavy construction material delivery vehicles. This also contributes towards safer site practices.

It has taken time for HCC projects to gain traction in South Africa, compared to countries in the developed world. This is considering the focus on labour-based construction in the country. The extremely labour-intensive nature of the manufacturing component of the precast concrete value chain is often overlooked.

In addition to providing a safer working environment for many people, workers in the precast concrete sector also enjoy secure employment, motivating ongoing investment by companies into internal skills development and training of their staff. This, in turn, has resulted in higher paid jobs and, therefore, improved living conditions. ■■

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